

## The Science You Build On.

Equipment

Category

## **Calibration Services**

Specification Reference

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Parameter

| Category             | Equipment                            | Parameter                                       | Specification Reference      |
|----------------------|--------------------------------------|---|------------------------------|
|                      |                                      |   |                              |
| Concrete             | Concrete Air Meter                   | Type B  | ASTM C231                    |
| Concrete             |                                      | Volumetric                                      | ASTM C173                    |
| General              | Electronic Balance                   | Field Scales                                    | USP Code                     |
|                      |                                      | General Purpose                                 | USP Code                     |
|                      |                                      | General Purpose                                 | USP Code                     |
|                      |                                      | Analytical                                      | USP Code                     |
| Concrete             |                                      | Bearing Block Planeness                         | ASTM C39                     |
| General              | Colinara                             |   |                              |
|                      | Calipers                             | Linearity, ID jaws, depth and step              | Manufacturers Specifications |
| Concrete             | Capping Plate                        | Planeness                                       | ASTM C617                    |
|                      | Capping Jig                          | Squareness                                      |                              |
| Soil                 | CBR Equipment                        | Spacer Diameter and Height                      | ASTM D1883                   |
|                      |                                      | Annular and Slotted Weights                     |                              |
| Asphalt              | Compactor Gyratory                   | Angle   | AASHTO T312                  |
| rispirare            | compactor dynatory                   | Height  | 7001101312                   |
|                      |                                      | =   |                              |
|                      |                                      | Rate  |                              |
|                      |                                      | Load  |                              |
| Asphalt/Soil         | Compactor Marshall or Proctor        | Drop  | ASTM D6926/D698/D1557        |
|                      |                                      | Weights   |                              |
|                      |                                      | Hammer diameter                                 |                              |
| Aggregate            | Conical Mold and Tamper              | Weight  | ASTM C128                    |
| 00 0                 | ·                                    | Diameters                                       |                              |
|                      |                                      | Height  |                              |
| Comments             | Core Leagth Managing France          |   | ASTM C174                    |
| Concrete             | Core Length Measuring Frame          | Length  |                              |
| Concrete             | Curing Room/Cabinet                  | Temperature                                     | ASTM C511                    |
|                      |                                      | Humidity  |                              |
| Concrete             | Curing Tank                          | Temperature                                     | ASTM C511                    |
| General              | Dial Indicator                       | Length  | Manufacturers Specifications |
| General              | Digital Indicator                    | Length  | Manufacturers Specifications |
| Soil                 | Dynamic Cone Penetrometer            | Weight  | MnDOT 5-692.255              |
| 3011                 | Dynamic cone renetrometer            | Length  | WIIDO1 5-032.233             |
|                      |                                      |   |                              |
|                      |                                      | Angle   |                              |
|                      |                                      | Diameter  |                              |
| Soil                 | Expansion Frames                     | Deflection                                      | ASTM D2844                   |
| Aggregate            | FAA Cylinder                         | Volume  | ASTM C1252                   |
| Aggregate            | Flakiness Gauge                      | Openings  | BS-812 or MnDOT 1223         |
| Aggregate            | Flat & Elongated Jig                 | Opening ratio                                   | ASTM D4791                   |
| Concrete             | Flexural Strength Fixture            | Length  | ASTM C78                     |
| Concrete             | riexurai strengtii rixture           | 9   | ASTIVI C78                   |
|                      |                                      | Planeness                                       |                              |
| General              | Humidity Indicators and Recorders    | Humidity  | Manufacturers Specifications |
| Soil                 | Hydrometer                           | Dimensions                                      | ASTM E100                    |
| Soil                 | Kneading Compactor                   | Force   | ASTM D2844                   |
|                      |                                      | Rate calculations                               |                              |
| Aggregate            | LA Abrasion                          | Diameter  | ASTM C131/C535               |
| 00 0                 |                                      | Rate calcs                                      | •                            |
| Soil                 | Liquid Limit Device and Groover      | Cup radius                                      | ASTM D4318                   |
| 3011                 | Elquid Ellille Device and Groover    | Dimensions                                      | A3110 D4310                  |
|                      |                                      |   |                              |
|                      |                                      | Rate calcs                                      |                              |
| General              | Load Frame Concrete                  | Indicated load                                  | ASTM E4                      |
|                      |                                      | Indicated load                                  | ASTM E4                      |
| Soil                 | Load Frame Consolidation             | Applied load                                    | ASTM E4                      |
| Soil                 | Load Frame Direct Shear              | Applied load                                    | ASTM D3080                   |
| Asphalt              | Load Frame Marshall Stability        | Indicated load                                  | ASTM E4                      |
| Soil                 | Load Frame R-Value                   | Applied load                                    | ASTM D2844                   |
|                      | Load Frame Triaxial                  |   |                              |
| Soil                 |                                      | Applied load                                    | ASTM D2850/D4767             |
| Asphalt              | Marshall Breaking Head               | Radius  | ASTM D6927                   |
| Concrete             | Maturity Meter                       | Temperature                                     | ASTM C918                    |
| Aggregate            | Mill Abrasion                        | Volume  | Union Pacific                |
| Aggregate            | Modified Mill Abrasion               | Rate calcs                                      | Union Pacific                |
|                      |                                      | Dimensions                                      |                              |
| Concrete             | Molds Beam                           | Dimensions                                      | ASTM C470                    |
|                      |                                      |   |                              |
| Soil                 | Molds CBR                            | Dimensions                                      | ASTM D1883                   |
|                      |                                      | Volume  |                              |
| Concrete             | Molds Cylinder                       | Dimensions                                      | ASTM C470                    |
|                      |                                      | Watertightness                                  |                              |
| Asphalt              | Molds Gyratory                       | Diameter  | AASHTO T312                  |
| Asphalt              | Molds Marshall                       | Dimensions                                      | ASTM D6926                   |
| Concrete             | Molds Mortar Cube                    | Dimensions                                      | ASTM C109                    |
| Soil                 | Molds Proctor                        | Dimensions                                      | ASTM D698/D1557              |
|                      | - 1 1 1                              | Volume  | = ====, =====,               |
| Coil                 | Molds R-Value                        |   | ASTM D2844                   |
| Soil                 | IVIOIUS K-Value                      | Diameter  | ASTM D2844                   |
|                      |                                      | Height  |                              |
| Soil                 | Molds-Soil Cement                    | Dimensions                                      | ASTM D698                    |
| Concrete             | Molds Steel Cylinder                 | Dimensions                                      | ASTM C470                    |
| Concrete             | Neoprene Retaining Cups              | Planeness                                       | ASTM C1231                   |
|                      | = •                                  | Dimensions                                      |                              |
| Soil                 | North and Describe Course Malistania | 1 point density validation each depth           | ASTM D6937                   |
|                      |                                      |   |                              |
|                      | Nuclear Density Gauge Validation     |   |                              |
| Aggregate            | , 5                                  | 1 point moisture validation                     |                              |
| Aggregate            | Oven Evaporation                     | 1 point moisture validation<br>Evaporation Rate | ASTM C88                     |
| Aggregate<br>General | , 5                                  | 1 point moisture validation                     |                              |

