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Previous Revisions: 03 May 2012

US Army Corps of Engineers®
Pittsburgh District

Charleroi Locks and Dam
Monongahela River
Westmoreland County, Pennsylvania

Emptying Basin Plans & Specifications
Project No. 113106
QUALITY CONTROL PLAN

	Signature / Date
Written by:	[redacted] 4/30/13
Reviewed by:	5/1/13
Reviewed by:	5/6/13
Approved by:	5/6/13

Quality Control Plan for Charleroi Locks Emptying Basin Plans and Specifications

1. Purpose.

This plan identifies all the quality control features to be used in completing the technical products and services described in paragraph 4.

2. Applicability.

This plan applies to completion of all deliverables of technical products and services including interim design, and construction contract drawings and specifications associated with this civil works project. Project internal design review and coordination by senior staff design "checkers" shall be performed prior to and independent of the quality control measures outlined herein.

3. References.

a. ER 1110-1-12, Quality Management

b. EC 1165-2-214, Civil Works Review

c. ER 1110-2-1150, Engineering and Design for Civil Works Projects

d. ER 415-1-11, Engineering and Construction Biddability, Constructability, Operability, Environmental and Sustainability (BCOES) Reviews

e. Regional Business Processes (RBP) 08504, Doc. # 4921, QC/QA Processes for Civil Works

f. RBP 08520, Doc. # 3443, Biddability, Constructability, Operability, and Environmental (BCOE) Review

g. RBP 08508, Doc. # 5041, Design Process for Civil Works Projects

h. RBP QMS560, Doc. # 187, Corrective Action

i. RBP 08503, Doc. # 3162, Control of Project Plans, Specifications and Design Documentation Reports

4. General.

a. Type: Civil Works type construction project.

b. Location: Charleroi Locks and Dam; Westmoreland County; Pennsylvania

c. Authorization: Inland Waterways Trust Fund (IWTF).

d. Project Description: This project consists of providing engineering services to perform investigations, calculations, DDR, ECIFP, and other analyses needed to develop the design; prepare plans, technical specifications, quantities and supporting documents pertaining to construction of the new emptying basin for Charleroi Locks and Dam.

e. Design Criteria: This project will be designed in accordance with current Corps of Engineers criteria contained in engineering regulations, manuals, and other guidance. Unified Facilities Guide Specifications (UFGS) shall be used for contract specifications, and Corps and Pittsburgh District CADD standards shall be used as the basis for production of drawing files and layout. Design will be based upon available Corps of Engineers Standardization Program Documents for this facility type.

f. Contract Background: INCA Engineers Incorporated (now INCA Tetra Tech) is the Designer of Record for the Charleroi Locks Emptying Basin (INCA was the primary designer of record for the Charleroi Locks and Dam Selected Middle and River Wall Monoliths, Valves, and Emptying Basin under Contract DACW59-00-D-0003, Task Order No.0005). The Emptying Basin design was updated by INCA Tetra Tech in the summer of 2012 under Contract No. W911WN-10-D-0003, Task Order 0006. The Pittsburgh District's original intent was to award the Emptying Basin construction contract in September, 2012. ATR and BCOE reviews were conducted in the spring of 2012, however, during the summer of 2012 the District decided to postpone advertisement of the Emptying Basin construction contract until 2013. It was also decided that the 2013 package would combine the Emptying Basin design and the Stilling Basin design into one construction contract. Redesign of the Stilling Basin was also a component of the new package. However, during redesign of the Stilling Basin, issues were encountered related to hydraulic design assumptions. It was determined that these issues could not be resolved in time for award of the combined package in 2013. Therefore, the District decided to proceed with awarding solely the Emptying Basin contract in 2013.

An addition to the 2013 package (from the 2012 package) is the new Operations Facility (trailer) located on the esplanade. The trailer design requires additional ATR and BCOES members for electrical and mechanical reviews, as well as life safety and fire protection reviews.

g. Project Complexity: Low – The projected cost of the contract is $6-10 Million. The construction methods and details are familiar to the Pittsburgh District Construction Field Office.

