

CHAPTER 3

The Method Statement For Electrical Final Sub Circuit Installation

Sarah Afzan Bt Abd Karim, Normalini Bt Mansor, Zarina Bt Mat Sapri

Building Services Units
Civil Engineering Department,
Politeknik Sultan Salahuddin Abdul Aziz Shah, Persiaran Usahawan, Seksyen U1,
40150 Shah Alam, Selangor, Malaysia.

3.1 INTRODUCTION

Method Statement is a document widely used in the construction industry to control identified health and safety risks (following the preparation of a risk assessment). Method statements outline the safe way of performing a specific job or accomplishing a project and ensure that necessary precautions or control measures are communicated to those involved. A method statement provides evidence that significant health & safety risks have been identified and there are safety systems in place.

Method statement for construction project is a mandatory requirement even sometimes at the pre-qualification stage of a construction contractor. Any reputable building construction company will follow the best construction methods in order to provide best quality of work. Many old companies are always maintaining a good documentation system hence ensuring that the method statement for construction project are utilized for optimum results.

The method statements achieved once developed is useful for any future projects as well. So we can say that preparation of good method statement for construction work is not a repetitive work. Instead once developed can be utilized for any other same activity or project.

This method statement is to define preparation and installation work instruction procedure for electrical final sub circuit installation to be followed by site trade men and workers.

This procedure applies to project site which requires electrical final sub circuit installation.

3.2 HANDLING AND STORAGE

3.2.1 Pre-delivery and Storage Preparation.

- a. Check the shop drawing to ensure the drawing is endorsed with 'Approval for Construction'
- b. QA/QC will prepare method statement for that specific final sub circuit installation work and submit to the consultant to comments.

- c. Estimate a more accurate material take off final drawing and site to check with final bill of quantity.
- d. Prepare delivery schedule and check site conditions as well as storage capacity.
- e. Coordinate with the site workers responsible for the final sub circuit installation.

3.2.2 Site Activities Preparation.

- a. Incoming storage at site.
- b. Check type and quantity of wires and cables against delivery order.
- c. Check any damage during transportation
- d. Check materials according to specification
- e. Keep material according to specification
- f. Keep the wires and cables conduit at a dry place and free from moisture and water.

3.3 WORK METHODOLOGY

3.3.1 Installation Procedure.

- a. Cable regulation shall be used as required and accordance to:
 - Suruhanjaya Tenaga
 - Electricity Supply Regulation
 - BS7671, Regulation for Electrical Installation (Formally IEE wiring regulation , 16th Edition)

3.3.2 Material preparation

- a. Cable with appropriate length shall be used for laying.
- b. Different type of cable shall be used as per tabulation below:

Item	Nature of Load	Type of Cable
1	Internal: Lighting and small power	Single core PVC
2	External: lighting point (compound, street, landscape etc) requires underground cables	Single or multi core PVC/SWA/PVC or XLPE/SWA/PVC

3.3.3 Final sub Circuit Installation

- a. Cable to be drawn in accordance to size and color coding as per phasing requirement. Each outlet shall be equipped with dedicated neutral and earth of similar size to conductor.
- b. Before laying cables in conduit/trunking, must ensure cable coils used is sufficient length. Such can achieved be achieved by laying the cables on the floor along conduit route starting from the last outlet to the next outlet.
- c. For all final circuits, a minimum of 1.5m length cable coil shall be provided (if needed) at lighting outlets to cater for necessary adjustment based on final layout and site condition.
- d. Spring line (cable puller) shall be inserted into the last outlets and pushed towards the next outlet. Once the drawing end of spring line emerged from the next outlet, indicating clear path for cable routing inside the conduit, all cables (phase, neutral and earth) shall then be tapped together to the

- remaining end of spring line. The connection shall be properly secured to avoid disconnection during cable pulling.
- e. Cable pulling shall be carried out by at least two (2) workers to avoid damaging the cable insulation; one pulls at one end while the other one push the cables at the other end.
 - f. The whole cable drawing process is completed once the spring line has completely withdrawn from the conduit, leaving behind correct size and correct length of cables. Once completed, dismantle the connection between cables and spring line for the next drawing.
 - g. No cable shall be drawn into any conduit containing cables previously drawn since the attachment between cables and spring line may damage the PVC insulation. Any additional cable to be drawn shall be earned out by removing existing cables from conduit and completely redraw.
 - h. Prior to the drawing of cables in conduit, the cable pullers must ensure the correct number of cables allowable for the intended size of conduit. The maximum allowable number of cables or the maximum allowable circuits that to be pulled inside a conduit shall be limited to as per tabulated.

