



## TECHNICAL PROPOSAL REPORT

<b>Agreement:</b> E02305	<b>Project Specific</b>	<b>Active</b>
<b>Name:</b> Big Cove Tannery Bridge		<b>Selection Process:</b> Modified
		<b>Initiating Org:</b> Engineering District 9-0

### Part 1 - Preliminary Engineering, Big Cove Tannery

#### Description

Preliminary Engineering for the replacement of the bridge on S.R. 0928, Section 02B, Fulton County, Ayr Township, over Big Cove Creek.

#### Task 1 - Project Management/Administration

##### Objective:

2.1.1 - Project Management/Administration

This task consists of the administrative effort required by principals, project manager, and involved personnel to complete the project on time and within budget, and to provide a quality product.

##### Scope:

2.1.1 - Project Management/Administration

Project Management involves the planning, scheduling, organizing and controlling of resources to achieve specific objectives within established schedule, budget and quality standards. The Project Manager is responsible for the tasks outlined in the Department Detail.

#### Detail Task 1 - Project Management/Administration

##### Department Details:

DEPARTMENT DETAILS:

The consultant will prepare and distribute to appropriate parties the minutes of all project meetings and telephone conversations where directions or decisions are made. The minutes are to be distributed within 10 calendar days following the meeting or telephone conversation.

The consultant shall provide construction cost estimates on a monthly basis or as required by the Department.

The consultant shall prepare the project design schedule using an Open Plan template to be provided by the Department. The consultant shall submit a baseline schedule to the Department for approval within three weeks following issuance of Notice-To-Proceed. Following approval of the baseline schedule, the schedule should be progressed and submitted to the Department on a monthly basis.

Coordinate the flow of information concerning the project. The number of meetings necessary will be a function of the duration and complexity of the project. While the core activities within the PDSPRJ and PDSMASTER templates are required for all Open Plan design schedules the District has

modified these standard templates to include additional activities. Therefore, always use the most current approved version of these template files. These templates can be obtained from either from the District Portfolio Manager or the District Project Manager.

The consultant must maintain an up to date electronic copy of the project's Open Plan schedule using the Department approved version of the Deltek's Open Plan software. This will allow the consultant the ability to address what if scenarios related to any necessary recovery plans, since the modification of relationships is not a functionality of WelcomHome.

After the District Project Manager has performed initial setup of the WelcomHome project the remainder of the project team will need added to the WelcomHome project by the District Project Manager. This will be accomplished utilizing the WelcomHome project administrative functions. Conduct status meetings to identify project and scope. Conduct regular status meetings.

The consultant will thoroughly check all design submissions prior to submitting them to the Department for review. All computation sheets shall bear the initials of both the individual who prepared the calculations and the individual who checked the calculations. The Department reviews will be cursory in nature and the consultant will be responsible for design and plan accuracy. The consultant will be liable for design and plan errors in accordance with 67 PA Code, Chapter 455, Consultant Highway Design Errors.

The prime consultant will be responsible for subconsultant and DBE progress. All submissions prepared by subconsultants will be submitted through the prime consultant's office. The prime consultant will be responsible for the accuracy and quality of work prepared by subconsultants.

For archiving into the ECMS Project Development Checklist, the following reports (once approved in writing by the District or the appropriate permitting agency) will be provided by the consultant to the District in electronic, PDF format:

- Final Joint Permit Application (including H&H Report)
- E&S Report/ NPDES Permit Submission
- Design Field View Submission

**Approach:**

C. C. Johnson & Malhotra, P.C and our sub-consultants are committed to providing the Department with the most qualified key staff throughout the duration of this project. The staff committed to at the time of our letter of interest will be assigned to the project. CCJM will provide overall management of the firms comprising our design team. Chick Babcock, P.E. will be the overall Project Manager and will be the lead contact for all work on this agreement. Any contract activities, including those of our sub-consultants, will be Mr. Babcock's responsibility. He will oversee the production and quality of all project participants and keep the Department's Project Manager apprised of ongoing activities. Mr. Babcock will also assist the Department's Project Manager in the coordination of Department, regulatory, agency and utility review.

Mr. Babcock will be the Department's single point of contact for this Agreement. As such, Mr. Babcock will attend all meetings, review all reports and correspondence and monitor all work including that of our sub-consultants. Department personnel will be able to contact Mr. Babcock at any time concerning the status and issues of this project.

On a weekly basis, CCJM's Project Manager will discuss the status of the work in progress with the design team. This will be to clearly define the progress made during the past week and the proposed work for the upcoming week. In addition, timely assignments of proper staff and resources will be made to ensure meeting critical deadlines. Any potential concerns, which may affect the project, can also be identified early and resolved quickly. Written Project Status Reports will be prepared every month. The Project Status Reports will be submitted via email so the District can readily evaluate the physical completion of work, project schedule, and any upcoming activity, which will require attention. Invoices will be

submitted on a monthly basis as well.

Standardized quality control procedures have been a corporate policy since our founding. The procedures are intended to provide uniformity and accuracy in our work as well as to allow for improvements to our work products, which will benefit our clients. The quality control procedures, which we specify in the plan, are company policy. No modifications are permitted except as authorized in advance by the Management Team. CCJM's Quality Management System is certified by an external registration authority as ISO 9001:2008 compliant. This policy is on file with the Department as part of our registration to do business with PennDOT.

Sub-consultants have been selected for their proven expertise as well as current project workload to enhance the overall project team. Their responsibilities will be clearly defined and key individuals assigned for coordination and representation. All sub-consultants are expected to be fully responsible for their work; however, the work will be reviewed by CCJM to ensure that the sub-consultant's work complies with the project requirements and client standards. On a monthly basis, we will discuss the status of sub-consultant work with their key staff members.

CCJM will develop a projected construction cost for this project prior to the completion of the Design Field View and will periodically update this estimate as project conditions warrant. We will develop costs for such things as utility relocation, right-of-way acquisition, construction, environmental mitigation, and engineering and construction inspection.

Upon Notice to Proceed with this part of the Agreement, CCJM will organize and conduct a kick-off-meeting. All project participants will be asked to attend. The purpose of this meeting is to coordinate all activities and expectations. A copy of this Scope of Work and the accompanying person-hour budget will be marked with each firm's responsibilities and obligations clearly delineated. A design schedule will be developed and potential areas of concern addressed.

C.C. Johnson & Malhotra, P.C. will prepare the Open Plan Schedule Template (to be received from the District) and will revise the schedule after the kick-off meeting to meet the project requirements and commitments of the District. The schedule will be delivered to the District in electronic format utilizing the Welcom Open Plan Program. CCJM, in consultation with the Project Team, will be responsible for developing and maintaining the Open Plan project development schedule. CCJM will update the schedule on a monthly basis. If the project begins to deviate from the schedule, CCJM and the Project Team will develop an action plan to bring the overall project schedule back on track.

Our subconsultant Raudenbush Engineering, Inc. (REI) adds:

REI is committed to providing the Department with qualified staff throughout the duration of this project. Mr. George Smith, PE will be the Project Manager for REI and will be the lead contact for our work. Contract activities will be his responsibility. He will oversee the production and quality of all geotechnical, survey, and right of way work. Mr. Smith will be supported by registered land surveyors and professional engineers for all activities on this contract.

On a regular basis, Mr. Smith will discuss the status of the work with the REI project participants. This will be to clearly define the progress made and to plan upcoming work. Timely assignments will be made with proper staff and resources to enable critical milestones to be met. Potential concerns which may affect the delivery of REI's product will be identified and resolved in a timely fashion. REI will provide, as necessary, monthly reports discussing the status of the work. These reports will be submitted with our monthly invoices.

Our subconsultant Skelly & Loy adds:

Skelly and Loy (S&L) will ensure the quality of our deliverables and will make all submissions through the prime, C.C. Johnson & Malhotra, P.C. (CCJM). S&L will provide CCJM with information on environmental investigations and assessments conducted by us for project scheduling purposes, along with project status updates on a monthly basis.

It is anticipated that one S&L representative will attend a project kick-off meeting at CCJM's office and will not attend any project meetings at the District 9-0 office. This scope assumes there will be no Agency Scoping Field View.

## **Task 2 - Surveys**

### **Objective:**

#### 2.4.1 - Surveys

This task consists of providing the survey requirements associated with specific PennDOT projects designated for studies, reports, design and construction.

### **Scope:**

#### 2.4.1 - Surveys

##### Guidance:

- Publication 122M, Surveying and Mapping Manual
- Strike Off Letter 430-99-20, QA/QC Control checklist for Right-of-Way and Construction Plans
- Publication 213, Work Zone Traffic Control Manual
- Form D-428, Field Book
- Design Manual 3, Plans Presentation
- Referencing alignments should be in agreement with Pub 122M, Ch. 3.1 and DM3 Figure 3.214

##### Scope:

Surveys may consist of either conventional data collection, Three-Dimensional data collection, or a combination, as directed by the District. Obtain published horizontal and vertical control data for project use.

The Quality Assurance/Quality Control Checklist will be completed and discussed with the District Chief of Survey for all preliminary design survey work.

Prior to initiating surveys, develop a Traffic Control Plan in accordance with Publication 213 for implementation during surveys within existing transportation facilities.

## **Detail Task 1 - Surveys**

### **Department Details:**

DEPARTMENT DETAILS:

Survey subtasks 10 and 12 are deleted.

Conventional surveys will be completed by consultant forces. All surveys shall be completed in accordance with current Design Manuals, Publication 122, and all applicable Strike-Off Letters.

The consultant will perform the following tasks:

- Reestablish and reference the existing right-of-way baseline. All surveys will be tied to this baseline.
- Check and plot all survey data.
- Any surveys necessary to support H&H studies.
- Send Letters of Intent to Enter to all involved parties prior to the start of field surveys.
- Collect survey using English units of measure.
- Any surveys necessary at intersections where temporary signals or intersection improvements are proposed along the detour route, if applicable.

**Approach:**

Upon issuance of a Notice to Proceed, REI will research the County tax records and deed records to obtain the current names and addresses of all property owners that may be affected by the project. REI will send out NOITEs as necessary. If six months has elapsed since this occurred upon issuance of a Notice to Proceed, REI will update the property owner contact list with names and addresses for the Notice of Intent to Enter Letters. REI will prepare, send to the District Engineer for signature and mail, via certified mail, "Notice of Intent to Enter" letters to each property owner. We will also attempt to contact the property owners preferably one day prior to expected entry of the properties.

We will obtain the Department's approval prior to making property contacts. We will also attempt to contact the property owners preferably one day prior to expected entry of the properties.

REI will plot the record deeds and right of way plats to prepare a Deed Mosaic to assist in locating property corners and monumentation during the field work.

This scope of work assumes that the Department will provide Right-of-Way plans or adequate descriptions of right-of-way limits for the existing state roadway. For local roads that do not have recorded right-of-way widths and positions Raudenbush will develop Legal R/W lines based on Section 3.7 of DM 3 and submit them for concurrence to the District Right of Way Administrator. In accordance with Section 3.5 of DM-3, this scope does not include the correcting of erroneous property line calls in deeds nor resolution of ownership limits of undocumented/unrecorded or conflicting properties. This scope does not include preparation of a chain of title or property abstract.

Prior to beginning field surveys REI will develop a Traffic Control Plan in accordance with Publication 213. A control traverse network will be established and bench levels run in accordance with the Department's Standards. PA One Call will be notified prior to beginning field surveys to mark existing utilities.

Utility poles (including utility pole numbers), core borings and wetland boundaries will be located.

Topographic data will be collected via a Total Station/Data Collection survey. All existing features will be located pertinent to the design of the

project, such as roadways, bridges, utilities, drainage structures, buildings, streams, signs, pavement striping, etc. Ground elevations and features will be collected in 3D format in order to create a digital terrain model. At least one benchmark will be established on each side of the bridge outside the limits of construction.

The road surveys will extend 200-feet on both approaches to the bridge for a total length of approximately 400-feet. The width of the road surveys will be 200-feet, centered on the roadway. Stream surveys will extend 500 feet upstream and 500 feet downstream for a total length of 1,000 feet plus the structure width. The width of the stream survey will be 200-feet, roughly centered on the stream.

Cross-sections will be obtained at the existing bridge face; 25 ft; 50 ft; 100 ft; 250 ft; and 500 ft upstream and downstream of the existing bridge. If necessary, additional width of stream survey will be provided to the limits of the 100-yr floodplain.

Wetland flagging will be obtained.

All visible or marked utilities will be surveyed including the height of existing overhead wires.

All deliverables will be provided electronically and, when in pdf format, will follow the District 9-0 electronic document submission standards.

