Design & Manual of Electrical Installations For Government Buildings

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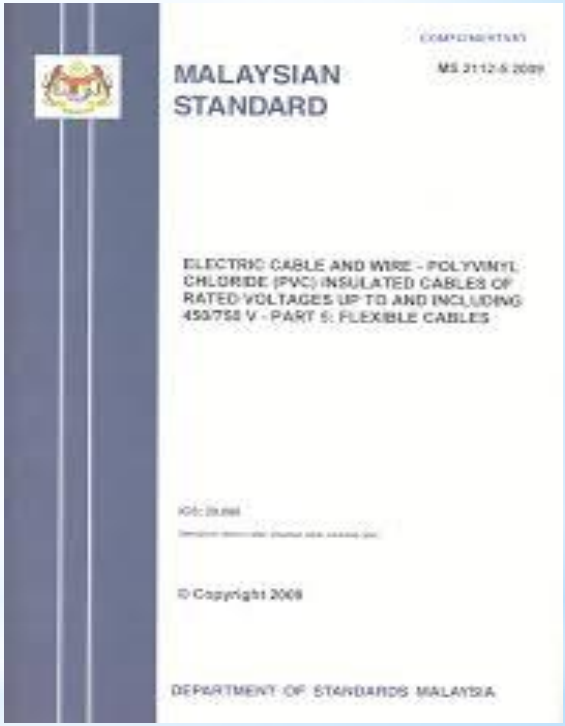
Standard

- Surat Senarai Dokumen Standard
- Some of standard for cables
  a) MS 2112-3
  b) MS 2112-4
  c) MS 274
  d) IEC 60502
  e) MS 2103
  f) MS 2105
  g) MS 2107
  h) IEC 60702
  i) IEC 60331
  j) BS 6387 Category C, W and Z



Selection of Cables

- Types of cables :-
  1. Final circuit
     i. PVC insulated cable
     ii. PVC insulated PVC sheathed cable
     iii. Mineral-insulated mineral sheathed copper conductor (MIMS) cable

Selection of Cables

- Types of cables :-
  2. Submains
     i. PVC insulated cable
     ii. PVC insulated PVC sheathed cable
     iii. XLPE/PVC cable
     iv. Mineral-insulated mineral sheathed copper conductor (MIMS) cable
     v. PVC/SWA/PVC cable
     vi. XLPE/SWA/PVC cable
     vii. XLPE/AWA/PVC cable

Selection of Cables

- MS IEC 60364-4-43 Electrical Installations of Buildings – Part 4-43 : Protection For Safety – Protection Against Overcurrent
- 433 Protection Against Overload Current

$$Ib \leq In \leq Iz$$

Where :-

Ib is the current for which the circuit is designed

Iz is the continuous current-carrying capacity of the cable

In is the nominal current of the protective device

Selection of Cables

- IEC 60364-5-52 Low Voltage Electrical Installations – Part 5-52 : Selection and erection of electrical equipment – Wiring systems

- 525 Voltage drop in consumer's installations

  "In the absence of any other consideration, the voltage drop between the origin of the consumer's installation and equipment should not be greater than that given in Table G52.1"

Selection of Cables

Table G.52.1 – Voltage drop

Type of Installation	Lighting %	Other uses %
A – Low voltage installations supplied directly from a public low voltage distribution system	3	5
B – Low voltage installation supplied from private LV supply*	6	8

* As far as possible, it is recommended that voltage drop within the final circuits do not exceed those indicated in installation type A.

When the main wiring systems of the installations are longer than 100 m, these voltage drops may be increased by 0,005 % per metre of wiring system beyond 100 m, without this supplement being greater than 0,5 %.

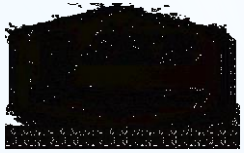
Voltage drop is determined from the demand by the current-using equipment, applying diversity factors where applicable, or from the values of the design current of the circuits.

