

Company	SHD Lighting Consultancy Ltd
Designer	Stephen Higham

Client	Vistry (Merseyside)
Date	25/04/2025

Title	Lickers Lane
Project no.	SHD2082

Stage	Early design
Status	Preliminary
Operation scenario	FP03 Cable Calculation

Project revisions

Revision	Revision by	Revision date	Comment
R0	Steve Higham	25/04/2025	

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Main supply report									
Company		SHD Lighting Consultancy Ltd							
Designer		Stephen Higham							
Supply details									
Description		Supply							
Supply method		User defined source/origin point Supply@100kVA							
Phase/Voltage		Single-phase 230V 50Hz							
Earthing system		TN-C-S							
Voltage drop limit		Public supply: Lighting 3%, other uses 5%							
Prospective 1Ph fault				Prospective Ph to N fault					
Ipf (kA)		7.2463		Ipn (kA)		7.2463			
Zpf (Ω)		0.0317		Zpn (Ω)		0.0317			
p.f.		0.5		p.f.		0.5			
Prospective earth fault				Earthing arrangements					
Ief (kA)		0.6571		Earthing conductor (mm²)		1x25			
Ze (Ω)		0.351		Earthing electrode resistance (Ω)		0			
p.f.		0.5		Main bonding conductor (mm²)		25			
Min/Max Fault levels									
Isc-max (kA)		7.0415	Cmax	1	Isc-min (kA)		7.2463	Cmin	1
Protection by supplier					Main protective device				
-					Fuse 1P 25A/80kA Generic BS88 fuses				
Meter tails			25mm² Single-core 70°C PVC non-armoured, L:1m						
Load calculations									
Phase		L1		L2		L3		N	
Connected load (A)		0.12		0		0		0.12	
Diversified load (A)		0.12		0		0		0.12	
Spare load (A)		0 (0%)		0		0		-	
Design load power calculations									
Phase		L1		L2		L3		Total	
Design load (A) (Diversified + Spare)		0.12		0		0		N:0.12	
kVA		0.03		0		0		0.03	
kW		0.03		0		0		0.03	
kVAr		0		0		0		0	
cos φ		1		1		1		1	
Main conductor			2Cx25mm² + 1x25mm² E PVC70/M/Cu Length: 1m						

Maximum demand report												
Company		SHD Lighting Consultancy Ltd										
Designer		Stephen Higham										
Supply details												
Description		Supply										
Supply method		User defined source/origin point Supply@100kVA										
Phase/Voltage		Single-phase 230V 50Hz										
Earthing system		TN-C-S										
Design load power calculations												
Phase		L1			L2			L3			Total	
kVA		0.03			0			0			0.03	
kW		0.03			0			0			0.03	
kVAr		0			0			0			0	
cos φ		1			1			1			-	
Load calculations												
Phase		L1			L2			L3			N	
Connected load (A)		0.12			0			0			0.12	
Diversified load (A)		0.12			0			0			0.12	
Spare load (A)		0 (0%)			0			0				
Design load (A) (Diversified + Spare)		0.12			0			0			N:0.12	
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
FP01 [Sub-Circuits]		1	1	1	0.12	0	0		0.03	0	0	0.03
N/A		1	1	1	0.12	0	0		0.03	0	0	0.03
N/A		0	0	0	0.12	0	0	0.12	0.03	0	0	0.03

Circuits schedule report : FP01



Company	SHD Lighting Consultancy Ltd
Designer	Stephen Higham

Description	Voltage	Phase	Total circuit ways			Spare load	Spare ways		Empty ways		
FP01	230V AC	SP&N	4			0%	0		1Ph: 3 (75%)		
							L1	L2	L3		
Location:		Mounting:	Surface	Reference No.:		Connected load (A) Diversified load (A) Diversified+Spare load (A)	0.12				
Connected from:	Supply	IP Rating:	IP 4X	Isolator Rating:			0.12				
Zs (Ω):	0.3521	Board Rating (A):		Fault Rating (kA):			0.12				
Incomer device											

				Power factor Diversity factor 3rd Harmonics %			Connected load (A) Diversified load (A) Diversified+Spare load (A)		
Way	Description	Conductor	Protective devices	L1	L2	L3	L1	L2	L3
1.L1	PR06	3Cx6mm ² (E cable core) SWA/XLPE90(70)/Cu Length: 5m	Fuse 1P 16A/80kA Generic BS88 fuses	1 1 0			0.12 0.12 0.12		
2.L1	empty								
3.L1	empty								
4.L1	empty								
L1	FP01	2Cx25mm ² + 1x25mm ² E PVC70/M/Cu Length: 1m	Fuse 1P 25A/80kA Generic BS88 fuses	1 1 0			0.12 0.12 0.12		

