

Laboratory **Quality Engineering Services, Plot No. 15, Ward No. 3/B, Ganpati Marg-Adipur, Gandhidham, Dist. Kutch, Gujarat**

Accreditation Standard **ISO/IEC 17025: 2005**

Certificate Number **TC-6688**

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Validity **03.01.2018 to 02.01.2020**

Last Amended on --

| Sl. | Product / Material of Test | Specific Test Performed | Test Method Specification against which tests are performed | Range of Testing / Limits of Detection |
|-----|----------------------------|-------------------------|---|--|
|-----|----------------------------|-------------------------|---|--|

**MECHANICAL TESTING**

| I.        | <b>BUILDING MATERIALS</b> |                                    |                                   |  |
|-----------|---------------------------|------------------------------------|-----------------------------------|--|
| <b>1.</b> | <b>Brick</b>              | Compressive Strength               | IS 3495 (Part 1): 1992 (RA 2016)  | 0.5 N/mm <sup>2</sup> to 20 N/mm <sup>2</sup>    |
|           |                           | Water Absorption                   | IS 3495 (Part 2): 1992 (RA 2016)  | 1 % to 20 %                                      |
|           |                           | Size and shapes (Dimension)        | IS 1077:1992 (RA 2011)            | 500 mm to 5000 mm                                |
|           |                           | Efflorescence                      | IS 3495 (Part 3): 1992 (RA 2016)  | Qualitative                                      |
| <b>2.</b> | <b>Cement</b>             | Fineness by Dry Sieving            | IS 4031 (Part 1): 1996 (RA 2010)  | 0 to 10 %  |
|           |                           | Fineness by Blain air Permeability | IS 4031 (Part 2): 1999 (RA 2008)  | 100 m <sup>2</sup> /kg to 600 m <sup>2</sup> /kg |
|           |                           | Soundness                          | IS 4031(Part 3): 1988 (RA 2014)   | 0.5 mm to 10 mm                                  |
|           |                           | Consistency                        | IS 4031(Part 4): 1988 (RA 2009)   | 20 % to 40 %                                     |
|           |                           | Initial Setting                    | IS 4031 (Part 5): 1988 (RA 2009)  | 30 min. to 300 min.                              |
|           |                           | Final Setting                      | IS 4031 (Part 5): 1988 (RA 2009)  | 100 min. to 600 min.                             |
|           |                           | Compressive Strength               | IS 4031 (Part 6): 1988 (RA 2009)  | 5 N/mm <sup>2</sup> to 70 N/mm <sup>2</sup>      |
|           |                           | Density                            | IS 4031 (Part 11): 1988 (RA 2009) | 1 g/cc to 5 g/ cc                                |
| <b>3.</b> | <b>Coarse Aggregate</b>   | Grading (Sieve analysis)           | IS 2836(Part 1): 1963 (RA 2016)   | 80 mm to 100 mm                                  |
|           |                           | Flakiness Index                    | IS 2836(Part 1): 1963 (RA 2016)   | 1 % to 50 %                                      |

