

General Specification for Electrical Installation 2007 Edition

The 2007 edition of the General Specification for Electrical Installation comprises considerable updating and revisions to the 2002 edition.

In line with the global consciousness for our environment, the new specification has been re-written with sustainability as the key objective.

The updating of specification is a continuous process. With the benefit of information technology, electronic version of this new 2007 edition can be kept up-to-date and may be viewed on the ArchSD Homepage.

In view of the revisions and new additions, there will be an introductory period of 3 months whereby the General Specification for Electrical Installation 2002 Edition will still be the Contractual Document, whilst the new General Specification for Electrical Installation 2007 Edition may be viewed in parallel in preparation for full implementation by 17 December 2007.

- **Hence, for tenders to be invited on or after 17 December 2007, General Specification for Electrical Installation 2007 Edition shall be used.**
- **Existing contracts (including contracts using previous editions tendered before 17 December 2007) would not be affected.**

**MAJOR CHANGES IN THE GENERAL SPECIFICATION FOR
ELECTRICAL INSTALLATION IN GOVERNMENT BUILDINGS – 2007 Edition**

Old Ref. No.	New Ref. No.	Major Changes	Overview
PART A – SCOPE AND GENERAL REQUIREMENTS			
Part A	Part A	Restructure of Part A of the General Specification : Section A1 : Scope of specification Section A2 : Statutory obligations and other regulations Section A3 : Execution of works Section A4 : Drawings and manuals	To re-organize and to standardize the structure of Part A of Electrical General Specification to be in line with the other BS General Specifications.
PART B – INSTALLATION METHODOLOGY			
SECTION B2 : INSTALLATION OF WIRING SYSTEMS			
B1.1.5	B2.1.5	The allowable length of flexible conduit for general application is revised from 2m to 1m but the allowable length inside false ceiling and raised floor is maintained at 2m.	To tally with the requirements stipulated in clause 25A(2)(b)(i) of the Code of Practice for Electricity (Wiring) Regulations.
B1.1.13	B2.1.13	“Extension ring” is changed to “extension piece”. The minimum requirement of plastering thickness for using the extension piece is upgraded from “32mm” to “25mm”.	Wall boxes are generally square but a ring implies circular in shape. Hence it is better to use the term “extension piece” to cope with the rectangular wall box. In addition 35mm screw is too long for fixing lighting switches / socket outlets on wall securely.

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Table B1.1.22-2	Table B2.1.21-2	Note 2 on the requirements of allowable space factor for cables in conduit is deleted.	General revision
B1.2.1	B2.2.1	Permission to install cable trunking on floor under special circumstances is given in the last sub-paragraph.	General revision
B1.2.3	B2.2.3	Note 2 on the allowable space factor for cables in trunking is revised from 40% to 45%.	To tally with the requirements of 14E(2)(d) of the Code of practice for the Electricity (Wiring) Regulations.
B1.3.2	B2.3.2	The allowable length of flexible conduit for general application is revised from 2m to 1m but the allowable length inside false ceiling and raised floor is maintained at 2m.	To tally with the requirements stipulated in clause 25A(2)(b)(i) of the Code of Practice for Electricity (Wiring) Regulations.
B1.3.7	B2.3.7	The requirements of expansion coupling or other fittings are revised from 10m to 8m.	To tally with the requirements of the Code of practice for the Electricity (Wiring) Regulations.
B1.4.3	B2.4.3	All conductors shall be coloured as specified in the current Code of Practice for the Electricity (Wiring) Regulations.	To tally with the requirements of the Code of Practice for Electricity (Wiring) Regulations.
B1.4.5 (1)	B2.4.5 (1)	“Table B1.4.5-2” is deleted and replaced by the table 25(3) of the COP.	To tally with the requirements of the Code of practice for the Electricity (Wiring) Regulations.
SECTION B3 : INSTALLATION OF POWER CABLES, CABLE TRAYS AND CABLE LADDERS			
B2.2	B3.2	“Table B2.2” is replaced by table 25(3) of the COP.	General revision
B2.3	B3.3	Installations methods and correction factors for cables laying inside cable trenches are made reference to the COP(wiring) regulations.	To tally with the requirements of the Code of practice for the Electricity (Wiring) Regulations.

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B2.7.1	B3.7.1	Unless otherwise specified in the Particular Specification and approved by the Architect, cable joint for power cable shall not be used for new electrical installation.	To tighten up the use of cable joint for power cable.
B2.10.8	Not applicable.	The whole clause on spare capacity for cable ladder is deleted.	General revision
SECTION B4 : INSTALLATION OF GENERAL LIGHTING AND POWER			
B3.3.4	B4.3.4	Exemptions for insulating cord switches, remotely operated switches using mechanical actuators with linkage incorporating insulating components, switched supplied from Separated Extra Low Voltage (SELV) and shaver units are added.	General revision.
B3.4.6	B4.4.6	The standard “BS EN 60742” is replaced by “IEC 61558-2-5:1997”.	General revision.
SECTION B5 : INSTALLATION OF DOMESTIC APPLIANCES			
		Add in last paragraph : ‘Twin core cables without earth wire are only allowed for double insulated appliances classified as Class II appliances under the IEC 61140:2001 and the subsequent amendments.	Take into account the lack of earth wire for double insulated appliances.
B4.2.1	B5.2.1	Change ‘5A D.P. switch’ to ‘5-20A D.P. switch’	Only 20A D.P. switch is available in the market
B4.2.3	B5.2.3	Change ‘5A D.P. switch’ in 1st paragraph to ‘5-20A D.P. switch’	Only 20A D.P. switch is available in the market
B4.3	B5.3	Change ‘5A D.P. switch’ in 1 st paragraph to ‘5-20A D.P. switch with pilot light’	Only 20A D.P. switch is available in the market

