Acceptance Program

Alternative Delivery Program

Rev. 01
Released: 11/20/2024

Texas Department of Transportation

November 20, 2024

This is a self-directed overview of Design-Build contracting based on Version 7.0 of the Programmatic Documents and the 2024 Quality Assurance Program (QAP).

The object shown below on a slide provides reference to the Section of the Programmatic Documents

Sample

Contract Reference: DBA GC, Sec. XXX

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1. Understand the TxDOT Material Acceptance Program.
2. Review roles and responsibilities of the Independent Quality Firm (IQF) as outlined in the programmatic documents and the Construction Quality Management Plan (CQMP).
3. Understand the Owner Verification responsibilities as required by FHWA and the TxDOT Quality Assurance Program.

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1 Overview

Contract Reference:
DB QAP Section 1.1

DB Quality Assurance Program

TxDOT DB Quality Assurance Program (QAP)

Quality Control Program (QCP)

DB Contractor

DB Contractor is responsible for establishing a robust Quality Control Program to pre-empt and avoid repeated discoveries of Nonconforming Work by the DB Contractor's QC staff, IQF, OVF or TxDOT.

Acceptance Program

Independent Assurance (IA) Program

TxDOT or TxDOT designated agent

Independent Quality (IQ)

Independent Quality Firm (IQF)
contracted by the DB Contractor to inspect & test.

Owner Verification (OV)

TxDOT District or Designee (OVF)
verifies IQ inspection and testing.

Legend: **TxDOT / GEC Oversight** | DB Contractor

★ *Contract Reference: DB QAP, Sec. 4.1 and 4.2*

Independent Assurance Program

The IA program evaluates as part of the acceptance decision:

- ***All sampling and testing procedures***
- ***Personnel***
- ***Equipment***

Independent Assurance Quality Plan (IAQP):

- TxDOT (or its designated IA agent) develops the IAQP.
- The IAQP must be submitted to TxDOT and approved before construction starts.

TxDOT (or its designated IA agent) will implement the IA Program.

The IAQP contains, at minimum, how IA staff will address methods and procedures that clearly define the administration of the IA program.

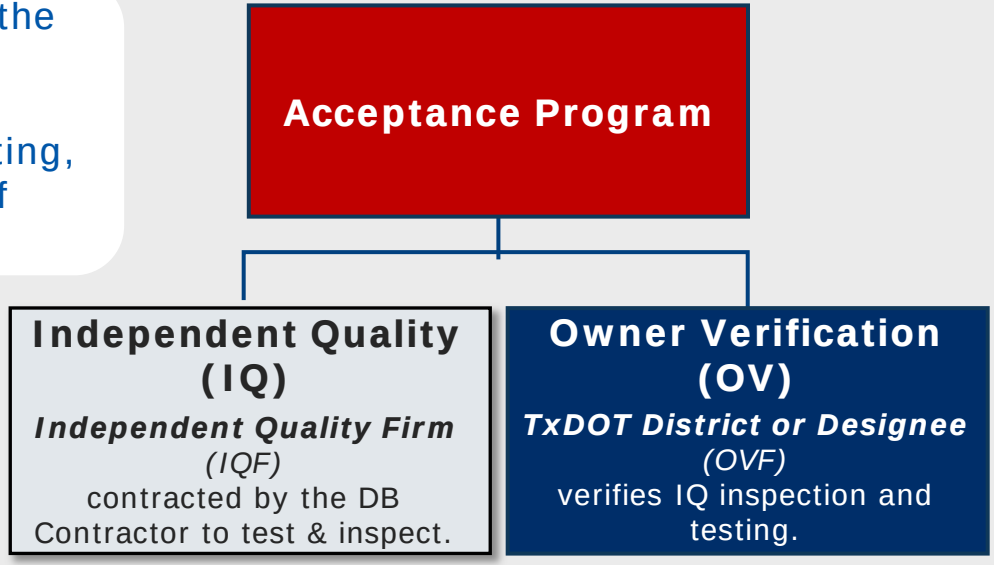
TxDOT's IA laboratory will meet the requirements of the Independent Assurance Program.

TxDOT will compose and submit an annual report to the FHWA Division Administrator summarizing the results of TxDOT's systems approach IA program.

Acceptance Program

TxDOT's program to determine quality of the product as specified in the contract requirements. These factors include acceptance and verification sampling, testing, and inspection, and may include results of quality control sampling and testing.

- Both the IQ and OV testing and inspection results together are the basis for the acceptance decision.
- IQ testing results may be used for acceptance when they are either statistically validated or verified by the OV testing results.



★ *Contract Reference: DB QAP Section 1.1, and Appendix A*

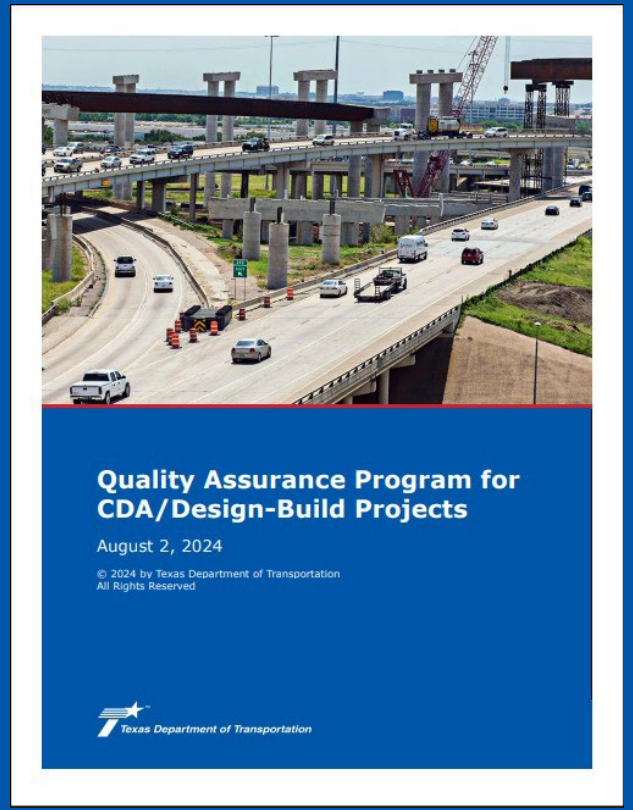
CDA / Design-Build Programmatic QAP

Procedures ensure that materials and workmanship incorporated into the highway construction project are in reasonable conformance with approved plans and specifications.

Ensures state-wide consistency and a programmatic approach in 3 parts.

