Construction Quality Management Plan

SR 520 Pontoon Construction Design-Build Project

Prepared for

Washington State Department of Transportation

Prepared by

Kiewit-General, A Joint Venture

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Construction Quality Management Plan Endorsements

Date	Name	Title	Signature
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Revisions

Revisions to this manual are made on a per-page basis as necessary to clarity, refine, or adapt the Plan for new or changed requirements. All manual revisions are recorded within the project's electronic document system, Centric Project®. Hard copies of this plan are not to be considered control documents and only the most recent version posted on Centric Project® should be considered current.

The following is a current list of revisions, including date and affected sections/changes:

Revision	Revision Date	Affected Section/Change
0	2/8/11	All sections- WSDOT review comments added
1	6/03/11	Added Section 4.6- Driven Steel Piling Acceptance
		Revised QA/QC Org. Chart, Appendix A1
		Revised Appendix C to reflect changes per RFI WSDOT 96 and RFI HNTB 20
		Added Appendix D- Lab Quality Systems Manual
		Added Pre Activity Meeting minutes
		Updated Appendix G Forms , added QA Checklists
2	12/30/11	
		Revised QA/QC Org. Chart Appendix A1
		Added Corrective Action Plans- Appendix E
		Added QA Checklists- Appendix G
3	3/6/12	
		Revised QA/QC Org. Chart Appendix A1
		Added Corrective Action Plans- Appendix E
		Added QA Checklists- Appendix G
3a	5/2/12	
		All sections- WSDOT review comments added

1.0 Management

1.1 Quality Policy

The following Quality Policy will be implemented by the project team and posted on the project site:

It is Kiewit-General's policy to meet project requirements as defined by the contract documents and to adhere to corporate quality objectives. Our principal quality objectives are to meet or exceed owners' expectations and to eliminate re-work by performing our work "right the first time." We monitor our performance against these objectives and require continual improvement.

1.2 Format

The Quality Management Plan is comprised of this Quality Manual and its Appendices. This manual describes the overall policies, program, organizational responsibilities, procedures, and the means of ensuring that all items of work are in conformance with the contract. The appendices describe the processes, procedures and details of reviews and checks that will be performed on the design of the project components, and the inspections and tests that will be performed on construction materials and workmanship to ensure the overall quality of the constructed project.

1.3 Project Quality Partnering Charter

Partnering is considered an integral part of this Quality Management Plan. A procedure for resolving conflicts will be developed during the initial partnering session. The partnering agreement will identify the dispute resolution system to be used if a dispute arises in the Quality Organization's sampling and testing process.

To reduce the number of disputes, Kiewit-General's Construction Quality Assurance Manager and WSDOT will review technical procedures, test methods, sampling procedures, equipment certifications, and lab procedures within the Quality Management Task Force meetings to look for procedural or technical causes for test discrepancies. Observation of sampling and testing method, as well as inspection of test equipment will be performed by a WSDOT Independent Auditor (IA).

1.4 Project Quality Organization

The Kiewit-General Project Management Team's quality organization is comprised of two separate groups; Quality Control (QC) and Quality Assurance (QA).

Quality Control, under the direction of the Project Manager includes design and construction. The design team is lead by the Design Manager who is responsible for design QC. The construction team is lead by the Construction Managers who are responsible for construction QC. The Design Manager and Construction Managers are responsible for the development and maintenance of the QC processes and procedures.

Quality Assurance is the primary responsibility of the Design Quality Assurance Manager and the Construction Quality Assurance Manager. The Design Quality Assurance Manager reports to the Design Manager and the Construction Quality Assurance Manager reports to the Project Manager. Together, the QA team is responsible for oversight and the requirements of QA auditing to ensure contract requirements are met.

The organizational chart in Appendix A1 identifies the lines of authority and reporting for key personnel in the Construction Quality Organization. The QA/QC Organization Chart in Appendix A1 will be updated as staffing levels change.

1.4.1 Quality Organization's Authority to Stop Work

The key Quality Organization staff identified above has the responsibility to identify quality problems and to recommend, provide, and verify implementation of solutions. If there is evidence that the Quality Management Plan is not being followed, all Quality Organization staff have the authority to stop work until the appropriate quality procedures are implemented.

After stopping work, the Design Quality Assurance Manager or Construction Quality Assurance Manager must notify the affected Design or Construction Manager and the Project Manager. When the issue(s) have been resolved to their satisfaction, the Design Quality Assurance Manager or Construction Quality Assurance Manager will allow the Design or Construction Manager to restart the operation.

1.5 Roles and Responsibilities

The entire Kiewit-General Team has the responsibility and authority to contribute to the achievement of the quality objectives as identified in the Quality Policy. The primary roles and responsibilities of the individuals that comprise the Quality Organization are summarized below.

1.5.1 Project Sponsor

- Review and approve the Quality Management Plan for the project.
- Periodically review Kiewit-General's performance with WSDOT personnel using WSDOT's Prime Contractor Performance Report (DOT Form 421-010 EF) and the Kiewit-General 4-Square Matrix.
- Designate appropriate trained personnel within the Quality Organization to perform quarterly audits.
- Review quarterly audits of the Quality Management Program to ensure the plan's ongoing suitability and effectiveness are satisfying the requirements of the contract and Kiewit-General's Quality Policy.

1.5.2 Project Manager

- Overall responsibility for ensuring the work performed by Kiewit-General and their subcontractors satisfies the requirements of the contract and Kiewit-General's Quality Policy.

- Review Quality Incidents, Non-Conformance Reports (NCR), and Non-Conformance Issues (NCI) with WSDOT on a weekly basis to ensure contract requirements are being met and the Quality Management Plan is suitable and effective.
- Implement recommendations made by Executive Oversight Committee based on quarterly audits of the Quality Management Program.

1.5.3 Construction Quality Assurance Manager

- Overall responsibility for implementing the construction portion of the Quality Management Plan including implementing, monitoring, and adjusting the processes to assure acceptable quality.
- Update the Quality Management Plan and facilitate the Executive Management Review.
- Coordinate with WSDOT's quality verification testing, inspection, and Independent Assurance (IA) requirements.
- Oversee QA testing and inspection. Coordinate and schedule resources to provide appropriate QA inspection and testing for all construction efforts on a daily and weekly basis.
- Review and approve Non design review (NDR) submittals
- Oversee material verification, and ensure all materials incorporated into the project have been approved and accepted. Maintain and update the Record of Materials (ROM).
- Completing the MCC (Manufacturer's Certificate of Compliance Checklist) Form 350-572 for all MCC received.
- Schedule quality check points as audits of on-going construction work for the duration of the project.
- Ensure all inspectors have appropriate training and certification for the types of construction activities they will be overseeing.
- Verify that all sampling and testing personnel have the appropriate training and certification for the types of materials they will be testing.
- Develop and maintain a list of lab equipment available, latest calibration data, and date of inspection.
- Stop any and all work that does not meet the standards, specifications, or criteria established for the project.
- Issue NCRs and maintain a Non-Conformance Report (NCR) log.
- Maintain utility relocations inspection information.
- Provide a monthly Certificate of Compliance to accompany the monthly invoice of all permanent construction and materials for conformance with Contract and design

requirements as required by General Provision 1-09.9(1).5 Certification by Design and Construction QA Managers.

- Use Statistical Analysis of Materials software to determine the acceptability of the test data, the total percent of the lot that is within specification limits and determine an appropriate pay factor.
- Coordinate the weekly Quality Management Team meetings during construction.

1.5.4 Quality Testing QA Supervisor

- Oversee all QA sampling and testing operations and review all Daily Inspection and Material Receiving reports.
- Ensure that qualified testers are performing tests according to proper test procedures.
- Track quality staff, labs, and equipment certification.
- Schedule, review, and verify for compliance all test reports performed by the QA testing laboratory.

1.5.5 QA Inspectors

- Inspect the work in a variety of areas, as required by the contract, plans, project specifications and hold points as defined in the Quality Management Plan.
- Perform inspections utilizing the detailed inspection plans and checklists.
- Complete Daily Inspection Reports.
- Prepare Materials Receiving Reports to document inspection and acceptance of permanent materials brought to the job site.
- Prepare documentation of field verification that all materials placed have been approved, including manufacturer and/or source, product identity, and quantities.

