

Laboratory Scientific Age Research & Testing Lab Pvt. Ltd., B-Block, Shiv Colony,  
Palla No. 1, Faridabad, Haryana

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-6808

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Last Amended on 12.07.2018

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|-----|----------------------------|-------------------------|---|--|

**CHEMICAL TESTING**

| I. | WATER                              |                                     |                   |                                |
|----|------------------------------------|-------------------------------------|-------------------|--------------------------------|
| 1. | Drinking water,<br>Bore well water | Alkalinity                          | IS 3025 (Part 23) | 1 mg/l to 500 mg/l             |
|    |                                    | In-organic solids                   | IS 3025 (Part 16) | 2.5 mg/l to 1000 mg/l          |
|    |                                    | Chloride as Cl                      | IS 3025 (Part 32) | 1 mg/l to 2000 mg/l            |
|    |                                    | Sulphate as SO <sub>4</sub>         | IS 3025 (Part 24) | 1 mg/l to 500 mg/l             |
|    |                                    | Suspended matter                    | IS 3025 (Part 17) | 2.5 mg/l to 100 mg/l           |
|    |                                    | Total Dissolved Solid               | IS 3025 (Part 16) | 5 mg/l to 5000 mg/l            |
|    |                                    | pH                                  | IS 3025 (Part 11) | 4 to 10                        |
|    |                                    | Total Hardness as CaCO <sub>3</sub> | IS 3025 (Part 21) | 2 mg/l to 1000 mg/l            |
|    |                                    | Magnesium as Mg                     | IS 3025 (Part 46) | 1 mg/l to 500 mg/l             |
|    |                                    | Electrical Conductivity             | IS 3025 (Part 14) | 0.1 µmS/cm to 10000 µmS/cm     |
|    |                                    | Ammoniacal Nitrogen                 | IS 3025 (Part 34) | 1 mg/l to 50mg/l               |
|    |                                    | Chemical Oxygen Demand (COD)        | IS 3025 (Part 58) | 5 mg/l to 500 mg/l             |
|    |                                    | Biological Oxygen Demand (BOD)      | IS 3025 (Part 44) | 2 mg/l to 200 mg/l             |
|    |                                    | Colour                              | IS 3025(Part 4)   | 1 Hazen Unit to 10 Hazen Units |
|    |                                    | Fixed Residue, Organic Solids       | IS 3025 (Part 18) | 5 mg/l to 1000 mg/l            |
|    |                                    | Fluoride as F                       | APHA 4500 FD, 485 | 0.1 mg/l to 10 mg/l            |
|    |                                    | Free Residual Chlorine              | IS 3025 (Part 26) | 0.5 mg/l to 5.0 mg/l           |
|    |                                    | Nitrate as NO <sub>3</sub>          | IS 3025 (Part 34) | 0.5 mg/l to 100 mg/l           |
|    |                                    | Oil & Grease                        | IS 3025 (Part 39) | 2 mg/l to 50 mg/l              |
|    |                                    | Phosphate as P                      | IS 3025 (Part 31) | 1 mg/l to 50 mg/l              |
|    |                                    | Silica as Si                        | IS 3025 (Part 35) | 0.2 mg/l to 10 mg/l            |
|    |                                    | Phenol Compound                     | IS 3025 (Part 43) | 0.05 mg/l to 5 mg/l            |
|    |                                    | Sodium as Na                        | IS 3025 (Part 45) | 1 mg/l to 1000 mg/l            |

