



Quality & Procedures Manual

AI Engineers, Inc.

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Table of Contents

1 - Approval and Revision2
 1.1 Approval.....2
 1.2 Vision.....2
 1.3 Mission.....2
 2 - Quality System Documentation.....3
 3 - Contract Review.....5
 4 - Design Control.....6
 4.1 Design and Development Planning6
 4.2 Design and Development Inputs6
 4.3 Design and Development Outputs.....6
 4.4 Design and Development Review7
 5 - Record Keeping - Documentation and Process Control7
 5.1 Control of Documents7
 6 - Purchasing12
 7 - Customer-furnished Material.....12
 8 - Product Identification and Traceability13
 9 - Inspection and Testing14
 10 - Test Equipment.....17
 10.1 Control of Monitoring and Measuring Equipment17
 11 - Inspection and Test Status.....19
 12 - Control of Nonconforming Product and Corrective Action19
 13 - Material Handling, Storage, Packaging, and Delivery20
 14 - Quality Records.....20
 15 - Internal Quality Audits21
 15.1 Management Commitment and Audits.....21
 16 - Customer Focus22
 16.1 Customer Focus.....22
 17 - Training.....23
 18 - Servicing and Statistical Techniques24

1 - Approval and Revision

1.1 Approval

Date of Revision: March 19, 2015
Name and Title of Approver: Abul Islam (President/CEO)
Date of Approval: March 23, 2015
Quality & Procedures Manual, Assurance Manager: Rohit Pradhan, P.E.

1.2 Vision

AI Engineers, Inc., P.C. (AI) is a leader in high quality engineering and technical services, innovators and integrators of ideas and technology, striving for a sustainable and better quality of life and society; taking a holistic approach to problem solving in design, upgrade, construction and maintenance of bridges, highways, transportation/transit, airports, buildings, utility and power infrastructure.

1.3 Mission

We strive towards being a transparent and continuous learning organization committed to attracting and retaining the high energy, committed, socially and culturally diverse top talent and help them grow their skills for maximum individual and team output through effective management and leadership development. Encouraging entrepreneurial thinking within the organization to meet the challenges of an evolving construction industry marketplace and a highly competitive global economy.

1.4 Quality Management System General Requirements, Management Review.

AI Engineers, Inc. (AI) through its interactive Quality Management Plan (QMP) developed to ensure that all work performed consistently meets or exceeds the expectations of our clients. The QMP establishes guidelines setting in approach and procedures to be followed to ensure product quality and assuring a proper monitoring and review procedure from inception to completion. The program lays out guidelines for projects related to civil and structural design and construction inspection/construction management services.

The AI project team will integrate QA/QC activities into the project to address all functions performed. AI's QA/QC quality professionals will work closely with all elements of the project team to verify that the appropriate focus on quality is incorporated into inspections, reports and

deliverables. The effectiveness of the QA/QC integration will be verified through reports, audits, surveillances, and assessments.

- 1.1 The Quality Assurance Program which is established by this Quality Assurance Manual shall be implemented by a Quality Assurance Department, under the Quality Assurance Manager.
- 1.2 All authority, responsibilities, and functions relating to Quality Assurance are in accordance to this Manual and by the accompanying Quality Assurance Procedures.
- 1.3 A project specific Quality Plan when required depending on size and complexity of the project to be drawn out in detail coherent with this Manual. This plan shall designate specific roles including that of the Quality Control Engineer(QCE). The QVE shall be sufficiently qualified, experienced and trained to perform this task.
- 1.4 The Quality Assurance Program shall apply to all activities affecting the quality of work performed for Quality Assured Projects.

Our staff operates as a team, keeping lines of communication open at all levels to ensure we continue to provide our clients with high quality services. AI's continually strives to improve our already high quality of services and provide quality assurance to our clients. The program, as outlined below, provides a procedure that has been successfully used from conceptual planning to design, and from construction inspection to condition inspection. Although some projects have specific needs and may have their own Quality Control/Quality Assurance (QA/QC) Programs, they will generally follow the guidelines of this parent plan. Management Responsibility The management at AI ensures responsibility in implementation of procedures and parameters laid out in this plan through the participation of our top management.