1.5.6 QA Testing Technician

- Perform tests on various materials in the laboratory or field in accordance with applicable test standards and procedures per Appendix C.

1.5.7 Construction Manager

- Coordinate with Construction Quality Assurance Manager on the schedule for work elements to ensure adequate staff is available for QC inspection, sampling, and testing.
- Review and approve all construction procedures and work plans to ensure Kiewit-General will meet all quality control requirements.
- Review and approve falsework drawings
- Identify operations requiring Pre-Activity Meetings.

- Meet with inspectors to review QC process requirements before starting any work element.
- Provide training to all personnel in the appropriate procedures to be used for the work element under construction.
- Track progress of Requests For Information (RFI) or Field Design Requests (FDR) initiated due to constructability issues or differing field conditions.
- Ensure quality reviews are coordinated with Kiewit-General personnel, WSDOT, and outside entities.
- Track quality issues identified during QC inspections and report to the Construction Superintendent. Cooperate in the development of strategies to correct quality issues.
- Review NCRs, NCIs, and QA inspection reports.

1.5.8 Construction Superintendents

- Develop construction procedures and work plans to meet all quality control requirements.
- Coordinate, administer, and document required Pre-Activity Meetings.
- Execute work process according to work plans and procedures to meet all QC requirements.
- Oversee QC sampling and testing to ensure the Kiewit-General means and methods during construction are sufficient to meet plans, specifications, and contract requirements.
- Report quality issues identified during QC inspections to the CQAM for inclusion in the NCR Log.
- Initiate and track Requests For Information (RFI) or Field Design Requests (FDR) required due to constructability issues or differing field conditions
- Submit required documentation to Construction Manager.

1.5.9 QC Engineers

- Perform quality control inspections to ensure conformance to the design drawings and specifications utilizing activity specific checklists that have been submitted to WSDOT 14 days before the start of the activity.
- Monitor subcontractor and supplier performance.
- Submit documentation to the Construction Manager.

1.5.10 Design Manager

- Overall responsibility for ensuring the design provided to Kiewit-General satisfies the requirements of the contract.
- Review, respond and track all comments provided by WSDOT regarding their design

- Review and respond to all FDR submitted to designer by Kiewit-General or WSDOT.
- Review all RFIs submitted to WSDOT by Kiewit-General.
- Periodically review Quality Incidents, Non-Conformance Reports (NCR), and Non-Conformance Issues (NCI) logs to ensure contract requirements are being met in regards to the design.
- Implement recommendations made by Executive Oversight Committee based on quarterly audits of the Quality Management Program.
- Direct and manage all design development, plan releases, specification releases, and QC.

1.5.11 Design Quality Assurance Manager

- Overall responsibility for implementing the design portion of the Quality Management Plan. Through audits, the Design Quality Assurance Manager shall be responsible for verifying and validating that the QA and QC procedures required by the Quality Management Plan are administered and being followed.
- Certify that all Design Documents have been subjected to all required QC checking procedures; all documentation has been completed and filed in an acceptable manner; and all design packages have been subjected to a QA audit prior to submittal to WSDOT or prior to release.
- Provide a monthly Certificate of Compliance to accompany the monthly invoice that the design meets the quality requirements as required by General Provision 1-09.9(1).5 Certification by Design and Construction QA Managers.

1.5.12 Materials Approval Engineer

- Cooperate with the Construction Quality Assurance Manager to review all Requests for Approval of Material (RAM) submittals and approve all permanent materials to be incorporated in the project.
- Approve materials in accordance with Section 9-1.5B of the WSDOT *Construction Manual*.

1.5.13 Design Discipline Lead

- Responsible to ensure the design meets the requirements of the contract.
- Oversee technical quality of design plan documents during development.
- Coordinate the design work effort with the design efforts of other disciplines and rectify any conflicts or omissions between disciplines.
- Assign qualified designers to check design work.
- Assemble and submit the review documents and quality records required by the Quality Management Plan.

- Assist Design Quality Assurance Manager in their verification that all QC procedures required by the Quality Management Plan are being performed.
- Respond to review comments as required.

1.5.14 Environmental Compliance Manager

- Environmental QC will perform a daily verification that environmental and permit commitments are being met.
- Environmental QA will perform weekly environmental compliance verifications. Coordinate with construction staff and managers on a weekly basis.
- Ensure overall environmental compliance for the project, including the authority to stop work.
- Principal technical advisor and coordinator for environmental issues
- Review engineering plans, provide internal QA/QC reviews, and documentation pertaining to environmental commitments.
- Prepare and implement a monitoring plan and identify when non-compliant events occur.
- Conduct field inspections to verify that proper sampling is occurring.

1.6 Staffing Levels

The quality organization will provide the staff needed to meet the contract requirements and project schedule. Monthly staffing levels will be provided to WSDOT in the Weekly Quality Management Team meetings during construction. WSDOT will review and comment on staffing levels to ensure project requirements are accurately met.

1.7 Quality Assurance Team

WSDOT and Kiewit-General will jointly form a Quality Assurance Team. The team meetings will address and rectify issues relating to inspection, substandard material quality, inadequate QA and QC processes that need to be adjusted, test results that are out of tolerance, disparity between QA and Quality Verification (QV) test data, future quality concerns, and any issues that WSDOT and Kiewit-General may have regarding quality of the project.

Attendees for this meeting will depend on the project stage but can include the Project Manager, Design Manager, Construction Manager, Design Quality Assurance Manager, Construction Quality Assurance Manager, Environmental Compliance Manager, Superintendents, and QC Engineers.

The Construction Quality Assurance Manager, or designee, will be responsible for setting the meeting schedule and agenda, and documenting the meeting minutes and distribution to attendees. At the start of the design and construction phases, meetings shall be held weekly to discuss quality issues. The meeting frequency may decrease as quality issues decrease.

By written notice, WSDOT reserves the right to permanently remove any of the following personnel from the project:

- A QA Teating Technician who does not perform QA tests in accordance with the test methods.
- A QA Testing Technician who does not report test results accurately.
- A QA Inspecting Technician or geotechnical or environmental monitor who, in the opinion of WSDOT, does not exercise good judgment in the performance of their duty.
- A QA Technician who is not certified in accordance with the Contract requirements.

1.8 Executive Oversight Committee

WSDOT and Kiewit-General will jointly form an Executive Oversight Committee to monitor the performance of the project team. The Executive Committee will consist of Kiewit-General's Project Sponsor and Project Manager, HNTB's Project Executive and Design Manager, and their WSDOT counterparts. These periodic meetings will discuss issues relating to Safety, Quality, Environmental Compliance, Schedule Performance, and Contract Administration.

The Kiewit-General project team is expected to receive a Superior performance rating, based on WSDOT's Prime Contractor Performance Report, as shown in Figure 2.

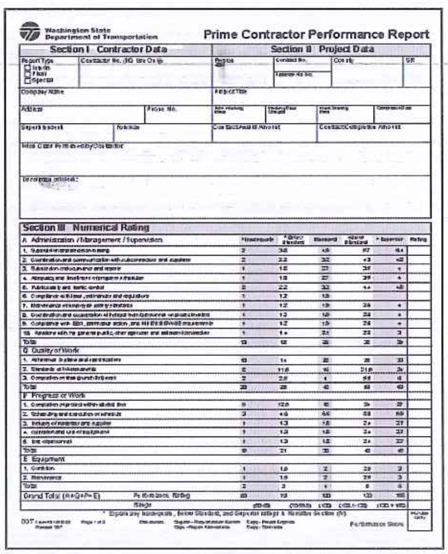

Washington State Department of Transportation
Prime Contractor Performance Report
Section I Contractor Data
Section II Project Data
Section III Numerical Rating

Figure 2 – WSDOT Prime Contractor Performance Report

To achieve this rating, the Executive Committee will monitor the team's performance using a 4-Square Matrix, as shown in Figure 3.

