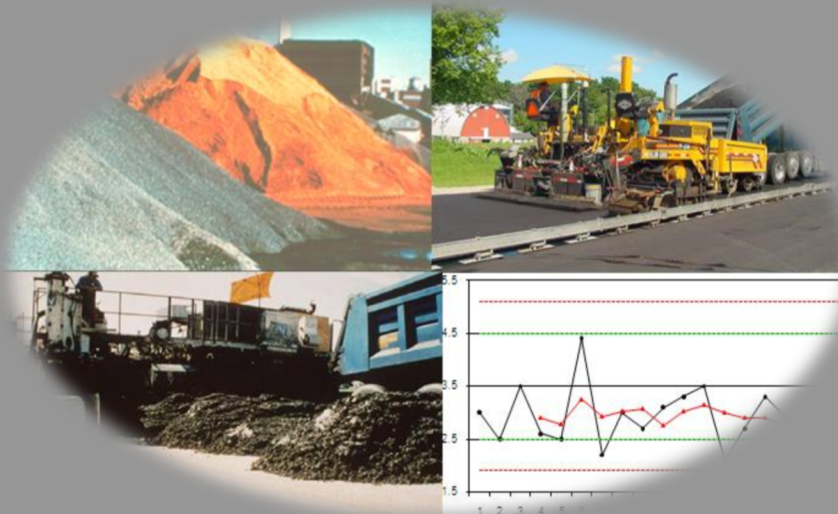
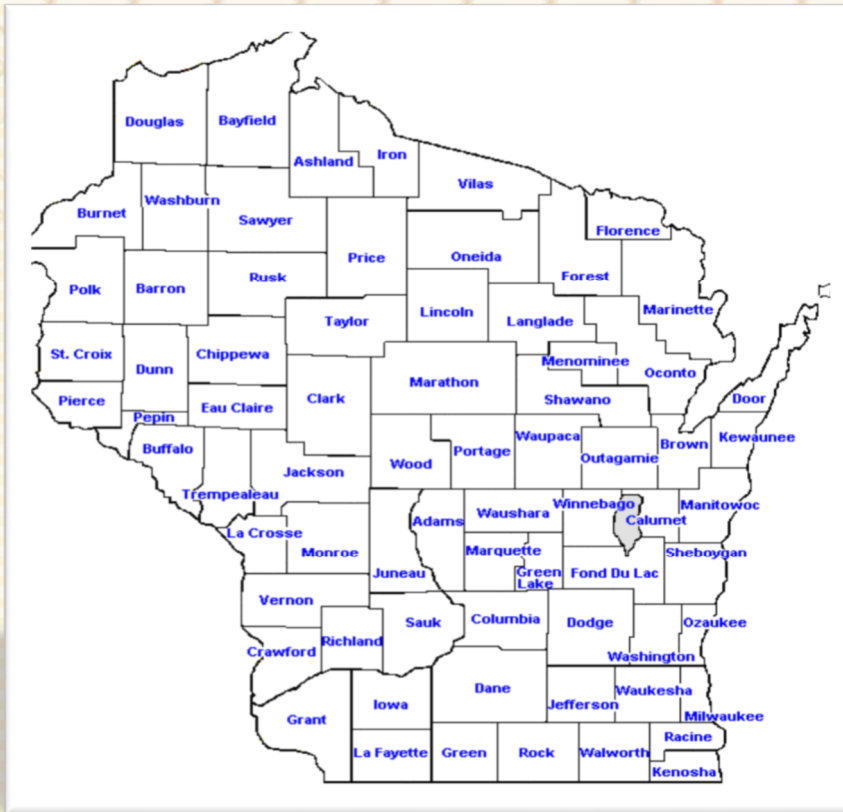


INDEPENDENT ASSURANCE PROGRAM GUIDE DOCUMENT



STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
Division of Transportation Systems Development
Bureau of Technical Services

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PURPOSE

This document is designed to define the **Independent Assurance Program (IAP)**, and to describe its relationships to the total Wisconsin Department of Transportation (**WisDOT**) **Materials Quality Assurance and Acceptance Program**, and to set forth policies, procedures and guidelines for its implementation. The IAP serves as a level of assurance that testers, samplers, and equipment remain qualified and capable of performing testing and sampling activities properly.

AUTHORITY

The **Federal Highway Administration's Federal-Aid Policy Guide, Title 23-Code of Federal Regulations, Chapter 1, Subchapter G, Part 637, Subpart B, entitled "Quality Management Procedures for Construction "**, **June 29, 1995**, prescribes the content of a state **IAP** for Federal-aid highway construction projects.

It is Department policy that the **Independent Assurance Program** is applicable to all Federal-aid projects and to all state funded construction projects except as may be specifically exempted.

MISSION

The primary mission of the **Independent Assurance Program** is to provide an unbiased and independent evaluation of all the sampling and testing procedures used in the material acceptance program. The goal of the independent evaluation is to assure the reliability of the test results used to assess the defined qualities of construction materials.

Figure 1 illustrates the four generalized features of the **WisDOT Materials Quality Assurance and Acceptance Program**.