5. Design Teams.

a. Project Design and Checker list is enclosed as Attachment 1. The Quality Control (QC) Certification Sheet for CELRP personnel is enclosed as Attachment 2. The QC Certification Sheet is required to be signed prior to solicitation.

b. Use of Centers of Expertise and Standardization do not apply to this project.

c. All necessary design expertise will be provided by INCA Tetra Tech, the Buffalo District, and the Pittsburgh District.

6. Agency Technical Review/Quality Assurance/BCOES Teams.

a. Agency Technical Review (ATR):
An ATR is mandatory for all decision and implementation documents. The ATR Team Leader will come from outside LRD (Rock Island District) and the other review team members will come from outside the home district (LRP) as required by EC 1165-2-209. The ATR includes all engineering and specialty review except Biddabilty, Constructability, Operability, Environmental and Sustainability (BCOES) which requires a separate and independent review process ending in an independently signed BCOES Certification. ATR review team member list is enclosed as Attachment 3. Also indicated on this list is the primary area of review assignment for each team member.

b. Quality Assurance (QA):
The QA review of the A/E products will be performed by the Pittsburgh District. QA review member list is enclosed as Attachment 4.

c. BCOES:
BCOES includes reviews performed by the Construction Branch of Engineering and Construction Division, the Acquisition Branch of Real Estate Division; Facility Support Section and the personnel in Operations Division; and the Environmental and Cultural Resource Sections of Business Resource Division. According to ER 415-1-11, dated 01 Jan 2013, a sustainability review is required, however, this review pertains primarily to High Performance Sustainable Buildings and is not applicable to Emptying Basin construction. The BCOES review team member list is enclosed as Attachment 5.

7. Review Process.

a. A/E Contract:
Quality Control for products prepared by INCA Tetra Tech shall be completed in accordance with INCA's approved QCP enclosed as Attachment 7.

b. In-House:
Non-technical specifications, the Government cost estimate, and all contract drawings excluding 20/EB1 through 20/EB25 will be prepared using in-house forces. Quality

control shall be completed using Pittsburgh District/Great Lakes and Ohio River Division authorized personnel and in accordance with this QCP.

c. Engineering and design Quality Control shall be accomplished using the following review methods:

(1) Internal Reviews (IR). Throughout the design process, a seamless internal review will be performed by senior level Pittsburgh District staff and will focus on fulfilling the project quality requirements for the work products produced. Seamless QC review involves the review of sub-products and products as they are prepared. The QC is performed in a proactive manner throughout the entire planning and design process to take advantage of collective experience. This review is in the form of formal and informal meetings, telephone conversations, and other forms of informal communication that may involve one or more review team members. Also, detailed reviews and design checks, which must be carried out as routine management practice. A design check is a detailed evaluation of the engineering analysis and contract documents prepared by each engineering discipline as an extension of the design process. All checked drawings, computations, quantity estimates, and analyses will be annotated to show the initials of the designer and the checker and the date of action. The checker will be qualified to originate the design that they check. Design checklists may be developed by each engineering discipline to strengthen the design process. These checks are performed by staff responsible for the work, such as supervisors, work leaders, team leaders, or designated individuals from the engineering staff and shall be performed prior to ATR of the deliverable. A design check should include a comprehensive evaluation of:

- the correct application of methods
- adequacy of basic data and assumptions
- correctness of calculations (error free)
- quantity estimates
- completeness of documentation
- testing, modeling, assumptions, calculations, text, and graphic presentations in all documents are complete, satisfy appropriate design criteria, and utilize sound engineering practice
- compliance with guidance, standards, regulations, laws, and BCOES issues

A memorandum of record prepared by the Project Engineer/Architect (PE/A) will be prepared after each such meeting or conversation documenting significant decisions reached. Copies are located in the project file and sent to the ATR Leader for distribution.

(2) Milestone Progress Review (MPR). This review process is conducted in the traditional approach using complete milestone deliverables. The ATR, QA and BCOES reviews will be conducted using this approach. It occurs during a specified period after the design progress has reached a target milestone. Deliverables are reviewed, and written comments are prepared by reviewers and input into DrChecks. Design progress

ceases during the review period. This review method reaches completion at a convened review conference where prepared comments are discussed in a formalized open meeting attended by all or most reviewers.

d. DrChecks will be used to manage project review comments.

e. Review During Construction. During the construction period, an approved representative of the design agent shall make such visits to the project site as required by ER 1110-1-12. The construction site visitors shall comply with all rules and regulations of the facility. Upon completion of the site visit, the visitor shall prepare a written report documenting their observations/recommendations relative to the purpose of the visit or site safety. This shall then be included in the project file along with all photos taken on such site visit.