Figure 3 – Performance 4-Square Matrix

Each of the 20 categories identified on the Prime Contractor Performance Report will be addressed and placed in one of the boxes on the Matrix based on the following definitions:

Current Issues – A new problem or issue has arisen in a category which would give the project team a performance rating of Standard or Below Standard by WSDOT.

Ongoing Issues – A problem or issue previously identified as a Current Issue has not been resolved. This Ongoing Issue has the potential for giving the project team a performance rating of Inadequate by WSDOT.

Good Trends – The project team's efforts in a performance category is good and will produce a performance rating of Above Standard by WSDOT.

Steady Performance – The project's team is showing solid performance in a category and continued performance will produce a performance rating of Superior by WSDOT.

Any performance category within the Current Issue or Ongoing Issue box of the 4-Square Matrix will be placed on an action item list until resolved. Each action item will be assigned to a member of the Executive Oversight Committee to determine the best means to resolve the issue and oversee the project team's improvement so the category can be moved to Good Trends during the next committee meeting.

2.0 Administration

2.1 Document Control

All information required by the contract that is necessary to document acceptable performance of the work will be maintained in an organized manner and available electronically to WSDOT using Kiewit-General's electronic document control system, Centric Project®. Centric Project® is a web based information management and document control system designed to manage and integrate multi-team project information and meet the storage and directory requirements of WSDOT.

Documents will be posted and controlled on Centric Project® in accordance with the approved Document Control Work Plan (copy in Appendix B). All documents will be maintained for the duration of the contract. WSDOT will have the ability to access all of the pertinent documents needed to monitor Kiewit-General's performance administering the Quality Management Plan.

2.2 Revisions to Control Documents

The Quality Management Plan is a living document used on an ongoing basis throughout the life of the project. Therefore, an updated document will be posted and stored on Centric Project®, and will include a revision number and date to ensure tracking control. This allows us to maintain all previous editions, while prominently displaying the most current version for project personnel to open and review. Project team members subscribed to the project site will be notified through e-mail whenever a document is updated.

Hard copies of any controlled documents are to be considered reference only. The only controlled version considered being correct and to date will be the most current posted to Centric Project®. All project personnel are required to use the controlled documents in Centric Project® to ensure they are referring to the most current information and requirements.

The Design-Builder shall document all revisions made to the RFC and design documents during the construction phase of the Project by preparing new, revised, or supplemental documents (including plan sheets, Technical Specifications, calculations, reports, and narratives). The new, revised, and supplemental documents shall meet the requirements for the original documents. Every revision will be assigned a number. The revision number shall be assigned sequentially, with each change in a document or plan sheet identified by a revision number. The assigned number shall be located both at the location of the change on the sheet and in the revision block of the document, along with an explanation of the change. A new RFC or design document (including plan sheets, Technical Specifications, calculations, reports, and narratives) shall be issued after a maximum of five revisions have been made to the current document. All revised documents shall be submitted to WSDOT for review and shall be re-released in accordance with the RFC Submittal process prior to implementation of the revisions during construction.

2.3 Design Clarifications and Changes

Two processes will be used to request a change or clarification in the design documents being used to construct the project, Field Design Clarification (FDC) and Request for Information (RFI). Both of these processes are detailed within the Document Control Procedures within Appendix C.

The FDC process will be used when requesting a change or clarification in a Released for Construction (RFC) drawing(s) provided by Kiewit-General's designer of record, HNTB. The RFI process will be used when requesting a change or clarification in design drawings provided by and stamped by WSDOT. Neither one of these processes has the ability to change the requirements of the contract. Any FDCs or RFIs that incorporate or identify a change to the contract will not be incorporated into the work until properly documented on a change order or notice to proceed from WSDOT and approved by the Project Manager.

Work that is performed on repetitive processes, such as pontoon construction, additional measures will be taken to ensure that design or construction conflicts and the resolution to the conflicts are communicated to all parties involved in the work including QA/ QC inspectors and production personnel. This will include follow up documentation through the FDC or RFI process.

2.4 Submittals

The Project Manager will assign a designee to create and maintain a Submittal Log. The Submittal Log will be used to identify and track all of the submittals required to successfully construct the project to the contract requirements. The Submittal Log will be posted and maintained on Centric Project®.

The review process for each submittal is identified in the project's Document Control Procedures (Appendix B) and will be classified as follows:

Submittal for Design Review – Submittals for components designed by Kiewit-General's designer of record, HNTB, and needing to be reviewed and approved by them to ensure concurrence with design assumptions. These submittals typically contain design calculations performed by an engineer other than HNTB, or WSDOT, for an item considered permanent material.

Submittal for Non-Design Review – Submittals for components designed by Kiewit-General's designer of record, HNTB, and reviewed and approved by the Construction Quality Assurance Manager to ensure compliance with the design drawings, specifications and corporate policies.

Submittal for WSDOT Review – Submittals for contract required plans and/or components designed by WSDOT and requiring their concurrence.

All submittals will be reviewed and approved by the Construction Managers, or their designees, prior to being forwarded for review. It is the responsibility of the Construction Managers to

ensure all submittals are properly prepared and easily understood. Submittals ready for review will be posted on Centric Project® by the Construction Manager's designee and they are responsible for tracking its progress throughout the approval process.

The submittal tracking data will include the following information:

- Submittal Identification Number
- Receipt Date of Submittal Document – Logged into the notes of the submittal.
- Date Sent to Reviewer
- Date Reviewer Received
- Date Response is Due
- Date Received Back from Reviewer (Response Date)
- Status/Action or Decision of Review
- Date Returned to the Submitting Company

The number of submittals rejected or requiring revision will be tracked as a percentage of total submittals to monitor our performance.

2.5 Quality Reporting

One of our principal quality objectives is to eliminate re-work by performing our work "right the first time." We recognize an effective way to achieve this goal is to identify when re-work does occur so we can learn from our mistake. With this in mind the project team will review their work for compliance with the contract requirements and identify when it does not comply. Quality issues will be reported using two different processes, Non-Conformance Report (NCR) Log and Non-Conformance Issues (NCI). The NCR process is primarily used by QA personnel for quality issues not identified or resolved during the QC process and discovered by QA personnel. The NCI process is primarily used by WSDOT's QV personnel for quality issues not identified by either the QC or QA process. Each of these document processes is further detailed in the Document Control Procedures (Appendix B).

2.5.1 Non-Conformance Report Log

The NCR log is used by the QA/QC organization to document and track work put in place which does not meet the Contract requirements. The CQAM will maintain the NCR log and present the NCRs and Corrective Action Plans at the QA Team meetings. Each NCR will be logged with the following information:

- Date of Non-Conformance Report, QA or QC Inspector, and Type of Inspection Performed
- Discrepancy and Contract Requirement Not Being Met
- Superintendent and QC Engineer Responsible for the Work
- Proposed Resolution and Document Describing Resolution (FDR/RFI/Corrective Action Plan) if required
- Date of Resolution Inspection and QA Inspector

QA/QC Staff will identify and QA staff will document all elements of Work that have not, or are believed to have not been constructed in accordance with the approved drawings, specifications, and the reason for nonconformance in the NCR. NCR's with a high potential of reoccurring, as determined by the Executive Oversight Committee, will have a formal Root Cause Analysis performed. The analysis will be performed by the Construction Quality Assurance Manager and Construction Manager. Each Root Cause Analysis will include the following items:

- Define the Problem
- Determine Potential Causes
- Identify Potential Solutions
- Implement the Most Effective Solutions
- Verify Solutions were Implemented and Effective

NCRs will be submitted to WSDOT in writing within 24 hours of identification, and a copy sent to the Design Manager or designated engineers. NCRs and Root Cause Analysis's will be periodically reviewed to identify systemic problems with the Quality Management Plan so revisions can be made to eliminate them. Documented remedial actions shall be submitted to WSDOT for review within 24 hours and prior to performing the remedial action. The CQAM shall sign the NCR stating that the remedial actions have undergone the same level of inspection and testing as required in the original design. When WSDOT does not agree with the remedial actions set forth in the NCR, WSDOT has the authority to call for removal of the non-conforming work.

