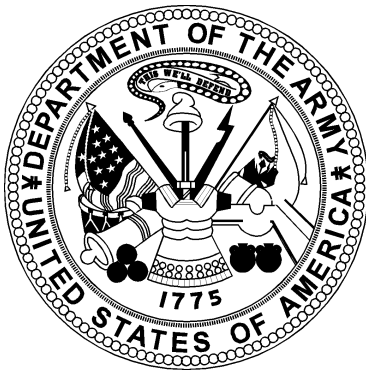


# **Construction Quality Assurance Plan Revision 1**

**For SWMU B-3 and AOC 65  
Remedial Activities and Other Construction Activities  
(CDRL A007)**



*Prepared for:*

**Camp Stanley Storage Activity  
Boerne, Texas**

**August 2006**

## TABLE OF CONTENTS

<b>LIST OF FIGURES .....</b>	<b>iii</b>
<b>SECTION 1 INTRODUCTION.....</b>	<b>1-1</b>
<b>1.1 Project Objectives.....</b>	<b>1-1</b>
<b>SECTION 2 RESPONSIBILITY AND AUTHORITY .....</b>	<b>2-1</b>
<b>2.1 Engineer/Contractor.....</b>	<b>2-1</b>
<b>2.2 CQA Personnel.....</b>	<b>2-1</b>
<b>2.3 Construction Subcontractor .....</b>	<b>2-2</b>
<b>SECTION 3 PROJECT MEETINGS .....</b>	<b>3-1</b>
<b>3.1 Preconstruction Meetings .....</b>	<b>3-1</b>
<b>3.2 Daily Progress Meetings.....</b>	<b>3-1</b>
<b>3.3 Problem or Work Deficiency Meeting .....</b>	<b>3-1</b>
<b>SECTION 4 PERSONNEL QUALIFICATIONS.....</b>	<b>4-1</b>
<b>4.1 CQA Officer .....</b>	<b>4-1</b>
<b>4.2 CQA Support Staff .....</b>	<b>4-1</b>
<b>SECTION 5 INSPECTION ACTIVITIES.....</b>	<b>5-1</b>
<b>5.1 General Preconstruction Activities .....</b>	<b>5-1</b>
<b>5.2 Design and Development Verification and Validation Process .....</b>	<b>5-2</b>
<b>5.3 Documentation and Records.....</b>	<b>5-1</b>
<b>5.4 Acceptance Criteria .....</b>	<b>5-1</b>
<b>5.5 Treatment of an Outlier .....</b>	<b>5-1</b>
<b>5.6 Corrective Measures.....</b>	<b>5-1</b>
<b>5.7 Documentation .....</b>	<b>5-1</b>
<b>5.8 Daily Recordkeeping .....</b>	<b>5-2</b>
5.8.1 Inspection Data Sheets .....	5-2
5.8.2 Problem Identification and Corrective Measures .....	5-2
<b>5.9 Acceptance of Completed Components .....</b>	<b>5-2</b>
<b>5.10 Final Documentation .....</b>	<b>5-2</b>
<b>SECTION 6 PROCUREMENT / SUBCONTRACT CONTROL PROCESS .....</b>	<b>6-1</b>
<b>6.1 Subcontractor/Supplier Evaluation Process .....</b>	<b>6-1</b>
<b>6.2 Preparation of a Purchase Order or a Subcontract .....</b>	<b>6-1</b>
<b>6.3 Bid Evaluation.....</b>	<b>6-2</b>
<b>6.4 Reviews .....</b>	<b>6-2</b>
<b>SECTION 7 MATERIAL CONTROL PROCESS.....</b>	<b>7-1</b>

---

<b>7.1 Review of Supplier/Subcontractor Submittals.....</b>	<b>7-1</b>
<b>7.2 Acceptance of Supplier/Subcontractor Items or Services.....</b>	<b>7-1</b>
<b>7.3 Handling of Materials and Items.....</b>	<b>7-1</b>
<b>7.4 Material Identification and Traceability .....</b>	<b>7-1</b>
<b>SECTION 8 DESIGN CONTROL PROCESS.....</b>	<b>8-1</b>
<b>8.1 FIELD DESIGN CHANGES .....</b>	<b>8-1</b>
8.1.1 Purpose.....	8-1
8.1.2 Scope.....	8-1
8.1.3 Responsibilities .....	8-2
8.1.4 Procedures.....	8-2
8.1.5 Forms .....	8-3
<b>8.2. STOP WORK NOTIFICATION.....</b>	<b>8-5</b>
8.2.1 Purpose.....	8-5
8.2.2 Scope.....	8-5
8.2.3 Responsibilities .....	8-5
8.2.4 Procedures.....	8-5
8.2.5 Forms .....	8-5
<b>SECTION 9 CUSTOMER PROPERTY CONTROL PROCESS.....</b>	<b>9-1</b>
<b>9.1 Customer-Furnished Product (CFP) .....</b>	<b>9-1</b>
<b>9.2 Customer-Furnished Information (CFI).....</b>	<b>9-1</b>
<b>SECTION 10 CONTROL OF MONITORING AND MEASURING DEVICES.....</b>	<b>10-1</b>
<b>10.1 Monitoring and Measuring Equipment.....</b>	<b>10-1</b>
<b>10.2 Calibration Control .....</b>	<b>10-1</b>
<b>SECTION 11 TEST CONTROL .....</b>	<b>11-1</b>
<b>11.1 Monitoring and Measurement of Product.....</b>	<b>11-1</b>
<b>11.2 Monitoring and Measurement of Construction Process .....</b>	<b>11-1</b>
11.2.1 Preparatory Testing.....	11-1
11.2.2 Initial Testing.....	11-2
11.2.3 Follow-up Testing.....	11-2
11.2.4 Final Testing and Commissioning .....	11-2
<b>11.3 Project Records.....</b>	<b>11-2</b>

## LIST OF FIGURES

Figure 5.1 Problem Identification and Corrective Measures Report .....	5-3
Figure 5.2 Daily Summary Report.....	5-4
Figure 5.3 Inspection Data Sheet.....	5-6
Figure 8.1 Field Change Memo/NCR.....	8-4
Figure 8.2 Stop Work Notification .....	8-6

## **ACRONYMS AND ABBREVIATIONS**

AOC	Area of Concern
CFI	Customer-furnished information
CFP	Customer-furnished product
CQA	Construction quality assurance
CQAP	Construction quality assurance plan
CSSA	Camp Stanley Storage Activity
DMCS	Document and Material Control System
DSR	Daily Summary Report
EIRC	Engineer in Responsible Charge
ISO	International Standards Organization
NCR	Non-conformance Report
O&M	Operation and Maintenance
PICM	Problem Identification Corrective Measures
PO	Purchase Order
RFP	Request for Proposal
RFQ	Request for Quotation
SCADA	Supervisory Control and Data Acquisition
SVE	Soil vapor extraction
SWMU	Solid Waste Management Unit
SOW	Statement of Work
TO	Task Order
VEW	Vapor extraction well

## **SECTION 1 INTRODUCTION**

This construction quality assurance plan (CQAP) is for the installation and testing of the remedial actions anticipated for Solid Waste Management Unit (SWMU) B-3 and Area of Concern (AOC) -65 at Camp Stanley Storage Activity (CSSA) in Boerne, Texas. This plan has been prepared to provide guidelines for the implementation of construction quality assurance (CQA) during construction and operation of the remedial system for effective and efficient operation. The purpose of this plan is to define the roles, responsibilities, authorities, and accountabilities for the remedial actions at CSSA. This CQAP is formatted to the ISO9001-2000 requirements as applicable. Project personnel performing duties affecting costs, schedule, quality, safety, and environmental compliance are responsible for meeting the requirements established in this CQAP.

