

# **FIELD TESTING FOR PROJECT & IA**





# FIELD TESTING FOR PROJECT AND IA

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# FIELD TESTING FOR PROJECT AND IA

## OVERVIEW

This resource has established the field testing guidelines to maintain compliance with 637B Title 23 Code of Federal Regulations (CFR) while assisting Construction Field Crews and the Construction Division in administering a quality construction project as it relates to field testing.

Sampling and testing on roadway construction contracts ensure that materials and construction methods conform to plans and specifications. Consistent sampling and testing procedures are necessary to ensure quality materials and construction techniques are provided to the Department.

**NOTE:** For more information regarding the Department's Quality Assurance Program, refer to Chapter 4, "Sampling and Testing", of the [Construction Manual](#).

## TESTING

### PROJECT ACCEPTANCE TESTING

Project acceptance testing (field testing) is performed during the progress of construction on the materials to be permanently incorporated into the contract to ensure quality and consistency. In addition, some materials are accepted by the Department with submission of Certificates of Compliance from the Contractor and/or producer of the material or products listed on the Qualified Products List (QPL).

The Department is responsible for all acceptance testing, with few exceptions. These exceptions include the measurement of pavement smoothness and the measurement of retroreflectivity for striping. Project acceptance tests (field tests) are performed by construction crew testers and/or the Materials Division using the [Synopsis of Materials Division Testing Manual for Field Testing](#) or the [Materials Test Manual](#), to determine which test method revision to use on a contract, refer to the contract advertised date found in [MasterWorks](#) and use the test method revision dated on or before the contract advertised date. Tests are to be conducted at the appropriate locations and times using methods as defined in the [Minimum Required Samples and Tests: Project](#). The Contract Item and Materials Association – BI Report identifies materials acceptance details for each contract. The Sampling and Testing Status Report (STSR) shows all known, at the time of generation, applicable minimum required tests needed for each contract. Unforeseen changes to existing materials and/or the addition of new materials requiring testing will need to be addressed by the Resident Engineer. The [Minimum Required Samples and Tests: Project](#) list the minimum required frequencies for each material on each contract. To determine which set of "Project Testing Frequencies" to use on a contract, refer to the contract advertised date found in [MasterWorks](#) and use the "Project Testing Frequencies" that are dated on or before the contract advertised date. Refer to "[Field Lab Record-Keeping](#)" for specific requirements on reporting test results.

## INFORMATIONAL TESTING

The Contractor is responsible for informational testing on material to be incorporated into the Contract, this testing is to be done prior to submitting the passing results to the Resident Engineer, at which time the Contractor can request for the Department to perform informational testing.

Examples of informational testing conducted by NDOT testers include but are not limited to:

- Aggregates produced for stockpile.
- Moisture content of aggregates.
- Hydrated lime in marinated aggregate.
- Cement treated base mixtures.
- Concrete cylinders other than the 28-day curing period.
- Material taken outside the specified acceptance point.

## RETESTS

For materials not complying with the specifications, the first retest of the unaccepted material should be run to determine if the sampling and testing methods were correctly performed. Any retest must be taken from the same acceptance point and be taken on the same material. If the retest produces comparable results, the Contractor shall use an appropriate method to correct the unacceptable material. Per Section 106, "Control of Material", of the [Standard Specifications for Road and Bridge Construction](#), the Contractor is responsible for providing a quality material that meets the specifications and complete their own informational testing to ensure conformance.

Before completing further retests, the Resident Engineer will ensure the Contractor made a constructive effort to correct the unacceptable material. Repetitive testing, to get a passing test, will not be allowed and is against the "NDOT Responsibilities Agreement for Field Testing" document signed by each qualified tester. After the second failing re-test, the Resident Engineer is to communicate to the Contractor that the failing material should not be incorporated into the contract and/or remove that material which has already been incorporated into the contract.

## MISCELLANEOUS SAMPLES AND TESTS

The Construction Division, District Engineer or FHWA may request sampling and testing of materials or work that may be in question.

## ACCEPTANCE OF SMALL QUANTITIES

Small quantity is defined as a material that has a quantity that is less than 10 percent of the minimum required tests for such material and are not required to be tested. Small quantities have been accounted for and built into AWP Materials.

EXAMPLE: Bit. Ratio is required every 1,000 tons:  $1000 \times .10 = 100$  tons

If the contract quantity is less than 100 tons, the minimum required frequencies may be waived by the Resident Engineer.

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If a material meets these criteria, the Resident Engineer may accept the material on substantial compliance and not require the minimum required tests. If the material is 10 percent or more of the minimum required testing frequency, then all applicable tests shall be completed per the [Minimum Required Samples and Tests: Project](#) frequency table.

## NUCLEAR TESTING PROGRAM

The Department's "Radiation Safety Class" is taught by the Corporate Radiation Safety Officer (CRSO) and covers all policies and procedures required for storing and transporting of the Department's nuclear density gauges. Each District Radiation Safety Officer (DRSO) provides the "Nuclear Gauge Operation Class" giving proper training and qualifications for the operation of the Department's nuclear density gauges. The "Radiation Safety Class" and/or "Nuclear Gauge Operation Class" must be taken and passed prior to transporting, storing and/or operating the Department's nuclear density gauges.