Non-Conformance Remediation

The NCR has several avenues for remediation depending on the severity of the problem. Among them are:

Remedy the situation—KPC corrects deficient work.

Prepare an RFI with proposed remedy to obtain the intended design purpose.

Design Related NCR Issue—The DQAM or CQAM will issue the NCR and request design review of the non-conformance. The QO is responsible for providing detailed information for the design team to review. The design engineer who signed and stamped the drawing for the work will evaluate and determine whether a non-conformance exists, and the effect of the non-conformance on performance, safety, durability, long-term maintenance, and the life of the item. Remedial actions will be documented and stamped by a Professional Engineer licensed in Washington. The DQAM must also sign the NCR, stating that remedial actions to be used have undergone the same level of checking, inspection, and testing as required for the original design.

Price Reduction—for the work element outlined in the contract specifications, the CQAM will perform the calculations in accordance with the contract, obtain written approval from the DM of structural adequacy if applicable, and forward this information to WSDOT and the Project Manager for administrative closure of the NCR.

Remove and Replace—The CQAM may require the CM to remove and replace any non-conforming work.

Remediation must have WSDOT concurrence and may require a change order.

Removal of Work

If WSDOT does not agree with the remedial actions set forth in an NCR, it has the authority to call for removal of the non-conforming work.

2.5.2 Non-Conformance Issues

NCIs will be issued by WSDOT's QV personnel when: (1) Work presented to them by Kiewit-General's QA organization as meeting the contract requirements is found to not be in compliance, and (2) Discrepancies are found during WSDOT performed quality audits. NCIs are considered a failure of both the QC and QA systems to properly monitor the work. With this in mind, WSDOT will issue NCIs through formal written correspondence which will require a written response by Kiewit-General. The Project Manager will notify the Project Sponsor upon receipt of a NCI from WSDOT.

All NCIs will have a formal Root Cause Analysis performed, and completed within one week. The analysis will be performed by the Construction Quality Assurance Manager and Construction Manager. The analysis will be reviewed and approved by both the Project Manager and Project Sponsor before being submitted to WSDOT with the NCI response. Each Root Cause Analysis will:

- Define the Problem
- Determine Potential Causes
- Identify Potential Solutions
- Implement the Most Effective Solutions

The project team will verify the solutions implemented are effective during the next quality audit.

2.6 As-Built Drawings

Kiewit-General and their design team will prepare as-built drawings for the project. As-built drawings will be compiled as the project is being completed and will be available for monthly review by the Design Quality Assurance Manager, Construction Quality Assurance Manager, and/or WSDOT. As-built drawings will be transmitted to WSDOT at major milestones. These milestones include:

- Completion of Off-Site Work;
- Completion of the Casting Facility;
- Segment Physical Completion of each Pontoon; and
- Demobilizing the Casting Facility at Project Physical Completion.

2.6.1 Casting Facility

As-built of the Casting Facility will be completed per section 2.12.5.2 As-Built Plans, to record how the project was constructed. As-built plans will reflect the same degree of detail as the RFC documents and will include: underground features, including buried or abandoned structures, shop drawings for pre-stressed structural elements, concrete reinforcing, and structural steel components. The shop drawings, as a portion of the as-built plans, shall be updated to include any subsequent field changes that occur after fabricated items leave the shop.

As-built plans will be transmitted as complete packages, in accordance with standard WSDOT numbering and naming conventions as defined in the WSDOT *Plans Preparation Manual*. The as-built plans shall include a cover sheet for the work, which will include the following:

- A written certification by the Engineer of Record that the as-built plans accurately and completely reflect all changes and corrections made during construction;
- The Engineer of Record's original signature, date of signature, original seal, registration number, and date of expiration; and
- An accompanying index and instructions.

Each sheet of the as-built plans shall be stamped or clearly marked "AS-BUILT".

Maintenance of Traffic (MOT) and Temporary Erosion and Sediment Control (TESC) Plans are exempt from the as-built requirements.

2.6.2 Pontoons

As-built plans of the Pontoons will be transmitted to WSDOT prior to each pontoon Segment Physical Completion as a record of how the pontoons were actually constructed. As-built plans shall reflect the same degree of detail as RFC Documents and reflect changes during construction, including any repairs required while being moored by Kiewit-General.

2.7 Progress Payment

2.7.1 Certification of Compliance

Each invoice will include a certificate signed by the Design and Construction Quality Assurance Managers that certifies:

- All work (including that of designers, Subcontractors, suppliers, fabricators, and builders) has been tested and/or inspected by either the Design QA staff or Construction QA staff.
- All work, except as specifically noted in the certification, conforms to the requirements of the Contract.
- This Quality Management Plan and all of the measures and procedures provide herein are functioning properly and are being followed.
- Invoice data sheets and supporting documents.

2.7.2 Contract Price Adjustments

A quality value has been established for various materials. Any deviations from those specifications are subject to contract price reductions as defined in the Contract Documents. Calculations for price reductions are made by the Construction QA organization and submitted to WSDOT for approval.

WSDOT bases any price reduction on the documentation of testing and inspecting results provided by the Construction QA organization, the quantity of noncompliant materials, and/or additional Quality Verification Testing by WSDOT.

2.8 Audits

The Project Sponsor and executive management shall approve the Quality Management Plan, and conduct a review or an internal audit of its effectiveness at least quarterly, and more frequently if repetitive QA issues and Corrective Action Reports have been issued. This review or internal audit shall ensure the plan's ongoing suitability and effectiveness in satisfying the requirements of the Contract and Kiewit-General's stated quality policy and objectives.

At a minimum, the Executive Management Review or internal audit shall evaluate the results of the review, WSDOT audit results, Corrective Action Reports, and plans implemented as a result of the NCRs and NCIs. Kiewit-General will respond within 20 Calendar Days to requests for the implementation of Corrective Action Plans that result from Executive Management Reviews. The Corrective Action Plan will be implemented into the QMP in a timely manner and any changes to the QMP will be approved by WSDOT.

2.9 Personnel Training

All personnel, including subcontractors, on the project will be made aware of the quality requirements of their position. Personnel will be trained in their job duties and the skills necessary to complete their work "right the first time."

2.9.1 Personnel Training During Design

The Design Manager will assign a designee to develop the design quality training for the project. The intent of this training is to ensure the entire project team understands the requirements and quality processes required for the project. Training subjects may include:

- Review of the Design Quality Management Plan
- Review of the Basis of Design Manual
- Review of WSDOT CADD Standards and Project CADD Manual
- Review of Commitment List and Permitting Constraints

2.9.2 Personnel Training During Construction

The Project Manager will assign a designee to develop the construction quality training for the project. There are four versions of this training.

Staff Training - Kiewit-General will review the Quality Management Plan with all salaried personnel prior to beginning construction. Periodic follow-up training will occur as quality audits occur and the plan is revised. The Quality Management Plan will also be reviewed by any new salaried personnel as they are assigned to the project.

New Hire Orientation - Quality will be addressed and documented at each of the four steps of the new hire orientation process. This will be documented and filed with the employee's folder.

Quality Tours – Periodic quality specific tours will be conducted by participants determined by the Project Manager. The results of these tours will be reviewed at the foreman's meeting and/or at the mass safety meeting.

Quality at Toolbox Meetings - Each crew on all projects will include a Quality related topic at their weekly toolbox meeting. The Quality topic will be documented on a Quality Toolbox Meeting form and should focus on the work they are performing.