### **1.1 PROJECT OBJECTIVES**

The objectives of this task order (TO) are multi-fold and will be achieved through a range of construction and engineering activities designed to meet CSSA requirements.

Interim remedial measures at SWMU B-3 will be effected with the installation of a Westbay<sup>®</sup> well monitoring network and new vapor extraction wells (VEWs), a push-pull tracer study, and the monitoring of enhanced natural attenuation of contaminants. The tracer study will include the acquiring the necessary permitting, subsequent injection process, and a 6-month detection period at SWMU B-3 and surrounding wells. The push-pull test will involve injecting a metabolic substrate to stimulate microbial activity within the subsurface and underlying aquifer.

The existing soil vapor extraction (SVE) systems at both SWMU B-3 and AOC-65 will be expanded to accommodate new VEWs and subsequently increase contaminant extractions. To this end, 12 months of operation and maintenance (O&M) at the SVE systems will be administered. This includes sampling and analysis of soil, water, and air samples to support the tracer study, interim actions, and O&M activities.

Permitting support of the selected remedial action, data validation, as well as preparation of appropriate documentation necessary to optimize the performance of the remedy planned at SWMU B-3 will be provided.

An upgrade of the two existing aboveground storage tank (AST) systems near the CSSA motor pool will be done to eliminate the operational deficiencies of the tank systems, improve their functionality, and enhance the safety, reliability and monitoring of the tanks. This includes integrating the tank monitoring system into the Supervisory Control and Data Acquisition (SCADA) system currently being implemented at CSSA.

Finally, this TO includes construction of a reclaimed water system using Outfall 001 wastewater. The system would allow automated irrigation of approximately five acres of onsite property using 10,000 to 20,000 gallons per day of sanitary wastewater effluent from CSSA's domestic wastewater Outfall 001.

## **SECTION 2**

### **RESPONSIBILITY AND AUTHORITY**

The principal organizations involved in the installation and construction of the TO 0006 systems are CSSA as the OWNER, Parsons Corporation, as the ENGINEER/CONTRACTOR and construction manager, and the CONSTRUCTION SUBCONTRACTOR(S).

#### **2.1 ENGINEER/CONTRACTOR**

Parsons as the ENGINEER/CONTRACTOR is responsible for design and construction of the systems. This responsibility includes assuring that the systems are constructed and installed to meet all design criteria, plans, and specifications. The ENGINEER/CONTRACTOR will also be responsible for commissioning the new or modified systems. However, CSSA will be responsible for the operations and maintenance of the AST and reclaimed water use systems.

The primary responsibility of the ENGINEER/CONTRACTOR is to design, procure and oversee construction of systems that fulfill the operational and performance requirements of CSSA. The ENGINEER/CONTRACTOR will also be responsible for responding to any Request for Information (RFI) posed by the CONSTRUCTION SUBCONTRACTOR(S) regarding the design. Any RFI will be expected to utilize the RFI form as provided in Appendix A. Consequently, the ENGINEER/ CONTRACTOR will make any decisions about the design or interpretations of design needs with respect to deviations from the specified design due to new information discovered or determined during construction activities by the CONSTRUCTION SUBCONTRACTOR, which could possibly result in the failure to meet specific provisions of the design criteria, plans, and specifications.

#### **2.2 CQA PERSONNEL**

The overall responsibility of CQA personnel is to perform those activities specified in the CQAP. The Construction Manager or his designee will serve as the CQA officer. Responsibilities of the CQA officer include:

1. Reviewing design drawings, specifications and contracts for clarity and completeness.
2. Communicating job and safety requirements to the CONSTRUCTION SUBCONTRACTOR(s).
3. Scheduling site inspections and directing and supporting the inspection staff in performing observations and tests.
4. Confirming that test equipment, personnel, and procedures do not change over time, or making sure that any changes do not reduce effectiveness of the inspection process.
5. Confirming that test data are accurately and properly documented and maintained.
6. Verifying that any raw data are properly collected, summarized and interpreted.
7. Providing the OWNER and ENGINEER/CONTRACTOR reports on inspection results including:
  - Reviews and interpretations of observation records and test results.
  - Identification of work the CQA officer believes should be accepted, rejected, or uncovered for observation, or that may require special testing, inspection, or approval.

- Reports that reject defective work and specify corrective measures.
8. Additional responsibilities of the ENGINEER/CONTRACTOR support staff include:
    - Verifying the equipment used in testing meets test requirements and that tests are conducted by qualified personnel according to the standard procedures defined by the CQAP.
    - Monitoring tests as may be required by the contract and/or the design specifications.
    - Performing onsite inspection of work in progress to assess compliance with facility design criteria, plans, and specifications.
  9. Reporting the results of all observations and tests to the OWNER and ENGINEER/CONTRACTOR as the work progresses, and providing assistance in modifying materials, procedures and work to achieve compliance with the specified design.
  10. Reporting to the OWNER and ENGINEER/CONTRACTOR results of all inspections including work not acceptable or failing to meet the specified design and contract requirements.

### **2.3 CONSTRUCTION SUBCONTRACTOR**

It is the responsibility of the CONSTRUCTION SUBCONTRACTOR(s) to construct the systems in strict accordance with the design criteria, plans, and specifications, as well as the requirements of the construction contract.

## **SECTION 3 PROJECT MEETINGS**

Periodic meetings held during the life of the project will clarify responsibility and authority associated with construction of the new or modified systems.

### **3.1 PRECONSTRUCTION MEETINGS**

A prebid meeting with the prospective CONSTRUCTION SUBCONTRACTORS followed by a kickoff meeting with the selected CONSTRUCTION SUBCONTRACTOR(s) will be held to resolve any uncertainties before commencement of construction activities. OWNER and ENGINEER/CONTRACTOR personnel as well as CONSTRUCTION SUBCONTRACTOR personnel will attend. This meeting will acquaint all parties with the CQA plan and their responsibilities with respect to the plan, establish communications channels, review CQA documentation procedures, and review work area security and safety requirements and procedures.

### **3.2 DAILY PROGRESS MEETINGS**

A progress meeting will be held daily to review work progress, plan upcoming work activities, assign and coordinate work assignments, and discuss potential construction problems.

The Construction Manager or his designee will schedule, chair and document these meetings.

### **3.3 PROBLEM OR WORK DEFICIENCY MEETING**

As needed, the CQA Officer or OWNER may call a special meeting to discuss construction problems or deficiencies. At these meetings, project staff will define and resolve problems or recurring work deficiencies that threaten the project quality, safety or integrity. The meeting will be documented by the Construction Manager or his designee.



## **SECTION 4 PERSONNEL QUALIFICATIONS**

The ENGINEER/CONTRACTOR will designate the Construction Manager/CQA officer and support staff assigned to implement the day-to-day activities and ensure that the construction activities meet or exceed requirements of the design criteria, plans, and specifications.

### **4.1 CQA OFFICER**

The CQA Officer is that individual assigned singularly responsibility for implementing all aspects of the CQAP. The CQA Officer is responsible to the design engineer and owner.