	20mm diameter conduit	25mm diameter conduit
1.5mm sq PVC cables	12 nos. / 4 circuits	15 nos. / 5 circuits
2.5mm sq PVC cables	6 nos. / 2 circuits	9 nos. / 3 circuits

3.3.4 Cable Identification

Cable shall be identified with color coding as per tabulated below:

Phase	PVC Cable Size & Color Identification	
	1.5, 2.5 & 4mm sq	6mm sq and above
Red	Red outer sheath	Red adhesion at both ends of black outer sheath
Yellow	Yellow outer sheath	Yellow adhesion at both ends of black outer sheath
Blue	Blue outer sheath	Blue adhesion at both ends of black outer sheath
Neutral	Black outer sheath	Black outer sheath
Earth	Green outer sheath	Green outer sheath

3.4 HEALTH, SAFETY, SECURITY AND ENVIROMENT.

- a. The objective is to implement the quality control at site which shall be strictly followed by the construction teams to promote safe, healthy, secured and environmental friendly workplace/site at all time.

- b. Incoming materials and equipment, erected equipment and system, site supervision and laboratory inspection services shall be checked to catch any errors early before costly correction are needed to meet specified requirement.
- c. The delivery Order and Quality Control reports of the materials shall be submitted and verified by the Consultant upon arrival at site.
- d. All workers will be provided with appropriate personnel protection equipment (PPE) and this must be worn during the work. Workers who failed to comply with this requirement will be removed from site.
- e. Safety work procedure will be established in compliance with DOSH requirements inclusive of all pertinent machinery and operator certificates will be submitted to the Safety Officer.
- f. Unauthorized personnel are not permitted within construction area.
- g. Safety Officer will closely supervise and checked the safety of the construction area. Safety measure will be intensified when the risk are higher during period of work.

3.5 INSPECTION AND TESTING

All inspection shall be carried out to satisfy the criteria that shall be evidence in the relevant inspection documents as detailed in the inspection and test plan (ITP).

Note: Refer to Attachment 7 - ITP for Final Sub Circuit Installation.

3.5.1 Receiving Inspection

The receiving inspection is carried out to ensure that all incoming material have been approved by consultant which material is in good condition and no damage.

Note: Refer to Attachment 5 - Material Receiving Checklist

3.5.2 In process and Final Inspection

The in-process inspection shall be carried out to ensure conformance of the installation works.

Note: Refer to Attachment 6 - Inspection and Checklist for Installation of Final Sub Circuit.