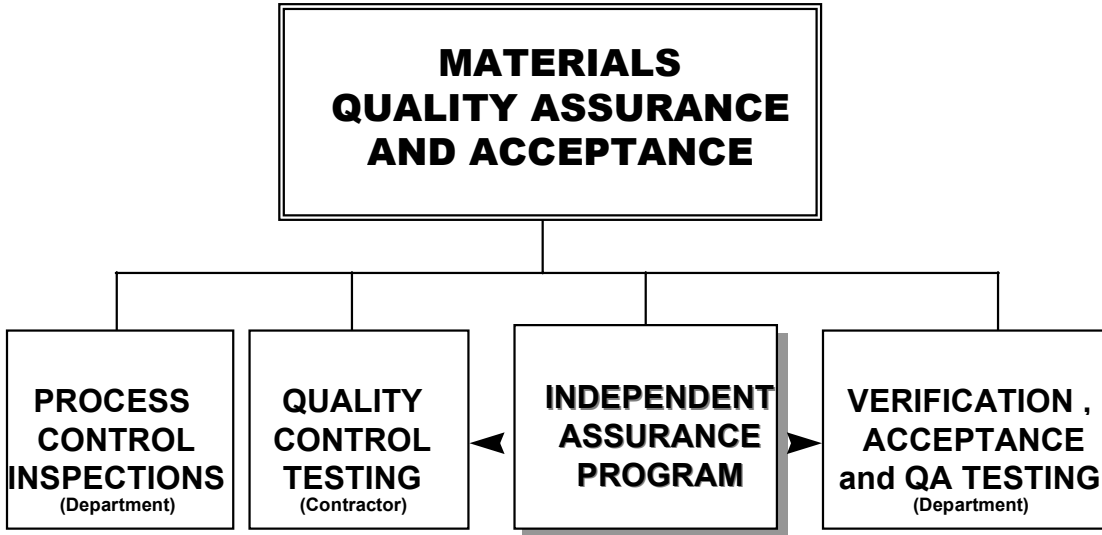


Figure 1

DEFINITIONS

For the purposes relating to this **Independent Assurance Program**, the following definitions apply:

Contractor Assurance (CA) sampling and testing- Optional tests taken by the contractor to further validate production testing. The results of these tests may be used by the contractor to limit liability for non-conforming materials identified by the department Hot Mixture Asphalt Verification Program specification.

Central Laboratory- The Department's **Central Laboratory** located at 3502 Kinsman Blvd. in Madison and those Regional laboratories so equipped, maintained, and staffed by qualified "Regional Laboratory Testers," that are considered as branches of the Department's **Central Laboratory**. It does not include testing facilities not so qualified or those under supervision or control of those associated with management of the construction projects.

Central Laboratory Personnel- Those persons qualified to observe/obtain and/or test Independent Assurance Samples. The following are included in this definition:

1. **Regional Independent Assurance Specialist (RIAS)** and their assistant(s)
2. Representatives of the Quality Assurance Unit or the Department's Central Laboratory
3. Regional Laboratory Testers approved by the **RIAS** with concurrence of the Chief Materials Management Engineer



Regional Independent Assurance Specialists (RIAS)- The individuals in each Region designated and trained to administer the **Independent Assurance Program (IAP)** at the Regional level. In some cases, one or more **Assistant Regional Independent Assurance Specialists (ARIAS)** may also be designated to assist during periods when the primary person is on leave or during the time of heavy workload.

Independent Assurance-. This refers to the independent unbiased review by the **RIAS**, or other approved personnel, of Contractor Quality Control or Contractor Assurance and the Department Verification, Qa and Acceptance Testing that may include, but is not limited to the following:

1. Split sample testing;
2. Proficiency sample testing;
3. Witnessed sampling and testing;
4. Test equipment inspections and calibration checks;
5. Review of Laboratory Quality Manuals- equipment calibration and verification records, etc.;
6. Review of test worksheets and calculations;
7. Review and monitoring of control charts used for quality and process control;
8. Directing testing personnel to take additional samples and perform testing;
9. Review of the qualifications of sampling and testing personnel.

The primary function of the **RIAS** is to validate that quality control, verification and material acceptance procedures are being properly performed and administered by Contractor Quality Control, Department personnel, and their representatives. The **RIAS** will document and report on observations and test results.

Materials Acceptance Testing and Documentation. This term refers to those samples and tests used to judge compliance and acceptance of materials in the course of project administration. The frequency of such sampling and testing is defined in the "**Materials Testing and Acceptance Guide**" which is included in the **Construction and Materials Manual Chapter 8, Subsection 8.50** and in the **Quality Management Program (QMP)** specifications when included in the contract.

Materials Quality Management and Acceptance Program. The total programmed effort designed to ensure that all materials related elements of the development and implementation of our transportation services are in reasonably close conformity with the applicable requirements. This program includes the four elements illustrated in Figure 1.

National Reference Laboratories- This refers to the **American Association of State Highway and Transportation Officials (AASHTO) Materials Reference Laboratory (AMRL)** and the **Cement and Concrete Reference Laboratory (CCRL)**, each operated by the **National Institute of Standards and Testing**.



Process Control Inspections- Specification compliance inspections conducted by the Department or designated agent as related to 1) the quality and capacity of construction equipment, 2) processes and procedures for manufacturing, processing, handling, transporting and incorporation of such materials into the work, and 3) a variety of other controls over conduct and execution of the work.

Quality Assurance (Qa) Sampling and Testing. Tests and observations conducted by Department personnel or designated representatives to validate the results of Contractor Quality Control. These tests and observations are defined by the **QMP** contract specifications.

Quality Control (Qc).-All contractor/vendor operational techniques and activities that are performed or conducted to fulfill the contract requirements.

Qualified Laboratories- Laboratories qualified as defined by the Department. Qualified ~~Department~~ Regional laboratories and ~~designated non-Department laboratories accredited by the AASHTO Accreditation Program~~ are qualified to do Independent Assurance testing.

