

SECTION 300.00 – ITD CENTRAL LABORATORY

The first formal testing of materials for Idaho highways took place at the University of Idaho in Moscow, Idaho in 1919. Later, as the need expanded, a small laboratory was set up in the basement of the Capitol Building in Boise in 1926. This laboratory operated until 1939 when a Central Laboratory building was built at 27th and Main Streets in Boise. In 1971 the Central Laboratory moved to the present location at 3293 Jordan Street in Boise. The Central Laboratory is comprised of separate laboratory units that perform specific laboratory tests. Refer to each section for a description of the laboratory unit and its function as follows:

- Aggregate-Asphalt Mix Laboratory [Section 310.00](#)
- Soils Laboratory [Section 320.00](#)
- Geotechnical Laboratory [Section 330.00](#)
- Chemistry Laboratory [Section 340.00](#)
- Asphalt Binder Laboratory [Section 350.00](#)
- Structures and Cement Laboratory [Section 360.00](#)

300.01 Accreditations. ITD Central Laboratory is AASHTO accredited.

300.02 Subject Matter Experts. The Central Laboratory provides subject matter experts (SME) from each of its laboratory units for the following needs:

- Professional oversight of specific materials testing methodology.
- Evaluate products for the Qualified Product List (QPL).
- Consultative services to the Districts, Contractors, Consultants, and other agencies for material testing.
- The Laboratory units work closely with the technical engineers from the Construction/Materials Section as needed to provide these services.

300.03 Referenced Documents.

- State of Idaho Contract and Plans (per project)
- Idaho Transportation Department Standard Specifications for Highway Construction
- Idaho Transportation Department Quality Assurance Manual
- AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing (<http://itdintranetapps/apps/ihs/ihs.aspx>)
- ASTM Standards (<http://compass.astm.org/CUSTOMERS/filtrexx40.cgi?index.frm>)

SECTION 310.00 AGGREGATE & ASPHALT MIX LABORATORIES

The Aggregate and Asphalt Mix Laboratories use approved testing procedures to provide consistent and reliable information to evaluate aggregate and asphalt mix materials. The information is used to determine the suitability of the material for use in highway construction and compliance to design specifications.

All materials received must be tested in accordance with the specifications of the awarded contract for each project. If no contract has been awarded, testing will be performed according to the requirements of the ITD Standard Specifications for Highway Construction.

310.01 Aggregate Laboratory. The Aggregate Laboratory is responsible for the analysis of aggregates submitted by the District Materials Engineers from Materials Source investigations for use in state of Idaho highway projects and for materials sampled from projects for project development and construction purposes. Aggregates submitted are primarily tested for the following:

- Quality Characteristics for materials source and project purposes.
- Establishing the need and quantity, if any, for anti-stripping additive for asphalt used in mix designs (AASHTO T167-ASTM D1075 and/or AASHTO T283) for materials source purposes
- Establishing the compaction target for aggregate base and granular borrow for materials source and project purposes
- The strength of compacted base and granular borrow materials (R-Value) for materials source and project purposes.

310.01.01 Testing Requirements. The following categories of testing are performed by the Aggregate Laboratory.

- Sample Preparation: Sieving, splitting, and test sample makeup.
- Aggregate Quality: L. A. Wear, Idaho Degradation, Sand Equivalent, Ethylene Glycol, and Soundness of Aggregate.
- Superpave Consensus Properties: Fracture Count, Sand Equivalent, Uncompacted Voids in Fine Aggregate, and Specific Gravity of Coarse and Fine Aggregate.
- Compaction: Vibratory Compaction, Standard Compaction (Moisture Density), Specific Gravity, and Sand Equivalent.
- Strength of Compacted Base and Granular Borrow: Moisture Conditioning, R-Value, Specific Gravity, and Sand Equivalent.
- Additional Testing: Cleanness of Cover Coat Aggregate and Loose Unit Weight.

310.01.02 Test Methods. Table 310.02.02.1 provides the AASHTO or ASTM designation for each test method performed.

Table 310.02.02.1: Aggregate Laboratory Test Methods

Test Method	Description
FOP for AASHTO T 11	Materials Finer Than 75 μm (No. 200) Sieve in Mineral Aggregates by Washing
AASHTO T 19	Unit Weight and Voids in Aggregate
FOP for AASHTO T 27	Sieve Analysis of Fine and Coarse Aggregates
FOP for AASHTO T 84	Specific Gravity and Absorption of Fine Aggregate
FOP for AASHTO T 85	Specific Gravity and Absorption of Coarse Aggregate
AASHTO T 96	Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
FOP for AASHTO T 176	Plastic fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
FOP for AASHTO R 76	Reducing Samples of Aggregate to Testing Size
FOP for AASHTO T 304	Uncompacted Void Content of Fine Aggregate
FOP for AASHTO T 335	Fracture Count
IDAHO IT-15	Idaho Degradation
IDAHO IT-72	Cleanness of Cover Coat Material
IDAHO IT-74	Vibratory Spring-Load Compaction for Coarse Granular Material
IDAHO IT-116	Ethylene Glycol
IDAHO IT-144	Specific Gravity and Absorption of Fine Aggregate Using Automatic Vacuum Sealing (CoreLok) Method

310.02 Asphalt Mix Laboratory. The Asphalt Mix Laboratory is responsible for the analysis of bituminous mixtures submitted for highway projects.

310.02.01 Testing Requirements. The following categories of testing and calculations are performed by the Asphalt Mix Laboratory.

- Sample Preparation: Heating, mixing, and splitting.
- Asphaltic Mixture Testing of Laboratory and Field produced samples: Superpave Gyratory Compaction, Rut depth using Asphalt Pavement Analyzer, Ignition Furnace, Sieve Analysis, Maximum Specific Gravity (Rice Method), Bulk Specific Gravity, Density, Voids in Mineral Aggregate, Mix Air Voids, Effective Asphalt Content, Asphalt Film Thickness, and Effects of Moisture.

310.02.02 Test Methods. Table 310.02.02.1 provides the AASHTO or ASTM designation for each test method performed.

Table 310.02.02.1: Asphalt Mix laboratory Test Methods

Test Method	Description
FOP for AASHTO T 30	Mechanical Analysis of Extracted Aggregate
ASTM D1075*	Effect of Water on Cohesion of Compacted Bituminous Mixtures
FOP for AASHTO T 166	Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens
AASHTO T 167	Compressive Strength Bituminous Mixtures
FOP for AASHTO T 209	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
FOP for AASHTO T 340	Determining Rutting Susceptibility of Hot Mix (HMA) Using the Asphalt Pavement Analyzer (APA)
FOP for AASHTO R 76	Reducing Samples of Aggregate to Testing Size
AASHTO T 269	Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
FOP for AASHTO R-47	Reducing Samples of Hot Mix Asphalt (HMA) to Testing Size
AASHTO T 283	Moisture Induced Damage of HMA
FOP for AASHTO T 308	Standard Test Method for Determining the Asphalt Content of Hot Mix Asphalt (HMA) by the Ignition Method
FOP for AASHTO T 312	Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of Superpave Gyratory Compactor
Idaho IR-125	Acceptance Test Strip for Plant Mix Pavement

*Formerly AASHTO T 165

SECTION 320.00 SOIL LABORATORY

The Soil Laboratory tests the physical properties of soil for project development, source development, construction projects, research, and other agencies.