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|     |                                    | Odour                                     | IS 3025 (Part 5)  | Qualitative   |
|     |                                    | Turbidity                                 | IS 3025 (Part 10)   | 0.1 NTU to 1000 NTU                                     |
|     |                                    | Calcium as Ca                             | IS 3025 (Part 40)   | 2 mg/l to 1000 mg/l                                     |
| 2.  | Construction water                 | pH  | IS 3025 (Part 11)   | 4 to 10   |
|     |                                    | Chloride as Cl                            | IS 3025 (Part 32)   | 1 mg/l to 2000 mg/l                                     |
|     |                                    | Alkalinity                                | IS 3025 (Part 23)   | 0.1ml to 50 ml of 0.02 N H <sub>2</sub> SO <sub>4</sub> |
|     |                                    | In-organic solids                         | IS 3025 (Part 16)   | 2.5 mg/l to 1000 mg/l                                   |
|     |                                    | Sulphate as SO <sub>4</sub>               | IS 3025 (Part 24)   | 1 mg/l to 500 mg/l                                      |
|     |                                    | Acidity                                   | IS 3025 (Part 22)   | 0.1 mg/l to 50 ml of 0.02N NaOH                         |
|     |                                    | Suspended Matter                          | IS 3025 (Part 17)   | 2.5 mg/l to 100 mg/l                                    |
| II. | <b>POLLUTION &amp; ENVIRONMENT</b> |   |   |   |
| 1.  | Effluent , Sewage, Waste Water     | pH  | IS 3025 (Part 11)   | 2 to 12   |
|     |                                    | Chemical Oxygen Demand (COD)              | IS 3025 (Part 58)   | 5 mg/l to 5000 mg/l                                     |
|     |                                    | Biological Oxygen Demand (BOD)            | IS 3025 (Part 44)   | 5 mg/l to 2000 mg/l                                     |
|     |                                    | Suspended Matter                          | IS 3025 (Part 17)   | 2.0 mg/l to 500 mg/l                                    |
|     |                                    | Oil & Grease                              | IS 3025(Part 39)  | 5.0 mg/l to 500 mg/l                                    |
|     |                                    | Dissolved Oxygen                          | IS 3025(Part 38)  | 1 mg/l to 10 mg/l                                       |
|     |                                    | Ammoniacal Nitrogen as NH <sub>3</sub> -N | IS 3025(Part 34)  | 0.1 mg/l to 500 mg/l                                    |
|     |                                    | Nitrate as NO <sub>3</sub>                | IS 3025(Part 34)  | 2 mg/l to 100 mg/l                                      |
|     |                                    | Nitrite as NO <sub>2</sub>                | IS 3025(Part 34)  | 0.01 mg/l to 100 mg/l                                   |
|     |                                    | Total Kjeldhal's Nitrogen                 | IS 3025(Part 34)  | 0.1 mg/l to 100 mg/l                                    |
|     |                                    | Phosphates as P                           | IS 3025(Part 31)  | 0.05 mg/l to 100 mg/l                                   |
|     |                                    | Electrical Conductivity                   | IS 3025(Part 14)  | 1 µmS/cm to 20000 µmS/cm                                |
|     |                                    | Phenolic compound                         | IS 3025(Part 43)  | 0.01 mg/l to 50 mg/l                                    |
|     | Fluoride as F                      | IS 3025(Part 60)                          | 0.2 mg/l to 20 mg/l   |   |