- Quality Control Program – Section 2
- Acceptance Program – Section 3
- Independent Assurance Program – Section 4

Clarifies and Implements the Federal requirements (23 CFR 637 Subpart B and Technical Advisory T6120.3).



Project-Specific QAP

Project-specific QAP inspection, sampling, and testing requirements are developed based on programmatic requirements and on a project-specific risk assessment.

Project risk assessment workshop is:

- Before Notice to Proceed 2 (NTP2).
- TxDOT and Proposers.
- Considering project scope and schedule.

Risk based inspection processes consider:

- Probability of failure.
- Consequences of short-term and long-term failure:
  - Safety
  - Increased maintenance cost
  - Ability to detect failure

Project specific requirements are:

- Approved by TxDOT ALD & FHWA.
- Documented in the project specific QAP.

Contract Reference: DB QAP Sections 3.1 and 3.4

CQMP & OVTIP Control Procedures

Ensure that nonconforming materials, equipment, and elements are not used or installed.

Ensure elements of the Work do not start or continue without formal IQ communication:

- *Cannot advance the work if there is one or more NCR without an accepted resolution.*

Ensure conditions adverse to quality are promptly identified and corrected such as failures, malfunctions, deficiencies, defective material and equipment, deviations.

★ *Refer to DB Contractor's QMP training for more information on DB Contractor's CQMP and the OVTIP*

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2 Prefabricated Product Fabrication Plants

Contract Reference: DB QAP Sections 3.1.1 and 3.2.1

TxDOT-Performed Materials Acceptance

The Material Producer List (MPL) contains materials monitored by TxDOT and the IQ may use these results.

If TxDOT has resources available DB Contractor may elect to use TxDOT inspection.

Example: prefabricated structural steel

IQ performs job control tests in the field for MPL materials as defined by the TxDOT Guide Schedule of Sampling and Testing for Design-Build Projects.

Example: mechanical couplers

Contract Reference:
DB QAP Section 3.2

Prefabricated Materials

- MPL Approved
- Not TxDOT inspected
- Supplier's QC is approved for acceptance decision

The CQMP includes QC and IQ procedures for prefabricated product fabrication plants.

IQF will

Independently perform a minimum 20% QC inspection, sampling, and testing.

OVF will

Perform on-site audits including independent inspection and testing during production and will review Supplier's documentation for compliance with Contract Documents and CQMP.

During initial start-up IQ inspection, sampling, and testing frequencies will be higher as directed by TxDOT.

Contract Reference:
DB QAP Section 3.2

Prefabricated Materials

- Not MPL Approved
- Not TxDOT inspected
- **Supplier's QC is not approved for acceptance decision**

  IQF and OVF inspection, sampling, and testing will be used for the acceptance decision.

IQF & OVF will

Audit the fabrication plant at the beginning of production.

IQF will

Perform 100% of the required sampling, testing, and inspection per the DMS and Contract Documents.

OVF will

Inspect, sample, and test at a minimum of 20% of IQ frequency. Frequency will be higher at start-up.

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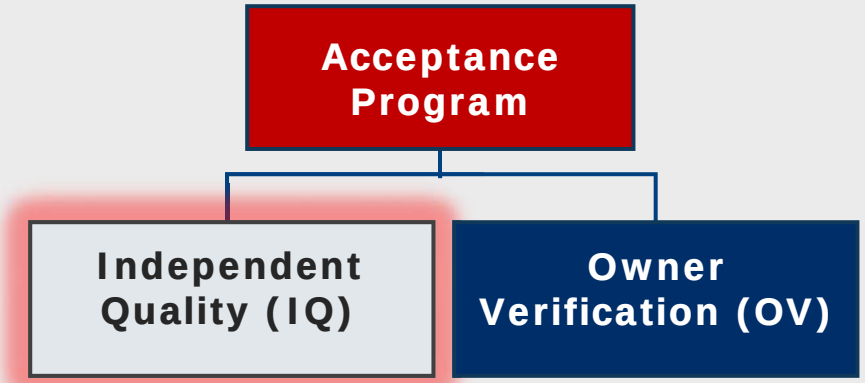
3 Independent Quality

Acceptance of Work

Independent Quality Firm (IQF):

- Inspects, checks, tests, documents and certifies all Construction Work is in accordance with Released for Construction (RFC) documents, Contract Documents, ESOC plans, Temporary Work plans and CQMP.
- Accepts Work validated/verified by the OVF.



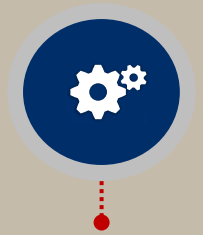
Contract Reference: DBA GC Attachment 4-2
Contract Reference: DB QAP Sections 1.1 and 3.5

Independent Quality Firm

Contract Reference: DBA GC Attachment 4-2
Contract Reference: DB QAP Section 3.5

Oversees the implementation of the QC and IQ processes in the CQMP:

Ensures qualifications, education, training and certification of QC and IQ personnel.



Ensures DB Contractor and IQF laboratories and measuring and testing devices are properly certified, calibrated, used, and maintained.

Performs independent audits of DB Contractor's QC processes and documentation and takes appropriate action.

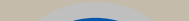
Independent Quality Firm

Contract Reference: DBA GC Attachment 4-2
Contract Reference: DB QAP Section 3.5

Is independent and reports jointly to TxDOT and DB Contractor

Is not owned by the DB Contractor.

Does not report to the DB Contractor's PM.



Is not involved in scheduling or production activities.

Does not perform Work or QC of Work for the Project.

Does not perform TxDOT OV, IA or referee testing for the Project.

Independent Quality Firm Manager (IQFM):

- Is a PE with relevant construction quality experience.
- Has the authority to stop work.
- Is co-located and on-site.

Oversees the implementation of the QC and IQ processes in the CQMP.

Interprets standards, policies, specifications, and contract documents as the Engineer during construction.

Identifies, documents, communicates, and helps resolve any Work not in conformance with plans and specifications.

Supervises construction IQ staff.

Contract Reference: DBA GC Attachment 4-2
Contract Reference: DB QAP Section 3.5.1

IQ Documentation and Certification

IQFM tracks and ensures the DB Contractor and IQ documentation of all tests, inspections, decisions and audits is complete and compliant with CQMP procedures.