320.01 Test Methods. Table 320.03.1 provides the AASHTO, ASTM, or Idaho designation for each test method.

Table 320.01.1: Soils Tests

Test Method	Description
FOP for AASHTO T 11	Standard Method of Test for Materials Finer Than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing
FOP for AASHTO T 27	Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates
FOP for AASHTO T 85	Standard Method of Test for Specific Gravity and Absorption of Coarse Aggregate
AASHTO T 87	Standard Method of Test for Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test
AASHTO T 88	Standard Method of Test for Particle Size Analysis of Soils
AASHTO T 89	Standard Method of Test for Determining the Liquid Limit of Soils
AASHTO T 90	Standard Method of Test for Determining the Plastic Limit and Plasticity Index of Soils
FOP for AASHTO T 99	Standard Method of Test for Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in.) Drop
AASHTO T 100	Standard Method of Test for Specific Gravity of Soils
FOP for AASHTO T 180	Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop
AASHTO T 215	Standard Method of Test for Permeability of Granular Soils (Constant Head)
AASHTO T 265	Standard Method of Test for Laboratory Determination of Moisture Content of Soils
AASHTO T 267	Standard Method of Test for Determination of Organic Content in Soils by Loss on Ignition

Test Method	Description
AASHTO T 288	Standard Method of Test for Determining Minimum Laboratory Soil Resistivity
AASHTO T 289	Standard Method of Test for Determining pH of Soil for Use in Corrosion Testing
AASHTO T 307	Standard Method of Test for Determining the Resilient Modulus of Soils and Aggregate Materials
AASHTO M 145	Standard Specification for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes
Idaho IT-8	Resistance R-Value and Expansion Pressure of Compacted Soils and Aggregates R-Value (Stability)
ASTM D2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

320.02 Tests Performed by the Soil Laboratory for the Aggregate Laboratory. Some of the Aggregate Laboratory tests require an R-Value and a Specific Gravity for fine-grained materials. The Aggregate Laboratory Technicians will break out the samples according to their procedures and deliver the sample to Soil Laboratory for testing. The test results are logged in the Soil Laboratory database and a copy of the tests results are delivered to the Aggregate Laboratory.

SECTION 330.00 GEOTECHNICAL LABORATORY

The Geotechnical Laboratory performs tests to determine physical and mechanical properties of undisturbed soil samples, remolded samples, and rock cores submitted by the districts.

The Geotechnical Laboratory also performs tests on geotextiles and geogrids, mostly for quality assurance during project construction. Testing is sometimes performed for other purposes, such as for research projects.

The Central Laboratory Manager or Geotechnical Engineer should be consulted for determining the types of test that are needed for each project.

330.01 Preparation of Samples. Most of the soil samples submitted to the Geotechnical Laboratory are undisturbed ring samples, Shelby tubes, or block samples. Shelby tubes or block samples will be trimmed to the required sizes for testing. Disturbed soil samples are sometimes received by the laboratory and in these cases; remolded samples are created in the lab for testing. Rock cores are normally submitted for strength tests and they are cut to the properly size for testing. Geotextile or geogrid samples are cut to sizes needed for different tests.

330.02 Testing of Samples. All tests are performed according to the test methods listed in the next section and the instructions of the Central Laboratory Manager or the Geotechnical Engineer.

330.03 Geotechnical Tests for Soils and Rock. Table 330.03.1 provides the AASHTO, ASTM, or other designation for each test method performed.

Table 330.03.1: Geotechnical Tests for Soil and Rock

Test Method	Description
ASTM D2166	Standard Method of Test for Unconfined Compressive Strength of Cohesive Soil
ASTM D7012	Standard Method of Test for Compressive Strength of Intact Rock
AASHTO T 216	Standard Method of Test for One-Dimensional Consolidation Properties of Soils
AASHTO T 236	Standard Method of Test for Direct Shear Test of Soils under Consolidated Drained Conditions
AASHTO T 296	Standard Method of Test for Unconsolidated, Undrained Compressive Strength of Cohesive Soils in Triaxial Compression
AASHTO T 297	Standard Method of Test for Consolidated, Undrained Triaxial Compression Test on Cohesive Soils
ASTM D5731	Determination of the Point Load Strength Index of Rock and Application to Rock Strength Classifications

330.04 Geotechnical Tests for Geosynthetic Materials. Table 330.04.1 provides the AASHTO, ASTM, or other designation for each test method performed.

Table 330.04.1: Geotechnical Tests for Geosynthetics

Test Method	Test
ASTM D4533	Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D6241	Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe
ASTM D4595	Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method
ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D6637	Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method
COE- CW-02215	Geogrid – Apparent Opening Size

330.05 Geosynthetic Material Price Adjustment. Acceptance of geosynthetics will be in accordance with ASTM D4759 Standard Practice for Determining the Specification Conformance of Geosynthetics. When verification test results indicate the material does not meet the required specifications for a specific lot, a price adjustment will be applied as shown in Table 330.05.1 and Table 330.05.2.

The price adjustments will accumulate for each property that does not meet the specification, however, if more than two properties are out of specifications, the geotextile or geogrid of that specific lot will be rejected. When one property is more than 40% out of specification, the geotextile or geogrid will also be rejected.

**Table 330.05.1: PRICE REDUCTION SCHEDULE FOR GEOSYNTHETIC MATERIALS
GEOTEXTILES**

Property	Test Method	Price Reduction	REMARKS
Grab Tensile Strength	ASTM D4632	The amount of the price adjustment is equal to the percentage difference of the test result and the specification limit.	Minimum Price Reduction is 10%
Grab Elongation	ASTM D4632	The amount of the price adjustment is one-half of the percentage difference of the test result and the specification limit.	
Puncture Strength	ASTM D6241	The amount of the price adjustment is equal to the percentage difference of the test result and the specification limit.	Minimum Price Reduction is 10%
Trapezoidal Tear Strength	ASTM D4533	The amount of the price adjustment is equal to the percentage difference of the test result and the specification limit.	Minimum Price Reduction is 10%
Apparent Opening Size (AOS)	ASTM D4751	The amount of the price adjustment is one-half of the percentage difference of the test result and the specification limit.	
Permittivity	ASTM D4491	The amount of the price adjustment is equal to the percentage difference of the test result and the specification limit.	Minimum Price Reduction is 10%

**Table 330.05.2 PRICE REDUCTION SCHEDULE FOR GEOSYNTHETIC MATERIALS
GEOGRIDS**

Property	Test Method	Price Reduction	REMARKS
Aperture Size Range	No test Method. Calipers are used.	The amount of the price adjustment is one-half of the percentage difference between the test result and the specification limit.	
Open Area	COE CW-02215	The amount of the price adjustment is one-half of the percentage difference between the test result and the specification limit.	
Tensile Strength	ASTM D6637	The amount of the price adjustment is equal to the percentage difference of the test result and the specification limit.	Minimum Price Reduction is 10%
Junction Strength	GRI-GG2 (2000) (not tested at ITD)	The amount of the price adjustment is equal to the percentage difference of the test result and the specification limit.	Minimum Price Reduction is 10%(not applied)

SECTION 340.00 CHEMISTRY LABORATORY

The Chemistry Laboratory's responsibility is to provide accurate, reliable, and consistent chemical and physical analyses of a wide variety of materials used in the construction and maintenance of the highways. The Chemistry Laboratory work includes:

- To monitor submitted samples of materials for ITD specification compliance in both Quality Control and Quality Assurance Programs.
- To conduct analyses and evaluations on project related Quality Assurance samples, and submitted samples for award of statewide contracts.
- The Chemistry Laboratory conducts research on new products and testing procedures.
- The Chemistry Laboratory generates new specifications for developing materials.