Old Ref. No.	New Ref. No.	Major Changes	Overview
B4.4.2	B5.4.2	Change '5A D.P. switch' in 1st paragraph to '5-20A D.P. switch with pilot light'	Only 20A D.P. switch is available in the market
B4.6.2	B5.6.2	Change 1 st paragraph to : Supply to a domestic thermal storage or instantaneous water heater shall be connected to an individual final circuit. Single phase water heater shall be controlled by a double-pole switch of adequate rating and with pilot light. Three phase water heater shall either be controlled by a 4-pole switch of adequate rating and with pilot light or by a 20A double-pole switch with pilot light through a 4-pole contactor of adequate rating.	General revision to include both storage and instantaneous types of domestic water heater
B4.7	B5.7	Add ', while those of ratings higher than 3kW is to be supplied and controlled by fused connection unit completed with separate DP control switch with pilot light' to the end of 1 st sentence	To extend coverage for tea urns of rating exceeding 3kW
SECTION B6 : INSTLLATION OF BUSBAR TRUNKING SYSTEM			
B5.12.1	B.6.12.1	Revised from "Unless otherwise specified, air-insulated busbar trunking system shall be used for vertical rising mains or short horizontal run only" to "Unless otherwise specified in the Particular Specification, air-insulated busbar trunking system shall not be used. However, if such a system is used, then the following requirements shall be followed"	Further limitation on use of air insulation busbar trunking imposed
SECTION B7 : INSTALLATION OF EARTHING SYSTEM			
B6.3.2	B7.3.2	Requirement of the electrode revised	To match with revised COP

Old Ref. No.	New Ref. No.	Major Changes	Overview
B6.9.1	B.7.9.1	Colour identification by yellow and green replaced with “in accordance with Code of Practice for the Electrical (Wiring) Regulation (2003 Edition”	To tally with future change in cable colour code.
B6.10.1	B.7.10.1	Revised the first paragraph to “The cross sectional area of a protective conductor, other than an equipotential bonding conductor, shall be determined by the Code of Practice for the Electricity (Wiring) Regulations Clause 11K, Table 11(1) to 11(7)	To match the COP requirement
SECTION B8 : MISCELLANEOUS INSTALLATIONS			
B.7.1.3 – B.7.1.5	B8.1.3 – B8.1.5	Add “labelled with the type of installation” after “...moulded blank plate”	To indicate the type of installation clearly.
B.7.1.8	B.8.1.8	Add “labelled with the type of installation unless otherwise specified” after “... Galvanized sheet metal over-lapping cover plate”	To indicate the type of installation clearly.
B.7.4.1(a)	B8.3.1 (a)	Amended as “.....relevant parts of IEC 60079-0:2004 and the associated parts of the standard and equivalent such as BS EN50014 to 50039 and relevant FM (Factory Mutual) or UL (Underwriters Laboratory) standards under ANSI or equivalent standard acceptable by relevant authorities “	To add relevant standards/ regulation
B.7.4.1 (c)	B8.3.1(c)	Added “such as BS EN50014 to 50039 and relevant FM (Factory Mutual) or UL (Underwriters Laboratory) standards under ANSI or equivalent standard acceptable by relevant authorities.” to the end of the sub-section.	To add relevant standards/ regulation
B7.4.6	B8.3.6	(i) ‘BS 4683’ revised to IEC 60079-0:2004 (ii) The luminaire with temperature classification of “T4 (135 °C)” revised to “T6 (85 °C)”	The BS has been withdrawn. To tally with B8.3.4 and C7.4.4.

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B7.5.4	B8.4.4	<p>The phrase “Pole caps, cat ladders and platforms shall be fitted where shown and as required.” Deleted</p> <p>Revised “ If imported lamp poles are offered...” to “If lamp poles not constructed in accordance with standard drawings are offered...” and “160Knots” to “80m/s”</p> <p>The 3rd Paragraph revised to “All lamp poles shall be earthed by approved means such as the armour of the underground armoured cables.”</p>	<p>Cat ladder and platform not required</p> <p>General revision</p> <p>Other appropriate earthing means is also allowed</p>
B7.5.6	B8.4.6	<p>Revised “ A mild steel service box.....” to “A galvanized steel service box.....”</p> <p>Deleted “ mild” from “3mm thick galvanized mild steel cover....” at the fifth paragraph of the Section.</p>	<p>Upgrade the material of the service box</p> <p>Tally with the first paragraph</p>
B7.5.7	B8.4.7	The distance between draw pits revised from 12 m to 15m.	To tally with Clause B3.4.5
B7.6.2	B8.5.2	BS 6651 replaced by IEC 62305.	Replace BS standard with IEC standard.
B7.6.4	B.8.5.4	Deleted the 2 nd paragraph of the B7.6.4.	This requirement is not specified in the new IEC 62305.
B7.6.10	B8.5.10	Isolation clearance requirement shall follow IEC 62305 instead of BS 6651.	Follow IEC standard
PART C – MATERIAL AND EQUIPMENT SPECIFICATION			