### **Task 3 - Wetland and Waters Studies**

#### **Objective:**

##### 2.2.1 - Wetland and Waters Studies

Identify wetlands and waters and determine the impact of the proposed alternatives

#### **Scope:**

##### 2.2.1 - Wetland and Waters Studies

#### Guidance:

- Pennsylvania Code Title 25, Chapter 105.17
- Publication 325, Wetland Resources Handbook
- U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual (1987)

#### Scope:

Identify the presence of wetlands, coordinate with USACE and DEP, evaluate the impact to the resource, and develop mitigation measures and/or permit package as appropriate.

### **Detail Task 1 - Wetland Studies**

#### **Department Details:**

An evaluation and analysis of area wetlands and potential impact and mitigation will be conducted in compliance with the Executive Order 11990, Protection of Wetlands; D.O.T. Order 5660.1A, Preservation of National Wetlands; 23c CFR Part 777, Mitigation of Environmental Impacts to Privately Owned Wetlands; Strike-Off Letter 439-90-07, Wetlands Finding Procedures; DEP Chapter 105 Regulations as amended, Section 404(b)

(1) guidelines and the EPA/COE Memorandum of Agreement dated February 6, 1990.

Project area wetlands will be preliminarily identified by consulting U.S. Fish and Wildlife Service NWI maps, U.S. Geological Survey topographic sheets and the appropriate County Soil Survey. A field investigation will then be undertaken to verify the preliminarily identified wetland areas and to identify any additional wetland areas that may exist. Detailed identification and delineation of project area wetlands will be done in accordance with the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region, U.S. Army Corps of Engineers, July 2010, USACOE, ERDC. The results will be presented in a Wetland Identification and Delineation Report. All identified project area wetlands will be classified and mapped in accordance with the FWS Classification of Wetlands and Deepwater Habitats (Cowardin, et. al.).

**Approach:**

Encroachment into, or obstruction of, jurisdictional wetlands and watercourses potentially requires the acquisition of federal authorization from the United States Army Corps of Engineers (USACE) under Section 404 of the Federal Clean Water Act (33 U.S.C. Section 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) as well as state authorization from the Pennsylvania Department of Environmental Protection under Chapter 105 of the Pennsylvania Dams Safety and Encroachments Act (Title 32 Sections 693.1-693.27)/Pennsylvania Clean Streams Law (35 P.S. 691.1-693.1001).

Jurisdictional wetland/watercourse investigations will be completed consistent with the methodology of Department Publication 325 in a study area extending along S.R. 0928 approximately 100 feet on each bridge approach, and 100 feet upstream and downstream from the existing structure. Existing wetland habitats within the project area will be identified and evaluated through the combined use of existing secondary source information and field investigation.

Existing secondary source information will include the following:

- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) Mapping;
- U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), Fulton County Soil Survey Maps and Hydric Soils List;
- USDA NRCS SoilMap Web site (<http://soilmap.psu.edu>);
- U.S.G.S. 7.5 Minute Topographic Mapping; and
- PennDOT's scoping form and supporting technical file information.

This information will be used to identify high probability wetland/watercourse locations prior to the field investigation. A field investigation will be required to identify and delineate the jurisdictional wetland boundaries in accordance with the U.S. Army Corps of Engineers' (USACE) Wetland Delineation Manual (1987) and USACE Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (2010). Guidance concerning delineations within active agricultural areas from the USACE Baltimore District will also be referenced during the process. This task will include flagging of the wetland boundaries during the field investigations and completion of Routine Wetland Determination Data Forms. Identified wetlands will be classified according to the Cowardin System. Recent guidance documents from the United States Environmental Protection Agency and USACE concerning Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States* (June 5, 2007) will be referenced during the delineation process.

Information related to existing vegetation, soils, and hydrology conditions will be recorded in the field for documentation within the Wetland/Watercourse Identification/Delineation Report. Color photographs will be taken of representative wetlands and compiled into a photographic log that will be incorporated into the documentation. The location and orientation of each photograph will be identified on the wetland/watercourse location map provided in the report.

Jurisdictional watercourses will be identified during the field investigation as channels or conveyances of surface water having defined bed and banks, natural or artificial, hydrologically sorted substrate material, and the presence of an Ordinary High Water Mark. These resources are regulated under the Federal Clean Water Act as Waters of the United States of America and Pennsylvania Code Title 25, Chapter 105 as Waters of the Commonwealth of Pennsylvania. Jurisdictional watercourses identified during the investigations will be delineated, boundary flagged in field, and qualitatively characterized for documentation purposes. Color photographs will be taken of representative watercourses and compiled into a photographic log that will be incorporated into the documentation. The location and orientation of each photograph will be identified on the wetland/watercourse location map provided in the report.

After completion of the field investigations, the Wetland/Watercourse Identification/Delineation Report will be prepared for the project to document the findings of the investigations. The report will contain the following information:

- Project Location Mapping
- Documentation of wetland identification procedures and findings
- Existing wetland conditions including size, classification, and necessary soils, hydrology and vegetation information
- Functional assessment narrative
- Map of wetland/watercourse locations within the project area
- Photograph log of wetlands/watercourses and project area
- Appended technical information (wetland data forms, agency correspondence, etc.)

A functional assessment of wetland habitats identified within the project area will be completed utilizing the parameters of the USACE New England Corps Descriptive Method (CDM). A determination of Exceptional Value criterion under Pennsylvania Code Title 25, Chapter 105 for each identified wetland habitat will also be completed within the documentation report. Two (2) draft copies and five (5) final copies of the Wetland/Watercourse Identification/Delineation Report will be submitted to the District.

This effort assumes that S&L will survey the flag points using GPS and will provide the survey information to CCJM in electronic format (MicroStation or AutoCAD dwg file format). It is anticipated that a 1-day field view will be conducted as part of the permit pre-application process and that one person from S&L will attend. S&L will provide meeting notes to CCJM to include in the formal pre-application meeting minutes that will also serve as the JD field view meeting minutes.

#### **Task 4 - Level 1B CE**

##### **Objective:**

2.3.2 - Level 1B CE

This task consists of the assembly and approval of the Level 1B Categorical Exclusion

##### **Scope:**

2.3.2 - Level 1B CE

Complete Part A and B, of the Categorical Exclusion Evaluation (CEE) form (Publication 294), that includes a Project Description and, may also

include a location map(s) and/or illustrations.

Sheet C-2 will also require completion.

Submit the completed CEE form and pertinent supporting documents for review, concurrence, and approval to the District Office. If necessary, revise the CEE form and or supporting documentation as directed.

### **Detail Task 1 - Level 1B CE**

#### **Department Details:**

The CEE document will be completed in the CEE/EA Expert System. The District will set up the document in the system and the consultant will complete. This task includes all necessary information necessary to obtain environmental clearance.

#### **Approach:**

This task will be performed by CCJM and Skelly and Loy.

We concur with the Department's Scope of Work for Level 1B CE.

CCJM will prepare a Level 1B CEE in accordance with PENNDOT Publication No. 294 (Categorical Exclusion Evaluation Handbook).

The CEE will be developed and submitted utilizing the Department's Categorical Exclusion (CE)/Environmental Assessment (EA) Expert System. The CEE will be written to address each of the environmental evaluation subject areas, and will contain appropriate maps, plans illustrations, and supporting documentation.

Each of the environmental evaluation subject areas will be identified according to the level of assessment necessary, based on the Scope of Work and on our understanding of the project as outlined below.

#### Part A - General Project Identification, Description, and Engineering Information

CCJM will complete this section with input from the Department and CCJM.

#### Part B - Environmental Evaluation Subject Areas

##### Streams, Rivers, and Watercourses

Big Cove Creek is a tributary to Licking Creek within the Potomac River watershed. Big Cove Creek is regulated under the Federal Clean Water Act as Waters of the United States of America, and Pennsylvania Code Title 25, Chapter 105 as Waters of the Commonwealth of Pennsylvania. Water uses within Big Cove Creek are protected for Cold Water Fishes (CWF) and Migratory Fishes (MF) in Pennsylvania Code Title 25, Chapter 93. Because PFBC identifies Big Cove Creek as Approved Trout Stocked Waters (2011) time of year restrictions for trout stocked waters (March 1 – June 15) may apply to in stream work unless written approval is acquired from PFBC. Big Cove Creek is a moderately sized, perennial headwater resource capable of supporting a diverse macroinvertebrate and fish community indigenous to cold water lotic habitats. Physical microhabitats throughout the project area included riffle – run complexes within a dominant substrate of angular rock, gravel, and some bedrock

outcropping.

#### Wetlands

Work performed under Task 3.0 - Wetland Studies will be summarized in the CEE.

#### Floodplains

CCJM will consult with the Federal Emergency Management Agency (FEMA), and in compliance with Executive Order 11988 Floodplain Management, we will obtain data that identify the limits of any base frequency (100-year) floodplains within the project area. The limits of the floodplains will be delineated on appropriate mapping and impact potential will be assessed and addressed in the CEE narrative.

#### Land Resources

S&L will calculate the impacts to farmland soils for the selected bridge design and complete a FCIR Form. S&L will also assess impacts to Primary Agricultural Land in accordance with PA Agricultural Land Preservation Policy (ALPP) and impacts to Productive Agricultural Land in accordance with PA Act 43. As part of this effort, S&L will contact Ayr Township and Fulton County officials to determine the extent of agricultural lands preservation efforts (including Conservation Easements, Agricultural Security Areas and properties in the Clean and Green Program) in the project area and identify the agricultural land owners and farm operators within and adjacent to the project area. S&L will submit the FCIR to the NRCS District office for concurrence. A summary of the ALPP findings and FCIR Form will be provided to CCJM for inclusion within the CEE document.

#### Hazardous or Residual Waste Site(s)

The PENNDOT Scope of Work did not identify any potential hazardous waste issues. Therefore, CCJM does not anticipate any hazardous waste issues. CCJM will field view the project area and complete the Environmental Due Diligence Form (PENNDOT Form EDD-VI) for the project.

#### Threatened/Endangered Plants and Animals

Work performed under Task 4.0 - Threatened and Endangered Species will be summarized in the CEE.

#### Historic Resources

The PENNDOT Scoping Field View minutes state that the bridge and surrounding structures are not National Register eligible. We assume the District Qualified Professional (QP) will clear this project for historic structures under Stipulation C.2 or Stipulation D.2 if there are no historic archaeological resources in the project area. We do not anticipate evaluating any historic structures. This proposal assumes that preparation of a Bridge Rehabilitation Feasibility Analysis Report is not required.

#### Archaeological Resources

Work performed under Task 21 - Archaeology will be summarized in the CEE.

#### Section 4(f) Resources

Because the PENNDOT Scope of Work did not identify any Section 4(f) or Section 2002 resources no Section 4(f) or Section 2002 evaluations are anticipated

#### Air Quality

This project is exempt from a CO and PM10 Hot Spot analysis. Air quality studies are not anticipated for this project. A statement to support that determination will be included in the CEE.

#### Noise

The project is neither a Type I nor a Type II Project. No detailed quantitative noise analysis is proposed. A qualitative statement to support that determination will be included in the CEE. If the improvements to the bridge and associated approaches are determined to be significant changes, Skelly and Loy will conduct a quantitative noise analysis under a supplemental agreement.

#### Public Facilities and Services

Through field investigation and coordination with planning organizations and public officials, CCJM will determine the locations of public facilities and services in the area and subsequently coordinate with the local township officials, emergency service providers, school bus dispatchers, and police and fire departments, to analyze the relationship of the project area to service routes and determine if a project detour may have an impact on their services. We will document with phone conversation records all coordination and include it in the CEE.

#### Socioeconomic Issues

A brief discussion of community cohesion, environmental justice, maintenance/operating costs, public controversy on environmental grounds, and aesthetic and other values will be included in the CEE.

#### Temporary Impacts to Air, Noise, and Water Quality

CCJM will prepare a qualitative narrative containing a brief discussion of any air, noise, and water quality concerns associated with the implementation of this project. It is anticipated that this project will only have temporary and insignificant impacts on air quality, noise levels, and water quality.

### **Task 5 - Waterway Permits**

#### **Objective:**

##### 2.7.4 - Waterway Permits

This task is the coordination with the appropriate environmental agencies and the preparation of permit applications.

#### **Scope:**

##### 2.7.4 - Waterway Permits

Needs completed.

### Detail Task 1 - Waterway Permits

#### **Department Details:**

A Pennsylvania DEP Chapter 105/ U.S. Corps of Engineers Joint Permit will be prepared in accordance with current DEP Chapter 105 Regulations.

