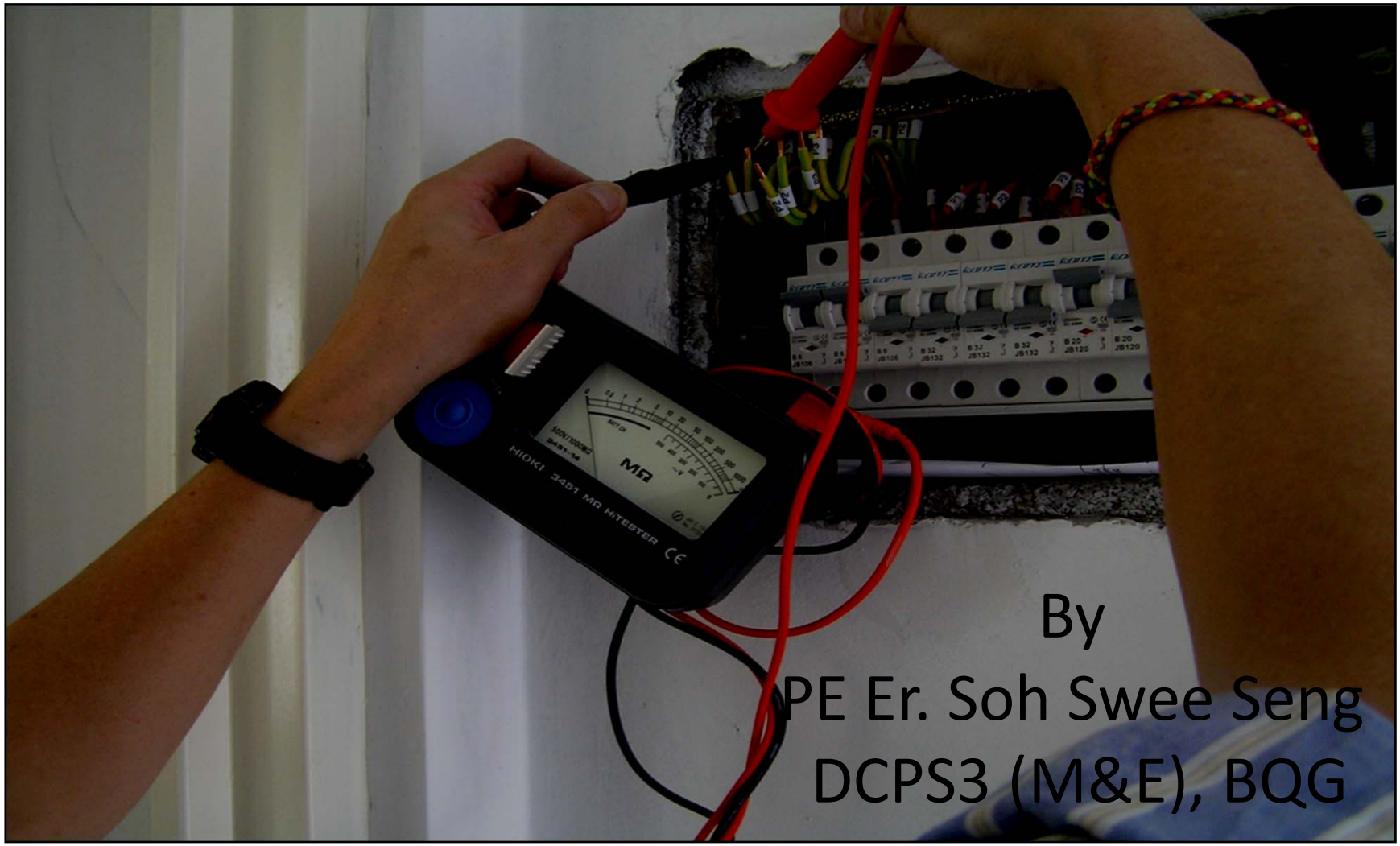
# HDB'S AUDIT ON ELECRICAL INSTALLATION




By
PE Er. Soh Swee Seng
DCPS3 (M&E), BQG

# Electrical Sub-contractor
# Minimum BCA Grade L4

Electrical sub-contractor of Grade L4 (minimum) to be engaged by the contractor:

- HIP tender from G14D onwards
- New development tender called on or after 17/9/2012

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# M&E Consultant And LEW (2010 Onwards)

HDB's Specifications for building tender called from Jan 2010 onwards:

- Consultant shall be both the Design and Installation (Supervision) LEW for the Project.