Old Ref. No.	New Ref. No.	Major Changes	Overview
SECTION C1 – GENERAL			
-	C1	New Section for general requirements for materials and equipment.	To re-organize the structure of the general specifications
-	C1.8	Specifications for cable markers added	To provide specifications for cable markers which are to be used in addition to cable color identification to meet the new requirement to adopt new cable colors.
SECTION C2 – WIRING SYSTEM : CABLES, CONDUITS, TRUNKING AND ACCESSORIES			
C1.1.1	C2.1.1	Title changed to “General” with following additional specification: Wiring cables shall be manufactured under a recognized quality surveillance scheme (e.g. British Approvals Service for Cables (BASEC) licence or the HAR scheme recognized by the European Committee for Electrotechnical Standardization, CENELEC, etc.) and bear the appropriate marking (e.g. BASEC mark or HAR mark, etc.) of the quality surveillance scheme.	Requirement on cable quality added.
C1.1.2	C2.1.2	The specifications of non-sheathed cables are updated.	To align the format and specifications for non-sheathed cables with respect to relevant standards.
C1.1.3	C2.1.3	The specifications of sheathed cables are updated.	To align the format and specifications for sheathed cables with respect to relevant standards.
C1.1.4	C2.1.4	The specifications of flexible cables are updated.	To align the format and specifications for flexible cables with respect to relevant standards.

Old Ref. No.	New Ref. No.	Major Changes	Overview
-	C2.1.5	<p>New specification:</p> <p>Conductors of wiring cables shall be of high-conductivity copper and all meet the requirements of IEC 60228:2004.</p> <p>The CSA of the neutral conductor shall not be less than that of the phase conductors, unless otherwise specified.</p>	To add “conductor” requirement for wiring cable.
-	C2.1.6	<p>New specification :</p> <p>Fire Performance of Cables Having Low Emission of Smoke and Corrosive Gases Characteristics</p> <p>The materials for insulation and outer covering (oversheath), if exists, shall be of low emission of smoke and corrosive gases characteristics when affected by fire. The cable shall be type tested to the following fire performance requirements:</p> <p>a) Flame propagation : IEC 60332-1-1:2004 b) Smoke emission : IEC 61034-2:2005 c) Acid gas emission : IEC 60754-1:1994</p>	To add specification for Fire Performance of Cables Having Low Emission of Smoke and Corrosive Gases Characteristics
-	C2.1.7	<p>New specification :</p> <p>Fire Performance of Fire Resistant Cables</p> <p>The materials for insulation and outer covering, if exists, of fire resistant cable shall be of low emission of smoke and corrosive gases characteristics when affected by fire. Fire resistant cable shall be type tested to the following fire performance requirement:</p> <p>a) Circuit integrity : BS 6387:1994 b) Flame propagation : IEC 60332-1-1:2004 c) Smoke emission : IEC 61034-2:2005 d) Acid gas emission : IEC 60754-1:1994</p>	To add specification for Fire Performance of Fire Resistant Cables

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C1.2.1	C2.2.1	IEC 60614-2-1 changed to IEC 61386-21:2002.	IEC 61386-21:2002 is the latest International Standard appropriate for conduit requirement. Most of the major conduit suppliers are supplying conduit complying with this requirement
C1.2.2	C2.2.2	General revision that the steel conduit shall be of the metallic type with PVC oversheathed.	The requirement of water tight pattern is not required.
C1.2.2	C2.2.2	(i) IEC 60614-2-5 changed to IEC 61386-23:2002; and (ii) Requirement on oversheath provision is added as below:- The steel flexible conduits shall be metallic type with PVC oversheath. Oversheath materials of low emission of smoke and corrosive gas characteristics shall be provided where specified. However, neither oversheath of PVC nor materials with low emission of smoke and corrosive gas characteristics shall be required for installations within ventilated ceiling void.	IEC 61386-23:2002 is the latest International Standard appropriate for conduit requirement. Most of the major conduit suppliers are supplying the conduit complying with this requirement. Requirement of oversheath material is clearly stated in this revised specification.
C1.2.4	C2.2.5	(i) IEC 60614-1 changed to IEC 61386-1:1996 for steel conduit, coupler and fittings; and (ii) IEC 60670/BS4662 changed to IEC 60670-1:2002 / BS4662:2006 for metal box.	IEC 61386-1:1996 is the latest International Standard appropriate for conduit requirement. Most of the major conduit suppliers are supplying the conduit complying with this requirement. Relevant parts of the IEC standard added for better clarity.
C1.4	C2.4	(i) Requirements of flush floor and under floor trunkings are added. (ii) Requirements of steel trunkings are generally updated.	To specify the general requirements of flush floor and under floor trunkings and to update the specifications for better clarity.
C1.5	C2.5	Revised the specification to : Cover for trunking shall be secured either by purpose-made rivets or clip-on mechanism to manufacturer standard.	To update the requirement on trunking cover.

