

SOUTHEAST ELECTRICAL SOLUTIONS

Title	Hailsham Active Circuit
Project no.	1650
Operation scenario	
Client	Hailsham Town Council
Date	09/05/2021
Company	Southeast Electrical Solutions Ltd - Southeast Electrical Solutions Ltd
Designer	Steve Lissamore

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Main supply report : Supply

Company	Southeast Electrical Solutions Ltd - Southeast Electrical Solutions Ltd	SOUTHEAST ELECTRICAL SOLUTIONS
Designer	Steve Lissamore	

Supply details

Description	Supply
Supply method	User defined source @100kVA
Phase/Voltage	Single-phase 230V 50Hz
Earthing system	TN-C-S
Voltage drop limit	Public supply: Lighting 3%, other uses 5%

Prospective symmetrical 3Ph fault

Isc-3ph (kA)	-
Zp-p (Ω)	-
cos φ	-

Prospective Ph to N fault

Isc-1ph (kA)	0.66
Zp-n (Ω)	0.35
cos φ	0.5

Prospective earth fault

Ief (kA)	0.66
Ze (Ω)	0.35

Earthing arrangements

Earthing conductor (mm²)	-
Earthing electrode resistance (Ω)	0
Main bonding conductor (mm²)	10

Min/Max Fault levels

Isc-max (kA)	0.66	Cmax	1	Isc-min (kA)	0.66	Cmin	1
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Protection by supplier

Fuse 1P 63A/80kA

Main protective device

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Load calculations

Phase	L1	L2	L3	N
Connected load (A)	4.52	0	0	
Diversified load (A)	4.52	0	0	
Spare load (A)	0 (0%)	0	0	
Design load (A) (Diversified + Spare)	4.52	0	0	4.52

Design load power calculations

Phase	L1	L2	L3	Total
kVA	1.04	0	0	1.04
kW	1.04	0	0	1.04
kVAr	0	0	0	0
cos φ	1	1	1	-

Main conductor

2x1Cx25mm² + 1x25mm² E
Pvc70/S/Cu Length: 2m

Circuits schedule report : Main DB

Company	Southeast Electrical Solutions Ltd - Southeast Electrical Solutions Ltd	Designer	Steve Lissamore
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Description		Voltage	Phase	Total circuit ways		Spare load	Spare ways		Empty ways	
Main DB		230V AC	SP&N	7		0%	3		1Ph: 0 (0%)	
							L1	L2	L3	
Location:	Other Electrical installation	Mounting:	Surface	Reference No.:		Connected load (A) Diversified load (A) Diversified+Spare load (A)	4.52			
Connected from:	Supply	IP Rating:	IP 4X	Isolator Rating:	125		4.52			
Zs (Ω):	0.3524	Board Rating (A):		Fault Rating (kA):			4.52			

					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	Lighting Feed 1 East	3Cx6mm ² + E(cable core and armour) SwaPvc70/M/Cu Length: 350m	RCBO C 1P 30mA Instant AC 6A/10kA Eaton EMCH Type C 10kA - 30mA	1 1 0			1.65 1.65		
2	L1	Lighting Feed 2 West	3Cx6mm ² + E(cable core and armour) SwaPvc70/M/Cu Length: 350m	RCBO C 1P 30mA Instant AC 6A/10kA Eaton EMCH Type C 10kA - 30mA	1 1 0			0.65 0.65		
3	L1	Lighting control	2x1Cx1mm ² + 1x1.5mm ² E Pvc70/S/Cu Length: 10m	RCBO B 1P 30mA Instant AC 6A/10kA Eaton EMBH Type B 10kA - 30mA	1 1 0			0.04 0.04		
4	L1	Frost protection heater	2x1Cx2.5mm ² + 1x1.5mm ² E Pvc70/S/Cu Length: 10m	RCBO B 1P 10mA Instant AC 16A/10kA Eaton EMBH Type B 10kA - 10mA	1 1 0			2.17 2.17		
5	L1	Spare	-		1 1 0			0 0		
6	L1	Spare	-		1 1 0			0 0		
7	L1	Spare	-		1 1 0			0 0		
L1		Main DB	2x1Cx25mm ² + 1x25mm ² E Pvc70/S/Cu Length: 2m		1 1 0			4.52 4.52 4.52		