## TESTING PERFORMED BY OTHER DIVISIONS

### MATERIALS DIVISION

Testing performed by the Materials Division is completed in accordance with the applicable section(s) of the [Standard Specifications for Road and Bridge Construction](#) and can be either source acceptance or project control, depending on the type of material and the required tests needed to be run.

When submitting samples to the Materials Division, verify they are accompanied with a completed Sample Label.

The following list shows the different Labs within the Materials Division, which materials are tested by each one and which lab to send contact submittals for review:

### AGGREGATE LAB

- Material Tested: Borrow, select borrow, aggregate base, backfill, granular backfill, MSE backfill, drain backfill, riprap, riprap bedding, topsoil, screenings, de-icing sand, plantmix bituminous surface aggregates, multilayer overlay aggregate, portland cement concrete aggregates, screenings (chips), micro-surfacing aggregate.
- Submittals Reviewed: Multilayer Overlay Aggregate – 497, Drain backfills – 704, Screenings (Chips) – 705, Micro-Surfacing Aggregate – 705, Riprap/Bedding – 719, Plantmix Aggregates – 705.

### ASPHALT LAB

- Material Tested: Refinery samples, asphalt cements, emulsified asphalts, cutback asphalts.
- Submittals Reviewed: Asphalt Binder – 703, Emulsions – 703, Cutback Asphalts – 703.

### BITUMINOUS LAB

- Material Tested: Bituminous surface mix designs, bituminous surface behind the paver samples, paving fabric, screenings (chips), slurry seal mix designs, micro-surfacing mix designs.
- Submittals Reviewed: Plantmix Designs – 401, Paving Fabric – 401, Screenings (Chips) – 705 (Stripping Test, other tests performed in Aggregate Lab), Slurry Seal Mix Designs – 408, Micro-Surfacing Mix Designs – 418.

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## CHEMICAL LAB

- Material Tested: Paint, traffic paint, traffic beads, water, hydrated lime, guideposts, metal fence posts, chain link fence, signposts, corrugated metal pipe, wire mesh, cement, pozzolan.
- Submittals and Products Reviewed: Paint – 714, Traffic Paint – 729, Beads – 730, Other miscellaneous materials (including 712, 718, and 720).

## CONCRETE OPERATIONS

- Submittals and Products Reviewed: Concrete related other than mix designs: Tie bars – 409, Dowels – 409, PCCP joint layout Plans – 409, Joint sealer – 409, and 502, Repair materials – 496, and 502, Couplers – 502, and 409, Expansion joints – 502, Curing compound – 702, Epoxies – 728, Polymer concrete – 496, Multilayer overlays – 497, Dampproofing, Waterproofing, Sealing, and Membranes – 646, Pneumatically Placed Concrete Mortar – 660.

## GEOTECHNICAL/R-VALUE LAB

- Material Tested: Borrow, select borrow, aggregate base, granular backfill, MSE backfill.

## GEOTECHNICAL SECTION

- Submittals and Products Reviewed: Driven Piles – 508 (also include Structures), Drilled Shafts – 509 (also include Structures), Mechanically Stabilized Earth Walls – 642 (also include Structures), Ground Anchors – 643 (also include Structures), Soil Nails – 644 (also include Structures), Engineering Fabrics (Geotextile/Geogrid/Geomembrane, but not Paving Fabric) – 731.

## PAVEMENT ANALYSIS SECTION

- Final concrete pavement samples of Portland cement concrete pavement.

## STRUCTURAL LAB

- Material Tested: Concrete cylinders, reinforcing steel, metal fence posts, guideposts, chain link fence, corrugated metal pipes, tensioning strand, concrete aggregates, slurry backfill, concrete cores.
- Submittals and Products Reviewed: Mix designs: Slurry Cement Backfill – 207, Concrete – 501, Grout – 502, 503, 644, 643, 660, Driven Piles – 508, Drilled Shaft Foundations – 509, Reinforced Concrete Pipe – 603, Bag mix for posts (small quantities) – 616, Mechanically Stabilized Earth Walls – 642, Shotcrete – 660.

## STRUCTURES DIVISION, NON-DESTRUCTIVE TESTING SECTION

- Structural steel: Inspection and testing during fabrication, welding, erection and/or paint application.
- Post tensioning: Strand installation and testing, grouting.

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## TESTING DISPUTES, RESOLUTION

The Contractor and Resident Engineer should discuss the appropriate corrective actions when materials or construction methods do not conform to the plans and/or specifications. If the contractor disputes the Department's acceptance testing and elects to have independent testing performed, refer to Section 106.04 in the [Standard Specifications for Road and Bridge Construction](#).

When a test result is questioned or disputed:

1. The Resident Engineer should first conduct the test using a different tester on the same crew. If the results are still in dispute, then the Resident Engineer will immediately request an audit from the District IA Lab.
2. If the results of the District IA Lab and field tester do not match, then each party will perform an additional test. This second test will consist of the District IA Lab and field tester running the test, side-by-side and with their own equipment. The District IA Lab inspector will then review the findings and provide recommendations to the Resident Engineer and field tester(s) for implementation.
3. If the first two steps do not resolve the dispute, then the Resident Engineer and District IA Lab will contact the Quality Assurance Engineer to arrange for a three-way split that includes the Materials Division for referee testing.