2 - Quality System Documentation

Some multi-year projects require several documents to be submitted annually/yearly. Some of these documents include the *Consulting Agreement Affidavit*, *Gift and Campaign Contribution Certification*, *Certificate of Resolution*, *Affirmative Action Plan*, etc. AI follows a well defined protocol to ensure that the required documents are filed appropriately and on time. Upon receipt of the contract documents, which typically include some of the aforementioned certificates, our Operations Department, in conjunction with the Accounting Department and the Human Resources Department, reviews the paperwork provided, processes it by filling out the requested information and has it independently reviewed for inaccuracies or inconsistencies by Senior Management. Once it is determined that all information being provided is accurate and consistent it is mailed to the client with a tracking number to ensure receipt of delivery. Some certifications, for instance the *Affirmative Action Plan*, are not part of the original contract document package and yet may have to be filed annually or as and when there is a material change in the company making the previously

submitted documents obsolete. For such certificates our Operations Department maintains a comprehensive list in-house, based upon our prior experience on various multi-year projects with similar requirements, which serves as a checklist while preparing the information package. Most annual certifications are filed for renewal in the month of December each year; however, our Operations Department keeps a record of when such renewals are due so that they are filed and submitted on time.

All documents which are a part of the Q.A. Program shall be controlled documents and shall be revised and distributed in accordance with the Q.A. Procedures, for corrective measures and consistency.

All employees shall follow the following instructions so that our documents are controlled and should be identifiable and track-able. The parameters include,

- Appropriate title.
- A date of initiation and changes correctly, revisions marked and initialed
- Make documents accessible to intended users, and protect them so they remain usable.
- Save shared documents on the Intranet or on a shared drive, then provide shortcuts and hyperlinks pointing to the document rather than emailing the document as an attachment
- Set permissions on the Intranet and on shared folders to protect documents from unintended and unauthorized use and/or change.

Keeping your instructions, forms and similar documents current

- Management ensures that instructions, forms and similar documents in their area of responsibility remain current.
- Review your instructions, forms and similar documents as needed to ensure they remain current.
- If necessary, assign an expiration date and then review documents on their expiration date.
- If you retain obsolete instructions, forms and similar documents, mark them clearly as obsolete.
- Create and maintain project type specific documents broadly categorized as Construction Inspection, Design and Condition Inspection.

External documents

The above requirements on identification and distribution also apply to documents that originate outside of AI. If you modify any such documents (thus making them your own), all of the above requirements apply.

3 - Contract Review

Understand and review Scope of Work thoroughly and an Executed Agreement in place. Understand the quality and quantum of work deliverables, budget and time line.

Scope of Work may include meeting with the Client's Authority, preparing structural engineering studies, condition surveys, designs, contract drawings, technical specifications and construction cost estimates for new facility structures and the renovation and rehabilitation of existing structures. The scoping may include providing a preliminary estimate, life expectancy of rehabilitation time line analysis for design and construction phase.

Identify critical aspects and milestones for schedule and cost controls and then layout important parameters involved in the assignment. Establish periodic internal reviews to monitor milestone progress and quality.

Staffing; Assure that the Team is adequately staffed and are expertly experienced and qualified to perform the designated Task. Manage the division of work for subconsultants and assure their participation is meaningful and as required; provide additional qualified teams when required and for emergency response.

Information; Provide the Teams with all related design guidelines, information, and manuals including but not limited to Federal Highway Bridge Inspection Manual, respective States Inspection Manuals, Authority's manual for condition and design of Buildings, Authority's Light Weight Ceiling Design Criteria and Plaster Ceiling Design standards, Safety Manuals, the QC Plan, the emergency contact's schedule, and milestones.

Equip teams with the required equipment, vehicles, tools, hardware, and software for performing daily tasks. Include D-Meter and/or calipers, work lights, vertical clearance rod, plumb bob, laptop computers with inverter and internet capability, manuals, health and safety plans, safety kits, and personal protection equipment.

Assure that the designated teams review previous paperwork and highlight specific needs, conditions, deficiencies and/or extra pre-cautions.

Coordinate for implementation of OSHA construction operating procedures and specific Quality Control/ Assurance guideline specifications for the approval of the Authority.

Set up the project filing system to document and preserve information for future reference of all daily correspondent transactions and pertinent project data. Assure that electronic storage of filing systems are backed-up regularly to safe-guard against the loss of data.

Constant Communication with the Authority to assure a quality and timely design and inspection within the stipulated schedule and budget. Submission of project deliverables; inspection reports,

progress reports and analysis reports are routinely submitted to the Authority for review and comment.

4 - Design Control

4.1 Design and Development Planning

AI plans and controls the design and development of our documents. These include plans, specifications and construction staging plans.

4.2 Design and Development Inputs

AI determines the inputs related to product requirements and keeps records of these inputs in compliance with the contract. All inputs are reviewed for adequacy, and to ensure that all requirements are complete, unambiguous and not in conflict with each other.