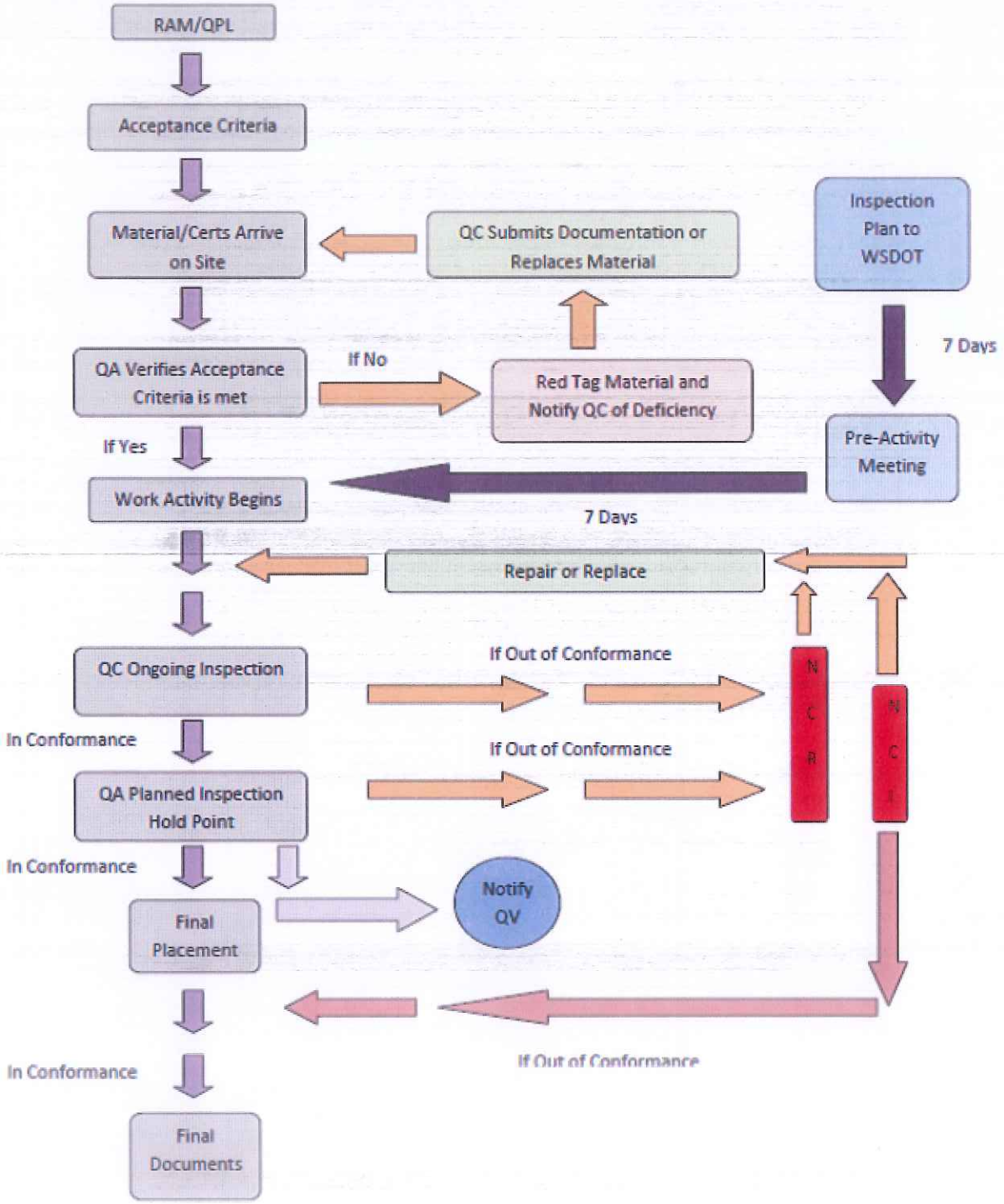
2.9.3 QA Personnel Training

QA staff shall be trained in the applicable procedures for inspection of work, geotechnical and environmental monitoring, and material sampling and testing. The professional training and experience of the QA staff shall be commensurate with the scope, complexity, and nature of the activity to be inspected, monitored, or tested.

All QA staff will be trained on Centric Project® document system for documenting Quality Checklist, RAM, ROM, Test Reports and project specifications. Training will be also provided to fill out Daily Inspection Checklist, Material Receiving Report and WSDOT construction inspection and documents training.

2.10 Processes Representation

Below is an overview of the processes and their relationships to each other, material acceptance, the inspection and test controls, and pre-planning.



3.0 Design

See Design QMP Submittal.

3.1 Review of Working Drawings

3.1.1 Falsework

Kiewit-General policy maintains that QC is responsible for design peer review and inspection of falsework. QA performs verification that Kiewit-General policies are being followed.

3.1.2 Shop Drawings

QA will review shop drawings.

3.1.3 Submittals

Engineer of Record will review critical submittals.

Non Design Review (NDR) submittals will be posted in Centric for review by the CQAM. These will be checked for compliance with contract requirements or verified to comply with project specific requirements such as requirements for third party or peer reviews. When the review is complete, the drawings and/or other documentation will be stamped "Released for Construction" by the CQAM.

Inspection Plans and Checklists will be reviewed for each work item and submitted to WSDOT 14 days before start of work activity.

4.0 Materials

4.1 Responsibilities

4.1.1 Quality Control Organization

Kiewit-General is responsible for the quality of construction and materials incorporated into the project. Our QC measures are intended to ensure that operational techniques and activities, performed by vendors and Kiewit-General, provide material of acceptable quality. The QC organization will monitor supplier quality control procedures, verify materials being ordered and supplied meet the contract requirements, and provide all required documentation to the QA organization.

4.1.2 Quality Assurance Organization

The QA organization is responsible for the acceptance of all materials and workmanship incorporated into the project. The QA organization will perform QA sampling and testing, determine acceptance/rejection of the materials, and implement a tracking system to monitor nonconforming materials and disposition of nonconforming materials, according to the contract.

4.1.3 Quality Verification Organization

WSDOT, or its agent, will perform an independent material QV to validate the Design-Builder's sampling and testing QA program. All verification sampling and testing will be performed by a statistically valid random sampling method using testing methods defined in the WSDOT Construction Manual, the WSDOT Materials Manual, and the Contract.

4.1.4 Independent Assurance

The Independent Assurance (IA) process validates both Kiewit-General's QA processes and WSDOT's QV processes. WSDOT will perform IA through observation of sampling and testing procedures, a review of the qualifications of the tester, and a verification of the testing equipment used to perform acceptance testing activities. The IA may include auditing of acceptance testing records, observing the tests being performed by Kiewit-General's technicians, or taking split samples with Kiewit-General on a random basis for verifying Kiewit-General's testing equipment. WSDOT will enter findings of all IA observations into the Construction Audit Tracking Systems (CATS). Any deficiency will result in an NCI and will require Kiewit-General to take corrective action immediately for any noted deficiencies.

4.1.5 Quality Assessment

WSDOT will perform non-scheduled Quality Assessments of Work- including sampling, testing, and documentation reviews for benefit of the owner.

4.2 Materials Process

The following outline identifies the Kiewit-General procurement process for permanent materials being incorporated into contract work that are not listed on WSDOT's Qualified Product's List (QPL). Materials listed on the QPL or a proprietary process will also be submitted to the CQAM for inclusion on the ROM.