There are no retests on any types of plantmix unless Nev. Test Method T344 is invoked by the Contractor at the pre-construction meeting and all requirements of Nev. Test Method T344 have been met prior to any production of Plantmix Bituminous Materials on the subject contract, including the Field Trial Mixture.

## INDEPENDENT ASSURANCE PROGRAM

The Independent Assurance (IA) Program is federally mandated by FHWA in accordance with 23 CFR 637B and follows a "System Based Approach". The IA program serves the Department by:

1. Ensuring that field testers have been provided with the appropriate training related to the material being evaluated and subsequently possess the necessary qualifications.
2. Verifying all equipment used to sample and test the material being evaluated is calibrated and in working order.

The Construction Division manages and runs the IA Labs which are in each District facility. Each District IA Lab is responsible for performing independent assurance inspection and verification testing on each construction crew within the district. To ensure an independent check of the field crew testing procedures and equipment, the District IA Lab and its staff are not associated with any field crew testing personnel. IA Lab test results are not used for acceptance testing on any contract nor to determine the quality and acceptability of the materials and/or workmanship.

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## RESPONSIBILITIES OF THE IA LAB

The IA Labs responsibilities include, but are not limited to the following:

- Certify a minimum of 90% of all “Active” field crew testers in a calendar year with Nevada Field Sampling and Testing Qualification Program (NFSTQP) and Nevada Concrete Qualification Program (NCQP) performance exams.
- Recertify all “Active” and “Backup” field crew testers with NFSTQP/NCQP written and performance exams every 5 years.
- Audit a construction crew (NDOT and Consultant) in accordance with the [Minimum Required Samples and Tests: Independent Assurance \(IA\)](#) frequency table.
- Audit lab equipment.
- Maintain testing consistency throughout the state by verifying that NDOT’s testing procedures are utilized and performed correctly by testing personnel.
- Perform visual audits.
- Perform side-by-side audits.
- Perform direct split audits.
- Report the audit findings.
- Discuss the audit with the individual(s) whose testing is being audited and with the Resident Engineer before leaving the job site (if corrective action is necessary).
- Perform follow-up audits as necessary.
- Perform testing result dispute audits when requested by the Resident Engineer.
- Verify that all personnel performing tests on NDOT contracts possess the necessary NFSTQP, Nevada Alliance for Quality Transportation Construction (NAQTC) or Western Alliance for Quality Transportation Construction (WAQTC), and NCQP or American Concrete Institute (ACI) qualifications.
- Provide annual training and qualification for new field crew testers for the NFSTQP/NCQP written and performance exams.
- Verify that field lab safety procedures are being followed.
- Perform annual field lab:
  - Safety inspections, on NDOT Form 040-055 (Field Lab Safety Equipment Inspection), by July 1 of every calendar year.
  - Field Laboratory Inspections, on NDOT Form 040-022 (Field Laboratory Inspection Report), by July 1 of every calendar year.
  - Fixed asset inventories conducted in January or February of every calendar year.
- Perform DRSO responsibilities.
- Assist in annual equipment budget requests.
- Acquire and distribute testing equipment to field testers as needed.

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- Provide equipment repair and maintenance.

## INDEPENDENT ASSURANCE SAMPLES AND TESTS

The [Minimum Required Samples and Tests: Independent Assurance \(IA\)](#) frequency tables outline the Nevada Test Methods to be audited per construction crew in a calendar year.

District IA Lab inspectors audit each construction crew throughout the calendar year. IA inspectors stay informed of the work for all contracts in their assigned District through close coordination with the field crew testers, this will help them organize their work efficiently. The Resident Engineer shall keep the District IA Lab informed of any schedule changes and coordinate the completion of testing requirements throughout the duration of the contract.

## SPLIT SAMPLES

Split sample tests are the same tests that are run on regular contract samples. As a part of the regular IA sampling and testing program, most samples are split between the field testers and the District IA Labs (two-way splits) or among the field testers, District IA Labs and a third party (three-way splits). The District IA Lab's test results provide an additional way to check the accuracy of the field testing procedures and equipment used in the acceptance process.

## OBTAINING SAMPLES

Take split samples at the same locations as regular contract samples or obtain the split from the field testers. The sample should be large enough so that each lab will have enough material for each required test. Coordinate with the field testers to either obtain the sample from their field lab location or if the field tester is available, coordinate delivery of the split sample to the District IA Lab.

## REPORTING REQUIREMENTS

The crew field lab shall provide the Sample Label for visuals, side by side and direct split samples to their District IA Lab. Audit results shall be reported by the IA Lab within 14 calendar days of receiving each sample.