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| <b>III.</b> | <b>ATMOSPHERIC POLLUTION</b>   |                                    |   |   |
| <b>1.</b>   | <b>Stacks Emission</b>         | Sulphur Dioxide                    | IS 11255 (Part 2)   | 1.0 mg/Nm <sup>3</sup> to 1000 mg/Nm <sup>3</sup> |
|             |                                | Carbon Monoxide (CO)               | IS 5182 (Part 10)   | 1 mg/Nm <sup>3</sup> to 500 mg/Nm <sup>3</sup>    |
|             |                                | Nitrogen Oxide (NO <sub>x</sub> )  | IS 11255 (Part 7)   | 1 mg/Nm <sup>3</sup> to 500 mg/Nm <sup>3</sup>    |
|             |                                | Particulate matter (PM)            | IS 11255 (Part 7)   | 10 mg/Nm <sup>3</sup> to 1000 mg/Nm <sup>3</sup>  |
| <b>2.</b>   | <b>Ambient Air</b>             | PM <sub>2.5</sub>                  | SOP CHEM-PM-2.5,<br>SOP No. F-33E,<br>Issue Date-30.04.2016 | 10 µg/m <sup>3</sup> to 500 µg/m <sup>3</sup>     |
|             |                                | Sulphur Dioxide (SO <sub>2</sub> ) | IS 5182 (Part 2)  | 5 µg/m <sup>3</sup> to 1000 µg/m <sup>3</sup>     |
|             |                                | Carbon Monoxide (CO)               | IS 5182 (Part 10)   | 1 µg/m <sup>3</sup> to 2000 µg/m <sup>3</sup>     |
|             |                                | Nitrogen Oxide (NO <sub>2</sub> )  | IS 5182 (Part 6)  | 9 µg/m <sup>3</sup> to 750 µg/m <sup>3</sup>      |
|             |                                | Suspended Matter (SPM)             | IS 5182 (Part 4)  | 5 µg/m <sup>3</sup> to 10000 µg/m <sup>3</sup>    |
|             |                                | RSPM (PM <sub>10</sub> )           | IS 5182 (Part 23)   | 10 µg/m <sup>3</sup> to 2000 µg/m <sup>3</sup>    |
| <b>3.</b>   | <b>Fugitive Emission</b>       | Suspended Particular Matter (SPM)  | IS 5182 (Part 4)  | 5 µg/m <sup>3</sup> to 10000 µg/m <sup>3</sup>    |
|             |                                | RSPM (PM <sub>10</sub> )           | IS 5182 (Part 23)   | 10 µg/m <sup>3</sup> to 1000 µg/m <sup>3</sup>    |
|             |                                | PM <sub>2.5</sub>                  | SOP CHEM-PM-2.5,<br>SOP No. F-33E,<br>Issue Date-30.04.2016 | 10 µg/m <sup>3</sup> to 1000 µg/m <sup>3</sup>    |
|             |                                | Sulphur Dioxide (SO <sub>2</sub> ) | IS 5182 (Part 2)  | 5 µg/m <sup>3</sup> to 750 µg/m <sup>3</sup>      |
|             |                                | Carbon Monoxide (CO)               | IS 5182 (Part 10)   | 1 µg/m <sup>3</sup> to 1500 µg/m <sup>3</sup>     |
|             |                                | Nitrogen Oxide (NO <sub>2</sub> )  | IS 5182 (Part 6)  | 9 µg/m <sup>3</sup> to 500 µg/m <sup>3</sup>      |
| <b>IV.</b>  | <b>BUILDING MATERIAL</b>       |                                    |   |   |
| <b>1.</b>   | <b>Cement-<br/>OPC<br/>PPC</b> | Aluminum Oxide                     | IS 4032, Cl 4.6   | 1 % to 20 %                                       |
|             |                                | Calcium Oxide                      | IS 4032, Cl 4.7.2   | 25 % to 70 %                                      |
|             |                                | Chloride                           | IS 4032   | 0.01 % to 2 %                                     |
|             |                                | Insoluble Residue                  | IS 4032   | 0.1 % to 40 %                                     |
|             |                                | Iron Oxide                         | IS 4032, Cl 4.5.2,  | 0.1 % to 10 %                                     |
|             |                                | Loss on Ignition                   | IS 4032   | 0.1 % to 20 %                                     |
|             |                                | Potassium Oxide                    | IS 4032   | 0.1 % to 5.0 %                                    |