8. Risks Inherent in the Project.

There are no special considerations, crucial design features or potential catastrophic failures associated with the work being performed in this contract.

9. QC Budget.

The budget for the ATR is $25,500 and the budget for the BCOES is $24,000. The cost of performing QC reviews by those noted as "Checkers" in attachment 1 is not tracked separately since this function is performed through internal design checks and seamless reviews throughout the design process on various products.

10. Schedule

The critical milestone for this contract is the award for construction by 30 September 2013. These dates are important to position the district for a contract award in FY 13:

Fit-up meeting w/INCA	05-06 March 2013
INCA submits revised 95% P&S package	19 April 2013
P&S to start 95% BCOES/ATR/QA	08 May 2013
End 95% BCOES/ATR/QA	17 May 2013
INCA submits 100% P&S package	29 May 2013
ATR, BCOES, and Real Estate Certifications	31 May 2013
Submit P&S/Certifications to BR-C	03 June 2013
Contract Advertisement:	TBD by BR-C
Contract Proposal Opening:	TBD by BR-C
Contract Award:	NLT 30 September 2013
Notice to Proceed Issued:	TBD by BR-C

11. Review Schedule.

All review milestones shall be scheduled in accordance with the Project Management Plan, and shall be conducted by the methods identified above. The review milestone and schedule is found in Attachment 6.

12. Construction Contract Document Quality Certifications.

Upon completion of corrected final design and normally prior to advertising, the 100 percent contract construction documents shall be adequately reviewed to assure quality control measures have been met and incorporated. Demonstrated commitment to fully and properly incorporate comments prior to and during BCOES Certification is considered part of the final design quality evaluation. The following documents shall be completed by the ATR, QA, and BCOES teams:

a. ATR Certification:
To ensure accurate and complete inclusion of all ATR comments in construction contract documents, an ATR certification form will be signed by each member of the ATRT listed in Attachment 3. In addition, a separate certificate will be signed by the ATRT Leader, the Lower Mon Project Manager, the A/E Project Manager, the Division RMO, and the District Chief of Engineering and Construction. The signed ATR Certification forms shall be placed in the permanent project file, and copies furnished to Contracting Branch prior to bid opening.

b. QA Certification:
To ensure accurate and complete inclusion of all QA comments in construction contract documents, Attachment 4 will be signed by all QA team members and shall be placed in the permanent project file.

c. BCOES Certification:
To ensure accurate and complete inclusion of all BCOES comments in construction contract documents, a BCOES certification form will be signed by each member of the review team listed in Attachment 5. In addition, a separate certificate will be signed by the Lower Mon Project Manager, the Value Engineering Officer, and the chief of each LRP organizational element having a stake of the final product. The signed BCOES Certification forms shall be placed in the permanent project file, and copies furnished to Contracting Branch prior to bid opening.

13. Designer Quality Evaluations.

Various designer evaluations will be accomplished over the lifetime of the project QCP. These will indicate to the design team the level of performance in executing the project design responsibility, which includes the final and total responsibility for assuring the correctness and specifically the constructed product adequacy and safety.

14. Design Quality Improvement.

Design review comments recurrent on several projects and recurrent construction change documentation/communications will be analyzed in accordance with the procedures defined by the Regional Business Processes (RBP). Where possible, recurring problem areas will be evaluated for corrective action in accordance with the RBP Corrective Action procedure (Document ID # 187). Frequently this will result in changes of design criteria, guide specifications, technical manuals, regulations, etc. In other cases where a change of criteria is not the necessary corrective action, a lesson learned may be identified and added to the USACE Enterprise Lessons Learned System.

15. Records.

Complete versions, if applicable, of the QCP, review meeting minutes, review dates, certification sheets and copies of all annotated review comments shall be placed with project permanent files upon completion of the deliverables. Items indicated above shall be included.