Brief calculations report : Main DB				SOUTHEAST ELECTRICAL SOLUTIONS
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			Steve Lissamore	

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	$I_b \leq I_n/I_r \text{ (A)}$	$\min I_z \leq I_t \text{ (A)}$	$I_{sc} \leq I_{cu} \text{ (kA)}$	$I^2t \leq k^2s^2 \text{ (x10}^3\text{)}$	$cpc \geq \sqrt{(I^2t)/k} \text{ (mm}^2\text{)}$	$Z_s \leq \max Z_s \text{ (}\Omega\text{)}$	$\text{disc} \leq \max \text{ (s)}$	
L1		Main DB	$4.52 \leq 63$	$69.3 \leq 101$	$0.66 \leq 80$	$42.87 \leq 8265.63$	$25 \geq 1.71$	$0.35 \leq 0.77$	$0.1 \leq 5$	OK

1	L1	Lighting Feed 1 East	$1.65 \leq 6$	$6.67 \leq 46$	$0.65 \leq 10$	$0.07 \leq 476.1$	$16.2 \geq 0.08$	$2.36 \leq 3.82$	$0.01 \leq 0.4$	OK
2	L1	Lighting Feed 2 West	$0.65 \leq 6$	$6.67 \leq 46$	$0.65 \leq 10$	$0.07 \leq 476.1$	$16.2 \geq 0.08$	$2.36 \leq 3.82$	$0.01 \leq 0.4$	OK
3	L1	Lighting control	$0.04 \leq 6$	$6 \leq 13.5$	$0.65 \leq 10$	$1.11 \leq 13.23$	$1.5 \geq 0.31$	$0.62 \leq 7.69$	$0.01 \leq 0.4$	OK
4	L1	Frost protection heater	$2.17 \leq 16$	$16 \leq 24$	$0.65 \leq 10$	$2.4 \leq 82.66$	$1.5 \geq 0.37$	$0.51 \leq 2.89$	$0.01 \leq 0.4$	OK
5	L1	Spare	-	-	-	-	-	-	-	-
6	L1	Spare	-	-	-	-	-	-	-	-
7	L1	Spare	-	-	-	-	-	-	-	-

Voltage drop analysis report : Main DB				SOUTHEAST ELECTRICAL SOLUTIONS
Company	Southeast Electrical Solutions Ltd - Southeast Electrical Solutions Ltd	Designer	Steve Lissamore	

					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	1%	2%	3%	4%	5%	6%	7%	8%	9%	10+	
L1		Main DB	2m, 2x1Cx25mm² + 1x25mm² E Pvc70/S/Cu	4.52	1.8	0.33	1	0.87	0	0	0	5											
1	L1	Lighting Feed 1 East	350m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	1.65	7.3	0	1	0.87	0	1.17	1.17	3.5											
2	L1	Lighting Feed 2 West	350m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	0.65	7.3	0	1	0.87	0	0.45	0.46	3.5											
3	L1	Lighting control	10m, 2x1Cx1mm² + 1x1.5mm² E Pvc70/S/Cu	0.04	44	0	1	0.87	0	0.01	0.01	5											
4	L1	Frost protection heater	10m, 2x1Cx2.5mm² + 1x1.5mm² E Pvc70/S/Cu	2.17	18	0	1	0.87	0	0.15	0.15	5											
5	L1	Spare	-	-	-	-	-	-	-	-	-	-											
6	L1	Spare	-	-	-	-	-	-	-	-	-	-											
7	L1	Spare	-	-	-	-	-	-	-	-	-	-											

Connected loads analysis report

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Company

**Southeast Electrical Solutions Ltd - Southeast
Electrical Solutions Ltd**

Designer

Steve Lissamore

Load types analysis for the whole installation

Connected Load Type	Circuits	Installation Points	Phase	L1 (kVA)	L2 (kVA)	L3 (kVA)	Connected kVA
Lighting	2	35	SPN	.53	.00	.00	.53
Provision	1	1	SPN	.01	.00	.00	.01
Electric heating element	1	1	SPN	.50	.00	.00	.50