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# LEW's Declaration Form

<Consultant's company letter head>
<Date>

Housing & Development Board
Building Quality Group
480 Lorong 6 Toa Payoh
West Wing 15th storey HDB Hub
Singapore 310480

PD : _____

Dear Sir,

Contract : _____

1. Please be informed that our company has engaged Mr <Name of installation LEW> (9/ )
   as the installation LEW for the above project.
2. Our company will assume responsibility for the electrical installation work under his charge.

_____
<Director M&E Name / Signature / LEW Rubber Stamp>

cc Lead Consultant PM
DCPS3 – Attn : PE Cheong Weng Yip / PE Soh Swee Seng

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I confirmed my engagement as the installation LEW of <Name of Consultant>

_____ _____
Signature of Installation LEW & LEW Rubber Stamp Date

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# 3 Levels of Quality Check

| | | |
|---|---|---|
| Level 1 | Contractor | Progressive testing |
| Level 2 | Consultant | Verification on final testing and commissioning |
| Level 3 | HDB | 50% check<br><br>Consultant's representative must be present (Tentative date of implementation: 1/8/2014). |

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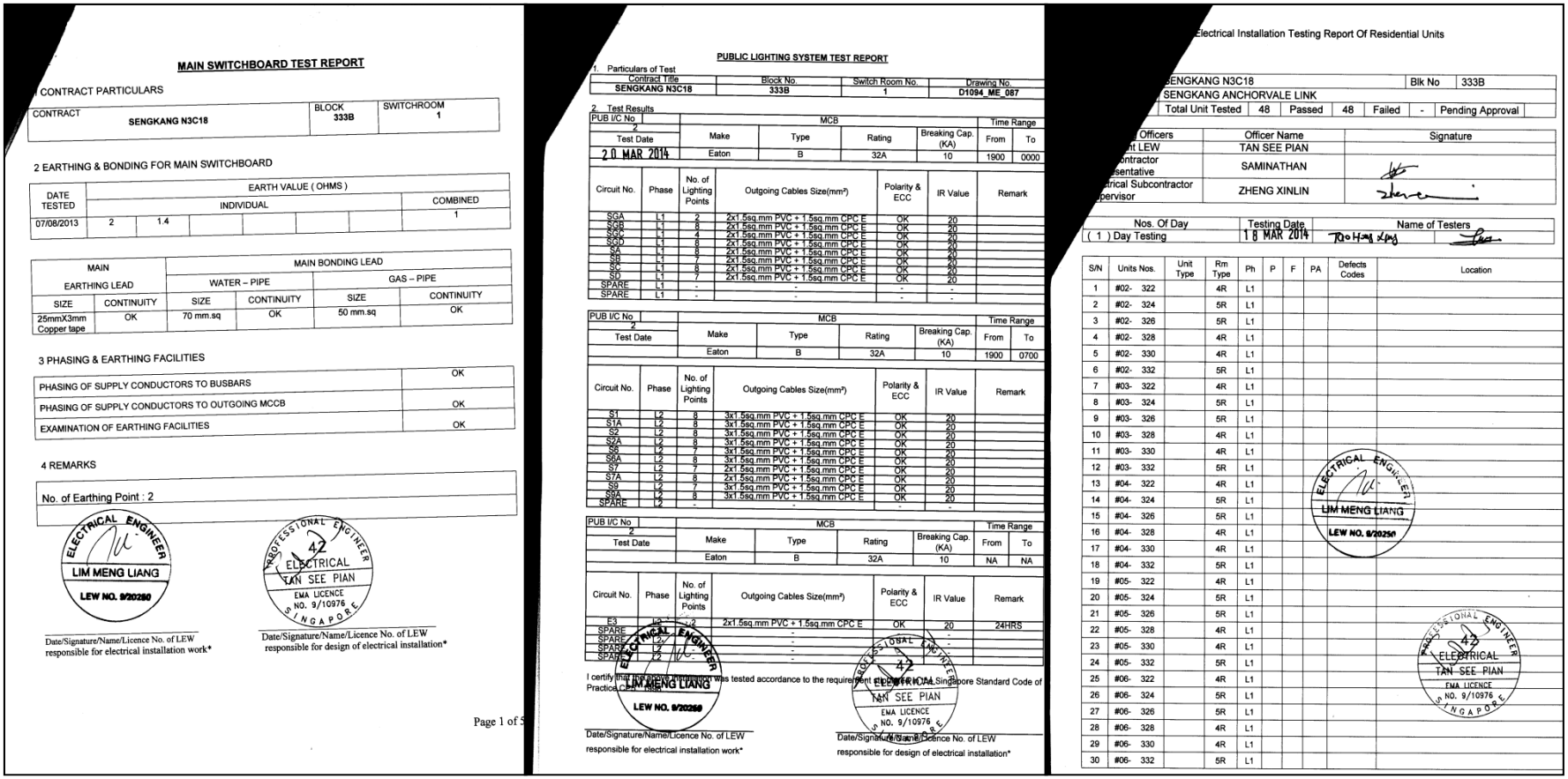
# LEW's Reports