340.01 Reference Documents.

- AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing
- American Standards of Testing and Materials (ASTM)
- ITD Standard Specifications for Highway Construction
- Special Provisions from Department contracts (SP)
- Standard Special Provisions (SSP)
- Steel Structures Painting Council Specifications and Test Methods (SSPC)
- United States Federal Specifications and Test Methods (FSTM)
- United States Military Specifications and Test Methods (Mil Specs)
- Idaho Test Methods (IT)
- ITD Quality Assurance Manual
- Society of Automotive Engineers Manuals (SAE)
- Handbook of Lubrication Engineering
- Idaho Transportation Department Contract and Plans
- Standard Methods for the Examination of Water and Wastewater (SM)
- National Association of Corrosion Engineers (NACE)
- United States Environmental Protection Agency (EPA)
- United States Department of Agriculture (USDA) Agricultural Handbook No. 60, Diagnosis Improvement of Saline and Alkaline Soils Methods.

340.02 Chemistry Laboratory Functions. Sample frequency for construction and maintenance materials is dictated by the Department MTRs Section 270 from the Idaho Quality Assurance Manual and/or as documented in Department contracts. General sample preparation is determined by the individual testing protocol. Testing tolerances for the materials being tested are governed by the ITD Standard Specifications. Test results must be within the specifications listed unless otherwise noted.

Samples received from a project or contracts are tested as routine or complete samples. Complete testing includes a series of tests as outlined in the next section. Routine testing involves a set of two or more tests. If any problem is found with the routine testing results, the material may then be tested according to the guidelines for complete analysis. Routine and complete testing is performed on materials with continual use throughout the contract year. Testing frequency is determined by the sequence of the samples submitted statewide as control samples. Occasionally, the Chemistry Laboratory will outsource samples requiring specialized testing procedures.

ITD's Preventative Maintenance Oil Analysis Program requires the Chemistry Laboratory to monitor state-owned equipment. As a part of this program, the Chemistry Laboratory performs chemical and physical analyses on used lubricating and hydraulic oils. This includes testing, evaluation, and interpretation of the test data to create a historical trend for the particular component of equipment. The Chemistry Laboratory coordinates with the ITD Maintenance Equipment Analyst to make appropriate recommendations for maintenance of the equipment tied to the historical trend data.

340.03 Not Used.

340.04 Out-of-Specification Material. Material that is determined by laboratory test results as out-of-specification must be removed and replaced unless allowed to remain with a price adjustment as detailed in the following sections. The price adjustment is applied to the invoice price of the material from the supplier to the contractor excluding shipping costs, unless otherwise noted.

340.04.01 Price Adjustment Letter. A price adjustment letter must be prepared when submitting a test report that includes out-of-specification material. The letter will include only one supplier's failures. Different suppliers, contracts, and contract items will not be used in the same letter.

The letter will be signed by the Central Laboratory Manager and accompany the test reports for distribution.

340.05 Testing Requirements. The following sections describe the various materials tested by the Chemistry Laboratory and the action for out-of-specification material. An asterisk (*) denotes a modification in the specified testing procedure.

340.05.01 Antifreeze. Sample Frequency: As determined in the Department contract.

Specifications:

FS A-A-52624A Federal Specifications for Antifreeze, Multi-Engine Type

Test Methods	Description
ASTM D92	Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester
ASTM D 1119	Standard Test Method for Percent Ash Content of Engine Coolants and Anti-rusts
ASTM D1120	Standard Test Method for Boiling Point of Engine Coolants
ASTM D1121	Standard Test Method for Reserve Alkalinity of Engine Coolants and Anti-rusts
ASTM D1122	Standard Test Method for Density or Relative Density of Engine Coolant Concentrates and Engine Coolants by the Hydrometer
ASTM D1287	Standard Test Method for pH of Engine Coolants and Anti-rusts
ASTM D1177	Standard Test Method for Freezing Point of Aqueous Engine Coolants
ASTM D1881	Standard Test Method for Foaming Tendencies of Engine Coolants in Glassware

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. The product is returned to the manufacturer and replaced with acceptable material. Price adjustments are not in place for this material.

340.05.02 Cement (Portland). Sample frequency and testing for Section 502 Structural Concrete and Section 409 Concrete Paving will be according to Section 270 in the ITD Quality Assurance Manual.

For bid schedule item 308 Cement Recycled Asphalt Base Stabilization cement samples, an XRF Scan will be performed for cement type.

Specifications:

AASHTO M 85 Standard Specification for Portland Cement

AASHTO M 240 Blended Hydraulic Cement

Test Methods:

AASHTO T 105 Standard Method of Test for Chemical Analysis of Hydraulic Cement

ASTM C114 Standard Test Methods for Chemical Analysis of Hydraulic Cement

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. The product is returned to the manufacturer and replaced with acceptable material. If product cannot be returned, the following price adjustment for Total Alkali Content is recommended:

Total Alkali Content (Percent):

Total Alkali Content (Maximum of 0.60%)	Price Adjustment
Less than or equal to 0.62	None
Greater than 0.62 but less than or equal to 0.64	15% of cement used
Greater than 0.64	25% of Contract item quantity

340.05.03 Chloride in Concrete. Sample Frequency: As requested by the District Materials Engineer

Test Methods:

IDAHO IT-131	Standard Method of Test for Total Chloride Content of Hardened Concrete by Gran Plot Method
AASHTO T 260	Standard Method of Test for Sampling and Testing for Chloride Ion in Concrete and Concrete Raw Materials

Noncompliant Material and Price Adjustment: Not applicable.

340.05.04 Curing Compound. Sample Frequency: According to Section 270 of the ITD Idaho Quality Assurance Manual.

Specifications:

ASTM C309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

Test Methods	Description
AASHTO T 155	Standard Test Method for Water Retention by Concrete Curing Materials
ASTM D1644	Standard Test Methods for Nonvolatile Content of Varnishes
ASTM D1475	Standard Test Method for Density of Liquid Coatings, Inks, and Related Products
ASTM E1347	Standard Test Method for Color and Color-Difference Measurement by Tristimulus (Filter) Colorimetry

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. The product is returned to the manufacturer and replaced with acceptable material. Price adjustments are not in place for this material.

340.05.05 De-icing and Anti-Icing Chemicals. The following sections give the testing requirements by category.

Sample Frequency: As determined by Department contract.