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|     |                                 | Silica  | IS 4032   | 10 % to 35 %                                       |
|     |                                 | Sodium Oxide  | IS 4032   | 0.1 % to 5 %                                       |
|     |                                 | Magnesium Oxide   | IS 4032, Cl 4.8.1& 4.8.2,                                   | 0.5 % to 15 %                                      |
|     |                                 | Sulphuric Anhydride as SO <sub>3</sub>  | IS 4032   | 0.5 % to 5 %                                       |
| 2.  | <b>Fly Ash</b>                  | Alumina Oxide   | IS 1727   | 25 % to 50 %                                       |
|     |                                 | Calcium Oxide   | IS 1727   | 0.5 % to 10 %                                      |
|     |                                 | Chloride  | IS 1727   | 0.01 % to 0.5 %                                    |
|     |                                 | Iron Oxide  | IS 1727   | 0.1 % to 10 %                                      |
|     |                                 | Loss on ignition  | IS 1727   | 0.1 % to 10 %                                      |
|     |                                 | Available Alkalis as Na <sub>2</sub> O  | IS 3812( Part 1)  | 0.0 %1 to 2.0 %                                    |
|     |                                 | Silica  | IS 1727   | 30 % to 70 %                                       |
|     |                                 | Magnesium Oxide   | IS 1727   | 0.1 % to 5 %                                       |
|     |                                 | Sulphuric anhydride as SO <sub>3</sub>  | IS 1727   | 0.1 to 10 %  |
| 3.  | <b>Plaster of Paris, Gypsum</b> | Calcium Oxide as CaO  | IS 1288, Cl 10 KMnO <sub>4</sub> ,                          | 10 % to 35 %                                       |
|     |                                 | Sulphur Trioxide as SO <sub>3</sub>   | IS 1288, Cl 12,   | 15 % to 50 %                                       |
|     |                                 | Soluble Magnesium salt as MgO   | IS 2547(Part 1), Appendix-A<br>IS 1288, Cl 11,              | 0.01 % to 0.5 %                                    |
|     |                                 | Soluble Sodium salt as Na <sub>2</sub> O  | IS 2547 (Part 1), Appendix-A                                | 0.01 % to 2 %                                      |
|     |                                 | Loss on ignition  | IS 2547 (Part 1), Appendix-B                                | 1 % to 20 %  |
| 4.  | <b>Aggregate</b>                | <b>Alkali Aggregate Reactivity</b> (Chemical Method)<br>- Reduction in alkalinity<br>- Dissolved Silica | IS 2386 (Part 7)  | 10 mmol/L to 200 mmol/L<br>10 mmol/L to 200 mmol/L |
|     |                                 | Organic Impurities  | IS 2386 (Part 2)  | Qualitative  |

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| 5.         | <b>Admixture</b>           | Ash Content                     | IS 9103   | 1 % to 15 %                                  |
|            |                            | Chloride Content                | IS 9103 , IS 6925   | 0.01 % to 1.0 %                              |
|            |                            | Dry Material Content            | IS 9103   | 20 % to 50 %                                 |
|            |                            | pH Value                        | IS 9103   | 5 to 8                                       |
|            |                            | Relative Density                | IS 9103   | 1 to 1.5                                     |
| 6.         | <b>Bitumen</b>             | Solubility in Trichloroethylene | IS 1216   | 80 % to 100 %                                |
|            |                            | Flash Point (COC)               | IS 1209   | 150°C to 270°C                               |
| <b>V.</b>  | <b>METALS &amp; ALLOYS</b> |                                 |   |  |
| 1.         | <b>Low Alloy Steel</b>     | Carbon                          | IS 228(Part 1)  | 0.02 % to 2.5 %                              |
|            |                            | Manganese                       | IS 228(Part 2)  | 0.1 % to 1.5 %                               |
|            |                            | Phosphorous                     | IS 228(Part 3)  | 0.01 % to 0.5 %                              |
|            |                            | Silicon                         | IS 228 (Part 8)   | 0.05 % to 5.0 %                              |
|            |                            | Sulphur                         | IS 228 (Part 9)   | 0.01 % to 0.5 %                              |
|            |                            | Carbon Equivalent               | IS 1786   | By Calculation                               |
| 2.         | <b>Stainless Steel</b>     | Chromium                        | IS 228 (Part 6)   | 0.15 % to 30 %                               |
|            |                            | Nickel                          | IS 228(Part 5)  | 2 % to 15 %                                  |
|            |                            | Carbon                          | IS 228(Part 1)  | 0.02 % to 1.5 %                              |
|            |                            | Manganese                       | IS 228(Part 2)  | 0.1 % to 1.5 %                               |
|            |                            | Phosphorous                     | IS 228(Part 3)  | 0.01 % to 0.5 %                              |
|            |                            | Silicon                         | IS 228(Part 8)  | 0.05 % to 5.0 %                              |
|            |                            | Sulphur                         | IS 228(Part 9)  | 0.01 % to 0.5 %                              |
| 3.         | <b>Metals</b>              | Molybdenum                      | IS 228(Part 7)  | 1.0 % to 4.0 %                               |
|            |                            | Mass of Zinc Coating            | IS 6745   | 0.1 g/m <sup>2</sup> to 500 g/m <sup>2</sup> |
| <b>VI.</b> | <b>SOIL &amp; ROCK</b>     |                                 |   |  |
| 1.         | <b>Soil</b>                | Electrical Conductivity         | IS 14767  | 10 mS/s to 500 mS/s                          |
|            |                            | Calcium Carbonates              | IS 2720 (Part 23)   | 0.01 % to 6.0 %                              |
|            |                            | Silica                          | IS 2720 (Part 25)   | 40 % to 90 %                                 |
|            |                            | Nitrogen                        | IS 14684  | 0.1 % to 5 %                                 |