Consultant will attend a Pre-Application meeting at the project site with District personnel prior to submitting the Joint Permit Application. The Consultant will prepare a Field Checklist for Preliminary Design Permit Coordination at least four (4) weeks prior to the pre-application meeting. The Department will provide a copy of the blank checklist to the Consultant for preparation.

The JPA will be created and submitted using PENNDOT's JPA2 Expert System. No hard copies of the permit application will be submitted to the Department. The consultant will provide an e-mail notification to the Department's project manager when the permit application is ready for review in the JPA2 Expert System.

#### **Approach:**

This task will be performed by CCJM and Skelly and Loy. We concur with the Department's Scope of Work with the following clarifications.

CCJM will prepare the Joint Section 404 /PA Chapter 105 Permit Application necessary to acquire the appropriate Federal and state authorizations for the project using PENNDOT's JPA2 Expert System

S&L will assist by preparing the Environmental Assessment Form (EAF). The inclusion of an Environmental Assessment Form (EAF) within the application is required by Section 105.3(c) and Section 105.15 of the PA DEP's Chapter 105 Rules and Regulations, 25 PA Code Chapter 105 for the project permit application. The EAF will be completed in accordance with PA DEP standards. The EAF will address existing resources and proposed impacts for the project. Additionally, any other direct and/or indirect impacts upon features regulated under PA DEP Chapters 93, 105, and 102 will be addressed. S&L will calculate the impacts to water resources for the selected bridge design and obtain the resource impact information for other resources as compiled by CCJM in the preparation of the CEE. Qualitative descriptions of the aquatic resources will be provided through the review of existing literature and the on-site field observations. No detailed aquatic assessments such as electroshocking or macroinvertebrate sampling will be conducted or considered to be included in this scope.

This effort does not include an alternatives analysis of unavoidable impacts to jurisdictional wetland and watercourse habitats to satisfy Section 404 (b)(1) requirements of the Federal Clean Water Act for the project, nor will a Conceptual Mitigation Plan be developed. If it is determined at a later time that these items are needed, a work order amendment will be necessary.

Big Cove Creek is considered a recreationally navigable stream within the project area according to "Keystone Canoeing" described on pages 368-370. Coordination with PFBC will be required during preliminary design so the PFBC can determine if an ATON plan is necessary in final design.

### **Task 6 - Line and Grade**

#### **Objective:**

2.4.6 - Line and Grade

This task consists of the development of the horizontal and vertical geometry. Publication 13M, Design Manual Part 2 applies to this task

**Scope:****2.4.6 - Line and Grade**

Prior to developing the vertical and horizontal geometry, all environmental and property constraints will be identified. The engineer will have a comprehensive understanding of all of the constraints and will discuss these with the District prior to finalizing the geometry.

Secure sufficient field survey information to develop the final geometry. Develop all control points for the vertical and horizontal geometry. The engineer will analyze the compatibility and acceptability of the horizontal and vertical geometry.

The following work elements are required for the successful completion of this task:

1. Finalize horizontal and vertical geometry and submit plans in accordance with Publication 10A, Design Manual Part 1A.
2. Review for compliance with design criteria and environmental constraints.
3. Tabulate project control point coordinates (POT, PC, PT, and PI) for all roadways and channel relocations.
4. Apply the project traffic data to the design criteria to determine lane requirements, turning movements, and weaving movements.
5. Check final structure depths and adjust vertical alignment as necessary. If alternative structures are being utilized, use the worst case scenario.
6. Tabulate pavement grades and superelevation for development of cross sections.

**Detail Task 1 - Line and Grade****Department Details:**

At existing location - use approximate existing line with adjusted grade as required to meet any H & H requirements and preliminary TS&L. This submission will also include the Typical Section submission.

The plans will also include anticipated required ROW lines, cut/fill lines, and approximate causeway location (if applicable).

**Approach:**

CCJM agrees with the Department's Scope of Work. Our technical approach is as follows:

CCJM anticipates development of the following alternative as detailed in the Letter of Interest.

The preferred alternative will likely be a single span box beam structure that maintains or perhaps even improves the current hydraulic opening.

Traffic will be maintained using a detour through the Village of Plum.

"Right-sizing" this low-volume bridge could entail a minimum roadway section similar to the existing approach roadway with two 10' travel lanes and 2' shoulders Using 3R criteria for a community collector and an ADT less than 400.

CCJM will prepare conceptual bridge designs consistent with DM-4 and the hydraulic requirements such that the profiles developed for each alternative will provide required levels of hydraulic capacity.

This alternative will be developed to the level of detail required in accordance with the Department's Scope of Work, and Penn DOT Pub 10C.

The alignment will be developed following the criteria in DM 2 Chapter 2. No design exceptions are anticipated at this time.

Upon completion CCJM will prepare an official Line and Grade Submission. The drawings will be prepared in accordance with DM 3, Chapter 2. The Submission will comply with District 9-0 electronic submission criteria.

### **Task 7 - Typical Sections**

#### **Objective:**

##### 2.4.7 - Typical Sections

This task consists of the development of typical sections. Publication 10A, Design Manual Part 1A and Publication 13M, Design Manual Part 2 apply to this task.

#### **Scope:**

##### 2.4.7 - Typical Sections

The following items should be included on each typical section:

- Pavement width and cross slope (clarify lane widths to two decimal places to match existing pavement width)
- Pavement depths
- Shoulder type, width, depth and cross slope
- Median type, width and cross slope
- Embankment and cut slopes
- Swales and contiguous gutters as applicable
- Subbase drainage treatment
- Rate of superelevation
- Unusual design conditions (i.e., special treatment of subgrade, subbase or under-drain)
- Median barrier and guide rail
- Point of profile grade
- Centerline or baseline
- Limits of variable widths
- Base course and subbase widths and depths (and slopes if not parallel with pavement)
- Seeding treatment
- Station Control

The following work elements are required for the successful completion of this task:

1. Develop superelevation rates and place on the related typical section.
2. Develop pavement design and list on each typical section.
3. Label all items in accordance with the item description on the summary of quantities sheet.
4. Submit typical sections for review and approval by the Department.

#### **Detail Task 1 - Typical Sections**

**Department Details:**

This submission shall be included as part of the Line and Grade Submission.

**Approach:**

CCJM agrees with the Department's Scope of Work.

**Task 8 - Preliminary Maintenance and Protection of Traffic****Objective:**

## 2.8.2 - Preliminary Maintenance and Protection of Traffic

This task consists of developing preliminary maintenance and protection of traffic plans in accordance with Publication 14M, Design Manual Part 3, the Manual on Uniform Traffic Control Devices and Publication 213, Work Zone Traffic Control to maintain safe and efficient traffic operations through the construction work zone.

**Scope:**

## 2.8.2 - Preliminary Maintenance and Protection of Traffic

Prepare a preliminary Maintenance and Protection of Traffic plan for anticipated work areas involving existing roads. The plans will include a conceptual sequence of operations and identify the type of traffic control needed for each roadway impacted by the anticipated work zones.

Plans will be developed at an appropriate scale.

Drawings will show the work areas and note the traffic control requirements for each area.

A conceptual sequence of operations will be developed identifying the anticipated phases and stages of work necessary to control traffic during hours of construction and at all other times during construction. Illustration of traffic control signs and devices, temporary pavement markings, temporary roads, detours, and other necessary details will not be developed.

The plans will include a title sheet with index map and general notes, and a listing of anticipated traffic control devices without quantities. The plan will also include the sequence of operations and plans sheets depicting the work areas.

**Detail Task 1 - Preliminary Maintenance and Protection of Traffic****Department Details:**

Revise Objective 2.8.2 to read:

This task consists of developing preliminary maintenance and protection of traffic plans in accordance with Publication 14M, Design Manual Part 3, Publication 212 (Official Traffic Control Devices), and Publication 213 (Work Zone Traffic Control) to maintain safe and efficient traffic operations through the construction work zone.

**Approach:**

CCJM agrees with the Department's Scope of Work. Currently a detour via the village of Plum is anticipated.

## Task 9 - Erosion and Sedimentation Control Plan / NPDES Permit

### Objective:

#### 2.10.25 - Erosion and Sedimentation Control Plan / NPDES Permit

This task is the development of the Erosion & Sedimentation Control Plan and submission of the NPDES Permit Application.

### Scope:

#### 2.10.25 - Erosion and Sedimentation Control Plan / NPDES Permit

The Erosion and Sediment Pollution Control Plans and supporting documentation shall be submitted to the applicable Engineering District for review and approval. Upon acceptance of the plans by the District, the submission will be forwarded to the County Conservation District for review and approval.

The following work elements are required for the successful completion of this task:

#### 1. Develop Erosion and Sedimentation Control Plans to include:

- cover sheet
- location map
- topography of the area including watershed areas and watercourses receiving runoff from the project
- proposed alterations to the area
- limits of the project
- the location of all temporary and permanent erosion and sediment pollution control measures and facilities
- all pertinent erosion control and construction details

2. Develop a narrative report describing the project and indicating the purpose, the engineering assumptions, the specifications, and the calculations for erosion control measures and facilities. The narrative shall include a schedule of installation and removal of temporary and permanent erosion control measures and facilities as they relate to the various earthmoving operations and a maintenance program for each type of temporary and permanent erosion control measure and facility.

3. Provide detailed instructions relating to the sequence of construction on the plan and in the narrative. Include staging, sequencing and scheduling of earthmoving activities and installation and removal of erosion and sediment pollution control measures and facilities as required.

4. Provide a detailed description in the narrative report of all soil types located within the project limits including each soil type, depth, slope and resistance to erosion. The soil boundaries and a summary table of the soil types and limitations should also be included on the plans.

5. Provide all applicable construction schedules, maintenance programs (including the removal and disposal of accumulated soil materials).

6. Prepare transmittal letter, plans and narrative report for submission to the County Conservation District. If necessary, on large projects meet with the County Conservation District prior to submission to discuss submission requirements and review conceptual plan.

7. For projects exceeding 5 acres of earth disturbance or impacting High Quality/Exceptional Value (HQ/EV) waterways, prepare a Notice of Intent (NOI) Application for an NPDES Storm Water Permit and a Preparedness, Prevention and Contingency (PPC) Plan (see below). The PPC plan should also be incorporated into the narrative report and the plans.

8. Address all applicable comments from the County Conservation District and/or PADEP and re-submit the revised package for approval.

The following tasks are required for the preparation of the NPDES permit application:

1. Develop an NPDES boundary map that includes the following information: limits of disturbance, highway alignment, cut & fill limits, ROW lines, contours, stations, location identifiers and, the permit boundary.
2. Complete the NPDES Permit Application. The application package will consist of the following items: Act 14 Notification, PNDI Form, location map, NPDES Application Form, Cultural Resources Notice (if involves a Special Protection Watershed), General Information Form (if project involves a Special Protection Watershed or an Individual NPDES Application), and the Erosion and Sediment Pollution Control Plan.
3. Submit NPDES Permit Application package to PennDOT for review. Revise as necessary. Obtain PennDOT's notarized signature on the application and make the designated amount of copies to submit to the County Conservation District and, if applicable, the PADEP.
4. Schedule review meetings with the agencies prior to submitting the NPDES permit package to expedite the permitting process.
5. Submit permit package to the Conservation District/PADEP.

#### **Detail Task 1 - Erosion and Sedimentation Control Plan/ NPDES Permit**

##### **Department Details:**

Task includes a separate erosion and sedimentation control plan showing control measures required and a narrative report to accompany the plans. The measures will be in accordance with the most recent Department and DEP criteria. The submission is to meet NPDES requirements and is to show contours, soil types, drainage areas, and flows.

The plan and narrative will be submitted to the Department for review. Once accepted by the Department, the consultant will then forward a copy to the Bedford County Conservation District Office for their review and approval.

Assume an NPDES permit will not be required.

##### **Approach:**

CCJM agrees with the District's Scope of Work. In addition we offer the following:

The plan will be in accordance with Design Manual Part 2, Chapter 13, and the guidelines set forth in PA Code, Title 25, Chapters 92 and 102. The final plan and narrative will address any modifications of the preliminary design and will include all earth moving details of the proposed construction including off-site borrow or disposal areas.

All controls and any additional measures that are recommended by environmental studies will be incorporated into the erosion and sedimentation pollution control plan and narrative. Control devices will be designed in close coordination with the District Environmental Manager, Fulton County Conservation District, and PADEP. The erosion and sediment control plan sheets and narrative will be prepared with specific safeguards to minimize soil erosion.

