SUPERVISION GUIDE
For Electrical Engineering Works



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Jan 2012 Edition

architectural I civil I **electrical** I mechanical I structural

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1 Introduction

This book serves to guide our Consultants in supervising electrical engineering works for new HDB development projects. HDB's general requirements and some examples cited are only for reference purposes. The Consultants shall develop their own comprehensive supervision system and specific checklists/forms for each project.

The Consultant shall submit the following to HDB Project Director according to the proposed timeline to ensure timely completion of works:

S/n	Description	Timeline
1	QP's responsibility in checking different stages of works	Before start of Contract
2	Inspection forms for electrical engineering works for Site Supervisors	Before work starts
3	Material selection and testing	
4	Workshop drawings	
5	Instructions and records	Upon resolution of each item / issue *

* HDB Project Director is to be consulted on the issues in advance if necessary.

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2 Material Selection

Material List

A wide selection of products which have met HDB's requirements are found in the HDB Material List. The list serves to help Consultants choose products with good track records in quality and reliability for use in HDB Residential Housing. The HDB Material List can be viewed from the web address: http://ml.eptc.sg.

The HDB Material List includes accessories, cables, circuit breaker, consumer control unit, fire alarm system, isolator, lightning protection system, luminaries, mechanical control system and switchgear equipment.

Consultants may also propose products which are not in HDB Material List. However, these products are subject to HDB's concurrence and must meet the specified performance / quality criteria.

Approval of Material

The Consultant shall approve all electrical material samples as specified in the Contract before setting up of timber mock up and sample units.

Before approving any product, the Consultant must ensure that it conforms to Specifications and Drawings, the relevant Code of Practice and any other statutory requirements.

The approved samples must bear the Consultant's endorsement and be displayed in the site office's sample display room for verification against those installed on site.

The Consultant shall supervise and ensure all electrical fittings are carried out with the approved material and using approved installation methods.

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Material Testing

The Consultant shall randomly select material listed in “Schedule of Material Tests” at the site for testing in a timely manner. Selected samples are to be marked for identification before sending to the relevant test laboratory. The test laboratory must be accredited for the test in question.

The tests are to ascertain that the material complies with the performance standard stated in the Specifications. All test results must be reviewed by the Consultant. If there is a test failure, Consultant must inform HDB immediately and follow up with a re-test at no additional cost to HDB. If the re-test fails, Consultant shall recommend follow-up actions for HDB’s concurrence.

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3 Timber Mock-Up

Purpose

With the extensive use of precast components in HDB residential building, it is important to provide timber mock-ups on site at the beginning of construction. This allows adjustments to be made to the workshop drawings before precast production and thus prevents abortive works. Problems related to design, maintenance and practicality of the proposed layout could also be addressed during the timber mock-up inspection.

The mock-up is to be constructed accurately to scale. The mock-up should show the proposed locations of sanitary pipes and electrical points in the kitchen, toilets, air-con ledge and service yard so that openings and recesses for concealed services could be confirmed.

Some common issues to look out for are:

a) floor waste/trap not obstructed by structural beam;
b) lighting points not obstructed by ceiling-mounted clothes drying rack;
c) use of external clothes drying rack not hindered by air-con ledge;
d) sufficient clearance for access to the air-con ledge for installation and maintenance of the air-con compressors;
e) toilet vent and other fittings do not obstruct future installation of shower screen; and
f) any other practical considerations.

Timeline to Construct

The Consultant shall ensure that the Contractor erects the timber mock-up for each unit type within three months from the start of the Contract.

Inspection

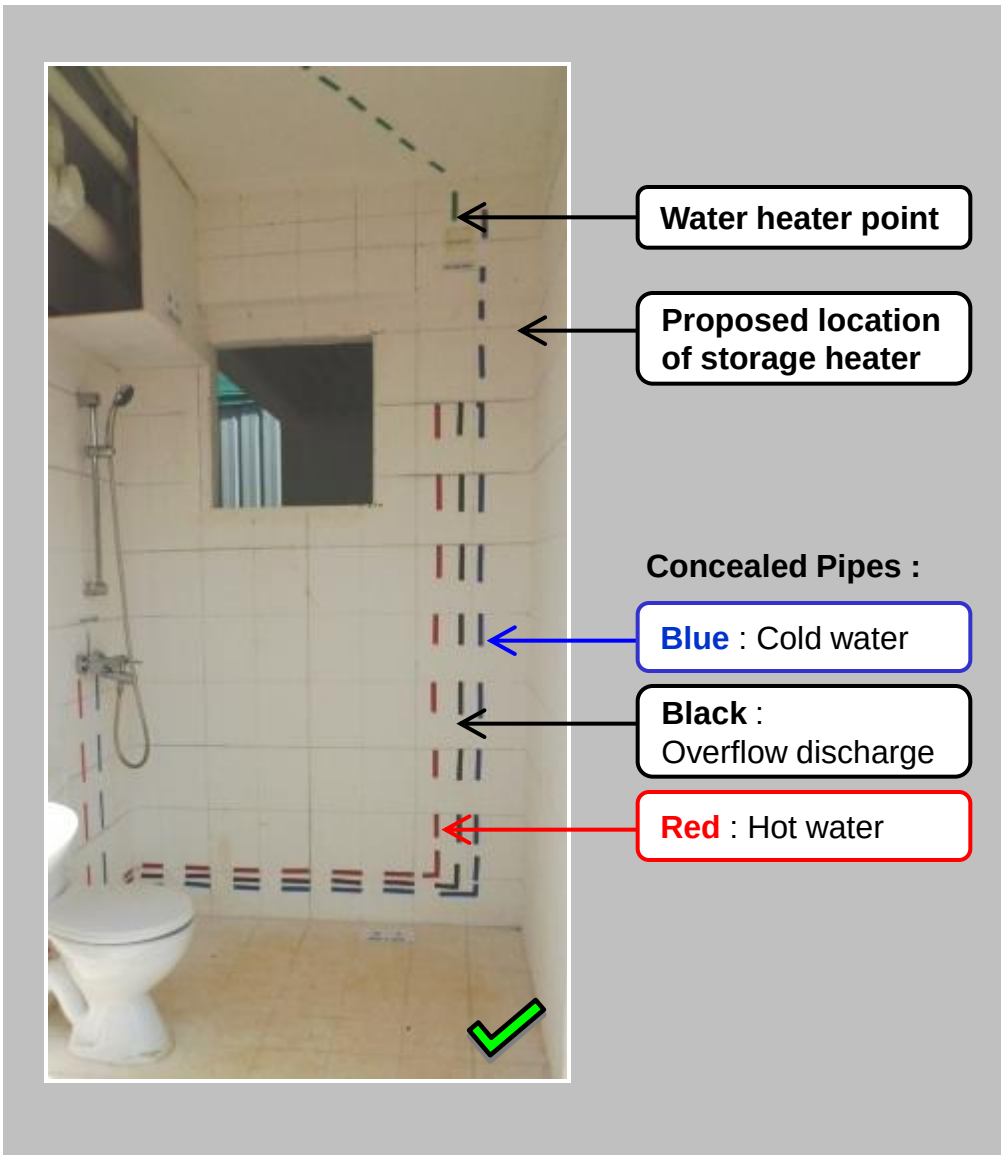
The Consultant shall inspect and verify the position of all electrical provisions before approving the precast drawings.