**MAIN SWITCHBOARD TEST REPORT**

CONTRACT PARTICULARS

| CONTRACT | BLOCK | SWITCHROOM |
|---|---|---|
| SENGKANG N3C18 | 333B | 1 |

2 EARTHING & BONDING FOR MAIN SWITCHBOARD

| DATE TESTED | EARTH VALUE ( OHMS ) | | | | | | |
|---|---|---|---|---|---|---|---|
| | INDIVIDUAL | | | | | | COMBINED |
| 07/08/2013 | 2 | 1.4 | | | | | 1 |

| MAIN EARTHING LEAD | | MAIN BONDING LEAD | | | |
|---|---|---|---|---|---|
| | | WATER – PIPE | | GAS – PIPE | |
| SIZE | CONTINUITY | SIZE | CONTINUITY | SIZE | CONTINUITY |
| 25mmX3mm Copper tape | OK | 70 mm.sq | OK | 50 mm.sq | OK |

3 PHASING & EARTHING FACILITIES

| | |
|---|---|
| PHASING OF SUPPLY CONDUCTORS TO BUSBARS | OK |
| PHASING OF SUPPLY CONDUCTORS TO OUTGOING MCCB | OK |
| EXAMINATION OF EARTHING FACILITIES | OK |

4 REMARKS

No. of Earthing Point : 2

ELECTRICAL ENGINEER LIM MENG LIANG LEW NO. 9/20280

Date/Signature/Name/Licence No. of LEW responsible for electrical installation work*

PROFESSIONAL ENGINEER 42 ELECTRICAL TAN SEE PIAN EMA LICENCE NO. 9/10976 E SINGAPORE

Date/Signature/Name/Licence No. of LEW responsible for design of electrical installation*

Page 1 of 5

**PUBLIC LIGHTING SYSTEM TEST REPORT**

1. Particulars of Test

| Contract Title | Block No. | Switch Room No. | Drawing No. |
|---|---|---|---|
| SENGKANG N3C18 | 333B | 1 | D1094_ME_087 |

2. Test Results

| PUB I/C No. | MCB | | | | Time Range | |
|---|---|---|---|---|---|---|
| Test Date | Make | Type | Rating | Breaking Cap. (KA) | From | To |
| 2 | | | | | | |
| 20 MAR 2014 | Eaton | B | 32A | 10 | 1900 | 0000 |

| Circuit No. | Phase | No. of Lighting Points | Outgoing Cables Size(mm²) | Polarity & ECC | IR Value | Remark |
|---|---|---|---|---|---|---|
| SGA | L1 | 2 | 2x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| SGB | L1 | 8 | 2x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| SGC | L1 | 4 | 2x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| SGD | L1 | 8 | 2x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| SA | L1 | 8 | 2x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| SB | L1 | 7 | 2x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| SC | L1 | 8 | 2x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| SD | L1 | 7 | 2x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| SPARE | L1 | - | - | - | - | |
| SPARE | L1 | - | - | - | - | |