Drainage areas and calculations for flows entering the site, occurring on site and exiting the site will be shown within the narrative. Both temporary and permanent erosion and sedimentation controls will be developed to minimize the site impacts of the estimated flows.

CCJM will submit the plan sheets and narrative to the District for review. A final set of the plan sheets and narrative, that incorporates review comments, will be submitted to the Fulton County Conservation District for their review and comment. CCJM will address any comments from the conservation district and incorporate them into the construction plans. A concurrence letter accompanying the joint permit application to the PADEP and USACOE will be requested from the Conservation District.

It is assumed that the proposed bridge will be constructed under one stage of stream diversion (between the abutments) and that the existing bridge will be removed during that stage.

### **Task 10 - Utilities**

#### **Objective:**

##### 2.9.1 - Utilities

This task involves project specific work requirements for utility relocation engineering activities.

#### **Scope:**

##### 2.9.1 - Utilities

#### **Guidance:**

- Publication 16M, Design Manual Part 5, Utility Relocation

PennDOT projects which involve public utilities must include all necessary provisions for the safety and protection of both existing and any required relocation of utilities.

Coordination efforts will be maintained with the utility throughout the project design process to allow amicable solutions for known and potential utility/highway project conflicts.

### **Detail Task 1 - Utilities**

#### **Department Details:**

Utility investigations and verification of all utilities within the project area shall be completed in accordance with Act 38 and Design Manual 1, Chapter 4, Section 2.

Preliminary plans showing all utility locations shall be forwarded to all utilities involved so that conflicts which influence line and grade can be determined. These utility location plans shall show utilities in color in accordance with the APWA Temporary Marking Standard, except that alternate colors shall be used in lieu of lighter colors (i.e. - yellow) which do not reproduce well.

Do not use aerial photography for utility data. Utilize conventional survey.

#### **Approach:**

CCJM agrees with the Department's Scope of Work. Our technical approach is as follows:

CCJM/REI will obtain the existing utility list from the Fulton County courthouse, and contact the PA One-Call system for utility involvement and field delineation prior to the field survey being conducted. We will contact all of the utility companies listed as maintaining facilities in the area to obtain copies of plans and as-built documents to assist us in accurately showing the location of their facilities. Upon receiving all survey data and existing utility plans required, the existing utilities will be shown on the base mapping. This mapping will be submitted to the utility companies to ensure that all facilities are properly shown. Form D4181X along with supporting information will also be submitted to the utility companies. Based on responses received, we will edit the utilities shown on the mapping to ensure proper plotting on the applicable plans, profiles and cross sections in accordance with Design Manual 5 and Design Manual 3.

There are apparently no underground utilities within the project area. It is anticipated that any existing poles and overhead lines on the right (downstream) side of the project area will be permanently relocated. CCJM will identify the poles requiring relocation under this task.

No preliminary utility meetings are anticipated at this time.

CCJM will keep in close coordination with the District Utility Unit throughout the project. CCJM will record minutes of all required meetings, and prepare and/or assist the District with all required forms

## **Task 11 - Preliminary Pavement Design**

### **Objective:**

#### 2.4.9 - Preliminary Pavement Design

This task consists of assembling design data and determining preliminary pavement and subbase types.

### **Scope:**

#### 2.4.9 - Preliminary Pavement Design

Because the pavement design analysis is typically not completed until after the Design Field View Submission, approximate pavement and shoulder depths are shown on the typical sections in Preliminary Design.

Approximate depths are based on traffic volumes and the functional classification of the roadway.

### **Detail Task 1 - Preliminary Pavement Design**

#### **Department Details:**

Utilize the standard scope for this task.

#### **Approach:**

CCJM agrees with the Department's Scope of Work. In addition we offer the following clarification:

CCJM will use existing pavement data, functional classifications and traffic volumes, supplied by the Department to estimate the proposed pavement depths for preliminary design. At a minimum, the preliminary section will conform to the minimum depths specified in Publication 242, Pavement Policy Manual.

## Task 12 - Preliminary Drainage Design

### Objective:

#### 2.4.3 - Preliminary Drainage Design

This task includes all elements to develop preliminary drainage design with associated hydraulic computations

### Scope:

#### 2.4.3 - Preliminary Drainage Design

1. Develop a storm sewer drainage system layout for the selected alignment using very preliminary calculations and engineering judgement.
2. Size major culvert cross pipes by determining approximate drainage area.
3. Determine the need for top of slope and toe of slope ditches.
4. Identify existing drainage restrictions and coordinate with stormwater management strategy.
5. Identify drainage structures which will require agency permitting.

Include the following on the Design Field View Plans:

- \* Minor drainage features (inlets and pipes)
- \* Major drainage structures
- \* Drainage ditches

### Detail Task 1 - Preliminary Drainage Design

#### Department Details:

Prepare and submit a preliminary drainage design report to the Department for review. Include all hydrologic and hydraulic computations (excluding those to be included as part of Task 18.0, Hydrologic and Hydraulic Report). Include plans showing drainage areas, flows, swale/ pipe sizes, inlet data, and invert elevations. All Department comments will be incorporated into the final drainage design submission.

#### Approach:

CCJM agrees with the Department's Scope of Work. In addition we offer the following clarification:

Preliminary drainage design will be developed in accordance with Design Manual 2, Chapter 10 and Publication 584. Drainage areas will be determined using base mapping, proposed contours, and by observing field conditions. Detailed computations will be prepared indicating drainage areas; runoff flows; time of concentration; and capacity analysis of swales and ditch linings.

## Task 13 - Safety Review/Audit

### Objective:

#### 2.8.7 - Safety Review/Audit

This task consists of the time required for the Safety Review Committee to review the preliminary plans and the Project Design Criteria Report.

### Scope:

#### 2.8.7 - Safety Review/Audit

1. Conduct the safety review/audit as early in the design process as possible.

2. Identify all applicable items on the Safety Review Checklist (see Publication 10A, Design Manual Part 1A). Add any additional items based on engineering judgement and experience.
3. Detect safety deficiencies in the design.
4. Recommend safety enhancements.
5. Prepare the Safety Review Submission (two copies) at least two weeks before the design field view (if applicable). Include the following:
  - \* Color coded plans
  - \* Profiles
  - \* Typical sections
  - \* Project Design Criteria Report (see Design Manual 1A for details)

### **Detail Task 1 - Safety Review/Audit**

#### **Department Details:**

The consultant will prepare a submission for review by the District Safety Review Committee in accordance with Design Manual Part 1A, Appendix E. This submission will include all data necessary to adequately evaluate the safety features, including all applicable information from DM-1A, Appendix E, Table 1, Safety Review Checklist. The consultant will attend and present the project at the formal Safety Review Committee Meeting at the District Office. Any changes that may result from this review will be incorporated into the Design Field View Submission.

The following are also required as part of the Safety Review submission: The guiderail length of need, point of need and type of end treatment labeled for each guiderail run and the required and proposed sight distances labeled for each intersection and driveway. If the proposed sight distance does not meet the required sight distance, list the existing sight distance also. These items should be submitted as extra sheets so the plan view is not cluttered. The consultant will attend the formal Safety Review Committee Meeting at the District Office. Any changes that may result from the review will be incorporated into the Design Field View Submission.

#### **Approach:**

CCJM will prepare a Safety Review Submission in accordance with the Design Manual, Part 1C, Appendix O. The submission will address all pertinent comments from the Line and Grade Submission, and include all information required for the District to effectively evaluate all the safety features and/or concerns for the preliminary design stage of the project. The submission will include the following:

- Color coded plans
- Profiles
- Typical sections
- Project Design Criteria Report based on an outline provided by the District.

By using the 3R design criteria no design exceptions are anticipated.

CCJM will provide the appropriate personnel to participate in the Safety Review meeting. We will also be available to answer any questions or provide any additional support services at any time during the review.

The submission will be made in accordance with the District 9-0 electronic submission criteria.

## Task 14 - Preliminary ROW Activities

### Objective:

#### 2.6.1 - Preliminary ROW Activities

This task includes the requirements as stipulated under Publication 14M, Design Manual Part 3.

### Scope:

#### 2.6.1 - Preliminary ROW Activities

A preliminary right-of-way plan will be prepared for all Department projects where the construction activities require property acquisition beyond the footprint of existing Department of transportation property. The right-of-way plan shall be prepared in accordance with the requirements and contents as stipulated in Design Manual Part 3.

The right-of-way plan(s) is(are) subject to a plan check review by the District Right-of Way Unit, Chief of Surveys and the Central Office Bureau of Design, Field Liaison Engineer, Highway Quality Control Division. The plan and all supporting data shall be submitted to the District in advance of the scheduled plan check review meeting. The person(s) responsible for the plan preparation will attend the review meeting. Departments and comments stemming from the plan review shall be addressed and incorporated in the subsequent right-of-way plan submission.

The right-of-way plan will be prepared on mylar with appropriate Pennsylvania professional engineer and surveyor seals affixed.

Until NEPA clearance has been obtained, the Department may not perform final negotiations and acquisitions of property.

A right-of-way certificate is issued when the Department has adequately acquired right-of-way to allow project construction.

## Detail Task 1 - Preliminary ROW Activities

### Department Details:

The preliminary right of way involvement will include research and investigation of property involvement in enough detail to establish an estimate of total and partial takes for the alignment studied; contacting affected property owners for their input as to existing iron pins, corners, septic tanks, septic fields, and/or wells, listing correct adverbs from parent deeds; and attempting to eliminate unknown property owners.

This work includes the research, investigation, and plotting of existing utility easements and right-of-ways.

Letters of Intent to Enter shall be sent to all involved parties prior to the start of field surveys.

All Right-of Way activities shall be completed in accordance with Design Manual 1.

This plan will include plat sheets and will be used for a preliminary plan check.

### Approach:

REI will provide all Professional Land Surveying services and CCJM will develop the Right of Way Plans.

REI concurs with the Department's scope for this project in conjunction with the specific detailed scope of work outlined in our Approach below:

Once the right-of-way requirements are agreed upon, REI will perform the functions as indicated below:

- REI will finalize and complete deed research for adjacent parcels.
- REI will adjust property lines per survey and final deed research.
- after CCJM adds R/W lines and Property Lines prepared by REI, REI will review and approve the Right-of-Way Plans at 25 scale with the property plot plans prepared at 50 scale unless individual property size would dictate that a different scale should be used to better depict the property and right-of-way impacts.

This scope of work assumes that the Department will provide Right-of-Way plans or adequate descriptions of right-of-way limits for the existing state roadway. For local roads that do not have recorded right-of-way widths and positions Raudenbush will develop Legal R/W lines based on Section 3.7 of DM 3 and submit them for concurrence to the District Right of Way Administrator. In accordance with Section 3.5 of DM-3, this scope does not include the correcting of erroneous property line calls in deeds nor resolution of ownership limits of undocumented/unrecorded or conflicting properties. This scope does not include preparation of a chain of title or property abstract.

REI will seal the preliminary Right-of-Way Plans and accompanying plot plans under the direction of a professional land surveyor (P.L.S.). Copies of applicable supporting documentation used in the development of the existing property and right-of-way lines including deeds, subdivision plans, utility agreements, etc. will be provided.

All deliverables will be provided electronically and, when in pdf format, will follow the District 9-0 electronic document submission standards.

### **Task 15 - Preliminary Type, Size and Location (TS&L)**

#### **Objective:**

#### 2.7.2 - Preliminary Type, Size and Location (TS&L)

This task consists of the assembly of Type, Size and Location studies and development of recommendations for proposed structures within the project. Publication 15M, Design Manual Part 4 apply to this task.

#### **Scope:**

#### 2.7.2 - Preliminary Type, Size and Location (TS&L)

Review any previous studies or preliminary designs with respect to the selection of structure type, span arrangements, horizontal and vertical clearances, design controls and type section. Coordinate with the District on the logical selection of span arrangements, types of piers, and structure types suitable at each location.

The preliminary structure designs will be performed at a stage when the highway alignment and profile are well defined. Review structure requirements with the District prior to Design Field View (Line and Grade) submission and approval.

The work elements are required for the successful completion of this task:

1. Develop a location plan showing the feature to be crossed or retained, design controls and regulated areas
2. Identify possible pier and abutment locations
3. Evaluate geotechnical conditions to identify potential foundation types
4. Recommend locations for structure foundation borings
5. Evaluate constructability, vertical and horizontal clearances and site constraint issues in determining the most suitable structure design for the

particular location

6. Prepare cost estimates for alternative structure designs
7. Prepare justification for recommended alternative
8. Prepare transmittal letter, plans and report for TS&L submission

### **Detail Task 1 - Preliminary Type, Size and Location (TS&L)**

#### **Department Details:**

Provide all information required by Design Manual Part 4, Volume 1, Part A, Section 1.9.3.