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The following are some of the items to be checked by the Consultant:

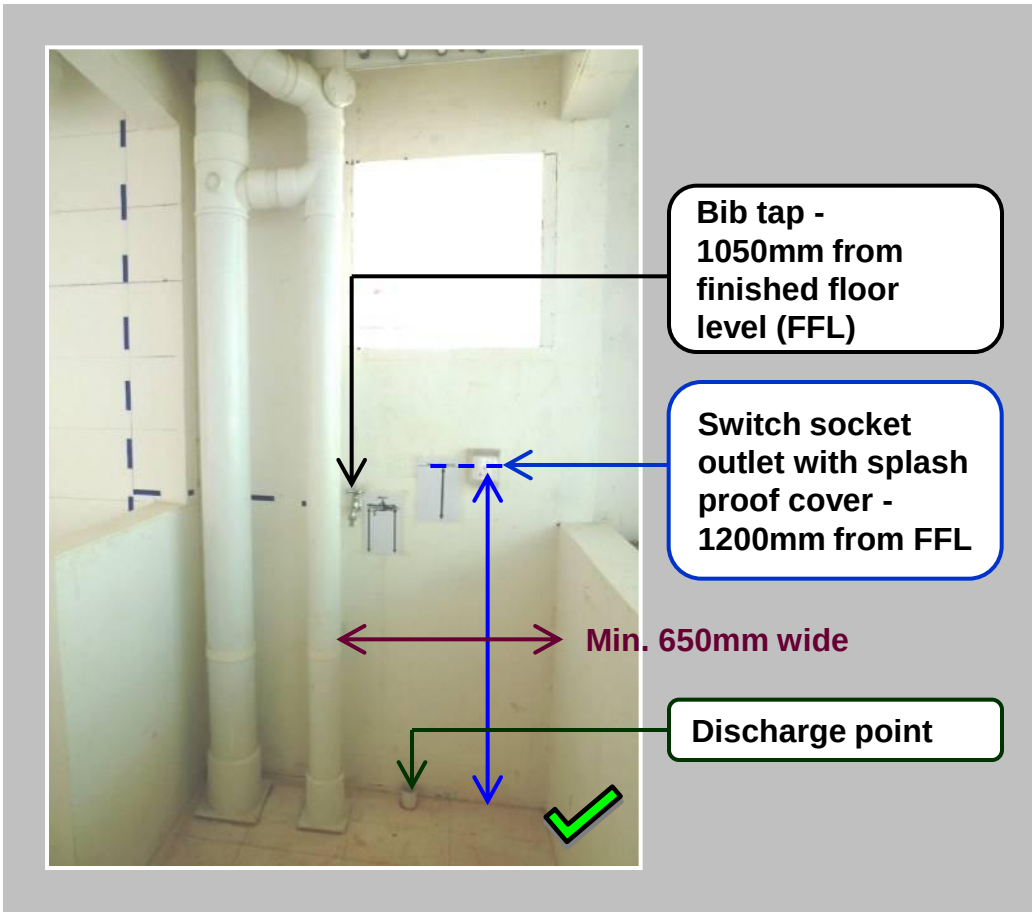
a) The switch socket outlets and switches are to be provided according to drawings and located in suitable positions.

b) Provision of the water heater point should be close to the proposed location of the storage heater.



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c) The location of the switch socket outlet, bib tap and discharge point shall be coordinated for the placement of washing machine in the service yard.



4 Sample Units

Purpose

Sample units are set up to ensure that the position, height and quantity of electrical accessories are constructed according to specifications, drawings and sales brochure before mass production. In the event of discrepancies between drawings and sales brochures, the latter will take precedence. The sample units would also serve as a reference for workmanship standard.

Timeline for Setting Up

Construction of the sample units should commence when structural work reaches the 5th storey and be completed within two to three months. A sample unit is to be provided for each flat type and approved by Consultant with HDB PD concurrence.

Sample Finishes

Switches should be positioned away from the edge of walls to avoid causing wall cracks.



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The height of the switch socket outlets at the living room / bedrooms should be 450mm from the finished floor level (FFL), measured from the centre line of the socket outlets. Exceptions are at the kitchen and service yard where the height of switch socket outlets should not exceed 1200mm.



Correct height of switch socket outlets at living room / bedrooms

The heater switch should be positioned beside the light switches to the bathroom for ease of operation.



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5 HDB Requirements

Location of Embedded Conduit inside the Flats

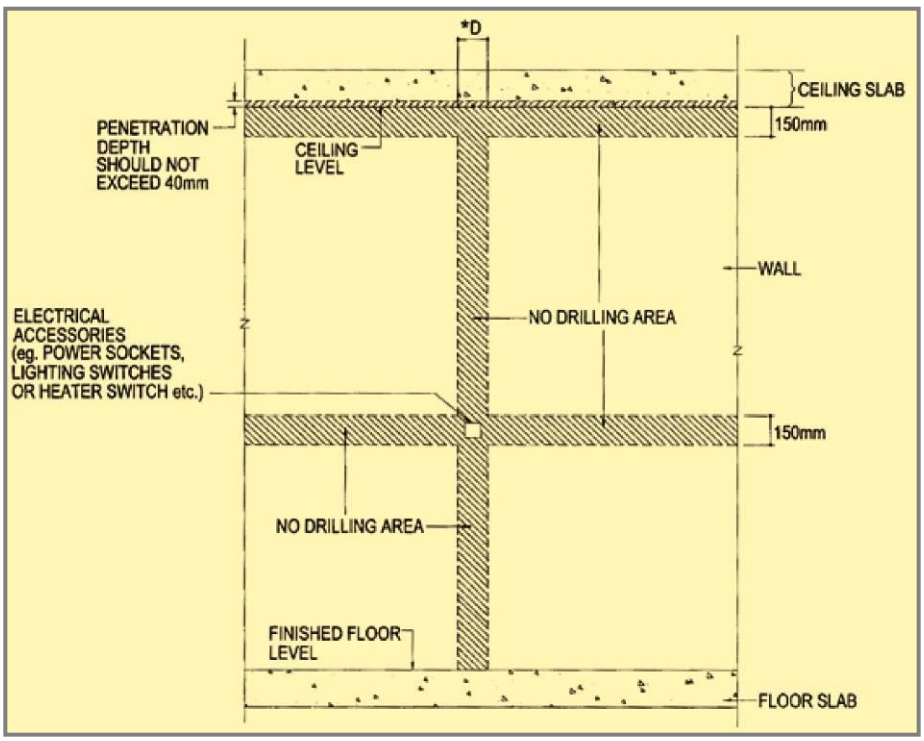
To facilitate the drilling of walls in a safe manner, residents will be given a “No drill zone” notice, informing them of the typical routing of embedded conduits within walls. The Consultant must pay special attention to ensure that the running of these embedded conduits in walls comply with the “No drill zone”.

No Drill Zone

For walls, flat owners are not allowed to drill any holes within 150mm bandwidth vertically above and below, and 150mm bandwidth horizontally to the left and right of electrical accessories such as socket outlets, lighting switches and heater points.