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|-----|----------------------------|-------------------------|---|--|
|     |                            | pH                      | IS 2720 (Part 26)   | 2 to 12                                |
|     |                            | Water soluble sulphates | IS 2720 (Part 27)   | 0.01 % to 5 %                          |
|     |                            | Organic matter          | IS 2720 (Part 22)   | 0.02 % to 10 %                         |

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**CHEMICAL TESTING**

| AT-SITE    |                                       |   |                              |                        |
|------------|---------------------------------------|---|------------------------------|------------------------|
| <b>I.</b>  | <b>ATMOSPHERIC POLLUTION</b>          |   |                              |                        |
| <b>1.</b>  | <b>Noise</b>                          | Ambient Noise Equivalent Levels (Leq) for Day & Night | IS 9876, IS 9989             | 30 dB(A) to 130 dB(A)  |
|            |                                       | Source Noise  | IS/ISO 8528 (P-10), EPA 2000 | 50 dB(A) to 130 dB(A)  |
| <b>II.</b> | <b>RESIDUES IN WATER</b>              |   |                              |                        |
| <b>1.</b>  | <b>Drinking water, Borewell water</b> | Aluminum as Al  | IS 3025 (Part 55)            | 0.02 mg/l to 5 mg/l    |
|            |                                       | Total Chromium as Cr                                  | IS 3025 (Part 52)            | 0.05 mg/l to 5.00 mg/l |
|            |                                       | Manganese as Mn                                       | IS 3025 (Part 59)            | 0.03 mg/l to 5 mg/l    |
|            |                                       | Nickel as Ni  | IS 3025 (Part 54)            | 0.1 mg/l to 10 mg/l    |
|            |                                       | Total Iron as Fe                                      | IS 3025 (Part 53)            | 0.1 mg/l to 15 mg/l    |
|            |                                       | Copper as Cu  | IS 3025 (Part 42)            | 0.05 mg/l to 5.0 mg/l  |
| <b>2.</b>  | <b>Waste Water</b>                    | Total Chromium as Cr                                  | IS 3025 (Part 52)            | 0.1 mg/l to 100 mg/l   |
|            |                                       | Hexavalent Chromium as Cr <sup>6+</sup>               | IS 3025 (Part 52)            | 0.05 mg/l to 100 mg/l  |
|            |                                       | Copper as Cu  | IS 3025 (Part 42)            | 0.015 mg/l to 100 mg/l |
|            |                                       | Zinc as Zn  | IS 3025 (Part 49)            | 0.05 mg/l to 100 mg/l  |
|            |                                       | Manganese as Mn                                       | IS 3025 (Part 59)            | 0.05 mg/l to 50 mg/l   |
|            |                                       | Aluminum as Al  | IS 3025 (Part 55)            | 0.01 mg/l to 10 mg/l   |