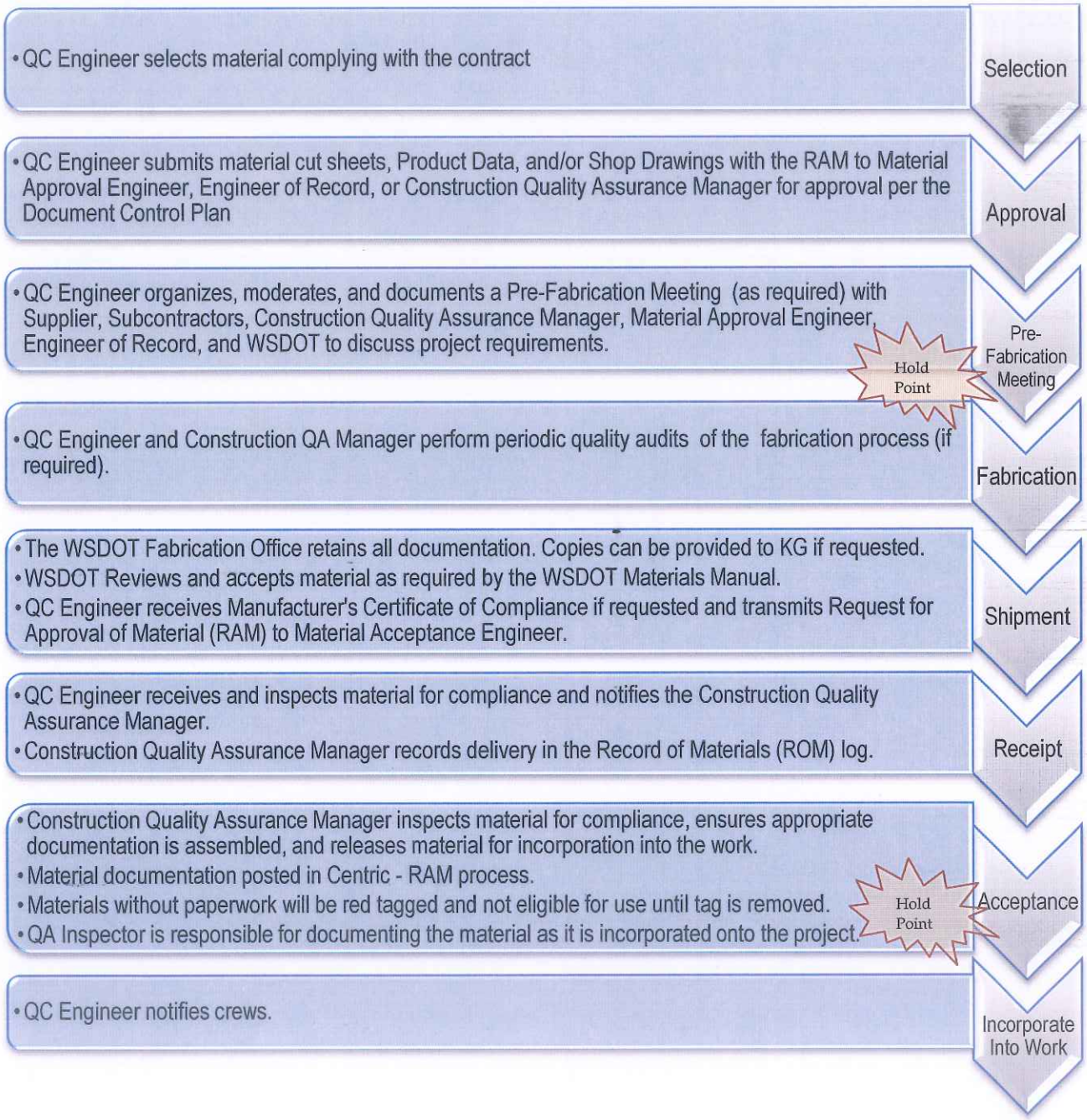


Figure 5 – Kiewit-General Material Procurement Process Outline

4.3 Materials QA Sampling and Testing

The QA organization will perform acceptance sampling and testing in frequencies identified in Appendix C –Testing and Inspection Frequency Plan. Activity specific Inspection and Test Plans will be prepared during the preparatory phase for each definable feature of work and perform the following:

- Identify hold points for when work will be accepted by QA personnel prior to proceeding to the next stage of the work.
- Define the activity to be tested or inspected, the agency/laboratory to perform the test or inspection, the frequency of the test or inspection, the test or inspection procedure or reference standard, the specified requirement reference, and the record that documents the results.
- Develop the Test Plans for materials that will be statistically accepted, for materials that will be non-statistically accepted, and for materials that will be accepted by small quantities.

The standards to be followed for material QA sampling and testing is identified below in Figure 6 – Mandatory Standards.

Priority	Author or Agency	Title (Document No)	Location
1	KG/WSDOT	Special Provisions	Appendix B2
2	WSDOT	Amendments to the Std. Specifications	Appendix B1
3	WSDOT	Standard Specifications (M-41-10)	Appendix D 18
4	WSDOT	Construction Manual (M41-01)	Appendix D2
5	WSDOT	Materials Manual (M46-01)	Appendix D10
6	WSDOT	Qualified Product List (M46-02) (QPL)	Appendix D 13

Figure 6 – Mandatory Standards

4.3.1 Documenting and Tracking Material Sampling and Testing

Material tests will be tracked using a Record of Materials (ROM) log created by the Construction Quality Assurance Manager in Centric Project®. The Construction Quality Assurance Manager will discuss any issues pertaining to materials at the weekly Quality Management Team meeting. Any rejected materials will be removed from the project and NCRs will be issued as needed. Two hard copies of all manufacturer's warranties, guarantees, instruction sheets, part list will be transmitted to WSDOT.

4.3.2 Materials Documentation Review

Kiewit-General will schedule regular documentation reviews to ensure that all materials documentation and certifications are complete prior to the material being installed on the project. WSDOT will perform periodic formal materials documentation reviews as follows:

- Pontoon Casting Facility: At 15, 50 and 75 percent construction completion.
- Pontoon Construction: At 15, 50 and 75 percent construction completion.

A final review will be performed at the completion of the project to review all materials documentation.

4.3.3 Fabrication Inspection

Per Technical Requirement 2.28.4.7 Fabrication Inspection, the WSDOT Fabrication Inspection Office will be responsible for in-plant inspection and approval of items fabricated specifically for the project. Kiewit-General will notify WSDOT at least 30 Calendar Days prior to fabrication to allow for fabrication plant approval.

Kiewit-General will notify WSDOT at least 14 Calendar Days prior to commencing fabrication so WSDOT can begin monitoring the fabrication. Kiewit-General will provide WSDOT two copies of plans, specifications, and approved shop drawings for items being fabricated. WSDOT's Fabrication Inspector will be responsible for the following:

- Collecting and reviewing all material certification documents for acceptance
- Collecting and reviewing all of the fabricator's inspection reports for acceptance
- Visually inspecting the fabricated items for acceptance
- Maintaining the Inspection Daily Report

Items requiring fabrication inspection will be stamped or tagged for approval, by the WSDOT Fabrication Inspector, prior to being shipped to the job site. In the event, non-compliance will prevent approval of a fabricated item. WSDOT's Fabrication Inspector will notify the fabricator, the Construction Quality Assurance Manager, and the WSDOT Engineer's office for resolution.

4.4 Procedures to Ensure Laboratory Qualifications

All QA testing will be performed at Kiewit-General's on-site lab or a WSDOT approved laboratory reporting directly to the Construction Quality Assurance Manager. The laboratory will meet the requirements of AASHTO R-18 for qualified testers and calibrated/verified equipment and will accomplish the testing according to the test procedure they are performing. A Laboratory Quality Systems Manual (Appendix D) will be developed and maintained. The manual will include:

- Staff qualifications, position description, and qualification process
- Listing of the test procedures used
- Equipment, including verification and calibration procedures and inventory
- Test reports, worksheets, and forms
- Sample management
- Diagnostic and corrective action
- Quality systems review

WSDOT will perform an onsite evaluation of the facility, in accordance with the WSDOT Materials Manual, to ensure all work is being performed according to the contract. The evaluation will include audit and inspection functions; review of training, equipment calibration, and verification of records; and observance of testers as they perform the test procedures. For laboratories located outside of Washington State, or laboratories performing only minor testing,

WSDOT may use the AASHTO Accreditation program or another state's Department of Transportation to inspect the laboratory.

Kiewit-General will request the WSDOT inspection a minimum of 14 calendar days prior to the start of construction. Together with the request, Kiewit-General will submit a copy of the Laboratory Quality Systems Manual and a list of the testing procedures that the laboratory will perform throughout the project. The laboratory shall be properly equipped, staffed, and fully operational at the time of WSDOT's inspection and for the duration of its use on the project.

WSDOT will advise Kiewit-General in writing of any deficiencies noted during the inspection, and Kiewit-General will take immediate action to correct them. Work requiring laboratory acceptance will not proceed until the laboratory and staffs have been inspected and have received written approval from the WSDOT Engineer.

Off-site laboratories conducting environmental test/ analysis of environmental media and generated wastes that must be characterized shall have proper accreditation for the testing performed and properly manage the storage and disposal of the samples.

