Internal Audit Report

Design-Build Project Oversight

TxDOT Internal Audit Division
**Objective**
To evaluate design-build project processes in the districts to determine if oversight responsibilities for the project are completed.

**Opinion**
Based on the audit scope areas reviewed, control mechanisms are effective and substantially address risk factors and exposures considered significant relative to impacting reporting reliability, operational execution, and compliance. The organization's system of internal controls provides reasonable assurance that key goals and objectives will be achieved despite control gap corrections and improvement opportunities identified. Control gap corrections and improvement opportunities identified have the potential to negatively impact the achievement of the organization's business/control objectives.

**Overall Engagement Assessment**
Satisfactory

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Management concurs with the above findings and prepared management action plans to address deficiencies.

**Control Environment**
The Dallas and Fort Worth Districts employ TxDOT project managers (PMs) that directly monitor contractor (developer) performance on their respective design-build projects for Interstate Highway (IH) 35E and State Highway (SH) 360. At the beginning of each project, the project manager conducts a material quality risk workshop with their project team to identify material quality risks and the verification approach for materials testing. The project team could include General Engineering Consultants (GECs), third party materials testing consultants, and representatives from the Construction Division (CST); if federal funds are involved, the Federal Highway Administration (FHWA) is also included. The workshop results are incorporated into the TxDOT project-specific Quality Assurance Program (QAP) that the project manager and developer will utilize throughout the duration of the project.

The QAP allows the developer’s Independent Quality Firm (IQF), under certain conditions, to exercise engineering judgement (EJ) to accept materials that do not meet minimum specifications but indicate reasonable conformance for their intended use. Some materials that do not meet minimum specifications require the review and approval of the developers’ design engineers and are documented in non-conformation reports (NCR). The IQF maintains a log of EJs and NCRs which is provided to the TxDOT project team monthly. The project team meets weekly with the developer and the IQF to discuss the status of daily project activities, non-validation reports, NCRs, and EJs.

Project managers also utilize an outside consultant to perform owner verification testing (OVT). The OVT consultant reviews the IQFs’ testing results and provides an independent
verification of a percentage of the test results. The OVT consultant also conducts continuous weekly analysis for specific materials identified as quality risks during the material quality risk workshop. The reviews and analysis help create quarterly statistical analysis information that is provided to the project teams for inclusion in their Quarterly Reports submitted to CST for review and to FHWA for federally funded projects. These Quarterly Reports are included with the projects final Material Certification as documentation for both the acceptance of materials through statistical validation and certification of materials with exceptions (i.e., EJs and NCRs).

TxDOT’s Project Finance, Debt & Strategic Contracts Division (PFD) also provides oversight of design-build projects including execution of the initial procurement contracts, managing the change order process, compiling the Major Projects Update Report for administration, and performing compliance reviews of design-build projects.

Summary Results
Audit testing completed resulting in management action plans.

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<th>Scope Area</th>
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| 1       | Reporting of Project Data    | Review of 5 Quarterly Reports for SH 360 and 13 Quarterly Reports for the IH 35E project noted the following: SH 360 reporting period January 1, 2016 to March 31, 2017 Quarterly Reports were not completed and submitted timely to Construction Division for review.  
  • 4 of 5 (80%) Quarterly Reports were not submitted timely

  Engineering Judgement (EJ) certifications were not consistently tracked to ensure completeness and accuracy of the Quarterly Reports and for TxDOT review. A total of 130 EJs were audited noting the following:
  • 12 of 130 (9%) EJs were not found to be included in the proper Quarterly Reports based on date of occurrence
  • 3 of 130 (2%) EJs were incorrectly deleted from the EJ log after being included on Quarterly Reports

  IH 35E reporting period November 1, 2013 to March 31, 2017 Quarterly Reports provided to FHWA did not consistently contain open NCRs, and EJs were not consistently reported in the correct reporting period.
  • 132 of 405 (33%) NCR’s did not continuously appear on Quarterly Reports until closed
  • 19 of 159 (12%) EJs found in the EJ log did not appear in their respective Quarterly Reports

| 2       | Reporting of Project Data    | A GEC was identified as being invoiced and paid through an unrelated work authorization for review work performed on Quarterly Reports for SH 360 and other design-build projects.  
  • Charges for SH 360 work amounted to $6,582
Audit testing completed not resulting in management action plans.