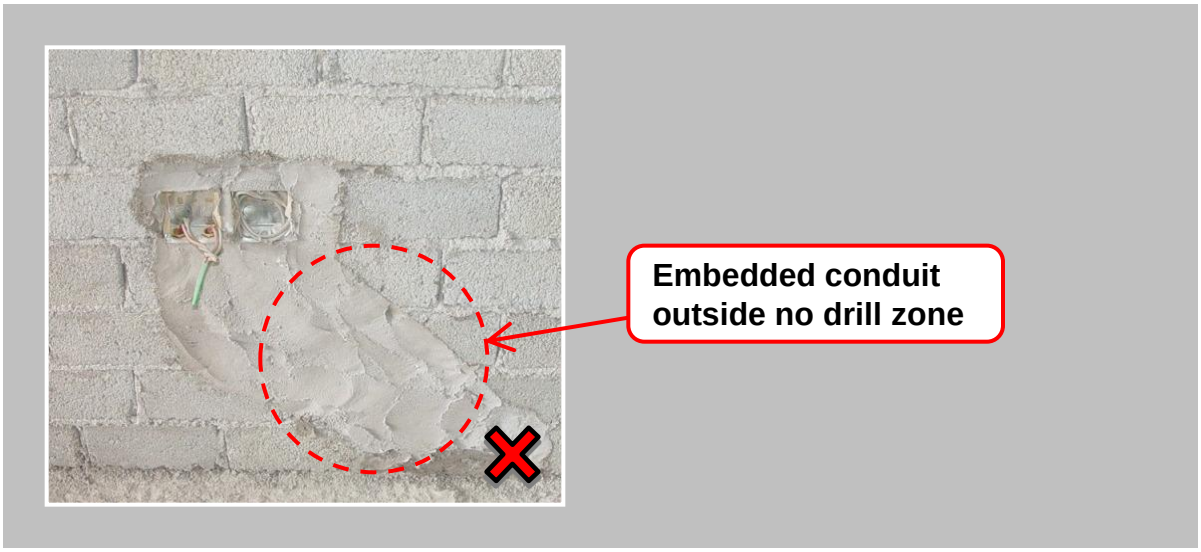
For areas with more than one accessory mounted together, the horizontal bandwidth, (annotated “*D” in the diagram below) should be 150mm multiplied by the number of electrical accessories.

For ceilings, drilling for the mounting of light fittings, ceiling fans, etc must not exceed 40mm in depth.



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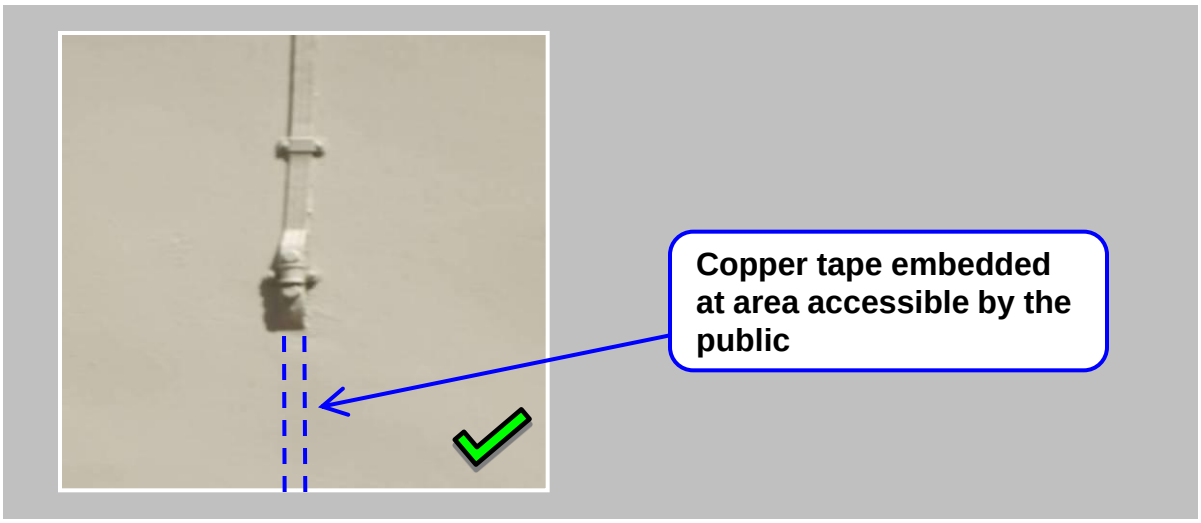
Running conduits at an angle is prohibited as part of the embedded conduits would be outside the protected “no drill zone”.



Down Conductor of Lightning Protection System

HDB uses aluminium lightning tape on the roof top and aluminium down conductor on the surface of external wall/column.

The aluminium down conductor is connected to the copper tape using bi-metallic aluminium/copper connector at a height of 2.5m. In areas which are accessible to the public, the copper tape shall be embedded to prevent theft.



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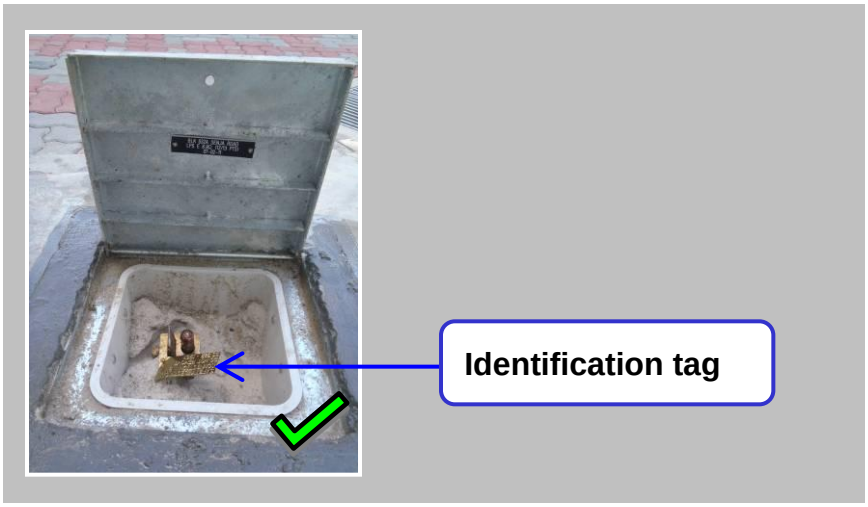
TV System

All distribution amplifiers are to be properly secured with locking device and engraved with serial number. All tee units in the telecom riser and distribution amplifiers are to be sprayed with paint to prevent theft.



Earth System

For every earth inspection pit, the Consultant should ensure information such as block number, street name, type of earthing, value of earth, earthing point number (e.g. 1 of 2) and date of testing are engraved on a durable identification tag. The tag is to be fixed on top of the earth inspection pit below the cover. The tag must remain visible after the inspection pit is filled with sand.



6 In-Process Checking

Purpose

The Consultant needs to monitor and control the quality and finish of the electrical installations.

Before work proceeds, the Consultant shall verify that the electrical sub-contractor is registered by BCA as minimum L2 grade contractor and also registered by IES/ACES as Qualified Electrical Contractor.

It is important to check for irregularities while the works are in progress to ensure works are carried out by qualified workers according to approved work method, specifications, drawings and sample unit.

Inspection by Consultant

The Consultant shall ensure that the following are checked before proceeding to next stage of work:

The following are some of the items to be checked by the Consultant:

a) Embedded conduit routing at 2nd storey floor slab;
b) Metal trunking at 1st storey ceiling;
c) Lightning Protection System down-conductor locations;
d) Coordinate service layout of the M&E services at the roof.

The Consultant shall visit the sites to check that all electrical installations are installed correctly. This will ensure that non-conformances are detected early and reduce rectification or abortive works.

Checklist

The scope for Site Supervisors / Registered Technical Officers encompasses supervision of multiple trades as well as safety, and housekeeping. They are usually not specialised in M&E works, hence it is important for the Consultant to guide them closely in the supervision of electrical installation works.

