



**PennDOT Engineering District 10  
Construction Unit  
ISO 9001:2015  
Quality Management System**

**Risk & Opportunities Appendix**  
Version 1.1  
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## **Preface**

The following document is a part of The Pennsylvania Department of Transportation Engineering District 10-0, Construction Unit Quality Manual as required by ISO 9001:2015; Quality Management System Standards. The master copy of this document is located and maintained electronically on the Departments Local Access Network (LAN) and addressed **J:\Construction\ISO**. All hard copies issued are uncontrolled and are noted as such. It is the user's responsibility to verify that all referenced copies of this manual are current prior to use.

# **PennDOT District 10-0 Construction Unit**

**Approved  
by:**

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Process	Name	Risk	Opportunity
C1	Employee Performance Review Processing	Involves Units that are not part of Construction's QMS Improper completion could cause difficulties with the unions. Improper documentation could impact the effectiveness of discipline. Inconsistent completion. Compromised accountability for both staff and managers.	Used to identify training and staffing needs. Develop procedure and timetable for EPR creation and review of interns and lower-level staff who are overseen by non-supervisor personnel.
C2	Customer Satisfaction	Loss of opportunities for improvement. Unknown customer dissatisfaction or inconvenience.	New ideas and external opinions are received. Customer satisfaction is a crucial metric for the effectiveness of the Quality System.
C3	Equipment Procurement (Under Development)	Equipment not distributed in a timely manner. Specialized equipment not available.	Costs are controlled. Standard equipment is issued to all personnel
C4	Internal Audit	Loss of opportunities for improvement. Unknown customer dissatisfaction or inconvenience.	Identification of implementation deficiencies or process improvements. Accountability.
CA1	Execution of Consultant Agreements	Selection of underqualified contractors, resulting in reduced quality products or increased cost. Legal actions for failure to follow Department policy. Reduced customer (consultant) satisfaction.	Flexibility in providing staffing and consultant support. Additional qualified staff available during increased workload.
CA2	Open End Agreement Work Order Creation	Insufficient staff for projects Delay in staffing provided by consultants	Flexibility in providing staffing and consultant support.
CR1	After-Action Review	Lack of accountability for errors Repeated errors and omissions	Data for process improvement. Transfer of knowledge and skill development
CR2	Constructability Review (Under Development)		
F1	Work Order Creation	Insufficient personnel training. Process inconsistency with other Districts and states. Loss or misappropriation of funding	Add a notification email to the IIC when a work order is rejected or needs revision. Provide additional training to field and office staff.
F2	Finals Unit Project Set-up	Reduced productivity Information security	Add additional steps or documents for consultant and intern IT account setups

<b>F3</b>	<b>Finals Unit Project Closeout</b>	<p>Reduced productivity  Waste and Fraud  Increased frequency of claims  Negative customer (contractor) interactions  Funding allocation and budget management</p>	<p>Increased use of electronic systems and files.  Rollout pdf editor software to all IICs</p>
<b>F4</b>	<b>Right-to-Know Treasury Database Update</b>	<p>Release of personal or other confidential information  Legal action  Imposition of civil penalties and court fees.</p>	<p>Increased use of electronic files.  Revise the process workflow to indicate that the document review is complete prior to upload of documents.  Revise guidelines within the process on the scope of document redactions.</p>
<b>FO1</b>	<b>Field Operations – Startup</b>	<p>Loss of funding  Lack of Department oversight  Work is not performed</p>	<p>Revise startup spreadsheet and actively provide a copy of it to each project and all new TCIS.  Encourage all inspectors to download copies of all standards and reference documents for quick and consistent field access.</p>
<b>FO2</b>	<b>Field Operations – Project Management</b>	<p>Poor quality construction  Inadequate materials  Legal actions  Waste of materials, funds, and time  Environmental damage  Poor relationships with customers (contractors and public)  Unsafe working conditions  Accidents</p>	<p>Continue development of single-source for construction document references.</p>
<b>FO3</b>	<b>Field Operations – Project Closeout</b>	<p>Waste  Improper contractor payments  Loss of project funding</p>	<p>Process eliminates rework and missed steps as the project changes hands during closeout</p>
<b>FO4</b>	<b>Field Operations – E&amp;S Details</b>	<p>Environmental damage  Legal fees and penalties</p>	<p>Opportunity exists to identify and document the condition of E&amp;S controls before breakdown, and in preparation for post-construction activities.  Opportunity exists to correct problems before significant environmental impacts occur and the Department and contractors are subject to punitive fines.</p>

<b>F05</b>	<b>Field Operations – Field Peer Reviews</b>	Non-uniformity of inspection Increased claims against the Department Waste	Staff training
<b>F06</b>	<b>Design Error Reviews</b>		
<b>GT1</b>	<b>In-House Design Requests</b>	Project delays Lack of sufficient design information	Review electronic submissions
<b>GT2</b>	<b>Construction Consultation</b>	Poor quality construction due to lack of specific geotechnical experience by field inspection personnel	Additional training on geotechnical topics through outside agencies. Require information from contractor on inspection equipment
<b>GT3</b>	<b>Geotechnical Hazard Inspection and Remediation</b>	Accidents and loss of roadway access Loss of institutional knowledge of intermittently visible hazards Natural disaster	Tracking of previous hazards and retaining walls provides data for maintenance priorities and sample work for future projects Hazard awareness and prevention
<b>GT4</b>	<b>Geotechnical Review of Consultant Reports</b>	Project delays Reduced records quality	Continue to review electronic submissions.
<b>GT5</b>	<b>Review of Contractor Submissions</b>	Project delays Poor quality construction due to lack of specific geotechnical experience by field personnel Accidents and unsafe conditions	Continue to review electronic submissions.
<b>GT6</b>	<b>Mine Variance Review</b>	Mining operations could endanger the stability of the Department's properties and the safety of customers (traveling public)	Continue to review electronic submissions.
<b>GT7</b>	<b>Compaction Control</b>	Poor quality construction Settlement Poor slope stability	Review process for updates based on revised Pub 408
<b>LC1</b>	<b>Subcontractor Approval</b>	Unqualified contractors Reduced quality work Unsafe working conditions Inappropriate labor conditions	Improve communication of contractor status changes through ECMS.
<b>LC2</b>	<b>Labor Compliance Project Review</b>	Illegal working conditions Legal action	Improve record-keeping to eliminate duplication of electronic and physical record-keeping
<b>M1</b>	<b>Material Supply Letter</b>	Legal action Inadequate materials	Utilize ECMS
<b>M2</b>	<b>Equipment Verification</b>	Accidents Waste Equipment damage	Recommend preventative maintenance Efficient use of materials