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| Monitoring of Materials Testing | Auditors observed six weekly project team meetings, evaluated supporting evidence of compliance with the Owner Verification Testing and Inspection Plan (OVTIP), and noted the following:  
  • 10 of 10 weekly Level 1 material testing results were communicated to the project team as required  
  • OVT met the minimum 10% of the materials to be tested by the IQF for both design-build projects  
  • Both project teams completed OVT audits of the IQF to verify compliance with the Construction Quality Management Plan for each project |
| Reporting of Project Data   | Monthly progress reports for both projects were reviewed and matched to updates provided by PFD to administration of project specific information through a Major Projects Update Report and verified with supporting documentation. The following was noted:  
  • 6 of 6 monthly progress reports created by the project teams (3 for each project) matched the Major Projects Update Reports that PFD creates and provides to Administration  
  • 2 of 2 monthly progress reports (one for each project) were validated by supporting documentation including project schedule, safety performance, right of way/utilities expenditures, and Disadvantaged Business Enterprise goal performance |

**Audit Scope**

The audit scope focused on monitoring and oversight of the IH 35E Managed Lanes Project and the SH 360 Project by focusing on: 1) whether district processes for design-build projects ensure that monitoring, validation, and reporting of materials testing is performed and 2) the accuracy and completeness of design-build project reporting.
Design-Build Project Oversight - Limited Scope

Scope Area 1: Monitoring of Materials Testing - observed project meetings with the developer and IQFs and reviewed materials testing reports for concrete and/or asphalt during Fiscal Year (FY) 2016 and 2017.

Scope Area 2: Reporting of Project Data – reviewed Quarterly Reports for the period November 1, 2013 to March 31, 2017 for the IH 35E project and January 1, 2016 to March 31, 2017 for SH 360, non-conformance and engineering judgement logs, monthly project progress reports, and Major Projects Update Reports to evaluate reporting accuracy and assess coverage of review.

The audit was performed by Letta Hinton, Sara Silva, Dwight Warren, Monica Washington, and Cynthia Scheick (Engagement Lead). The audit was conducted during the period from June 5, 2017 to August 18, 2017.

Methodology
The methodology used to complete the objectives of this audit included:

- Reviewed TxDOT internal documents, including but not limited to, policy and procedure manuals, organizational charts, and internal memorandums for design-build projects.
- Reviewed design-build contracts for two projects, including the contracts, the contract Technical Provisions, project management plan (PMP), OVT and OVTIP, and federal requirements and guidance.
- Interviewed the IH 35E and SH 360 project teams in Dallas and Fort Worth Districts, representatives for the independent engineer, general engineering consultants, and Federal Highway Administration representatives to understand monitoring expectations and requirements.
- Observed six project meetings and reviewed 10 monthly Owner Verification/Quality Control (OV/QA) meeting minutes to evaluate oversight of materials testing.
- Reviewed prior audit reports, including the SH 183 Managed Lanes report (December 2016) and the SAO Design-Build Contracts at the Department of Transportation report (August 2016).
- Judgmentally selected 2 of 15 active design-build and concession projects for testing based on status (construction phase) and contract value.
- Reviewed 18 Quarterly Reports to determine if NCRs and EJs were accurately reported.
- Matched six monthly progress reports prepared by the project team to the Major Projects Update Reports prepared by PFD for presentation to TxDOT Administration.
- Reviewed GEC agreements and related work authorizations and invoices for the SH 360 project and two unrelated projects to assess proper billing protocol for work related to review of Quarterly Reports.