The Consultant shall develop their own checklists for the project and train the Site Supervisors to check on critical work including but not restricted to the following:

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<table>
<tr><th>S/n</th><th>Critical Items to be included in Checklist</th></tr>
<tr><td>(a)</td><td><u>Ground Floor to 3rd Storey</u>
• Check and ensure that the locations of electrical fittings in the sample unit and access corridor are correct.
• Check and verify critical structural dimension of the lift shaft.</td></tr>
<tr><td>(b)</td><td><u>Typical Storey</u>
• Check and ensure that the locations of electrical fittings in the units and access corridor are correct.
• Check that the correct light fittings are used at common areas and positioned correctly to provide the required lighting distribution.
• Check for natural lighting at areas blocked by the lift shaft / staircase core / central rubbish chute, during downcast weather. If necessary, Consultant is to provide photocell circuit control to automatically light up areas which are affected by downcast weather to achieve the minimum average lighting level as shown below:
<table>
<tr><th>Item</th><th>Area</th><th>Min. Ave. Lighting Level (Lux)</th></tr>
<tr><td>a</td><td>1st storey area</td><td>30</td></tr>
<tr><td>b</td><td>1st storey lift lobby</td><td>80</td></tr>
<tr><td>c</td><td>Upper storey access corridor</td><td>15</td></tr>
<tr><td>d</td><td>Upper storey lift lobby</td><td>40</td></tr>
<tr><td>e</td><td>Stairway</td><td>30</td></tr>
</table></td></tr>
<tr><td>(c)</td><td><u>Roof</u>
• Check and verify the location of the air terminal of Lightning Protection System is correct.</td></tr>
<tr><td>(d)</td><td><u>Site Work and Landscape</u>
• Check and verify that the lighting level on the service road and footpath meets the minimum of 10 lux.
• Check and ensure that the location of the lamp post meets the design guideline.
• Check to ensure that the outdoor lights do not shine into the windows of lower floor units.</td></tr>
</table>

The inspection records shall be monitored until all items are properly closed and endorsed by the Consultant.

Audits by HDB

HDB may carry out audits on the electrical installation. The Consultant shall respond to HDB's audit within two weeks.

The Consultant shall not rely on HDB's audit but carry out their own regular audits to ensure the quality of the electrical installations.

CONQUAS

M&E installation work forms part of the assessment in Construction Quality Assessment System (CONQUAS) by BCA. For public housing, the M&E score constitutes 5% of total score. The Consultant shall ensure that the finishes of the electrical installations are of high workmanship and quality; fittings properly aligned.

No stain marks and visible damages / defects shall be found at the switches, socket outlets and Consumer's Control Unit (CCU).

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7 Good Practices / Common Defects

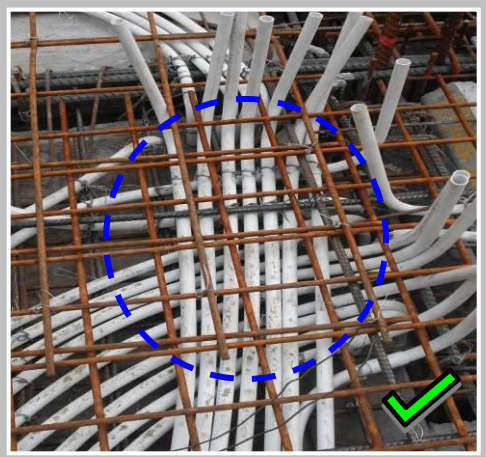
Electrical Conduits

Care must be taken to ensure that embedded conduits are properly supported, with no ingress of water.

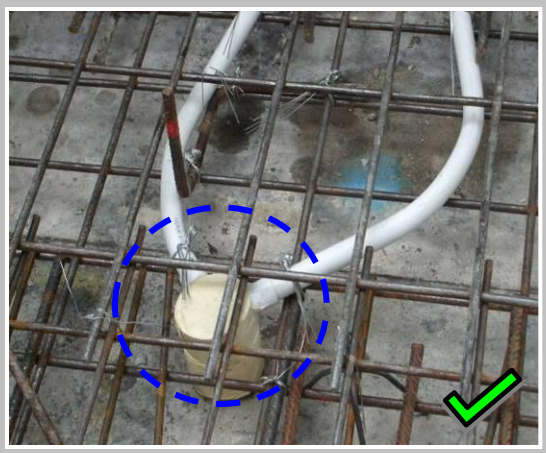
The embedded conduits are to be gradually bent with not more than two 90° bends between two points. This is to allow subsequent pulling of cable through the embedded conduit.



There shall only be a maximum of 2 overlapping conduits so that concrete cover would be sufficient. Proper conduit accessories are to be used.



Max. of 2 overlapping conduits



Proper extension box for lighting point area

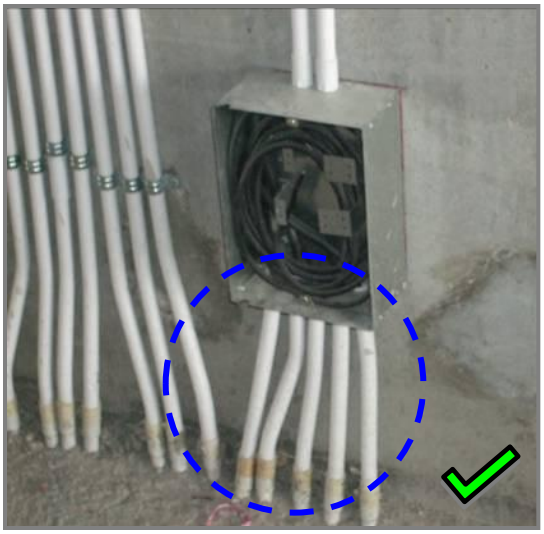
For recesses in the precast wall, Consultant shall ensure that the conduit up-turn is aligned properly with the recess.





In addition, all concealed cabling must be properly protected in conduit or trunking.





The Consultant shall also inspect the concrete cover for the embedded conduit. Galvanised iron (GI) pipes are to be used if the concrete cover is less than 50mm thick.



Inadequate cover for PVC conduit



GI conduit used for concrete cover that is less than 50mm

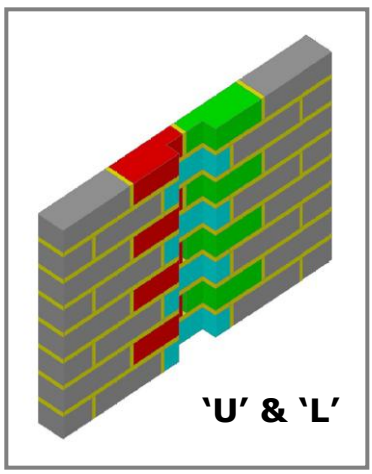
Consultant can consider casting the socket outlets separately to ensure that the socket outlets are in level position first before erecting the brick wall. This will contribute to better quality by reducing hacking of the brick wall later for the installation of conduits.

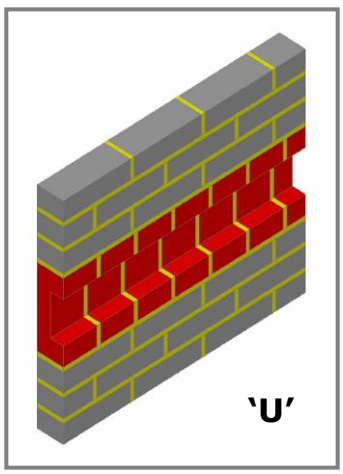


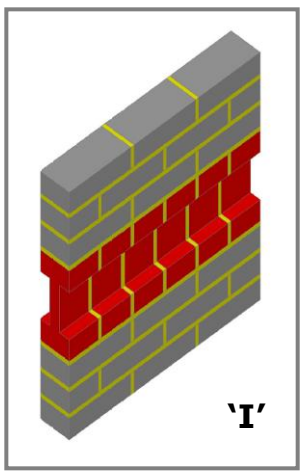
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The recesses on concrete block walls shall not be created by hacking. It can be created by purpose-made building blocks as illustrated below:

- 'U' & 'L'-shaped blocks to form vertical recess;
- 'U'-shaped block to form horizontal recess; and
- 'I'-shaped block to form horizontal recesses for both sides of the wall.