All project files are kept in the appropriate official project directory located on ProjectWise. Current project directories are:

pw:\\LRP-AP-PWINT.lrp.ds.usace.army.mil:lrp-ap-pwint.lrp.ds.usace.army.mil\Documents\Civil Works\Monongahela River Basin\Charleroi Locks and Dam\Emptying Basin

ATTACHMENT 1

DESIGN TEAM

Charleroi Locks Emptying Basin
Plans and Specifications
Monongahela River, Pennsylvania

Area of Responsibility	Principal	Office Symbol
Project Engineer/Architect (PE/A)	[redacted]	CELRP-EC-NS
Cost Engineer - Government Estimate		CELRP-EC-NT
Checker		CELRP-EC-NT
Specification Engineer - Contract Specs		CELRP-EC-NT
Checker		CELRP-EC-NT
Construction Schedule		CELRP-EC-NT
Checker		CELRP-EC-NT
Cast-in-place Concrete Mix Design		CELRP-EC-CM
Checker		CELRP-EC-DG
Specification Engineer – Technical Specs		INCA Tetra Tech
Checker		INCA Tetra Tech
Structural		INCA Tetra Tech
Checker		INCA Tetra Tech
Hydraulics		INCA Tetra Tech
Checker		INCA Tetra Tech
CADD - INCA Contract Dwgs EB1- EB25		INCA Tetra Tech
Checker		INCA Tetra Tech
Site Drawings, 20/EB29, 20/EB30		CELRP-EC-NS
Checker		CELRP-EC-NS
Project Lead Technician (PLT)		CELRP-EC-NS
Checker		CELRP-EC-NS
Excavation/Stone Protection		CELRP-EC-NC
Checker		CELRP-EC-NC
Hydraulics		CELRP-EC-DH
Checker		CELRP-EC-DH

DESIGN TEAM

Charleroi Locks Emptying Basin
Plans and Specifications
Monongahela River, Pennsylvania

Area of Responsibility	Principal	Office Symbol
Disposal Site	[redacted]	CELRP-EC-NC
Checker		CELRP-EC-NC
Environmental - Disposal of Materials		CELRP-EC-NC
Checker		CELRP-PM-EV
Geotechnical		CELRP-EC-DG
Checker		CELRP-EC-DG
Operations Trailer		CELRB-TD-DS
Checker		CELRB-TD-DS
Trailer Specifications		CELRB-TD-DS
Checker		CELRB-TD-DS
Trailer Mechanical		CELRP-EC-NT
Checkers		CELRP-EC-NT
Trailer Electrical		CELRP-EC-NT
Checker		CELRP-EC-NT

ATTACHMENT 2

QUALITY CONTROL CERTIFICATION (LRP)

CERTIFIED FINAL DOCUMENTS

Charleroi Locks Emptying Basin
Plans and Specifications
Monongahela River, Pennsylvania

Area of Responsibility	Principal	QC Certification Signature / Date
Project Engineer/Architect (PE/A)	[redacted]	
Cost Engineer - Government Estimate		
Checker		
Specification Engineer – Contract Specs		
Checker		
Construction Schedule		
Checker		
Cast-in-Place Concrete Mix Designs		
Checker		
Site Drawings, 20/EB29, 20/EB30		
Checker		
Project Lead Technician (PLT)		
Checker		
Excavation/Stone Protection		
Checker		

QUALITY CONTROL CERTIFICATION (LRP)

CERTIFIED FINAL DOCUMENTS

Charleroi Locks Emptying Basin
Plans and Specifications
Monongahela River, Pennsylvania

Area of Responsibility	Principal	QC Certification Signature / Date
Hydraulics	[redacted]	
Checker		
Disposal Site		
Checker		
Environmental - Disposal of Materials		
Checker		
Geotechnical		
Checker		
Operations Trailer		
Checker		
Trailer Specifications		
Checker		
Trailer Mechanical		
Checker (mechanical calculations)		
Checker (mechanical drawings)		
Trailer Electrical		
Checker		

ATTACHMENT 3

AGENCY TECHNICAL REVIEW TEAM

Charleroi Locks Emptying Basin
Plans and Specifications
Monongahela River, Pennsylvania

Primary Area of Review Responsibility	Name	Office Symbol
Team Leader / Hydraulics	[redacted]	CEMVR-EC-HH
Geotechnical		CEMVP-EC-D
Structural		CELRH-DSPC-GE
Mechanical (trailer)		CELRH-EC-DE
Electrical (trailer)		CELRH-EC-DE