Qualifications of the CQA Officer assigned to the project include adequate academic and on-the-job training in engineering, construction management or closely-associated disciplines, and sufficient practical, technical, and managerial experience to successfully oversee and implement CQA activities during the construction period. The CQA Officer will ensure that communication of all CQA-related matters is conveyed to and acted upon by the affected organizations.

### **4.2 CQA SUPPORT STAFF**

The CQA support staff designated to assist in implementation of the project and CQA plan will possess adequate formal training and sufficient practical, technical, and administrative experience to execute and record inspection activities successfully. This includes demonstration knowledge of specific field practices and construction techniques concerning material and equipment installation, observation and testing procedures, documentation procedures, and site safety.

## **SECTION 5**

### **INSPECTION ACTIVITIES**

This section describes the inspection activities by ENGINEER/CONTRACTOR personnel during construction activities. CQA activities are necessary to ensure that the completed facility meets or exceeds the design criteria, plans, and specifications. Subsequent subsections address each facility component separately and are further subdivided into sections on preconstruction, construction, and post construction activities unique to each component.

#### **5.1 GENERAL PRECONSTRUCTION ACTIVITIES**

Prior to commencement of construction activities, the CONSTRUCTION SUBCONTRACTOR, ENGINEER/CONTRACTOR personnel, and the OWNER should review the design criteria, specifications and drawings to assure understanding of the requirements. ENGINEER/CONTRACTOR personnel will also review any inspection procedures at this time and, if necessary, will undergo training to familiarize inspectors with required procedures.

Inspection procedures will generally consist of three phases: preparatory inspection; initial inspection, and follow-up inspections.

##### **Preparatory Inspections**

Prior to the initiation of construction, preparatory inspections will generally consist of the following:

- Review contract and verify conformance to project objectives;
- Verify that materials and equipment from offsite sources have been inspected and/or tested as required;
- Verify that conformance documentation such as test results and performance data is submitted and approved prior to construction;
- Verify that QA/QC inspection procedures are in place;
- Discuss procedures for conducting the work and quality concerns with project personnel who will perform the work; and
- Review potential safety and environmental hazards that may be associated with the planned activity, including the presence of buried and overhead utilities.

The results of the preparatory inspections will be documented and included with the records for the project.

##### **Initial Inspections**

Initial inspections will occur just prior to the initiation and during startup of field work, and generally consists of the following:

- Examine the work area to ensure that all preliminary work has been accomplished in compliance with the contract documents;
- Physically examine required materials, equipment, and storage areas to ensure conformance with contract documents;

- Observe and verify that the construction methods and quality of workmanship meet the requirements set forth in the scoping documents;
- Perform receiving inspections, if required (as described further below);
- Check dimensional requirements relevant to the specific work activity and compatibility with subsequent or adjacent work; and
- Verify that safety procedures are strictly enforced and in full compliance with the Health and Safety Procedures.
- The initial inspections also include inspections of materials or equipment arrival at the job location and include the following:
  - Verification of the quantities of the materials, supplies, or equipment received;
  - Visual inspection of the materials, supplies, or equipment for damages, defects, or other quality aspects;
  - Acceptance of the transport manifests or other delivery documents; and
  - Coordination of material and/or equipment storage, if required, prior to construction of installation.

### **Follow-up Inspections**

Follow-up inspections are conducted during some construction activities to verify that work in progress meets technical, contractual, and regulatory requirements, and includes the following types of inspection activities:

- Material quality testing to verify that materials being used are in conformance with project requirements;
- Examination of the work area and QA/QC documentation to verify that all previous work has been accomplished in compliance with the project requirements;
- Placement testing to verify that materials are being placed and constructed in conformance with the plans and scoping documents; and
- Final follow-up inspections to verify that final surface grades and completed work are in compliance with the project requirements.

## **5.2 DESIGN AND DEVELOPMENT VERIFICATION AND VALIDATION PROCESS**

Competent qualified personnel possessing appropriate experience and educational credentials (other than those who prepared the design documents being verified) shall perform the verification of the design. Design verification shall include review of all disciplines to ensure design outputs have met the design inputs, and to evaluate the ability of the design and development to meet requirements. Any problems should also be identified along with proposed corrective actions. This so-called interdisciplinary review process may include verification of design supported by alternative calculations, a comparison of a new design with a similar proven design, undertaking tests and demonstrations, or modeling or simulation. At the completion of the design and development, the checker and the designer shall sign the design documents. The

design and development verification can be performed as a peer review, provided the reviewer is independent and did not participate in the design and development decision process.

Where previously verified design output is used, reverification is not required. The interdisciplinary review for previously verified documents shall ensure the applicability of previously verified or proven designs.

Design and development validation shall ensure design outputs meet regulatory requirements, and the requirements for the specified application or intended use, where known. Design and development verification and validation may be performed as part of the interdisciplinary review or through additional steps such as qualification testing and inspection. Wherever practicable, validation shall be completed prior to delivery or use of the product.

### **5.2.1 Construction Activities**

The construction activities listed in Table 5.1 include visual observations to ensure that all site preparation activities are completed prior to beginning installation of the bioreactor, equipment is operating properly and safely, installation of monitoring wells is completed properly, the mulch mixture is prepared properly and mulch availability will not slow construction, health and safety monitoring is performed, and the as-built records of the bioreactor are maintained. These inspection activities will ensure that the bioreactor is installed in accordance with the project scope of work and all components of reporting can be fully met.

### **5.2.2 Material Homogenization and Stockpiling**

The components of the gravel/wood chip mixture will be delivered to the staging areas separately and homogenized by a subcontractor. The homogenized mulch mixture will be stockpiled adjacent to the bioreactor for loading into the continuous trencher.

**Table 5.1**  
**Construction Inspection Activities for Bioreactor Construction**

<b>Construction Inspection Activity</b>	<b>Method</b>	<b>Frequency</b>	<b>Acceptance Criteria</b>
Demarcation of Bioreactor	GPS Site Survey – Survey in alignment and mark with grade stakes.	Once along bioreactor alignment prior to construction of the section.	Establish grade stakes along the designed bioreactor alignment according to the design drawings. Grade stakes shall be placed at the start and termination of each segment, at 50-foot intervals along each segment, at 20-foot intervals along curves, and at any change in biowall direction.
Demarcation of Monitoring Sumps	GPS Site Survey – Survey in monitoring sumps.	Twice: Prior to installation of hydraulically upgradient and downgradient sumps. Prior to installation of sumps in bioreactor.	Establish grade stakes at locations according to the design drawings.
Dig Permit Acceptance	Visual	Once prior to each monitoring sump or section of bioreactor installation.	Confirm that each location has been cleared for intrusive work and all utilities are clearly marked.
Equipment Examinations (Drilling and Earthwork)	Visual	Once upon arrival at site.	Determine that equipment type and size conform to project specifications and record information in field book. Determine that equipment conforms to OSHA safety requirements. Determine that equipment is in working order and is not leaking oil or fuel in quantities sufficient to be classified as a spill (Section 2.6).