Circuits schedule report : PR06



Company	SHD Lighting Consultancy Ltd
Designer	Stephen Higham

Description		Voltage	Phase	Total circuit ways		Spare load	Spare ways				
PR06		230V AC	SP&N	2		0%	0				
								L1	L2	L3	
Location:		Mounting:	Surface	Reference No.:		Connected load (A) Diversified load (A) Diversified+Spare load (A)	0.12				
Connected from:	FP01	IP Rating:	IP 4X	Isolator Rating:			0.12				
Zs (Ω):	0.3719	Board Rating (A):		Fault Rating (kA):			0.12				
Incomer device											

				Power factor Diversity factor 3rd Harmonics %			Connected load (A) Diversified load (A) Diversified+Spare load (A)		
Way	Description	Conductor	Protective devices	L1	L2	L3	L1	L2	L3
1.L1	Street Light	3Cx1.5mm ² (E cable core) PVC70/M/Cu Length: 7m	Fuse 1P 6A/80kA Generic BS88 fuses	1 1 0			0.06 0.06		
2.L1	PR07	3Cx6mm ² (E cable core) SWA/XLPE90(70)/Cu Length: 40m		1 1 0			0.06 0.06 0.06		
1.L1	Street Light	3Cx1.5mm ² (E cable core) PVC70/M/Cu Length: 7m	Fuse 1P 6A/80kA Generic BS88 fuses	1 1 0			0.06 0.06		
L1	PR06	3Cx6mm ² (E cable core) SWA/XLPE90(70)/Cu Length: 5m	Fuse 1P 16A/80kA Generic BS88 fuses	1 1 0			0.12 0.12 0.12		

Lighting columns schedule report : PR06	
Company	SHD Lighting Consultancy Ltd
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Supplied from:	FP01	Voltage:	230V AC	Max. volt drop/Limit:	0.01% (Street Light)/Public supply: 3%
First column:	PR06	Location:		Total load (A):	0.12
Cables to Columns: Multicore 90°C XLPE armoured		Total length(m): 45		Cables to Lightings: Multicore 70°C PVC non-armoured	
				Total length(m): 14	

Column	Supplied from	Protective devices			Cable to column	Length(m)	Load(A)
[L1] PR06	FP01	Fuse 1P 16A/80kA			3Cx6mm² (E cable core), SWA/XLPE90(70)/Cu	5	0.12
Lighting	Watts	cos(φ)	3rd Harmonics	Protective devices	Cable to lighting	Length(m)	Volt Drop
[L1] Street Light	1x14W	1	0%	Fuse 1P 6A/80kA	3Cx1.5mm² (E cable core), PVC70/M/Cu	7	0.01%
Column	Supplied from	Protective devices			Cable to column	Length(m)	Load(A)
[L1] PR07	PR06				3Cx6mm² (E cable core), SWA/XLPE90(70)/Cu	40	0.06
Lighting	Watts	cos(φ)	3rd Harmonics	Protective devices	Cable to lighting	Length(m)	Volt Drop
[L1] Street Light	1x14W	1	0%	Fuse 1P 6A/80kA	3Cx1.5mm² (E cable core), PVC70/M/Cu	7	0.01%

Cables schedule report		
Company	SHD Lighting Consultancy Ltd	
Designer	Stephen Higham	

Cable ID	Voltage	From	To	L (m)	Make-up	Type	Method	Classification
c-d-1	230V AC	Supply	FP01	1	2Cx25mm² + 1x25mm² E PVC70/M/Cu	Multicore 70°C PVC non-armoured - Cu	Ref. C - Clipped direct	
c-d-2	230V AC	FP01	PR06	5	3Cx6mm² (E cable core) SWA/XLPE90 (70)/Cu	Multicore 90°C XLPE armoured (Run to 70 °C) - Cu	Ref. D - In underground ducts	
c-f-1	230V AC	PR06	Street Light	7	3Cx1.5mm² (E cable core) PVC70/M/Cu	Multicore 70°C PVC non-armoured - Cu	Ref. C - Clipped direct	
c-d-2	230V AC	PR06	PR07	40	3Cx6mm² (E cable core) SWA/XLPE90 (70)/Cu	Multicore 90°C XLPE armoured (Run to 70 °C) - Cu	Ref. D - In underground ducts	
c-f-1	230V AC	PR07	Street Light	7	3Cx1.5mm² (E cable core) PVC70/M/Cu	Multicore 70°C PVC non-armoured - Cu	Ref. C - Clipped direct	

Brief calculations report : FP01	
Company	SHD Lighting Consultancy Ltd
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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	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	FP01	$0.12 \leq 25$	$25 \leq 112$	$7.25 \leq 80$	$1.86 \leq 8265.63$	$25 \geq 0.38$	$0.3521 \leq 2.1688$	$0.01 \leq 5$	OK
1.L1	PR06	$0.12 \leq 16$	$16.93 \leq 46$	$6.95 \leq 80$	$0.5 \leq 476.1$	$6 \geq 0.2$	$0.3719 \leq 3.9441$	$0.01 \leq 5$	OK