ATTACHMENT 4

QUALITY ASSURANCE REVIEW TEAM

Charleroi Locks Emptying Basin
Plans and Specifications
Monongahela River, Pennsylvania

Area of Responsibility	Name	Office Symbol	QA Certification Signature / Date
Structural	[redacted]	CELRP-EC-NS	
Structural		CELRP-EC-NS	
Structural		CELRP-EC-NS	
Structural		CELRP-EC-NS	
Specifications		CELRP-EC-NT	
CADD		CELRP-EC-NS	

ATTACHMENT 5

BIDDABILITY, CONSTRUCTABILITY, OPERABILITY, ENVIRONMENTAL, AND SUSTAINABILITY (BCOES) REVIEW TEAM

Charleroi Locks Emptying Basin
Plans and Specifications
Monongahela River, Pennsylvania

Area of Responsibility	Name	Office Symbol
Construction	[redacted]	CELRP-EC-CM
Construction		CELRP-EC-CM
Construction		CELRP-EC-CM
Environmental		CELRP-BR-E
Operations		CELRP-OP-MS
Operations		CELRP-OP-LM4
Real Estate		CELRP-RE-A
Life Safety (trailer)		CELRL-ED-D-A
Fire Protection (trailer)		CELRL-ED-D-M
Project Management		CELRP-BR-P

ATTACHMENT 6

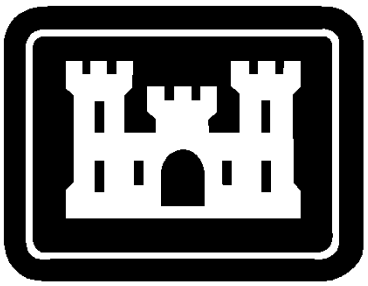
CIVIL WORKS
REVIEW MILESTONES

Charleroi Locks Emptying Basin
Plans and Specifications
Monongahela River, Pennsylvania

MILESTONE	DATE	REVIEW METHOD
95% Plans and Specs Submittal for BCOES/ATR/QA Review:	08 May 2013	MPR
95% BCOES/ATR/QA Reviews Completed:	17 May 2013	MPR
Plans, Specs, & Certifications submitted to BR-C:	03 June 2013	MPR

ATTACHMENT 7

INCA Tetra Tech
Final Quality Control Plan (QCP)



US Army Corps of Engineers
Pittsburgh District

CHARLEROI LOCKS AND DAM
PLANS AND SPECIFICATIONS FOR THE EMPTYING BASIN

QUALITY CONTROL PLAN

INDEFINITE DELIVERY CONTRACT NO. W911WN-10-D-0003
TASK ORDER 0006

INCA Tetra Tech Job No: 09-025F

prepared by

INCA/Gannet Fleming JV

December 2011

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1.0 MANAGEMENT PHILOSOPHY

In conformance with ER 1110-1-12, Engineering and Design Quality Management, dated July 2006, a Quality Control Plan (QCP) is required for the Charleroi Locks Emptying Basin P&S Project. This document describes the manner in which the INCA Engineers, Inc. and Gannet Fleming, Inc. Joint Venture (INCA/Gannet Fleming JV) team will produce the deliverables and the steps that will be taken to control the quality of the work. The INCA/Gannet Fleming JV team is dedicated to providing a quality product for this project and adhering to the QCP will facilitate the obtaining of that goal.

The team management philosophy is to provide quality professional engineering services and products that consistently exceed our client's needs and expectations. Our management Techniques are focused on this single philosophy. In order to complete the Charleroi Locks Emptying Basin P&S Project in accordance with this philosophy, we have developed specific management elements to facilitate the effort. These elements are as follows:

- Understand and respond to the client's needs and constraints. This is a prerequisite to successful work.
- Project success depends on good management.
- Key elements to good management are planning, communication and coordination.
- The Project must be continuously and systematically tracked to ensure a quality product delivered on schedule and within budget. The Project Manager and key team personnel must know the project status at all times.
- Quality assurance necessitates competent and responsible team members, open and effective communication, clear definition of goals and constraints, adequate tools and resources, and thorough checking, coordination and review of submittals.
- Schedules must be realistic and attainable.