The inputs include:

- a) functional and performance requirements,
- b) information derived from previous similar designs (if applicable),
- c) statutory and regulatory requirements (as they may apply),
- d) other requirements that are essential for the design and development this including but not limited to:
 - a) soil testing reports
 - b) topographical survey reports
 - c) utility survey reports
 - d) hydraulic survey
 - e) environmental study

4.3 Design and Development Outputs

AI documents the outputs of the design and development process in a format that allows for verification against the design and development inputs. The outputs are approved by AI prior to release in order to ensure that they meet the following conditions:

- Meet input requirements
The outputs meet the input requirements for design and development.
- Detail
The outputs provide appropriate information for proper build-up and/or execution of plan
- Acceptance criteria
The outputs either contain or reference the criteria for product acceptance, and approval from the client

4.4 Design and Development Review

AI performs systematic reviews of the design and development at suitable stages in accordance with the design plan, documents the results of the reviews and any necessary actions, and maintains records in compliance with the contract. The reviews include representatives of those functions concerned with the design and development states under review.

These reviews address the following:

- Meet contractual and code requirements
AI evaluate the results of design and development and determine if they are able to meet requirements.
- Problems
AI identifies constructability and bid-ability any problems and proposes necessary actions.

5 - Record Keeping - Documentation and Process Control

5.1 Control of Documents

5.1.1 - General

AI has established, documented, implemented and maintains this Quality Procedure for the control of documents. This procedure defines how AI controls all documents that are required by our Quality Management System.

Records are a considered a special type of document; records are controlled according to the requirements in Chapter 4.2.4.

5.1.2 - Purpose

Ensure that the right persons have the current version of the documents they need, while unauthorized persons are prevented from use.

5.1.3 - Scope

All documents are controlled but the level of control is appropriate to the importance and impact of the document. These also depend on the type of project, and are enumerated below for construction projects, design projects and condition inspection projects. These documents lead to control of day to day operations and serve as a means of process control.

5.2 Construction Projects

Project records reflect contract compliance by the Contractor. The following record, and others will be maintained throughout the duration of the projects. These will be looked into by the QC Engineer.

- Project Diaries: The Inspector will maintain a field diary, which will contain entries of site related activities, instructions issued to the contractor and field checks performed. The diary may also contain their time in and time out on the project.
- Inspector's Weekly Reports (IWR) will be prepared by construction inspectors. This will show the status of the project related to completion, major activity or targets achieved by the contractor and any related event.
- Other records that will be maintained include Item Summary Sheets, Material Acceptance Records, Overrun Reports, Contract Change Requests, Material Test Records, Minutes of monthly progress meetings and incoming/outgoing correspondence.
- Emphasis laid on proper documentation plays a significant role in claim avoidance, tackling delay issues and assisting in a harmonious completion of the project.
- During the performance of the work, problems or potential problems to be addressed promptly
- Attempts to be made to minimize this type of change order to the extent possible within the terms and conditions of the contract
- Quality control consciousness are timely administrative actions, prompt responses to Contractor queries, proper coordination with other agencies related to the project including utility companies

- Compliance to Design Plans, lay out precision and accuracy within tolerance limits. Compliance to local, state and federal regulations as applicable.

5.3 Design Projects

- All bridge structure, building structure, highway and civil/site, design/rehabilitation project plans, specifications and estimate is reviewed by the QC Engineer at each progress submissions typically at 25%, 50%, 75%, and 100% of completion stages.
- Ground Survey/Mapping, Technical Accuracy including drafting errors and omissions,
- Structural analysis, including correctness of computer models, computations and review of assumptions.
- Conformance to client's standards and specifications and standard details, if applicable, or use standard CSI format. Project Manager apprises QC/QA reviewer of the project needs, specifications and an overview. Updated codes are made available.
- Quality of product drafting standards, report write up, photographs and other inclusions.
- Constructability Review and cost consciousness.
- Special provisions (if any) are drafted, reviewed and checked for complete conformance with Final Design Plans. All quantity computations, engineers' cost, and estimates are thoroughly reviewed prior to bid phase submissions of PS & E.
- Review meetings, discussions, feedback and additional information if available to be incorporated.
- Corrective and preventive action includes preventive measures for nonconforming and deficient conditions, tracking and overall improvement in quality.
- Document control is established by logging, correspondence, noted and transmittals.
- Summary findings of reviewer are noted discussed if necessary and comments complied.
- If sub-consultants are included they are required to maintain same quality and diligence for the final product.
- Ensure back up and safety of storage. This includes temporary storage to completion and perpetual storage.

5.4 Condition Inspection

Inspection Procedures- The QC duties of the Inspection Team Leader during the field inspection shall include:

- Observance of proper safety and traffic control procedures in accordance with the requirements of the contract and other applicable references.
- Proper recording of field conditions with clear, clean and complete field notes.