| PUB I/C No. | MCB | | | | Time Range | |
|---|---|---|---|---|---|---|
| Test Date | Make | Type | Rating | Breaking Cap. (KA) | From | To |
| 2 | | | | | | |
| | Eaton | B | 32A | 10 | 1900 | 0700 |

| Circuit No. | Phase | No. of Lighting Points | Outgoing Cables Size(mm²) | Polarity & ECC | IR Value | Remark |
|---|---|---|---|---|---|---|
| S1 | L2 | 8 | 3x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| S1A | L2 | 8 | 3x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| S2 | L2 | 8 | 3x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| S2A | L2 | 8 | 3x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| S6 | L2 | 7 | 3x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| S6A | L2 | 8 | 3x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| S7 | L2 | 7 | 2x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| S7A | L2 | 8 | 2x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| S9 | L2 | 7 | 3x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| S9A | L2 | 8 | 3x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | |
| SPARE | L2 | - | - | - | - | |

| PUB I/C No. | MCB | | | | Time Range | |
|---|---|---|---|---|---|---|
| Test Date | Make | Type | Rating | Breaking Cap. (KA) | From | To |
| 2 | | | | | | |
| | Eaton | B | 32A | 10 | NA | NA |

| Circuit No. | Phase | No. of Lighting Points | Outgoing Cables Size(mm²) | Polarity & ECC | IR Value | Remark |
|---|---|---|---|---|---|---|
| E3 | L3 | 2 | 2x1.5sq.mm PVC + 1.5sq.mm CPC E | OK | 20 | 24HRS |
| SPARE | L2 | - | - | - | - | |
| SPARE | L2 | - | - | - | - | |
| SPARE | L2 | - | - | - | - | |
| SPARE | L2 | - | - | - | - | |

I certify that the above installation was tested accordance to the requirement of Clause 10.4 Singapore Standard Code of Practice CP5 : 1998

ELECTRICAL ENGINEER LIM MENG LIANG LEW NO. 9/20280

Date/Signature/Name/Licence No. of LEW responsible for electrical installation work*

PROFESSIONAL ENGINEER 42 ELECTRICAL TAN SEE PIAN EMA LICENCE NO. 9/10976 E SINGAPORE

Date/Signature/Name/Licence No. of LEW responsible for design of electrical installation*

Electrical Installation Testing Report Of Residential Units

| SENGKANG N3C18 | | | | | | Blk No | 333B |
|---|---|---|---|---|---|---|---|
| SENGKANG ANCHORVALE LINK | | | | | | | |
| Total Unit Tested | 48 | Passed | 48 | Failed | - | Pending Approval | |

| Officers | Officer Name | Signature |
|---|---|---|
| nt LEW | TAN SEE PIAN | |
| ontractor esentative | SAMINATHAN | |
| rical Subcontractor pervisor | ZHENG XINLIN | |

| Nos. Of Day | Testing Date | Name of Testers |
|---|---|---|
| ( 1 ) Day Testing | 18 MAR 2014 | Tan Hong Ling |