<b>Construction Inspection Activity</b>	<b>Method</b>	<b>Frequency</b>	<b>Acceptance Criteria</b>
Gravel/wood chip Material Stockpile from the former SWMU B10	Visual	Once prior to commencing bioreactor installation.	Confirm that 50% of the required gravel/wood chip material is on site and homogenized.
Gravel/wood chip Mixture Delivery	Visual	Daily	Review the homogenized gravel/wood chip mixture and the individual materials (wood chips and gravel) as they arrive on site to ensure that they meet the specifications of the project.
Gravel/wood chip Mixture Examination	Weight Percentage of Organics	Every 200 feet along the alignment	Perform testing of the gravel/wood chip mixture as described in Section 3.2.7.1.
Equipment Decontamination	Visual	Prior to installation of each monitoring sump.	Confirm that the augers and other equipment that will be placed in the auger hole have been decontaminated.
Construction Methods Observation	Visual	During start-up and construction.	Ensure that the methods conform to standard construction practices and the worker safety is always a primary consideration.

### **5.3 DOCUMENTATION AND RECORDS**

Design documentation and records, which provide evidence that the design and development verification, validation and interface reviews were performed, shall be collected, stored, and maintained.

### **5.4 ACCEPTANCE CRITERIA**

Criteria for acceptance of materials or work sampled are to be provided by the ENGINEER/CONTRACTOR and/or Manufacturer.

### **5.5 TREATMENT OF AN OUTLIER**

Occasionally, in homogeneous samples, one of the test values may deviate markedly from the remainder. This is called an outlier. The identification and management of outlier data are important because outliers do not necessarily signify unacceptable construction methods or materials, even though they may lie outside established acceptance criteria.

The CQA officer will identify and manage outlier values. If the CQA officer determines the outlier as simply a manifestation of extreme variance, the outlier will be processed with the remainder of the data. If the CQA officer determines that the outlier may be due to sampling, testing, or other error, which prejudices the ability of the results to define construction quality, the block will be resampled. In cases when resampling is not possible or practical, the CQA officer may authorize statistical evaluation to determine the outlier significance. As a final alternative, the CQA officer may drop the outlier data from the evaluation if it is determined to be insignificant. The handling of outliers by resampling or failure to include the outlier data will be documented in the CQA records of the project.

### **5.6 CORRECTIVE MEASURES**

The CQA records of the project will contain the results of tests to document that the various components were constructed in a manner consistent with the design criteria, plans, and specifications. In cases where test results do not conform to the acceptance criteria, corrective measures will be taken.

For materials subject to 100-percent inspection, substandard material will simply be replaced and retested. For materials or workmanship subject to judgmental or statistical methods, test results outside of criteria will be evaluated as outliers and managed as previously discussed. Materials which the CQA officer determines to have failed testing or retesting will be replaced or reworked and then resampled as directed by the CQA officer.

In some instances, the design engineer and CQA officer may determine that test results reflect satisfactory construction quality, even though the acceptance criteria are not explicitly met. In these cases, the agreement that the sampled work is satisfactory will be recorded on a "Problem Identification and Corrective Measures Report" (see Figure 5.1). This report also will be signed by the design engineer.

### **5.7 DOCUMENTATION**

Recordkeeping on any construction project serves a number of important purposes including payment of contractor services, warranty documentation, as well as safety and health information backup. Most importantly, records, including As-Built Drawings are required to assure the

systems have been constructed in conformance with the plans and specifications. Additionally, well-organized and complete records will allow proper operation and maintenance.

## **5.8 DAILY RECORDKEEPING**

Required daily recordkeeping is the responsibility of the Construction Manager/CQA officer or his designee. Daily recordkeeping includes preparation of a daily summary report such as shown on Figure 5.2 with supporting data sheets or entries in daily logs as appropriate. When necessary, problem identification and corrective measures report(s) will be completed by the Construction Manager/CQA officer or his designee.

### **5.8.1 Inspection Data Sheets**

Observations and field tests may be recorded on an inspection data sheet. The inspection data sheet is shown in Figure 5.3. Any field notes or sketches made by inspectors or vendor tests results sheets will be provided to the Construction Manager either separately or attached to the inspection data sheets and provided with Contract Close-out documents. Photo documentation will be collected and included in reports as appropriate.

### **5.8.2 Problem Identification and Corrective Measures**

The problem identification and corrective measures report is shown as Figure 5.1. This report identifies material or workmanship not meeting the design criteria, plans, or specifications. Each time a block of work or other item does not meet these requirements, a problem and corrective measures report will be completed and signed by the CQA officer or designee.

## **5.9 ACCEPTANCE OF COMPLETED COMPONENTS**

Additionally, the Owner may use other forms to record inspections and acceptance of components during construction.

## **5.10 FINAL DOCUMENTATION**

Upon completion of each installation, the ENGINEER/CONTRACTOR with the aid of the SUBCONTRACTOR will prepare a final report or Job Book for the OWNER. This Job Book or report will include copies of all test and inspection reports, photographs, and as-built drawings.



**Figure 5.1**  
**Problem Identification and Corrective Measures Report**

SHEET No.: PICM-

LOCATION

DESCRIPTION OF IDENTIFIED PROBLEM:

PROBABLE CAUSE:

HOW AND WHEN WAS PROBLEM LOCATED AND HOW LONG  
HAS PROBLEM EXISTED?:

SUGGESTED CORRECTIVE MEASURES:

FINAL RESULTS:

SUGGESTED METHOD(S) TO PREVENT SIMILAR PROBLEMS:

\_\_\_\_\_  
CQA OFFICER          DATE

CORRECTIVE MEASURES INSPECTION RESULTS FOUND ON REPORT:

**Figure 5.2**  
**Daily Summary Report**

<p><b>DAILY MEETING SUMMARY</b></p> <p>Names of persons present:</p> <p>Purpose of meeting:</p> <p>Topics discussed:</p> <p>Supporting documents</p>	<p><b>SUMMARY OF CONSTRUCTION PROGRESS</b></p> <p>Location</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol> <p>Unit Process</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol> <p>Equipment and personnel working in</p> <p>Each Unit Process:</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol>	<p><b>FIGURE CQAP-2</b></p> <p><b>DAILY SUMMARY</b></p> <p><b>REPORT</b></p> <p><b>CONSTRUCTION OF</b></p> <p><b>SHEET No.:</b></p> <p><b>DSR-</b></p>
---	---	---

<p><b>MATERIAL SUMMARY</b></p> <p>Material Received/Vendor:</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> <li>4.</li> </ol>	<p><b>INSPECTION</b></p> <p><b>BLOCK INSPECTION SUMMARY</b></p> <p>Areas inspected</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol> <p>Results of inspections (reference insp. docs.):</p> <p>Results</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol> <p>Corrective Actions Initiated:</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol>	<p>_____</p> <p>DATE:</p> <p>_____</p>
<p><b>WEATHER DATA:</b></p> <p>High Temperature _____</p> <p>Low Temperature: _____</p> <p>Precipitation: _____</p> <p>Comments: _____</p>		<p>_____</p> <p>CQA FIELD OFFICER</p>

**Figure 5.3**  
**Inspection Data Sheet**

DATE:.....  
.....  
.....  
.....  
.....  
..... SHEET:

INSPECTION ACTIVITY

ACTIVITY LOCATION (building or well grid coordinates):

SAMPLE COLLECTION LOCATION(S) (if applicable):

INSPECTION PROCEDURE (e.g., visual obs., ASTM #, etc.):

OBSERVATION DATA (e.g., test results, notes, etc.):

COMPARISON WITH SPECIFICATIONS (test results vs. specs)

.....  
.....  
INSPECTOR.....  
.....  
..... CQA FIELD OFFICER

## **SECTION 6**

### **PROCUREMENT / SUBCONTRACT CONTROL PROCESS**

This section describes the procurement/subcontracting process and evaluation activities by CQA personnel during the construction activities. These activities are necessary to ensure, with a reasonable degree of certainty, that the procurement of materials and subcontracting of vendors meet the necessary quality requirements set forth in the CQAP. For the purpose of this CQAP, CSSA is defined both as the OWNER and the CUSTOMER.