Chemical products included are as follows:

Category 1	Corrosion Inhibited Liquid Magnesium Chloride
Category 2	Corrosion Inhibited Liquid Calcium Chloride
Category 3	Non Corrosion Inhibited Liquid Calcium Magnesium Acetate
Category 4A	Corrosion Inhibited Solid Sodium Chloride (Corrosion Percent Effectiveness of 30% or less)
Category 4B	Corrosion Inhibited Solid Sodium Chloride (Corrosion Percent Effectiveness of 31% to 85%)
Category 5	Corrosion Inhibited Sodium Chloride Plus 10% Magnesium Chloride (Solid)
Category 6	Corrosion Inhibited Sodium Chloride Plus 20% Magnesium Chloride (Solid)
Category 7	Calcium Magnesium Acetate (Solid)
Category 8A-B	Non Corrosion Inhibited Sodium Chloride (Standard Gradation, Brining Salt, Insoluble Material less than 1%, and Moisture less than 0.5%)
Category 8A-R	Non Corrosion Inhibited Sodium Chloride (Standard Gradation, Road Salt, Insoluble Material less than 10%, and Moisture less than 0.5%)
Category 8B	Non Corrosion Inhibited Sodium Chloride (Insoluble Material less than 10%, and Moisture less than 5.0%)
Category 8C-B	Non Corrosion Inhibited Sodium Chloride (Fine Gradation, Brining Salt, Insoluble Material less than 1%, and Moisture less than 0.5%)
Category 8C-R	Non Corrosion Inhibited Sodium Chloride (Fine Gradation, Road Salt, Insoluble Material less than 10%, and Moisture less than 0.5%)
Category 9	Corrosion Inhibited Liquid Sodium Chloride
Category 10	Corrosion Inhibited Liquid Sodium Chloride Plus Calcium Chloride
Category 11	Corrosion Inhibited Liquid Chloride Blended Brines
Category	Experimental

Inhibitor Products are as follows:

Category A1	Corrosion Inhibitor for Sodium Chloride Brine (Minimum 21% NaCl)
Category A2	Corrosion Inhibitor for Sodium Chloride and Calcium Chloride Brine (Minimum 15% NaCl & 2% CaCl ₂)
Category A3	Corrosion Inhibitor for Sodium Chloride (Minimum 15% NaCl)

Specifications:

Pacific Northwest Snowfighters (PNS) and ITD (PNS Website- <http://www.pnsassociation.org>)

Test Methods	Description
PNS and ITD	Test Methods and Appendixes
ASTM E534	Standard Test Methods for Chemical Analysis of Sodium Chloride
ASTM D632	Standard Specifications for Sodium Chloride
ASTM D1293	Standard Test Methods for pH of Water
ASTM D1429	Standard Test Methods for Specific Gravity of Water and Brine
SM 3111A*	Metals by Flame Atomic Absorption Spectrometry
SM 3112B*	Cold-Vapor Atomic Absorption
SM 3125B*	Atomic Absorption
SM 4500-P*	Phosphorus
SM 4500-CN*	Cyanide
NACE TM-0169-95*	Standard Test Method – Laboratory Corrosion Testing of Metals – PNS Modified

*See Chemistry Central Laboratory Personnel for current Method Procedures

Noncompliant Material and Price Adjustment: Statewide contracted material will follow the contract-specified price adjustments included with in the contract. For material purchased for use but not under the statewide contract, follow the terms outlined below.

Noncompliant material is not accepted. The product is returned to the manufacturer and replaced with acceptable material. If product cannot be returned, the following price adjustments are recommended as per the contract:

Percent Concentration (Liquid Only)

340.05.05.01 Bidder Quoted Concentration (BQC)

BQC (25.0% Minimum)

Percent of total shipment or lot number as represented by sample	Price Adjustment
BQC less 1%	None
25.0% to BQC less 1.1%	25%
24.0% to 24.9%	50%
Less Than 24.0%	100%

340.05.05.02 Total Metals, Total Phosphorus, and Total Cyanide

Percentage Over the Specified Limit

Percent of total shipment or lot number represented by sample	Price Adjustment
0% to 5.0%	None
5.1% to 20.0%	15%
20.1% to 40.0%	25%
40.1% to 75.0%	35%
75.1% to 100.0%	50%
Over 100.1%	100%

340.05.05.03 Percent Corrosion Effectiveness

Samples will be tested against their PNS QPL established Corrosion Effectiveness percentage. Each product will be placed into one of the following ranges based upon their qualified Corrosion Effectiveness value.

 Corrosion Effectiveness Ranges

25.0% to 30.0%

20.0% to 24.9%

15.0% to 19.9%

10.0% to 14.9%

5.0% to 9.9%

Less than 5.0%

Price adjustments will be taken on material that is more corrosive than it was qualified at according to the following table.

Corrosion Effectiveness Range	Price Adjustment
Percent of total shipment or lot number represented by sample	
1	None
2	50%
3	100% or Rejection

Corrosion Effectiveness (30.0% Maximum)

Percent of total shipment or lot number represented by sample	Price Adjustment
30.1% to 35.0%	15%
35.1% to 50.0%	50%
Greater than 50.0%	100% or Rejection

340.05.05.04 Total Settleable Solids (percent by volume)

Settleable Solids (1.0% Maximum)

Percent of total shipment or lot number represented by sample	Price Adjustment
1.1% to 1.5%	None
1.6% to 3.5%	25%
3.6% to 5.0%	50%
5.1% to 7.5%	75%
Greater than 7.5%	100% or Rejection

340.05.05.05 Percent Passing No. 10 Sieve (percent by volume)**Percent Passing the No. 10 Sieve (99.0% Minimum)**

Percent of total shipment or lot number represented
by sample

Percent of total shipment or lot number represented by sample	Price Adjustment
98.5% to 98.9%	None
98.0% to 98.4%	35%
97.5% to 97.9%	50%
Less than 97.5%	100% or Rejection

340.05.05.06 Gradations. Gradations outside the following limiting tolerances will be assessed a price adjustment of 10% of the total shipment or lot number as represented by the sample.

Sieve Size	Wt. % Passing	Permissible Variation
3/4"	100%	± 5%
# 4	15% to 100%	± 5%
# 8	5% to 65%	± 5%
# 30	0% to 20%	± 5%

340.05.05.07 Moisture Content. Category 8A material must be dried to a maximum moisture content of 0.5% (percent by weight). Water in excess of 0.5% of dry salt weight will not be paid for. The amount of salt to be paid for, when moisture exceeds 0.5%, will be computed as follows:

$$\text{Pay Weight} = \frac{(100.5 \times \text{Wet Weight. of Salt})}{(100 + \text{Percent of Moisture})}$$

Category 8B material must be dried to a maximum moisture content of 5.0% (percent by weight). Water in excess of 5.0% of dry salt weight will not be paid for. The amount of salt to be paid for, when moisture exceeds 5.0%, will be computed as follows:

$$\text{Pay Weight} = \frac{(105.0 \times \text{Wet Weight. of Salt})}{(100 + \text{Percent of Moisture})}$$

340.05.06 Dust Abatement – Magnesium Chloride.

Sample Frequency: According to the Idaho Quality Assurance Manual or Department contract.

Specifications:

Idaho Transportation Department Standard Specifications for Highway Construction

Test Methods:

PNS and ITD Test Method 1, Appendix A

Noncompliant Material and Price Adjustment: The price adjustments will as shown in the following table.

Contract-Specified Concentration

Contract-Specified Concentration (28.0% Minimum)

Percent of total shipment or lot number represented by sample	Price Adjustment
27.5% to 27.9%	None
26.5% to 27.4%	25%
25.5% to 26.4%	50%
Less Than 25.4%	100%

340.05.07 Fencing.

Sample Frequency: According to the Idaho Quality Assurance Manual or Department Contract.

Sample Testing Tolerance: The laboratory testing tolerance for weight of coatings on galvanized (zinc only) products shall be set at not more than 0.03 oz/ft² less the minimum coating requirement for all Classes and Types of fencing materials. All products with a galvanized coating weight less than the minimum coating weight value, including the sample testing tolerance, will be noncompliant material and will not be accepted. Material is returned to the manufacturer and replaced with acceptable material. Price adjustments are not in place for this material.

340.05.07.01 Barbed Wire.

Specifications:

AASHTO M 280 Standard Specification for Metallic-Coated (Carbon) Steel Barbed Wire

Test Methods:

AASHTO T 65 Standard Method of Test for Mass [Weight] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. Material is returned to the manufacturer and replaced with acceptable material. Price adjustments are not in place for this material.