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SECTION C3 – POWER CABLES AND ASSOCIATED CABLING FACILITIES			
C2.1	C3.1	<p>General revision to :</p> <p>Power cables are mainly for electricity supply and distribution. They shall be manufactured under a recognized quality surveillance scheme (e.g. British Approvals Service for Cables (BASEC) licence or the HAR scheme recognized by the European Committee for Electrotechnical Standardization, CENELEC, etc.) and bear the appropriate marking (e.g. BASEC mark or HAR mark, etc.) of the quality surveillance scheme.</p>	General update.
C2.2	C3.2	The specifications for power cables are updated.	To align the format and specifications for power cables with respect to relevant standards.
C2.3	C3.3	Revise specification on making reference to clause C2.1.5 for detail requirement	General revision
C2.4	C3.4	<p>Revise the specification to :</p> <p>The armour shall be of galvanized steel wire for multi-core cables. Single core armoured cables shall be provided with non-ferrous armour. Use of steel armour for single core cable is not accepted.</p>	To clearly specify armoured material
C2.5	C3.5	Outer covering deleted and replaced by “Fire Performance of cables having Low Emission of Smoke and Corrosive Gases Characteristics”	Requirement of fire performance for LSOH cable type is added
-	C3.6	Add new specification of “Fire Performance of Fire Resistant Cables”	Requirement of fire performance for fire resistant cable type is added
C2.6 Table C2.6	C3.7 Table C3.7	Core identification of power cables revised	To tally with the latest requirement of cable color code revision

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SECTION C4 – WIRING ACCESSORIES AND MEASURING INSTRUMENTS			
C3.2.2	C4.2.2	Revise the specification to : Lighting switch shall be single pole of rated fluorescent load not less than 5AX or 10AX as specified in the Particular Specification or Drawings.	Fluorescent load was used for specifying lighting switch.
C3.2.5	C4.2.5	The specifications and requirements of time switch are revised.	General revision.
C3.4.1	C4.4.1	The requirements of fused clock connector are deleted.	Fused clock connector, which is not commonly used, is deleted from the general specification.
C3.4.2	C4.4.2	LED indicator is allowed for use in connection unit.	To match with the market trend.
C3.6.4	C4.6.4	Specifications of Edison screw type lamp holder are added. Requirements of cord grip lamp holder and lamp holder for weatherproof luminaire are deleted from the specifications. Lampholder for use with tubular fluorescent lamp shall be of bi-pin type, complying with IEC 61184:1997, BS EN 60061-1:1997 and BS EN-60061-2:1997.	General update to include specifications on Edison screw type lampholder. Specifications for cord-grip lampholder, which is not commonly used, are removed.
C3.7.1	C4.7.1	Watt-hour meter shall comply with IEC 62053-11:2003.	General revision. The latest IEC standard is adopted.
C3.7.3	C4.7.3	Current transformer for use with measuring instrument shall comply with IEC 60044-1:1996.	General revision. The latest IEC standard is adopted.
C3.7.6	C4.7.6	The ingress protection for the outdoor type shall be at least IP 54 in accordance with IEC 60529:2001.	General revision. The latest IEC standard is adopted.

Old Ref. No.	New Ref. No.	Major Changes	Overview
SECTION C5 – SWITCHGEAR AND ASSOCIATED EQUIPMENT			
C4.4.3	C5.4.3	The requirement of “slow closing mechanism for ACBs” is deleted	Revise the clause to suit modern ACB
C4.5.1	C5.5.1	Revise last sentence of the first paragraph as “ Utilization category for those MCCB with built-in protection and rated at 400A or above shall be class B, unless otherwise specified in the Particular Specification or on Drawings or the Contractor can substantiate with calculations to the satisfaction of the Architect that class A MCCBs are suitable for ensuring discrimination under overload and short circuit conditions for the circuits concerned.”	Clarify that requirement of class B MCCB required for rating at 400A & above. Add the clause for the contractor to prove suitability of Class A MCCB in the application to the satisfaction of the Architect.
C4.5.1	C5.5.1	Re-phrase the second paragraph to specify that MCCBs should be suitable for use as isolators.	Revise the clause to clarify requirement.
C4.5.2	C5.5.2	Hydraulic magnetic type tripping device for MCCB is deleted	Revise to suit modern MCCB
C4.8.4	C5.8.4	Delete the Clause on “semi-enclosed fuse”	Delete the requirement as the use of semi-enclosed fuse in new building is uncommon now.
C4.8.5	C5.8.5	Revise BS 88 to IEC 60269-1:2006, the heading to be renamed as “Fuse Ratings and Dimensions”.	General revision. The latest IEC standard is adopted.
C4.11.1	C5.11.1	Include also IEC 60439-3:2001 as standard for distribution board	Incorporate relevant IEC standard for distribution board
C4.13	C5.13	Delete the Clause on “Fuseboard”.	Delete the requirement as the use of fuseboard in new building is uncommon now.
C4.14	C5.14	Omit “motor starters” related references and clauses C5.14.5 and C5.14.6, which are to be covered in Clause C5.26	General revision to match with the new G.S. arrangement

