BUROHAPPOLD ENGINEERING

BH-ZSG-SCH-E-0002

Section D - Electrical Voltage Drop & Cable Schedule

Revision	Description	Issued by	Date	Checked by
01	VFC	JV	Dec-15	PG

ELEMENT DESCRIPTION	CABLE SIZING AND VOLTAGE DROP CALCULATION	Document No.	BH-ZSG-SCH-E-0002	Prepared by Date	JV 23/11/2015
		Sheet No. Rev. No.	01	Checked by Date	PG NOV 2015

Condition-1 : $I_b < I_n < I_z$

Condition -2 : VD =< 1.5% at Every Level of Distribution except final circuits

Condition -3 : %TVD =< 5% at final circuits

Note: This spreadsheet is a starting point.

Derating Factors for Cable Sizing

Ambient Temperature:	C_a	**0.91**	T-4B1	**40°C**
Ambient Temperature:	C_a	**1.00**	T-4B1	**20°C**
Grouping:	C_g	**0.65**	T-4C3	**Method D- Laid in Duct in Ground**
Grouping:	C_g	**0.80**	T-4C4	**Method E- Cable tray**
Thermal Insulation:	C_i	**1**		

Design Load Current:	I_b
CPD Nominal Current:	I_n
Current Carrying Capacity:	I_z
3-phase Supply Voltage:	**415 V**
1-phase Supply Voltage:	**240 V**
Maximum % VD:	**5.0%**
Switchboard fault level:	**25 kA**

