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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 ITD 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 Section — Section 310.00
- Soils Laboratory — Section 320.00
- Soils Mechanics Laboratory — Section 330.00
- Chemistry Laboratory — Section 340.00
- Asphalt Laboratory — Section 350.00
- Structures Laboratory — Section 360.00

300.01 Qualification of Testing Technicians. Each separate laboratory supervisor is responsible to administer individual performance evaluations at least annually to qualify the testing technicians. The evaluations are part of the overall ITD Central Laboratory Quality Control Program.

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.

The Aggregate Laboratory and the Asphalt Mix Laboratory are AASHTO accredited.

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 Referenced Documents.

State of Idaho Contract and Plans (per project)

Idaho Transportation Department Standard Specifications for Highway Construction

AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing (Parts 1 and 2)

ASTM Standards

Western Alliance for Quality Transportation Construction (WAQTC) sampling, testing and inspection manual(s)

Idaho Transportation Department Laboratory Operations Manual

Idaho Transportation Department Quality Assurance Manual

310.02 Aggregate Laboratory. The Aggregate Laboratory is responsible for the quality analysis of aggregates submitted for use in state of Idaho highway projects. Aggregates submitted are primarily tested for the following:

- Quality
- Establishing the need and quantity, if any, for anti-stripping additive for asphalt used in mix designs (Immersion Compression)
- Establishing the compaction target for aggregate base and granular borrow
- The strength of compacted base and granular borrow materials (R-Value)

310.02.01 Testing Requirements. The following categories of test methods are performed by the Aggregate Laboratory.

- Sample Preparation: Sieving, splitting, and makeup.
- Aggregate Quality: Sieve Analysis, L. A. Wear, Idaho Degradation, Sand Equivalent, Ethylene Glycol and, when requested, Soundness of Aggregate.
- Immersion Compression (Aggregate Portion): Sieve Analysis, Fracture Count, Sand Equivalent, Uncompacted Voids in Fine Aggregate, and specific Gravity of Coarse and Fine Aggregate.
- Compaction: Vibratory Compaction, Standard Compaction (Moisture Density), Sieve Analysis, Specific Gravity and Sand Equivalent, and surface area.
- Strength of Compacted Base and Granular Borrow: R-Value, Sieve Analysis, Specific Gravity, and Sand Equivalent.
- Miscellaneous Testing: Cleanness of Cover Coat Aggregate and Loose Unit Weight.

310.02.02 Test Methods. The following list provides the AASHTO or ASTM designation for each test method performed.

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
AASHTO T 27	Sieve Analysis of Fine and Coarse Aggregates
AASHTO T 84	Specific Gravity and Absorption of Fine Aggregate
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
AASHTO T 176	Plastic fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
AASHTO T 248	Reducing Samples of Aggregate to Testing Size
AASHTO T 304	Uncompacted Void Content of Fine Aggregate
AASHTO TP61	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

310.03 Asphalt Mix Laboratory. The Asphalt Mix Laboratory is responsible for the quality analysis of bituminous mixtures submitted for use in state of Idaho highway projects. Materials are primarily tested for:

- Establishing the need and quantity, if any, for anti-stripping additive for asphalt used in mix designs (Immersion Compression).
- Compliance of asphalt mix to specification(s). (Current production.)
- Investigating mix properties of previously produced and placed asphalt mix. (From the existing roadway.)

310.03.01 Testing Requirements. The following categories of test methods are performed by the Asphalt Mix Laboratory.

- Sample Preparation: Heating, mixing, and splitting.
- Plant Mix and Cold Mix Testing and Immersion Compression: Hveem Stability, Maximum Specific Gravity (Rices Method), Bulk Specific Gravity, Density, Voids in Mineral Aggregate, Mix Air Voids, Effective Asphalt Content, Asphalt Film Thickness, Stripping and Centrifuge Kerosene Equivalent, and Effects of Moisture.
- Plant Mix Produced at the Job Site and Cores Extracted from the Roadway: Asphalt Content, Sieve Analysis, Maximum Specific Gravity (Rices Method), Bulk Specific Gravity, Mix Air Voids Density, and Hveem Stability.