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C4.16.1(a)	C5.16.1(a)	“Code of Practice for Energy Efficiency of Electrical Installations” is added into the clause and “(Note: For precise definition coupling)” is deleted.	Requirement updated.
C4.16.1(d)	C5.16.1(d)	AHF shall be manufactured“5 years” instead of “3 years”.	To align the manufacturer years up to 5 years
C4.16.2(f)	C5.16.2(f)	“.....For ease of expansion, it shall be modular type or” i added into the clause.	General revision to include modular type of AHF.
C4.17.1(d)	C5.17.1.(d)	Surge Protection Device shall be Type tested to IEC 61643-1:2005 instead of IEC 61024-1 or or IEEE C62.41-1991	General revision to specify more appropriate requirements for surge protective devices to be used in low-voltage power distribution systems.
C4.17.1(d)(ii)	C5.17.1(d)(ii)	“...The peak ‘let-through’ voltage shall not exceed (600V), unless otherwise specified.” is deleted.	The requirement in Clause C5.17.2(c) can be referred.
C4.17.2(c)	C5.17.2(c)	“...the let through voltage shall not be greater than 600V under the standard test waves.....” is changed to “...the let through voltage shall not exceed the impulse withstand voltage of the equipment to be protected specified in IEC 60364-4-44:2006.....”	In line with the requirement of international standards
C4.17.3(b)	C5.17.3(b)	“For panel mounting, the installation method and construction of the surge protection device shall refer to the manufacturer’s instruction and recommendation. For wall mounting and floor mounting,” is added.	General revision
C4.17.3(c)	C5.17.3(c)	“.....As an option, a surge counter shall be required if specified in the Particular Specification.” is added.	General revision
C4.18.4	C5.18.3	The specification that “...with power factor of not less than 0.9 lagging without external chokes or power factor correction capacitors...” in Clause C4.18.4(c) of the old GS is deleted.	General revision. The effect of power factor is not significant to the performance of soft starter which mainly deals with the starting condition only.
C4.19	C5.19	The words “with Throughput Power up to 150 kVA” is deleted from the title.	General update.

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C4.19.2(a)(iv)	C5.19.2(a)(iv)	The limits of total odd harmonic current distortion produced by the equipment are clearly specified. The total even harmonic distortion shall not exceed 25% of the total odd harmonic distortion.	The requirement for total odd harmonic current distortion is updated.
-	C5.19.2(a)(v)	The clause “comply with Code of Practice for Energy Efficiency of Air Conditioning Installation; and” is added.	Requirement updated.
C4.20.2 (a)(i)	C5.20.2 (a) (i)	<ul style="list-style-type: none"> - 600V a.c. between phase maximum direct voltage is changed to minimum direct voltage of 380V a.c. between phase - other voltages: through potential transformers is deleted 	<ul style="list-style-type: none"> - To allow more feasibility in metering selection and enhance cost effectiveness - In line with manufacturer’s technology as power meters would either a.c. or d.c. power.
C4.20.2 (b)	C5.20.2 (b)	Revision to “either using lithium battery or non volatile flash memory for data storage shall be adopted on condition that the memory shall be backup not less than 3 years”.	Requirement updated.
C4.21.1(d)	C5.21.1(e)	Change battery from nickel-cadmium to nickel-metal hydride battery and the proven life expectancy is revised to 4 years.	Requirement updated.
C4.22.1(a)	C5.22.1(a)	The requirements of de-tuning reactors are added.	To enhance the performance of the equipment.
C4.22.2(a)	C5.22.2(a)	<ul style="list-style-type: none"> (i) “Oil type capacitors shall be rejected” added at the end of 1st para. (ii) The capacitors shall comply to IEC 60931-1 and BS EN 60831-2 instead of IEC 60831 and IEC 60070. 	<p>Clearly specify that oil type capacitors will not be accepted.</p> <p>General update on the requirements.</p>
C4.22.2(e)	C5.22.2(e)	Add “all exposed ferrous metal surfaces of the capacitor bank where applicable shall be treated with rust-inhibiting primer paint, undercoat and finished to a colour approved by the Architect.”	Enhance the integrity of the capacitor bank
-	C5.22 (f)	The requirements of blocking filter / de-tuning reactors are added.	To enhance the performance of the equipment.

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C4.23.1(f)	C5.23.1(f)	Delete IEC 61000 standards and added series of IEC 60255 standards for the electromagnetic compatibility performance requirements of digital relay.	Updated standard is adopted.
C4.23.2(b)	C5.23.2(b)	The memory shall be backup not less than 3 years. Instead of minimum 5 fault records.	Requirement updated.
C4.24.2(c)	C5.24.2(c)	Allow the use of non volatile flash memory for data storage and the memory shall be backup not less than 3 years instead of stating the battery life not less than 7 years.	Requirement updated.
-	C5.25	Specifications of electric motors included.	Detailed specifications of electric motors with the requirements on minimum efficiency included. To enhance reliability of motor fed by converter, requirements on motor winding insulation are also clearly specified in relevant application.
-	C5.26	Incorporated a new section on “Motor Switchgear, Starters and Control Panel”, with materials mainly transferred from the General Specification for Air-Conditioning, Refrigeration, Ventilation and Central Monitoring & Control System Installation and former Clause 4.14 on starters of this General Specification. Standards are also reviewed & updated.	Match with the new arrangement to include general requirements of electrical equipment of other B.S. installations into this General Specification, with additional and specific requirements applicable to the particular type of installations (e.g. air-conditioning and fire services, etc.) specified in the respective General Specifications and Particular Specifications.
SECTION C6 – BUSBAR TRUNKING SYSTEM			
C5.4	C6.4	<p>Busbars shall be three phase and full rated neutral made of hard drawn, high conductivity solid copper bars to BS EN 13061:2002 in lieu of BS 1432 nor BS 1433.</p> <p>The busbars shall be of adequate size to carry the rated current continuously at mean ambient temperature of 35°C and shall not exceed the temperature rise in accordance with Clause 7.3 of IEC 60439-1:2004.</p>	<p>The latest international standard is adopted.</p> <p>Mean ambient temperature corrected from “40°C”to “35°C“ to follow IEC 60439-1:2004.</p>