#### **6.1 SUBCONTRACTOR/SUPPLIER EVALUATION PROCESS**

The evaluation and selection of the SUBCONTRACTOR/supplier shall be based on a bid analysis. Selection will be made based on responsiveness, the ability to meet specific bid requirements including certification, quality requirements, previous experience with the CONSTRUCTION SUBCONTRACTOR and last, but not least, cost. When potential suppliers or subcontractor capabilities are unknown, prior to award of a subcontract or purchase order (PO), the project staff shall perform qualification assessment.

Evidence of the subcontractor/supplier evaluation will be maintained by the ENGINEER/CONTRACTOR's Document and Material Control System (DMCS) or project files as appropriate. The OWNER's representative shall have the opportunity of verifying at the subcontractor/supplier's location that the item or process complies with the specified requirements.

#### **6.2 PREPARATION OF A PURCHASE ORDER OR A SUBCONTRACT**

Project staff will prepare a requisition to procure the items, system, or to subcontract the services. Each requisition will include an applicable Statement of Work (SOW) describing the item, equipment, or services to be furnished, including:

1. Technical requirements specified by applicable design output documents, drawings, specifications, process requirements, and other relevant technical data.
2. Quality program requirements appropriate for the subcontractor or the supplier ability to supply the product or services.
3. ENGINEER/CONTRACTOR and OWNER access to supplier/subcontractor and sub-tier facilities. Types of controls to be exercised may include requirements for source inspection at the supplier's or subcontractor's location during manufacturing, inspection, testing, and release for shipment commensurate with the effect of the product or services on the subsequent product or the final product.
4. Requirements for of subcontractor / supplier personnel qualification.
5. Supplier/subcontractor data requirements list specifying the submittal requirements.
6. Record retention time, when appropriate.

The subcontracts or procurement staff shall be responsible for including the appropriate commercial terms and conditions, issuing the request for proposal (RFP) or request for quotation (RFQ) to the potential bidders, and qualifying proposals received.

### **6.3 BID EVALUATION**

The project and the subcontract/procurement staff shall perform the bid evaluation to determine each supplier's capability to conform to technical and process requirements.

### **6.4 REVIEWS**

When required, subcontract or PO shall be reviewed for compliance with the project requirements (including the CQAP requirements) by the CONTRACTOR's quality representative or a designated individual. Prior to issue of the PO or the subcontract it will be reviewed by the ENGINEER/CONTRACTOR's management, project manager, subcontracts staff, and technical manager depending on the value and complexity of the subcontract or PO as described in the Parsons Corporate Matrix of Authority. All subcontract or PO amendments, if any, shall be controlled, reviewed, and issued in the same manner as the original subcontract or PO.

## **SECTION 7**

### **MATERIAL CONTROL PROCESS**

This section describes the material control process by ENGINEER/CONTRACTOR personnel during the construction activities. Subsequent subsections address subcontractor submittal and necessary surveillance unique to each component.

#### **7.1 REVIEW OF SUPPLIER/SUBCONTRACTOR SUBMITTALS**

The procurement/subcontract staff shall administer and control the review of supplier/subcontractor submittals. The documents shall be transmitted to the cognizant project staff for review and verification for compliance with the approved process, technical, inspection, and test requirements, as appropriate. The subcontractor/supplier is advised to revise the submittal incorporating the comments and resubmit for project approval or change to design output documents to reflect supplier/subcontractor submittal interfaces is requested through configuration control process.

#### **7.2 ACCEPTANCE OF SUPPLIER/SUBCONTRACTOR ITEMS OR SERVICES**

The supplier/subcontractor shall furnish documentary evidence that the item conforms to the procurement requirement. ENGINEER/CONTRACTOR shall identify the method to accept the item, system, or service at the time of receipt inspection. In addition, the receipt inspection performed and documented by the project staff shall confirm the configuration identification, dimensional, physical and other characteristics, freedom from shipping damage, and cleanliness. The method of acceptance shall be based on the certificate of conformance or objective evidence of compliance, source verification (inspection, surveillance or an audit), or post-installation testing.

#### **7.3 HANDLING OF MATERIALS AND ITEMS**

The project staff shall preserve the conformity and integrity of equipment or product during internal processing and delivery to the intended destination. The preservation shall include identification, handling, packaging, storage and protection. Preservations shall also apply to the constituent parts of the equipment or product.

#### **7.4 MATERIAL IDENTIFICATION AND TRACEABILITY**

Process Control assures that the applicable material item traceability is maintained during product acquisition. When traceability is specified by the OWNER the following requirements are implemented:

1. Materials, assemblies, and subassemblies (intended for use in fabrication, construction, maintenance, or operations) are identified and segregated until inspection confirms that they conform to technical and quality requirements.
2. Material identification markings are transferred from parent materials to their subparts prior to division.
3. Items remain identified until they are removed from service and such identification includes sufficient information to relate the items to the applicable design documents.

4. Materials are traceable to documents attesting to their conformance with technical requirements that are stated in specifications or drawings. Testing of materials will also be conducted as deemed necessary to verify conformance with material specifications.
5. Where practical, identification is maintained on the material or item or its container; however, methods of identifying materials and items shall not detrimentally affect the function or service of the material or item.
6. The product status with respect to monitoring and measurement requirements shall be identified during installation. This information will be included in the system O&M plan.

Permanent identification/labeling of all equipment, power and control panels, underground pipes, etc. shall required of the SUBCONTRACTOR by the ENGINEER/CONTRACTOR of all new or modified systems. Identification records to be maintained as a part of the system records shall be provided by the ENGINEER/CONTRACTOR to the OWNER.



## SECTION 8 DESIGN CONTROL PROCESS

### 8.1 FIELD DESIGN CHANGES

#### 8.1.1 Purpose

To establish the scope, responsibilities, procedures, and forms for the processing of field design changes during construction, responses to Nonconformance Reports (NCRs), clarifications and other designer input requested.

#### 8.1.2 Scope

Construction contracts often require field design changes to the original design of the project. Changes in site conditions, improvements to the original design, corrections to the original design, value engineering proposals, and preferred construction method/material proposals from the contractor are often viable reasons why the original design could require modification. The nature of this project requires an efficient method of processing these field design changes during construction.

Field Change Memos will be issued to document field design changes. This memorandum is necessary to inform construction personnel, and the Construction team members of authorized field changes and to help track field changes for as-built drawings. Field design change levels can either be "major " or "minor".

Field design changes will be classified as "minor" are as follows:

- Small adjustment in location or length of any feature to improve constructability or compatibility where there is no negative effect on feature performance.
- Corrections to plan dimensions or notes.
- Clarifying and/or improving construction details.
- Providing specific input on items that are addressed in design drawings with general notes such as "match existing " or "transition to fit".