| S/N | Units Nos. | Unit Type | Rm Type | Ph | P | F | PA | Defects Codes | Location |
|---|---|---|---|---|---|---|---|---|---|
| 1 | #02- 322 | | 4R | L1 | | | | | |
| 2 | #02- 324 | | 5R | L1 | | | | | |
| 3 | #02- 326 | | 5R | L1 | | | | | |
| 4 | #02- 328 | | 4R | L1 | | | | | |
| 5 | #02- 330 | | 4R | L1 | | | | | |
| 6 | #02- 332 | | 5R | L1 | | | | | |
| 7 | #03- 322 | | 4R | L1 | | | | | |
| 8 | #03- 324 | | 5R | L1 | | | | | |
| 9 | #03- 326 | | 5R | L1 | | | | | |
| 10 | #03- 328 | | 4R | L1 | | | | | |
| 11 | #03- 330 | | 4R | L1 | | | | | |
| 12 | #03- 332 | | 5R | L1 | | | | | |
| 13 | #04- 322 | | 4R | L1 | | | | | |
| 14 | #04- 324 | | 5R | L1 | | | | | |
| 15 | #04- 326 | | 5R | L1 | | | | | |
| 16 | #04- 328 | | 4R | L1 | | | | | |
| 17 | #04- 330 | | 4R | L1 | | | | | |
| 18 | #04- 332 | | 5R | L1 | | | | | |
| 19 | #05- 322 | | 4R | L1 | | | | | |
| 20 | #05- 324 | | 5R | L1 | | | | | |
| 21 | #05- 326 | | 5R | L1 | | | | | |
| 22 | #05- 328 | | 4R | L1 | | | | | |
| 23 | #05- 330 | | 4R | L1 | | | | | |
| 24 | #05- 332 | | 5R | L1 | | | | | |
| 25 | #06- 322 | | 4R | L1 | | | | | |
| 26 | #06- 324 | | 5R | L1 | | | | | |
| 27 | #06- 326 | | 5R | L1 | | | | | |
| 28 | #06- 328 | | 4R | L1 | | | | | |
| 29 | #06- 330 | | 4R | L1 | | | | | |
| 30 | #06- 332 | | 5R | L1 | | | | | |

ELECTRICAL ENGINEER LIM MENG LIANG LEW NO. 9/20250

PROFESSIONAL ENGINEER 42 ELECTRICAL TAN SEE PIAN EMA LICENCE NO. 9/10976 E SINGAPORE

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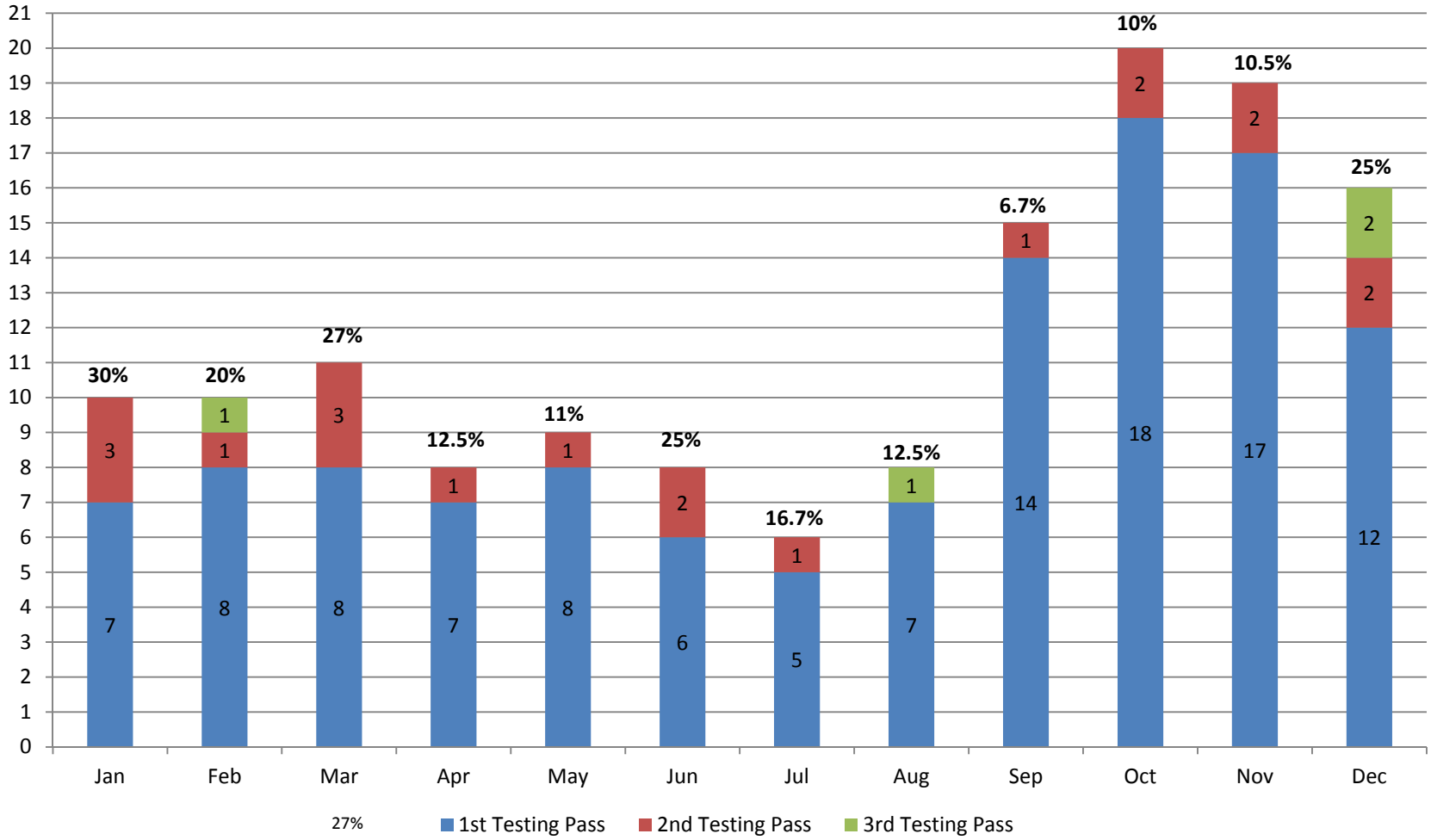
# Summary of Results of Audit Tests