- Daily inspection reports and daily test reports, signed by responsible technicians and supervisors, are transmitted to TxDOT within 48 hours after the work shift.
- Weekly inspection reports are completed.
- Monthly quality reports with **evidence and certification that the Work in the monthly payment request is completed, accepted, and that the CQMP procedures were followed.**

Contract Reference: DBA GC Attachment 4-2 Table 3
Contract Reference: DB QAP Section 3.5.6 and Appendix G

IQ Documentation and Certification (continued)

The IQF takes the lead in the documentation and resolution of deficient and nonconforming work.

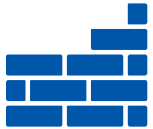
- Maintains an IQF Engineering judgment log.
- Maintains Construction Deficiency and Nonconforming Work logs including documentation of resolution.
- Reviews and communicates Suppliers NCRs.

Contract Reference: DBA GC Attachment 4-2 Table 3
Contract Reference: DB QAP Section 3.5.5 and Appendix G, K, L, M, N, O

IQ Minimum Construction Hold Points

At a minimum, the DB QAP requires the IQ to perform the following inspections:

Drainage



Structural elements
(bridges, walls, foundations and support structures)

Environmental compliance

Embankments

Traffic Devices and Maintenance of Traffic

Lighting

Surfacing, Paving and Concrete

Contract Reference: DBA GC Attachment 4-2
Contract Reference: DB QAP Section 2.2.2 and Appendix J

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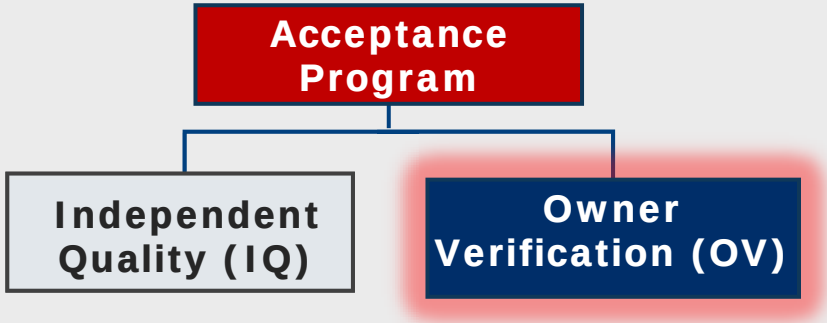
4 Owner Verification



Determines if IQ inspection and testing is a suitable basis for acceptance decisions based upon validation analysis, engineer decision logs, nonconformance reports, and materials certifications.

Owner Verification

- **Review IQF results and documentation.**
- **Perform an appropriate level of verification.**
  - **Level 1 tests:**
    Continuous statistical analysis comparing IQ and OV test results
  - **Level 2 tests:**
    Independent verification
  - **Level 3 tests:**
    Observation verification

Contract Reference: DB QAP Section 3.5, Appendix A and Appendix D

Owner Verification Firm

TxDOT or TxDOT's designated agent tasked with performing OV inspection, sampling, and testing to verify *and/or validate* the IQ inspection and testing.

Oversees the implementation of the CQMP & OVTIP by:

- Facilitating an OVI and OVT Risk Assessment Workshop and writing the Owner Verification, Testing, and Inspection Plan (OVTIP) in conjunction with TxDOT and FHWA.
- Performing independent audits of QC, IQ, and OV processes and documentation.
- Submitting quarterly reports to TxDOT documenting TxDOT's compliance with the approved QAP for reporting to FHWA.
- Overseeing the status and disposition of any nonconforming work.

Contract Reference: DB QAP Section 3.6 and Appendix A

Owner Verification Firm continued

Oversees the implementation of the CQMP & OVTIP by:

- Ensuring qualifications, education, training and certification of personnel performing OV work.
- Ensuring OV laboratories and measuring and testing devices are properly used, maintained, calibrated and certified.
- Performing statistical analysis validating IQ testing results.
- Auditing and OV inspection, sampling and testing during production at prefabrication plants.

Contract Reference: DB QAP Section 3.6

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5 Materials Sampling

Contract Reference:
DB QAP Section 3.3

Material Sampling

Random Sampling

- IQ and OV samples are taken at random locations.
- Frequency of sampling and testing is based on:

IQ – DB Guide Schedule

OV – Project-specific QAP

Fixed Sampling

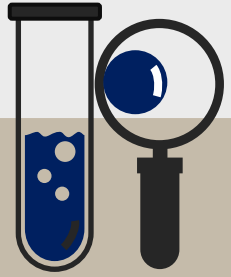
- If material quality is in question at a fixed location the IQF will take additional samples at this location.
- Fixed tests do not count toward sampling and testing frequency requirements but are acceptance tests.

- Sampling locations can be selected dependently or independently.

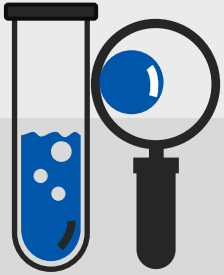
Contract Reference:
DB QAP Appendix B

Split Sample Verification

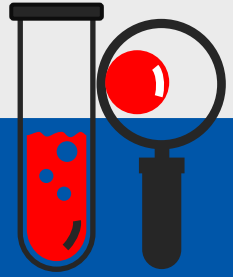
Test results from the IQF and OVF on samples from the same location to:



Test, evaluate and align laboratories, processes and proficiency as part of project start-up



Investigate failed test results



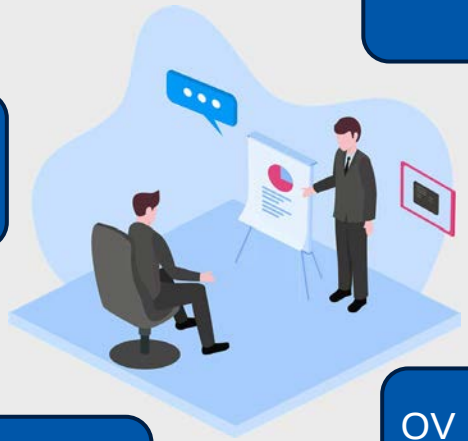
Investigate non-verification test results

Test Lab

Conflict of Interest

To avoid an appearance of a conflict of interest, any non-TxDOT entity will perform only one of the following functions on the same project:

- Referee testing
- IA testing
- Quality Control (QC) testing and inspection
- IQF testing and inspection
- OV testing and inspection



★ *Contract Reference: DB QAP Sections 1.4 and 4.4, and Appendix H*

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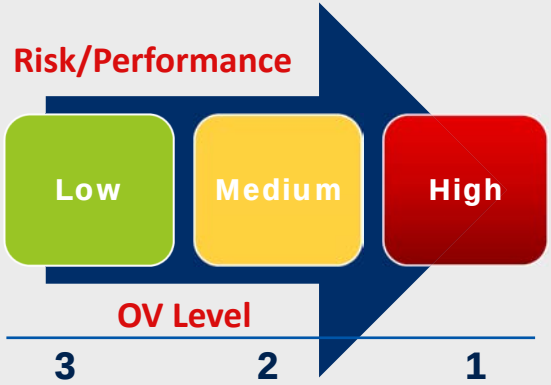
6 Materials Verification