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C5.10.6	C6.10.6	The verification of short circuit strength shall be carried out by Short Circuit Testing authorities internationally recognized as having equal standing as ASTA.	To tally with Section 6.11.5
C5.11.3	C6.11.3	Change “ fish tapes” in the first paragraph to “ draw wire”	Fish tapes are not commonly used.
SECTION C7 – FLUORESCENT LUMINAIRE AND LAMP			
C6.1.2	C7.1.2	<ul style="list-style-type: none"> (i) The standards for fixed general purpose luminaires and recessed luminaires are clearly specified; (ii) electronic ballast is to follow IEC 61347-2-3:2004 and/or IEC 60929:2006 as applicable; and (iii) The performance requirements for internal cables are clearly defined. (iv) The requirement of test certificate is moved to C7.1.5. 	To refer to suitable standard for various types of luminaires and to give clearer performance requirements for internal cables in luminaires. General update of IEC for electronic ballast.
C6.1.3	C7.1.3	Delete the requirement of “interconnected cables of appropriate color codes”	General revision.
C6.1.4	C7.1.4	Revise to “The lamp circuit power factor for luminaire employing electromagnetic ballast shall not be less than 0.85, whilst that for luminaire employing electronic ballast shall be higher than 0.95.”	To clearly state the power factor requirement per luminaire.
C6.1.5	C7.1.5	Delete the requirement for low loss ballast. Clearly state the requirement on type test certificate, as well as marking on the luminaires.	Electronic ballast in lieu of low loss ballast is now commonly used. The requirements on type test certificate and marking for luminaires are clearly specified.
C6.2	C7.2	<ul style="list-style-type: none"> (i) Include recessed modular fluorescent luminaires in Group 1; and (ii) Delete the luminaire group of “wall-mounted fluorescent luminaire complete with shaver socket” 	<ul style="list-style-type: none"> (1) General revision (2) Wall-mounted fluorescent luminaire complete with shaver socket is not commonly used in ArchSD projects.

Old Ref. No.	New Ref. No.	Major Changes	Overview
C6.3.1	C7.3.1	Add “Starter is not required if electronic ballast is used”	General revision.
C6.4.2	C7.4.2	<ul style="list-style-type: none"> (i) The construction of the luminaire shall be suitable for chemically corrosive atmosphere and complying with IEC 60598-1:2006; (ii) Add “Starter is not required if electronic ballast is used”; and (iii) Delete the requirement that “The exterior of the fitting shall be of white acrylic finish. The luminaire shall maintain a maximum light output ratio of not less than 73%.” 	<p>The latest IEC standard is adopted.</p> <p>General revision.</p>
C6.5.1	C7.5.1	<ul style="list-style-type: none"> (i) T5 lamps added (i.e. 14W T5 550mm long for Type I; 28W T5 1150mm long for Type II and 35W T5 1450mm long for Type III); and (ii) Delete the clause “All fluorescent lamps shall not be larger than 26mm diameter.” 	General revision.
C6.5.2	C7.5.2	Specification for isolating transformer deleted.	General update. Requirements for isolating transformer have been included in inverter assembly.
C6.5.3(e)	C7.5.3(e)	Color temperature of 4500K changed to 4000K. Revise lumen output to include T5 lamps	General revision
C6.5.4	C7.5.4	The component parts in self-contained emergency fluorescent luminaries are clearly specified.	General revision.
C6.6	C7.6	Deleted C6.6 for luminaire group - “wall-mounted fluorescent luminaire complete with shaver socket”. The Clause is blanked.	Wall-mounted fluorescent luminaire complete with shaver socket is not commonly used in ArchSD projects now.
C6.7.1 (a)	C7.7.1 (a)	Colour rendering index for car parking spaces or similar changed to 70Ra	General revision for better illuminance performance.

Old Ref. No.	New Ref. No.	Major Changes	Overview
C6.7.2 and associated Tables	C7.7.2 and associated Tables	Tables on lumen output for various types of fluorescent lamps are updated as per C7.7.2-1 to C7.7.2-7.	General revision with reference to available products in the market.
C6.7.3 and Table C6.7.3	C7.7.3 and Table C7.7.3	Delete “circular” and “U-tube” fluorescent lamps from the table. Average rate life for T8 lamp is updated.	General revision with the less commonly used “circular” and “U-tube” fluorescent lamps removed.
C6.8.3	C7.8.3 and Table C7.8.3	The maximum allowable power loss of electronic ballasts are clearly specified in Table C7.8.3. The allowable maximum total Harmonic Distortion of electronic ballasts is reduced from 20% to 15%.	General revision to give more stringent performance requirements of electronic ballasts.
-	C7.8.4	New specification of electronic dimmable ballast added	Inclusion of electronic dimmable ballast which is commonly used in the building projects
SECTION C8 – HIGH PRESSURE DISCHARGE LAMP AND LUMINAIRE			
C7.1	C8.1	LBS references are added for various high pressure discharge lamp types.	General revision.
C7.2	C8.2	International standards and lamp cap revised. Initial light outputs are revised.	General update of appropriate international standards and revision to tally with the latest product development in the market
C7.3	C8.3	International standards revised. Initial light outputs are updated.	General update of appropriate international standards and revision to tally with the latest product development in the market
C7.4	C8.4	(i) The Clause is revised for specification of linear metal halide and linear high pressure sodium lamps. The specification for luminaire for floodlight is restructured to Clause C8.5; and (ii) Tables on luminous efficacy for linear metal halide and linear high pressure sodium lamps are added	General revision
-	C8.5	New Clause for specification of floodlighting luminaries	General revision