- Photographing deficient areas in accordance to requirement.
- Develop sketches or marked-up drawing in sufficient detail to describe the conditions.
- Cleaning of delaminated steel sections and measurement of remaining section to determine losses.
- Sounding of concrete structures to locate delimitations.
- Implementing of inspection and documentation procedures in accordance with the requirement of the DOT Bridge Inspection Manual.
- Proper reporting of safety and structural flag conditions.
- “Hands-on” inspection of non-redundant members, FCM's, and fatigue prone details.
- Documentation of access required for inspection.
- Updating of plans and inventory database upon observed inspection conditions.
- Documentation of section losses for load rating updates.
- Documentation for further investigations and/or design services, if necessary, to identify and resolve observed deficiencies.
- Assure that contents of inspection vehicle includes all required inspection tools and equipment and applicable manuals and references.

5.5 Quality Control Related to Operation Safety for all Field Work

1. Maintenance and protection of traffic with emphasis to minimize disruption to normal traffic and inconvenience to traveling public (i.e., set patterns such that it creates minimal tie-ups etc.)
2. Ensure safety of inspection team members, compliance with safety guidelines, gears, etc.
3. Proper timely, friendly communications in person, by phone, fax or e-mail with every person involved in field inspection including the client's representative present if any, Department of Transportation, access equipment vendors (snoopers, bucket trucks, etc.) and individuals, Town, City, State troopers, RR Flagmen, District Maintenance and other individuals involved in inspection.
4. Have all field staff constantly trained regarding legal and safety aspects of working inactive and or inactive railroad R.O.W.

5. The company has a comprehensive safety manual and project specific safety plans are developed depending on the project type, size, and complexity.

5.6 Control of Records

5.6.1 - General

AI has established, documented, implemented and maintains this Quality Procedure for the control of records. This procedure defines how AI controls records to provide evidence of conformity to requirements and of the effective operation of our Quality Management System. All such records are kept legible, readily identifiable and retrievable.

5.6.2 - Purpose

Ensure that evidence of conformity to requirements and of the effective operation of our Quality Management System is available as planned.

5.6.3 - Scope

All records are controlled.

5.6.4 - Responsibility

- The Management Representative is responsible for the Record Retention Guide.
- The department managers are responsible for filing, archiving and destruction.
- All employees are responsible for proper identification of records and obsolete documents.

5.6.5 - Record Retention Guide

The Management Representative sets up a Record Retention Guide that defines for each record or record type the following information:

- Electronic filing of records (Cloud based, web based or a proprietary storage system)
- The retention period, for specific Hard copies of records.
- The filing and archiving location, a naming system that can be tracked.

- The method of destruction

5.6.6 - Control of Records Process

All employees shall follow the following instructions so that our records are controlled.

(Note: the instructions correspond to the illustration above)

Recording

- Give the record a **title**.
- Add a **date** (do not use the auto date function!) and a **source** (e.g., your department and your initials).

Filing

- If you retain obsolete instructions, forms and similar documents, mark them clearly as obsolete.
- Index and file records so that they can be easily retrieved if needed.

Archiving and Record Retention

- Refer to the Record Retention Guide on the Intranet for instructions and retention periods.
- Label archive boxes with the following information: box number, contents, dates covered, destruction date.
- Keep a storage log listing archived records and their location.
- Keep archived records secure in a locked area throughout the required retention period.
- Destroy records that are passed their indicated destruction date. Most records must be shredded. See the Record Retention Guide for details.

Shredding

- As a rule of thumb, all documents that should not be seen by competitors or outsiders must be shredded. This includes extra printouts, copies and worksheets.
- See the Record Retention Guide for details.

6 - Purchasing

Not Applicable

7 - Customer-furnished Material

Not Applicable

8 - Product Identification and Traceability

Quality Management is the responsibility of every person who is engaged in design, drafting, construction management, construction inspection and survey related project deliverables. This philosophy is communicated to all staff members in weekly/monthly meetings and discussions. However, a senior team member with requisite experience and qualification is named as Quality Management Engineer. Often times, it is the Project Manager who takes on this additional formal role. For larger and/or complex project(s), a corporate Vice President with appropriate relevant experience in a discipline and/or sub-discipline, who is usually not involved in the day-to-day production and/or operations, is assigned as Quality Management Engineer. His responsibilities include:

- Attend meetings
- Administrative reviews of various invoices
- Review and monitor the quality control of field operations and reports
- Coordinate and implement basic training programs for inspectors and specialized instruction on aspects of the work requiring special attention, such as work safety, field issues related to critical details, unanticipated field conditions or any specific project related item.
- Provide inspectors with access to the latest applicable standards and training in proper use of inspection tools.
- Perform field review reports ensure elimination/minimization of repeated problems. Meet appropriate staff to remedy.
- Review all inspection reports, diaries, correspondence of significance.
- Provide monthly progress reports.
- Track financial and job progress.
- Continually train team members on the latest requirements.