310.03.02 Test Methods. The following list provides the AASHTO or ASTM designation for each test method performed.

AASHTO T 30	Mechanical Analysis of Extracted Aggregate
AASHTO T 165	Effect of Water on Cohesion of Compacted Bituminous Mixtures
AASHTO T 166	Bulk Specific Gravity of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens
AASHTO T 167	Compressive Strength Bituminous Mixtures
AASHTO T 182	Coating and Stripping of Bitumen-Aggregate Mixtures
AASHTO T 209	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
AASHTO T 246	Resistance to deformation and Cohesion of Bituminous Mixtures by Means of Hveem Apparatus
AASHTO T 247	Preparation of Test Specimens of Bituminous Mixtures by Means of California Kneading Compactor
AASHTO T 248	Reducing Samples of Aggregate to Testing Size
AASHTO T 269	Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
AASHTO T 283	Resistance of Compacted Bituminous Mixture to Moisture Induced Damage
AASHTO T 308	Standard Test Method for Determining the Asphalt Content of Hot Mix Asphalt (HMA) by the Ignition Method
AASHTO TP 4	Density of Hot Mix Asphalt (HMA) Specimens by SHRP Gyratory Compactor
Idaho IR-125	Acceptance Test Strip for Plant Mix Pavement

310.04 Inspection and Equipment Certification of Satellite Laboratories. Once per year, personnel from the Central Laboratory will qualify satellite laboratories located in each of ITD's districts. The District Laboratories must meet the requirements according to the ITD Laboratory Qualification Program. See Section 200.

SECTION 320.00 SOIL LABORATORY

The Soil Laboratory tests the physical properties of soil samples that are submitted by the districts and/or the Headquarters Materials Section. Test results are employed mainly for design during project development and quality control during construction.

The Soil Laboratory also performs tests on soil samples that are not related to project development or quality control, such as samples from research projects, from other state agencies, and from American Materials Reference Laboratories (AMRL).

320.01 Preparation of Soil Samples. The soil sample is prepared according to AASHTO T 87. After the sample is properly dried and the material is reduced to its natural state, a sample is broken out for each individual test.

320.02 Testing of Soil Samples. After the samples have been prepared, a worksheet is created for recording test data. As the tests are completed, the information is entered into the Soil database from these worksheets. Calculations are then performed and results are plotted if required. Upon each test's completion, a computer-generated worksheet is printed and used to prepare the Final Report.

320.03 Soil Tests. The following list provides the AASHTO or ASTM designation for each test method performed as well as the sample size required.

Test	AASHTO or Idaho Designation	Quantity of Soil Needed per Test
Moisture/Density Relations	T 99 T 99 T 180	Method A - 8 lb (4 kg) Method C - 12 lb (6 kg) Method D -25 lb (12 kg)
Moisture Content of Soils	T 265	10 – 1000 grams
Liquid Limit	T 89	100 grams
Plastic Limit & Plasticity Index	T 90	100 grams
Unified Soil Classification	M 145 (ASTM D 2487)	1000 grams
R-Value (Stability)	Idaho T-8	16 lb (7 kg)
Particle Size Analysis	T 88	60 to 110 grams
Specific Gravity (Fine)	T 100	25 to 100 grams
Specific Gravity (Coarse)*	T 85	5000 grams
Sand Equivalent (S.E.)*	T 176	1000 grams
Resistivity	T 288	1500 grams
pH	T 289	100 grams
Gradation (Sieve Analysis)	T 27, T 11	+ # 4, entire sample - #4, 300 to 500 grams

Test	AASHTO or Idaho Designation	Quantity of Soil Needed per Test
Permeability of Granular Soils	T 215	10 – 70 lbs.

*These tests are performed by the Aggregate Laboratory. The Soil Laboratory Technician will break out the sample according to the test procedure and deliver the sample to the Aggregates Laboratory. Upon completion of testing, the results are returned to the Soil Laboratory Technician.

320.04 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 MECHANICS LABORATORY

The Geotechnical Laboratory performs tests to determine physical and mechanical properties of undisturbed soil samples (and disturbed soil samples in some cases) or rock cores submitted by the districts.

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

The 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 Geotechnical Engineer.

330.03 Geotechnical Tests. The following list provides the AASHTO or ASTM designation for each test method performed.

Test Title	AASHTO or ASTM Test Method
Consolidation	T 216
Triaxial Compression	T 296 & T 297
Direct Shear	T 236
Unconfined Compressive Strength	T 208
Lime-Treated Soils	Idaho T-105
Particle Size Analysis of Soils	T 88
Moisture Content	T 265
Density	In-Laboratory Method
Rock Point Load Test	In-Laboratory Method
Unified Soil Classification	M 145 (ASTM D 2487)
Moisture Density Relationship	T 99 & T 180
Atterberg Limits	T 89 & T 90
Mechanical Analysis of Soil	T 88
Specific Gravity	T 100
Geotextile -Trapezoidal Tear Strength	ASTM D 4533

Test Title	AASHTO or ASTM Test Method
Geotextile – GrabTensile Strength	ASTM D 4632
Geotextile – Grab Elongation	ASTM D 4632
Geotextile - Puncture Resistance	ASTM D 4833
Geotextile – Permeability	ASTM D 4491
Geogrid – Tensile Strength	ASTM D 6637

SECTION 340.00 CHEMISTRY LABORATORY

The Central Materials 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. Primarily the Chemistry Laboratory work includes:

- To monitor submitted samples of materials for ITD specification compliance in both Quality Control and Quality Assurance Programs.
- To develop the Qualified Product List for selected materials used by ITD.
- To conduct analyses and evaluations on project related Quality Assurance samples, and submitted samples for award of statewide contracts.