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**TABLE 1: IA AUDIT TOLERANCES**

TEST	CONTROL	TOLERANCE RANGE (PLUS OR MINUS)
Sieve Analysis	Percent Passing 3 in. to 1 in. sieves	7%
	Percent Passing 3/4 in. to 3/8 in. sieves	6%
	Percent Passing No. 4 sieve	5%
	Percent Passing No. 8 to No. 16 sieves	4%
	Percent Passing No. 20 to No. 50 sieves	3%
	Percent Passing No. 60 to No. 200 sieves	2%
Fractured Face	Percent Fractured Faces	7%
Sand Equivalent	Sand Equivalent Value	4%
Plasticity Index	Plasticity Index	3
Density	Calculated Maximum Dry Density	3 lbs./cu.ft.
Density	Apparent Specific Gravity	3 lbs./cu.ft.
Slump	Slump of Concrete	1 inch
Air Content	Percent of Air in Concrete	0.5%
Unit Weight	Pounds per Cubic Foot	1.5 lbs.
T.M.D. (Rice)	Density	3 lbs./cu.ft.
Ignition Oven	Bitumen Ratio	0.3%
Absorption	Percent Absorption	0.5%
CV	Cleanliness Value	4.0%

When split samples or side-by-side samples vary more than the allowable tolerances, the IA Lab will confirm that tester(s) are following proper testing procedures, and their testing equipment is working properly. The IA Lab inspectors will obtain and test an additional follow-up audit (if available). If the follow-up audit still confirms unsatisfactory results, a meeting with the tester, Resident Engineer, the District IA Lab, and the Construction Division's Quality Assurance Engineer will occur. If deficiencies continue, the Construction Division's Quality Assurance Engineer will meet with all parties to determine the appropriate resolution.

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## RECORDS

The IA Lab maintains accurate records to confirm:

- Proper frequency of audits (visual, split, side-by-side).
- Audits are reported immediately.
- Corrective action is taken when necessary.
- Testing documentation is maintained.

## VISUAL AUDITS OF FIELD TESTING PROCEDURES

The District IA Lab will visually audit field sampling and testing procedures to verify the accuracy of field methods and testing equipment. The visual audit can be conducted in person, via FaceTime or a video provided by the construction crew. Other new technologies as they are created may be used in lieu of the other three previously listed. Audits include inspecting any or all the following:

- Sampling procedures.
- Sample splitting procedures.
- Sample preparation.
- Testing procedures.
- Calculations.
- Sample Records.
- Equipment use and procedures.
- Discuss the audit with the tester(s) who is/are being observed and with the Resident Engineer before leaving the job site (if corrective action is necessary).
- Report the visual audit on NDOT forms 040-079 (Visual Audit Report Form), 040-089 (Visual Audit for Nuclear Density Gauge - Plantmix) or 040-089A (Visual Audit for Nuclear Density Gauge - Soils).
- Verify that field lab safety procedures are being followed.

A follow-up audit (if available) is required for any failing or unsatisfactory audit, visual or procedural, to verify conditions have been corrected. If the follow-up audit still confirms unsatisfactory results, a meeting with the tester, Resident Engineer, the District IA Lab, and the Construction Division's Quality Assurance Engineer will occur. If deficiencies continue, the Construction Division's Quality Assurance Engineer will meet with the Resident Engineer and the Materials Division to determine the appropriate resolution.

## INDEPENDENT ASSURANCE FORMS

Complete IA audit reports daily. Consecutively number inspection IA audits per Nevada Test Method per construction crew in a calendar year.

Use the following information when numbering audits:

- Crew number, Test Method, Audit Number and Year (Ex. C901 – T102 – 1 – 2024)

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## INDEPENDENT ASSURANCE FILES AND RECORDS

Keep all IA audit reports on file in the electronic filing system per construction crew and per calendar year, until the contract is closed. Distribute completed audits to all appropriate divisions within 14 calendar days of the receipt of audit material. Submit the IA audit results even if the field tester has not completed their Sample Record for comparison. Forward all completed audit reports electronically to the Construction Division's Quality Assurance Section, the Resident Engineer, the Assistant Resident Engineer, and the Assistant District Engineer. Refer to Appendix C of the [Documentation Manual](#) for a list of inspection audit reports and the corresponding distribution.

## SAMPLING AND TESTING FREQUENCIES

Every material must be tested and accepted based on the minimum sampling frequencies for each contract. These frequencies have been established to help ensure consistency of the quality of materials and to meet federal requirements. If these frequencies are not met, federal funding for the contract may be withheld. There are processes available to assist the Resident Engineer in meeting the minimum required frequencies, these are cooperatively developed by the Materials Division and the Construction Division.

The Construction Crew will receive an e-mail from the Materials Specification Engineer (MSE) stating that the Contract is active, and Contract specific materials are set-up. This e-mail should be received at least two weeks prior to the Notice to Proceed (NTP), if you have not received it two weeks prior to the NTP, please reach out to the Construction Division ADMIN Section and MSE's to inquire on the status of the contract. Once the e-mail is received, generate the following documents, and review them prior to construction starting to verify contract accuracy:

- Contract Item and Materials Associations – BI Report
- Certification Tracking – BI Report
- Sampling and Testing Status Report (STSR)

These are active reports and change as construction progresses throughout the life of the contract.

The District IA Lab will forward an updated "Crew Test Method Audit Tracking Form – Annual IA Frequencies" (monthly, unless all contract testing for the calendar year has been completed) to the Resident Engineer.

The [Minimum Required Samples and Tests: Project](#) frequency table defines the minimum requirements for sampling and testing of materials. The sampling frequency may be increased to ensure adequate control and may vary on some contracts according to unique conditions. Any changes to the frequencies defined in the STSR must be discussed with the Quality Assurance Engineer prior to making changes. The Resident Engineer must address the reason for not meeting the minimum required frequencies in the STSR with a "failing" remark.