OV – Validation Levels



Level 1 – Statistical Validation for high-risk materials

- IQF test results statistically compared to OVF test results
- Based on F-test and t-test on random samples
- Determines if both tests are representative of the same material
- Example: Structural Concrete compressive strength test

Level 2 – Independent Validation for medium-risk materials

- Compares a test by OVF to a group of tests by IQF
- Engineering judgement
- Example: Concrete slump test

Level 3 – Observation Verification for low-risk or low frequency of use materials

- Example: Hamburg Test

Contract Reference: DB QAP Appendix D

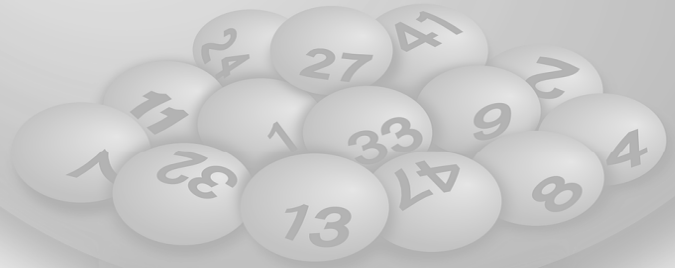
Level 1 Validation Testing

Level 1 Tests – continuous analysis of categories that are strong indicators of performance.

Level 1 tests and trends are monitored daily.

F-tests and t-tests analyze IQ data on *random independent or random split* samples.

F-tests and t-test are checking that the OV and IQ testing is reliable and averaging out the same over time.



t-test

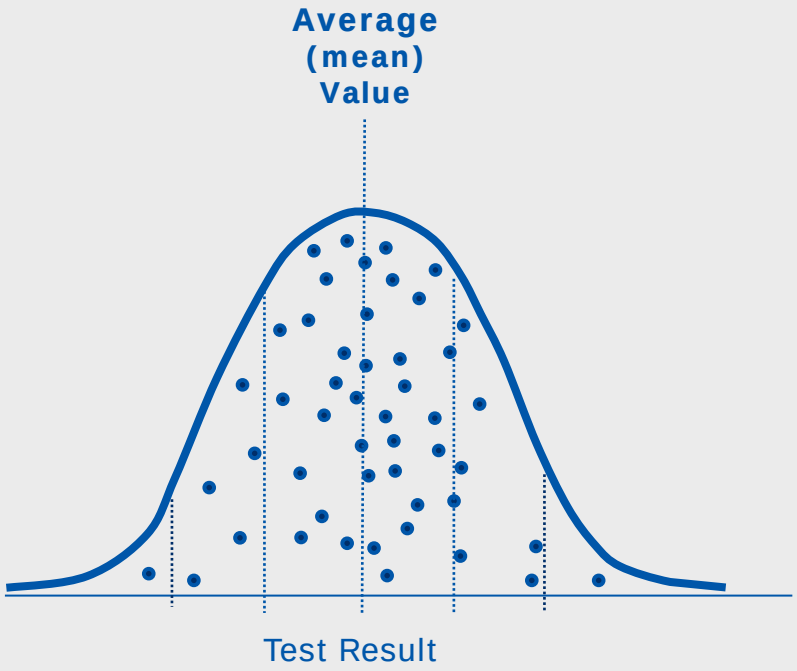
Statistical analysis to compare means of two sets of data.

F-test

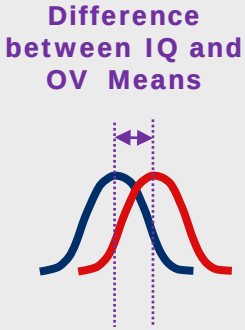
Statistical analysis to compare variances of two sets of data.

Contract Reference: DB QAP Section 3.6.3.1

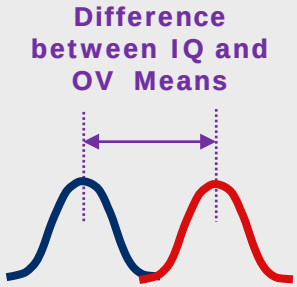
Compare Means = t-test



Difference between means within applicable standard – t-test validates.

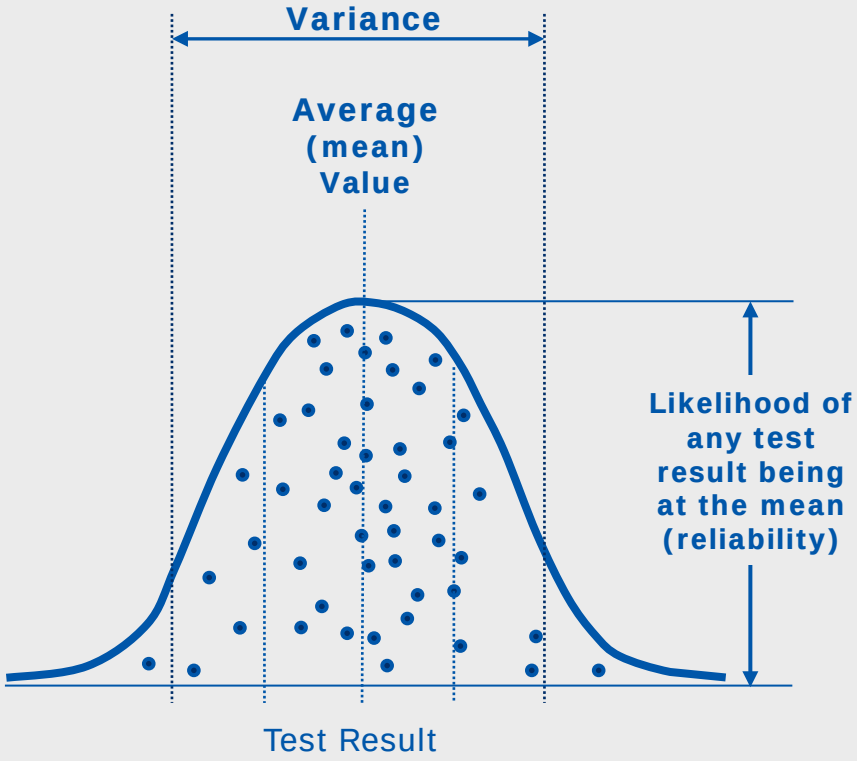


Difference between means outside applicable standard – t-test does not validate.