Materials tested include traffic line paint, glass beads, anti-icing and deicing chemicals, pavement markings, cement, fly ash, etc.

The Chemistry Laboratory is accredited by the American Association for State Highway and Transportation Officials (AASHTO) for cement analysis. The laboratory participates in the sample proficiency programs with the Cement and Concrete Reference Laboratory (CCRL) and the American Materials Reference Laboratory (AMRL) through AASHTO. The Chemistry Laboratory maintains an internal Quality Control/Quality Assurance program. The Chemistry Laboratory Supervisor must have at least a bachelor’s degree in chemistry and 5 years of analytical experience.

The Chemistry Laboratory provides a consultative service for select materials used in ITD projects. The Chemistry Laboratory conducts research on new products and testing procedures. Research results are evaluated for either compliance to existing specifications or for implementation in future specifications. The Chemistry Laboratory also 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).

Idaho Transportation Department Standard Specifications for Highway Construction.

Special Provisions from ITD 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.

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 and Improvement of Saline and Alkaline Soils Methods.

340.02 Chemistry Laboratory Functions. Sample frequency for construction and maintenance materials is dictated by the ITD MTRs from the Idaho Quality Assurance Manual and/or as documented in ITD contracts. General sample preparation is determined by the individual testing protocol. Testing tolerances for the materials being tested are governed by the Idaho 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 out-source 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 Section's Equipment Specialist to make appropriate recommendations for maintenance of the equipment tied to the historical trend data.

340.03 Qualification of Testing Technicians. The testing technicians are trained and supervised by the Chemistry Laboratory Supervisor who must have at least a bachelor’s degree in chemistry. Each testing technician is qualified by annual performance evaluations as part of the laboratory’s QC program.

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 Materials Engineer 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 ITD contract.

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

Test Methods:

ASTM D 92	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 Antirusts
ASTM D 1120	Standard Test Method for Boiling Point of Engine Coolants
ASTM D 1121	Standard Test Method for Reserve Alkalinity of Engine Coolants and Antirusts
ASTM D 1122	Standard Test Method for Density or Relative Density of Engine Coolant Concentrates and Engine Coolants By the Hydrometer
ASTM D 1287	Standard Test Method for pH of Engine Coolants and Antirusts
ASTM D 1177	Standard Test Method for Freezing Point of Aqueous Engine Coolants
ASTM D 1881	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 Subsection 502 Structural Concrete and Subsection 409 Concrete Paving will be according to the Idaho 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
Idaho Transportation Department Standard Specifications for Highway Construction	

Test Methods:

AASHTO T 105	Standard Method of Test for Chemical Analysis of Hydraulic Cement
AASHTO T 153	Standard Method of Test for Fineness of Hydraulic Cement by Air Permeability Apparatus
ASTM C 114	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 can not 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 T-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 the Idaho Quality Assurance Manual.

Specifications:

AASHTO M 148	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

Idaho Transportation Department Standard Specifications for Highway Construction

Test Methods:

AASHTO T 155	Standard Test Method for Water Retention by Concrete Curing Materials
ASTM D 1644	Standard Test Methods for Nonvolatile Content of Varnishes
ASTM D 1475	Standard Test Method for Density of Liquid Coatings, Inks, and Related Products
ASTM E 1347	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 Deicing and Anti-Icing Chemicals. The following sections give the testing requirements by category.

Sample Frequency: As determined by ITD contract.

Category 1 – Corrosion Inhibited Liquid Magnesium Chloride

Category 2 – Corrosion Inhibited Liquid Calcium Chloride

Category 3 – Non corrosion Inhibited Liquid Calcium Magnesium Acetate

Category 4 – Corrosion Inhibited Sodium Chloride

Category 5 – Corrosion Inhibited Sodium Chloride Plus 10% Magnesium Chloride

Category 6 – Corrosion Inhibited Sodium Chloride Plus 20% Magnesium Chloride

Category 7 – Solid Calcium Magnesium Acetate

Category 8A – Noncorrosion Inhibited Sodium Chloride

Category 8B – Noncorrosion Inhibited Sodium Chloride

Category – Experimental

Specifications:

Pacific Northwest Snowfighters (PNS) and ITD

ASTM D 632 Standard Specification for Sodium Chloride

Test Methods:

PNS and ITD	Test Methods and Appendixes
ASTM E 534	Standard Test Methods for Chemical Analysis of Sodium Chloride
ASTM D 1293	Standard Test Methods for pH of Water
ASTM D 1429	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-01-95	Standard Test Method – Laboratory Corrosion Testing of Metals – PNS Modified