Qualified Sampling and Testing Personnel. Personnel defined as qualified ~~capable~~ by the Department. The Highway Technician Certification Program serves as the primary means of establishing tester qualification.

Quality Management Program (QMP)- A specification or contract provision requiring a Contractor Quality Control Program. The specification defines certain Quality and Process Control (**Qc**) samples and tests that are used for determining material specification compliance and acceptance.

System Approach- The process of administering the frequency requirements of the ~~Independent Assurance Program~~ **IAP** based on evaluation of the total sampling and testing program done within the construction season for a Region or the entire state. The system approach emphasizes the periodic assessment of all personnel and testing equipment, independent of the specific projects on which testing occurs.

Quality Verification ~~Verification sampling and testing (Qv, V)~~- Sampling and testing performed by the Department or designated qualified agent to validate the quality of the product or material. The verification testing shall be performed on samples that are taken *independently* of the quality control samples.

SCOPE

The scope of involvement of the **IAP** includes all materials and activities defined in this document and extends to all contractor and department sampling and testing used for determining specification compliance and acceptability of the materials involved.



The program also includes certain activities that require sampling and field-testing of materials, the monitoring of field sampling, testing and documentation procedures and the inspection of field-testing equipment. This will include monitoring of any **Quality Control (Qc), Contractor Assurance (CA), Quality Assurance (Qa) and Verification (Qv, V)** activities when a **Quality Management Program (QMP)** is part of the contract.

The sampling and testing defined by this program does not supersede or void any project acceptance sampling, testing or inspection required under the "**Materials Testing and Acceptance Guide**" or other contract documents.

MANAGEMENT

Nomination and Approval Requirements:

Each **Region** will nominate one or more WisDOT full time employees whose primary responsibility will be the administration of this program. The authority for nomination will be the supervisor in responsible charge of administration of construction materials within the Region. This nominating authority may also nominate other individuals who will perform as an assistant and/or lab tester within this program. In these functions, these individuals are considered a representative of the **Bureau of Technical Services, Materials Management Section** directly responsible to the **Chief Materials Management Engineer**.

The **Chief Materials Management Engineer** will:

1. Review the qualifications of the nominee and recommend training that may be needed. The minimum qualifications are to include WisDOT **Highway Technician Certification Program (HTCP) certifications** as follows:
 - a) Aggregate Technician IPP
 - b) Asphaltic Technician I
 - c) Portland Cement Technician I
 - d) Nuclear Density Gauge Operator I.
 - e) Concrete Strength Tester

The named assistants to the **RIAS** shall likewise hold appropriate certification as related to their areas of responsibility. It is recommended and strongly encouraged that the **RIAS** and others involved in the **IAP** obtain the highest levels of certification in all areas of the **HTCP**. The approving authority for the **RIAS** or assistant **RIAS** nominee may waive the initial certification qualifications due to operational needs if such authority considers the individual(s) to be otherwise qualified. The nominee must obtain the minimum **HTCP** certifications within one calendar year of appointment.

2. Approve or reject the nominee.
3. Maintain a list of approved individuals.

The **Chief Materials Management Engineer** may also withdraw approval of an individual at any time.



The **Bureau of Technical Services Independent Assurance Program Coordinator** coordinates all **Independent Assurance Program** activities and provides guidance for the **RIAS**.

It is important that all **Independent Assurance Program** activities be completely independent of project management activities, though close coordination of the two is essential.

The primary **RIAS** shall be engaged in **IAP** activities at a minimum of 70 percent of the time. The **RIAS** is responsible to administer the program to ensure at least 90 percent of all active samplers and testers are being evaluated once each year.

It should be noted that the defined total duties of the **RIAS** include other than just the Independent assurance sampling and testing activities. The following duties are also exempt from normal project management activities and may be performed by the **RIAS** or **ARIAS**:

1. Inspect facilities and monitor production of certain manufacturing or fabrication plants, including: treated wood products, concrete pipe, metal pipe, commercial aggregates, precast concrete units, prestressed concrete beams, ready mix concrete plants, asphaltic mixture plants and others.
2. Inspect, maintain, procure and calibrate all field materials sampling and testing equipment.
3. Provide training for all project materials testing personnel.
4. Review of Materials Test Report Records for final submittal.
5. Others

When the **RIAS**, **ARIAS**, or **IAP Laboratory tester** is assigned to perform project acceptance sampling and testing or are engaged in contract administration activities **they will not perform any Independent assurance sampling and testing on the given project on any day that they are so project related**. The dates of any occurrences shall be noted in the project records.

STANDARDS

To assure reliability of derived testing data, the following will be adhered to:

Department Central Laboratory accreditation by the **AASHTO** Accreditation Program. Areas of accreditation are Asphalt Cement, Hot Mix Asphalt (HMA) and HMA Aggregates, Soils, Portland Cement Concrete (PCC), PCC Aggregates, and Hydraulic Cement.



The **Materials Management Section and Quality Assurance Unit**, the **Department's AASHTO Central Laboratory**, and others will monitor the **IAP** activities, other testing activities, and the documentation records to assure that all sampling, testing and documentation are thorough, reliable and accurate. Then, as needed and appropriate, any of the following may be pursued:

- A. Comparative test samples may be circulated and test results analyzed in order to detect and correct possible deficiencies in testing procedures.
- B. Regional testing facilities, procedures and test equipment will be inspected, as appropriate, to assure full compliance with applicable standards.
- C. As needed, appropriate training will be planned, provided or recommended.