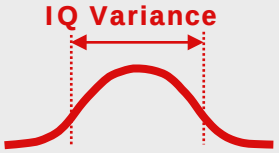
IQ distribution
OV distribution

Compare Variances = F-Test

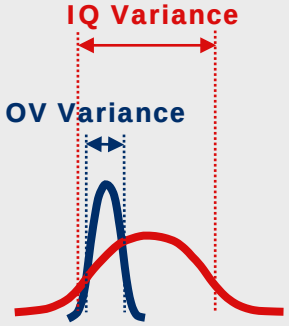


Low variability – test results fall in a tight group close around the mean value - a taller thinner curve.

High variability – test results are more spread out and less reliable.

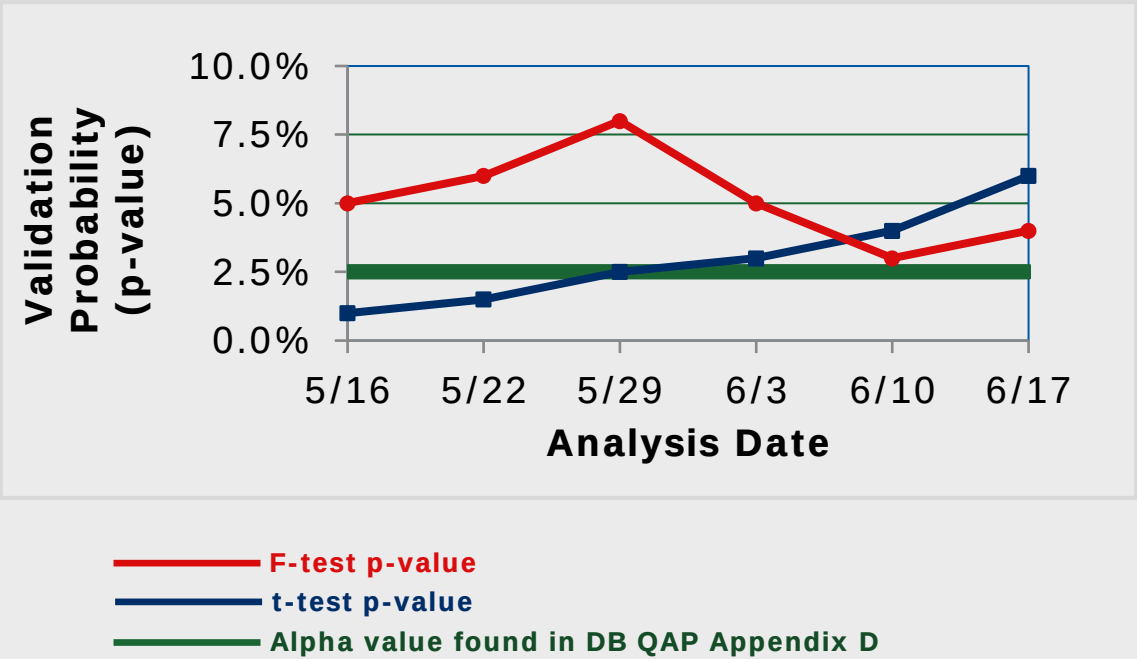


If IQ variance is significantly **different** than OV variance – these test results are not considered to be from the same population and are not validated.



IQ distribution
OV distribution

Statistical Validation – Probability Value

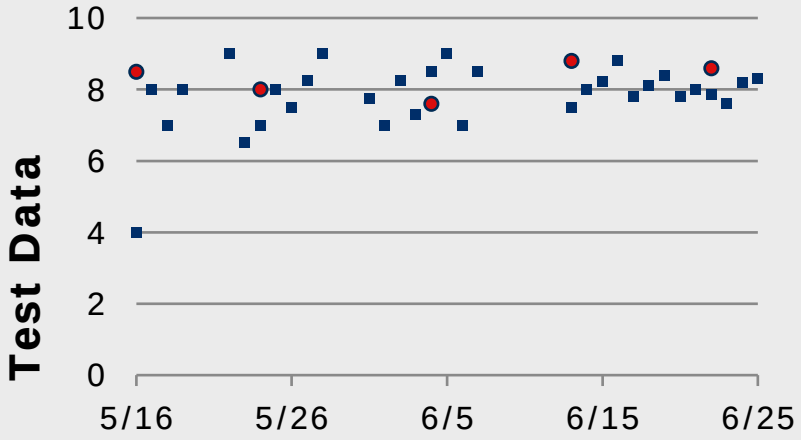


The p-value is a probability value that helps determine whether an observed result is statistically significant.

Results are validating if they are above the Alpha line like the F-test (red) here.

Results are not validating if they are below the Alpha line like the t-test (blue) before 5/29.

Level 2 – Independent Verification



Level 2 Tests: Independent Verification for materials that are secondary indicators of performance.

- OV testing frequency of three tests per quarter with lower frequency tests missed during one quarter being specifically targeted the next quarter.
- Split samples tests are also performed on all tests considered Level 2.

Level 3 – Observation Verification

Materials that are infrequently used or where risk of failure does not affect long term maintenance.

- The OVF or TxDOT observe and review start-up testing operations and ongoing operations to verify compliance with test procedures.

Test Method	Description	Date Observed	Observed By	Comments
DB-418-A	Hamburg	05/23/13	Mary Ham	
DB-114-E	Max Density	05/25/13	Rick Dense	

Contract Reference: DB QAP Sections 3.6.3.2 and 3.7.5

Non-verifying Materials

A **joint investigation** is conducted by IQF/OVF with IA assistance when test results are not verifying.

1. Data integrity and accuracy.
2. Technician testing procedures & reporting issues.
3. Testing equipment calibration.
4. Sampling variability.
5. Material variability.

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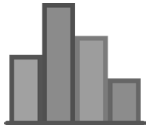
Owner Verification Report Guide

- If non verification continues sampling and testing increases to add more data for better statistical analysis and significance.
- If there are 5 consecutive non-validating analysis runs the NCR process will be implemented.
- The OV Report Guide provides requirements for quarterly OV reporting.

Contract Reference:
DB QAP Section 3.6

Owner Verification Documentation

TxDOT submits OV Reports to FHWA Quarterly.



Level 1 statistical analysis and Level 2 and 3 verifications.

Non-validation and nonverification investigations.

OVF Engineering judgment log.

IQF's Monthly material certification.