Noncompliant Material and Price Adjustment: Noncompliant material is not accepted. The product is returned to the manufacturer and replaced with acceptable material. If product can not be returned the following price adjustments are recommended:

Percent Concentration (Liquid Only)

Bidder Quoted Concentration (BQC)

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

Total Metals, Total Phosphorus, and Total Cyanide

Percentage Over the Specified Limit	Price Adjustment
Percent of total shipment or lot number represented by sample	
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%

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

Total Settleable Solids (percent by volume)

Settleable Solids (1.0% Maximum)	Price Adjustment
Percent of total shipment or lot number represented by sample	
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

Percent Passing No. 10 Sieve (percent by volume)

Percent Passing the No. 10 Sieve (99.0% Minimum)	Price Adjustment
Percent of total shipment or lot number represented by sample	
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

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%

Moisture Content

Category 8A material shall 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% shall be computed as follows:

Pay Weight = (100.5 x Wet Wt. of Salt) divided by (100 + Percent of Moisture)

Category 8B material shall 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% shall be computed as follows:

Pay Weight = (105.0 x Wet Wt. of Salt) divided by (100 + Percent of Moisture)

340.05.06 Dust Abatement – Magnesium Chloride.
Sample Frequency: According to the Idaho Quality Assurance Manual or ITD contract.

Specifications:

Idaho Transportation Department Standard Specifications for Highway Construction

Test Methods:

PNS and ITD Test Method and 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 ITD Contract.

340.05.07.01 Barbed Wire.
Specifications:

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

Idaho Transportation Department Standard Specifications for Highway Construction

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

Idaho Transportation Department Standard Specifications for Highway Construction

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 A 185 Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete

Idaho Transportation Department Standard Specifications for Highway Construction

Test Methods:

ASTM A 90 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 A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire

Idaho Transportation Department Standard Specifications for Highway Construction

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 A 116 Standard Specification for Metallic-Coated, Steel Woven Wire Fence Fabric

Idaho Transportation Department Standard Specifications for Highway Construction

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

Idaho Transportation Department Standard Specifications for Highway Construction

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 1083	Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

Idaho Transportation Department Standard Specifications for Highway Construction

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 A 116	Standard Specification for Metallic-Coated, Steel Woven Wire Fence Fabric

Idaho Transportation Department Standard Specifications for Highway Construction

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
AASHTO T 68	Standard Method of Test 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

Idaho Transportation Department Standard Specifications for Highway Construction

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

Idaho Transportation Department Standard Specifications for Highway Construction

Test Methods:

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

ASTM C 311 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. If product can not be returned the following price adjustment for Available Alkali Content is recommended:

Available Alkali Content (1.5% Maximum)

Available Alkali (1.5% Maximum)	Supplier	Aggregate Source	Price Adjustment
Greater than 1.5%	Approved	Non Reactive	25% of Fly Ash
Greater than 1.5%	Approved	Reactive	75% of Fly Ash
Greater than 1.5%	Non Approved	Non Reactive	25% of Contract Item
Greater than 1.5%	Non Approved	Reactive	25% of Contract Item

Calcium Oxide Content (maximum of 11%)

Calcium Oxide (11% Maximum)	Supplier	Aggregate Source	Price Adjustment
Greater than 12% but less than 13%	Approved	Non Reactive	25% of Fly Ash
Greater than 12% but less than 13%	Approved	Reactive	75% of Fly Ash
Greater than 12% but less than 13%	Non Approved	Non Reactive	25% of Contract Item
Greater than 12% but less than 13%	Non Approved	Reactive	25% of Contract Item
Greater than 13%	Approved	Non Reactive	25% of Contract Item
Greater than 13%	Approved	Reactive	25% of Contract Item
Greater than 13%	Non Approved	Non Reactive	25% of Contract Item
Greater than 13%	Non Approved	Reactive	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:

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.

340.05.10 Latex Modifier.
Sample Frequency: According to the Idaho Quality Assurance Manual.

Specifications:

Idaho Transportation Department Standard Specifications for Highway Construction

Test Method:

IDAHO T-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 C 977 Standard Specification for Quicklime and Hydrated Lime for Soil Stabilization

Test Methods:

ASTM C 25	Standard Test Methods for Chemical Analysis of Limestone, Quicklime, and Hydrated Lime
ASTM C 110	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 ITD contract.