Except as provided in Section 106.05, Control of Material - Certificates of Compliance, of the [Standard Specifications for Road and Bridge Construction](#), all materials are inspected and/or tested for acceptance before incorporating into the work.

## TESTER QUALIFICATION PROGRAM

In accordance with 23 CFR 637B, NDOT testers performing work on a contract shall be certified under an approved program. The Department utilizes the following internal programs:

- Nevada Field Sampling and Testing Qualification Program (NFSTQP) – Four (4) people minimum are required to hold the new certification class. District 1 will have a maximum of 12 people per calendar year. District 2 and District 3 will have a maximum of 8 people per calendar year.
- Nevada Concrete Qualification Program (NCQP) – Four (4) people minimum are required to hold the new certification class.
- “Active” tester is defined as a tester that has taken the annual performance exam and will be testing in the field lab for the calendar year.
- “Back-up” tester is defined as a tester that has taken the annual performance exam and can test for the calendar year but may not be assigned permanently to the field lab during the calendar year.
- “Certified” tester is defined as a tester who has taken the 5-year certification/re-certification written and performance exam and could potentially be deemed as an active or back-up tester at some point in the calendar year.

The NDOT qualification program(s) for new certification and/or re-certification include a written and performance examination. Employees must successfully complete the entire qualification program(s) to become a certified tester. These certifications are valid for 5 years. This 5-year new certification/re-certification will allow the testers to meet the active tester qualification for that calendar year.

In summary, active testers and back-up testers are required to complete an annual performance exam to perform tests during a calendar year.

Every year, Resident Engineers will receive an e-mail directing them to a TEAMs folder providing instructions on how to sign-up their crew for training for the next calendar year. The instructions will direct them to a list of certified personnel who they will deem as an active or back-up tester for the calendar year. They will decide who to send for the annual performance certification. For new certifications, re-certifications, and performance exams, they will determine what training is needed and will be able to sign-up their personnel. If there are more students than available spots for the new NFSTQP class, the District Engineer or Assistant District Engineer will review the list of potential students and determine which employees will be sent to training. It is the Resident Engineer’s responsibility to ensure adequate staffing to perform the necessary testing for their assigned contracts. Names of NFSTQP and NCQP qualified technicians are listed on SharePoint in the [Construction Division Training Database](#).

All qualifications carry inherent rights and responsibilities. These responsibilities include performing and reporting test results with accuracy and precision in accordance with the required NDOT test procedures outlined in the [Synopsis of Materials Division Testing Manual for Field Testing](#). Each tester will sign the “NDOT Responsibilities Agreement for Field Testing” document when qualifying for NFSTQP and NCQP certification. Failure to follow the testing requirements may result in suspension from testing duties or other penalties.

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Consultants and Contractors qualify/certify their testers under the following programs:

- NAQTC
- WAQTC
- ACI

Consultant tester certifications are checked during the Review for Proposal (RFP) process. If the tester(s) certification(s) expire and they re-certify during the life of the consultant agreement, their new certification(s) need to be submitted to the Construction Division - Quality Assurance Section to update their credentials in AWP.

## FIELD LAB FACILITIES AND EQUIPMENT

The field labs belong to the Equipment Division and are assigned by the Construction Division to each individual construction crew. The lab trailers are on a 20-year replacement program through the Equipment Division. The Equipment Division, the Construction Division, and the Architecture Division work closely to make sure acceptable lab facilities are procured through the Equipment Division's Annual Budget.

The Resident Engineer uses and is responsible for maintaining their assigned lab trailer, along with the equipment assigned to the lab. Only appropriate materials and approved equipment are authorized in the field lab. The Resident Engineer is responsible for enforcing this policy. The District Engineer is responsible for the security of the field lab when stored by the District. The Contractor is responsible for the field lab security at the job site.

If the field lab is broken into and items are stolen or damaged, contact the local authorities to complete a police report. Notify the local District Engineer and/or Assistant District Engineer of the break-in. If equipment needs to be replaced or fixed, notify the local IA Lab. If lab repairs are required, notify the local District Services.

- Submit the police report to the local IA Lab. The police report is required for all stolen equipment that had a Fixed Asset tag assigned to it, to complete a Property Disposition Report (PDR). The PDR is required to have the equipment removed from the Purchasing Fixed Asset Inventory Report for the lab trailer.
- The police report is needed to have the local District Services repair any lab damage that occurred.

### REFILLING PORTABLE PROPANE TANKS:

- Re-Fill portable 5-gallon propane tanks, contact the local stockroom, this will be purchased using a 51.
- Re-fill larger than 5-gallon propane tanks, contact the District Administration Office to set-up an account with a propane tank "keep full" utility, this will be paid using a Payment Voucher (PV).

A list of approved equipment utilized in a field lab can be found on NDOT Form 040-020 (Inventory of Standard Testing Equipment - Construction Field Labs).

## LAB REMOVAL AND SETUP

The coordination of the entire process related to take down and setup of the lab trailer is the responsibility of the Resident Engineer and no one from Quality Assurance has been instructed to verify that the items listed below have been adequately handled.