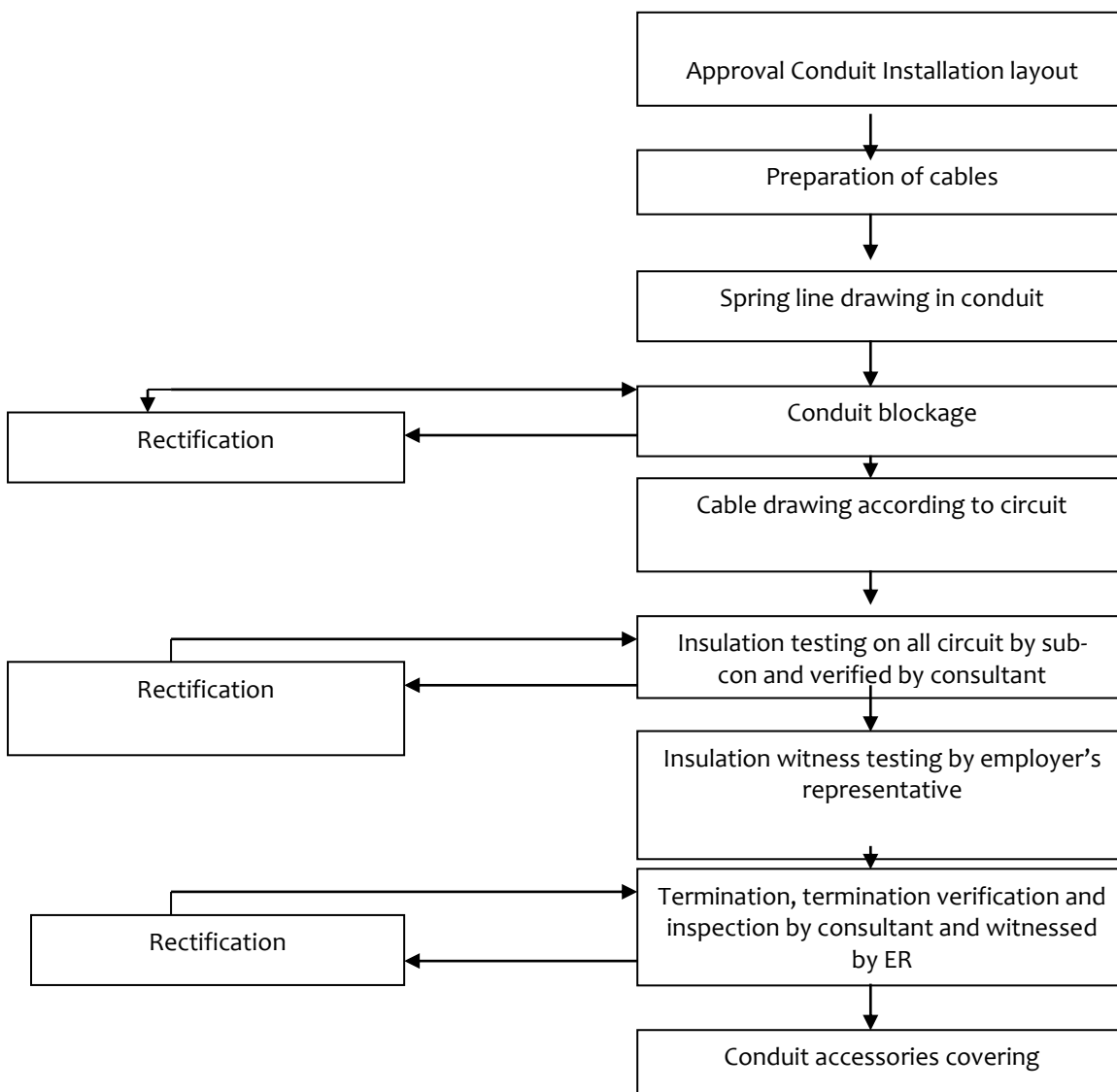
3.5.3 Testing for the above work will be carried out upon full installation of final sub circuit.

3.5.4 All measuring and testing instrument shall be supplied with Test Certificate by the manufacturer for their functionality and accuracy.

- 3.5.5 The test shall be conducted as per BS 7671 (IEE Wiring Regulation).
- 3.5.6 Testing and commissioning checklist form will be used during the inspection.
- 3.5.7 Submit request for Inspection to the SO prior to testing.
- 3.5.8 In the event that the test failed shall take necessary measure to remedy the defect and installation shall be considered as completed until such test have been passed.
- 3.5.9 Compile and submit test record and test certificate to the SO.

3.5 INSTALLATION WORK PROCEDURE

3.5.1 Cable Installation in Conduit



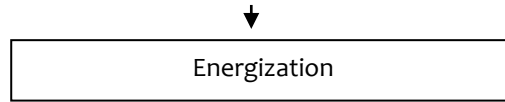


Figure A: Sequence of Work for Cable Drawing In Conduit.