Specifications:

ASTM D 520	Standard Specification for Zinc Dust Pigment
SSPC Paint 20 (Type II) Organic	
SSPC Paint 27	
TT-E-529 (Type I)	Federal Specification Enamel, Alkyd, Semigloss
TT-P-19	Federal Specification Paint, Acrylic Emulsion: Exterior
TT-P-615 (Type II)	Federal Specification Primer Coating: Basic Lead Chromate Ready Mixed

Idaho Transportation Department Standard Specifications for Highway Construction

Test Methods:

AASHTO T 155	Standard Method of Test for Water Retention by Concrete Curing Materials
ASTM D 562	Standard Test Method for Consistency of Paints Measuring Kreb Unit (KU) Viscosity Using a Stormer-type Viscometer
ASTM D 823	Standard Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels
ASTM D 968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D 1005	Standard Practices for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers
ASTM D 1475	Standard Test Method for Density Liquid Coatings, Inks, and Related Products
ASTM D 2369	Standard Test Method for Volatile Content of Coatings
ASTM D 2486	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 ITD contract.

Specifications:

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

Test Methods:

ASTM D 823 Standard Test Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels

ASTM D 4061 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 ITD contract.

Specifications:

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

Test Methods:

ASTM D 522 Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings

ASTM D 562 Standard Test Method for Consistency of Paints Measuring Kreb Unit (KU) Viscosity Using a Stormer-type Viscometer

ASTM D 661 Standard Test Method for Evaluating Degree of Cracking of Exterior Paints

ASTM D 711 Standard Test Method for No-Pick-Up Time of Traffic Paint

ASTM D 823 Standard Practices for Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels

ASTM D 869 Standard Test Method for Evaluating Degree of Settling of Paint

ASTM D 969 Standard Test Method for Laboratory Determination of Degree of Bleeding of Traffic Paint

ASTM D 1005 Standard Test Method for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers

ASTM D 1293 Standard Test Methods for pH of Water

ASTM D 1394 Standard Test Methods for Chemical Analysis of White Titanium Pigments

ASTM D 1475 Standard Test Method for Density Liquid Coatings, Inks, and Related Products

ASTM D 2243 Standard Test Method for Freeze-Thaw Resistance of Water-Borne Coatings

ASTM D 2369 Standard Test Method for Volatile Content of Coatings

ASTM D 2486 Standard Test Methods for Scrub Resistance of Wall Paints

ASTM D 2805 Standard Test Method for Hiding Power of Paints by Reflectometry

ASTM D 3723	Standard Test Method for Pigment Content of Water-Emulsion Paints by Low-Temperature Ashing
ASTM E 1347	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 ITD contract.

Specifications:

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

Idaho Transportation Department Standard Specifications for Highway Construction

Test Methods:

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

ASTM C 311 Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete

ASTM C 430 Standard Test Method for Fineness of Hydraulic Cement by the 45-um (No. 325) Sieve

ASTM C 1240 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. Price adjustments are not in place for this material.

340.05.16 Soils.
Sample Frequency: According to the Idaho Quality Assurance Manual.

Specifications: As determined by ITD

Test Methods:

USDA Soil Method Diagnosis and Improvement of Saline and Alkali Soils

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.

340.05.17 Water for Concrete, Grout, and Mortar.
Sample Frequency: According to the Idaho Quality Assurance Manual.

Specifications:

Idaho Standard Specification for Highway Construction

Test Methods:

AASHTO T 26 Standard Method of Test for Quality of Water to be Used in Concrete

ASTM D 512 Standard Test Methods for Chloride Ion in Water

ASTM D 516 Standard Test Method for Sulfate Ion in Water

ASTM D 1125 Standard Test Methods for Electrical Conductivity and Resistivity of Water

ASTM D 1293 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.

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:

ASTM D 445	Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)
ASTM E 1252	Standard Practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis
ASTM D 4206	Standard Test Method for Sustained Burning of Liquid Mixtures Using the Small Scale Open-Cup Apparatus
ASTM D 6595	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 LABORATORY

The Asphalt Laboratory is responsible for testing the quality of all bituminous products for highway construction projects and maintenance projects. The Asphalt Laboratory is AASHTO accredited and participates in American Materials Reference Laboratories (AMRL) proficiency testing.

350.01 Testing Procedures. Specifications governing the quality of asphalt are found in the ITD Standard Specifications for Highway Construction, Subsection 702. All asphalt test methods are American Association of State Highway and Transportation Officials (AASHTO), with the exception of Detection of Anti-Strip Additive (Idaho T-99) and Elastic Recovery (AASHTO T301)

Asphalt samples received by the Asphalt Laboratory for testing fall within five general types:

1. Performance Graded Binders
2. Cutback Asphalt
3. Emulsified Asphalt
4. Viscosity Graded Asphalt Cements and Polymerized Asphalt Cements
5. Special Products (Crack Filler, Bituminous Coatings, Anti-Strip Additive Approval, etc.)

Asphalt samples received from a project will be tested as complete or routine samples. Complete testing includes a series of tests as outlined in the next section. A routine test involves one or two tests.

350.01.02 Performance Graded Binders. Complete testing of Performance Graded Binders consists of the following tests found in AASHTO Standards.