Old Ref. No.	New Ref. No.	Major Changes	Overview
SECTION C9 – TUNGSTEN HALOGEN LAMP			
C8.2	C9.2	Table on luminous efficacy for tungsten halogen lamp added	General revision to tally with the latest product development in the market
C8.3.2	C9.3.2	The requirement of transformer being capable of using with d.c. supplies for emergency lighting purpose is deleted.	General revision
SECTION C10 – DOMESTIC APPLIANCES			
C9.1.1	C10.1.1	Replace ‘the specified or relevant IEC or equivalent standards’ in (b) to ‘IEC 60335-1:2006 Household and similar electrical appliances – Safety – Part 1 : General requirements’	General update
C9.1.2(a)	C10.1.2(a)	Change ‘220V±6%’ to ‘220V± 10%’	To allow for greater voltage tolerance
C9.1.2(c)	C10.1.2(c)	Delete ‘as Class II appliances under the specified IEC or equivalent standards’	Class II appliances are covered in the new sub-clause (d)
	C10.1.2(d)	Add in sub-clause (d) that ‘Twin core cables without earth wire are only allowed for double insulated appliances classified as Class II appliances under the specified IEC or equivalent standards.’	To take into account the lack of earth wire for double insulated appliances
-	C10.1.2(g)	Add sub-clause (g) – “Unless otherwise specified, domestic appliances and office equipment shall be incorporated with the associated Energy Label if relevant scheme is available under The Hong Kong Voluntary Energy Efficiency Labeling Scheme from Electrical and Mechanical Services Department.”	Additional requirement.
C9.2.2(b)	C10.2.2(b)	Add ‘not less than’ before the air delivery rates in the table	General revision

Old Ref. No.	New Ref. No.	Major Changes	Overview
C9.2.3(e)(ii)	C10.2.3(e)(ii)	Change 'The cover shall be in white or ivory colour to match the fan' to 'Plastic cover shall be in white or ivory colour to match the fan. Metal cover shall be of stainless steel or metal clad finish'	To allow the use of metal cover
C9.2.3(e)(iii)	C10.2.3(e)(iii)	Change 'five (5) speed' to 'at least three (3) speed controls'	To allow greater flexibility in the use of fan regulator
C9.7.1	C10.7.1	(i) Change 'design and the construction of the fan shall be manufactured and tested' to 'design, construction and testing of the fan shall be' (ii) Add '2-core cord is allowed only for double insulated appliances classified as Class II' in sub-clause (c).	General revision Take into account the lack of earth wire for Class II
C9.8.1	C10.8.1	Add '2-core cord is allowed only for double insulated appliances classified as Class II' in sub-clause (c).	Take into account the lack of earth wire for Class II
C9.9.3(d)	C10.9.3(d)	Add '2-core cord is allowed only for double insulated appliances classified as Class II' in sub-clause d(ii).	Take into account the lack of earth wire for Class II
C9.14.2(b)	C10.14.2(b)	Change 'pressure test to 50 kPa' to 'pressure test to manufacturer's standard or 50kPa, whichever is greater.'	General revision to include manufacturer's standard.
C9.15.1(f)		Deleted	Delete
C9.15.1(g)	C10.15.1(f)	Delete 'or equivalent standards' and update the headings of the standards	Adopt IEC standard
	C10.15.1(g)	Add 'The water heater shall have obtained Recognition Type Energy Label Grade 1 or 2 of the Energy Efficiency Office (EEO) of Electrical and Mechanical Services Department.'	New requirement
C9.15.2(a)	C10.15.2(a)	Change 'pressure test to 1.5 times the working pressure' to 'pressure test to manufacturer's standard or 1.5 times the working pressure, whichever is greater.'	General revision to include manufacturer's standard.

Old Ref. No.	New Ref. No.	Major Changes	Overview
C9.22.1	C10.22.1(c)	Add 'The rice cooker shall have obtained Recognition Type Energy Label of the Energy Efficiency Office (EEO) of Electrical and Mechanical Services Department.'	New requirement
C9.24	C10.24	Change 'Electric hand dryer' to 'Electric hand/face dryer' in the heading and throughout the section Add 'The air outlet shall be fixed with downward air discharge for hand dryer, but shall be movable to an upward direction when used as face dryer.' in C10.24.3(i).	To match with Section B5
C9.29.1	C10.30.1(c)	Add 'The dehumidifier shall have obtained Recognition Type Energy Label of the Energy Efficiency Office (EEO) of Electrical and Mechanical Services Department.'	New requirement
C9.30.2(d)	C10.31.2(d)	Delete '1.25mm ² ' Change 'both with current capacity of not less than the rated value of the room cooler.' to 'Size of the 3-core flexible cord shall have current carrying capacity not less than that of the circuit breaker protecting the room cooler.'	Specify size of flexible cord to cover full range of room cooler
SECTION C11 : LOW VOLTAGE CUBICLE SWITCHBOARD			
A.3	C11.3	Incorporate the conditions for exempting the EMC immunity or emission tests for the Switchboard	To match with the exemption conditions per clause 7.10.2 of IEC 60439-1
A.4	C11.4	(iii) Paragraph 11 is revised as follows: "... The end plates shall be of non-corrosive type....whereas the external fixing bolts and set screws shall be of chrome-plated finish or equivalent anti-corrosion treatment."	To clarify the G.S. clause requirement