POLICIES AND PROCEDURES

INITIATION AND SCHEDULING OF THE PROGRAM

The **Independent Assurance Sampling and Testing Program** will be initiated as early in the construction phase as feasible. Before the program is started, an appropriate observation and sampling plan and schedule should be established. A **The System Approach** shall be used. Close cooperation should exist between the **RIAS** and project personnel so that sampling and observations can be planned expeditiously and with minimum interference with project management and operations.

FREQUENCY OF SAMPLING AND OBSERVATIONS

The frequency of IAP samples, tests, and observations will be based on a system wide evaluation of all active qualified samplers and testers. Every attempt should be made to evaluate each active qualified sampler and tester at least once each year. A statistically representative sampling of a minimum of **90** percent of active qualified samplers and testers is the minimum annual requirement.

Qualified samplers and testers will be evaluated for IA in their appropriate areas of testing and testing as defined in "**Independent Assurance Program Sampling and Testing Frequency Guide- Table 1.**"

SELECTION OF SAMPLES

Independent assurance samples will normally be a split portion of a sample. This may be a **QMP** contractor quality control, contractor assurance or process control sample; a **QMP Qa** sample, a verification sample, or other sample of material used in the acceptance decision. **The sampling and splitting process will be observed by the RIAS or other IAP approved personnel.**

When a Regional laboratory performs Independent assurance testing, it may occasionally be appropriate to further split the samples; one portion to be tested by the Regional laboratory



and the other portion sent to the **Department's Central Laboratory**, or other qualified laboratory, for testing, to provide a basis for establishing a correlation between the two laboratories.

IDENTIFICATION OF SAMPLES

Samples should be completely identified as to type, grade, and other identification of material, specific location of sampling, tests required, complete project identification, etc. In addition, the sample should be clearly identified as being an **Independent Assurance Program** sample. "**IAP Split Sample**," boldly shown, will be adequate identification on the sample tag.

POSSESSION OF SAMPLES

Samples must be in the possession of the **RIAS** or other approved personnel from the time the **IAP** samples are obtained until the time they are placed under the control of a commercial shipping agency, the state delivery truck or delivered to the Regional or qualified laboratory for testing.

TESTING AND OBSERVATIONS

All **Independent assurance samples** will be tested for properties as prescribed in the **Independent Assurance Sampling and Testing Frequency Guide** and all testing will be done by the **Department's Central Laboratory** or approved qualified Regional laboratories using accepted standard test procedures and equipment different from that used for acceptance testing. The RIAS or assistant RIAS will do all IAP observations.

EVALUATIONS AND DOCUMENTATION

An important part of this program is the prompt evaluation of all observations and sample test results to afford an independent measure of the adequacy and reliability of project materials acceptance procedures.

Refusal to participate or lack of cooperation in IA evaluations is sufficient cause to consider an evaluation unsatisfactory.

The RIAS shall observe the following guide:

Split Sample Testing

1. Compare the **Independent assurance sample** test data with the project acceptance test data. Enter the test data electronically. It should be noted on the **Independent assurance test report** that the comparison has been made, when and by whom. Correlation tolerances used for data comparison are those listed in the "**Independent Assurance Program Correlation Comparison Precision Tolerances**" tables attached to this document.
2. If the **Independent assurance sample** test data and the corresponding project acceptance test data **satisfy the allowable specified table of "Independent Assurance Program Correlation Comparison Precision Tolerances"** indicate

- reasonable, ~~close agreement~~, no further action is required.
3. If agreement is not evident, the reasons for the apparent deficiencies or anomalies *must* be investigated. This investigation may include observing the testing techniques, checking equipment, worksheets, etc. Then as appropriate, suggest changes and recommend training where necessary.
 4. If problems are identified, the **RIAS** should obtain additional samples, as necessary, preferably on the present project or, if that is not possible, on the next project where the tester/sampler is doing the same type of materials sampling and testing.
 5. An out of tolerance split sample or proficiency sample correlation is considered a deficient or unsatisfactory evaluation. This will require follow up testing and investigation. The original tester is to be re-evaluated on the follow up.
 6. If the follow up evaluation is also unsatisfactory immediately notify the **Bureau of Technical Services Independent Assurance Program Coordinator**.

Equipment Checks

1. Evaluate equipment by using one or more of the following: Calibration checks, observations, split sample testing, or proficiency sample testing.
2. An evaluation is considered unsatisfactory if deficient equipment is found. Equipment that has not been properly calibrated or verified, or that exceeds the defined calibration schedule is considered deficient.
3. Deficient equipment is disallowed for use until appropriate corrections have been made.
4. Follow up evaluation is required to assure that deficient equipment has been suitably repaired, cleaned, re-calibrated or replaced.
5. Notify the Quality Operations Engineer if deficient lab equipment is identified.
6. Notify the project engineer/leader if deficient field equipment is identified.

Observations

1. Evaluation by means of observation is permitted where specifically allowed as defined in the **Independent Assurance Sampling and Testing Frequency Guide- Table 1**. An example is fresh concrete mix testing.
2. Observations of sampling and testing should be done on samples used for acceptance whenever practical.
3. Evaluation by observation is considered satisfactory if all items on the IAP prefix 800 checklists, applicable to the sampling and testing observed, are completed correctly.
4. Evaluation of an individual for fresh concrete sampling and testing is not considered completed until all aspects of the testing (including, sampling, air content, slump, mix temperature and cylinder casting) have been satisfactorily conducted or demonstrated.
5. **Follow up on all exceptions noted.** Follow up observations can be done on the same visit where time permits. If exceptions noted on the checklist were small in number and the evaluator is assured of the qualifications of the tester the report can be noted as satisfactory. Appropriate notation is to be made on the report.
6. If the follow up evaluation is also *unsatisfactory* immediately notify the **Bureau of Technical Services Independent Assurance Program Coordinator**.