Background
This report is prepared for the Texas Transportation Commission and for the Administration and Management of TxDOT. The report presents the results of the Design-Build Project Oversight audit which was conducted as part of the Fiscal Year (FY) 2017 Audit Plan.

Design-build is a method of project delivery in which the design and construction phases of a project are combined into one contract. Design-build projects include development, design, and construction of a highway project, and can also include the subsequent operation and maintenance of tolled lanes, general purpose lanes, and associated facilities.
The design-build contracts for these projects describe the terms and conditions between TxDOT and the developer. The contracts include Technical Provisions which are specific technical requirements that the developer must achieve, as well as, a PMP. The PMP establishes the framework for TxDOT’s management of the project and the methodology for organizing, directing, and coordinating the resources required for the project, as well as, monitoring responsibilities (e.g. project reporting and tracking, cost tracking, and oversight).

Design-build projects follow a Quality Assurance Program (QAP) that requires validation testing of the developer’s Independent Quality Firms (IQF) materials test results if the results are used for the material’s acceptance decision. Each design-build contract includes an OVTIP that describes TxDOT’s responsibility to validate or verify the IQF inspection and test results of materials used on the project. At project completion, a materials certification is prepared by the project team for review and approval. As a federal funded project, the final materials certification for IH 35E is approved by FHWA and for the state funded project SH 360, the final materials certification is approved by CST.

TxDOT may also hire separate consultants (e.g. General Engineering Consultants or Independent Engineers) to supplement resources and to assist with monitoring and oversight activities for design-build projects. Assistance includes reporting on impacts to the project, delays, statistical validation testing, project oversight, and construction inspections to assess if the developer’s performance of work is in accordance with the design-build contract.

We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards and in conformance with the International Standards for the Professional Practice of Internal Auditing. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. Recommendations to mitigate risks identified were provided to management during the engagement to assist in the formulation of the management action plans included in this report. The Internal Audit Division uses the Committee of Sponsoring Organizations of the Treadway Commission (COSO) Internal Control – Integrated Framework version 2013.

A defined set of control objectives was utilized to focus on reporting, operational, and compliance goals for the identified scope areas. Our audit opinion is an assessment of the health of the overall control environment based on (1) the effectiveness of the enterprise risk management activities throughout the audit period and (2) the degree to which the defined control objectives were being met. Our audit opinion is not a guarantee against reporting misstatement and reliability, operational sub-optimization, or non-compliance, particularly in areas not included in the scope of this audit.
Detailed Findings and Management Action Plans (MAP)

Finding No. 1: Timeliness, Completeness, and Review of Quarterly Reports

Condition
Management of the design-build quarterly reporting process for the State Highway (SH) 360 and Interstate Highway (IH) 35E design-build projects requires improvement to ensure timeliness of submission, completeness, and consistent review of reports/results.

Effect/Potential Impact
Incomplete or untimely Quarterly Reports may delay materials certification for final project acceptance and delay release of federal funds.

Criteria
The TxDOT Quality Assurance Program (QAP) requires project managers produce Quarterly Reports in order to demonstrate monitoring of materials quality for design-build projects. The QAP specifies that the Quarterly Report include a/an:

- Non-conformance log (i.e., a list of materials or construction deficiencies identified by TxDOT, the Developer, Independent Quality Firm (IQF), or Owner Verification Testing (OVT) firm that do not meet the minimum specification requirements)
- Engineering judgement log (i.e., a record of acceptance of materials that reasonably conformed with specification requirements but did not meet the minimum)

Cause
Procedures for the Quarterly Report review process do not include specific guidance regarding:

- Timely recording of non-conformance reports (NCR) and engineering judgements (EJ) in the logs
- Timelines for the preparation of the reports
- Reconciliation steps for reports and logs to ensure all NCRs and EJs are included
- Submission requirements for the reports
- Review responsibilities
- Approval and distribution audience for the reports (i.e. Construction Division (CST), District Engineer, Chief Engineer) prior to external distribution outside of TxDOT

Evidence
The following was noted based on review for accuracy and completeness of 5 Quarterly Reports for SH 360 and 13 Quarterly Reports for the IH 35E project:

**SH 360 reporting period January 1, 2016 to March 31, 2017**
Quarterly Reports were not completed and submitted timely to CST for review.