3.5.2 Cable Installation in Trunking

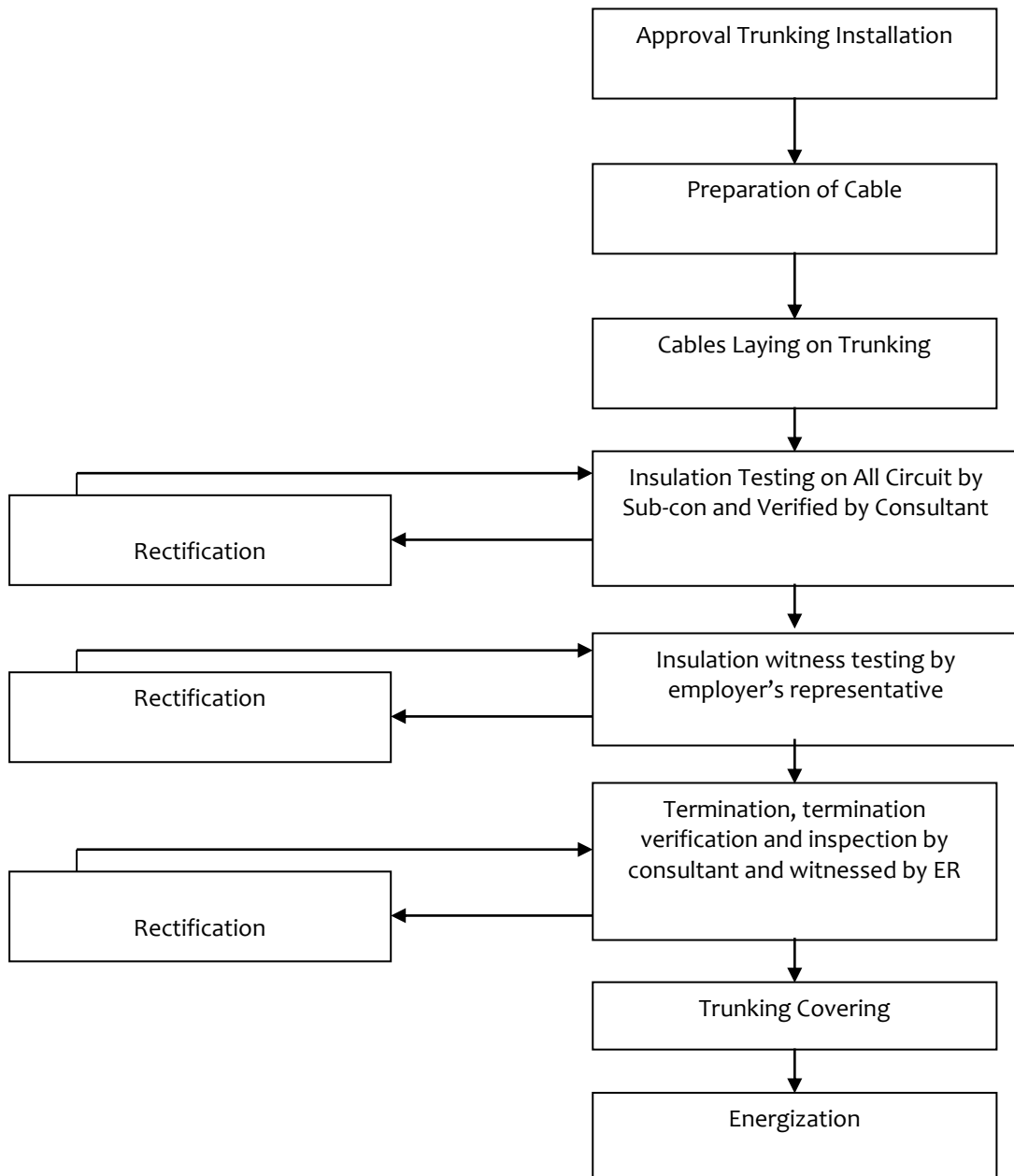


Figure B: Sequence of Work For Cable laid in Trunking

3.5.3 Cable Installation on Cable Tray

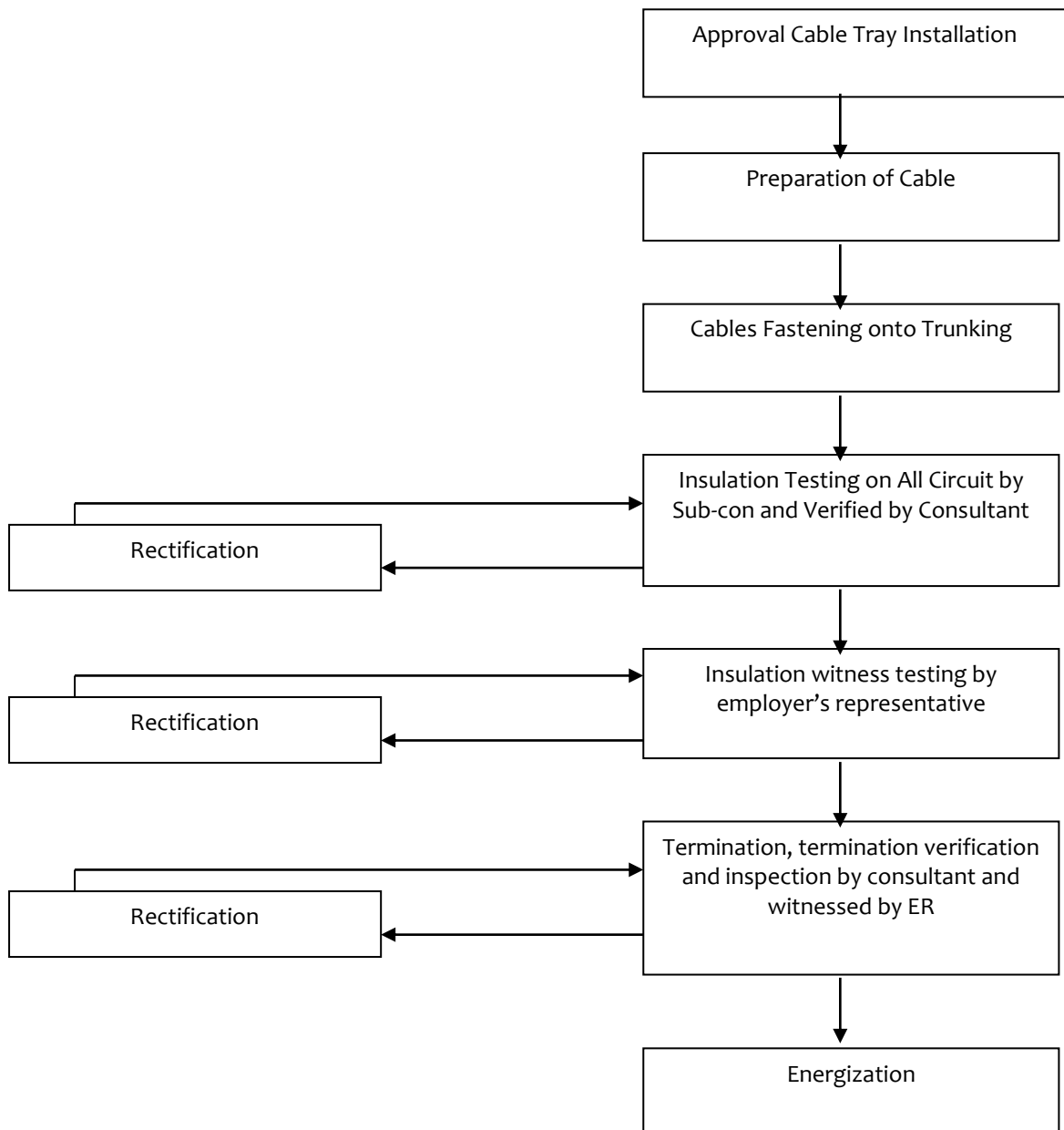


Figure C: Sequence of Work for Cabling on Cable tray