Connected loads analysis report

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Designer

Steve Lissamore

Load types analysis for distribution circuit

Distribution Circuit Details		Connected / Diversified Load					Design Load Analysis				
Description	Main DB		L1	L2	L3	Total		L1	L2	L3	Total / N
Voltage (V)	230	Connected kVA	1.04	.00	.00	1.04	Amperes	4.52	0	0	4.52
Phase	SPN	Diversified kVA	1.04	.00	.00	1.04	kVA	1.04	0	0	1.04
Max. Demand	4.52 A	Power factor	1	1	1		kW	1.04	0	0	1.04
Location	Other Electrical installation	Spare %	0				kVAr	0	0	0	0

Connected Load Type	Circuits	Installation Points	Phase	L1 (kVA)	L2 (kVA)	L3 (kVA)	Connected kVA
Lighting	2	35	SPN	.53	.00	.00	.53
Provision	1	1	SPN	.01	.00	.00	.01
Electric heating element	1	1	SPN	.50	.00	.00	.50

Analytical calculations report : Main DB																	
Company			Southeast Electrical Solutions Ltd - Southeast Electrical Solutions Ltd			Designer		Steve Lissamore									
Circuit Description	Main DB		Voltage / Phase		Single phase+N (230V) / L1			Cable ID	c-d-1								
Supply from	Supply		Circuit type		Din Rail			Cable Classification									
Circuit design data																	
Conductor type		Single-core 70°C thermoplastic insulated non-armoured, 2x1Cx25mm ² + 1x25mm ² E, Pvc70/S/Cu							Length (m)	2							
		Element	Copper (Cu)		Armour	No		Temp (°C)	Full loaded:70 / Actual:30.1		Reference	BS/4D1					
Installation method		In trunking on a wall running horizontally - Reference method B					Correction factors		Ci:1 Cg:1 Ca:1 Ct:0.87 Cf:1 Ch:1								
		Settings	In Metallic Trunking dimensions (mm x mm) 100x100. Ambient temperature (°C): 30.														
Protective conductor C.P.C		Installation settings		Separate conductor													
		Separate conductor (mm ²)		25		Other cpc (mm ²)		0		Total equivalent to Cu (mm ²)		25					
Protective devices		Overcurrent		Generic, BS88 fuses (from supply) Rating(A): 63						Icu / Ics	80kA / 80kA						
		RCD/Earth fault device		No						mA	-						
Circuit calculations																	
Currents (A)								Impedances (Ω) at operating temperature									
Design current I _b		Device rating I _n		Minimum effective conductor capacity - min I _z		Tabulated conductor capacity I _t		Phase conductor Z ₁		CPC Z ₂		Earth external		Phase external			
4.52		63		69.3		101		0.00183		0.00183		0.35		0.35			
Load factors		L1		L2		L3		Design load		L1		L2		L3			
Power factor		1		-		-				Current (A)		4.52		-		-	
3rd Harmonics (%)		0		-		-				Load (kVA)		1.04		-		-	
Diversity factor		1		-		-				Resistive (kW)		1.04		-		-	
Spare (%)		0								Reactive (kVAr)		0		-		-	
Voltage drop		L1		L2		L3		N/Totals		Source (%)		0		-			
		Circuit (%)		0		-				Total (%)		0		-			
		Limit		Public supply other uses:5%													
		Earth Fault Calculations		Earth fault current(kA)		Z _s (Ω) at fault conditions				Max Z _s (Ω)		Max Disconnection Time (s)		Device Disconnection Time (s)		Min CPC (mm ²)	
		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)			
		0.62		0.3524		0.7744		5		0.1006		1.71					
		0.66		0.65		0.65		0.1		19.4							