Documentation

1. Documentation shall be made in the project records of the evaluations, additional testing, corrective actions, etc. It is particularly important that both the **RIAS** and the project personnel appreciate the importance of this facet of the **Independent Assurance Program** and cooperate fully to accomplish its intended purpose.
2. All observations and test results will be reported electronically on a Materials Tracking System (MTS) series 800 prefix Independent Assurance Program Report, in the project records for which they correspond and the appropriate personnel notified of any areas of concern. A prefix 155 Report of Field Inspection (RFI), or similar report may be used when is prefix 800 report is not available or applicable.
3. IAP aggregate test results shall be reported on the MTS as prefix 217 or 162 report as appropriate.
4. Reporting shall be done as soon as feasible. In lieu of sending hard copies of electronic reports to the **Quality Assurance Unit**, submit the project ID and test number of each verified report.
5. Each RIAS, as a reference in preparing the RIAS's Annual IAP Report, will maintain a file containing documentation of the yearly IAP activities.

Communication

It important to share the documented results of IAP reviews and tests with both the individuals reviewed and their supervisors or managers. This is of particular importance when exceptions to procedures or equipment are noted. This is readily done by sending e-mail attachments of reports, which can be printed using the "CutePdf Writer" programs loaded on WisDOT computers.

1. Department and consultant verification testing
 - a. Send a copy of the report(or refer to the report number on the system) to:
 - i. Sampler/ tester
 - ii. PDS supervisor/ Project Manger or Team leader
 - iii. Consultant lab manger or sampler tester supervisor(as applicable)
2. Contractor and consultant QC testing
 - a. Send a copy of the report(or refer to the report number on the system) to
 - i. Sampler/ tester
 - ii. PDS supervisor/ Project Manger or Team leader
 - iii. Prime contractor
 - iv. Subcontractor (as applicable)
 - v. Sampler/ tester lab manager or supervisor

Refer to **Figure 2, Flowchart for Independent Assurance Program Evaluation** and **Figure 3, Flowchart for Independent Assurance Program Equipment Evaluation**.

The **Bureau of Technical Services Independent Assurance Program Coordinator** also will monitor the Independent assurance sample test results, including making appropriate comparisons with other available data and information. When significant differences in comparison test results are noted, he will discuss these variations with the **RIAS**.

When the Independent assurance test results are not in reasonably close agreement with the



acceptance tests, a copy of the Independent assurance test report (or the project ID and test number of the electronic report) showing the comparison with acceptance test data and all notations and worksheets concerning the evaluations, comparisons and explanations of actions taken will be submitted to the **Bureau of Technical Services Independent Assurance Program Coordinator**. When the test results are in reasonably close agreement, no additional information in this regard is to be submitted.

ANNUAL MEETING

Once each year all **Regional Independent Assurance Specialists** and the **Bureau of Technical Services Independent Assurance Program Coordinator** will meet to discuss an agenda of mutual concerns. At this meeting each **RIAS** will present a review of the **IAP** activities of note for the on-going or past (as the case may be) construction season in their respective Region. The review should include:

- ✎ A summary of the **IAP** activities completed during the past year.
- ✎ Problems encountered with the **IAP**.
- ✎ Resolutions for the referenced problems and suggestions for improvement of the **IAP**.
- ✎ A list of testers reviewed and projects on which IAP activities took place during the past year.

The **RIAS's** Annual Regional **IAP** Review Reports will be submitted in writing to the meeting recorder for inclusion in the minutes of the meeting. The Regional Annual IAP Reports shall be submitted in a suitable electronic format to the **Independent Assurance Program Coordinator**. A copy of the minutes and annual reports will be submitted to the **Federal Highway Administration** as the **Department's Annual Report on the results of the Independent Assurance Program**.