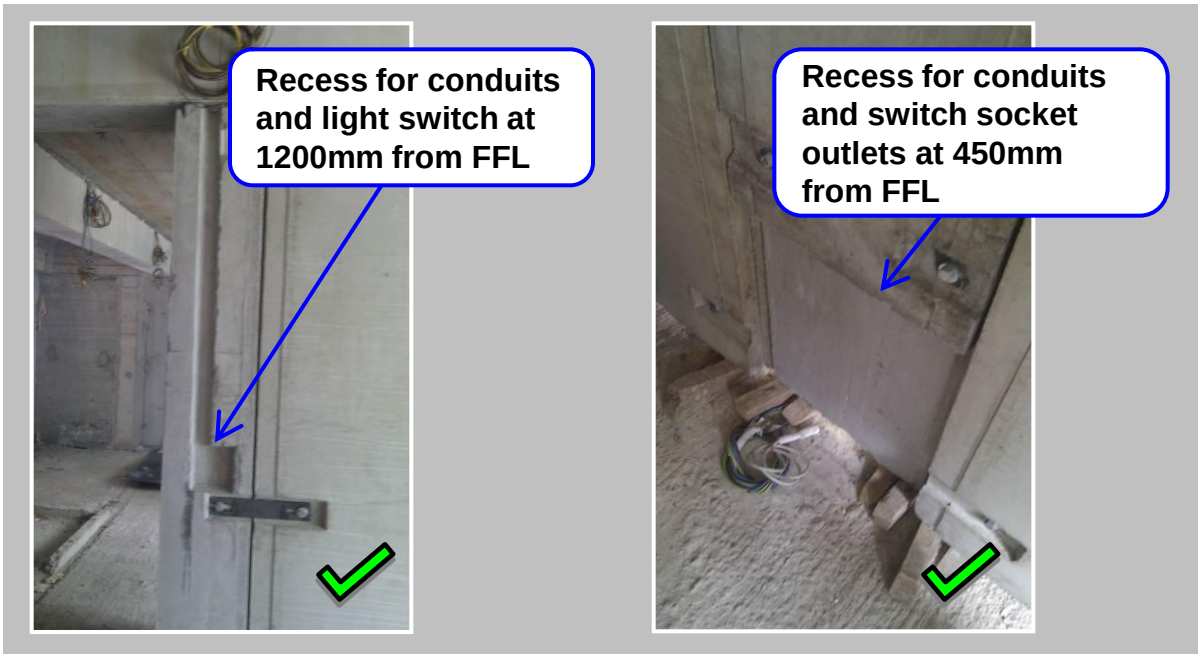


Untidy recess created by hacking

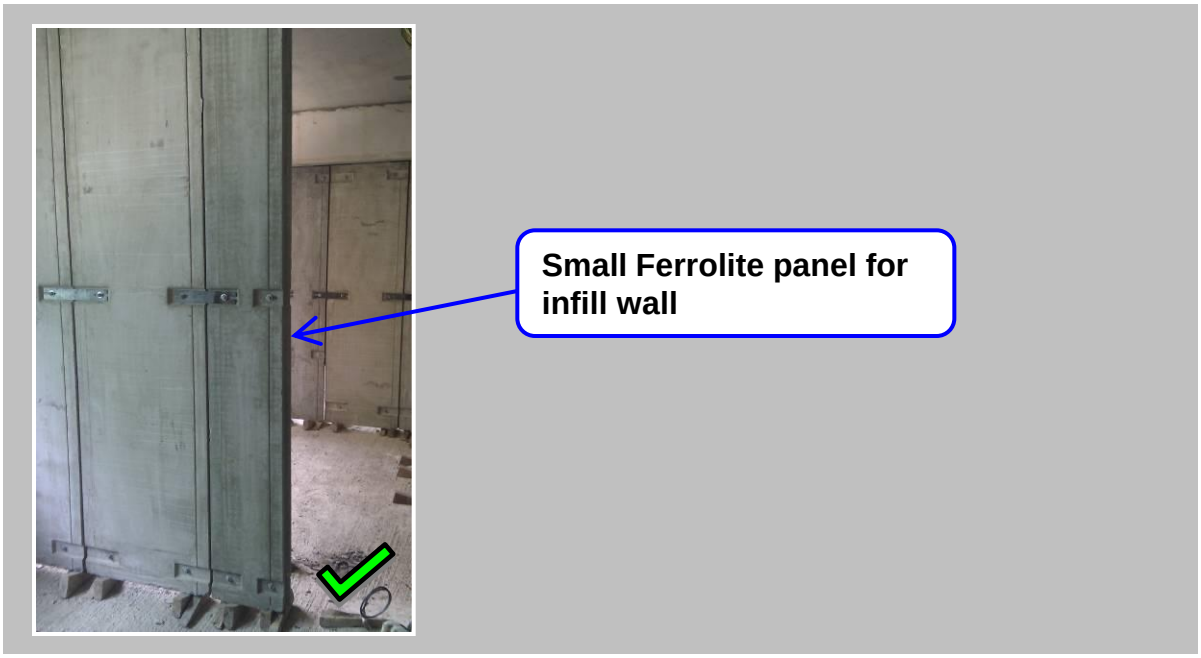


Other than pre-shaped concrete blocks, Contractor is also encouraged to use special Ferrolite panels to increase productivity and minimise hacking:

(a) Ferrolite panels with built-in recesses for electrical fittings and concealed electrical conduits :