The lab trailers:

- Approximately 53' long x 10' wide without the stairs x 14'9" high without the updraft blower fans attached to the roof.
- Approximately 53' long x 22' wide with the stairs x 17' high with updraft blowers attached to the roof.
- Require a 200-amp service or a 48kw with 240V generator to power the lab.

**The following list will assist with this process if the lab trailer is being moved internally by the local NDOT Equipment Shop (TRACTOR TRAILER CHASSIS - ONLY):**

- E-mail the local District Equipment Shop with enough notice and cc: Construction Division's Quality Assurance Engineer and the local District IA Lab. In the request include:
  - The address where the lab is being picked-up.
  - The address where the lab is being delivered.
  - Any sheds, cargo containers and/or stairs that need to be transported at the same time.
  - The date the move needs to be completed.
  - The name of the contact person and their phone number of who will meet the transport driver at the pick-up location and follow to the delivery location.
  - Request a safety check of the trailer to verify it has working brakes, brake lights, tires, etc., before the transport driver arrives.
- If the lab trailer is in a pit, contact the Contractor, in accordance with Section 628 "Mobilization" of the Standard Specifications for Road and Bridge Construction: **or** if the lab trailer is in an NDOT facility contact the local District Services via phone, e-mail or the local work order process; to request them to complete the following work:

Remove and disconnect the power, water, portable holding tank, the two updraft blowers on the roof (the holes need to be covered by plywood that is wrapped in plastic) and the two updraft blowers placed inside the lab or cargo container), and the ignition oven pipes pushed down as far as they can be or removed and pipe holes covered with plastic. This work will be completed prior to the arrival of the transport driver.

- Secure any equipment inside the lab trailer from falling and breaking during transport.
  - Ignition Oven scale(s) are removed and stored per the "[Procedure for removing Ignition Oven Scale, Hearth Plate and Ceramic Tubes](#)" document, **PRIOR** to moving the ignition oven(s) off the counter onto the lab floor or strapping the oven(s) securely to the countertop for transport.
  - All equipment is removed from the counters and placed securely on the floor or in locked cabinets.

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- Any equipment with wheels, is laid on its side or back to prevent moving during transport.
- Equipment in cabinets is secure and cabinet doors are locked.
- Office Door and Nuke Room Door are closed.
- Lab windows closed and locked.
- Ensure all equipment - jack-stands, tie downs, chains, etc., outside of the lab trailer are removed and placed in the lab trailer or cargo container prior to the transport driver arriving.
- Ensure the stairs are pulled away from the lab trailer and are transported to the new location. DO NOT take the stairs apart!
- Meet the transport driver at the existing lab trailer location. Follow the transport driver to the new lab trailer location, assist the transport driver and verify that the lab trailer is delivered and set in the correct location.
- After the lab trailer has been removed from the former location, ensure all garbage and construction material has been disposed of properly, leaving the old lab site in the same or better condition than it was found, while satisfying any storm water requirements.

Once the transport driver delivers the lab trailer to the new location:

- Hire a vendor to level, brace and tie-down the lab trailer. Refer to [Prepping and Moving Lab Trailers](#) for an example of a completed envelope packet for the quote and a completed envelope packet for the invoice:
  1. Obtain 3 quotes from licensed vendors to level, brace, and tie-down lab trailer.
  2. Fill out "State of Nevada Department of Transportation Equipment Division Request for Rental/Service" with the three quotes. No response from a vendor is considered a quote, if the request is documented in an e-mail or screenshot from the website.
  3. Fill out a "51" with the three quotes.
  4. Add the documents from Step 1, 2, and 3 into one DocuSign envelope for approval and to obtain the P.O. Number (given by the Equipment Division Buyers Group), prior to work being completed.
  5. Once the P.O. # is obtained, schedule the vendor that provided the lowest quote to complete the work.
  6. When the work is completed, the vendor will send an invoice with the P.O. # on it for the work that needs to be paid. This invoice and the original approved documents will be loaded into one envelope in DocuSign. The Resident Engineer will sign off on the invoice as services received and completed, the Equipment Division will process and pay the invoice.
  7. Set up all lab equipment in the appropriate places inside and outside of the lab trailer.
- If the lab trailer is in a pit, contact the Contractor, in accordance with Section 628 "Mobilization" of the Standard Specifications for Road and Bridge Construction: **or** if the lab trailer is in an NDOT facility contact the local District Services via phone, e-mail or the local work order process; to request them to complete the following work: Connect the lab trailer up to water,

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drainage tank or basin, electricity, the two updraft blowers attached to the roof and operational, and the ignition oven vents installed if applicable.

**The following list will assist with this process, if the lab trailer is being transported and setup by a hired certified manufactured housing company vendor (MOBILE HOME CHASSIS - ONLY):**

- If the lab is moved through mobilization on an active contract using a letter of authorization or contract modification – the Contractor is a certified manufactured housing company vendor or will hire a certified manufactured housing company vendor to obtain all necessary permits required by the State of Nevada Housing Division - Manufactured Housing.
- If the lab is moved through a vendor who is a certified manufactured housing company hired by District - the certified manufactured housing company vendor will obtain all necessary permits required by the State of Nevada Housing Division - Manufactured Housing.
- The certified manufactured housing company vendor hired will:
  - Remove – tie-downs or chains, jack stands, stairs and two updraft blowers on the roof.
  - Transport – lab trailer, tie-downs and chains, jack stands, stairs and two updraft blowers to new lab location.
  - Setup – level lab trailer, place tie-downs or chains, jack stands and stairs.
  - Occupancy – will do what is necessary (repairs) to obtain the permitted occupancy of the lab trailer.