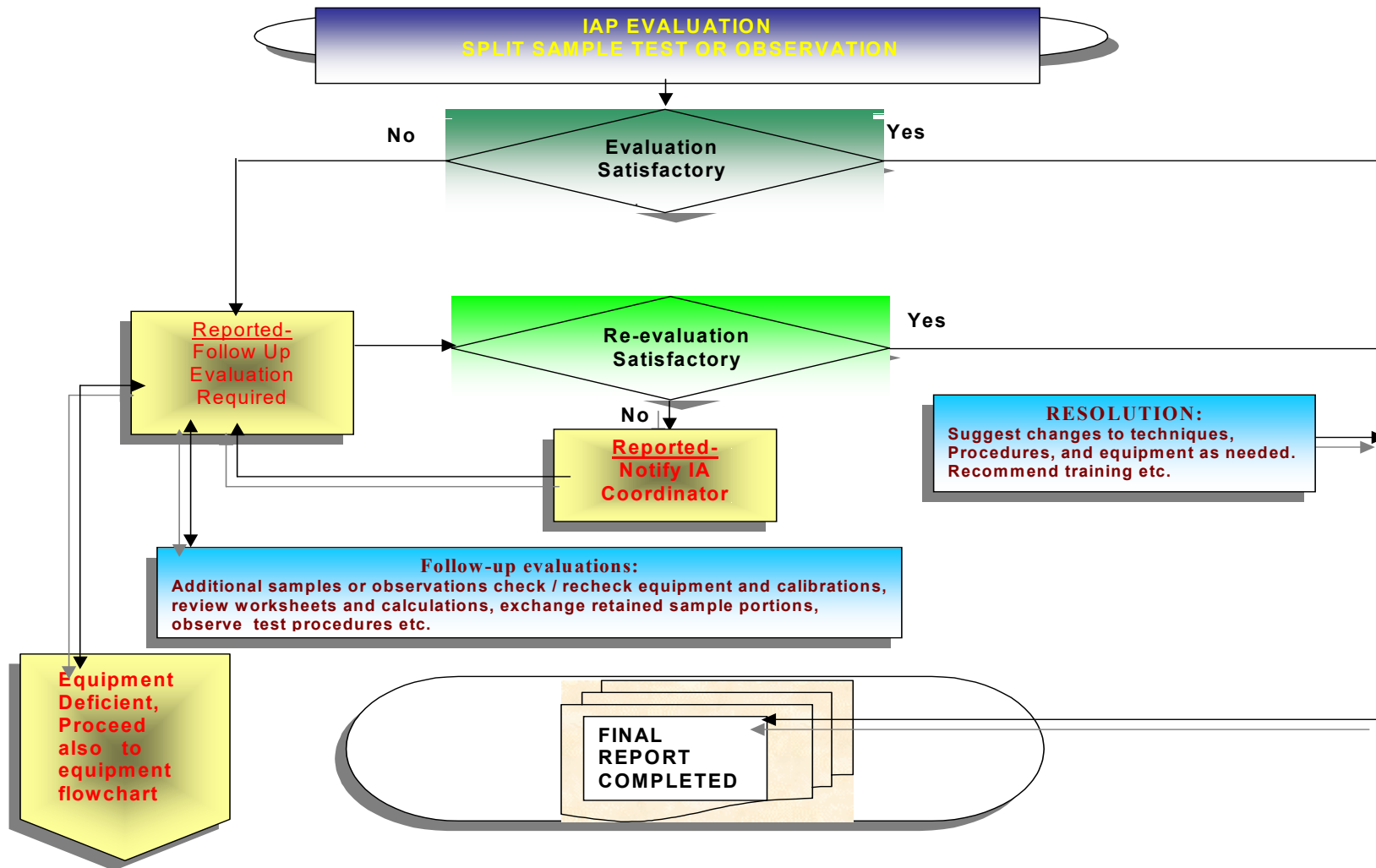


Figure 2 - Flow chart for Independent Assurance Program Evaluation

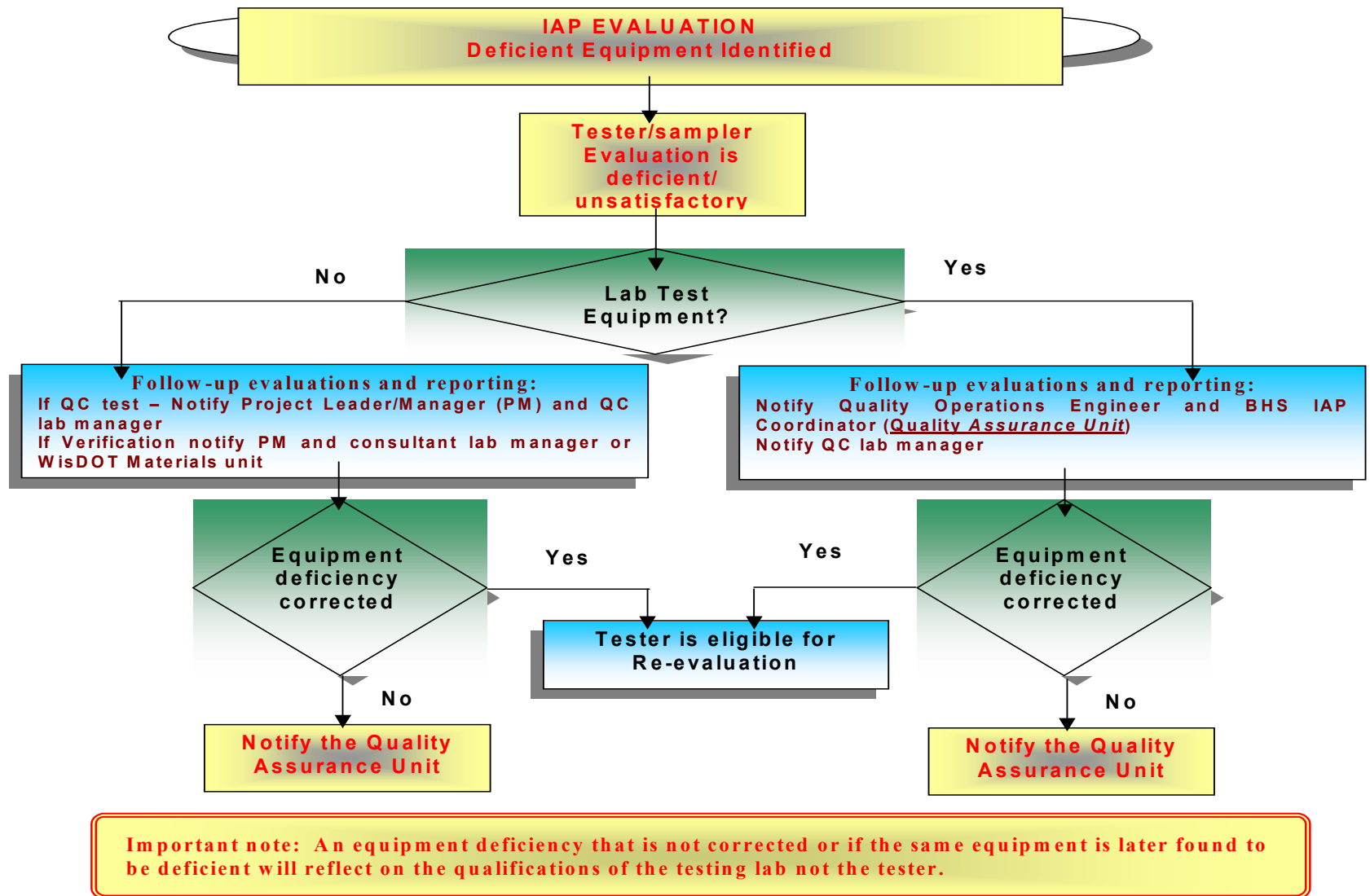


Figure 3 - Flow chart for Independent Assurance Program Equipment Evaluation



INDEPENDENT ASSURANCE PROGRAM SAMPLING AND TESTING FREQUENCY GUIDE –Table 1

<u>Material</u>	<u>Frequency of Sampling¹</u>	<u>Field Sample Size²</u>	<u>Remarks</u>
Base Course Aggregates		CMM 8.60.2	Test samples for gradation only.. Samples shall be a split portion of a project acceptance sample as described under “SELECTION OF SAMPLES.” Note on the sample tag that the submitted sampled is an “IAP split sample.” Fractured particle shall be considered when applicable.
Aggregates for Portland Cement Concrete, Structures and Miscellaneous		CMM 8.60.2	Sampling may be waived for miscellaneous items of work, such as, slope paving, cast-in place piling, curbs, parapets, curb and gutter, culvert pipe end walls, etc. Samples shall be a split portion of a sample as described under “SELECTION OF SAMPLES.” Only one size of aggregate needs to be sampled at any one sampling. A cross section of all aggregate sizes used for a program or contract should be obtained by varying the selection of aggregate size(s) taken at each sampling.
Aggregates for Portland Cement Concrete Pavements and Miscellaneous		CMM 8.60.2	Sampling may be waived for miscellaneous items of work, such as, concrete base courses, median barrier wall, sidewalk, curb and gutter, etc. Samples shall be a split portion of a sample as described under “SELECTION OF SAMPLES.” Only one size of aggregate needs to be sampled at any one sampling. A cross section of all aggregate sizes used for a program or contract should be obtained by varying the selection of aggregate size(s) taken at each sampling. When QMP testing requires 75µm wash loss and moisture testing of samples from the plant stockpiles all sizes of aggregate will be sampled and tested.
Asphaltic Mixtures		CMM 8.36	Test gradation using the same method as the contractor qc (extraction or cold feed). Test for Maximum Specific Gravity (G _{mm}) and Bulk Specific Gravity (G _{mb}). Samples shall be a split portion of a sample as described under “SELECTION OF SAMPLES.”
Asphaltic Pavement Density		N/A	Testing is to be done with a nuclear density gauge and is to consist of three to five individual tests. Tests may be of acceptance tests or tests done for IAP only. Compare non-acceptance test observation results with project acceptance tests. Testing by the RIAS using a different gauge for correlation comparison shall be done. Report all test results and comparisons when applicable. IAP testing of only one course is necessary. The RIAS should consider varying his selection of grade, mix type and layer throughout the year.