The preliminary TS&L plans for the recommended structure shall show the plan and elevation of the structure, the proposed type and size of the structure, a section through the approach pavement and shoulders, and the controlling horizontal and vertical clearances.

A detailed cost estimate including quantities and unit costs will be included, including back-up data showing the source of information, for a minimum of three structure types.

If single-span, BRADD alternates are studied:

An initial meeting will be held to discuss the BRADD system. Consultant will develop geometric layout for the bridge (profile, typical sections, skew, locations, substructure units, minimum clearances, and wing wall layout). Consultant will be present when BRADD is run. Consultant will provide all available hydraulic line and grade data and updated unit cost menu. Consultant will make trial runs using consultant prepared input sheets for various structures. The Consultant will then print TS&L plans and computations for most economical structure and submit the TS&L to the District. This will be used for Design Field View submissions.

#### **Approach:**

CCJM agrees with the Department's Scope of Work. Our Technical Approach is as follows:

A Bridge Replacement Study will be performed and a preliminary TS&L submission will be prepared for the recommended bridge alternative in accordance with Design Manual, Part 4. LRFD design criteria and specifications will be utilized. The submission will include the items specified by Design Manual, Part 4, Policy and Procedures, Section 1.9.3.3. Included with the preliminary bridge plan will be preliminary roadway plans, profiles and typical sections.

CCJM will consult with the District on the logical selection of structure types and span arrangements, and identification of alternatives to be studied in detail. Any previous studies will be obtained and reviewed. Based on our preliminary investigation into the hydraulic considerations it does not appear that hydraulics will be an issue during design. It is anticipated that the proposed structure will be a single span bridge. Therefore, the TS&L will be developed using the Bridge Automated Design and Drafting (BRADD III) software program.

The Bridge Replacement Study will be conducted in coordination with the roadway alignment studies. Structure parameters will be considered in the alignment study, so that the roadway alignment will be compatible with suitable structure types. Following development of the roadway horizontal and vertical alignments, detailed bridge studies will be undertaken. The final Bridge Replacement Study and Preliminary TS&L Submission will be developed following the Design Field View.

Details to be addressed by the Preliminary TS&L Submission will include: proposed type and size of structure, abutment locations, locations of fixed and expansion bearings, typical section of approach roadway and shoulders, controlling horizontal and vertical clearances, cost estimate determined on a pay item quantity/unit cost basis, cost quotations from fabricators, existing and finished grading, RSGER, proposed boring locations, and additional items specified by Design Manual, Part 4, Policy and Procedures, Section 1.9.3. A narrative report describing the alternatives studied and justifying the recommended alternative will also be included. All issues affecting the type, size and location of the structure, including site features, environmental constraints, utility impacts, constructability, geometric design criteria and other relevant factors will be discussed.

An electronic version of the Preliminary TS&L (transmittal letter, plans, report) will be submitted to the District for review and comments.

### **Task 16 - Hydrologic and Hydraulic Report**

#### **Objective:**

##### 2.7.1 - Hydrologic and Hydraulic Report

This task consists of the preparation of Hydrologic and Hydraulic reports for all bridges, culverts and longitudinal encroachments to size waterway openings properly and to satisfy permitting requirements. Publication 13M, Design Manual Part 2, Publication 15M, Design Manual Part 4; and PADEP Chapter 105 apply to this task.

#### **Scope:**

##### 2.7.1 - Hydrologic and Hydraulic Report

A separate Hydrologic and Hydraulic Report is required for each hydraulic structure. However, dual structures or structures located within the same hydraulic system should be combined into one report.

The following work elements are required for the successful completion of this task:

1. Gather existing information to be used in the development of the hydrologic and hydraulic analyses and in the preparation of the H&H Report.
2. Perform a hydrologic analysis of the watershed at each proposed crossing using one or more of the Department approved methodologies. The use of a particular model shall be justified as valid for the situation in which it is being used. All assumptions and/or limitations of each model shall be clearly identified and referenced. Multiple hydrologic models are recommended to assist in validating the selected approach. An analysis of the flood history according to the guidelines contained in Design Manual Part 2 should also be considered.
3. Perform a hydraulic analysis for each proposed crossing including alternatives, if necessary, using one or more of the Department approved hydraulic models. The use of a particular model shall be justified as valid for the situation in which it is being used. All assumptions and/or limitations of each model shall be clearly identified and referenced. Where a Flood Insurance Study has been established by FEMA, the hydraulic data included in the study should be utilized to the maximum extent deemed appropriate. Each proposed alternative shall be modeled to assist in the justification for the selected alternative. The hydraulic model shall extend a sufficient distance upstream and downstream to adequately evaluate the potential impacts due to the proposed construction. The hydraulic model should be used to compare existing and proposed conditions with respect to water surface elevations and channel velocities for the design discharge rate(s), including the 500-year event for the scour evaluation and the "overtopping event" for the risk assessment.
4. Evaluate the scour potential at bridge abutments and piers in accordance with Design Manual Part 4. Evaluate the erosion potential at culvert

outlets in accordance with HEC-14.

5. Evaluate the channel stability and design countermeasures, if needed.
6. Perform a risk assessment or analysis for each applicable waterway structure or encroachment alternative.
7. Evaluate the hydraulic impacts as a result of temporary encroachments and/or permanent bank protection, if applicable.
8. Prepare the Hydrologic and Hydraulic Report following the general outline described in Design Manual Part 2.
9. If applicable, prepare a Conditional Letter of Map Revision (CLOMR) in accordance with FEMA regulations. The scope of work for the preparation of the CLOMR is not included herein and should be developed prior to initiating the work.

#### **Detail Task 1 - Hydrologic and Hydraulic Report**

##### **Department Details:**

The consultant is responsible for attending a Pre-H&H meeting with District Bridge Unit personnel prior to beginning the Hydrologic and Hydraulic Study.

The hydraulic design of the bridge shall be in accordance with Design Manual 2 - Chapter 10. The consultant will prepare all approval requests, permit requests and any other applications as stated in Chapter 10.

Consultant will determine if a FEMA Flood Study or stream gauging data is available for this project site and obtain data accordingly.

Special attention should be given to the following:

- The existing structure conditions will be analyzed and compared to the proposed conditions.
- If the proposed construction would have the potential to cause flooding problems, the construction phasing will be hydraulically analyzed to produce the least adverse impacts.
- Include scour analysis and riprap design (use FHWA method).
- Include all necessary data for a temporary bridge and/or roadway, if feasible and approved by the Department. In addition, the need for a contractor's causeway will be evaluated at this time and documented in writing that it has been considered, is not necessary or, if necessary, then it is to be included in the H & H Report.

All data generated during the hydrologic and hydraulic design analysis will be developed into maps, profiles, and tables related to the replacement of the existing structure. A formal report presenting the details of the analysis will be prepared. A one hundred year "Risk Assessment" should be on a separate page and broken into two parts. The first part should discuss the proposed structure and the second part should discuss any temporary roadway, causeways, etc. which are needed to construct the bridge.

The consultant will provide two (2) draft copies of the H&H report. Upon approval, one final PDF will be submitted to the District along with a separate computer diskette of the HEC 2 or HEC-RAS data used to prepare the report.

**Approach:**

CCJM agrees with the District's Scope of Work and offers the following clarification:

CCJM will attend a Pre-H&H meeting with District Bridge Unit personnel prior to beginning the Hydrologic and Hydraulic study.

CCJM has performed a preliminary survey of the FEMA and USGS documentation for the bridge site to determine the need for a waterway permits. A Joint permit Application as provided under Title 25 of Chapter 105 of the Pennsylvania Code will be required for the floodway encroachment on this project. The JPA requirements include a hydrologic and hydraulic report as part of its documentation.

The FEMA information for the project area indicates that a flood plain is present under the structure and extending upstream. Impacts to the 100-year flood plain water surface elevation should remain at less than a one foot increase. Recommendations regarding scour protection will be made based on the results from the hydraulic model.

The low chord elevation will be maintained or raised as appropriate.

CCJM will produce an electronic Hydrology and Hydraulics Report for review and approval of the District. The report will form one of the components of the TS&L and will be used as part of the Joint Permit Application.

### **Task 17 - Design Field View**

**Objective:**

2.4.10 - Design Field View

This task consists of the development, submission and approval of the Design Field View submission.

**Scope:**

2.4.10 - Design Field View

1. Conduct design field view at the end of the preliminary engineering and within several weeks of the Design Field View Submission.
2. Evaluate the proposed alternatives under field conditions.
3. Solicit comments from review agencies for further project development.
4. Determine the preferred alternative if applicable.

#### **Detail Task 1 - Design Field View**

**Department Details:**

The plans and cross sections submitted as part of the Design Field View Submission shall be in a scale of 1"=25'.

A Design Field View Report is required as part of the Design Field View Submission to include but not be limited to the following:

- " Location Map
- " Project Description
- " Design Criteria
- " Traffic Information
- " General Evaluation of accident history
- " Scoping Field View Minutes
- " Letter of recommendation from the District Safety Review Committee.

If design exceptions are required, the Design Field View Report and the Design Exception Request can be combined as one report and submitted as the Design Field View Submission. Requirements for the design exception request are included in the standard scope. Do not include collision diagrams and/or accident cluster diagrams in the Design Exception Request or Design Field View Submission. A general evaluation of the accident history will be sufficient.

Additional plans, reports, details, and other deliverables not listed in this task shall be included in the Design Field View Submission as necessary to support the proposed design.

**Approach:**

CCJM will prepare a Design Field View Submission in accordance with Publication 10C, Design Manual Part 1C, Chapter 3. The submission will address all comments received from the Line and Grade Submission, and the Safety Review Submission.

The investigation of alternate alignments and interchange/intersection schematics are not anticipated on this project and therefore will not be included in the Design Field View Submission.

The submission will include preliminary line and grade, typical sections, pavement depths, representative cross-sections used to develop preliminary Right-of-Way impacts, preliminary roadway drainage and associated computations, preliminary signing and pavement markings, preliminary traffic control plans, preliminary erosion and sediment pollution control plans, draft of the Reconnaissance Soils and Geological Engineering Report, preliminary special provisions, preliminary cost estimate, a design field view report, and preliminary T S & L information.

No Design Exceptions are anticipated.

The plans will be in accordance with Design Manual Part 3

The Design Field View for this project has been waived, therefore no meeting is anticipated at this time. This task is for the preparation and submission of plans and report only.

### **Task 18 - Preliminary Geotechnical Engineering Report**

**Objective:**

2.5.2 - Preliminary Geotechnical Engineering Report

This task is the preparation of a Geotechnical Engineering Report for Pre-Final Design in accordance with Publication 10A, Design Manual Part 1A and Publication 293.

**Scope:**

## 2.5.2 - Preliminary Geotechnical Engineering Report

The following work elements are required for the successful completion of this task:

1. Coordinate the effort with the District Geotechnical Engineer (DGE) and the other engineering disciplines involved. Perform QA/QC on work processes and products.
2. Perform analysis and design associated with embankment and cut slope construction, stormwater management facilities, drainage conduits, pavements, unsuitable materials, special geotechnical treatments, benching and transition zones, and geotechnical instrumentation for construction control.
3. Develop recommendations for use by the design team, and draft special provisions and details for construction.
4. Identify the anticipated scope of geotechnical investigations required during Final Design.
5. Prepare the GER for Pre-Final Design, presenting the recommendations and providing supporting documentation. Follow the outline in Publication 293, including a summary of the structure-related geotechnical investigations and reports for the project. Submit both a draft (95%) and a final (100%) version of the GER to the DGE.
6. Gather the information and materials necessary to assemble a preliminary soil profile plan. Obtain plan and profile sheets for the alignment from the design team. Obtain approval of the proposed graphics layout, scales and symbology.
7. Prepare the preliminary soil profile cover sheet and index sheet. Develop graphic logs of the borings. Prepare the profile sheets, showing the graphic boring logs and test results. Assemble the cover, index and profile sheets and submit a half-size copy as an appendix to the GER.

**Detail Task 1 - Preliminary Geotechnical Engineering Report****Department Details:**

Delete Scope 2.5.2, work elements 1 through 7. This task will consist only of those items included under Scope 2.5.2.1.

In order to fully evaluate the feasibility of each structure alternate, a soils and geological reconnaissance survey will be undertaken in accordance with Design Manual Part 4, Volume 1, Part A, Chapter 6, Section 6.2. No borings will be required under this task.

**Approach:**

This task will be performed by REI with QA by CCJM.