Flash C.O.C.	T 48
Brookfield Viscosity	T 316
Dynamic Shear	T 315
Rolling Thin Film Oven Test	T 240
Dynamic Shear on RTF Residue	T 315
Pressure Aging Vessel	PP 1
Dynamic Shear on PAV Residue	T 315
Bending Beam (Creep Stiffness)	T 313
Direct Tension	T 314
Elastic Recovery	T 301

Idaho T-99 is also performed as part of complete testing.

350.01.02 Cutback Asphalt (MC-70, MC-350, MC-800, etc.). The first sample of a project is tested as a complete (Identification No. 2001-C). Complete testing will be performed on every tenth sample thereafter (2010-C, 2020-C, etc.). Routine testing will be performed on all other samples. Complete testing of cutback asphalt consists of the following AASHTO tests.

Flash T.O.C.	T 79
Kinematic Viscosity	T 201
Specific Gravity	T 228
Distillation	T 78
Absolute Viscosity on Distillation Residue	T 202

Routine testing of cutback asphalt:

Kinematic Viscosity	T 201

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

1. Seal Coat Emulsions (CRS-2, CRS-2R, CRS-P, etc.)
2. Tack Coats and Fog Seals (CSS-1, SS-1, etc.)
3. Cold Mix Recycle Emulsions (CMS-2, CMS-2s, etc.)

Seal Coat Emulsions are tested in conjunction with District Seal Coat Field Viscosity Testing. All samples, whether field tested or not, are sent to the Central Materials Laboratory. If samples have been field tested, the Central Materials Laboratory will perform the following AASHTO tests.

Residue by Evaporation T 59

Penetration on Residue T 49

If viscosity has not been performed in the field, the Central Materials Laboratory will test for Viscosity (AASHTO T 59, Consistency Test) and Saybolt Viscosity (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.

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

Consistency Test (Saybolt Viscosity at 25°C or 77°F)	T 59 and T 72
Residue by Evaporation	T 59
Penetration of Residue	T 49

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

Consistency Test (Saybolt Viscosity at 50°C or 122°F)	T 59 and T 72
Residue by Evaporation	T 59
Penetration of Residue	T 49

The following procedure is used to perform the Evaporation Test:

The 50 gram samples of emulsion are cooked on a hot plate until all foaming is finished.

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

350.01.04 Asphalt Cements (AC-5, AC-10, AC-20, Type II-C, PBA-3, PBA-6, etc.). The first sample of a project is tested as a complete (Identification No. 2001-C). Routine tests will be performed on 2006-C and 2011-C followed by a complete test on 2016-C. This pattern of testing frequency will continue through the rest of the project. (2021-C and 2026-C will be routines, 2031-C a complete; 2036-C and 2041-C routines, 2046-C a complete; etc.)

Complete testing of Asphalt Cements consists of the following AASHTO tests.

Absolute Viscosity T 202

Kinematic Viscosity T 201

Penetration T 49

Flash C.O.C. T 48

Rolling Thin Film Oven Test T 240

Absolute Viscosity on Residue T 202

Routine testing of asphalt cements consists of the following AASHTO tests.

Absolute Viscosity T 202

Penetration T 49

Idaho T-99 anti-strip detection is also performed, as required, as part of complete and routine testing. Asphalt cement samples are preheated and held for testing at temperatures under 300°F. Sample cans with 1 1/2" openings for pouring are preferred. The lids are to be left on tightly until the sample is tested.

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.

Test Method	Deviation (-) % of Spec Value	Price Adjustment
Flash Point C.O.C. (230°C minimum 450°F)	0 to 8	0%
	8.5 to 16	10%
	16.5 +	25%
Brookfield Viscosity (3 Pa.S. maximum)	0 to 10	0%
	10.5 to 20	10%
	20.5 +	25%
Dynamic Shear – Original (1.0 kPa minimum) and Rolling Thin Film Residue (2.2 kPa minimum)	0 to 10	0%
	10.5 to 20	10%
	20.5 +	25%
Dynamic Shear – PAV Residue (5000 kPa maximum)	0 to 10	0%
	10.5 to 20	10%
	20.5 +	25%
Rolling Thin Film Oven Test (1.0% maximum loss)	0 to 20	0%
	20.5 to 40	10%
	40.5 +	25%
Bending Beam (Stiffness, 300 MPa maximum)	0 to 5	0%
	5.5 to 10	10%
	10.5 +	25%
Bending Beam (Slope, m-value .300 minimum)	0 to 5	0%
	5.5 to 10	10%
	10.5 +	25%
Elastic Recovery (50% minimum at 25°C)	Under 50%	25%

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 "lot" and price reduction will be assessed on the entire lot.