Project-Specific Levels of Analysis.

IQ Engineering Judgment log.

Split-sample test results.

Nonconformance log.

Material Acceptance

Material Acceptance

IQ Acceptance

- Either through passing test specifications
- or accepted with IQ Engineering Judgement (EJ)
- or through Nonconforming Report (NCR)

OV Verification

- Either through passing test specifications
- or accepted with OVF EJ
- or through Nonconforming Report (NCR)

Materials Validation

- or accepted with OV test results or Engineering Judgement (EJ)
- or NCR report after 5 consecutive nonvalidating tests on the same material

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7

Resolution of Nonconforming Work

Contract Reference: DB QAP Appendix A

Contract Reference: DBA GC Section 1.2.2 and Attachment 4-1

Definitions

Engineer of Record (EOR)	Engineering Judgement (EJ)	Construction Deficiency Item	Nonconforming Work
The engineer in responsible charge of each item, element, or phase of the Work and will be personally responsible for directly supervising the Work.	Determination as to whether a material failing to meet specification requirements and not within applicable tolerances should be accepted, or not accepted.	Work feature that is typically still “work in progress”, that does not require a design change, and can be reworked in the field to be in compliance with the original requirements.	Work that does not conform to the requirements of the Contract Documents, the Governmental Approvals, applicable Law or the Released for Construction Documents.

Construction Deficiency Report (CDR)

CDRs are used for workmanship deficiencies **that do not require an engineering decision by the EOR**.

Examples include: Re-working earthwork, re-tying steel, etc.

1. Construction deficiencies can **be addressed through rework** in the field to comply with the original requirements.
2. The CDR records how Construction Deficiency Items have been documented and resolved.
3. Construction deficiencies must be noted in the daily inspection report.
4. Corrected deficiencies will be re-inspected by construction QC and IQ staff for compliance.

★ *Contract Reference: DB QAP Section 3.6.3.4*

★ *Contract Reference: DBA GC Attachment 4-2*

Nonconformance Report (NCR)

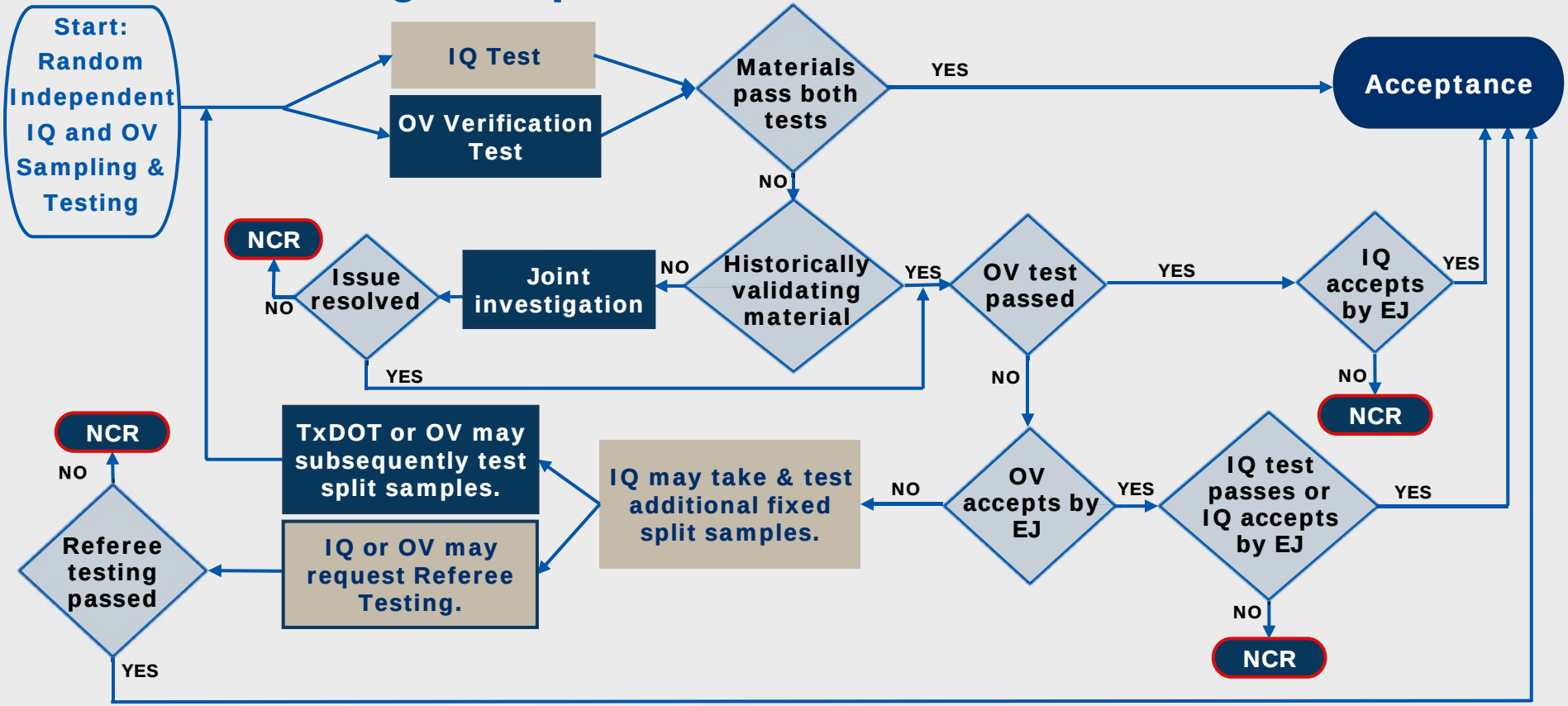
Within 24 hours of identifying Nonconforming Work, the DB Contractor must notify TxDOT in writing and copy the EOR and the IQ. Any affected third parties or governmental entities must also be notified.

1. NCR describes the element of Work that is nonconforming and the reason for the nonconformance.
2. EOR evaluates the effect of the nonconformance on the performance, safety, durability, and effect of the long-term maintenance.
3. EOR determines remedial actions, if any.
4. Actions resulting in changes to the original calculations or design must include the stamp of the EOR or the qualified licensed professional engineer from the same firm, and TxDOT approval.
5. Any NCR resolution involving materials should be based on acceptance procedures in the construction plans and specifications, and random testing by IQ with OV verification using test methods qualified by IA.