Brief calculations report : PR06	
Company	SHD Lighting Consultancy Ltd
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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	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	PR06	$0.12 \leq 16$	$16.93 \leq 46$	$6.95 \leq 80$	$0.5 \leq 476.1$	$6 \geq 0.2$	$0.3719 \leq 3.9441$	$0.01 \leq 5$	OK
1.L1	Street Light	$0.06 \leq 6$	$6 \leq 19.5$	$4.12 \leq 80$	$0.06 \leq 29.76$	$1.5 \geq 0.07$	$0.5165 \leq 12.7578$	$0.01 \leq 5$	OK
2.L1	PR07	$0.06 \leq 16$	$16.93 \leq 46$	$4.12 \leq 80$	$0.5 \leq 476.1$	$6 \geq 0.2$	$0.5909 \leq 3.9441$	$0.01 \leq 5$	OK
1.L1	Street Light	$0.06 \leq 6$	$6 \leq 19.5$	$0.79 \leq 80$	$0.06 \leq 29.76$	$1.5 \geq 0.07$	$0.7721 \leq 12.7578$	$0.01 \leq 5$	OK

Connected loads analysis report	
Company	SHD Lighting Consultancy Ltd
Designer	Stephen Higham



Load types analysis for the whole installation

Connected Load Type	Circuits	Installation Points	Phase	L1 (kVA)	L2 (kVA)	L3 (kVA)	Connected kVA
Lighting with gear losses (lb x 1.8)	2	2	SPN	0.03	0.00	0.00	0.03

Connected loads analysis report	
Company	SHD Lighting Consultancy Ltd
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Load types analysis for distribution circuit

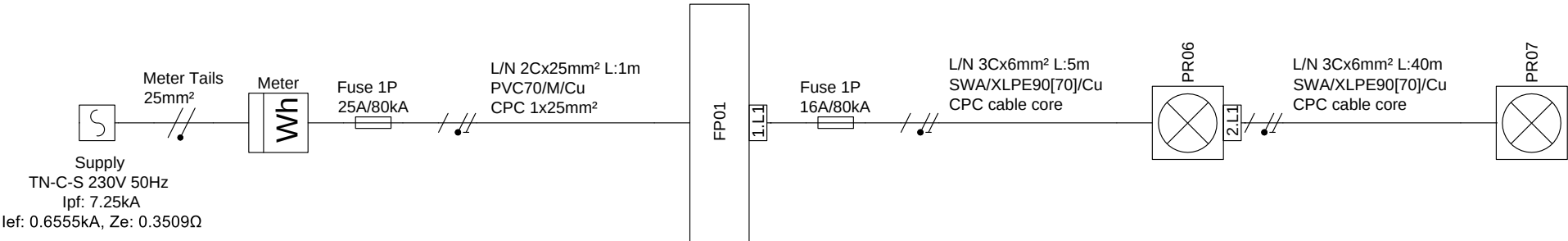
Distribution Circuit Details		Connected / Diversified Load					Design Load Analysis				
Description	PR06		L1	L2	L3	Total		L1	L2	L3	Total / N
Voltage (V)	230	Connected kVA	0.03	0.00	0.00	0.03	Amperes	0.12	0	0	0.12
Phase	SPN	Diversified kVA	0.03	0.00	0.00	0.03	kVA	0.03	0	0	0.03
Max. Demand	0.12 A	Power factor	1	1	1		kW	0.03	0	0	0.03
Location		Spare %	0				kVAr	0	0	0	0

Connected Load Type	Circuits	Installation Points	Phase	L1 (kVA)	L2 (kVA)	L3 (kVA)	Connected kVA
Lighting with gear losses (lb x 1.8)	2	2	SPN	0.03	0.00	0.00	0.03

Warnings

No Warnings were found in the calculated circuits

Symbols	
	Fuse
	General source
	Lighting Unit
	Lighting final circuit



All Distribution Circuits								
Working Voltage	From	To	Conductor Make-up	Conductor Type	Length (m)	Method	Protective Device	Voltage Drop
230V AC	Supply	FP01	2Cx25mm² + 1x25mm² E	PVC70/M/Cu	1	Ref. C - Clipped direct	Fuse 1P 25A/80kA	0 %
230V AC	FP01	PR06	3Cx6mm² (E cable core) (Run to 70 °C)	SWA/XLPE90(70)/Cu	5	Ref. D - In underground ducts	Fuse 1P 16A/80kA	0 %
230V AC	PR06	PR07	3Cx6mm² (E cable core) (Run to 70 °C)	SWA/XLPE90(70)/Cu	40	Ref. D - In underground ducts	N/A	0.01 %

Project description:		Details:			
Lickers Lane		FP03 Cable Calculation - Main			
Design firm:		Design by:	Design date:	Drawing No.:	
SHD Lighting Consultancy Ltd		Stephen Higham	25/04/2025		
Client:		Revision by:	Revision date:	Sheet No.:	
Vistry (Merseyside)		Steve Higham	25/04/2025		