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# Imposition Of Administration Charge And Demerit Points For Failing The Test On Dwelling Units

| S/N | Failed Test at a Block | Building Contractor | Electrical Contractor | Consultant's LEW |
|---|---|---|---|---|
| 1 | 1st | • Admin charge of $2,000 | • Written warning | • Written warning |
| 2 | 2nd | • Admin charge of $2,000<br>• 20 demerit points | • 20 demerit points | • 20 demerit points |
| 3 | 3rd and subsequent test | • Admin charge of $2,000<br>• 20 demerit points | • 20 demerit points | • 20 demerit points<br>• Highlight test failure to EMA for consideration to suspend the LEW |

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# Imposition Of Administration Charge And Demerit Points For Failing Other Electrical Audit Tests

New development projects

- Main Switchboard
- Public Lighting
- Lightning Protection System

(Tentative date of implementation: 1 August 2014)

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# Consultants To Note

- 20 demerit points
- Reporting of failing the test (violation of regulations, CP5, etc.) to EMA

  (Tentative date of implementation: 1 Oct 2014)
- Suspension from participation in HDB's tenders

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THE END

# Consultant Verifies Test By Contractor

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

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

Attn: _____

Dear Sir

**Witness of Testing Carried Out By Electrical Sub-Contractor And His LEW**

| | | |
|---|---|---|
| Contract Title: | | |
| Block: | Street Name: | |
| Main Contractor | | |
| Electrical Sub-Contractor | | |
| Witness Officers | Officer Name | Signature |
| Consultant Supervisor | | |
| LEW-in-Charge<br>(Licence No : ) | | |
| Electrical Sub-Contractor<br>Supervisor | | |

1 I declare the Electrical works ticked have been witnessed and tested satisfactorily by the Electrical Sub-Contractor & the LEW.

| S/N | Type of Installation | Date of Witness | Remarks |
|---|---|---|---|
| 1 | Unit Wiring ☐ | | |
| | Day 1 | | |
| | Day 2 | | |
| | Day 3 | | |
| | Day 4 | | |
| | Day 5 | | |
| | Day 6 | | |
| 2 | Main Switchboard ☐ | | |
| 3 | Public Lighting ☐ | | |
| 4 | Outdoor Lighting ☐ | | |
| 5 | Lightning Protection System ☐ | | |

Remarks: _____

Yours faithfully

Name & Designation
M&E Consultant

cc BQD PD _____

Note : This form shall be submitted together with the test report verified by the consultant.
* delete where not applicable
☐ tick if applicable