350.02.02 Cutback Asphalt.

Test Method	Deviation (-) % of Spec Value		Price Adjustment
Flash Point T.O.C.	0 to 8		0%
	8.5 to 16		15%
	16.5 +		25%
Kinematic Viscosity at 60°C (140°F)	Below 3000 CST	3000 to 6000 CST	
	0 to 3	0 to 9	0%
	3.5 to 6	9.5 to 18	15%
	6.5 +	18.5 +	25%
Distillation	*0 to 2		0%
	*2.5 to 4		15%
	*4.5 +		25%
	*Distillation Fractions and % Residue		
Absolute Viscosity	0 to 10		0%
	10.5 to 20		15%
	20.5 +		25%

The specification cutback asphalt sample will be assessed a price adjustment based on the contractor's supplier price.

350.02.03 Emulsified Asphalt.

Test Method	Deviation (-) % of Spec Value		Price Adjustment
	25°C (77°F)	50°C (122°F)	
Saybolt Viscosity	0 to 15	0 to 21	0%
	15.5 to 30	21.5 to 42	15%
	30.5 +	42.5 +	25%
Residue by Evaporation	0 to 1		0%
	1.5 to 2		15%
	2.5 +		25%
Penetration of Residue	Below Minimum		
	0 to 16		0%
	16.5 to 24		15%
	24.5 +		25%
	Above Maximum		
	0 to 8		15%
	8.5 +		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.

350.02.04 Asphalt Cements.

Test Method	Deviation (-) % of Spec Value	Price Adjustment
Absolute Viscosity – Original and Residues at 60°C (140°F)	0 to 10	$0
	10.5 to 20	$300
	20.5 +	$500
Kinematic Viscosity at 135°C (275°F)	0 to 9	$0
	9.5 to 18	$300
	18.5 +	$500
Penetration at 25°C (77°F)	0 to 8	$0
	8.5 to 16	$300
	16.5 +	$500
Flash Point C.O.C.	0 to 8	$0
	8.5 to 16	$300
	16.5 +	$500
Rolling Thin Film Oven Test	0 to 40	$0
	40.5 to 80	$300
	80.5 +	$500

Each sample of asphalt cement tested represents a "lot" of five trucks or trailers or any combination thereof. If a failure occurs, a flat rate price reduction will be assessed against the entire lot. No additional samples from that lot will normally be tested. If a failure occurs on a project fewer then five loads, the price reduction will be prorated with the number of loads used.

350.02.05 Anti-Strip Additives. Anti-strip additives are accepted for use on ITD projects only when pre-approved by ITD HQ Materials Section. The additive submittals are tested by the ITD Central Asphalt Laboratory according to Idaho Test Method T-137.

Field testing for the presence of anti-strip is performed at the project site in accordance with the ITD Quality Assurance Manual. If plantmix is placed without anti-strip or with failing anti-strip then the following price adjustment will apply.

Idaho T-99 Anti-Strip Test

Deviation	Price Adjustment on Mix Placed
Negative	25%

An additional tolerance for test results is allowed for material that contains anti-strip.

	Deviation
Increase in Original Penetration	8%
Decrease in Original Absolute Viscosity	10%
Decrease in Kinematic Viscosity (AC Grades only)	9%

350.03 Noncompliant Material and Price Adjustment Letters. In the event of a failing asphalt test result, repeat the test after making sure that all methods, procedures, equipment, and specifications are correct. If the sample passes specifications upon retest, report the sample as passing.

If the sample fails on retest, immediately report the average test results. The test report with the failure on it will be published on pink paper. Failing samples are retained in the laboratory for one year.

350.04 Asphalt Price Adjustment Letters. When submitting a report that includes out-of-specification material, a Price Adjustment Letter must be prepared. The letter will include only one supplier's failures. Different suppliers and different contracts will not be used in the same letter.

There are two versions of the Price Adjustment Letter. One refers to price adjustments based on F.O.B. contractor's supplier price and is used when assessing penalties to Cutback Asphalt and Emulsified Asphalt. F.O.B. is defined as including the freight charges in the supplier’s price. The other version refers to flat rate reductions commonly used for Asphalt Cements.

A rough draft should accompany each test report to be used by the ITD HQ Materials Section office staff to produce a master letter to be signed by the Materials Engineer. The letter will accompany the test reports for distribution as directed.

SECTION 360.00 STRUCTURES LABORATORY

360.01 The Structures Laboratory. The Structures Laboratory tests the physical and mechanical properties of all materials related to highway construction and the fabrication of structures, both concrete and steel. The testing may be performed in the laboratory or in the field, using destructive and/or nondestructive testing methods. All testing is accomplished in accordance with AASHTO and ASTM Test Methods and Specifications under the direction of the Quality Assurance Engineer. Sampling is performed at the project sites and submitted to the appropriate areas for testing. AASHTO and Cement & Concrete Reference Laboratories (CCRL) accreditation requirements are maintained.