Select Breaker Size

From	To	Phase	Load					Design Current	CPD Rating	Derating Factors				Selected Cable as per VD & Current Carrying Capacity									Calculated	CPC As per BS-7671			Z	Voltage Drop	
Equipment	Equipment		CL	DIV	NMD	PF	NMD	I_b	I_n	C_a	C_g	C_i	Min. I_z	L	Mate-rial	Core	Size	Diameter	Insul-ation	Reqd cables in parallel	Selected cables in parallel	Termi-nations	Total Size of CPC	Cables in parallel	Size of CPC	Termi-nations	Ω/km	Feeder Volt Drop	Allowable maximum % VD
		ϕ	kW		kW	Cosϕ	kVA	Amp	Amp				Amp	Meter	Al/Cu		mm^2	mm		Nos.	Nos.								
EXT. FEEDER PILLAR	SG-ATS-0001	3	150.0	0.8	**120.0**	0.8	150.0	**208.7**	**400**	1.00	0.65	1.0	615.4	152	Al	4	**300**	70.9	XLPE/SWA/LSF	2.15	**4**	8	152	**1**	-	2	0.26	**2.06**	0.5
DG SET	SG-DG-0001	3	150.0	0.8	**120.0**	0.8	150.0	**208.7**	**400**	1.00	0.91	1.0	439.6	30	Al	4	**240**	70.9	XLPE/SWA/LSF	1.74	**2**	4	152	**1**	-	2	0.31	**0.97**	0.5
SG-ATS-0001	SG-MDB-L0001	3	150.0	0.8	**120.0**	0.8	150.0	**208.7**	**400**	1.00	0.91	1.0	439.6	30	Al	4	**240**	70.9	XLPE/SWA/LSF	1.74	**2**	4	152	**1**	-	2	0.31	**0.97**	0.5
SG-MDB-0001	SG-APFCR-L0001	3	50.0	0.8	**40.0**	0.9	44.4	**61.8**	**100**	1.00	0.91	1.0	109.9	30	Al	4	**70**	70.9	XLPE/SWA/LSF	0.85	**1**	2	35	**1**	**35**	2	0.97	**1.80**	1.5
SG-MDB-0001	SG-UPS-L0001	3	18.0	1.0	**18.0**	0.9	20.0	**27.8**	**100**	1.00	0.65	1.0	153.8	30	Al	4	**95**	70.9	XLPE/SWA/LSF	1.00	**1**	2	47.5	**1**	**50**	2	0.72	**0.60**	0.5
SG-MDB-0001	SG-CP-DWP-L0001	3	2.2	1.0	**2.2**	0.9	2.4	**3.4**	**63**	1.00	0.65	1.0	96.9	101	Al	4	**50**	24.2	XLPE/SWA/LSF	0.91	**1**	2	25	**1**	**25**	2	1.45	**0.50**	1.5
SG-MDB-0001	SG-ODU-L0001	3	49.5	1.0	**49.5**	0.9	58.2	**81.0**	**100**	1.00	0.65	1.0	153.8	80	Al	4	**95**	24.2	XLPE/SWA/LSF	1.00	**1**	2	47.5	**1**	**50**	2	0.72	**4.67**	3.5
SG-MDB-0001	SG-ODU-L0002	3	16.5	1.0	**16.5**	0.9	19.4	**27.0**	**40**	1.00	0.65	1.0	61.5	55	Al	4	**25**	24.2	XLPE/SWA/LSF	0.82	**1**	2	25	**1**	**25**	2	2.70	**4.01**	3.5
SG-MDB-0001	SG-ODU-L0003	3	9.0	1.0	**9.0**	0.9	10.6	**14.7**	**32**	1.00	0.65	1.0	49.2	90	Al	4	**16**	24.2	XLPE/SWA/LSF	0.83	**1**	2	16	**1**	**16**	2	4.20	**5.57**	3.5
SG-MDB-0001	SG-LPDB-L0001	3	10.0	0.8	**8.0**	0.9	8.9	**12.4**	**63**	1.00	0.65	1.0	96.9	40	Al	4	**50**	24.2	XLPE/SWA/LSF	0.91	**1**	2	25	**1**	**25**	2	1.45	**0.72**	1.5
SG-MDB-0001	SG-WB-L0001	3	3.0	1.0	**3.0**	0.9	3.3	**4.6**	**32**	1.00	0.65	1.0	49.2	60	Al	4	**16**	24.2	XLPE/SWA/LSF	0.83	**1**	2	16	**1**	**16**	2	4.20	**1.17**	0.5
SG-MDB-0001	SG-ACDB-L0001	3	5.0	1.0	**5.0**	0.9	5.6	**7.7**	**63**	1.00	0.65	1.0	96.9	45	Al	4	**50**	24.2	XLPE/SWA/LSF	0.91	**1**	2	25	**1**	**25**	2	1.45	**0.50**	1.5
SG-MDB-0001	SG-ACDB-L0002	3	5.0	1.0	**5.0**	0.9	5.6	**7.7**	**63**	1.00	0.65	1.0	96.9	60	Al	4	**50**	24.2	XLPE/SWA/LSF	0.91	**1**	2	25	**1**	**25**	2	1.45	**0.67**	1.5
SG-MDB-0001	SG-TENANT-L0001	3	12.6	0.8	**10.1**	0.9	11.2	**15.6**	**63**	1.00	0.65	1.0	96.9	75	Al	4	**50**	24.2	XLPE/SWA/LSF	0.91	**1**	2	25	**1**	**25**	2	1.45	**1.69**	1.5
SG-MDB-0001	SG-EXT-LPDB-L0001	3	15.0	0.8	**12.0**	0.9	13.3	**18.5**	**63**	1.00	0.91	1.0	69.2	20	Al	4	**25**	24.2	XLPE/SWA/LSF	0.92	**1**	2	25	**1**	**25**	2	2.70	**1.00**	1.5
SG-MDB-0001	SG-LPDB-L0002	3	10.0	0.8	**8.0**	0.9	8.9	**12.4**	**63**	1.00	0.65	1.0	96.9	65	Al	4	**25**	24.2	XLPE/SWA/LSF	1.29	**1**	2	25	**1**	**25**	2	2.70	**2.17**	1.5
SG-UPS-L0001	SG-ELLT-L0001	3	10.0	0.8	**8.0**	0.9	8.9	**12.4**	**63**	1.00	0.91	1.0	69.2	15	Al	4	**25**	24.2	XLPE/SWA/LSF	0.92	**1**	2	25	**1**	**25**	2	2.70	**0.50**	0.5
SG-ELLT-L0001	SG-ELPDB-L0001	3	10.0	0.8	**8.0**	0.9	8.9	**12.4**	**63**	1.00	0.91	1.0	69.2	15	Al	4	**25**	24.2	XLPE/SWA/LSF	0.92	**1**	2	25	**1**	**25**	2	2.70	**0.50**	0.5
INTERIOR SCOPE																													
INFRA SCOPE																													
MECH / PLUM SCOPE																													

Notes:

1. MULTICORE ARMOURED CABLES. 90°C THERMOSETTING INSULATION, ALUMINUM CONDUCTORS to BS 7671 (REFERED TABLE 4J4A & 4J4B)
2. NOT APPLICABLE TO SEIBLE FUSES WITH HIGHER FUSING FACTORS
3. CONDUCTOR TEMPERATURE TAKEN AT FULL OPERATING TEMPERATURE (90°C), NO FURTHER DERATING APPLIED