AI applies the following controls:

- Product identification
 - a) AI identifies our situation by job numbers, where appropriate, by suitable means throughout the contract realization. Each job number is serialized and contains minimum information regarding the client information, contact information, duration, budget, type of services needed, project leader and staff assigned.
 - b) Each job may have subtasks and the staff with respect to that job and task, maintains time cards, reimbursable costs are identified and associated with the job number per contract applicability.
- Product traceability
 - a) Each proposal is tracked by the RFP Number

- b) Once a job is won, the job number is assigned to the project
- c) Budget and timeline for each job is tracked by the job number
- d) Performance and client feedback is also tracked by the job number
- e) Where required for inspection/testing activities or deliverables, project documentation describes the unique methodology for identifying and tracing individual jobs, and are linked to the contract

9 - Inspection and Testing

9.1 Inspection Control

The following are guidelines as what to inspect and test in a construction project.

A program for inspection of activities influencing quality to verify conformance with the contract, instructions, drawings, and specifications for accomplishing the activity.

Inspections shall be not be performed by the individuals who the activity being inspected, to ensure quality.

The inspection program shall include:

- Written Quality Control Procedures for performing inspections, which are approved by responsible management.
- Examinations, measurements, or tests of materials and work performed shall be carried out for each work operation to assure quality.
- Verification and acceptance of test applications based on approved procedures.
- Mandatory inspection hold points are indicated in the Inspection Plan for each project and the contract specifications.
- Inspection status is recorded on inspection reports to include:
 - Work in progress
 - Finished work
 - Supporting documentation identifiable to production and inspection personnel responsible for the operation
- Provisions to identify quality conformance and acceptance or rejection of work in progress
- Measures for final inspection
- All planned inspections will be performed, documented, and verified in the checklists below

Component Inspection	What To Inspect	
<u>Structural Steel</u>	<ul style="list-style-type: none"> ✓ Correct member shape, size and steel grade. ✓ Straightness, alignment, fabrication and erection within tolerances. ✓ Inspect tension/fracture critical steel members/CVN. ✓ Inspect for all fins, tears, silvers, burred or sharp edges and remove by grinding and/or sandblasting. ✓ Paint and or coating requirement ✓ Shop drawings, Plans and Specifications ✓ Operational Safety ✓ Transfer of Loads means 	
<u>Structural Concrete</u>	<ul style="list-style-type: none"> ✓ Conduct tests to determine important characteristics of concrete including slump, air-entrainment, temperature, density and cylinder strength. ✓ Mix design and Plasticizer content. ✓ Temperature at pour. ✓ Form strength, stability & alignment. 	<ul style="list-style-type: none"> ✓ Cement and aggregate certificates for gradation and CBR/ABR values. ✓ Grade and finish. ✓ Curing procedures. ✓ Rebar size and spacing. ✓ Quality of epoxy treatment. ✓ Concrete cover.
<u>Asphalt and Concrete Paving</u>	<ul style="list-style-type: none"> ✓ Time of dispatch. ✓ Asphalt content. ✓ Sulfur content. ✓ Thickness. ✓ Line and level (check for undulations) 	<ul style="list-style-type: none"> ✓ Compaction and Density. ✓ Mix design. ✓ Aggregate type and quality. ✓ Presence of deleterious material. ✓ Penetration.
<u>Painting/Galvanizing of Structural Steel</u>	<ul style="list-style-type: none"> ✓ NACE certified inspectors will be provided to check the paint coat thickness and uniformity. ✓ Number of paint coats. ✓ Galvanizing Thickness 	
<u>Electrical</u>	<ul style="list-style-type: none"> ✓ Circuitry. ✓ Leakages or voltage drops. 	