EMAL

- Electrical Material Approved List
- https://jmal.jkr.gov.my/
- Forms of Technical Information:-
  i. PVC insulated cable
  ii. XLPE insulated, PVC sheathed power cables (armoured and non armoured)
  iii. Fire resistant cable

Installation of cables

- JKR Technical Specification
- Specification For Low Voltage Internal Electrical Installation (L-S1)



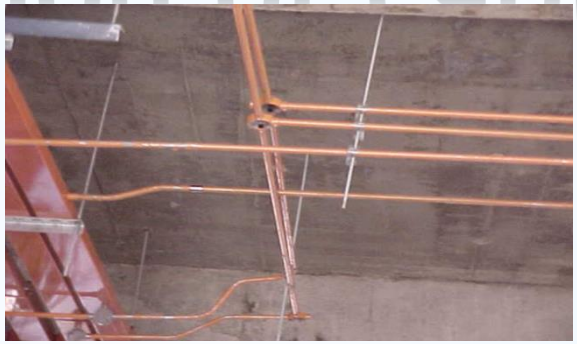
SPECIFICATION FOR LOW VOLTAGE INTERNAL ELECTRICAL INSTALLATION (L -S1)

CKE.LS.01.01.(04).2017

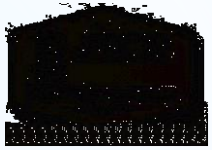
CAWANGAN KEJURUTERAAN ELEKTRIK

Installation of cables

- 4 methods of the installation:-
  i. In conduit
  ii. In Trunking
  iii. On Tray
  iv. On Ladder



Installation of cables



- JKR Technical Specification
- Specification For Low Voltage Underground Cable (L-S3)

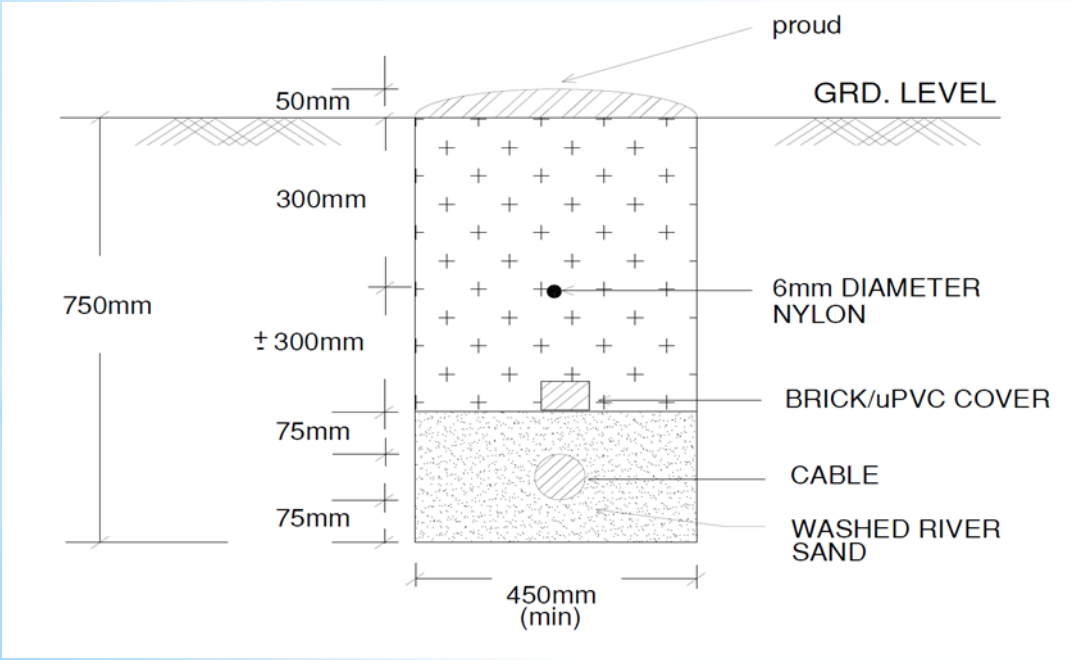
SPECIFICATION FOR LOW VOLTAGE UNDERGROUND CABLE (L-S3)