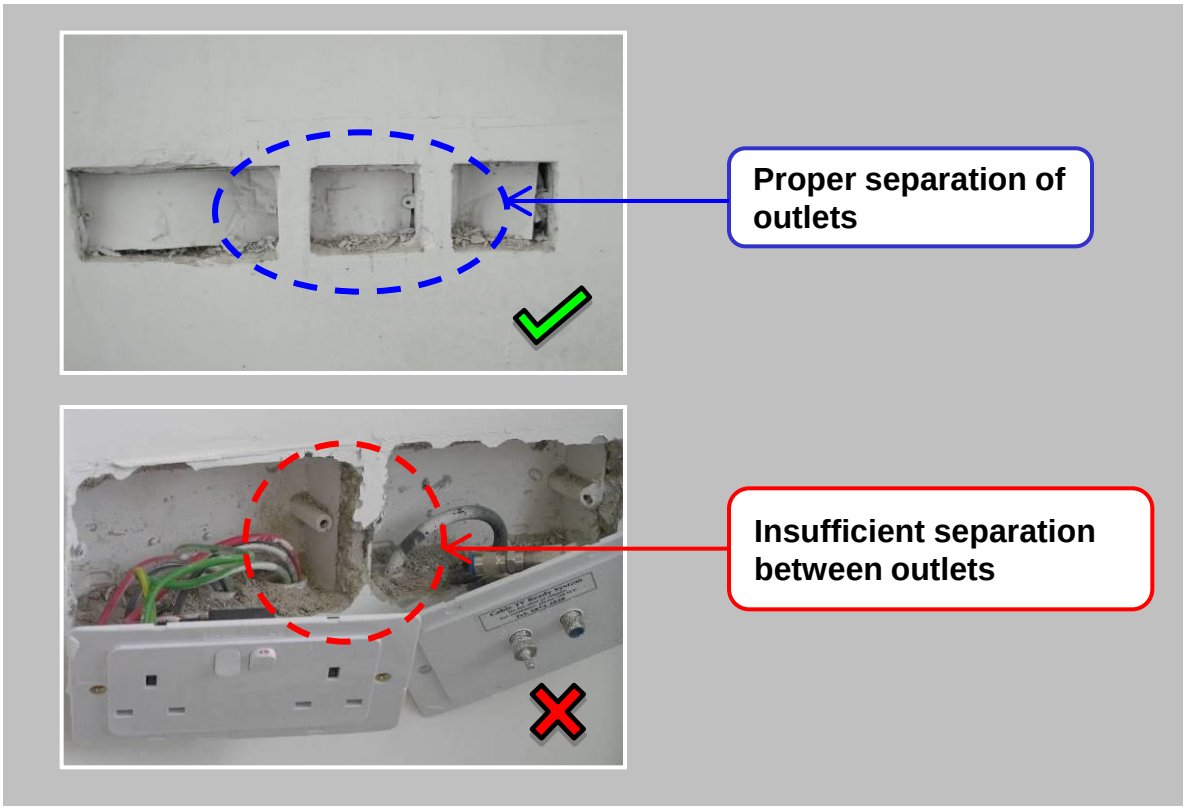
(b) Small Ferrolite infill panel for consistency in material.



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Separation of Electrical and Data Outlets

There are instances where the switch socket outlet and TV / Telephone outlet are next to one another. Proper segregation should be maintained between the two to prevent interference.



Arrangement of SP PowerGrid (SPPG) Meter Box

Where two or more residential units share an electrical riser, the Consultant shall ensure that the meter boxes are positioned properly for easy identification by the respective owners.



Location of Consumer's Control Unit (CCU)

The Consultant shall ensure that the CCU is positioned away from the main door so that the latter will not hit the CCU when it is fully opened.



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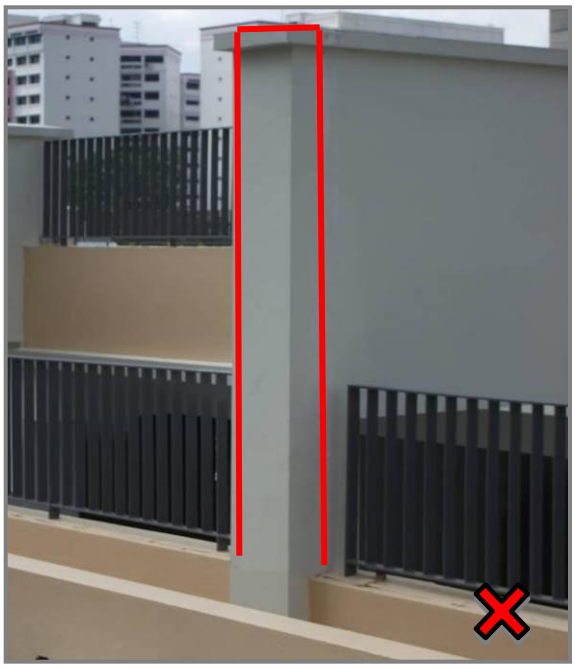
Lightning Protection System

The Consultant shall check the location of the aluminium air terminal of the Lightning Protection System and ensure that they are located appropriately with consideration of the ladder or railing installed at the roof.

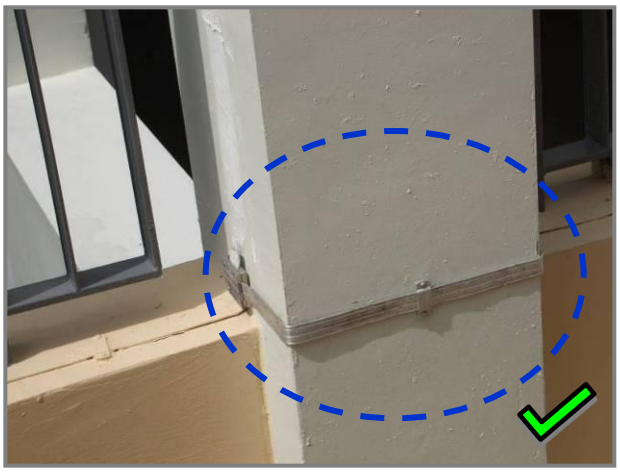




The Consultant shall take precaution to ensure running of lightning conductors on roof features will not result in re-entrant loop as shown below:



In a situation where re-entrant loop occurs, the Consultant may consider closing of the open side of the loop as illustrated below.



Provision for Future Electronic Parking System

HDB may implement Electronic Parking System (EPS) near the ingress/egress of the precinct in future. The Consultant is to ensure that underground pipes are provided at the correct locations to meet HDB Car Parks Section's requirements. This is to avoid future hacking of the road/slabs. UPVC pipes with draw-wire is only required at road and slab crossings leading to the proposed EPS locations. The pipes should terminate with sealed capping above the slab. They are not required at turfed areas and within the MSCP compound as the future cabling will be surface-mounted for routing within the building.

8 Inspection, Testing and Handover

Introduction

On completion of the electrical installations, the Consultant shall carry out appropriate tests and inspections to verify that the electrical installations meet all requirements of relevant codes and Technical Specifications.

The Consultant shall commission the electrical services one month before the handover of each block / precinct.

Tests by HDB

Before the block can be considered complete, the Consultant shall arrange with our Technical Management (M&E) team for the following tests:

a) Tests related to Wiring Regulation

- Residential Unit Wiring (100% Test)
- Main Switchboard (Audit Testing)
- Public Lighting Circuit (Audit Testing)
- Outdoor Lighting Circuit (Audit Testing)