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**MECHANICAL TESTING**

| <b>I. BUILDING MATERIALS</b> |                                    |  |                  |   |
|------------------------------|------------------------------------|--|------------------|---|
| 1.                           | <b>Cement</b>                      | Normal consistency                                 | IS 4031 (Part 4) | 20 % to 40 %  |
|                              |                                    | <b>Setting time</b><br>- Initial<br>- Final        | IS 4031 (Part 5) | 10 Min to 300 Min<br>100 Min to 600 Min                     |
|                              |                                    | Soundness Le-chatelier                             | IS 4031 (Part 3) | 0.5 mm to 10.0 mm   |
|                              |                                    | Autoclave Expansion                                | IS 4031 (Part 3) | 0.01 % to 1.5 %   |
|                              |                                    | Fineness by Blain's Cell                           | IS 4031 (Part 2) | 100 m <sup>2</sup> /kg to 500 m <sup>2</sup> /kg            |
| 2.                           | <b>Fly Ash</b>                     | Compressive Strength                               | IS 4031 (Part 6) | 10 N/mm <sup>2</sup> to 80 N/mm <sup>2</sup>                |
|                              |                                    | Fineness by Blain's Cell                           | IS 1727          | 100 m <sup>2</sup> /kg to 600 m <sup>2</sup> /kg            |
| 3.                           | <b>Concrete</b>                    | Particles retain on 45µ<br>IS sieve ( wet sieving) | IS 1727          | 1 % to 70 %   |
|                              |                                    | Compressive strength                               | IS 516           | 10 N/mm <sup>2</sup> to 80 N/mm <sup>2</sup>                |
| 4.                           | <b>Bricks-Clay, Fly ash Bricks</b> | Compressive strength of Accelerated Cured Concrete | IS 9013          | 10 N/mm <sup>2</sup> to 80 N/mm <sup>2</sup>                |
|                              |                                    | Water absorption                                   | IS 3495 (Part 2) | 2.0 % to 30.0 %   |
|                              |                                    | Compressive Strength                               | IS 3495 (Part 1) | 2.0 N/mm <sup>2</sup> to 20 N/mm <sup>2</sup>               |
|                              |                                    | Efflorescence                                      | IS 3495 (Part 3) | Qualitative   |
| 5.                           | <b>Coarse Aggregate</b>            | Dimension<br>- Length<br>- Width<br>- Height:      | IS 1077          | 100 mm to 5000 mm<br>100 mm to 5000 mm<br>100 mm to 5000 mm |
|                              |                                    | Sieve Analysis                                     | IS 2386 (Part 1) | 4.75 mm to 125 mm<br>(0 % to 100 %)                         |
|                              |                                    | Bulk Density                                       | IS 2386 (Part 3) | 1.5 kg/L to 2.5 kg/L  |
|                              |                                    | Flakiness Index                                    | IS 2386 (Part 1) | 2 % to 40 %   |
|                              |                                    | Elongation Index                                   | IS 2386 (Part 1) | 2 % to 40 %   |
|                              |                                    | Impact value<br>Crushing Value                     | IS 2386 (Part 4) | 1 % to 60 %<br>1 % to 60 %                                  |