- 4 of 5 (80%) Quarterly Reports were not submitted timely to CST for review
  - The four Quarterly Reports for the periods covering April 1, 2016 through March 31, 2017 were submitted between 123 days and 205 days after the quarter end
- EJs were not always accurately tracked to ensure completeness in reporting of Quarterly Reports:
11 EJs dated between May 2016 and March 2017 were reported between 48 days and 372 days late and had not been reported on a Quarterly Report as of August 18, 2017 which was the end of audit fieldwork.

1 EJ appeared on the EJ log in January 2017, but it was not included in the first quarter 2017 Quarterly Report.

3 EJs were changed or deleted from the EJ log by the IQF after they were included in the fourth quarter 2016 and first quarter 2017 Quarterly Reports:
- 2 EJs were changed into NCRs and moved to the non-conformance log
- 1 EJ was deleted by the IQF after it was determined to not be out of conformance with testing standards

IH 35E reporting period November 1, 2013 to March 31, 2017
Quarterly Reports provided to FHWA did not always contain all open NCRs, and EJs were not always reported in the correct reporting period.

- 132 of 405 (33%) NCR's did not continuously appear on Quarterly Reports until resolved and closed
  - 119 were ultimately closed/resolved
  - 13 remained open as of August 18, 2017 which was the end of audit fieldwork
- 19 of 159 (12%) logged EJs were reported outside of their respective date of occurrence
  - 11 EJs were reported in the following quarter
  - 6 EJs were reported two or more quarters later
  - 2 EJs were reported more than 7 quarters later

Based on interviews with project managers and CST, Quarterly Reports, used as support for final materials certification and project acceptance, were not being distributed to higher levels of district and CST leadership or to the Chief Engineer of TxDOT in either detail or summary format. This higher level of review may assist in identifying engineering decisions or non-conformance trends that should be further assessed and understood.

Management Action Plan (MAP):

MAP Owner:
Brett Haggerty, P.E., M&P Section Director, Construction Division

MAP 1.1:
- Construction Division (CST) will develop a Quarterly Report template and manual that will encapsulate requirements detailed in the Quality Assurance Program (QAP) and QAP Implementation Guide for items to be included for all projects. The manual will include procedures on including documentation that Engineering Judgement (EJ) and Non-Conformance Report (NCR) items have been received and reviewed by the TxDOT Project Team. The Quarterly Report template for all future projects will ensure consistency in reporting and increase efficiency of review and approval.
- Training for Independent Quality Firms (IQF), Independent Assurance (IA), Owner Verification (OV) and TxDOT project managers will include Quarterly Report generation, review and approval processes for all new projects.
• CST will work with Project Finance, Debt & Strategic Contracts Division (PFD) to
develop a standard protocol for the level of review and distribution of quarterly
reports, and development of an executive summary to be provided to the Chief
Engineer quarterly.

Completion Date: April 15, 2018

MAP Owner:
Katherine Holtz, CDA Program Director, Project Finance, Debt & Strategic Contracts Division

MAP 1.2:
• Project Finance, Debt & Strategic Contracts Division (PFD) will work with district staff
and Professional Engineering Procurement Services (PEPS) to develop a new
template for scope of services language to be included in all new Owner Verification
contracts. The new language shall clearly specify the submission deadlines for
quarterly reports.
• As of July 2017, SharePoint has been used for approval workflow and distribution to
ensure timelines and approvals noted above (i.e. to keep track of approval workflow
from Project Team to TxDOT PM, CST, and FHWA).*

*item is considered complete

Completion Date: February 15, 2018

MAP Owner:
Greg Cedillo P.E., Director of Construction, Fort Worth District

MAP 1.3: Development of time schedule for the General Engineering Consultant (GEC),
Owner Verification (OV), and TxDOT Project Office for Quarterly Report development and
submission will be prepared for the SH 360 Project.