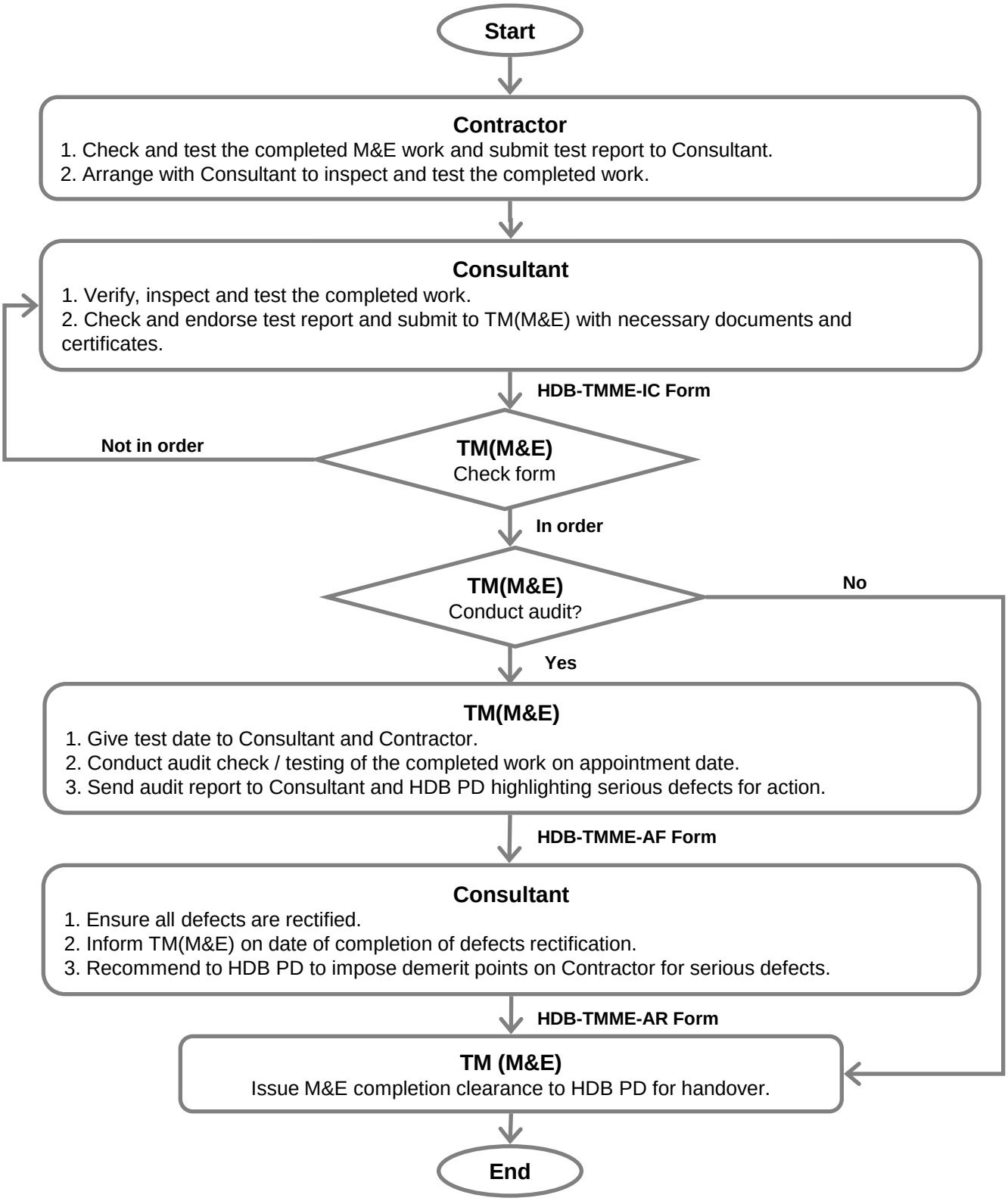
b) Others (Audit Testing)

- Lightning Protection System
- Alert Alarm System
- TV System
- Telecom Wiring

Please refer to the flowchart on the following page for procedures on testing and seeking clearances for M&E Works.

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Audit Test & Completion Clearance for M&E Works



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Submissions to HDB

The application for HDB audit test shall be made at least one month before the handover of each phase. The following prescribed forms shall be used for HDB audit tests:

Item	HDB Forms	Description of Forms	Used By
a	HDB-TMME-IC	Declaration of completion of M&E works	Consultant
b	HDB-TMME-AD	Appointment for M&E audit testing / electrical unit testing	HDB
c	HDB-TMME-AF	M&E audit test report	HDB
d	HDB-TMME-AR	M&E audit test report reply	Consultant
e	HDB-TMME-CC(ND)	Completion clearance of M&E services	HDB
f	HDB-TMME-CC(NDPW)	Completion clearance of M&E Services for precinct work only	HDB

The above forms are enclosed in the **Annex** for your reference.

The latest forms and sample HDB test reports can be obtained from HDB Technical Management (M&E).

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The following Certificates and Test Reports are also to be included with the application for audit tests:

S/n	Item	Forms
a	Residential Unit	Certificate of Fitness of Residential Unit / Certificate of Compliance by LEW
		Unit Wiring Test Report by LEW
b	Main Switchboard	Test Report by LEW
c	Public Lighting	Test Report by LEW
d	Lightning Protection	Test Report by LEW
e	Outdoor Lighting	Test Report by LEW
f	TV System	Test Report by PE
g	Telecommunication	Test Report by Licensed Installer
h	Alert Alarm System	Test Report by PE

Other Considerations

Unlike private projects, HDB projects are generally handed over on block by block basis. The Consultants must ensure that Temporary Occupation Permit is obtained and the block has passed the employer's inspection before certifying completion for the block.

Electricity supply to ESS should be energized at least four months before first block is handed over.

The Consultant shall provide HDB the information to call quotation for the Registered Inspector for Mechanical & Electrical Fire Safety Works six months before the first block handover.

TV system for the block shall be verified by SCV for takeover, activation and maintenance before handing over of the block.

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Annex : Forms for HDB Audit Tests

HDB – TMME – IC (Pg 1/2)

DECLARATION OF COMPLETION OF M&E WORKS

Deputy Director,
Development & Construction Productivity Section 3
(Technical Management M&E)
Building Quality Group
Housing & Development Board
HDB Hub, West Wing, 15th Storey
480 Lorong 6 Toa Payoh
Singapore 310480 Fax: 68543208

Instructions:

1. Fill in where applicable.
2. * Delete if not applicable.

Block No.: Address: Project Ref. No.:

Contract Title:

Main Contractor Name: Contractor Rep:
Contact Tel. no./HP:

A Completion of M&E Works

I/We declare the M&E works ticked have been completed and tested satisfactorily. Relevant test reports, certificates and drawings are enclosed.

Tick if applicable	System/Service	Installation drawings enclosed	Checklists enclosed	Test reports & certs enclosed	Remarks
	Section I: Systems related to Fire Safety				
	Automatic/Manual Fire Alarm System *				PE:
	Dry Rising Main / Down Comer / Wet Rising Main System *				PE:
	Hose Reel System				PE:
	Sprinkler System				PE:
	Mechanical Ventilation / Air-Conditioning System *				PE:
	Smoke Control / Smoke Purging / Fume Extract / Pressurization System *				PE:
	Lift / Escalator Installation *				PE:
	Section II: Mechanical Services				
	Water Supply System				
	Gas Supply System				
	Sanitary System / Ejector Pump *				
	Refuse Handling Equipment				
	Submersible Pump For Rainwater				
	Others (please specify)				
	Section III: Electrical Services				
	Unit Wiring				LEW:
	MATV				
	Telecom Wiring				
	Electrical Installation				LEW:
	(i) Main Switchboard				
	(ii) Public Lighting				
	(iii) Outdoor Lighting				
	(iv) Exit / Emergency Lighting				
	Standby Generator				LEW:
	Lightning Protection System				PE:
	Intruder Alarm / Integrated Security System				
	Others (please specify)				

B Application for inspection and clearance by Technical Management (M&E) Section

I/We declare that the above works are ready for inspection and clearance by Technical Management (M&E) Section.

Confirmation by Main Contractor:

Signed by: _____

Name: _____

Date: _____

Verified by Consultant PE:

Signed by: _____

Name: _____

Date: _____

Form HDB-TMME-IC Feb12

Annex : Forms for HDB Audit Tests

HDB – TMME – IC (Pg 2/2)

Addendum to Declaration of Completion of M&E Works

Please provide and fill in the following details to facilitate correspondence

Contract Title:	Type of Project : NT / D&B / MUP / HIP / RUP / HUP / IPD / PLD / SPT * (e.g. Large Commercial premises)
Block No:	Street Name:
Block OCD:	Block PACD:
HDB PD/Officer-in-charge	Email: Contact no.
Main Contractor: Rep. name:	Email: Contact no.
Subcontractor: Rep. name:	Email: Contact no.
Design LEW name: Licence No.:	Email: Contact no.
Licensing LEW name: Licence No.:	Email: Contact no.
Licensing Telecom Installers' name: Licence No.:	Email: Contact no.
Consultant Project Manager-in-charge:	Email: Contact no.
Consultant Engineer-in-charge:	Email: Contact no.