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|     |                             | Los Angles Abrasion Value   | IS 2386 (Part 4)  | 1 % to 60 %                                 |
|     |                             | Specific Gravity            | IS 2386 (Part 3)  | 2.0 to 3.5                                  |
|     |                             | Water Absorption            | IS 2386 (Part 3)  | 0.1 % to 10 %                               |
|     |                             | 10 % Fines Value            | IS 2386 (Part 4)  | 1 kN to 400 kN                              |
|     |                             | Soundness                   | IS 2386 (Part 5)  | 0.1 % to 20 %                               |
|     |                             | Polish stone Value          | IS 2386 (Part 4)  | 40 to 70                                    |
|     |                             | Moisture Content            | IS 2386 (Part 3)  | 0.01 % to 2 %                               |
| 6.  | <b>Fine Aggregate</b>       | Sieve Analysis              | IS 2386 (Part 1)  | 150 µm to 12.5 mm (0 to 100 %)              |
|     |                             | Material Finer than 75 µ    | IS 2386 (Part 1)  | 0.1 % to 30 %                               |
|     |                             | Bulk Density                | IS 2386 (Part 3)  | 1.15 kg/L to 2.5 kg/L                       |
|     |                             | Specific Gravity            | IS 2386 (Part 3)  | 2.0 to 3.5                                  |
|     |                             | Water Absorption            | IS 2386 (Part 3)  | 0.1 % to 10 %                               |
| 7.  | <b>Concrete Paver Block</b> | Compressive Strength        | IS 15658  | 5 N/mm <sup>2</sup> to 80 N/mm <sup>2</sup> |
|     |                             | Water Absorption            | IS 15658  | 0.5 % to 20 %                               |
| 8.  | <b>Fresh Concrete</b>       | Slump test                  | IS 1199   | 0 mm to 200mm                               |
|     |                             | Compaction factor           | IS 1199   | 0.68 to 0.98                                |
| 9.  | <b>Tile</b>                 | Mohr's Hardness             | IS 13630 (Part 13)  | 2 to 10                                     |
|     |                             | Water Absorption            | IS 13630 (Part 2)   | 0.1 % to 10 %                               |
| 10. | <b>Bitumen</b>              | Specific Gravity            | IS 1202   | 0.5 to 1.5                                  |
|     |                             | Ductility                   | IS 1208   | 35 cm to 100 cm                             |
|     |                             | Penetration                 | IS 1203   | 10 div. to 400 div.                         |
|     |                             | Softening Point             | IS 1205   | 40°C to 55°C                                |
|     |                             | Absolute Viscosity          | IS 1206 (Part 2)  | 400 Poise to 5000 Poise                     |
|     |                             | Kinematic Viscosity         | IS 1206 1978(Part 3)  | 100 cSt to 600 cSt                          |
| 11. | <b>Bitumen Emulsion</b>     | Residue on 600 Micron Sieve | IS 8887 (Annex. B)  | 0.01 % to 2 %                               |
|     |                             | Viscosity by Ford Cup       | IS 1206 (Part 1)  | 10 s to 1000 s                              |
| 12. | <b>Bituminous Mix</b>       | Binder Content              | ASTM D 2172-2011  | 1.0 % to 10 %                               |
|     |                             | Marshal Stability           | ASTM D 6927-2006  | 0.1 kN to 25 kN                             |
|     |                             | Flow Test                   | ASTM D 6927-2006  | 1 mm to 10mm                                |
|     |                             | Stripping Value             | IS 6241   | Qualitative (Upto 100)                      |