Examples of major field design changes may include the following:

- Revision of any standard design feature or specific project design element to the mainline alignment, crossroads and significant detours, including structural section and change in access control.
- Addition, deletion, or modification to the work stipulated by written agreement between ENGINEER/CONTRACTOR and the SUBCONTRACTOR.
- Changes in the character of work or site conditions that result in requiring design drawings to be revised and re-released.
- Changes that are greater than can be accomplished through as-built redlining

The Construction Manager/CQA Officer, will determine whether a field change is considered "major" or "minor". Regardless of designation, all field design changes that can be logically represented with drawings or notes will be reflected on the as-built plans.

### 8.1.3 Responsibilities

The basic responsibilities for the personnel involved in design changes during construction are as follows. The Construction Manager/CQA Officer is the focal point for all field-generated design changes that must be made after the release of construction drawings. After the release for construction, the Construction Manager/CQA Officer is responsible for coordination, preparation, and forwarding of all field design change proposals to the OWNER. All proposals for major /minor design changes, or requests for other designer input regarding field issues are initiated and documented with a form called the Field Change Memo, see form at the end of this section). Preparing and presenting this form is the responsibility of the Construction Manager/CQA Officer.

The Construction Manager/CQA Officer has responsibility to ensure that ENGINEER/CONTRACTOR staff are provided the opportunity for a timely review of all field design changes. For changes classified as "minor", a copy of the completed Field Design Memo shall be signed by the Construction Manager (or designee) and forwarded to the Project Manager for acceptance. Major field design changes are to be copied to the Project Manager at the time they are generated for review and approval. Final distribution of completed major field design changes occurs as part of the standard distribution process.

The Construction Manager may respond to the Field Change Memos proposing minor changes without written designer input. If written designer input is determined to be necessary for the minor changes, the issue should be escalated to the Design Manager.

The designer of record or Engineer in Responsible Charge (EIRC) is responsible for providing the technical support required to evaluate field-generated design change proposals.

Authority to approve a Field Change Memo and release it to the SUBCONTRACTOR is as follows:

- Major Field Design Change: Field/Design Manager or a professional engineer of appropriate experience, if the original designer is no longer available.
- Major NCR Issue: Design Manager and Construction Manager (both signature approvals required)
- Minor Field Design Change: Construction Manager
- Minor NCR Issue: Construction Manager

Field design change communication is encouraged between Construction Manager and the Design Team.

The Construction Manager/CQA Officer shall be responsible to notify field personnel, in charge of assessing the work for conformance with the CQAP, of the upcoming changes contained in the Field Change Memo. Field QC personnel shall monitor the work elements impacted by the Field Change Memo and report on observed activities, which may be contrary to the intended modifications.

### 8.1.4 Procedures

Field design changes during construction will be accomplished by the following procedures:

- The proposed changes and proposed solutions are documented by the Construction Manager/CQA Officer on the Field Change Memo form. The

Construction Manager then designates change as "minor" or "major". The Construction Manager/CQA Officer will coordinate as needed any "minor" changes with the Design Manager by forwarding the Field Change Memo. The Construction Manager's staff either develops a response or ensures that the issue is distributed to the appropriate designer for analysis, design, and resolution. All final responses will come from Construction Manager.

- Major field design changes, as defined previously, require designer input. Such changes shall be approved in writing by the Design Manager. Major field design changes shall be subject to a design review and approval process similar to that for the original design. Any major design changes are subject to review and audit under the approved QA/QC process.

All designer input is transmitted to the Construction Manager/CQA Officer via a completed Field Change Memo. Supportive material is included as appropriate to facilitate verification of compliance with quality procedures. Not all parties on the distribution list need receive all supportive material.

- Responses to minor design change proposals, or other types of Field Change Memo responses not normally requiring formal QA/QC will be sent to the SUBCONTRACTOR as soon as a response is ready. Any associated calculations will be kept on file with a copy of the approved Field Change Memo for review/audit.
- Not all Field Change Memos involve actual field design changes. Field Change Memos will also be used to provide designer input for a NCR and general consulting. The NCR process can sometimes require designer input towards resolution of a NCR. In addition, designer input will regularly be solicited for clarification and/or professional opinion where no change results. The procedures for resolving NCRs will follow the same procedures outlined herein for field design changes, including but not limited to, the designation as "minor" or "major", and design QA/QC.
- Regardless of classification of Field Change Memo, all completed responses are returned to the Construction Manager for construction release and distribution.
- Construction Manager shall not release Field Change Memos for construction before all required QA/QC activities are complete.
- All minor and major design changes not reflected on the final approved design plans shall be reflected on the as-built drawings.

### 8.1.5 Forms

CQP Figure No: 8.1 Field Change Memo. Additional forms are provided in Appendix A which may be utilized as appropriate.

**Figure 8.1**  
**Field Change Memo/NCR**

Field Design Memo No:	(1)	Design Units:	(2)	(2)	(2)
Construction Segment:	(3)	Price Center Code:	(4)		
Requested By:	(5)	Date Requested:	(6)	Date Required	(7)
Subject Document Type:	(8) Specifications	(8) Standard Plans	(8) Other Contract Document	(8) N/A	
Affected Sheets:	(9)		(9)		
Memo Type:	(10) Major Field Design Change (FDC)	(10) NCR Issue - Design Input			
	(10) Minor Field Design Change (FDC)	(10) General/Clarification/Information			
Service Type:	(11) Post Design Services (PDS)	(11) Original Design Target			

Subject: (12)

DESCRIPTION OF ISSUE/PROPOSED RESOLUTION: (13)

MAJOR FIELD DESIGN CHANGE or NCR Initials: Design Oversight (14) Constr QA Mgr (14)

Design Approval (15)  
\_\_\_\_\_  
Engineer in Responsible Charge (Sign & Print Name) Date

Response written above (18)

Response attached

Approval or QC/QA Process (16)  
\_\_\_\_\_  
Design QA Manager/Designee (Sign & Print Name) Date

Contract document  
 Released concurrently  
 Release to follow  
 None to be released

Approval by Project Design (17)  
\_\_\_\_\_  
Design Manager/Designee (Sign & Print Name) Date

Change Order or Tech Agmnt Memo required  
 TCR/DCR not required  TCR/DCR complete

MINOR FDC, NCR & OTHER TYPES Initials: Design Oversight (19) Constr QA Mgr (19)

Design Approval (20)  
\_\_\_\_\_  
Construction QA Manager/PDS Manager (Sign & Print Name) Date

Response written above (21)

Response attached \_\_\_\_\_

Change order or Tech Agmnt Memo required

RECEIVED & ACCEPTED

Received & Accepted (22)  
\_\_\_\_\_  
Field Design Coordinator (Sign & Print Name) Date

CR not required  CR complete (23)

DISTRIBUTION: PARSONS/  
(24) Design QA Manager

OTHER

Document Control  
Design Manager

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## **8.2. STOP WORK NOTIFICATION**

### **8.2.1 Purpose**

To establish the procedure for issuance of Stop Work Notification by the Construction Manager/CQA Officer.

### **8.2.2 Scope**

This procedure applies to all work not in conformance with the contract requirements that has the potential to cause significant damage or rework as determined by the Construction Manager/CQA Officer.

### **8.2.3 Responsibilities**

The Construction Manager/CQA Officer has the responsibility to issue and to respond Stop Work Notification on items of work that have the potential to cause significant damage or rework.