Notes on declaration of completion of M&E work and appointment for audit testing and unit wiring testing

1 Consultant is satisfied that the works have been satisfactory completed by Contractor when submitting the declaration.
2 Consultant has also inspected and tested the works and is satisfied that the works completed have complied to HDB and all statutory requirements.
3 All test reports and certificates submitted are in order and have been verified and endorsed by Consultant.
4 Consultant confirm the works have been installed according to installed drawings provided.
5 Contractor have rectified all defects pointed by Consultant before HDB audits and if defects are not rectifed during HDB audits, Consultant would recommend to impose demerit points on the Contractor.
6 For any serious defects affecting safety detected by Consultant or HDB audit, Contractor would be liable for demerit points to be imposed.
7 Consultant shall ensure all defects are not repeated and shall be rectified within 3 days. Consultant shall inform HDB when defects have been rectifed to obtain HDB clearance.
8 Consultant shall report recalcitrant LEW to EMA for committing serious defects on electrical safety.
9 Contractor shall provide qualified assistants to receive instruction during HDB audits. HDB audit would be considered fail if no assistant is present and Consultant shall recommend to impose demerit points on the Contractor.
10 For unit wiring testing, Contractor shall provide at least four assistants for HDB to conduct unit wiring testings. COC, form CS/5 and Form E and single line drawings shall be submitted to HDB before the unit wiring testing.
11 Appointment with HDB to audit the completed work or test unit wiring the work can be made with TM(M&E), HDB by phone (Tel. 64903163) or personally between 2 pm to 4 pm at HDB Hub, West Wing at 17th storey.
12 Any cancellation of audit/test appointment shall be made at least one day in advance, otherwise Consultant will recommend demerit points to be imposed on Contractor for no show.
13 If testing requires shutdown of supply, Contractor shall provide confirmed copy of shutdown date/time at least one day before the testing appointment to be faxed to TM(M&E), HDB.

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Appointment for M&E Audit Testing / Electrical Unit Testing

To: Consultant Engineer-in-charge

Consultant Project Manager

Contractor

Copy to: HDB PD/Officer-in-charge

Based on your declaration of completion of the M&E work, appointment has been made to audit test the following M&E system on the date and time as stated below. Please arrange for Contractor to provide the approved as-installed drawings and manpower to be present to receive instructions during the audit testing.

Contract Title:			
Address:			
Block No.:			Postal Code:
Type of Installation	Block No.	Date & Time of Appointment	Remark
MSB *			
Unit wiring *			
PL / FSC / LPS *			
OLS / ESS *			
SUBMAIN EXTENSION *			
Other services (Pls. State) *			
Fire safety system (Pls. State)*			
Mechanical services (Pls. State)*			

_____ _____

Officer Name Date
Development & Construction Productivity Section 3 (Technical Management M&E)
Tel. no.: 64903163

Note: * Delete where necessary
MSB – Main Switchboard, PL – Public Lighting, FSC – Final Sub-Circuit,
LPS – Lightning Protection System, OLS – Outdoor Lighting System

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HDB-TMME-AF

HOUSING & DEVELOPMENT BOARD
BUILDING QUALITY GROUP

M & E AUDIT TEST REPORT

CONTRACT TITLE:	
BLOCK:	STREET NAME:
MAIN CONTRACTOR:	CONTRACTOR'S REP. NAME:

To : Consultant : _____ Attn : _____

Thru' Project Mgr : _____

1.The audit test for _____, has been carried out on _____

2. The findings are listed below :

3. The audit test is passed/failed/pending verification.

4. Please follow-up on the items listed above and reply to us using TMME-AR form by _____.

Note:
For items not installed according to the contracts, please follow-up if RVO is necessary.
For serious defective work, please warn the contractor and recommend to impose demerit points if necessary.

_____ Date:_____
Building Quality Group
Development & Construction Productivity Section 3 (Technical Management M&E) cc PD

_____

Note : All the rectification details and dates must be stated clearly on your reply in TMME-AR form

Your Ref :
Our Ref :
Date :
TEL (DID) :
EMAIL :

Building Quality Group
Development & Construction Productivity Section 3 (Technical Management M&E)

Attn: _____

Dear Sir

M&E AUDIT TEST REPORT REPLY

Contract Title:	
Block:	**Street Name:**
Type of installation:	**Contractor:**

1 Please refer to your audit test report dated _____.

2 This is to inform you that the following items listed in the audit test report have been approved/rectified

(i) ☐ Modifications (item(s) _____) have been approved and updated in drawings. RVO is / is not* required.

(ii) ☐ Modifications (item(s) _____) have not been approved and were rectified on _____ (Date).

(iii) ☐ Defects (item(s) _____) have been rectified on _____ (Date).

3. We will / will not* be taking the following action:

(i) ☐ Contractor will be warned not to repeat the defects.

(ii) ☐ PD will be recommended to impose demerit points.

Remarks: _____

_____

Yours faithfully

Name & Designation
Consultant Name

cc Project Manager :
cc Project Director (HDB):

* delete where not applicable
☐ tick if applicable

Your Ref :
Our Ref : 452-20-22-0314
Date :

Project Director: _____
Dept: _____

Tel :
Fax : 68543208

Completion Clearance of Mechanical & Electrical Services

Contract : _____ Blk No : _____

S/N	System	Testing/ Audit Check	Status	Remarks	Date of Report Submitted
1	Units				
2	Main Switch Board				
3	Public Lighting System (Excluding Linkway system)				
4	Lightning Protection System				
5	Final Sub-Circuit (Excluding Linkway system)				
6	Telecom				
7	TV System				
8	Lift				
9	Transfer Pumping System				
10	Booster Pumping System				
11	Refuse Chute Flushing System				
12	Refuse Handling Equipment				
13	Rain Water Sump Pump				
14	Ejector System				
15	Dry/Wet Rising Main System				
16	Manual/Automatic Fire Alarm System				
17	Automatic Sprinkler Protection System				
18	Hose Reel System				
19	Mechanical Ventilation System				
20	Others				

(R.I.'s Form : NA/Submitted)

YUE WENG KWONG
Principal Technical Officer
Development & Construction Productivity Section 3 (Technical Management M&E)
Building Quality Group

cc PE Er Soh Swee Seng
SE Rajasararan s/o Lechimanah
PE Er Denis Wong
Attn: _____ (Name of Consultant)

Note : √ Test/Audit Check
X No Test/Audit Check
NA Not Applicable

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Your Ref :
Our Ref : 452-20-22-0314
Date :

Project Director: _____
Dept: _____

Tel :
Fax : 68543208

Completion Clearance of Mechanical & Electrical Services
(For Precinct Work only)

Contract : _____ Blk No : _____

S/N	System	Testing/ Audit Check	Status	Remarks	Date of Report Submitted
1	Linkway Lighting				
2	Outdoor Lighting				
3	Others				

YUE WENG KWONG
Principal Technical Officer
Development & Construction Productivity Section 3 (Technical Management M&E)
Building Quality Group

cc PE Er Soh Swee Seng
PE Er Denis Wong
Attn: _____ (Name of Consultant)

Note : √ Test/Audit Check
X No Test/Audit Check
NA Not Applicable

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" Together, we provide excellent project management to deliver quality homes in a sustainable environment."

Dr Johnny Wong, Er.
Director (Building Quality), HDB

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