3.5.4 Cable Installation on Cable Tray

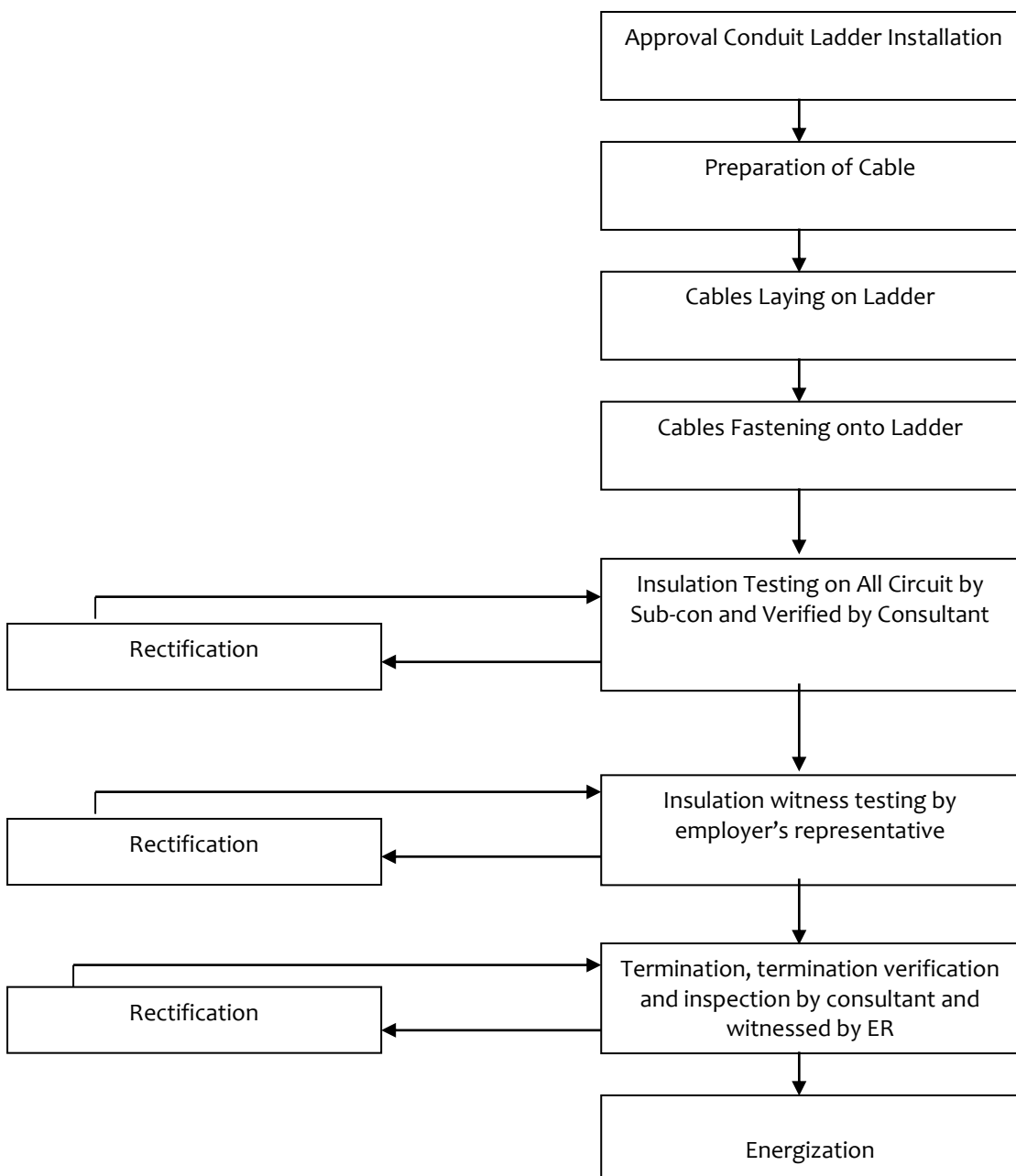


Figure D: Sequence of Work for Cabling on Cable Ladder

REFERENCES

- [1] Electrical and Mechanical Services Department, (2015) “Code of Practice For the Electrical (Wiring) Regulations
- [2] Methods Statement HQ Retrieved from : <http://methodstatementhq.com/method-statement-for-building-construction-project.html>
- [3] Locke, D., (2008) “Guide to the Wiring Regulations 17th Edition IEE Wiring Regulations (BS7671 : 2008)
- [4] Method Statement from Jallcon (M) Sdn Bhd.