

NO: SAMM 711

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LABORATORY LOCATION:  
(PERMANENT LABORATORY)FACULTY OF ENGINEERING  
UNIVERSITI PUTRA MALAYSIA  
43400 UPM SERDANG  
SELANGOR  
MALAYSIA

FIELDS OF TESTING:

CHEMICAL AND MECHANICAL

FIELD OF CALIBRATION:

MASS

This laboratory has demonstrated its technical competence to operate in accordance with MS ISO/IEC 17025:2005 (ISO/IEC 17025:2005).

This laboratory's fulfillment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001 (see Joint ISO-ILAC-IAF Communiqué dated April 2017).

**MATERIAL CHARACTERIZATION LABORATORY (MCL)**

SCOPE OF TESTING: CHEMICAL

| Materials/<br>Products Tested                | Type of Test/<br>Properties Measured/<br>Range of Measurement | Standard Test Methods/<br>Equipment/Techniques |
|--|---|--|
| Surface Water (Sample analyzed as submitted) | Ni, Zn and Cu   | APHA 3111B (21 <sup>st</sup> Edition)          |

Signatory:

1. Mrs. Shafizah Binti Masuri

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**MATERIAL CHARACTERIZATION LABORATORY (MCL)****SCOPE OF TESTING: CHEMICAL**

| Materials/<br>Products Tested              | Type of Test/<br>Properties Measured/<br>Range of Measurement  | Standard Test Methods/<br>Equipment/Techniques   |
|--|--|--|
| Amorphous, partially crystalline materials | Glass Transition Temperature (T <sub>g</sub> ) of amorphous, partially crystalline materials from 30°C - 300°C | ASTM 1356-98 Standards Test Method for Assignment of the Glass Transition Temperature by Differential Scanning Calorimetry or Differential Thermal Analysis. |

**Signatories:**

1. Mrs. Shafizah Binti Masuri
2. Dr. Dayang Radiah Binti Awang Biak
3. Assoc. Prof. Dr. Norhafizah Binti Abdullah

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**STRENGTH OF MATERIALS LABORATORY (SML)****SCOPE OF TESTING: MECHANICAL**

| Materials/<br>Products Tested                                      | Type of Test/<br>Properties Measured/<br>Range of Measurement  | Standard Test Methods/<br>Equipment/Techniques   |
|--|--|--|
| Metallic materials form of rectangular and circular cross sections | Determination of the tensile properties for metallic materials :<br><br>i. Tensile Strength<br><br>ii. Elongation after fracture<br>Load: 5 kN to 100 kN | ASTM E8/E8M –15a Standard Test Methods for Tension Testing of Metallic Materials (excluding preparation of specimen) |

**Signatories:**

1. Dr. Eris Elianddy Bin Supeni

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**AEROSPACE STRUCTURE LABORATORY (ASL)****SCOPE OF TESTING: MECHANICAL**

| <b>Materials/<br/>Products Tested</b>                      | <b>Type of Test/<br/>Properties Measured/<br/>Range of Measurement</b> | <b>Standard Test Methods/<br/>Equipment/Techniques</b> |
|--|--|--|
| Metallic materials in<br>Rectangular Cross Section<br>Form | Fatigue Strength   | ASTM E466 – 15   |

**Signatories:**

1. **Dr. Noorfaizal Yidris**
2. **Prof. Ir. Dr. Faizal Mustapha**
3. **Assoc. Prof. Dr. Dayang Laila Abang Abdul Majid**

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**CONSTRUCTION MATERIALS LABORATORY (CML)****SCOPE OF TESTING: MECHANICAL**

| <b>Materials/<br/>Products Tested</b> | <b>Type of Test/<br/>Properties Measured/<br/>Range of Measurement</b> | <b>Standard Test Methods/<br/>Equipment/Techniques</b> |
|---------------------------------------|--|--|
| Concrete Cube                         | Compressive Strength   | MS EN 12390-3: 2012<br>BS EN 12390-3: 2009             |

**Signatories:**

1. **Dr. Noor Azline Mohd Nasir**
2. **Mrs. Ernaleza Mahsum**

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\* The expanded uncertainties are based on an estimated confidence probability of approximately 95% and have a coverage factor of  $k=2$  unless stated otherwise.

**MASS METROLOGY LABORATORY (MML)****SCOPE OF CALIBRATION: MASS**

| Instrument Calibrated/<br>Measurement<br>Parameter | Range   | Calibration and<br>Measurement Capability<br>Expressed as<br>an Uncertainty( $\pm$ )*  | Remarks   |
|--|---|--|---|
| Standard Weights                                   | 1 g<br>2 g<br>5 g<br>10 g<br>20 g<br>50 g<br>100 g<br>200 g<br>500 g<br>1 kg<br>2 kg<br>5 kg<br>10 kg | 0.02 mg<br>0.02 mg<br>0.03 mg<br>0.03 mg<br>0.04 mg<br>0.06 mg<br>0.1 mg<br>0.2 mg<br>0.4 mg<br>0.8 mg<br>2 mg<br>4 mg<br>9 mg | Calibrated Using<br>Standard Weight<br>Sets and Mass<br>Comparator<br>Based on OIML<br>R111-1 |

**Signatories:**

1. Assoc. Prof. Ir. Dr. B.T. Hang Tuah Baharudin
2. Dr. Khairil Anas Md Rezali

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**MASS METROLOGY LABORATORY (MML)**

SCOPE OF CALIBRATION: MASS

SITE CALIBRATION: CATEGORY I

| Instrument Calibrated/<br>Measurement<br>Parameter | Range       | Calibration and<br>Measurement Capability<br>Expressed as<br>an Uncertainty( $\pm$ )* | Remarks                             |
|--|-------------|---|-------------------------------------|
| Electronic Balances                                | Up to 100 g | 0.1 mg  | Calibrated Using<br>Standard Weight |
|  | Up to 1 kg  | 1 mg  |                                     |
|  | Up to 10 kg | 11 mg   |                                     |

**Signatories:**

1. Assoc. Prof. Ir. Dr. B.T. Hang Tuah Baharudin
2. Dr. Khairil Anas Md Rezali