Completion Date: December 15, 2017

MAP Owner:
Duane Milligan, P.E., Director of Construction, Dallas District

MAP 1.4: IH 35E Project close out is scheduled for October 2017, therefore only a review of
time schedule will be conducted with the Owner Verification and TxDOT Project Office for
Quarterly Report development and submission.

Completion Date: December 15, 2017
Finding No. 2: Work Authorization for Quarterly Report Reviews

Condition
Work authorizations for General Engineering Consultant (GEC) review of SH 360 quarterly reports were approved and charged to an unrelated project. The process of delegating tasks to a GEC and review of those charges was not coordinated between two divisions resulting in improper payments.

Effect/Potential Impact
Contract disputes could occur if duties assigned and work delivered do not adhere to the agreed upon or job-specific work authorization. Expenditures will also not properly align or be tracked to the appropriate contract(s) established for work to be performed.

Criteria
The contract with the GEC for Engineering Services includes a clause for reimbursement of eligible costs, stating the costs must be incurred in accordance with the terms of a valid work authorization. Charges for work performed for other design-build projects are not eligible for reimbursement from funds allocated to the SH71 work authorization.

The TxDOT Financial Management Policy Manual (Chapter 2, Section 4: Signatures and Certifications) states that all persons who sign any document are responsible for ensuring that it is accurate and complete, and that certification is made by someone who has confirmed that the goods or services were actually received and correct.

Cause
The Project Finance, Debt & Strategic Contracts Division (PFD) manages GEC contracts and work authorizations, and their responsibilities include review and approval of invoices for work performed. The Strategic Projects Division (now PFD) authorized Construction Division (CST) to assign work to a GEC for review of Quarterly Reports with a work authorization that was limited to the SH 71 design-build project. PFD did not coordinate with CST to review validity of invoices submitted by the contractor and subcontractor for work performed under the SH 71 work authorization.

Evidence
At the time of testing, a total of three Quarterly Reports for the SH 360 project for the period January 1, 2016 to September 30, 2016 had been submitted to CST and reviewed by a GEC. The GEC review of these Quarterly Reports for SH 360 and two other design-build projects were invoiced and paid through a work authorization for an unrelated design-build project.
- $6,582 in charges for review of the SH 360 Quarterly Reports were charged to an unrelated project (SH 71 project)
- $1,545 in charges for reviews of Quarterly Reports for two other design-build projects were also identified as being charged to the same unrelated project (SH 71 project)

Management Action Plan (MAP):

MAP Owner:
Katherine Holtz, CDA Program Director, PFD
MAP 2.1: Project Finance, Debt & Strategic Contracts Division (PFD) will work with Professional Engineering Procurement Services (PEPS) and the respective consultants to ensure that all invoices for active work authorizations involving Quarterly Report review are marked and reviewed for approval/concurrence by CST.

Completion Date: December 15, 2017

MAP 2.2: PFD will execute a new work authorization to allow the review of quarterly reports on any design-build project.

Completion Date: Action completed
## Summary Results Based on Enterprise Risk Management Framework

**Audit Results Dashboard**  
**Design-Build Project Oversight**

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**Rating Assessment Grid**

- Exemplary
- Satisfactory
- Needs Improvement
- Unsatisfactory

### Closing Comments

The results of this audit were discussed with/provided to the Dallas District Engineer, Fort Worth District Engineer, Project Finance, Debt & Strategic Contracts Division (PFD) Director, and Construction Division (CST) Director on October 26, 2017. The Internal Audit Division appreciates the cooperation and assistance received from the Dallas and Fort Worth Districts, PFD, and CST during this audit.