### **8.2.4 Procedures**

When an item of work is identified by the quality control group to be a recurring non-conformance or has the potential to cause significant damage to existing completed work or rework, the Construction Manager/CQA Officer shall be notified. Upon notification the Construction Manager/CQA Officer will investigate the issue or item of work and determine the need for a Stop Work Notification. If the Construction Manager/CQA Officer determines that the work needs to be stopped, he will issue a Stop Work Notification in writing to the SUBCONTRACTOR on CQP Stop Work Notification Form. The work shall stop until the Construction Manager/CQA Officer determines the need to proceed at risk or until the required corrections are completed and approved by the Construction Manager/CQA Officer. Only the Construction Manager/CQA Officer may authorize the work to proceed at risk. All Stop Work Notifications and resolution will be documented in the Quality Control Records.

### **8.2.5 Forms**

CQP Stop Work Notification Form.

**Figure 8.2**  
**Stop Work Notification**

This notice is hereby given to stop work activities until further notification is given for the following work activity.

Work Activity: .....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Comments: .....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Date: \_\_\_\_\_ Construction Manager: \_\_\_\_\_

\_\_\_\_\_

**Resume Work Order**

Work Activity: .....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Comments: .....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Date: \_\_\_\_\_ Construction Manager :

## **SECTION 9 CUSTOMER PROPERTY CONTROL PROCESS**

This section describes the customer or vendor control process that is anticipated with potential use of propriety information or systems. These activities are necessary to ensure, with a reasonable degree of certainty, that vendor products or information are kept with appropriate accountability. For the purpose of this CQAP, CSSA is both the OWNER and CUSTOMER.

### **9.1 CUSTOMER-FURNISHED PRODUCT (CFP)**

At the time of issuance of CFP to Parsons, the Customer may require that the ENGINEER/CONTRACTOR be responsible and accountable for keeping the Customer's official records of the CFP. If ENGINEER/CONTRACTOR is not advised of the requirement to be accountable, ENGINEER/CONTRACTOR will control the CFP as material to be consumed during the execution of the contract. Material is defined as the property that can be incorporated into or attached to a deliverable end item or that can be consumed or expended in performing a contract. All CFP shall be controlled in the manner specified in Section 7. Any CFP lost, damaged, or rendered incapable of use shall be reported to the Customer as soon as reasonable possibly but no later than thirty days of such determination by ENGINEER/CONTRACTOR customer property administrator appointed by the Project Manager. A construction damage report form is provided in Appendix A.

### **9.2 CUSTOMER-FURNISHED INFORMATION (CFI)**

CFI issued by the Customer will be controlled in the manner specified in advance of receipt of such information.



## **SECTION 10**

### **CONTROL OF MONITORING AND MEASURING DEVICES**

#### **10.1 MONITORING AND MEASURING EQUIPMENT**

The ENGINEER/CONTRACTOR's project staff shall determine the monitoring and measurement to be undertaken and identify the monitoring and measuring devices needed as follows:

1. The monitoring and measuring devices shall be as specified in the technical documents. They shall be selected based on the type, range, accuracy, and tolerance required for determining conformance to specified requirements established in the design of the remedial systems. SUBCONTRACTOR shall supply specified devices to provide the proper range and accuracy for the intended use.
2. Monitoring and measuring devices shall be used in a manner that ensures that the measurement uncertainty is known and is consistent with the required measurement capability.

#### **10.2 CALIBRATION CONTROL**

SUBCONTRACTOR shall provide measuring equipment, which shall :

1. Be identified in the controlled inventory.
2. Be calibrated or verified at prescribed intervals, or prior to use, against measurement standards traceable to national or international measurement standards. Where no such standards exist, the basis for calibration or verification shall be documented.
3. Be identified with a label or identification record to show the calibration status.
4. Be adjusted or re-adjusted as necessary.
5. Ensure that environmental conditions are suitable for the calibrations, measurements, and tests being performed.
6. Be protected from damage and deterioration during handling, maintenance and storage.
7. Be safeguarded from adjustments that could invalidate the measurement result.

When the monitoring and measuring devices is found to be out of calibration, the project staff shall assess and document the validity of previous test results. The assessment will document appropriate action on the equipment and any product affected. The SUBCONTRACTOR project manager shall maintain calibration records for monitoring and measuring devices that will be incorporated into the Job Book or testing report upon substantial completion.

## **SECTION 11 TEST CONTROL**

### **11.1 MONITORING AND MEASUREMENT OF PRODUCT**

Industry standard test methods for monitoring and measuring the characteristics of the product to assure that the product requirements have been met shall be used. The remedial systems installers may develop an inspection based on the requirements contained in the design specifications, environmental requirements, and applicable O&M manuals.

The inspection and testing may include:

1. Product characteristics to be inspected, methods of inspection and test, acceptance criteria, frequency, and the report format for documenting the results of an inspection or test, (for example, the inspection and test plan may include, preparatory, initial, in-process, and final inspections for a construction process. Test requirements and acceptance criteria shall be approved by the organization responsible for the design.)
2. Appropriate environmental conditions, temporary changes necessary to an approved configuration for testing purposes.
3. Mandatory inspection hold points beyond which work shall not proceed without specific recorded consent of the authorized representative (Parsons or Customer).
4. Requirements for qualifications of the performer to conduct the inspection or test.

Test results, if generated, shall be documented and evaluated by the cognizant project staff to ensure that the test requirements have been satisfied.

### **11.2 MONITORING AND MEASUREMENT OF CONSTRUCTION PROCESS**

During construction of the remedial systems(s), Parsons may implement a four phase inspection and testing program for each definable feature of work. A definable feature of work is a task that is separate and distinct from other tasks and has separate control requirements. It could be identified by different trades or disciplines, or it could be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there is frequently more than one definable feature under a particular section, e.g. utility control, remedial systems operation, etc. The inspection and testing may be established to identify measurable process characteristics during each phase of inspection. The four phases of inspection are as follows:

#### **11.2.1 Preparatory Testing**

This testing is performed before the start of any definable feature of work. This phase shall ensure that the following required resources are available:

1. Equipment, labor, materials, approved documents, approved permits.
2. Inspection and test requirements.
3. Safety and environmental requirements.
4. Inspection and test equipment is available.

This process allows the project staff to schedule the work and the construction staff to be fully prepared to start and complete the work without interruptions and on schedule.

### **11.2.2 Initial Testing**

Initial testing shall be performed at the beginning of a definable feature of work, as soon as a representative portion of the particular item of work has been accomplished. During this phase, the Parsons inspector shall examine the quality of workmanship, review test reports, and conduct measurements. The initial testing is repeated for each new work crew or any time acceptable specified quality requirements are not being met. This confirms that the processes used produce satisfactory work.

### **11.2.3 Follow-up Testing**

The inspector shall perform follow-up testing and inspections frequently to ensure continued compliance with the approved drawings and specifications, including control testing, until the completion of the work. Any deficiencies identified by the inspection are corrected prior to continuing work. The process control staff may hold the item in process until inspection and test or necessary reports have been completed. If testing of processed items is impossible or disadvantageous, indirect control or monitoring of processing methods, equipment, and personnel may be conducted.

### **11.2.4 Final Testing and Commissioning**

At the completion of all work or any increment thereof, the inspector shall conduct a final inspection and testing of the work and operation of equipment. A punch-list of items that do not conform to the approved drawings and specifications shall be prepared during the final inspection. The punch list should specify the estimated date by which the deficiencies will be corrected. The inspector then shall make a second completion inspection to ascertain that all deficiencies have been corrected prior to acceptance. This phase is part of the Joint Acceptance Inspection with the OWNER.