The Resident Engineer is still responsible for:

- If the lab trailer is in a pit, contact the Contractor, in accordance with Section 628 “Mobilization” of the Standard Specifications for Road and Bridge Construction: **or** if the lab trailer is in an NDOT facility contact the local District Services via phone, e-mail or the local work order process; to request them to complete the following work:

Remove and disconnect the power, water, portable holding tank, the two updraft blowers on the roof (the holes need to be covered by plywood that is wrapped in plastic) and the two updraft blowers placed inside the lab or cargo container), and the ignition oven pipes pushed down as far as they can be or removed and pipe holes covered with plastic. This work will be completed prior to the arrival of the transport driver.

- Secure any equipment inside the lab trailer from falling and breaking during the move.
  - Ignition Oven scale(s) are removed and stored per the “[Procedure for removing Ignition Oven Scale, Hearth Plate and Ceramic Tubes](#)” document, **PRIOR** to moving the ignition ovens off the counters onto the lab floor or strapping the ovens securely to the countertop for transport.
  - All equipment is removed from the counters and placed securely on the floor or in locked cabinets.
  - Any equipment with wheels, is laid on its side or back to prevent moving during transport.
  - Equipment in cabinets is secure and cabinet doors are locked.
  - Office Door and Nuke Room Door are closed.

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- Lab windows closed and locked.
- Meet the transport driver at the existing lab trailer location. Follow the transport driver to the new lab trailer location, ensure the lab trailer is delivered and set in the correct location.
- After the lab trailer has been removed from the former location, ensure all garbage and construction material has been disposed of properly, leaving the old lab site in the same or better condition than it was found, while satisfying any storm water requirements.
- Once the occupancy permit is obtained, set up all lab equipment in the appropriate places inside and outside of the lab trailer.
- If the lab trailer is in a pit, contact the Contractor, in accordance with Section 628 "Mobilization" of the Standard Specifications for Road and Bridge Construction: **or** if the lab trailer is in an NDOT facility contact the local District Services via phone, e-mail or the local work order process; to request them to complete the following work: Connect the lab trailer with water, drainage tank or basin, electricity, the two updraft blowers attached to the roof and operational, and the ignition oven vents installed if applicable.

## WINTERIZING FOR WINTER SHUTDOWN:

The Resident Engineer is responsible for ensuring that their assigned lab trailer is protected from cold temperatures whether the lab is being used throughout the winter months or it is being winterized in its current location. The following list will assist with this process:

- Hot water heater is turned off and drained properly. Hot water heater valve is left open to eliminate any residual water that could freeze and cause damage.
- Water lines need to be blown out, contact District Services or your local Equipment Shop for assistance.
- Water hose has been disconnected from the lab trailer and the water source. Water hose has been drained and placed in your cargo container for the winter.
- Turn water faucet on and ensure it is pointing into the sink. No water should come out of the faucet as everything has already been disconnected. However, turning the water faucet on will allow any water left in the lines to drain, eliminating any residual water that could freeze and cause damage.
- Grey water tank is empty and closed so that water doesn't leak into it, allowing it to freeze and crack over the winter.
- All windows and doors are locked.
- Updraft blowers are turned off, and the ceiling louvers are closed.
- To ensure the security and condition of the lab trailer, have someone perform a weekly check.

## ACTIVELY WORKING THROUGH THE WINTER MONTHS:

If your crew is actively working on a contract and work will proceed through the winter months, please discuss with your testers the proper procedures to implement, that will ensure the water pipes and hose lines do not freeze.

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- Unhook and drain hose from lab water hook up and water spicket nightly. Heat tape can be purchased from grainger.com. However, there will need to be enough heat tape for the entire hose and spicket to work. If there is no heat tape, unhook and drain hose nightly.
- Ensure that the heater is on 24 hours a day and set to a minimum of 60°F, even on weekends. (If utilizing contractor's generator for power, ensure the generator is running 24 hours a day, 7 days a week). This is stated in Section 628, "Mobilization", of the Standard Specifications for Road and Bridge Construction and is enforceable by the Resident Engineer.

For assistance or more information, contact the local District IA Lab or the Construction Division's Quality Assurance Engineer.

## LAB CALIBRATION

The Materials Division is responsible for conducting the annual equipment calibration of each field lab.

Annually and/or any time a lab trailer is moved, the Resident Engineer is responsible to contact the Materials Division's Lab Services Section via e-mail (cc: Quality Assurance Engineer and the local IA Lab personnel) to calibrate the lab trailer equipment. Request the calibration 30 days in advance of the beginning of testing, however, the lab trailer must be setup with water and power, fully equipped, clean, level, and operational before the scheduled calibration. Failure to setup the lab trailer properly will result in the calibration being rescheduled. Lab Services will e-mail you NDOT Form 020-097 (Field Lab Verification Request Form). Once this form is completed and returned, Lab Services will email you NDOT Form 020-098 (Field and IA Lab Pre-Calibration Checklist). This form will need to be completed and returned to them one week prior to the lab calibration.