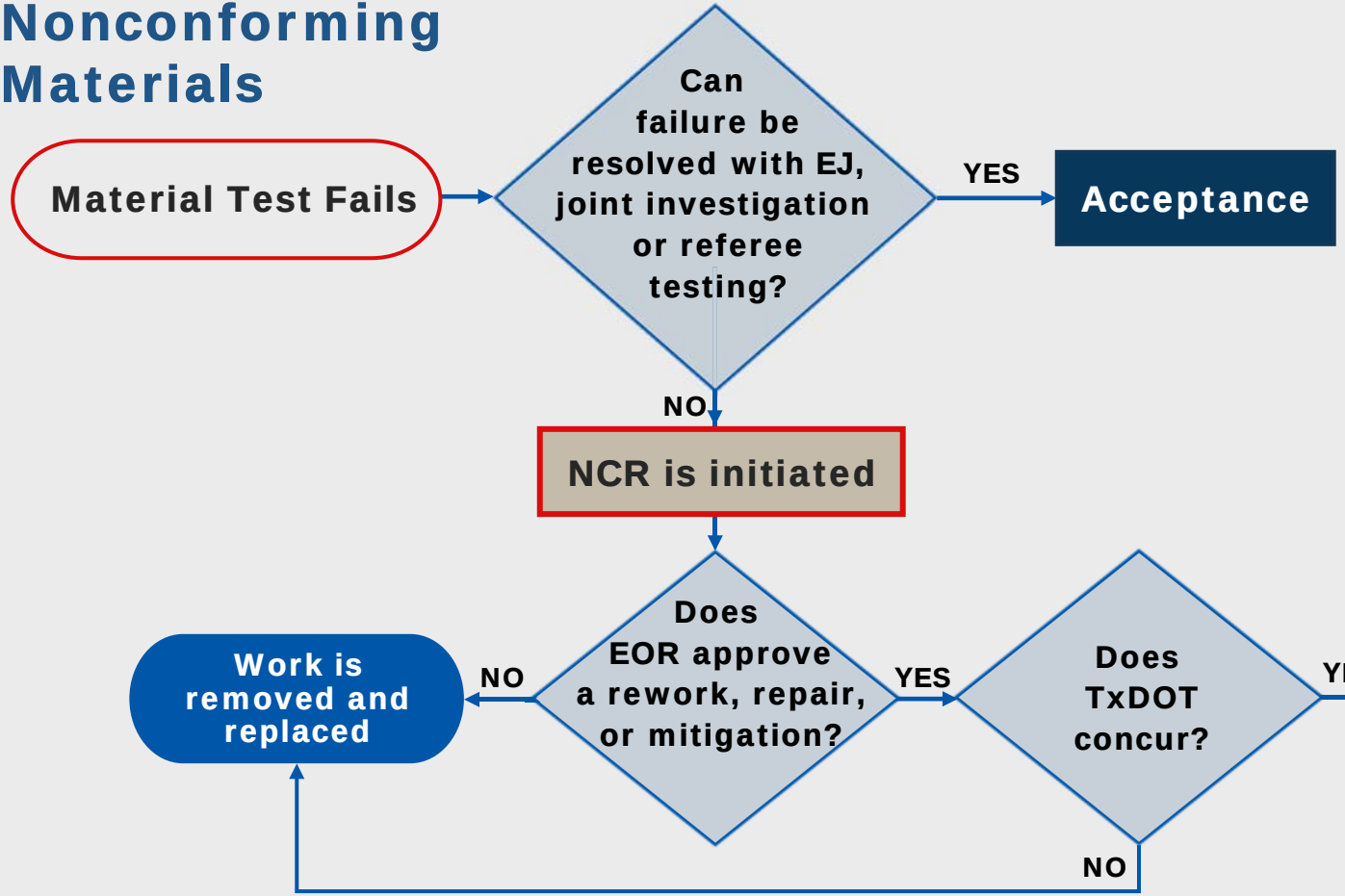
★*Contract Reference: DB QAP Section 3.6.3.4*

★*Contract Reference: DBA GC Attachment 4-2 Table 2 QCP-10*

Material Testing Acceptance



Nonconforming Materials



Refer to the training "Deficient and Nonconforming Work" for more information on the NCR process.

Engineering Judgment

Contract Reference:
DB QAP, Sec. 3.6.3.3

Engineering Judgment (EJ)

Determination as to whether a material failing to meet specification requirements and not within applicable tolerances should be accepted, or not accepted.

TxDOT allows the IQ to exercise EJ

IQ Agrees to Exercise EJ

- TxDOT notified of EJ within 24 hours.
- EJs decisions are made as soon as test results are available.
- Documented in the EJ log within 7 days.
- EJ log submitted to TxDOT monthly.

IQ Does not Agree to Exercise EJ

- Failing materials or work may still be accepted through the NCR process
  - Repaired if approved.
  - Brought into conformance with specifications.
  - Removed and Replaced.
- NCR log submitted to TxDOT bi-weekly

Contract Reference:
DB QAP Section 3.7.6

Referee Testing

A process to resolve disputes over differing test results between the IQ and the OV in a reliable, unbiased manner by testing and evaluation performed by a referee laboratory.

Independent Quality Firm (IQF) may request TxDOT initiate Referee Testing.

TxDOT will approve or reject the request to perform Referee Testing.

Referee Testing is solely a TxDOT function, therefore a 3rd Party laboratory cannot be hired by the DB Contractor.

The referee laboratory will be the MTD laboratory or a qualified independent 3rd party testing laboratory approved by TxDOT.

Test results are signed and sealed by a licensed professional engineer registered in Texas.

The referee laboratory's decision is FINAL.

Texas Department of Transportation

Nc

7 Take Aways and Resources

Takeaways

IQ + Verification = Acceptance

IQ inspections and test results can be used for Acceptance of Work if verified by TxDOT.

Testing and inspection frequencies and procedures are based on risk

The programmatic documents and DB Guide schedule as well as the project specific CQMP & QAP are based on the likelihood and consequences of failure of Work.

Nonconforming Work may be accepted through the NCR process

Work may be partly or fully corrected, replaced, or accepted with a Price reduction if agreed by the EOR and TxDOT.

Acceptance Program Contract Reference Documents

Quality Assurance Program for CDA / Design-Build Projects (DB QAP)

Includes programmatic language to guide creation of a project specific QAP, CQMP and OVTIP.