340.05.07.02 Chain Link Wire.

Specifications:

AASHTO M 181 Standard Specification for Chain-Link Fence

Test Methods:

AASHTO T 65 Standard Method of Test for Mass [Weight] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. Material is returned to the manufacturer and replaced with acceptable material. Price adjustments are not in place for this material.

340.05.07.03 Gabion Fence.

Specifications:

ASTM A1064 Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

Test Methods:

ASTM A90 Standard Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. Material is returned to the manufacturer and replaced with acceptable material. Price adjustments are not in place for this material.

340.05.07.04 Gabion Fence Tie Wire and Connecting Wire.

Specifications:

ASTM A641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. Material is returned to the manufacturer and replaced with acceptable material. Price adjustments are not in place for this material.

340.05.07.05 Silt Fence.

Specifications:

ASTM A116 Standard Specification for Metallic-Coated, Steel Woven Wire Fence Fabric

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. Material is returned to the manufacturer and replaced with acceptable material. Price adjustments are not in place for this material.

340.05.07.06 Steel Fence Posts and Assemblies for Woven Wire and Barb Wire Fences.

Specifications:

AASHTO M 281 Standard Specification for Steel Fence Posts and Assemblies, Hot-Wrought

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. Material is returned to the manufacturer and replaced with acceptable material. Price adjustments are not in place for this material.

340.05.07.07 Steel Fence Posts or Braces for Chain Link Fences.

Specifications:

AASHTO M 181	Standard Specification for Chain-Link Fence
AASHTO M 281	Standard Specification for Steel Fence Posts and Assemblies, Hot-Wrought
ASTM F 1043	Standard Specification for Strength and Protective Coatings on Steel Industrial Fencing

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. Material is returned to the manufacturer and replaced with acceptable material. Price adjustments are not in place for this material.

340.05.07.08 Tension Wire and Accessories and Hardware.

Specifications:

AASHTO M 181	Standard Specification for Chain-Link Fence
ASTM A116	Standard Specification for Metallic-Coated, Steel Woven Wire Fence Fabric

Test Methods:

AASHTO T 65	Standard Method of Test for Mass [Weight] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
ASTM E8	Standard Test Methods for Tension Testing of Metallic Materials

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. Material is returned to the manufacturer and replaced with acceptable material. Price adjustments are not in place for this material.

340.05.07.09 Woven Wire.

Specifications:

AASHTO M 279	Standard Specification for Metallic-Coated Steel Woven Wire Fence Fabric
--------------	--

Test Methods:

AASHTO T 65	Standard Method of Test for Mass [Weight] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
-------------	--

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. Material is returned to the manufacturer and replaced with acceptable material. Price adjustments are not in place for this material.

340.05.08 Fly Ash.

Sample Frequency: According to the Idaho Quality Assurance Manual.

Specifications:

AASHTO M 295	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
--------------	---

Test Methods:

AASHTO T 105	Standard Method of Test for Chemical Analysis of Hydraulic Cement
--------------	---

ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete
-----------	--

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. The product is returned to the manufacturer and replaced with acceptable material. The limits of Available Alkalies do not apply to fly ash used as a mineral admixture.

If product cannot be returned, the following price adjustments are recommended:

Class F Fly Ash used as ASR MitigationAvailable Alkali Content (1.5% Maximum)

<u>Available Alkalies (%)</u>	<u>Supplier</u>	<u>Price Adjustment</u>
Greater than 1.5%	Approved	50% of Fly Ash
Greater than 1.5%	Non-Approved	25% of Contract Item

Calcium Oxide Content (Maximum of 11%)

<u>Calcium Oxide (%)</u>	<u>Supplier</u>	<u>Aggregate Source</u>	<u>Price Adjustment</u>
Greater than 12% but less than 13%	Approved	Reactive	50% of Fly Ash
Greater than 13%	Approved	Reactive	25% of Contract Item
Greater than 12%	Non-Approved	Reactive	25% of Contract Item

Loss on Ignition Content (1.5%)

<u>Loss on Ignition (%)</u>	<u>Supplier</u>	<u>Price Adjustment</u>
Greater than 1.5%	Approved	50% of Fly Ash
Greater than 1.5%	Non-Approved	25% of Contract Item

Class F Fly Ash used as a Mineral AdmixtureCalcium Oxide Content (15% Maximum)

<u>Calcium Oxide (%)</u>	<u>Supplier</u>	<u>Price Adjustment</u>
Greater than 16% but less than 17%	Approved	25% of Fly Ash
Greater than 17%	Approved	25% of Contract Item
Greater than 16%	Non-approved	25% of Contract Item

Loss on Ignition Content (1.5%)

<u>Loss on Ignition (%)</u>	<u>Supplier</u>	<u>Price Adjustment</u>
Greater than 1.5%	Approved	50% of Fly Ash
Greater than 1.5%	Non-Approved	25% of Contract Item

340.05.09 Glass Beads.

Sample Frequency: According to the Idaho Quality Assurance Manual.

Specifications:

- FSTM TT-B-1325D* Federal Specification Beads, (Glass Spheres), Retro-Reflective
- AASHTO M 247 Standard Specification for Glass Beads Used in Traffic Paints
- Idaho Transportation Department Specifications for Dual Chemically Coated Glass Spheres (Beads) for Water Borne Traffic Line Paint

Test Methods	Description
ASTM D1155	Specification Test Method for Roundness of Glass Spheres
ASTM D1214	Specification Test Method for Sieve Analysis of Glass Spheres
FSTM TT-B-1325D*	Federal Specification Beads, (Glass Spheres), Retro-Reflective
Special IDAHO Test*	Adherence and Anti-Wetting Coating Tests

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. The product is returned to the manufacturer and replaced with an acceptable product. Price adjustments are not in place for this material.

***See Chemistry Central Laboratory Personnel for current Method Procedures.**

340.05.10 Latex Modifier.

Sample Frequency: According to the Idaho Quality Assurance Manual.

Specifications:

Test Method:

Idaho IT-121 Standard Method of Test for Determining Total Solids-Latex, Percent

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. The product is returned to the manufacturer and replaced with an acceptable product. Price adjustments are not in place for this material.

340.05.11 Lime/Quicklime Products.

Sample Frequency: According to the Idaho Quality Assurance Manual.

Specifications:

ASTM C977 Standard Specification for Quicklime and Hydrated Lime for Soil Stabilization

Test Methods:

ASTM C25 Standard Test Methods for Chemical Analysis of Limestone, Quicklime, and Hydrated Lime

ASTM C110 Standard Test Methods for Physical Testing of Quicklime, Hydrated Lime, and Limestone

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. The product is returned to the manufacturer and replaced with an acceptable product. Price adjustments are not in place for this material.

340.05.12 Structural Paint (All Formulas).

Sample Frequency: According to the Idaho Quality Assurance Manual or Department contract.