REI will comply with the WBS (2.5.2.1) Scope of Work with the following clarifications and enhancements:

The work for this task will be done in accordance with PennDOT Publication 10A, Design Manual 1A, Design Manual 4, and Publication 293.

REI will coordinate with the District Geotechnical Engineer (DGE) and the other engineering disciplines involved including the District Bridge Engineer and BOD Bridge Quality Assurance Division (BQAD), if appropriate. REI will also coordinate with the Environmental disciplines for all phases of this work.

REI will conduct an office investigation including preparation of the SGH form; Review of background geological information and maps, boring logs, project files and reports, environmental documents, and right-of-way plans to describe the soil/rock/hydrologic setting, Contact of Federal and State agencies with access to soils and geologic data; and Review of previous geotechnical work performed in the vicinity of the structure.

REI will conduct Site Reconnaissance which will include a visit to the site, interviewing local residents and engineers; obtain photographs of the site; refine the soil/rock/hydrologic setting description and prepare notes from reconnaissance.

REI will evaluate the site characteristics and evaluate their impact on the proposed construction.

REI will: Determine the field and laboratory investigation needs. Assemble a soil/rock boring and testing plan; As warranted by the project, assemble a water/soil/sediment sampling and testing plan; Prepare a tabular summary of the proposed drilling following the format of Publication 222 and a similar tabulation for testing.

REI will prepare a draft RSGER, presenting the information required in Design Manual Part 4, with the boring and testing plan as an appendix and submit the report for approval.

All deliverables will be provided electronically and, when in pdf format, will follow the District 9-0 electronic document submission standards.

### **Task 19 - Public Involvement**

#### **Objective:**

##### 2.1.3 - Public Involvement

This task includes the attendance and preparation of informational materials to be viewed and/or distributed to the general public at public meetings. This task may also include the preparation of newsletters, public announcements and all other aspects of public involvement as outlined in Publication 295.

#### **Scope:**

##### 2.1.3 - Public Involvement

1. Obtain approval from PMC to proceed with public involvement activities.
2. Prepare announcement for public meeting.
3. Prepare visual materials and/or flyers for general public meetings.
4. Attend all public meetings and address comments made at the meeting.
5. Prepare minutes to the meeting and submit to the Project Manager for review. Revise if necessary.

### Detail Task 1 - Public Involvement

#### **Department Details:**

The consultant will provide plans and displays for a public officials meeting and a public plans display. The consultant will notify the public officials (township, borough, county, state, police, fire, schools, emergency services, etc.) by letter. Time, date, and place of meetings will be coordinated by the consultant. The consultant will prepare and pay for newspaper ads for the public plans display to be included in the local newspapers circulated in the area. The ad will be submitted to the Department for review and approval prior to submitting it to the newspapers. The consultant will make all necessary arrangements and pay for hall rental for public plans display. Costs for ads and hall rental to be included in Estimated Direct Expenses. Use \$500.00 for ads and \$300.00 for hall rental. The consultant will record minutes of the public officials meeting and the public plans display and will distribute to interested parties with 10 calendar days after the meetings.

#### **Approach:**

CCJM concurs with the Department's scope with the following clarifications:

CCJM will prepare informational materials and conduct one public officials meeting and public plans display during the Preliminary Design of this project. It is anticipated that the meetings will be in conjunction with regularly scheduled municipal government meetings and will be in conjunction with public plans displays. A separate meeting will not be required. We will be responsible for all arrangements, including: developing public advertisements, notifying local officials and property owners, preparing hand-outs and displays, providing audio-visual equipment and setting up displays.

All public involvement for the project will be conducted in accordance with PENNDOT's Public Involvement Handbook, Publication 295 (September 1995).

### **Task 20 - Structure Boring**

#### **Objective:**

##### 2.5.4 - Structure Boring

This task is the performance of core borings for structures by an approved test boring contractor in accordance with Publication 15M, Design Manual Part 4, Publication 293 and Publication 222M.

#### **Scope:**

##### 2.5.4 - Structure Boring

The following work elements are required for completion of this task:

1. Coordinate the effort with the District Geotechnical Engineer (DGE), District Bridge Engineer, BOD Bridge Quality Assurance Division (BQAD), and the other engineering disciplines involved. Perform QA/QC on work processes and products. Verify that roadway alignment and structure TS&L have not changed since approval of the Reconnaissance Soils and Geological Engineering Report (RSGER).
2. Advertise and receive bids on a contract for performance of the test borings in accordance with Publication 222M, based on the boring program in the approved TS&L for the structure.
3. Submit a summary of the bids to the District for approval to award the contract and proceed with the work.

4. Upon notice to proceed, notify the affected public, and award and administer the test boring contract in accordance with Publication 222M.
5. Provide PennDOT-certified inspectors to oversee the field operations and to prepare the field logs of the borings as they are drilled.
6. Prepare water testing required to allow analysis of foundation conditions. Tabulate the results of the testing
7. Upon completion of the field work, verify contract terms have been met, close out the subcontract, and prepare and submit the subcontractor evaluation form.
8. Prepare a record copy of the engineer's logs for the borings for submission with the Foundation Report for the structure.

### **Detail Task 1 - Structure Boring**

#### **Department Details:**

Upon receiving boring layout approval, the consultant will obtain core borings for the structure foundations and complete the following:

- Complete contract documents for soliciting bids in accordance with Design Manual 1, Chapter 5, Section 9, Design Manual Part 4, Volume 1, Part A, Chapter 6.3 and Publication No. 222.
- Submit the bid documents to the Department for review and approval prior to advertising for bids.
- Provide core boring contractors with a pre-labeled envelope for the purpose of returning bids to the consultant.
- Administer the bid opening (at consultant's office) and tabulate the bids.
- Upon authorization from the Department, award contract to successful bidder and administer contract.
- Stake-out core borings in field, provide core boring inspection (inspector to be pre-approved by District), and prepare core boring drawings.
- Testing to determine foundation design parameters, based on the reconnaissance report for depths and locations of tests. Proposed tests should include rock strengths (unconfined compression) and soil parameters (gradation, density, direct shear, consolidation, etc.) as may be required for the foundation report. Obtain Department approval of the proposed testing prior to submitting rock and soil samples for testing.

#### **Approach:**

REI will comply with the WBS (2.5.4) Scope of Work with the following clarifications and enhancements

The work for this task will be done in accordance with PennDOT Publication 15M, Design Manual 4, Publication 222, and Publication 293.

REI assumes a HASP will not be required for drilling operations.

REI will prepare and administer the exploration contract(s) which includes the following subtasks:

- a. Prepare the Final Contract Documents.
- b. REI will solicit bids from drilling contractors on the statewide drillers list. REI anticipated the cost of drilling being less than \$20,000. We will solicit bids from as many qualified bidders as practical for the performance of the test borings and other exploration in accordance with Publication 222, based on the approved PSDEP for preliminary design
- c. Review Notice of Intent to Enter Letters prior to subsurface investigation commencing. The NOITE letters will be prepared under Task 2.
- d. Conduct a pre-bid meeting with the drillers at the site.
- e. Conduct a bid opening.

- f. Conduct a document check and tabulation of bids and submit a summary of the bids to the District with recommendations for approval of award of the contract to the lowest responsible bidders.
- g. Upon notice to proceed, notify the affected public, and award and administer the test boring contract in accordance with Publication 222.

REI will perform Drilling inspection duties based on the following assumptions:

- a. 4 Structure Borings
- b. 170 Total footage
- c. 35 feet per day (10 hour days)
- d. Certified inspectors
- e. Borings logged as drilled

REI's Drilling inspector's duties will include:

- a. Field Inspection of the drillers activities
- b. Perform the water/soil/sediment sampling.
- c. Laboratory sample selection and send to an AAP accredited laboratory.
- d. Attend and prepare minutes of 50% exploration meeting, if required.
- e. Coordinating testing of soil, rock, and water testing.
- f. Conducting site inspection, punch list preparation, and final inspection.
- g. Conducting core box documentation.
- h. Review and submission of contractor's invoices.
- i. Upon completion of the field work, verify contract terms have been met, close out the subcontract, and prepare and submit the subcontractor evaluation form.
- j. Prepare a record copy of the engineer's logs for the borings for submission with the Foundation Report for the structure.

**Consultant Hierarchy**

<b>Business Partner</b>	<b>DBE Type</b>	<b>Supervising BP</b>
C.C. Johnson & Malhotra, P.C.	Yes	
Raudenbush Engineering, Inc.	Yes	C.C. Johnson & Malhotra, P.C.
Skelly and Loy, Inc.	No	C.C. Johnson & Malhotra, P.C.

**Attachments**

-  [CONCEPT ALIGNMENT.pdf](#)

**Part 2 - Final Design, Big Cove Tannery**

**Description**

Final Design for the replacement of the bridge on S.R. 0928, Section 02B, Fulton County, Ayr Township, over Big Cove Creek

**Task 1 - Project Management/Administration**

**Objective:**

## 2.1.1 - Project Management/Administration

This task consists of the administrative effort required by principals, project manager, and involved personnel to complete the project on time and within budget, and to provide a quality product.

**Scope:**

## 2.1.1 - Project Management/Administration

Project Management involves the planning, scheduling, organizing and controlling of resources to achieve specific objectives within established schedule, budget and quality standards. The Project Manager is responsible for the tasks outlined in the Department Detail.

**Detail Task 1 - Project Management/Administration****Department Details:**

The consultant will prepare and distribute to appropriate parties the minutes of all project meetings and telephone conversations where directions or decisions are made. The minutes are to be distributed within 10 calendar days following the meeting or telephone conversation.

The consultant shall provide construction cost estimates on a monthly basis or as required by the Department.

The consultant shall progress the schedule and submit the updated Open Plan design schedule to the Department on a monthly basis.

The consultant must maintain an up to date electronic copy of the project's Open Plan schedule using the Department approved version of the Deltek's Open Plan software. This will allow the consultant the ability to address what if scenarios related to any necessary recovery plans, since the modification of relationships is not a functionality of WelcomHome.

The consultant will thoroughly check all design submissions prior to submitting them to the Department for review. All computation sheets shall bear the initials of both the individual who prepared the calculations and the individual who checked the calculations. The Department reviews will be cursory in nature and the consultant will be responsible for design and plan accuracy. The consultant will be liable for design and plan errors in accordance with 67 PA Code, Chapter 455, Consultant Highway Design Errors.

The prime consultant will be responsible for subconsultant and DBE progress. All submissions prepared by subconsultants will be submitted through the prime consultant's office. The prime consultant will be responsible for the accuracy and quality of work prepared by subconsultants.

For archiving into the ECMS Project Development Checklist, the following reports (once approved in writing by the District or the appropriate permitting agency) will be provided by the consultant to the District in electronic, PDF format:

- Final TS&L Report, including RSGER
- Final Foundation Report
- Final Drainage Design Report
- Final Pavement Design
- Final Structure Design Computations
- Final Roadway Design Computations
- Final Quantity Computations

**Approach:**

CCJM has reviewed the Department's scope of work for this task and concurs with the following clarifications:

CCJM's Project Manager will be responsible for the overall coordination of the project team and work effort. He will be responsible and accountable for completion of the project within the budget and schedule as well as seeing that all work effort is consistent with the quality and standards of the Department.

In addition, CCJM will perform routine quality control/quality assurance reviews prior to submissions in accordance with our corporate quality management system.

CCJM will have previously prepared a project design schedule using Open Plan and will update the schedule monthly using the WELCOM Home project tracking system. The schedule updates will include the original baseline, the updated schedule, and the changes that occurred the previous month.

Reports will be provided to the District in electronic PDF format.

**Task 2 - Supplemental Surveys****Objective:**

## 2.10.3 - Supplemental Surveys

This task includes all survey required to supplement the original roadway survey or Photogrammetric mapping performed in Preliminary Design.

**Scope:**

## 2.10.3 - Supplemental Surveys

## Guidance:

- Publication 122M, Surveying and Mapping Manual
- Strike Off Letter 430-99-20, QA/QC Control Checklist for Right-of-Way and Construction Plans
- Publication 213, Work Zone Traffic Control Manual
- Form D-428, Field Book

## Scope:

The Quality Assurance/Quality Control Checklist will be completed and discussed with the District Chief of Survey for all final design survey work.

Prior to initiating surveys, develop a Traffic Control Plan in accordance with Publication 213 for implementation during surveys within existing transportation facilities.