The INCA/Gannet Fleming JV team management recognizes that quality services are critical to the success of the project. The Joint Venture has developed this QC Plan in order to ensure that we provide the highest quality professional service.

2.0 MANAGEMENT APPROACH

2.1 Project Manager Approach

The INCA/Gannet Fleming JV team management approach utilizes a decisive Project Manager. The INCA Tetra Tech Project Manager will act as a single point of contact with the client and the joint venture team. The INCA Tetra Tech Project Manager is responsible for understanding the client's needs and communicating all necessary requirements to the study team. The INCA Tetra Tech Project Manager has the authority to direct the Project Team members and the resources available to meet the client's needs. James Costello is assigned as INCA Tetra Tech's Project Manager for the Charleroi Locks Emptying Basin P&S Project.

2.2 Communications

2.2.1 General

As the INCA Tetra Tech Project Manager, James Costello will communicate directly with Pittsburgh District Staff and with the Project Team. Correspondence to Pittsburgh District staff should be addressed to Timothy O'Loughlin, the Primary POC for Technical Issues or Silvio Iera, the District Task Order Manager. All correspondence to the INCA/INCA Tetra Tech JV Project Team Members should be addressed to James Costello.

2.2.2 Teleconferences

In order to facilitate communication, periodic teleconferences between the INCA/INCA Tetra Tech JV team and the Pittsburgh District staff will be conducted. The intention of the teleconferences is to facilitate communications on a regular basis. In general, the INCA Tetra Tech Project Manager will be responsible for setting up and leading the teleconferences.

2.2.3 Monthly Reports

Monthly reports will be provided by INCA's Project Manager, James Costello, to the Pittsburgh District Technical Lead, Timothy O'Loughlin and the Task Order Manager, Silvio Iera. The monthly reports are intended to keep the Pittsburgh District aware of project progress.

2.2.4 Review Meetings

Presentations, Coordination and In Progress Review meetings will be scheduled in accordance with the requirements of the scope of work (SOW) to present the progress of the work. These meetings will by teleconference or face-to-face meetings as appropriate.

2.2.5 Meeting Minutes

Meeting minutes will be prepared by the INCA/INCA Tetra Tech JV team for all teleconferences and meetings which occur. The draft of these minutes will be distributed to the Pittsburgh District Staff, as well as to the other primary meeting participants, for review, revision and addition within five working days of the meeting. Final meeting minutes will be distributed to the District Staff.

2.3 Documentation and Management Control

Copies of all documents will be kept in a central file, organized under the following subject headings:

a. SF-1 Correspondence
b. SF-2 Contracting
c. SF-3 Project Deliverable
d. SF-4 EDC

The INCA Project Manager and Project Management Assistant are responsible for establishing and maintaining the project files.

2.4 Coordination Procedures

2.4.1 General

In an effort to coordinate all aspects of the work so that a quality deliverable can be achieved, coordination meetings and procedures have been established to efficiently transmit information. Meetings and procedures have been established for coordination between the INCA/INCA Tetra Tech JV team and the Pittsburgh District Staff.

2.4.2 Internal Coordination Meetings

Periodic internal INCA/INCA Tetra Tech JV team meetings will be held as required to determine the project progress, the work remaining to be accomplished, and any information required from others in order to efficiently complete the work.

2.4.3 Formal INCA/INCA Tetra Tech JV QC Reviews

Prior to submitting the 95 percent, BCOE and 100 percent Design Documentation Reports, quality control reviews will be conducted by the INCA/INCA Tetra Tech JV team. For this project, Greg Katzenberger will be the Quality Control Engineer, with Moein El-Aarag performing the QC reviews. These reviews are intended to confirm the accuracy, completeness, and presentation of the submittal documents. Participants at these QC reviews and the associated subsequent discussions will include:

Quality Control Engineer – Moein El-Aarag
Project Manager – James Costello
Project Engineer – Perry Cole
Independent Technical Reviewer – Greg Katzenberger

With the 95 and 100 Percent submittals, the A-E Quality Certification Sheet, signed by the Project Team and the Quality Control Team, shall be submitted to the Pittsburgh District.

2.4.4 Independent Technical Review

No new design is currently anticipated under this task order. Therefore, no Independent Technical Review is anticipated.