Formula No. 1	Primer, Inorganic Zinc Rich
Formula No. 2	Primer, Organic Zinc Rich
Formula No. 3	Primer, Zinc Rich Moisture-Cure Polyurethane
Formula No. 4	Primer, High Solids Polyamide Epoxy
Formula No. 5	Intermediate, High Solids Polyamide Epoxy
Formula No. 6	Intermediate, Moisture-Cured Polyurethane, Micaceous Iron Oxide Reinforced, Performance Based
Formula No. 7	Topcoat, High Solids Polyamide Epoxy
Formula No. 8	Topcoat, High Solids Aliphatic Polyurethane
Formula No. 9	Topcoat, Aliphatic Moisture-Cured Polyurethane
Formula No. 10	Micaceous Iron Oxide – Aluminum, Moisture-Cured Polyurethane
Formula No. 11	Primer, Latex, Exterior
Formula No. 12	Primer, Latex, Exterior, Semi-Gloss
Formula No. 13	Concrete Stain, Flat
Formula No. 14	Highway Traffic Line Paint, Latex

Specifications:

ASTM D520 (Type II) Standard Specification for Zinc Dust Pigment

SSPC Paint 20 Type I-C and Type II

SSPC Paint 27, 22, 36, 38, 40 & 41

TT-P-19 Federal Specification

TT-P-1984 Federal Specification

Test Methods	Description
ASTM D562	Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-type Viscometer
ASTM D823	Standard Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels
ASTM D968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1005	Standard Practices for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers
ASTM D1475	Standard Test Method for Density Liquid Coatings, Inks, and Related Products
ASTM D2369	Standard Test Method for Volatile Content of Coatings
ASTM D2486	Standard Test Methods for Scrub Resistance of Wall Paints
FTMS 4061.1	Standard Test Method for Drying Time of Coatings

Noncompliant Material and Price Adjustment: Material shall meet Idaho Transportation Department and Manufacturer's specifications. Noncompliant material is not accepted. The product is returned to the manufacturer and replaced with an acceptable product. Price adjustments are not in place for this material.

340.05.13 Durable Markings (Epoxy, High Performance Tape, Methyl Methacrylate, Polyurea, Thermoplastic, etc.).

Sample Frequency: According to the Idaho Quality Assurance Manual or Department contract.

Specifications:

AASHTO M 249 Standard Specification for White and Yellow Reflective Thermoplastic Striping Material (Solid Form)

Test Methods:

ASTM D823 Standard Test Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels

ASTM D4061 Standard Test Method for Retroreflectance of Horizontal Coatings

Noncompliant Material and Price Adjustment: Material shall meet Idaho Transportation Department and Manufacturer's specifications. Noncompliant material is not accepted. The product is returned to the manufacturer and replaced with an acceptable product. Price adjustments are not in place for this material.

340.05.14 Waterborne Traffic Line Paint.

Sample Frequency: According to the Idaho Quality Assurance Manual or Department contract.

Specifications:

Specifications for White and Yellow Waterborne Traffic Line Paint Idaho Transportation Department

Test Methods	Description
ASTM D522	Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings
ASTM D562	Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer
ASTM D661	Standard Test Method for Evaluating Degree of Cracking of Exterior Paints
ASTM D711	Standard Test Method for No-Pick-Up Time of Traffic Paint
ASTM D823	Standard Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels
ASTM D868	Standard Practice for Determination of Degree of Bleeding of Traffic Paint.
ASTM D869	Standard Test Method for Evaluating Degree of Settling of Paint
ASTM D1005	Standard Test Method for Measurement of Dry Film thickness of organic Coatings using Micrometers
ASTM D1394	Standard Test Methods for Chemical Analysis of White Titanium Pigments
ASTM D1475	Standard Test Method for Density Liquid Coatings, Inks, and Related Products
ASTM D2243	Standard Test Method for Freeze-Thaw Resistance of Water-Borne Coatings
ASTM D2369	Standard Test Method for Volatile Content of Coatings
ASTM D2486	Standard Test Methods for Scrub Resistance of Wall Paints
ASTM D2805	Standard Test Method for Hiding Power of Paints by Reflectometry
ASTM D3723	Standard Test Method for Pigment Content of Water-Emulsion Paints by Low-Temperature Ashing
ASTM E70	Standard Test Method for pH of Aqueous Solutions with the Glass Electrode
ASTM E1347	Standard Test Method for Color and Color-Difference Measurement by Tristimulus (Filter) Colorimetry Using Micrometers
FTMS 4051.1	Standard Test Method for Vehicle Solids
FTMS 6131	Standard Test Method for Yellowness Index

Noncompliant Material and Price Adjustment: Price adjustments will be assessed on product cost, excluding freight. Determination of the price adjustment to be applied will be based on ITD Materials Laboratory testing procedures. Total price adjustments will not exceed 50% or complete rejection. The price adjustments will be based on the paint price F.O.B.

Density (lb/Gallon)

Density (plus or minus 0.20 lb/Gal)	Price Adjustment
Greater than 0.20 but less than or equal to 0.30 lb/Gal	25% of lot or batch number
Greater than 0.30 lb/Gal	50% or Rejection

Viscosity (Krebs Units)

Viscosity (85 to 95)	Price Adjustment
83 K.U. to 97 K.U.	None
80 K.U. to 82 K.U. or 98 K.U. to 100 K.U.	25% of lot or batch number
Less than 80 K.U. or Greater than 101 K.U.	50% or Rejection

Scrub Resistance (Cycles)

Scrub Resistance (800 cycles Minimum)	Price Adjustment
775 to 799	None
750 to 774	25% of lot or batch number
Less than 750	50% or Rejection

pH (standard units)

pH (9.8 Minimum)	Price Adjustment
9.7 to 9.8	None
9.5 to 9.6	25% of lot or batch number
Less than 9.5	50% or Rejection

340.05.15 Silica Fume.

Sample Frequency: According to the Idaho Quality Assurance Manual or Department contract.

Specifications:

AASHTO M 307 Standard Specification for use of Silica Fume as a Mineral Admixture in Hydraulic-Cement Concrete, Mortar, and Grout

Test Methods	Description
AASHTO T 105	Standard Method of Test for Chemical Analysis of Hydraulic Cement
ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete
ASTM C430	Standard Test Method for Fineness of Hydraulic Cement by the 45-um (No. 325) Sieve
ASTM C1240	Standard Specification for Silica Fume Used in Cementitious Mixtures

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. The product is returned to the manufacturer and replaced with an acceptable product.

Available Alkali Content (1.5% Maximum)

Available Alkali (1.5% Maximum)	Price Adjustment
Greater than 1.5%	25% of Silica Fume

Retained when wet-sieved on the #325 Screen (10% Maximum)

#325 Screen (10% Maximum)	Price Adjustment
Greater than 10%	25% of Silica Fume

340.05.16 Reserved.**340.05.17 Water for Concrete, Grout, and Mortar.**

Sample Frequency: According to the Idaho Quality Assurance Manual.

Specifications:

Standard Specification for Highway construction

Test Methods	Description
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D512	Standard Test Methods for Chloride Ion in Water
ASTM D516	Standard Test Method for Sulfate Ion in Water
ASTM D1125	Standard Test Methods for Electrical Conductivity and Resistivity of Water
ASTM D1293	Standard Test Methods for pH of Water

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. Another source of water for concrete is located, sampled, and tested for compliance. Price adjustments are not in place for this material.

340.05.18 Hazardous Materials and Waste

Sample Frequency: As required.

Specifications:

EPA Guidelines

Test Methods:

EPA Guidelines*

USDA Soil Method 24* Diagnosis and Improvement of Saline and Alkali Soils

Noncompliant Material and Price Adjustment: Not applicable.

***See Chemistry Central Laboratory Personnel for current Method Procedures.**

340.05.19 Used Lubricating and Hydraulic Oils.

Sample Frequency: According to ITD's Preventative Maintenance Program.

Specifications:

According to ITD's Preventative Maintenance Program.