Analytical calculations report : Lighting Feed 1 East													SOUTHEAST ELECTRICAL SOLUTIONS
Company		Southeast Electrical Solutions Ltd - Southeast Electrical Solutions Ltd				Designer			Steve Lissamore				
Circuit Description		Lighting Feed 1 East		Voltage / Phase		Single phase+N (230V) / L1			Cable ID		c-f-1		
Supply from		Main DB (Way 1)		Circuit type		Lighting x22			Cable Classification				
Circuit design data													
Conductor type		Multicore 70°C thermoplastic insulated armoured, 3Cx6mm ² + E(cable core and armour), SwaPvc70/M/Cu									Length (m)	350	
		Element	Copper (Cu)	Armour	Steel	Temp (°C)	Full loaded:70 / Actual:20.1			Reference	BS/4D4		
Installation method		In underground single way ducts - Reference method D					Correction factors		Cc:0.9 Cd:1 Cs:1 Cg:1 Ca:1 Ct:0.87 Cf:1 Ch:1				
		Settings	In Plastic Conduit Φ75 Light 1 Bends. Ground temperature (°C): 20. Underground settings: Depth 0.7m. Soil thermal resistivity 2.5K.m/W.										
Protective conductor C.P.C		Installation settings		Cable armour and integral conductor									
		Integral conductor (mm ²)		6	Armour (mm ²)		23		Total equivalent to Cu (mm ²)		16.2		
Protective devices		Overcurrent		Eaton, EMCH Type C 10kA - 30mA Rating(A): 6						Icu / Ics	10kA / 10kA		
		RCD/Earth fault device		RCBO, 6A. Touch voltage = 0.07V (Maximum = 50V)						mA	30		
Circuit calculations													
Currents (A)							Impedances (Ω) at operating temperature						
Design current I _b	Device rating I _n	Minimum effective conductor capacity - min I _z		Tabulated conductor capacity I _t		Phase conductor Z ₁		CPC Z ₂	Earth external		Phase external		
1.65	6	6.67		46		1.2775		0.88259	0.3524		0.3524		
Load factors	L1	L2	L3	Design load	L1	L2	L3	N/Totals	Voltage drop	L1	L2	L3	
Power factor	1	-	-	Current (A)	1.65	-	-	1.65	Source (%)	0	-	-	
3rd Harmonics (%)	0	-	-	Load (kVA)	0.38	-	-	0.38	Circuit (%)	1.17	-	-	
Diversity factor	1	-	-	Resistive (kW)	0.38	-	-	0.38	Total (%)	1.17	-	-	
Spare (%)	-			Reactive (kVAr)	0	-	-	0	Limit	Public supply lighting:3.5% (extra limit >100m = 0.5%)			
Earth Fault Calculations	Earth fault current(kA)		Zs(Ω) at fault conditions		Max Zs(Ω)		Max Disconnection Time (s)		Device Disconnection Time (s)		Min CPC (mm ²)		
	0.09		2.3583		3.8226		0.4		0.01		0.08		
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)			
	0.65		0.1		0.08		0.01			68.08			

Analytical calculations report : Lighting Feed 2 West													SOUTHEAST ELECTRICAL SOLUTIONS		
Company		Southeast Electrical Solutions Ltd - Southeast Electrical Solutions Ltd				Designer			Steve Lissamore						
Circuit Description		Lighting Feed 2 West		Voltage / Phase			Single phase+N (230V) / L1			Cable ID		c-f-1			
Supply from		Main DB (Way 2)		Circuit type			Lighting x13			Cable Classification					
Circuit design data															
Conductor type		Multicore 70°C thermoplastic insulated armoured, 3Cx6mm ² + E(cable core and armour), SwaPvc70/M/Cu									Length (m)		350		
		Element	Copper (Cu)		Armour	Steel		Temp (°C)	Full loaded:70 / Actual:20			Reference	BS/4D4		
Installation method		In underground single way ducts - Reference method D					Correction factors		Cc:0.9 Cd:1 Cs:1 Cg:1 Ca:1 Ct:0.87 Cf:1 Ch:1						
		Settings	In Plastic Conduit Φ75 Light 1 Bends. Ground temperature (°C): 20. Underground settings: Depth 0.7m. Soil thermal resistivity 2.5K.m/W.												
Protective conductor C.P.C		Installation settings		Cable armour and integral conductor											
		Integral conductor (mm ²)		6	Armour (mm ²)		23		Total equivalent to Cu (mm ²)			16.2			
Protective devices		Overcurrent		Eaton, EMCH Type C 10kA - 30mA Rating(A): 6							Icu / Ics		10kA / 10kA		
		RCD/Earth fault device		RCBO, 6A. Touch voltage = 0.07V (Maximum = 50V)							mA		30		
Circuit calculations															
Currents (A)								Impedances (Ω) at operating temperature							
Design current I _b		Device rating I _n		Minimum effective conductor capacity - min I _z		Tabulated conductor capacity I _t		Phase conductor Z ₁		CPC Z ₂	Earth external		Phase external		
0.65		6		6.67		46		1.2775		0.88259	0.3524		0.3524		
Load factors		L1	L2	L3	Design load		L1	L2	L3	N/Totals	Voltage drop		L1	L2	L3
Power factor		1	-	-	Current (A)		0.65	-	-	0.65	Source (%)		0	-	-
3rd Harmonics (%)		0	-	-	Load (kVA)		0.15	-	-	0.15	Circuit (%)		0.45	-	-
Diversity factor		1	-	-	Resistive (kW)		0.15	-	-	0.15	Total (%)		0.46	-	-
Spare (%)		-			Reactive (kVAr)		0	-	-	0	Limit		Public supply lighting:3.5% (extra limit >100m = 0.5%)		
Earth Fault Calculations		Earth fault current(kA)		Zs(Ω) at fault conditions		Max Zs(Ω)		Max Disconnection Time (s)		Device Disconnection Time (s)		Min CPC (mm ²)			
		0.09		2.3583		3.8226		0.4		0.01		0.08			
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)					
		0.65		0.1		0.08		0.01		68.08					