	<ul style="list-style-type: none"> ✓Wiring gauge. ✓NFPA 70, ANSI C2, NFPA 70E ✓Equipment and Rating 	<ul style="list-style-type: none"> ✓Supports and cable tray installations. ✓Joints and Insulation and Grounding.
<u>Mechanical</u>	<ul style="list-style-type: none"> ✓Fire damping. ✓Mechanical ducting size. ✓Noise control. ✓Electronic temperature controls. 	<ul style="list-style-type: none"> ✓Air flow, Ducting ✓Balancing. ✓Air changes per minute. ✓Leakages.
<u>Safety</u>	<ul style="list-style-type: none"> ✓Signs ✓Poisonous and Harmful Substances ✓Safe Material Handling, Storage, and Disposal ✓Fire Protection and Prevention 	<ul style="list-style-type: none"> ✓Ramps, Platforms, Scaffolds, and Ladders ✓Safety for Blasting, Welding and Cutting and mechanized Equipment ✓Ensure at least one life time during all phase of construction
<u>Doors, Doorframes and Windows</u>	<ul style="list-style-type: none"> ✓Handling, Storage and Protection ✓Installation ✓Performance of Work 	<ul style="list-style-type: none"> ✓Cleaning ✓Workmanship ✓Operation & Maintenance Instruction & Guarantees
<u>Masonry</u>	<ul style="list-style-type: none"> ✓Material Checks ✓Pigments ✓Mortar ✓Preparation Work 	<ul style="list-style-type: none"> ✓Installation of Masonry ✓Alignment ✓Chases and Recesses ✓Cleaning, Curing & Efflorescence
<u>Aluminum</u>	<ul style="list-style-type: none"> ✓Aluminum Welding Inspection ✓Power Source Selection ✓Health Hazard Information ✓Finish 	<ul style="list-style-type: none"> ✓Personal Protective Equipment ✓Glazed Aluminum Curtain Walls ✓Protection, Storage ✓Structural Adequacy
<u>Micro tunneling/ Trenchless Construction</u>	<ul style="list-style-type: none"> ✓Correct Mining Technique ✓Pipe Jacking Issues ✓Horizontal Pipe Driving Straightness 	<ul style="list-style-type: none"> ✓Horizontal Directional Drilling alignment ✓Guided Auger Boring ✓Spoils Removal
<u>Wood</u>	<ul style="list-style-type: none"> ✓Dimensions, irregularities & Alignment 	<ul style="list-style-type: none"> ✓Pressure Preservative Treatments of wood supports embedded in ground, seasoning

	<ul style="list-style-type: none"> ✓Bracing (permanent and temporary) ✓Nailing and Connections ✓Protection During Transport ✓Storage 	<ul style="list-style-type: none"> ✓Treatment of the soil around foundations, Termite Seals ✓Firestop and blocking
<u>Thermal And Moisture Protection</u>	<ul style="list-style-type: none"> ✓Application Method and manufacturer instructions ✓ Installation of Water stops, flashings ✓Joint treatment 	<ul style="list-style-type: none"> ✓Cleanliness and smoothness ✓ coating ✓ Grout reveals, depression, cracks ✓Underlayments, metal edge drips.
<u>Drywall</u>	<ul style="list-style-type: none"> ✓Joint treatment Compound ✓Straightness, Corners and returns. 	<ul style="list-style-type: none"> ✓Nails and Annular rings used ✓Attachment to Studs and Runner Channels
<u>Floor Coverings</u>	<ul style="list-style-type: none"> ✓Temperature at installation ✓Adhesives ✓Pattern Color, Distribution 	<ul style="list-style-type: none"> ✓Joints ✓Cleaning and Protection ✓Storage
<u>Plumbing</u>	<ul style="list-style-type: none"> ✓Number, Size and location ✓Storage for adequate weather protection 	<ul style="list-style-type: none"> ✓Materials, and workmanship ✓Secure connection, tightness ✓ Pressure tests where required

9.2 Test Control

Testing requirements are normally defined in the contract. Tests shall be conducted through an independent lab, by the methods specified in the contract. Documents and test results shall form an integral part of the project documentation.

10 - Test Equipment

10.1 Control of Monitoring and Measuring Equipment

In order to provide evidence that our equipment is calibrated to contract requirements, AI determines the monitoring and measuring activities to be undertaken, as well as the monitoring and measuring equipment needed are preformed in an accredited and approved lab.

- Measuring equipment
 - AI applies the following controls on measuring equipment where necessary to ensure valid results:
 - Calibration for in house equipment - Measuring equipment is calibrated or verified, or both, at specified intervals or prior to use. This calibration or verification is done against recognized measurement standards; where no such standards exist, the basis used for calibration or verification is recorded.
 - Calibration Status - Measuring equipment has a form of identification that enables us to determine its calibration status.
 - Adjustment - Measuring equipment is adjusted or re-adjusted as necessary. When measuring equipment is found not to conform to requirements, AI assesses and records the validity of previous measuring results. In addition, AI takes appropriate action on the equipment and any product that is affected.
 - Protection - Measuring equipment is safeguarded from adjustments that would invalidate the measurement results, and protected from damage and deterioration during handling, maintenance and storage.
 - Software - In cases in which we use computer software in the monitoring and measurement of specified requirements, AI confirms the software's ability to satisfy the intended application. This is done prior to the initial use and reconfirmed as necessary.
 - Records - AI maintains records of the results of calibration and verification in compliance with the contract.

10.2 Material

- Compliance to Materials Specified. Testing performed or certificates of Testing are compliant.
- Quality within allowable tolerance limits as specified
- Physical appearance not in deviation to specification. Performance Specification verified.
- Routine Testing: Concrete, Aggregate, Steel, Asphalt, Welding Shop/Field etc.
- Sampling and acceptance by attributes is correctly applied to the quality control methods adopted.