Where the process fails to achieve the desired results, it shall be identified as a nonconformance and corrective actions shall be taken. ENGINEER/CONTRACTOR will not release for use any item or system until all punch list items and tests specified have been satisfactorily completed and the associated documentation is provided to the ENGINEER/CONTRACTOR.

## **11.3 PROJECT RECORDS**

The project staff will document the results of inspections, monitoring and measurements, etc. which may include the following information:

1. Identity of the process, product, equipment or system.
2. Date of monitoring, measurement or inspection.
3. Identification of measuring and testing equipment used.
4. Acceptance criteria.
5. Results and indication of acceptability; type of observation.
6. Identity of inspector.
7. Action taken in connection with nonconformance.

The records providing evidence that the process or the product has been monitored or measured shall be maintained as specified in Section 5 of the CQAP.

Other records that will be obtained and reviewed by the project staff include Operations and Maintenance manuals for adequate and proper content.

As-built drawings will be maintained by the Subcontractor as a condition of his contract. As field changes or deviations are made, the Subcontractor will mark up a single set of drawings to capture all changes in one location. Once the work is complete, the Subcontractor will have the hand mark-ups turned into electronic mark-ups. The Contractor's project staff will review the electronic drawings for accuracy and completeness. Drawings with any deficiencies or errors will be returned to the Subcontractor for correction before being issued to the Client 'as-built'.

**APPENDIX A  
SAMPLE FORMS USED IN PROJECT**

**PROBLEM IDENTIFICATION AND CORRECTIVE MEASURES REPORT .....11-5**

**DAILY SUMMARY REPORT .....11-6**

**INSPECTION DATA SHEET .....11-8**

**FIELD CHANGE MEMO/NCR.....11-9**

**STOP WORK NOTIFICATION.....11-10**

## PROBLEM IDENTIFICATION AND CORRECTIVE MEASURES REPORT

SHEET No.: PICM-

LOCATION

DESCRIPTION OF IDENTIFIED PROBLEM:

PROBABLE CAUSE:

HOW AND WHEN WAS PROBLEM LOCATED AND HOW LONG HAS PROBLEM EXISTED?:

SUGGESTED CORRECTIVE MEASURES:

FINAL RESULTS:

SUGGESTED METHOD(S) TO PREVENT SIMILAR PROBLEMS:

---

CQA OFFICER          DATE

CORRECTIVE MEASURES INSPECTION RESULTS FOUND ON REPORT:

**DAILY SUMMARY REPORT**

<p><b>DAILY MEETING SUMMARY</b></p> <p>Names of persons present:</p> <p>Purpose of meeting:</p> <p>Topics discussed:</p> <p>Supporting documents</p>	<p><b>SUMMARY OF CONSTRUCTION PROGRESS</b></p> <p>Location</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol> <p>Unit Process</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol> <p>Equipment and personnel working in</p> <p>Each Unit Process:</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol>	<p><b>FIGURE CQAP-2</b></p> <p><b>DAILY SUMMARY REPORT</b></p> <p><b>CONSTRUCTION OF</b></p> <p><b>SHEET No.:</b></p> <p><b>DSR-</b></p>
---	---	---

<p><b>MATERIAL SUMMARY</b></p> <p>Material Received/Vendor:</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> <li>4.</li> </ol>	<p><b>INSPECTION</b></p> <p><b>BLOCK INSPECTION SUMMARY</b></p> <p>Areas inspected</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol> <p>Results of inspections (reference insp. docs.):</p> <p>Results</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol> <p>Corrective Actions Initiated:</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol>	<p>_____</p> <p>DATE:</p> <p>_____</p>
<p><b>WEATHER DATA:</b></p> <p>High Temperature _____</p> <p>Low Temperature: _____</p> <p>Precipitation: _____</p> <p>Comments: _____</p>		<p>_____</p> <p>CQA FIELD OFFICER</p>



---

## INSPECTION DATA SHEET

DATE:.....  
.....  
.....  
.....  
..... SHEET:

INSPECTION ACTIVITY

ACTIVITY LOCATION (building or well grid coordinates):

SAMPLE COLLECTION LOCATION(S) (if applicable):

INSPECTION PROCEDURE (e.g., visual obs., ASTM #, etc.):

OBSERVATION DATA (e.g., test results, notes, etc.):

COMPARISON WITH SPECIFICATIONS (test results vs. specs)

.....  
.....  
INSPECTOR.....  
.....  
..... CQA FIELD OFFICER

## FIELD CHANGE MEMO/NCR

Field Design Memo No:	(1)	Design Units:	(2)	(2)	(2)
Construction Segment:	(3)	Price Center Code:	(4)		
Requested By:	(5)	Date Requested:	(6)	Date Required:	(7)
Subject Document Type:	(8) Specifications	(8) Standard Plans	(8) Other Contract Document	(8) N/A	
Affected Sheets:	(9)				
Memo Type:	(10) Major Field Design Change (FDC)	(10) NCR Issue - Design Input			
	(10) Minor Field Design Change (FDC)	(10) General/Clarification/Information			
Service Type:	(11) Post Design Services (PDS)	(11) Original Design Target			

Subject: (12)

DESCRIPTION OF ISSUE/PROPOSED RESOLUTION: (13)

---

**MAJOR FIELD DESIGN CHANGE or NCR**      Initials: Design Oversight (14)    Constr QA Mgr (14)

Design Approval \_\_\_\_\_ (15) \_\_\_\_\_ Date \_\_\_\_\_

*Engineer in Responsible Charge (Sign & Print Name)*

Approval or QC/QA Process \_\_\_\_\_ (16) \_\_\_\_\_ Date \_\_\_\_\_

*Design QA Manager/Designee (Sign & Print Name)*

Approval by Project Design \_\_\_\_\_ (17) \_\_\_\_\_ Date \_\_\_\_\_

*Design Manager/Designee (Sign & Print Name)*

Response written above (18)

Response attached

Contract document

Released concurrently

Release to follow

None to be released

Change Order or Tech Agmnt Memo required

TCR/DCR not required     TCR/DCR complete

---

**MINOR FDC, NCR & OTHER TYPES**      Initials: Design Oversight (19)    Constr QA Mgr (19)

Design Approval \_\_\_\_\_ (20) \_\_\_\_\_ Date \_\_\_\_\_

*Construction QA Manager/PDS Manager (Sign & Print Name)*

Response written above (21)

Response attached \_\_\_\_\_

Change order or Tech Agmnt Memo required

---

**RECEIVED & ACCEPTED**

Received & Accepted \_\_\_\_\_ (22) \_\_\_\_\_ Date \_\_\_\_\_

*Field Design Coordinator (Sign & Print Name)*

CR not required     CR complete (23)

---

DISTRIBUTION:    PARSONS/    OTHER

(24)    Design QA Manager    \_\_\_\_\_

   Document Control    \_\_\_\_\_

   Design Manager    \_\_\_\_\_

**STOP WORK NOTIFICATION**

This notice is hereby given to stop work activities until further notification is given for the following work activity.

Work Activity: .....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

Comments: .....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

Date: \_\_\_\_\_ Construction Manager: \_\_\_\_\_  
\_\_\_\_\_