Test Methods:

Test Methods	Description
ASTM D445	Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)
ASTM E1252	Standard Practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis
ASTM D4206	Standard Test Method for Sustained Burning of Liquid Mixtures Using the Small Scale Open-Cup Apparatus
ASTM D6595	Standard Test Method for Determination of Wear Metals and Contaminants in Used Lubricating Oils or Used Hydraulic Fluids by Rotating Disc Electrode Atomic Emission Spectroscopy

Testing Tolerances: According to laboratory-determined acceptable ranges.

Noncompliant Material and Price Adjustment: Not applicable.

SECTION 350.00 ASPHALT BINDER LABORATORY

The Asphalt Binder Laboratory is responsible for testing the quality of all bituminous products for highway construction projects and maintenance projects.

350.01 Testing Procedures. Bituminous samples received by the Asphalt Binder Laboratory for testing fall within three general types:

1. Performance Graded Binders
2. Emulsified Asphalt
3. Special Products (e.g., Crack Filler, Bituminous Coatings, Anti-Strip Additive Approval, etc.)

350.01.01 Performance Graded Binders. Testing of Performance Graded Binders consists of the following tests found in AASHTO Standards and Idaho Test Methods.

Table 350.01.01.1: PG Binder Methods

Test Methods	Description
T 48	Standard Method of Test for Flash and Fire Points by Cleveland Open Cup
T 316	Standard Method of Test for Viscosity Determination of Asphalt Binder Using Rotational Viscometer
T 315	Standard Method of Test for Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)
T 240	Standard Method of Test for Effect of Heat and Air on a Moving Film of Asphalt Binder (Rolling Thin-Film Oven Test)
R 28	Standard Practice for Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)
T 313	Standard Method of Test for Determining the Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer (BBR)
T 301	Standard Method of Test for Elastic Recovery Test of Asphalt Materials by Means of a Duclilometer
IT-99	Detection of Anti-Stripping Additive in Asphalt
IT-137	Effectiveness of Anti-Strip Agents After Hot Storage in Asphalt Binder Using Bottle and Sand

350.01.02 Anti-Strip Additives. Anti-strip additives are accepted for use on Department projects only when pre-approved by Central Asphalt Binder Laboratory and placed on the QPL. The products are tested according to IT-137 and IT-99. The State reserves the right to conduct additional testing on materials if required to determine acceptance.

Field testing for the presence of anti-strip is performed in accordance with the ITD Quality Assurance Manual.

350.01.03 Emulsified Asphalt. Emulsified asphalt is divided into three groups.

350.01.03.01 Seal Coat Emulsions (CRS-2, CRS-2R, CRS-P, etc.) Seal Coat Emulsions are tested in conjunction with District Seal Coat Field Viscosity Testing (IT-61). All samples, whether field tested or not, are sent to the Central Laboratory. If samples have been field tested, the Central Laboratory will perform the following AASHTO tests.

Test Methods	Description
T 59*	Residue by Evaporation
T 59 and 72	Consistency Test (Saybolt Viscosity at 50°C or 122°F)
T 49	Penetration on Residue
T 301	Elastic Recovery
CTM 332	Torsional Recovery (California Test Method)

* Modify the Evaporation Test for T 59 as follows:

- Cook the 50 gram samples of emulsion on a hot plate until all foaming is finished.
- Follow with an oven treatment at 325°F for one hour.

NOTE: If viscosity has not been performed in the field, the Central Laboratory will test for Viscosity (AASHTO T 59, or AASHTO T 72). All attempts will be made to perform viscosities within 30 days of the day of sampling. When the workload becomes heavy and there are two or more samples representing the same delivery ticket number, only one of these samples needs to be tested. If the sample passes, all samples representing the delivery ticket will be considered acceptable.

350.01.03.02 Tack Coats and Fog Seals (CSS-1, SS-1, etc.)

Tack Coat and Fog Seal Emulsion testing will include the following AASHTO tests.

Test Methods	Description
T 59 and T 72	Consistency Test (Saybolt Viscosity at 25°C or 77°F)
T 59*	Residue by Evaporation
T 49	Penetration of Residue
T 301	Elastic Recovery
CTM 332	Torsional Recovery (California Test Method)

* Modify the Evaporation Test for T 59 as follows:

- Cook the 50 gram samples of emulsion on a hot plate until all foaming is finished.

- Follow with an oven treatment at 325°F for one hour.

350.01.03.03 Cold Mix Recycle Emulsions (CMS-2, CMS-2s, etc.)

Cold Mix Recycle Emulsion testing will include the following AASHTO tests.

Test Methods	Description
T 59 and 72	Consistency Test (Saybolt Viscosity at 50°C or 122°F)
T 59*	Residue by Evaporation
T 49	Penetration of Residue
T 301	Elastic Recovery
CTM 332	Torsional Recovery (California Test Method

* Modify the Evaporation Test for T 59 as follows:

- Cook the 50 gram samples of emulsion on a hot plate until all foaming is finished.
- Follow with an oven treatment at 325°F for one hour.

350.02 Testing Tolerances and Price Adjustments. The following sections give the values for testing tolerances and the price adjustment required if the asphalt samples are not within the tolerance range.

350.02.01 Performance Graded Binders.

Table 350.02.01.1 Performance Graded Binder Testing Tolerance and Price Adjustment

Test Method	Deviation % of Spec Value	Price Adjustment
AASHTO T 48 Flash Point C.O.C. (230°C minimum 450°F)	0 to 8.4	0%
	8.5 to 16.4	10%
	16.5 +	25%
AASHTO T 316 Brookfield Viscosity (3 Pa·S. maximum)	0 to 10.4	0%
	10.5 to 20.4	10%
	20.5 +	25%
AASHTO T 15 Dynamic Shear – Original (1.0 kPa minimum)	0 to 10.4	0%
	10.5 to 20.4	10%
	20.5 +	25%
AASHTO T 15 Dynamic Shear -Rolling Thin Film Residue (2.2 kPa minimum)	0 to 10.4	0%
	10.5 to 20.4	10%
	20.5 +	25%
AASHTO T 15 Dynamic Shear – PAV Residue (5000 kPa maximum)	0 to 10.4	0%
	10.5 to 20.4	10%
	20.5 +	25%
AASHTO T 240 Rolling Thin Film Oven Test (1.0% maximum loss)	0 to 20.4	0%
	20.5 to 40.4	10%
	40.5 +	25%
AASHTO T 313 Bending Beam (Stiffness, 300 MPa maximum)	0 to 5.4	0%
	5.5 to 10.4	10%
	10.5 +	25%
AASHTO T 313 Bending Beam (Slope, m-Value 0.300 minimum)	0 to 5.4	0%
	5.5 to 10.4	10%
	10.5 +	25%
AASHTO T 301 Elastic Recovery (50% minimum at 25°C)	0 to 5.4	0%
	5.5 +	25%

Noncompliant Material and Price Adjustment: Price adjustments will be assessed on product cost, excluding freight. Determination of the price adjustment to be applied will be based on ITD Materials Laboratory testing procedures. Total price adjustments will not exceed 50% or complete rejection. The price adjustments will be based on the binder price F.O.B.

Out-of-specification performance graded binder will be assessed a price adjustment based on the Contractor's supplier price. The PG Binder will be clearly identified by verification unit and price reduction will be assessed on the entire lot.

350.02.02 Anti-Strip Additives. Field testing for the presence of anti-strip is performed at the project site in accordance with the ITD Quality Assurance Manual. If plant mix is placed without anti-strip or with failing anti-strip results, then the following price adjustment will apply.