4.5 State Tested Items

Procedures for state inspected and tested items are as follows:

- Prior to sampling of the materials, Kiewit-General will provide 14 days notice to WSDOT prior to the sampling, and coordinate these activities with the WSDOT engineer.
- WSDOT Engineer notifies the Material Lab.
- Kiewit-General delivers the material.
- Material Lab performs testing.
- WSDOT Engineer notifies Kiewit-General when testing is complete.

4.6 Driven Steel Piling Acceptance

Procedures for acceptance of driven steel pipe piles are as follows:

1. Pile driving equipment will be approved by the Engineer of Record
2. Pile driving will be monitored by taking a continuous driving record of each pile on a log form approved by the Engineer of Record.
3. Pile driving logs for each completed pile will be forwarded to the Engineer of Record to determine that pile has obtained required capacity
4. Engineer of Record will notify QA of the acceptability of each pile driven and reported
5. QA will post results on Centric

5.0 Construction

This section defines the quality organization and systems designed to ensure that the specified materials are used and that the installation meets the contract requirements.

5.1 Quality Processes in Construction

The following processes outlined below in Figure 7 identify the responsibilities for QC/QA in each step of our planning, execution, and inspection of the work.

Quality Control		Quality Assurance
Review contract documents, codes, standards, RFIs, and submittals pertinent to operation.	Review Documents	Review contract documents, codes, standards, RFIs, and submittals pertinent to operation.
Reviews operation requirements with foreman and assemble a Work Plan and Inspection Checklist to ensure work is built per the contract.	Assemble Work Plan	Determine Acceptance Inspection Guidelines for Inspection and Testing Plan & provide QA checklists and Hold Points for Inspection Checklist.
Organizes and moderates Pre-Activity Meeting to review contract, work plan, submittals, and checklists. **Hold Point**	Pre-Activity Meeting	Documents Pre-Activity meeting and reviews Acceptance Inspection Work Plan. **Hold Point**
Foreman and engineer review work plan and checklists with crew.	Initial Meeting	
QC Engineer reviews work at the end of the day or other predetermined point with foreman and QA to ensure it meets contract requirements.	Initial Inspection	QA Inspector reviews work at predetermined point with foreman/QC Engineer, and WSDOT QV to ensure it meets contract requirements.
Daily review of applicable parts of the work plan by the crew. QC Engineer provides training as required.	Play-of-the-Day	
Foremen and QC Engineers review work as it occurs, signs off the inspection checklists, and assembles punch lists as required.	Follow Up Inspections	QA Inspector performs inspections and testing as required to maintain operations and signs off the inspection checklist.
	Acceptance	Ensures documentation is in order, checklists are completed properly, inspects work for acceptance and confirms QC punch list is complete and accurate.

Figure 7 – Quality Processes in Construction

5.2 Quality Control in Construction

Kiewit-General's Construction Managers are responsible for ensuring the work we are providing WSDOT adheres to the requirements of the contract by following the processes as outlined in section 5.1 Quality Processes. These processes fall into four stages: understanding and planning the work, communicating expectations through meetings, ensuring work meets expectations through inspections, and closing out work as the job progresses.

The project team will assemble a Verification Risk Assessment to determine the level of effort required for each operation and if every process in section 5.1 Quality Processes is necessary. The Verification Risk Assessment will identify:

- All operations for the project,
- The quality risks associated with each operation,
- Which process steps outlined in 5.1 Quality Processes are required, and
- The verification documentation most suitable to the risk.

5.2.1 Pre-Engineering Planning

Pre-engineering planning consists of those efforts required to properly plan an operation. This work includes assembling submittals and shop drawings for approval (as discussed in Section 2 – Administration), reviewing all pertinent RFIs and FDCs, and creating the Work Plans to be used by the craft. As much as possible, this information should be contained in a single binder. These Pre-engineering binders are intended to assist supervision in organizing their operations and are not intended to be provided to the crews. All information required by the crews should be contained within the Work Plan. Each work plan should contain:

- Operation overview – outline steps or procedures
- Safety - Job Hazard Analysis **(To be completed by Crews)**
- Environmental Controls
- Checklist relevant to the operation
- Budget and/or production goals
- Material and STS (small tools & services) List
- Equipment
- Schedule
- Material Handling Plan / Access Plan
- Subcontractors and Suppliers

5.2.2 Meetings

The meetings that are the responsibility of the QC organization to help ensure we understand and communicate the expectations of the work are as follows:

Pre-Activity Meetings – Pre-Activity meetings are held to ensure that all parties have a clear understanding of the work to be performed and agree on the contract requirements for a specific operation. Inspection Plans will be submitted to WSDOT 7 days prior to the Pre-Activity Meetings. Information contained within the Pre-engineering binders should be reviewed during the Pre-Activity Meetings. Pre-Activity Meetings will be scheduled for major operations as well as those posing a significant Safety, Quality, or Environmental risk. The scheduling and content

of the Pre-Activity Meeting is the responsibility of the Superintendent overseeing the operation with the assistance of the QC Engineer. Attendees of the Pre-Activity Meeting should include: Superintendent and Foreman, WSDOT, QA Inspectors, Environmental Compliance Manager, Subcontractors, Material Suppliers, and any third parties who may require acceptance of the work. The agenda for each Pre-Activity Meeting should include:

- Pertinent Specification Sections/Contract Requirements
- RFIs/FDCs
- Submittals/Shop Drawings
- Work Plans
- Checklists
- Inspection and Testing Requirements
- Schedule Overview

Refer to Appendix F for a list of Pre-activity meetings

5 Week Schedule Meetings – 5 Week Schedule Meetings are held to facilitate coordination between QA and QC, and to ensure that all testing and inspection requirements are being met.

Play-of-the-Day Meetings – Daily Play-of-the-Day meetings are similar to Initial Meetings but focus on just the work being performed for that day. Information passed on in Play-of-the-Day Meetings includes: JHA or Daily Safety Snap Shot, List of Activities Being Performed, Schedule/Production Requirements, and Inspections.

5.2.3 QC Inspections

The QC organization is responsible for ensuring the work is constructed to the requirements of the contract. These QC Inspections should be identified on the operational checklist as witness points and require sign-off by the QC Engineer, Superintendent, or Foreman. There are two types of inspections used by QC to ensure work is being constructed properly:

Initial Inspections – The first inspection of a major and/or repetitive operation performed by the QC Engineer to ensure work is being built as identified within the Work Plan. The initial inspection allows us to identify and stop work that will not meet the contract requirements before an operation gets too far. The Activity Checklist within the Work Plan should identify when an Initial Inspection is to be performed, who should perform it, and what the inspection entails.

Follow-up Inspections – The inspections that occur after an initial inspection and typically performed by the Foreman to ensure their crews are performing as required. Follow-up inspections that are WSDOT required Witness Points should be performed by the QC Engineer and identified on the Activity Checklist.

5.2.4 Close-Out Procedures

The QC organization is responsible for ensuring that work is completed and reviewed by WSDOT as the project progresses. The QC Engineer responsible for the operation should fully inspect their completed work to ensure it complies with the contract. Any discrepancies identified in the work should rectified as soon as possible.

The QC Engineer should notify the QA organization and an NCR written once all discrepancies have been identified and before the repair process has begun. This notification will begin the

acceptance process and QA will review the work to ensure all discrepancies have been identified. QC, QA, and WSDOT will review the final work when all discrepancies have been resolved.

5.3 Subcontractor Quality Control

A Subcontractor Risk Matrix will be assembled by the project team and periodically updated throughout the duration of the project. The Subcontractor Risk Matrix is prepared to determine the amount of risk each subcontract exposes Kiewit-General to, and establish controls to reduce the likelihood of these risks from occurring.