Old Ref. No.	New Ref. No.	Major Changes	Overview
A.7	C11.7	(i) Updated the standard of copper for busbars to “BS EN 13601:2002” (ii) Paragraph 7 "Busbar shall also be provided for all circuits which have a current rating of 400A and above" is deleted.	To clearly state the adopted standard. The paragraph is deleted to avoid ambiguity.
A9	C11.9	The clause for shunt-trip release is revised to include both 24V and 30V DC supply voltage.	24V DC is an industrial popular voltage for accessories in the market.
A11	C11.11	Chinese translations are incorporated to the warning labels	Enhance the safety of chinese electrician
A.14	C11.14	(i) Specify the use of “nickel-metal-hydride” type of battery and omit specification details for battery and charger which are stipulated in C5 of the Electrical GS and instead, make cross reference to that (ii) Add requirement that spare fuses be covered up to prevent the contacts from rusting due to corrosion	Revise battery type in line with the G.S. requirement and avoid unnecessary duplication As a measure to prevent electrical hazards due to deteriorated contacts of the spare fuses
A.17	E3	Requirements during maintenance period revised with following remarks for incorporation into corresponding section of the T&C procedures: - Omit the 6-monthly test requirement and specify that end-of-maintenance period tests be conducted at timing representative of the full load condition - Replace the “temperature rise measurement” with “thermographic scanning” which is more practical for ascertaining existence of hot spots and operational condition of the Switchboard - Specify that “contact resistance test” be required only when abnormal hot spots are detected and overhaul has been done	Match with the format of the G.S. to include maintenance requirement during maintenance period into Section E3
SECTION C12 - DIESEL GENERATING SET INSTALLATION			
B1.2	C12.1.2 (a)	Upgrade fuel requirement from “light” diesel to “ultra low sulphur” diesel (ULSD) to BS EN 590:2004.	Updated standard is adopted. Upgrade fuel requirement
	C12.1.2 (b)(viii)	Delete the clause.	Delete duplicated clause.

Old Ref. No.	New Ref. No.	Major Changes	Overview
B7.2	C12.7.2(b)(vii)	Revise Clause	Rephrase sentence to clarify requirement
B7.3	C12.7.3(a)(ii)	Upgrade fuel requirement from “light” diesel to “ultra low sulphur” diesel	Upgrade fuel requirement
B8.2	C12.8.2(g)	Delete word “new”.	Delete inappropriate words
B8.3	C12.8.3(b)	Revise “aluminum rich paint” to “Zinc rich paint”	Align requirement.
B9.2	C12.9	The specifications for exhaust fan for emergency generator room are simplified.	Simplify requirement as these clauses can be referred in A/C GS.
B10.3	C12.10.3	Revise BS 2903 to EN 1677-5:2001	Updated standard is adopted.
<u>Section 13: HIGH VOLTAGE SWITCHGEAR AND EQUIPMENT</u>			
-	C13.1 to C13.6	Incorporate new sections on “high voltage” equipment and accessories, with materials mainly abridged from the AC GS and standards reviewed & updated	Match the new G.S. arrangement to include general requirements of electrical equipment of other B.S. installations into G.S., with additional and specific requirements applicable to the particular type of installations (e.g. A/C and FS) specified in the respective GS and PS
PART D – INSPECTION, TESTING AND COMMISSIONING DURING CONSTRUCTION PERIOD			
Part D	Part D	To restructure the G.S. and to clearly define the requirements on inspection, testing and commissioning during construction period :- Section D1 : General requirement Section D2 : Routine inspection Section D3 : Handover inspection Section D4 : Testing and commissioning	General revision of the G.S. to clearly define the requirements on Part D - Inspection, testing and commissioning during construction period and the requirements on Part E - Training, inspection, attendance and operation & maintenance during maintenance period.
D1.2	D2.3	Visual inspection is revised to be carried out in accordance with both Code 21A and Code 21C.	Revise to cover HV

Old Ref. No.	New Ref. No.	Major Changes	Overview
	D2.4	Paragraph 3.: "Registered or suitably qualified electrical workers shall be employed to conduct such test' is added	Ensure the quality and safety
PART E – TRAINING, INSPECTION, ATTENDANCE AND OPERATION & MAINTENANCE DURING MAINTENANCE PERIOD			
-	Part E	<p>To clearly define the requirements on training, inspection, attendance and operation & maintenance during maintenance period :-</p> <p>Section E1 : Training to users and operation and maintenance agents Section E2 : Emergency services and attendance to fault calls Section E3 : Inspection, operation & maintenance requirements Section E4 : Completion of outstanding and defective works</p>	General revision of the G.S. to clearly define the requirements on Part D - Inspection, testing and commissioning during construction period and the requirements on Part E - Training, inspection, attendance and operation & maintenance during maintenance period.
ANNEX 1 : LIST OF TECHNICAL STANDARDS USED IN THE ELELECTRICAL SPECIFICATION			
Annex C	Annex 1	General update to the list of technical standards used in the Electrical General Specification	General update.