2.5 Drawing, Report, and Calculation Checking

The requirements for the checking of engineering services for this project are outlined in the following sections. Those requirements are:

2.5.1 Calculations

No significant new calculations are anticipated. However, a nominal amount may be produced to check the design against current code requirements. These additional calculations will meet the following requirements.

- Analyses must be reviewed for conformance with the established criteria.
- All calculations are to be on INCA/INCA Tetra Tech calculation sheets. They must be dated and signed by the lead engineer.

- All calculations are to be based on the established criteria for the project.
- Calculations supporting all analyses must be checked.
- Calculation checking will be performed by an engineer who did not prepare the original computations.
- In case of a disagreement between the engineer and the checker, the Chief Engineer or a Senior Engineer is to be consulted.
- Independent checks need not be rechecked.
- Checking of calculation sheets is to be performed on copies of the originals. They must be dated and signed, then returned to the lead engineer. At the point of agreement between the engineer and the checker, all original sheets are to be signed and dated.
- Calculation sheets are to be kept in the permanent project file.

2.5.2 Drawings

No new drawings are anticipated. However, existing drawings will be updated. These new drawings will meet the following requirements.

- All drawings are to be checked by the engineer after the calculations are checked.
- Checking is to be performed on prints and which are to be dated and signed.
- All original sheets and electronic disks are to be kept in permanent project files.
- All drawings must show names of the engineer and drafter. Drawings must be dated, sealed and signed in accordance with the client's requirements.

2.5.3 Reports

- Report quality is primarily the responsibility of the Project Manager and Project Engineer.
- All reports, including intermediate submittals, will be reviewed by a Department Project Manager or Senior Engineer who has not been involved in report preparation just prior to printing. The purpose of this final review is for overall report presentation, appearance and consistency.
- All reports will be prepared using a consistent report format.

3.0 MANAGEMENT STRUCTURE

3.1 Organization Chart

The Project Organization Chart is as follows:

3.2 Key Personnel Responsibilities

3.2.1 Project Manager – [redacted]

- Project management and reporting.
- Coordination with Pittsburgh District Staff including teleconferences.
- Client correspondence, scheduling, staff resources and Technical reviews.

- Conduct project meetings with internal staff and Pittsburgh District Staff.
- Monitor quality control and constructibility reviews by Technical staff.
- Review of submittals for completeness.
- Monitoring of work to assure compliance with budget and schedule.
- Contracting and modification issues with Pittsburgh District Staff, INCA Tetra Tech and Team Subconsultants.
- Report preparation.

3.2.2 Quality Control Plan Engineer – [redacted]

- Implementation of Quality Control Plan for review of construction documents.
- QCP Review Team member.
- Lead formal QA Review.

3.2.3 Independent Technical Reviewer – [redacted]

- QCP Review Team member.
- Verify that concepts, assumptions, features, methods, analyses, and details are appropriate, fully coordinated, and correct.
- Verify that an appropriate range of feasible alternatives was evaluated.
- Verify that problems, opportunities, and issues are properly defined and scoped.
- Verify that the analytical methods used are appropriate and yield reliable results.
- Verify that the results and recommendations are reasonable, within policy guidelines, and supported by the presentation.
- Confirm that any deviations from policy, guidance, and standards are appropriately identified and have been properly approved.
- Verify that the products represent constructable, operable, environmentally sound, and cost effective design.
- Verify that the products meet the customers' needs.

3.2.4 Structures – [redacted]

- Review Design Criteria
- Provide new design if required

3.2.5 Hydraulics – [redacted]

- Review Hydraulic modeling
- Perform new modeling if required

3.2.6 Specification – [redacted]

- Review Contract Specifications
- Make specification revisions as required

3.2.6 CADD – [redacted]

- Review drafting standards
- Make drawing revisions as required

4.0 AUTOMATED TOOLS

4.1 CADD Standards

All CADD work will be prepared electronically in a medium compatible with MicroStation V8 and will be transmitted to the Corps as MicroStation V8 (.dgn) files

4.2 Computer Application Programs

4.2.1 Microsoft Excel XP

In-house analyses and management application programs.

4.2.2 Microsoft Word XP

Reports and Correspondence. All electronic correspondence to the District will be in Microsoft Word XP format.