Each subcontractor will be assigned a Kiewit-General monitor who is responsible for ensuring they comply with all Safety, Quality, and Environmental requirements for the project. The experience of the subcontractor monitor should be based on the results of the Subcontractor Risk Matrix. The subcontractor is responsible for monitoring their own Quality Control and adhering to the contract requirements. Kiewit-General's subcontractor monitor is responsible for monitoring the performance of the subcontractor and identifying when they are not fulfilling their obligations by:

- Monitoring JHA's and Daily Safety Snap Shot
- Reviewing Submittals and Shop Drawings for Compliance
- Reviewing and Tracking RFIs and FDRs
- Reviewing Work Plans and Play-of-the-Day
- Assisting with the Planning of Pre-Activity Meetings
- Ensuring RAMs are Submitted Timely
- Auditing Subcontractors Performance of Initial and Follow-up Inspections
- Reviewing Final Work before Requesting QA Acceptance and WSDOT Review
-

5.4 Quality Assurance in Construction

Kiewit-General's Construction Quality Assurance Manager is responsible for ensuring that the work we are providing WSDOT adheres to the requirements of the contract by following the processes as outlined in section 5.1 Quality Processes and in Appendix C- Construction Inspection and Testing Quality Plan. These processes are intended to ensure personnel understand what is required of the work and properly documenting that the work meets the contract requirements.

5.4.1 Inspection Guidelines

During the final design of the project, Kiewit-General will review each item of work to determine which significant characteristics of the items need to be monitored during the construction phase. The inspection guidelines will include the appropriate criteria, tests, and inspection requirements identified in the Standard Specifications, the WSDOT Construction Manual, and the WSDOT Materials Manual. The Inspection Plan shall address the following elements within each item of Work:

- Identification - Work items included in the Inspection Plan.
- Characteristics - What characteristics of the item will be inspected?

- Acceptance Criteria - Design-Builder shall provide sufficient information for the inspector to use to determine if the item or activity is conforming or nonconforming.

QA/QC Inspectors will utilize the inspection plans and checklists that are submitted to WSDOT 14 days before the activity begins.

5.4.2 Field Verification/Inspections

The QA organization is required to field verify and document all materials permanently incorporated into the Project. The field verification or visual inspection will occur prior to, or during, placement of materials. Inspections shall be performed during all phases of the project from start to completion in order to ensure that work is in accordance with the Contract, RFC documents, approved submittals, and known requirements of the local jurisdictions.

Hold points will be identified where critical characteristics are to be measured and maintained, and at points where it is impractical to determine the adequacy of either materials or workmanship once work proceeds past a point. Hold points will be identified by the QA organization and provided to the QC Engineer or Superintendent no later than the Pre-Activity Meeting. The Design-Builder will provide WSDOT with three Calendar days notice of each hold point so that WSDOT, at its discretion, can observe or visually examine a specific Work operation or test. QC shall ensure that work does not proceed until inspection of the hold point has been performed by the QA organization.

Witness points will be identified as QC inspections in the construction process intended to facilitate early identification of non-conforming materials or workmanship where it would be impractical to remove, rework, or repair once the Work proceeds past this point. Witness points will be identified at Pre-Activity Meetings for coordination with QA and WSDOT staff for participation at their discretion.

The Construction Quality Assurance Manager will attend the weekly construction scheduling meeting to review and update the inspection schedule. Inspectors will be assigned for each work activity requiring an inspector according to the Inspection and Test Plan (ITP) outlined in Appendix D – Testing and Inspection Frequency Plan.

With the assistance of WSDOT, the Construction Quality Assurance Manager will schedule the inspection of utility relocations with the utility owner before construction. These inspections will be documented and placed in the quality record for that particular utility relocation.

5.4.3 Inspection Documentation

Daily inspection reports are the primary means to document that construction practices, finished work and sampling and testing have met the requirements of the contract. Kiewit-General will use WSDOT's Inspectors Daily Report or a similar form to maintain a written record of inspection results. Copies of daily inspection reports will be submitted to WSDOT daily. The Construction Quality Assurance Manager or their designee will review all daily inspection reports at the end of each shift for accuracy and completeness. All approved daily inspection reports will be posted on Centric Project® for review by WSDOT.

5.4.4 Material Sampling and Testing

The QA organization will complete field sampling per the requirements of the Contract and Appendix D - Testing and Inspection Frequency Plan. Further information can be found in Section 4.0 Materials within this Quality Management Plan.

5.4.5 Non-Conforming Work

Any work found not to be in compliance with the contract will be rejected using the procedures identified in Section 2.5 of Quality Reporting within this Quality Management Plan.

6.0 Surveying

All survey work will be performed in accordance with Kiewit-General's approved Survey Plan, the plans and specifications, and standard engineering and surveying practices under the responsibility of a professional land surveyor registered in the State of Washington.

6.1 Construction Staking Quality Control

6.1.1 Development of Field Books and Supplemental Field Staking Data

The Construction Surveyor will use an electronic model to establish field staking information such as coordinate data, station offset data, and property corner and right of way calculations. The Construction Surveyor will spot check the accuracy of the electronic model using the Released For Construction drawings.

The Construction Surveyor will use the electronic model to establish the geometrics for staking. This staking information, in the form of Stations and Offsets is used to develop field books. A separate field book is developed for each staking activity (i.e., utilities, slope stakes, etc). An individual, who has not been involved in the particular aspect of the field book data being checked, will spot-check the information for accuracy. The checker will document his check by placing a red check mark in the field book adjacent to the item checked. If errors are found, they will be corrected before inserting the red check mark.

For some locations, supplemental staking plots will be developed in addition to the field books to provide additional information to the survey crew. These supplemental drawings offer an additional level of quality control in more complex areas by providing a visual reference of staking points.

6.1.2 Field Survey

The Construction Surveyor will use conventional GPS technology surveying for construction field staking. Levels will be used to acquire the vertical element. The Survey Plan addresses specifics of the Construction Surveyor's method for staking construction points.

6.2 Construction Staking Quality Assurance

6.2.1 Verification of Field Book

To ensure that the Construction Surveyor has performed spot checks in accordance with Section 6.1.1 above, a QA Surveyor will periodically audit the field books.

6.2.2 Verification of Field Survey

The QA Surveyor will provide periodic checks on actual staked points to verify that the established points are good. This independent survey check on the Construction Surveyor may not be able to exactly duplicate the surveyed points due to inconsistencies in the methods. Since the difference in the field verifications may be greater than the allowable tolerances, the QA Surveyor will identify the field verified point to either conform to the design intent and/or conform to the project specification tolerances.

6.2.3 Documentation of Survey Verification

The QA Surveyor will document verification of field survey points. The control points will be verified by the QA surveyor using different control from the original survey control. The documentation will provide a description of the item checked, findings, comments, conformance with specifications and/or design intent, any action taken due to discrepancies, the resolution of any discrepancies, and any supporting documentation.

6.2.4 Resolving Discrepancies

If errors are identified during the field verification process, the QA Surveyor will notify the Construction Surveyor, the Construction Manager, and the Construction Quality Assurance Manager. The QA Surveyor and Construction Surveyor will try to resolve the discrepancy. The Construction Surveyor will have the opportunity to accept and correct the error or reject the discrepancy. If the discrepancy is not resolved, a meeting will be scheduled between the Construction Surveyor, Construction Manager, Construction Quality Assurance Manager, and the QA Surveyor to resolve the discrepancy. If the discrepancy is not resolved at this level, the issue will be escalated to the Project Manager.

6.3 As-Built Documentation

Field records will be maintained for all plan changes and will be submitted to Kiewit-General for inclusion in the electronic files. As-built drawing processes and procedures will be in accordance with Section 2.6 (As-Built Drawings) of this QMP and the approved Survey Plan.

7.0 Utilities

This section defines the QC and QA processes for the following elements associated with utility work required for this project:

- Design Manager may prepare plans for utility work, and is responsible for the checking of those plans.
- Design Quality Assurance Manager audits all utility relocation, modification, or installation plans to ensure conformance to the quality process.
- Construction Manager will be responsible for the quality control for the utility work, including checking the work and testing the materials.
- Construction Quality Assurance Manager will provide the quality assurance inspection, sampling and testing of materials used for the utility work and audit processes for compliance.

Utility activities will be monitored and tracked at the quality task force meetings.