360.02 Cement Laboratory. The cement laboratory performs physical testing of cementacious materials. Cements, Types I, I and II, and III, are tested for specific properties designated by AASHTO and ASTM to ensure quality and consistency of the product. AASHTO and CCRL accreditation requirements are maintained. Samples are taken from the concrete supplier's storage, silos or bulker trucks. Cement samples brought into the laboratory are randomly sampled for chemical and physical analysis. All physical testing on cements is performed. Mortar pats, made for the ITD Chemistry Laboratory (see Section 340), are used for testing curing compounds.

360.03 Inspection of Pre-cast Concrete. Personnel from the Structures Laboratory perform inspection of precast concrete components when required. Products inspected are numerous styles of girders, slabs, stiff legs, pipe, and wall panels, as well as decks and structures. This inspection is performed in-state and out-of-state for Idaho projects. Inspection is performed in accordance with project requirements, Standard Specifications for Highway Construction, and PCI (Precast Concrete Institute). 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. Every three months, personnel in the Structures Laboratory perform 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 every 12 months or less, is used to verify the portable scales. Scale certification is performed in accordance with parts 137.0 in the POE Operations Manual.

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

The test results are immediately emailed to the project staff and subsequently posted to the ITD intranet Materials 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 laboratory is AASHTO accredited. 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 and specifications that are currently being used in the Structures Laboratory. Test methods and specifications are AASHTO unless otherwise noted.

360.06.01 Cement.

Test	Test Methods	Specifications
Sampling	T 127	M 85
Mechanical Mixing	T 162	T 162
Compressive Strength	T 106	M 85
Autoclave Expansion	T 107	M 85
Normal Consistency	T 129	M 85
Time of Set (Vicat)	T 131	M 85
Time of Set (Gilmore)	T 162 & T 154	M 85
Specific Gravity	T 133	M 85
Air Content	T 137	M 85
False Set (Paste Method)	T 162 & T 186	M 85
Flow Table & Caliper		M 152

360.06.02 Concrete Aggregate.

Test	Test Methods	Specifications
Sampling	T 2	409, 502 & 703 (Idaho)
Unit Weight	T 19	M 6
Organic Impurities	T 21	M 6
Sieve Analysis	T 27	M 6
Mortar Strength	T-13 (Idaho)	M 6
Specific Gravity, FA	T 84	
Specific Gravity, CA	T 85	
L.A. Wear, CA	T 96	M 80
Sand Equivalent	T 176	703 (Idaho)

360.06.03 Concrete.

Test	Test Methods	Specifications
Compressive Strength	T 22	409 & 502 (Idaho)
Obtaining & Testing Cores	T 24	409 & 502 (Idaho)
Slump	T 119	409 & 502 (Idaho)
Unit Weight, Fresh	T 121	From Mix Design
Laboratory Produced Concrete (Idaho)	T 126	409 & 502
Sampling Fresh Concrete	T 141	409 & 502 (Idaho)

Test	Test Methods	Specifications
Air Content, Pressure Method	T 152	409 & 502 (Idaho)
Capping Concrete Cylinders	T 231	T 231
Mix Design, Absolute Volume	T 126	409 & 502 (Idaho)
Single Use Molds		M 205
Moist Cabinets & Curing Tanks		C 511 (ASTM)
Unit Weight, Hardened Concrete	T 106 (Idaho)	

360.06.04 Steel for Concrete Reinforcement.

Test	Test Methods	Specifications
Deformed Billet – Steel Bars	T 68 & T 244	M 31
Cold Drawn Steel Wire	T 68 & T 244	M 32
Welded Wire Fabric	T 68 & T 244	M 55
Uncoated Seven-Wire Strand	T 68 & T 244	M 203
Uncoated Stress Relieved Wire	T68 & T 244	M 204
High Strength Alloy Bars	T 68 & T 244	M 215
Carbon Steel Bars, Plain Round	T 68 & T 244	M 227

360.06.05 Steel Plate Fasteners.

Test	Test Methods	Specifications
Hi-Strength Bolts	T 68 & T 244	M 164
Hi-Strength Nuts	RC Assembly	M 292
Hardened Washers	RC Assembly	M 293
DTIs (Direct Tension Indicators)	RC Assembly	F 959 (ASTM)
Brinell Hardness	T 70	
Rockwell Hardness	T 80	

360.06.06 Building Block Materials.

Test	Test Methods	Specifications
Blocks & Bricks	T 32	M 89 & M 114
Mortar & Grout Aggregate		C 144 & C 404 (ASTM)
Mortar	C 91 (ASTM)	C 270 (ASTM)
Flow or Grout	C 939 (ASTM)	Special Provisions

360.06.07 Joint Filler.

Test	Test Methods	Specifications
Sampling & Testing Joint Filler	T 42	M 153 & M 213