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|     |                               | Elongation Index        | IS 2836 (Part 1): 1963 (RA 2016)                            | 1 % to 50 %                                 |
|     |                               | Specific Gravity        | IS 2836 (Part 3): 1963 (RA 2016)                            | 0.2 to 3.5                                  |
|     |                               | Water absorption        | IS 2836 (Part 3): 1963 (RA 2016)                            | 0.1 % to 5 %                                |
|     |                               | Bulk Density            | IS 2836 (Part 3): 1963 (RA 2016)                            | 1 kg/L to 3 kg/L                            |
|     |                               | Abrasion Value          | IS 2836 (Part 4): 1963 (RA 2016)                            | 2 % to 50 %                                 |
|     |                               | Impact Value            | IS 2836 (Part 4): 1963 (RA 2016)                            | 2 % to 50 %                                 |
|     |                               | Crushing Value          | IS 2836 (Part 4): 1963 (RA 2016)                            | 2 % to 50 %                                 |
|     |                               | 10% Fineness Value      | IS 2836 (Part 4): 1963 (RA 2016)                            | 20 kN to 500 kN                             |
| 4.  | <b>Concrete (Fresh)</b>       | Slump Test              | IS 1199:1959 (RA 2013)                                      | 0 to 200 mm                                 |
| 5.  | <b>Fine Aggregate</b>         | Grading(Sieve Analysis) | IS 2836 (Part 1): 1963 (RA 2016)                            | 0.075mm to 4.75 mm                          |
|     |                               | Specific Gravity        | IS 2836 (Part 3): 1963 (RA 2016)                            | 1.5 to 3.5                                  |
|     |                               | Water Absorption        | IS 2836 (Part 3): 1963 (RA 2016)                            | 0.1 % to 5 %                                |
|     |                               | Bulk Density            | IS 2836 (Part 3): 1963 (RA 2016)                            | 1 kg/L to 3 kg/L                            |
|     |                               | Finer than 75 micron    | IS 2836 (Part 1): 1963 (RA 2016)                            | 0 to 15 %                                   |
| 6.  | <b>Hardened Concrete Cube</b> | Compressive Strength    | IS 516:1959 (RA 2013)                                       | 5 N/mm <sup>2</sup> to 80 N/mm <sup>2</sup> |
| 7.  | <b>Paver Block</b>            | Compressive Strength    | IS 15658:2006 (RA 2016) Annex D                             | 5 N/mm <sup>2</sup> to 60 N/mm <sup>2</sup> |
|     |                               | Water Absorption        | IS 15658:2006 (RA 2016), Annex C                            | 1 % to 10 %                                 |

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| 8.  | <b>Bitumen &amp; Bituminous Mix</b>   | Specific Gravity        | IS 1202:1978 (RA 2009)                                      | 0.5 to 2.0                                     |
|     |   | Penetration Test        | IS 1203:1978 (RA 2009)                                      | 10 mm to 100 mm                                |
|     |   | Softening Point Test    | IS 1205:1978 (RA 2009)                                      | 10 °C to 60 °C                                 |
|     |   | Ductility Test          | IS 1208:1978 (RA 2009)                                      | 25 cm to 100 cm                                |
|     |   | Flash Point             | IS 1209:1978 (RA 2009)                                      | 75 °C to 300 °C                                |
|     |   | Absolute Viscosity      | IS 1206 (Part 2): 1978 (RA 2009)                            | 360 Poise to 8000 Poise                        |
|     |   | Kinematic Viscosity     | IS 1206 (Part 3): 1978 (RA 2009)                            | 60 cSt to 1000 cSt                             |
|     |   | Loss on Heating         | IS 1212:1978 (RA 2009)                                      | 0 to 10 %                                      |
|     |   | Marshall Stability      | ASTM D 6927:2006  | 1 kN to 50 kN                                  |
|     |   | Marshall Flow Value     | ASTM D 6927:2006  | 1 mm to 30 mm                                  |
|     | Binder Content  | ASTM D 2172:2011        | 0.1 % to 20 %   |  |
| II. | <b>MECHANICAL PROPERTIES OF METALS</b>  |                         |   |  |
| 1.  | <b>High Strength Deformed Steel Bars and Wires for Concrete Reinforcement</b> | Yield Stress            | IS 1786:2008 (RA 2013)                                      | 160 N/mm <sup>2</sup> to 900 N/mm <sup>2</sup> |
|     |   | Tensile Strength        | IS 1608:2005 (RA 2011)                                      | 160 N/mm <sup>2</sup> to 900 N/mm <sup>2</sup> |
|     |   | Elongation %            |   | 5 % to 40 %                                    |
|     |   | Mass per meter          |   | 0.095 kg/m to 10 kg/m                          |