4.2.3 Microsoft Outlook Exchange

Electronic correspondence between the District and the INCA/INCA Tetra Tech JV team.

4.2.4 Analytical Software

Flow 3-D.
GT STRUDL

5.0 SCHEDULING

5.1 General

The project schedule has been developed to meet the Pittsburgh District goals for the Charleroi Locks Emptying Basin P&S Project. Time has been allowed for adequate progress review and quality control at each submittal.

5.2 Project Schedule

Significant project milestones are as listed in the following table.

Work Item	Description	Days After TO Award (approx.)	Completion Date
1	Task Order (TO) Award	0	21 Dec 11
2	Submit Draft QC Plan	7	28 Dec 11
3	QC Plan Review Comments Due	12	2 Jan 12
4	Submit Final QC Plan	22	12 Jan 12
5	Criteria Review Teleconference	44	18 Jan 12 (tentative)
6	95% Submittal	49	8 Feb 12
7	95% ATR/QA/BCOE Reviews	54	2 Mar 12
8	100 % Submittal	93	23 Mar 12

6.0 COST CONTROL

The INCA/INCA Tetra Tech JV team utilizes accounting and project tracking software to manage projects. Our accounting systems have been developed to provide important current financial information to the Project Manager. In addition, the INCA/INCA Tetra Tech JV team utilizes earned value/project cost tracking software to monitor both budget and schedule.

Monthly project status meetings are held between the Project Manager and INCA/INCA Tetra Tech JV team upper management to review project cost and schedule progress.

7.0 COMMUNICATIONS

7.1 Communications Procedures

7.1.1 General

A set of procedures has been developed to ensure consistent, thorough communications between Pittsburgh District and the INCA/INCA Tetra Tech JV team. These procedures are in conformance with the management approach outlined in Section 2.0. The procedures are as follows:

- Communications should be conducted through these primary contacts, the Pittsburgh District Technical Lead, [redacted], the Task Order Manager, [redacted] and the INCA Tetra Tech Project Manager, [redacted], whenever possible. In all cases, the primary contacts should be appraised of any communication.

- All communications to Pittsburgh District related to the Technical aspects of the work should be sent to the attention of [redacted]. All communications related to contractual issues and billing invoices should be sent to the attention of [redacted]. All communications to INCA Tetra Tech should be sent to the attention of [redacted].

- All communications will be documented, filed in the INCA Tetra Tech project files, and a copy will be provided to the Pittsburgh District.

7.1.2 Website

The INCA/INCA Tetra Tech JV team has established an ftp system to foster timely and accurate communication. This site allows the user to send and receive large files, and drawings with a minimum of effort.

The USACE maintains an FTP site: ftp.usace.army.mil. Each District has a folder on this site. INCA/INCA Tetra Tech JV will upload files to the "LRP" folder (Pittsburgh District folder), from which files can be retrieved. Should LRP have files, comments, etc. which are too large to email (larger than 2 MB), they will be uploaded to said FTP site, under the LRP folder.

7.2 Corps of Engineers Contact List

The following key personnel from the Pittsburgh District are participating in this Project:

Contact	Title	Organization	Address	Telephone	Comments
[redacted]	Technical Lead	CELRP	Wm. S. Moorhead Federal Building 1000 Liberty Avenue Pittsburgh, PA 15222-4186	[redacted]	
e-mail	[redacted]				
[redacted]	Task Order Manager	CELRP	Wm. S. Moorhead Federal Building 1000 Liberty Avenue Pittsburgh, PA 15222-4186	[redacted]	
e-mail	[redacted]				

7.3 Consultant Contact List

The following list gives contact information for the INCA/INCA Tetra Tech JV team Project Manager.

Contact	Title	Organization	Address	Telephone	Fax
[redacted]	Project Manager	INCA Engineers	400 112th Ave. NE Suite 400 Bellevue, WA 98004	[redacted]	[redacted]
[redacted]	Project Engineer	INCA Engineers.	400 112th Ave. NE Suite 400 Bellevue, WA 98004	[redacted]	[redacted]
[redacted]	Project Admin.	INCA Engineers.	400 112th Ave. NE Suite 400 Bellevue, WA 98004	[redacted]	[redacted]
e-mail	[redacted]				