10.3 Work Elements

- Appropriate action to ensure that work is performed in accordance with contract specifications, applicable codes & practices.
- If further Training is required for the Staff to facilitate quality training for project staff.
- Ensure the appropriate and required testing program is implemented; evaluate, review, monitor and document results.
- Ensure that submittals meet the contract and project requirements and are submitted to the client as required and in a timely matter and are approved before implementation.
- Check completeness and thoroughness of reports, logs, and records, and that client communications in a timely and accurate manner.
- Provide oversight to subcontractors, clients, and project team members to ensure

that construction activities are completed according to design, safely.

- Report quality and safety incidents on the Company Incident Database, and ensure Client is informed about all pertinent incidents.
- Rejection of work item, initiate stop work or re-work in coordination with the client circumstances where nonconformance to prescribed work methodologies occurs.
- Ensure correct contractual procedure is followed for such action.
- Provide mentoring, direction, and subject matter expertise to Supervisors and/or junior level staff.
- In addition to the accountabilities above, other responsibilities, tasks, and deliverables may be assigned to the incumbent of this position
- Review the implementation and documentation of corrective actions and ensure that errors/ omissions are not repeated.
- Verify implementation and close-out corrective actions
- As needed, provide performance feedback regarding all staff to Senior Management.

11 - Inspection and Test Status

Not Applicable.

12 - Control of Nonconforming Product and Corrective Action

12.1 Procedure for acceptance of nonconforming products in design

- Items, services, or activities, which do not conform to requirements, shall be controlled to prevent their inadvertent use or installation.
- Control measures shall include provisions for identification, documentation, segregation, disposition, and notification of responsible management.
- Nonconforming items shall be reviewed and accepted, rejected, repaired, analyzed or reworked in accordance with documented procedures. As needed non-conforming conditions and will be analyzed and investigated, in order to document any non-conformances and analyze is non-acceptability with known engineering techniques standards and applications.
- Research any non-conforming material in respect of adverse effects, if any, to the other conforming material impact on strength and service life of the end product in relation to the contract requirements.
- Non conforming products or conditions that have been found in error shall have a Non Conformance Report (NCR) or Corrective Action Request (CAR) generated to track disposition, assign responsibility as well as time / date for completion. This process applies to all AI project personnel and its subconsultants / subcontractors. The NCR and CAR's are

issued, logged and monitored by the AI QA Manager, in communication and with approval of the client.

12.2 Procedure for acceptance of nonconforming products in construction

- The Chief Inspector/Resident Engineer or their sub-inspectors shall immediately advise the Contractor or their representatives, orally and in writing, that the work being performed is in violation of the Contract provisions. The inspector shall document these orders in a Non-Compliance Notice and also on his/her Daily Work Report. For each Non-Compliance Notice issued that requires a corrective procedure to ensure there is agreement as to the scope of the repair work required, the final/approved corrective procedure will be approved or issued by the client. In some instances, the correction is obvious and may be determined by project personnel. Project personnel are to obtain such approval, when required. When the corrective work has been completed in accordance with the approved corrective procedure, a Compliance Notice is to be issued to clear the Non-Compliance Notice. The Compliance Notice shall have the same number as the Non-Compliance Notice.
- The client's Project Engineer and/or Supervising Engineer should be immediately advised of the problem and any orders that were given to the Contractor.
- Additional measurements will be taken at the direction of the client's management.

13 - Material Handling, Storage, Packaging, and Delivery

Not Applicable

14 - Quality Records

Quality records are provided as evidence of compliance to the contract. The following records are stored and maintained either in hard copy or electronic storage system. These are used as project documentation and record. See Section 2 and Section 5.6 for further details. Quality records may be used for:

- Internal Quality Managements System Audits and Improvements
- External Client Audit Reports, Responses and Corrective Action Request Files
- AI Corporate Surveillance Audit and Budget Control
- Check-printed and submittal documents i.e., drawings, calculations, reports, cost estimates.
- Correspondence related to project quality and quality assurance

15 - Internal Quality Audits

15.1 Management Commitment and Audits

- AI's management philosophy is that QC is the responsibility of every person involved on the team from the Construction Inspector to the Project Executive. Formal designated members of the organization must lead and perform the QC functions of all tasks. To accomplish this objective there will be an interactive, three tiered level of quality oversight:
- **Tier One** oversight is the responsibility of the Project Engineers/Inspectors or the lead staff. AI's lead staff Engineers are responsible for all aspects of AI's performance on the project. They will interact daily with both the Construction Inspectors and the Owner's Representatives to coordinate work assignments and resolve issues. At a minimum, they will confer weekly with the client's Project Engineer to resolve issues and pre-plan future activities to ensure proper allocation of staffing and resources.
- **Tier Two** oversight is the responsibility of our Project Managers for all field operations. Our Project Managers have extensive experience in their respective fields that include design, construction of infrastructure, bridges, Transit facilities and are designated accordingly depending on size, complexity and required project parameters. They will assign work to their respective staff and follow up with day to day interaction to ensure total compliance with all project requirements. Special emphasis, in addition to project requirements for field work, is in compliance with all regulatory permits and safety.
- **Tier Three** oversight will be provided by AI's Project Executive or the Quality Assurance Manager who will interact with all personnel on site monthly and confer with the client's Project Engineer to measure performance and make any necessary adjustments.