**Detail Task 1 - Supplemental Surveys****Department Details:**

All conventional roadway surveys will be completed by consultant forces. All surveys shall be in accordance with current Design Manuals and

Publication 122. The consultant will resurvey the approved Design Field View alignment as necessary for topography and cross sections. The consultant will be responsible for re-painting and flagging the construction centerline at 50 foot intervals. The consultant will flag and mark all permanent references and flag benchmarks not more than 30 days prior to the beginning of construction. The consultant will be notified by the Department project manager concerning the construction start date.

**Approach:**

REI agrees with the Department's Scope of Work and Department Details for Supplemental Surveys.

REI will resurvey, stakeout and reference the approved Design Field View alignment and stakeout the approved baselines and centerlines. Reference circle data will be obtained for each control point. Permanent benchmarks and references will be established outside the limits of the proposed construction.

All surveys will be performed in accordance with Publication 122M, Survey Manual; Publication 203M, Work Zone Traffic Control and applicable sections of Publication 10A, Design Manual Part 1A.

All deliverables will be provided electronically and, when in pdf format, will follow the District 9-0 electronic document submission standards.

### **Task 3 - Final Type, Size & Location (TS&L) Report**

**Objective:**

2.7.3 - Final Type, Size & Location (TS&L) Report

This task consists of the assembly of Type, Size and Location studies and development of recommendations for proposed structures within the project. Publication 15M, Design Manual Part 4 apply to this task.

**Scope:**

2.7.3 - Final Type, Size & Location (TS&L) Report

Review any previous studies or preliminary designs with respect to the selection of structure type, span arrangements, horizontal and vertical clearances, design controls and typical section. Coordinate with the District on the logical selection of span arrangements, types of piers, and structure types suitable at each location.

The preliminary structure designs will be performed at a stage when the highway alignment and profile are well defined. Review structure requirements with the District prior to Design Field View (Line and Grade) submission and approval.

The following work elements are required for the successful completion of this task:

1. Develop a location plan showing the feature to be crossed or retained, design controls and regulated areas
2. Identify possible pier and abutment locations
3. Evaluate geotechnical conditions to identify potential foundation types
4. Recommend locations for structure foundation borings
5. Evaluate constructibility, vertical and horizontal clearances and site constraint issues in determining the most suitable structure design for the particular location
6. Prepare cost estimates for alternative structure designs
7. Prepare justification for recommended alternative
8. Prepare transmittal letter, plans and report for TS&L Submission

### **Detail Task 1 - Final Type, Size & Location (TS&L) Report**

#### **Department Details:**

Following Design Field View approval, consultant will submit formal TS&L with (BRADD, if applicable) plan sheets and other applicable Design Manual 4 information for each of the structures.

Contours are not required for a BRADD submission but other custom drafting is required for this submission.

Report to be in accordance with Design Manual, Part 4, Volume 1, Part A, Chapter 1.9.3. The consultant will provide a current construction cost estimate, with back-up information for lump sum items, with the Final TS&L submission.

#### **Approach:**

CCJM agrees with the Department's Scope of Work with the following clarification:

Following review of the Preliminary TS&L submission and after Design Field View approval, a formal Type, Size, and Location submission and report will be prepared for the preferred alternate in accordance with Design Manual, Part 4 Policy and Procedures. The Final TS&L submission will include a TS&L Submission Letter; TS&L Plans (General Plan and Elevation Views, Typical Cross Section, and Special Details); the RSGER; additional pertinent information; appropriate Quality Assurance Forms; and the TS&L Cost Estimate.

The proposed bridge will a single span bridge with two stages of construction unless a viable detour is approved.

CCJM will determine the minimum low chord elevation, the minimum clear span length and the minimum clear roadway width as part of the analysis. While the roadway geometry will be developed precisely, the bridge plans will show an "envelope" of the acceptable bridge.

All comments from the Preliminary TS&L submission will be addressed in the Final TS&L report and submission. CCJM will provide an electronic version to the District for approval.

### **Task 4 - Cross Sections**

#### **Objective:**

2.10.4 - Cross Sections

This task is the preparation of final cross sections in accordance with Publication 10A, Design Manual Part 1A.

#### **Scope:**

2.10.4 - Cross Sections

The cross sections will be based on the vertical and horizontal alignments and will be plotted at an appropriate vertical and horizontal scale.

Cross section intervals should be taken at a distance that clarifies the existing conditions not to exceed 50 feet. Shorter intervals should be considered for walls and other permanent structures or special conditions. Develop a half - section at each driveway location without prepared profiles.

The following work elements are required for the successful completion of this task:

1. Cross sections at selected intervals.
2. Cross section title sheet providing number of cross section sheets in the package, break-down of each alignment with stations and related sheet numbers.
3. Cross section reference sheet at all interchanges and complex intersections
4. Develop earthwork quantities for each section and place on sheet.
5. Submit cross sections in accordance with Publication 14M, Design Manual Part 3.

#### **Detail Task 1 - Cross Sections**

##### **Department Details:**

Show all utility poles and right-of-way lines on the cross sections.

##### **Approach:**

CCJM will develop cross sections to the extent necessary to meet requirements in accordance with Design Manual Part 1A, Chapter 6, and in accordance with Design Manual 3. In addition to the underground utilities, all existing poles and overhead lines will be shown.

Cross sections will be developed at 50' intervals for the preferred alignment.

#### **Task 5 - Pavement Marking Plan**

##### **Objective:**

2.10.16 - Pavement Marking Plan

This task is the development of the pavement marking plan.

##### **Scope:**

2.10.16 - Pavement Marking Plan

The final submission will include:

- General Plans
- Special Details
- Delineator Spacing Tables
- Delineator Mounting Details
- Quantities
- Specifications

For mainline roadway sections where markings and delineators are consistent and repetitive, typical details will be developed to eliminate unnecessary drafting and design sheets. The pavement marking and delineation plan for the interchange areas will detail all gore areas, islands and other special markings. Beginning and ending stations will be shown for longitudinal pavement markings and station locations will be identified for pavement legends.

Depending on the complexity of the project, the details of the plan and the total length of the project, the elements of the pavement marking and delineation plan may be incorporated with the signing plan.

### **Detail Task 1 - Pavement Marking Plan**

#### **Department Details:**

Separate plan to be included in construction plan.

#### **Approach:**

Pavement Marking Plans will be included on the Roadway Plan Sheets but tabulated separately.

### **Task 6 - Utility Engineering**

#### **Objective:**

##### 2.10.8 - Utility Engineering

This task consists of engineering for utility relocation.

##### 2.10.8.1 - Utility Coordination

This task consists of the coordination of all project utility relocation activities.

##### 2.10.8.2 - Utility Agreements

This task consists of coordinating the submission of the Preliminary Estimate for Utility Relocation package to the Department.

##### 2.10.8.3 - Utility Relocation Highway Occupancy Permits Application

This task consists of coordinating the utility relocation permit application submission to the Department.

##### 2.10.8.4 - D-419 (Utility Clearance)

This task is the preparation of the utility clearance (D-419).

#### **Scope:**

##### 2.10.8 - Utility Engineering

#### **Guidance:**

- Publication 16M, Design Manual Part 5, Utility Relocation

Solicit the utilities requirements for the design and construction of the relocations as soon as possible to determine if:

- work will be done by utility staff and forces,
- work will be done by utility consultant and contractor,

- work will be requested to be done by PennDOT's project designer and contractor, or any combinations of the above.

All utility related formal requests for agreements, permits and occupancy applications must be in accordance with the applicable policies and procedures of Design Manual Part 5.

Authorization to perform preliminary and final utility engineering will be provided in writing by the Department.

#### 2.10.8.1 - Utility Coordination

Guidance:

- Publication 16M, Design Manual Part 5, Utility Relocation
- Form D4181, Utility Relocation Questionnaire and Permit Application
- Form D4181UC, Utility Relocation Clearance Report
- Form D4181A, Utility Relocation Estimates Relocation Plans & Supporting Data
- Cost Sharing Request Information, DM5

The scope of work will include the following activities:

1. Schedule and facilitate an Initial Utility Design Stage meeting to explain the project improvement goals, schedules, and targeted utility clearance dates.
2. Transmit copies of the Department's right-of-way plans, profiles and cross sections along with forms D4181, D4181UC, and D4181A to the utility companies for their relocation engineering design and cost estimates.
3. Delineate the type, size and location utility information verified by the utility company onto the project plans, profiles and cross sections.
4. Upon receipt of utility relocation alignment plans, establish and delineate the substitute right-of-way, or reserved easements, corridor for the utility relocation on the project Right-of-Way Plan.
5. Solicit utility company input relative to project design/utility conflicts, and potential need for substitute right-of-way corridors for utility relocations.
6. Schedule and conduct a utility meeting to review the proposed utility relocations and to resolve any outstanding issues with the individual affected utilities, as needed.
7. Schedule and facilitate the Final Utility Design Stage meeting to discuss and resolve utility/design conflicts and concerns, including substitute right-of-way, when required.
8. Keep utility companies informed of all design changes that could impact existing or planned utility facilities.
9. Ensure the following items are made part of the P.S.&E. package:
  - a. Utility relocation, abandonment and removal information onto the roadway construction plans, based on plans and information received from the

utility company.

b. Incorporated utility work to be performed by the PennDOT contractor, as ALSO Plans, or other approved procedures, into the project construction contract documents.

c. Obtain the restrictive, prior, concurrent, and coordinated calendar work day estimates from the utility companies for work to be performed by their own forces. The utility relocation construction duration time and schedule restrictions must be incorporated into the overall project construction schedule.

10. Invite District Utility Unit representative to attend the Final Design Stage Meeting, pre-bid, pre-construction, and all construction status meetings.

Scope Deliverables:

Document and distribute all meeting minutes, correspondence, memorandums and telephone conversations regarding project related utility issues.

#### 2.10.8.2 - Utility Agreements

Guidance:

- Publication 16M, Design Manual Part 5, Utility Relocation
- Form D4181A, Preliminary Estimate for Utility Relocation
- Form D4181UC, Utility Relocation Clearance Report
- Cost Sharing Request Information, DM5

Scope:

Arrangements for utility relocation, or adjustment, reimbursements and highway occupancy for highway projects must be accomplished through applicable estimate packages.

Details concerning the preparations and processing of the estimate packages are contained in Design Manual Part 5.

Scope Deliverables:

1. Coordinate and assist utilities with all utility related forms.
2. Preliminary Estimate for Utility Relocation (D4181A) package including the attachments listed in the Department Details.

#### 2.10.8.3 - Utility Relocation Highway Occupancy Permits Application

Guidance:

- Publication 16M, Design Manual Part 5, Utility Relocation
- Form D4181, Utility Relocation Questionnaire and Permit Application
- Publication 213, Work Zone Traffic Control Manual

The scope of work will include the following activities:

1. Transmit form D4181 to the utility company.
2. Coordinate and assist the utility company with the completion of Form D4181.
3. Track submission of the completed Form D4181 to the Department.

Scope Deliverables:

1. Coordinate and assist utilities with all utility related forms.
2. The Form D4181, Utility Relocation Questionnaire and Permit Application submission must include:
  - an index plan
  - plan of adjustments and/or relocation
  - profiles of longitudinal occupancies of underground facilities
  - cross sections and/or typical sections of all underground crossings
  - typical crossing profiles of all aerial facilities crossings showing minimum vertical clearances
  - Work Zone Traffic Control plans or applicable figures from Publication 213.
  - On all underground installations the utility must provide types of restoration to be utilized within the highway right-of-way

2.10.8.4 - D-419 (Utility Clearance)

Guidance:

- Publication 16M, Design Manual Part 5, Utility Relocation
- Form D-419, Utility Clearance

Scope:

For every highway project, a Form D-419 must be prepared prior to project advertisement.

The scope of work will include the following activity:

Identify and record disposition, from all available resources, of all utilities in the immediate vicinity of the project.

Scope Deliverable:

Prepare utility clearance Form D-419 for the District Utility Relocation Administrator review and approval.

- Indicate the nature of the utility work in accordance with DM-5, Chapter 11, Utility Clearance Procedures.

**Detail Task 1 - Utility Engineering**

**Department Details:**

As part of Scope 2.10.8.1, the consultant will provide a utility impact plan and a description/ tabulation of apparent utility impacts including station, offset, and nature of impact (i.e. - widening, cut, fill, drainage, etc.). These utility impact plans shall show utilities in color in accordance with the APWA Temporary Marking Standard, except that alternate colors shall be used in lieu of lighter colors (i.e. - yellow) which do not reproduce well.

This activity will be a continuation of the utility efforts initiated in the Preliminary Design phase.

The consultant will work with the affected utilities as the plan develops to insure that the utility locations shown on the final roadway and bridge plans are totally accurate.

All requirements of Act 38 will be fulfilled.