General Displayed pressure Various ASTM Test Specifications Displayed pressure ASTM D698/D1557 Proctor Straightedge Soil Planeness Beveled thickness Soil Proving Ring Indicated load ASTM D2166 ASTM D6927 ASTM C128 General Proving Rings Indicated load Filled weight Aggregate Pycnometer Asphalt Pycnometer Filled weight Pycnometer Filled Weight ASTM D954 Ruler R-Value Equipment Length Dimensions NIST SOP 10 ASTM D2844 General Soil Pressure Soil Sand Cone Bulk Density Loose Density ASTM D1556 Weight to fill Soil Sand Cone & Plate **ASTM D1556** Sand Equivalent ASTM D2419 Plunger weight Aggregate Misc dimensions Schmidt Hammer ASTM C805 Concrete Standard rebound Scratch Hardness Weight of assembly Spot Check Openings ASTM C851 Aggregate MnDOT 2008/2009 Sieves-coarse General General Sieves-fine Visual condition MnDOT 2009 Concrete Slump Cone and Rod Diameters ASTM C143 Heights/Lengths Visual Condition General Splitter ASTM C702 General Straightedges Planeness ASTM C39 General Stressing Ram Indcated force ASTM E4 Temperature Indicators and Recorders Infrared thermometers ASTM C511 Temperature Temperature General General Ice bath target Blackbody target Timer Unit Weight Bucket Digital/Mechanical Volume calcs NIST Pub 960-12 Direct Comparison General ASTM C29/C138 Agg/Conc Planeness Asphalt/Soil Vacuum System Absolute pressure ASTM D2041/D854 ASTM D4253 NIST SOP-7 Soil General Vibration Amplitude Weights Class F Validation Frequency Weights - 25 lb

Weights - 50 lb

NIST SOP-7

General

Weights Class F Validation