<b>M3</b>	<b>Initial Aggregate Plant Inspection – Annual</b>	Inadequate materials Fraud and Waste	Knowledge sharing of issues Expand inspection by ISO-certified districts to sources located in non-ISO districts. Alternatively, share processes with non-ISO districts and request compliant inspections for projects delivering within the ISO districts
<b>M4</b>	<b>Initial Asphalt Inspection – Annual</b>	Inadequate materials Fraud and Waste	Knowledge sharing of issues Expand inspection by ISO-certified districts to sources located in non-ISO districts. Alternatively, share processes with non-ISO districts and request compliant inspections for projects delivering within the ISO districts
<b>M5</b>	<b>Initial Concrete Plant Inspection – Annual</b>	Inadequate materials Fraud and Waste	Knowledge sharing of issues Expand inspection by ISO-certified districts to sources located in non-ISO districts. Alternatively, share processes with non-ISO districts and request compliant inspections for projects delivering within the ISO districts
<b>M6</b>	<b>District Quality Assurance, Hot/Warm Mix Asphalt Plant, 30-day Review</b>	Inadequate materials Fraud and Waste	Knowledge sharing of issues Expand inspection by ISO-certified districts to sources located in non-ISO districts. Alternatively, share processes with non-ISO districts and request compliant inspections for projects delivering within the ISO districts
<b>M7</b>	<b>Warranty Review</b>	Failure of warranted materials Failure to take advantage of new technologies and products for system improvements and cost savings	Involve CE Council in both Construction Inspection and Warranty Review to preserve institutional knowledge. Remove this process from the responsibility of the Materials Unit
<b>SC1</b>	<b>Structural Plans Review</b>	Reduced quality work Claims against the Department Project delays	Utilize a single comment response pathway for all comments.

<b>SC2</b>	<b>Disposal of Bridge Paint Waste</b>	Environmental damage Legal action Permit revocation and denial	Add the pre-paint meeting to the process flowchart Add a review of the process to the meeting agenda Update the standard Special Provision
<b>SC3</b>	<b>Project Initiation – Local Bridge Projects</b>	Continued deterioration of transportation infrastructure Unqualified personnel or contractors Lack of Department oversight Poor quality construction Waste and Fraud	Department oversight provides access to resources and knowledge base to municipalities that may not have the in-house construction and project management knowledge and experience. Process builds a knowledge base independent of individual staff.

# Methodology

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## **Types of Opportunity:**

1. Specific process or activity improvements.
2. Advantageous or beneficial results of process compliance.

## **Sources of Opportunities**

1. Process Audits
  2. General Management Review of Quality Management System
  3. Internal and External Customer Surveys
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## **Types of Risk:**

Every Process was evaluated for different types of risk and classified and scored based on the following tables.

**Organizational Risk:** Which occurs at the entity and activity levels

**Strategic Risk:** Which happens when an organizations strategy or business plan is inadequate.

**Compliance Risk:** Which involves failures to comply with legal and regulatory requirements

**Operation Risk:** Which includes subcategories related to procedures and actions

## **Risk Questions:**

What are the impacts to the Department or the Department's customers (external groups) of the Department's non-implementation of the process?

What are the impacts to the customers (external groups) or the Department of the customer's non-implementation of the process?

What negative events is the process steps designed to detect and prevent?

What events or rules inspired the creation of this process?

Which of the following general risks apply to this process? Accidents Safety Unsafe Working Conditions Fraud Waste Legal Action

<b>Likelihood Matrix</b>			
<b>Score</b>	<b>Probability</b>	<b>Description</b>	<b>Example</b>
1	<2%	Very Rare	Little evidence but event could occur in theory
2	2-5%	Rare	Event has been known to occur somewhere else
3	6-10%	Unlikely	Event has happened before perhaps every 5 years
4	11-20%	Possible	Occasional: once every 2-3 years
5	21-40%	Likely	Periodically: yearly or semi-annual
6	41-80%	Almost Certain	Frequently: every few months
7	>80%	Imminent	Occurs on a regular basis: weekly or monthly

<b>Consequence Matrix</b>					
<b>Assigned Worth</b>	<b>Safety</b>	<b>Quality</b>	<b>Legal</b>	<b>Environmental</b>	<b>Customer Expectations</b>
0	NA	NA	NA	NA	NA
1	No Risk	Exceeds	Little or no issues	DEP/ Local organizations pleased	Exceeds expectations
2	Low	Meets	Minor - easy to settle	No issues	Meet expectations
3	Medium	Minor Deviation	Moderate- potential for Court action	Events corrected	CCCs received
4	High	Major Deviation	Moderate - Fines or penalties	Fines	Major Ongoing complaints
5	Fatal	Remove/replace	Significant - Claim or Prosecution	NPDE permit pulled	Legislative involvement/ complaints