1 Every effort should be made during the construction season to observe as many individual operations and testers as possible, irrespective of contract size. As much testing equipment as possible should also be checked. The IAP shall be administered on a system approach.

2 Denotes location of referenced section in the “Construction and Materials Manual (CMM)”. When material is sampled as part of a QMP careful reference should be made to the QMP guide language in the CMM or specification.



<u>Material</u>	<u>Frequency of Sampling</u> ¹	<u>Field Sample Size</u> ²	<u>Remarks</u>
Portland Cement Concrete Mixtures, Structures and Miscellaneous	A complete evaluation of a fresh concrete mix tester must include air content, slump, mix temperature and casting of cylinders	CMM 8.70	The RIAS will observe sampling of fresh concrete mixtures and the test procedures for air, slump, mix temperature, and casting of cylinders. Testing for air content, slump and temperature by the RIAS for purposes of correlation comparison should be considered. Material for the comparison tests is to be taken from the same composite mix sample, which was obtained for testing by the project tester. Field-testing equipment such as air meters, slump cones, thermometers, etc. should be checked. Air content gauges should be checked using a calibration canister. Laboratory cylinder curing, preparation, testing procedures and equipment shall be observed.
Portland Cement Concrete Mixtures, Pavements and Miscellaneous	A complete evaluation of a fresh concrete mix tester must include air content, slump, mix temperature and casting of cylinders	CMM 8.70	The RIAS will observe sampling of fresh concrete mixtures and the test procedures for air, slump, mix temperature, and casting of cylinders. Testing for air content, slump and temperature by the RIAS for purposes of correlation comparison should be considered. Material for the comparison tests is to be taken from the same composite mix sample, which was obtained for testing by the project tester. Field-testing equipment such as air meters, slump cones, thermometer, etc. should be checked. Air content gauges should be checked using a calibration canister. Laboratory cylinder curing, preparation, testing procedures and equipment shall be observed. Observe probing for pavement thickness and check probing equipment.
Earthwork (QMP or Special Compaction)		N/A	Testing is to be done with a nuclear density gauge and is to consist of at least three individual tests. Tests may be of acceptance tests or tests done for IAP only. Testing by the RIAS using a different gauge for correlation comparison shall be done. Compare non-acceptance test observation results with project acceptance tests. Report all test results and comparisons when applicable. When tests are conducted by the RIAS or other approved personnel the location of the test sites shall be as close as practical to the acceptance test sites.