Analytical calculations report :Lighting control											SOUTHEAST ELECTRICAL SOLUTIONS	
Company		Southeast Electrical Solutions Ltd - Southeast Electrical Solutions Ltd			Designer		Steve Lissamore					
Circuit Description		Lighting control		Voltage / Phase		Single phase+N (230V) / L1			Cable ID	c-f-3		
Supply from		Main DB (Way 3)		Circuit type		Provision			Cable Classification			
Circuit design data												
Conductor type		Single-core 70°C thermoplastic insulated non-armoured, 2x1Cx1mm² + 1x1.5mm² E, Pvc70/S/Cu							Length (m)	10		
		Element	Copper (Cu)	Armour	No	Temp (°C)	Full loaded:70 / Actual:30		Reference	BS/4D1		
Installation method		In conduit on a wall - Reference method B				Correction factors	Ci:1 Cg:1 Ca:1 Ct:0.87 Cf:1 Ch:1					
		Settings	In Metallic Conduit Φ20 Light 1 Bends. Ambient temperature (°C): 30.									
Protective conductor C.P.C		Installation settings		Separate conductor								
		Separate conductor (mm²)		1.5	Other cpc (mm²)		0		Total equivalent to Cu (mm²)		1.5	
Protective devices		Overcurrent		Eaton, EMBH Type B 10kA - 30mA Rating(A): 6						Icu / Ics	10kA / 10kA	
		RCD/Earth fault device		RCBO, 6A. Touch voltage = 0.02V (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		
0.04	6	6		13.5	0.22		0.145	0.3524		0.3524		
Load factors	L1	L2	L3	Design load	L1	L2	L3	N/Totals	Voltage drop	L1	L2	L3
Power factor	1	-	-	Current (A)	0.04	-	-	0.04	Source (%)	0	-	-
3rd Harmonics (%)	0	-	-	Load (kVA)	0.01	-	-	0.01	Circuit (%)	0.01	-	-
Diversity factor	1	-	-	Resistive (kW)	0.01	-	-	0.01	Total (%)	0.01	-	-
Spare (%)	-			Reactive (kVAR)	0	-	-	0	Limit	Public supply other uses:5%		
Earth Fault Calculations		Earth fault current(kA)		Zs(Ω) at fault conditions		Max Zs(Ω)		Max Disconnection Time (s)		Device Disconnection Time (s)		Min CPC (mm²)
		0.35		0.6227		7.6937		0.4		0.01		0.31
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)		
		0.65		0.37		0.33		0.01		0.12		