Ensure all lab equipment is in the lab trailer and available for the scheduled calibration. (Reminder: If you have lent out or removed an item from the trailer, obtain it prior to the calibration)

Once the calibration is complete, a report will be sent to the Resident Engineer, Independent Assurance Lab, Assistant District Engineer, and the Construction Division's Quality Assurance Section. The report will be available in:

- AWP Materials → Lab → Select appropriate Lab ID → Select Component Action Menu and Attachments
- Construction SharePoint Page → Quality Assurance → Field Labs → Select Crew → Annual Lab Calibration

If applicable, any equipment not passing calibration will be noted on the calibration report and removed from the lab trailer. The IA Lab will be notified of equipment needing to be replaced or repaired.

## LAB EQUIPMENT REPAIR, MAINTENANCE AND REPLACEMENT

The Resident Engineer is responsible for maintaining a clean and safe lab facility.

For any necessary structural or mechanical repairs on the lab trailers, contact the local District Services via phone, e-mail, or local work order process.

For repair or replacement of equipment, contact the local District IA Lab.

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## INVENTORIES

An inventory of all testing equipment for each lab trailer is performed by July 1 of every calendar year, by the Resident Engineer assigned to the lab trailer and reported on NDOT Form 040-020 (Inventory of Standard Testing Equipment - Construction Field Labs). Equipment assigned to the lab trailer shall not be transferred to another trailer without permission of the District IA Lab.

For equipment over \$5,000, the District IA Lab will schedule and complete the annual fixed asset inventories for the Equipment Division once per calendar year.

## FIELD LAB RECORD-KEEPING

### REPORTING OF DAILY TESTING SAMPLE RECORDS

Complete a Sample Record(s) of test results for the day the respective work is performed. Within 24 hours of completing the test, notify the Contractor of the preliminary test results. Sample Record(s) can be tracked by downloading the "[Materials Tracking Worksheets](#)" and storing them in the crew Contract Files directory.

Sample Record(s) will be marked complete and Reviewed through Level 1 within 24 hours of the day the respective work is completed.

Sample Record(s) need to be Reviewed through Level 2 and Authorized within 7 calendar days of Sample Record completion.

Prime Contractor shall review contract Sample Record(s) using their NV Contractor ReadOnly Role in AWP Materials. The Nevada Department of Transportation website has an [AWP Contractor ReadOnly User Guide](#) to use for instruction.

### SAMPLE LABEL

When submitting samples to the Materials Division, verify they are accompanied by a completed passing test(s) (if required) and the appropriate Sample Label. Sample Label(s) will be placed in a clear Ziplock bag attached to the outside of the sample container or the outside of the canvas sample sack. Ensure all sample containers are not contaminated prior to placing any sample inside of them and that the exterior of all sample containers are clean and free of any excess material.

All sample containers shall be labeled on the lid and all sample sacks shall be labeled on the side of the bag with the following information:

- Contract Number
- Sample Record ID
- Mix Design Number (if applicable)
- Date
- Material type
- Cylinder Set Number (if applicable)
- Quantity of samples, 1 of 5 (if applicable)

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The following are the standard sample containers available from the Equipment Division's Headquarters Stockroom:

- Aggregate and stone: Sack, sample large cotton canvas, 19 in. x 32 in. Seal the sample bag with duct tape and attach the Ziplock bag with the Sample Label to the outside of the sample bag.
- Slurry backfill, plantmix bituminous surface and Portland cement concrete (when the maximum aggregate particle size exceeds 1 in.): Mold, plastic cylinder, 6 in. x 12 in. Seal the sample lid with duct tape and attach the Ziplock bag with the Sample Label to the exterior side of the cylinder with duct tape.
- Portland cement concrete for structures: Mold, plastic cylinder, 4 in. x 8 in. Seal the sample lid with duct tape and attach the Ziplock bag with the Sample Label to the exterior side of the cylinder with duct tape.
- Cutback asphalts: Can, rectangular metal, 1 qt., sample with lid. Attach the Ziplock bag with the Sample Label to the exterior side of the can with masking tape.
- Fly ash, hydrated lime, and Portland cement: Mold, plastic cylinder, 4 in. x 8 in. Seal the sample lid with duct tape and attach the Ziplock bag with the Sample Label to the exterior side of the cylinder with duct tape.
- Water and emulsified asphalt: Bottle, plastic wide mouth with lid, 1 qt. Attach the Ziplock bag with the Sample Label to the exterior side of the bottle with masking tape.
- Asphalt cement, traffic paint and traffic beads: Can, paint round, 1 qt. with lid. Attach the Ziplock bag with the Sample Label to the exterior side of the can with masking tape.

**Note:** to properly calculate the actual tonnage for the days used asphalt refer to the [AWP Documentation Manual with Materials](#).

## FIELD TESTER SAFETY

All sampling, testing and equipment operations will adhere to the safety requirements of Federal and State Occupational Safety and Health Administration (OSHA) standards, which can be found at [www.osha.gov/SLTC/etools/construction/shprogram.html](http://www.osha.gov/SLTC/etools/construction/shprogram.html).