¹ Every effort should be made during the construction season to observe as many individual operations and testers as possible, irrespective of contract size. As much testing equipment as possible should also be checked. The IAP shall be administered on a System Approach.

² Denotes location of referenced section in the "Construction and Materials Manual (CMM)." When material is sampled as part of a QMP careful reference should be made to the QMP guide language in the CMM or specification.



INDEPENDENT ASSURANCE PROGRAM CORRELATION COMPARISON PRECISION TOLERANCES

BASE COURSE AGGREGATES

(Washed Sieve Analysis -Combination of Fine and Coarse Aggregates)

Sieve Size	+/- Tolerance Limit % by weight passing
1.5-Inch (37.5 mm)	6.0
1- Inch (25.0 mm)	6.0
3/4 - inch (19.0 mm)	5.0
1/2 - inch (12.5 mm)	6.0
3/8 - inch (9.5 mm)	7.0
No. 4 (4.75 mm)	5.0
No. 8 (2.36 mm)	5.0
No. 10 (2.00 mm)	5.0
No. 16 (1.18 mm)	4.0
No. 30 (0.600 mm)	4.0
No. 40 (0.425 mm)	4.0
No. 50 (0.300 mm)	4.0
No. 100 (0.150 mm)	2.0
No. 200 (0.75 mm)	2.0

COARSE AGGREGATES

(Washed Sieve Analysis - Aggregates for Concrete Masonry and Open Graded Base #1)

Sieve Size	+/- Tolerance Limit % by weight passing
1.5-Inch (37.5 mm)	6.0
1- Inch (25.0 mm)	6.0
3/4 - inch (19.0 mm)	6.0
1/2 - inch (12.5 mm)	6.0
3/8 - inch (9.5 mm)	7.0
No. 4 (4.75 mm)	5.0
No. 8 (2.36 mm)	4.0
No. 10 (2.00 mm)	4.0
No. 16 (1.18 mm)	4.0
No. 30 (0.600 mm)	4.0
No. 40 (0.425 mm)	4.0
No. 50 (0.300 mm)	3.0
No. 100 (0.150 mm)	2.0
No. 200 (0.75 mm)	1.5

Discrepancy in MTS 801 report on 3/8" sieve tolerance. MTS reports 6.0%.

INDEPENDENT ASSURANCE PROGRAM CORRELATION COMPARISON PRECISION TOLERANCES

FINE AGGREGATES

(Washed Sieve Analysis - Aggregates for Concrete Masonry)

Sieve Size	+/- Tolerance Limit % by weight passing
No. 4 (4.75 mm)	2.0
No. 8 (2.36 mm)	4.0
No. 10 (2.00 mm)	4.0
No. 16 (1.18 mm)	4.0
No. 30 (0.600 mm)	3.0
No. 40 (0.425 mm)	3.0
No. 50 (0.300 mm)	3.0
No. 100 (0.150 mm)	2.0
No. 200 (0.75 mm)	1.5

Discrepancy in MTS 801 report, does not show PCC Fine Agg.

ASPHALTIC MIXTURES - AGGREGATES

(Blended Aggregates- Extracted or Virgin)

Sieve Size	+/- Tolerance Limit % by weight passing
1.5-Inch (37.5 mm)	6.0
1- Inch (25.0 mm)	6.0
3/4 - inch (19.0 mm)	6.0
1/2 - inch (12.5 mm)	6.0
3/8 - inch (9.5 mm)	6.0
No. 4 (4.75 mm)	5.0
No. 8 (2.36 mm)	4.0
No. 10 (2.00 mm)	4.0
No. 16 (1.18 mm)	4.0
No. 30 (0.600 mm)	3.5
No. 40 (0.425 mm)	3.5
No. 50 (0.300 mm)	3.5
No. 100 (0.150 mm)	2.0
No. 200 (0.75 mm)	2.0

ASPHALTIC MIXTURES

Mixture Property	+/- Tolerance limit
Gmb (Marshall or Gyratory Bulk Specific Gravity)	0.030
Gmm (Maximum Specific Gravity)	0.020



INDEPENDENT ASSURANCE PROGRAM CORRELATION COMPARISON PRECISION TOLERANCES

CONCRETE MIXTURES

(Fresh Concrete Mixture Testing)

Test	+/- Tolerance limit
Air Content by Pressure Method	0.5 %
Slump	1/2- inch (10 mm)
Temperature	2° Fahrenheit (1° Celsius)

NUCLEAR DENSITY TESTING

(Asphaltic Pavements)

Test Gauge to Gauge Comparison	+/- Tolerance
Single test - identical footprint	1.5 lbs/ft ³ (24 kg/m ³)
3 or 5 test average - identical footprints *	1.5 lbs/ft ³ (24 kg/m ³)

Should we be only requiring 3 or 5 test average. No more single test? Missing soils nuc density as well. Same?

*If any single test of the three-test average exceeds 2.0 lbs/ft³, five tests must be taken for correlation comparison.

AGGREGATE MOISTURE CONTENT

(Concrete Aggregates)

Aggregate Size	+/- Tolerance limit
No. 2	0.5 %
No. 1 and single size coarse	0.5 %
Fine	0.5 %

FRACTURED PARTICLES- CRUSH COUNT

Test Aggregate size	+/- Tolerance limit
CMM 8.60.4 (modified ASTM D5821) Coarse aggregate - No. 4 (4.75 mm) retained	10 %



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