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| Sl.         | Product / Material of Test             | Specific Test Performed   | Test Method Specification against which tests are performed | Range of Testing / Limits of Detection   |
|-------------|--|---------------------------|---|--|
| <b>II.</b>  | <b>WOOD AND WOOD PRODUCTS</b>          |                           |   |  |
| 1.          | Wood                                   | Moisture content          | IS 1708   | 1 % to 30 %  |
|             |  | Density                   | IS 1708   | 200 kg/m <sup>3</sup> to 1500 kg/m <sup>3</sup>  |
| 2.          | AAC Blocks                             | Compressive Strength      | IS 6441 (Part 5)  | 2 N/mm <sup>2</sup> to 15 N/mm <sup>2</sup>  |
|             |  | Moisture Content          | IS 6441 (Part 1)  | 0.05 % to 3 %  |
|             |  | Bulk Density              | IS 6441 (Part 1)  | 500 kg/m <sup>3</sup> to 1500 kg/m <sup>3</sup>  |
| <b>III.</b> | <b>MECHANICAL PROPERTIES OF METALS</b> |                           |   |  |
| 1.          | Steel bar for concrete Reinforcement   | Ultimate Tensile Strength | IS 1608, IS 1786  | 100 N/mm <sup>2</sup> to 800 N/mm <sup>2</sup>   |
|             |  | Yield Stress              | IS 1608, IS 1786  | 100 N/mm <sup>2</sup> to 800 N/mm <sup>2</sup>   |
|             |  | Elongation                | IS 1608, IS 1786  | 10.0 % to 40 %   |
|             |  | Bend                      | IS 1599, IS 1786  | Qualitative:<br>[Mandrel Diameter:<br>16mm, 20 mm, 24 mm, 32 mm, 36 mm,40 mm,48 mm, 50 mm,60mm, 64 mm, 72 mm, 75 mm, 80 mm, 84 mm, 96 mm, 100 mm, 112 mm,116 mm,120 mm,125 mm,136 mm,140 mm,150 mm,175 mm, 200 mm, 224 mm and 256mm] |
|             |  | Re-bend                   | IS 1786   | Qualitative:<br>[Mandrel Diameter:<br>16mm, 20 mm, 24 mm, 32 mm, 36 mm,40 mm,48 mm, 50 mm,60mm, 64 mm, 72 mm, 75 mm, 80 mm, 84 mm, 96 mm, 100 mm, 112 mm,116 mm,120 mm,125 mm,136 mm,140 mm,150 mm,175 mm, 200 mm, 224 mm and 256mm] |

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|            |                            | Mass per Meter  | IS 1786   | 0.01 kg/m to 9.50 kg/m                  |
| <b>IV.</b> | <b>SOIL &amp; ROCK</b>     |   |   |   |
| <b>1.</b>  | <b>SOIL</b>                | Grain size Analysis (Wet sieving, 75 $\mu$ to 40mm sieve size)  | IS 2720 (Part 4))   | 0 to 100 %                              |
|            |                            | Liquid Limit  | IS 2720 (Part 5)  | 15 % to 50 %                            |
|            |                            | Plastic Limit   | IS 2720 (Part 5)  | 5 % to 50 %                             |
|            |                            | Free Swell Index  | IS 2720 (Part 40)   | 0 to 100 %                              |
|            |                            | Light Compaction<br>MDD:<br>OMC:                                | IS 2720 (Part 7)  | 1.4 g/cc to 2.6 g/cc<br>5 % to 30 %     |
|            |                            | Heavy Compaction<br>MDD:<br>OMC:                                | IS 2720 (Part 8)  | 1.4 g/cc to 2.6 g/cc<br>5 % to 30 %     |
|            |                            | California Bearing Ratio  | IS 2720 (Part16)  | 1 % to 60 %                             |
|            |                            | Tri axial Test with Pore Pressure measurement<br>C=<br>$\phi$ = | IS 2720 (Part 12)   | 0 to 2.0 kg/cm <sup>2</sup><br>5 to 40° |
|            |                            | Compaction by core cutter Method<br>FDD:                        | IS 2720 (Part 29)   | 1.4 g/cc to 2.6 g/cc                    |
|            |                            | Compaction by sand replacement method<br>FDD:                   | IS 2720 (Part 28)   | 1.4 g/cc to 2.6 g/cc                    |

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|-----|----------------------------|-------------------------|---|--|

**NON-DESTRUCTIVE TESTING**

| I. | <b>BUILDING MATERIALS-REINFORCED CONCRETE STRUCTURES</b> |   |                    |  |
|----|--|---|--------------------|--|
| 1. | <b>Structural Concrete</b>                               | Rebound Hammer                                    | IS 13311 (Part 2)  | 10 N/mm <sup>2</sup> to 80 N/mm <sup>2</sup> |
|    |  | Ultrasonic Pulse Velocity Test                    | IS 13311 (Part 1)  | 0.1 km/s to 6.0 km/s                         |
|    |  | Concrete Cover Test                               | BS 1881 (Part 204) | 10 mm to 60 mm                               |
|    |  | Corrosion Potential of uncoated reinforcing steel | ASTM-C-876         | ±1 mV to ± 999 mV                            |