15.2 Commitment to Internal Audits

Top management at AI has not only actively participated in developing and implementing our Quality Management System but is also committed to continually improving its effectiveness. Top management of AI clearly demonstrates its commitment by:

- Communicating to AI the importance of meeting customer requirements, as well as statutory and regulatory requirements,
- Establishing our Quality Policy ensuring the Quality Objectives are established,
- Conducting periodic management reviews of the Quality Management System, and
- Ensuring the availability of resources.

16 - Customer Focus

16.1 Customer Focus

AI is committed to customer satisfaction.

Top Management at AI provides leadership to ensure that we first clearly determine customer requirements, and then meeting those customer requirements, all with the aim of enhancing customer satisfaction.

16.1.1 Payments

All payments to the contractor will be accomplished utilizing the client's Project Management System. The following provides the oversight of AI's quality role:

- Project Engineer oversees assignment of inspection personnel to construction activities and reviews items of payments for work inspected.
- Project Engineer reviews Daily Work Reports (DWR's) to ensure coverage of work.
- If any items are made on an estimated basis they will be reviewed with the client's Project Manager and documented as to the method for making actual payments.
- The Project Engineer will review completed work on a monthly basis to determine progress and make an appropriate payment.
- T&M records will be maintained by the Project Engineer and payments made as required.
- The Project Engineer will perform a preliminary review of the DWR's for completeness and to ensure all required information has been received
- The DWR's will be organized and submitted to the Project Manager for review and signature. The Project Manager will review and verify information on DWR.
- Items on the payment estimate will be reviewed for material testing deficiencies. A list of deficiencies will be developed and forwarded to the Contractor with the preliminary payment estimate for agreement/resolution.
- Upon resolution material testing deficiencies and conflict resolution with the Contractor the estimate will be approved by the Project Engineer.
- The payment estimate will be forwarded to the client's Project Manager for review and approval.

16.1.2 Correspondence

- The project correspondence will be date stamped upon receipt and logged chronologically in an excel spreadsheet with reference to type
- A copy of correspondence requiring further action will be distributed to the appropriate individuals for action and a list of pending correspondence maintained and reviewed daily by the Project Engineer. Further action required and/or responses will be issued in an expeditious manner.
- All correspondence will indicate the Project No. and relevant information.
- All project related emails will be printed and maintained in the correspondence files.

- Correspondence received directly will be copied and the official copy forwarded to the client's Project Manager for their project records.

17 - Training

17.1 General Training

AI does the following regarding competence, training and awareness of our employees:

- AI determines the necessary competence for personnel who perform work that affects how our products conform to their requirements.
- Where personnel lack that competence, AI provides the necessary training or takes other actions in order to achieve the necessary competence.
- AI evaluates the effectiveness of the training or other actions taken.
- AI ensures that all our personnel are aware of the relevance and importance of their activities and how they contribute to the achievement of the quality objectives.
- AI maintains personnel files that include appropriate records of education, training, skills and experience in compliance with the contract.
- Training could be in safety training (OSHA), HAZMAT training, customer specific training, railroad safety training, high lift operating training.
- Training in technical augmentation, certificate examination, seminars, webinars, conferences, and the like.
- Corrective action training could be one on one specific to an employee or group of employees conducted by senior management.

17.2 Field Review and On-Site Training

It is AI's policy that each AI employee inspection team be field reviewed by AI's QC Engineer at least twice yearly. In some situations, more frequent review may be needed to appropriately address areas of special concern.

AI will conduct periodic field reviews throughout the year in sufficient detail and duration to enable the QC Engineer to determine whether the field inspections are being conducted and documented in full accordance with contract policies and procedures.

A Quality Control report shall be prepared by the QC Engineer to summarize each field review. The QC report shall specify the time, date, location of each field review effort. The report shall state the name and titles of all team members at the inspection site and list all major equipments used or operating in vicinity.

A completed "Field Review Checklist" with additional supplementary review documentation shall be attached to each QC report. Any deviations from standard policies or practices shall be clearly stated in a "Findings" section of the QC report. Positive attributes of the reviewed inspection shall also be documented.

The Project Manager shall maintain a separate file of all QC review reports. A record of the follow-up meeting shall be documented in the files along with the Review Report.

18 - Servicing and Statistical Techniques

Not Applicable