Note: Failing IT-99 field test results for anti-strip can be sent to the Central Laboratory for acceptance using a modified IT-137 test method where the anti-strip additive and the 96-hour hot storage is not conducted. The sample will be heated, mixed uniformly, and tested. The results on the modified IT-137 test will confirm the presence or absence of an effective amount of anti-strip additive being contained in the asphalt binder.

<u>Deviation</u>	<u>Price Adjustment on Mix Placed</u>
Negative	25%

350.02.03 Emulsified Asphalt.**Table 350.02.03.1: Emulsified Asphalt Testing Tolerance and Price Adjustment**

Test Method	Deviation % of Spec Value		Price Adjustment
	<u>25°C (77°F)</u>	<u>50°C (122°F)</u>	
AASHTO T 59 Saybolt Viscosity	<u>25°C (77°F)</u>	<u>50°C (122°F)</u>	—
	0 to 15.4	0 to 21.4	0%
	15.5 to 30.4	21.5 to 42.4	15%
	30.5 +	42.5 +	25%
AASHTO T 59 Residue by Evaporation	0 to 1.4		0%
	1.5 to 2.4		15%
	2.5 +		25%
AASHTO T 49 Penetration of Residue	<u>Below Minimum</u>		—
	0 to 16.4		0%
	16.5 to 24.4		15%
	24.5 +		25%
	<u>Above Maximum</u>		—
	0 to 8.4		15%
	8.5 +		25%
AASHTO T- 301 Elastic Recovery	<u>Below Minimum</u>		—
	0 to 5.4		0%
	5.5 +		25%
CTM 332 Torsional Recovery	<u>Below Minimum</u>		—
	0 to 5.4		0%
	5.5 +		25%

When a failure occurs, any remaining samples representing that delivery ticket number must be tested. A price adjustment will be based on the contractor's supplier price.

350.03 Noncompliant Material and Price Adjustment Letters. In the event of a failing asphalt test result, repeat the test. If the sample fails on retest, report the average of the two test results. Failing samples are retained in the laboratory for one year. If the sample passes specifications upon retest, report the sample as passing.

350.04 Asphalt Price Adjustment Letters. When submitting a report that includes out-of-specification material, a Price Adjustment Letter will be sent to the District Engineer. The letter will include only one of the supplier's failures.

SECTION 360.00 STRUCTURES & CEMENT LABORATORY

360.01 Structures Laboratory. The Structures Laboratory tests the physical and mechanical properties of concrete, steel, and fasteners related to statewide construction. The testing may be performed in the laboratory or in the field using destructive and/or nondestructive testing methods.

360.02 Cement Laboratory. The cement laboratory performs physical testing of cementitious materials. Cement is tested for specific properties designated by AASHTO and ASTM to ensure quality and consistency of the product.

360.03 Inspection of Pre-cast Concrete. Personnel from the Structures Laboratory perform inspection of precast concrete components (e.g., girders, slabs, stiff legs, pipe, wall panels, decks, and structures). This inspection is performed in-state and out-of-state for Department projects. Inspection is performed in accordance with project requirements, Standard Specifications for Highway Construction, and the Precast Concrete Institute (PCI). The inspection may also be assigned to ITD District personnel or contracted to consultants or other state DOT personnel. Testing must be performed in accordance with AASHTO and ASTM requirements.

360.04 Verification of Portable Scales. The Structures Laboratory performs biannual load verification of portable scales for the Port-of-Entry (POE), County Sheriff, and Boise Police. A universal test machine, which is certified by NIST standards annually, is used to verify the portable scales. Scale certification is performed in accordance with Handbook 44 for Weight and Measurement Devices.

360.05 Steel Reinforcement Testing. The Structures Laboratory is responsible to perform all acceptance or verification strength testing for steel reinforcement products, including metal reinforcing bar, steel strand, dowel bars, bolts, etc.

The test results are immediately emailed to the project staff and subsequently posted to the ITD intranet Central Laboratory page. A failing test will require an additional sample. Failing material is rejected and removed from the project.

360.06 Testing of Material. Materials used in highway construction must comply with specified criteria as outlined in the ITD Standard Specifications for Highway Construction. The majority of the testing performed in the Structures Laboratory can be found in Standard Specification Subsections 409, 502, 506, and 703. The majority of the tests performed are AASHTO Test Methods; however, there are some ASTM and Idaho Test methods being utilized.

The following information is a complete listing of tests that are currently being used in the Structures Laboratory. Test methods are AASHTO unless otherwise noted.

360.06.01 Cement.

Test Methods	Description
Idaho IR-143	Sampling
AASHTO T 162	Mechanical Mixing
AASHTO T 106	Compressive Strength
AASHTO T 107	Autoclave Expansion
AASHTO T 129	Normal Consistency
AASHTO T 131	Time of Set (Vicat)
AASHTO T 133	Specific Gravity
AASHTO T 137	Air Content
AASHTO T 153	Fineness of Hydraulic Cement by Air Permeability Apparatus
AASHTO T 162 & AASHTO T 186	False Set (Paste Method)
AASHTO M 152	Flow Table & Caliper

360.06.02 Concrete Aggregate.

Test Methods	Description
FOP for AASHTO T 2	Sampling
AASHTO T 19	Unit Weight
AASHTO T 21	Organic Impurities
FOP for AASHTO T 27	Sieve Analysis
Idaho IT-13	Mortar Strength
FOP for AASHTO T 84	Specific Gravity, FA
FOP for AASHTO T 85	Specific Gravity, CA
AASHTO T 96	L.A. Wear, CA
FOP for AASHTO T 176	Sand Equivalent

360.06.03 Concrete.

Test Methods	Description
AASHTO T 22	Compressive Strength
AASHTO T 24	Obtaining & Testing Cores
FOP for AASHTO T 119	Slump
FOP for AASHTO T 121	Unit Weight, Fresh
AASHTO R 39	Laboratory Produced Concrete
AASHTO T 141	Sampling Fresh Concrete
FOP for AASHTO T 152	Air Content, Pressure Method
AASHTO T 231	Capping Concrete Cylinders
AASHTO R 39	Mix Design, Absolute Volume

360.06.04 Steel for Concrete Reinforcement.

Test Methods	Description
AASHTO T 68 & T 244	Deformed Billet – Steel Bars
AASHTO T 68 & T 244	Cold Drawn Steel Wire
AASHTO T 68 & T 244	Welded Wire Fabric
AASHTO T 68 & T 244	Uncoated Seven-Wire Strand
AASHTO T 68 & T 244	Uncoated Stress Relieved Wire
AASHTO T 68 & T 244	High Strength Alloy Bars
AASHTO T 68 & T 244	Carbon Steel Bars, Plain Round

360.06.05 Steel Plate Fasteners.

Test Methods	Description
AASHTO T 68 & T 244	Hi-Strength Bolts
RC Assembly	Hi-Strength Nuts
RC Assembly	Hardened Washers
RC Assembly	DTIs (Direct Tension Indicators)
AASHTO T 80	Rockwell Hardness

360.06.06 Building Block Materials.

Test Methods	Description
ASTM C67	Blocks & Bricks
ASTM C144 and C404	Mortar & Grout Aggregate
ASTM C91	Mortar
ASTM C939	Flow or Grout

360.06.07 Joint Filler.

Test Method	Description
AASHTO T 42	Sampling & Testing Joint Filler