CKE.LS.01.03.(02).2018

CAWANGAN KEJURUTERAAN ELEKTRIK

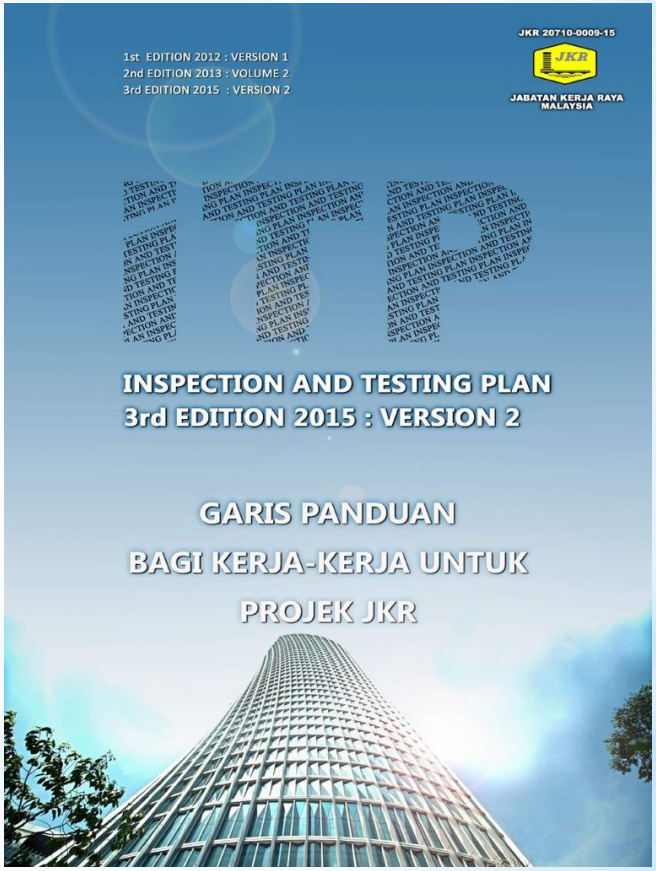
Installation of cables

- Cable laid in ducting and precast manhole
- Cable laid direct in ground



Inspection and Testing Plan

- Garis panduan bagi kerja-kerja untuk projek JKR
- Electrical works
  - Wiring system and underground cable



MS ISO 9001

- Quality Management System
- Prosedur Pembinaan Dan Penyeliaan Tapak Bina
- Pemeriksaan Pemasangan
  - Borang Pemeriksaan Pemasangan/Pendawaian Konduit/Trunking
- Pengujian Pemasangan
  - Borang Pemeriksaan Ujian Ujian Elektrik/ICT/ELV

Electrical Inspectorate Manual

- Compliance in accordance with Electricity Supply Act 1990 under Electricity Regulations 1994
- PPE 110 (1), yang menyatakan, ”Sesuatu pepasangan hendaklah diselenggara dalam keadaan baik dan berfungsi dan langkah-langkah awasan hendaklah dipatuhi pada setiap masa untuk mencegah bahaya.”

Electrical Inspectorate Manual

- Compliance in accordance with Electricity Supply Act 1990 under Electricity Regulations 1994
- PPE 110 (3), yang menyatakan, “Sesuatu pepasangan, selain daripada pepasangan domestik, hendaklah diperiksa dan diuji oleh orang kompeten sekurang-kurangnya sekali setiap lima tahun atau bila-bila masa yang diarahkan oleh Suruhanjaya.”

Electrical Maintenance Policy Manual

- Corrective Maintenance
- Rewiring shall be carried out if :-
  - the result of Insulation Resistance Test < 1 MΩ

    or
  - the wiring is > 15 years

Electrical Maintenance Policy Manual

- MS IEC 60364-6 : Verification
- Minimum value of insulation resistance

Table 61A – Minimum value of insulation resistance

Nominal circuit voltage V	Test voltage V	Insulation resistance MΩ
SELV and functional extra-low voltage, when the circuit is supplied from a safety transformer (411.1.2.1) and also fulfils the requirements of 411.1.3.3	250	≥ 0,5
Up to and including 500 V, with the exception of the above cases	500	≥ 1,0
Above 500 V	1 000	≥ 1,0

Thank You