Design-Build General Conditions (DB GC)

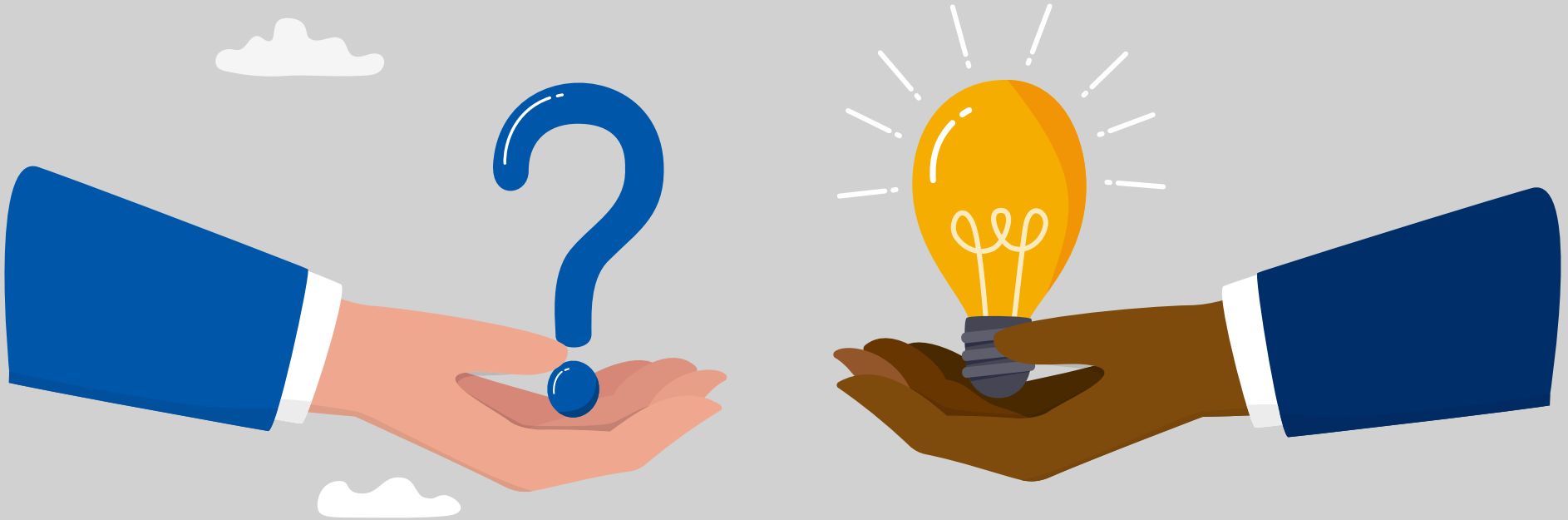
Items 1-9 of the DB Specifications are the Design–Build General Conditions and provide the static terms and conditions for Design–Build contracts.

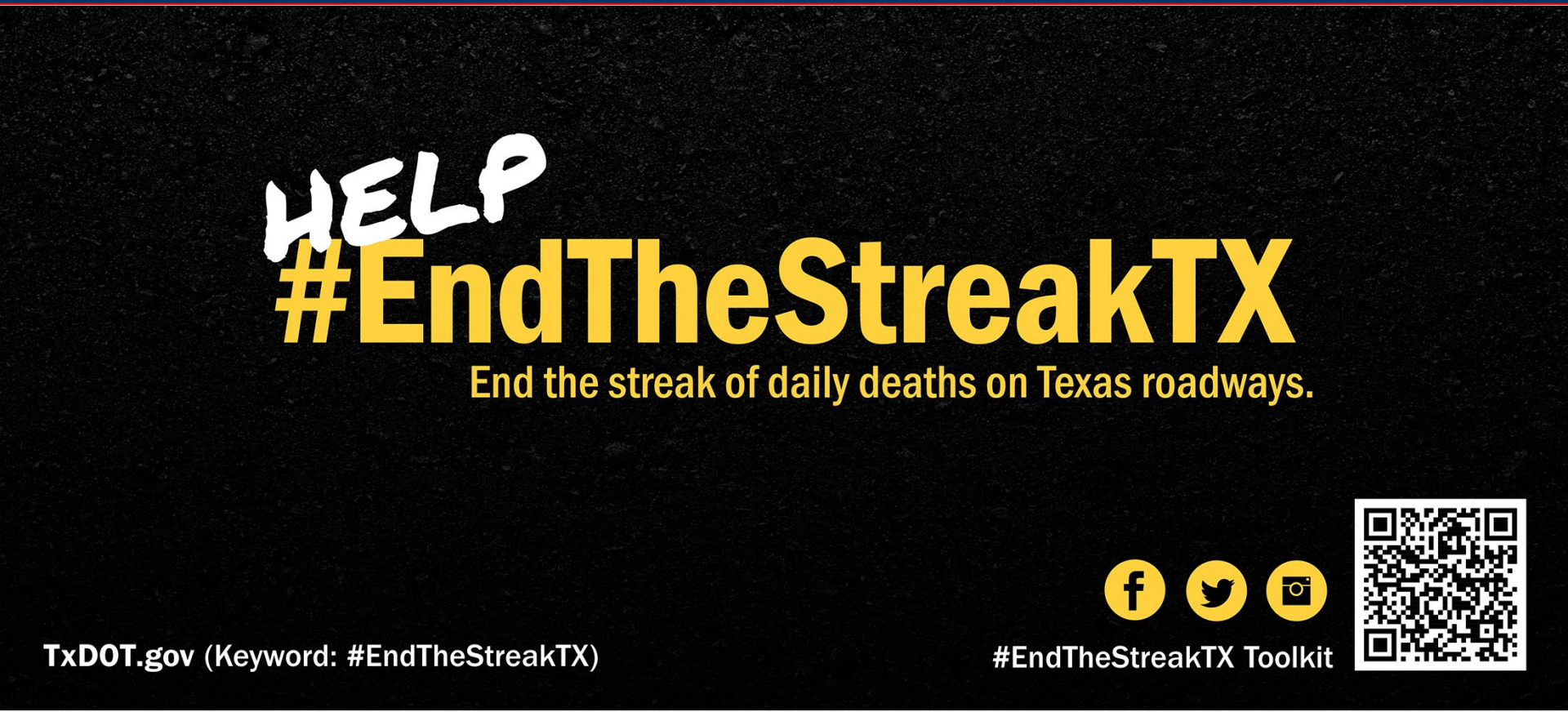
Design-Build Agreement (DBA)

Includes DB specific and traditional contract language. Allows flexibility for district specific language.

These and other resources can be found at:
https://ftp.txdot.gov/pub/txdot/atd/programmatic-docs/

Questions & Discussion




HELP
#EndTheStreakTX
End the streak of daily deaths on Texas roadways.
TxDOT.gov (Keyword: #EndTheStreakTX)
#EndTheStreakTX Toolkit