Analytical calculations report : Frost protection heater											SOUTHEAST ELECTRICAL SOLUTIONS			
Company		Southeast Electrical Solutions Ltd - Southeast Electrical Solutions Ltd			Designer			Steve Lissamore						
Circuit Description		Frost protection heater		Voltage / Phase		Single phase+N (230V) / L1			Cable ID			c-f-3		
Supply from		Main DB (Way 4)		Circuit type		Electric heating element			Cable Classification					
Circuit design data														
Conductor type		Single-core 70°C thermoplastic insulated non-armoured, 2x1Cx2.5mm² + 1x1.5mm² E, Pvc70/S/Cu								Length (m)		10		
		Element	Copper (Cu)	Armour	No	Temp (°C)	Full loaded:70 / Actual:30.3			Reference	BS/4D1			
Installation method		In conduit on a wall - Reference method B				Correction factors		Ci:1 Cg:1 Ca:1 Ct:0.87 Cf:1 Ch:1						
		Settings	In Plastic Conduit Φ20 Light 1 Bends. Ambient temperature (°C): 30.											
Protective conductor C.P.C		Installation settings		Separate conductor										
		Separate conductor (mm²)		1.5	Other cpc (mm²)		0		Total equivalent to Cu (mm²)			1.5		
Protective devices		Overcurrent		Eaton, EMBH Type B 10kA - 10mA Rating(A): 16						Icu / Ics	10kA / 10kA			
		RCD/Earth fault device		RCBO, 16A. Touch voltage = 0.01V (Maximum = 50V)						mA	10			
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			
2.17	16	16		24		0.09		0.145	0.3524		0.3524			
Load factors	L1	L2	L3	Design load		L1	L2	L3	N/Totals	Voltage drop		L1	L2	L3
Power factor	1	-	-	Current (A)		2.17	-	-	2.17	Source (%)		0	-	-
3rd Harmonics (%)	0	-	-	Load (kVA)		0.5	-	-	0.5	Circuit (%)		0.15	-	-
Diversity factor	1	-	-	Resistive (kW)		0.5	-	-	0.5	Total (%)		0.15	-	-
Spare (%)	-			Reactive (kVAR)		0	-	-	0	Limit		Public supply other uses:5%		
Earth Fault Calculations		Earth fault current(kA)		Zs(Ω) at fault conditions		Max Zs(Ω)		Max Disconnection Time (s)		Device Disconnection Time (s)		Min CPC (mm²)		
		0.43		0.5132		2.8853		0.4		0.01		0.37		
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)			
		0.65		0.52		0.49		0.01			0.35			

Zs - Earth fault loop impedance report : Main DB					SOUTHEAST ELECTRICAL SOLUTIONS
Company	Southeast Electrical Solutions Ltd - Southeast Electrical Solutions Ltd		Designer	Steve Lissamore	

Uo - Nominal Line Voltage to Earth: 230V

					Max Discon.	Zs Calculated (Ω)		Max Zs Calculated (Ω)	
Way	Phase	Description	Conductor	Protective devices	time(s)	Zs	Zs x 0.8	max Zs	max Zs x 0.8
L1		Main DB	2x1Cx25mm ² 1x25mm ² E Pvc70/S/Cu Length: 2m		5	0.35	0.28	0.77	0.62
1	L1	Lighting Feed 1 East	3Cx6mm ² E(cable core and armour) SwaPvc70/M/Cu Length: 350m	RCBO C 1P 30mA Instant AC 6A/10kA Eaton EMCH Type C 10kA - 30mA	0.4	2.36	1.89	3.82	3.06
2	L1	Lighting Feed 2 West	3Cx6mm ² E(cable core and armour) SwaPvc70/M/Cu Length: 350m	RCBO C 1P 30mA Instant AC 6A/10kA Eaton EMCH Type C 10kA - 30mA	0.4	2.36	1.89	3.82	3.06
3	L1	Lighting control	2x1Cx1mm ² 1x1.5mm ² E Pvc70/S/Cu Length: 10m	RCBO B 1P 30mA Instant AC 6A/10kA Eaton EMBH Type B 10kA - 30mA	0.4	0.62	0.5	7.69	6.16
4	L1	Frost protection heater	2x1Cx2.5mm ² 1x1.5mm ² E Pvc70/S/Cu Length: 10m	RCBO B 1P 10mA Instant AC 16A/10kA Eaton EMBH Type B 10kA - 10mA	0.4	0.51	0.41	2.89	2.31
5	L1	Spare	-		-	-	-	-	-
6	L1	Spare	-		-	-	-	-	-
7	L1	Spare	-		-	-	-	-	-