The consultant will coordinate, set-up, and attend all required utility meetings. Assume one utility coordination meeting.

Once the involvement for each utility has been defined for the project, the utility clearance Form D-419 will be prepared by the Department.

**Approach:**

CCJM will keep in close coordination with the District Utility Unit and the Utility companies throughout the final design stage of the project. Informing all the appropriate agencies of any design changes made during the final design process that may impact any existing or proposed utility facilities.

CCJM will incorporate all proposed utility work as received from the utility companies into the contract documents. All utility work to be done by the PADOT contractor will be incorporated into the final P.S. & E. Package. All utility work will be incorporated in accordance with Design Manual 5 and Design Manual 3. CCJM will perform a final design PA One-Call as required.

CCJM will schedule and conduct a final design project utility meeting in accordance with the Departments scope of work. All outstanding issues will be addressed and resolved for incorporation into the final contract documents. CCJM will record minutes of the meeting and distribute to all of those in attendance.

**Task 7 - Final Structure Plans****Objective:**

2.10.13 - Final Structure Plans

This task is the development of the final structure plans.

**Scope:**

2.10.13 - Final Structure Plans

1. Complete final engineering design(s) for structures on the project based upon the approved type, size and location (TS&L) plans and approved foundation recommendations. Prepare design calculations, construction documents and QA/QC forms in accordance with the Department's Design Manuals as amended by current strike-off letters.

2. Provide pay items and special provisions for design alternate bidding.

3. Provide plan details and special provisions as required for support of excavation and for construction phasing.
4. Provide special provisions for items not covered by Department specifications. Obtain current standard special provisions list from District and utilize standard special provisions whenever possible. Write project specific special provisions, if needed.
5. Prepare cost estimate for each structure based upon estimated quantities and historical data for similar structures in the project region. Consider access, phasing, and relative difficulty of construction in establishing unit prices.
6. Make a pre-final submission to the Department of completed plans, special provisions, quantity estimates, cost estimates, QA/QC forms and computations.
7. Revise the previously submitted documents as required to address the Department's comments thereon. Document responses to comments in writing.
8. Submit the final plans, special provisions, quantity estimates, cost estimates, QA/QC forms and computations properly signed and sealed and in the form described in Publication 15M, Design Manual Part 4.

#### **Detail Task 1 - Final Structure Plans**

##### **Department Details:**

The structure design will be prepared in English units.

Provide an updated cost estimate for the entire project with this submission. Provide back-up information for all lump sum items.

Provide alternate structure special provisions.

If a non-BRADD alternate is selected, the structure design will be prepared using Load Resistance Factor Design.

If a single span bridge replacement alternative is selected during the TS&L stage, the final bridge plans will be prepared using the BRADD System in accordance with Design Manual Part 4 and the following:

- The consultant will be responsible for preparing BRADD input forms and verifying the proper usage of this input data for BRADD, incorporating BRADD generated bridge plans and quantities into the PS&E package, and developing all needed construction special provisions for the bridge (including the Alternate Structure Special Provisions).
- Incorporate additional information such as existing and proposed ground lines in the vicinity of the structure, approach guide rail data, roadway drainage, existing structure layout, rock protection at abutments and wing walls, slope protection, scour treatment, point of minimum vertical clearance, horizontal clearances, utilities, core boring sheets, and perform all other work needed to complete the bridge plans.
- Final structure design will proceed as follows: (1) Consultant submits final input sheets and superstructure drainage computations. (2) District reviews input and provides comments. (3) Consultant runs BRADD, prepares the drawings, then submits pre-final structure plans for review. (4) District returns with comments, if any. (5) Consultant finalizes the drawings and special provisions and submits for approval. (6) Consultant incorporates the final plans and submits P.S. & E. (7) District Bridge Engineer recommends the final plans. (8) Consultant seals and signs the final input sheets and adds notes from Design Manual Part 4, Volume 1, Section 1.4.2.2(b) to plans.

**Approach:**

C.C. Johnson and Malhotra, P.C. (CCJM) agrees with the Department's Scope of Work. In addition, we offer the following:

CCJM will prepare the final bridge design and structure plans based on the approved TS&L Submission and Structure Foundation Submission. The design will be prepared in accordance with PENNDOT specifications, procedures and policies for design and plan preparation, as set forth in the AASHTO LRFD Bridge Design Specifications, PENNDOT Design Manual, Part 4, Strike-Off Letters, Standard Drawings for Bridge Design, and Standard Drawings for Bridge Construction. The design will be developed utilizing Load and Resistance Factor Design (LRFD) criteria. Load ratings will be included as specified by Design Manual, Part 4 (including TK-527 ratings).

It is anticipated that the proposed structure will be a single span bridge and will therefore allow the use of the Department's Bridge Automated Design and Drafting (BRADD III) software program. The latest version will be used to generate the design and plans for the single span bridge. Prior to the generation of the final plans, all BRADD III input sheets will be submitted to the Department for review. Other design calculations will be neatly prepared on 8 ½" x 11" pages (one side only). All computer program input and calculations will include the source of all data, the assumptions made and any conclusions drawn. The computations will be initiated by the person responsible for quality control. The design calculations will be submitted in .pdf format following the District's latest policy.

The bridge design will be in accordance with current design criteria for seismic resistance and policy guidelines for constructability and future maintenance. Site conditions such as historic or environmentally sensitive features, context-sensitive design considerations, and any other unusual issues will be addressed by the design. These issues will be identified at the TS&L stage, and final design details will be in accordance with the approved TS&L Plan. CCJM will bring any design issues to the attention of the District, and interim progress submissions and/or meetings will be made as necessary.

Bridge plans will be prepared using the Department's BRADD III program and edited as required by our CAD system. Bridge plan presentation will meet PENNDOT standards and guidelines. A list of current standard special provisions will be obtained from the Data in ECMS. Standard special provisions will be utilized when applicable; project-specific special provisions will be developed for any special or atypical work. Site-specific details and special provisions will be prepared for temporary excavation support and construction phasing, if required. Any constraints, restrictions or special methods for demolition and removal of the existing bridge will also be developed. The design requirements for the Alternate Structure bid items will be provided in the special provisions.

An up-to-date structure cost estimate will be maintained as the design progresses. The unit prices for items used in the cost estimate will be based on considerations of access, phasing, and relative difficulty of construction. Historical cost data for similar bridge types in the region will also be considered. Cost justification calculations will be provided to document all lump sum pay items.

Pre-final bridge plans will be submitted for review and comment and will include: complete and checked plans, design calculations, special provisions, quantities, cost estimates, and all relevant QA Forms. CCJM will address and provide written responses to all review comments. After all review comments are addressed, a final submission will be made that will include signed and sealed plans, design calculations, special provisions, quantity calculations, cost estimates and QA Forms, and will subsequently be incorporated into the PS&E package.

**Task 8 - Final Structure Foundation Report****Objective:**

2.5.5 - Final Structure Foundation Report

This task includes all items necessary to prepare the Final Structure Foundation Report in accordance with Publication 15M, Design Manual Part 4.

**Scope:**

**2.5.5 - Final Structure Foundation Report**

This task consists of the development of a Final Structure Foundation Report for each structure in the project. The report presents recommendations for design and construction of the structure foundations, and provides geotechnical data in support of the recommendations.

The following work elements are required for completion of this task:

1. Coordinate the effort with the District Geotechnical Engineer (DGE), District Bridge Engineer, BOD Bridge Quality Assurance Division (BQAD), and the other engineering disciplines involved. Perform QA/QC on work processes and products.
2. Perform an office investigation, reviewing available geotechnical reports for the project including the Reconnaissance Soils and Geological Engineering Report (RSGER) for the specific structure. Review the Preliminary Foundation Report. Obtain the record copy of the engineers logs for the borings drilled for the structure.
3. Perform the soil, rock, and water testing required to allow analysis of foundation conditions. Tabulate the results of the testing.
4. Perform analyses to determine the preferred foundation for the structure, and document the rationale for the preference. Include cost comparisons for foundation alternatives. Prepare a tabular summary of the site conditions and foundation recommendations at each substructure location.
5. Identify and address special site conditions through appropriate design. Develop foundation notes, construction details, and special provisions as warranted.
6. Prepare plotted boring log sheets for the core borings used in foundation analysis and design.
7. Prepare the Final Foundation Report for the structure, presenting the information required in Design Manual Part 4, with the tabular summary of foundation recommendations, foundation notes, construction details, special provisions, and plotted boring log sheets appended. Submit the report, with the other documentation required by Design Manual Part 4, for approval.
8. Prepare quality assurance (QA) form for foundations.

**Detail Task 1 - Final Structure Foundation Report**

**Department Details:**

The consultant will prepare a Foundation Recommendation Report in accordance with Design Manual Part 1, Chapter 5, Section 11 and Design Manual Part 4, Volume 1, Part A, Section 1.9.4.

The foundation recommendation will include a determination of the foundation material properties required by the PAPIER and abutment programs,

and a cost comparison study for alternate foundations.

Updated scour computations are to be provided with this submission.

**Approach:**

REI concurs with the Department's scope for this project in conjunction with the specific detailed scope of work outlined in our Approach below:

REI will prepare an abbreviated Final Structure Foundation Report for the project. We will provide the soil and rock parameters necessary for input into the abutment design and PAPIER programs. We will prepare the plotted structure boring logs.

REI will review the RSGER and Environmental documents. REI will coordinate with CCJM for the soil and rock laboratory testing program for this project and will contract the lab testing as part of their agreement. REI will provide a PennDOT Level 2 drilling inspector to review the core boxes as part of our work.

REI will evaluate the foundations to determine if deep or shallow foundations are needed. REI will perform the bearing capacity analyses for spread footings on rock if shallow foundations are required. If deep foundations are required, REI will evaluate the pile tip elevations and pile capacities for the abutments. REI will perform COM 624 analyses for the piles, if needed, and coordination with CCJM as to the required pile size. CCJM will be responsible for completing the integral abutment spreadsheet, if needed.

The Structure Foundation Reports will include the scour calculations which will be prepared by CCJM, structure boring logs, QA forms, foundation plan, geotechnical special provisions, foundation notes and construction details.

The Structure Foundation Reports will contain the geotechnical analyses and recommendations for the roadway portions of the bridge approaches. Soil Profile Plan sheets will not be prepared for this project.

REI will prepare the foundation submission letter to be submitted by CCJM. REI will also submit an electronic PDF to the District of the structure foundation report in accordance with District 9-0 guidelines.

CCJM is to prepare the foundation plans.

All deliverables will be provided electronically and, when in pdf format, will follow the District 9-0 electronic document submission standards.

**Task 9 - Roadway**

**Objective:**

2.10.2 - Roadway

This task includes survey, roadway, pavement and drainage design, plans, cross sections, soil profile, final design office meeting, draft special provisions and final design field view.

2.10.2.1 - Final Drainage Design

This task includes the design of roadway drainage items. Publication 13M, Design Manual Part 2 applies to this task.

2.10.2.2 - Final Pavement Design

This task is the preparation of the final pavement design.

#### 2.10.2.3 - Roadway Plan

This task includes the preparation of the final roadway plans and profiles in accordance with Publication 10A, Design Manual Part 1A.

##### **Scope:**

2.10.2 - Roadway  
Needs completed.

#### 2.10.2.1 - Final Drainage Design

One copy of the plan depicting the drainage design and the hydraulic design computations for roadway drainage structures shall be submitted to the appropriate District Office for review and comment by the Project Manager or designated drainage engineer. As directed by the District, one additional copy of the drainage submission shall be sent to Central Office, Bureau of Design for quality assurance review.

The following work elements are required for the successful completion of this task:

1. Develop a drainage design that provides the proper capacity, spacing, size and type of drainage facility (existing and proposed) for each drainage area, location, fill height, roadway type and environmental condition including all inlets, pipes, culverts, ditches and base drains.
2. Prepare hydraulic design computations using appropriate methodologies for all roadway drainage structures. Include energy grade line and hydraulic grade line computations for existing and proposed systems.
3. Develop alternate pipe designs as required with corresponding hydraulic computations for each alternate. Provide "For Information Only" quantities for each pipe type and alternate as well as minimum and maximum fill heights as required.
4. Verify that downstream drainage capacity is sufficient for the proposed design. Conform to local municipal storm water requirements, if a local storm water ordinance exists.
5. Show all existing and proposed drainage facilities on construction cross sections and profiles.
6. Prepare transmittal letter to include, plans showing drainage design and hydraulic design computations. Provide PE seal on all plans and computations.

#### 2.10.2.2 - Final Pavement Design

Follow Publication 13M, Design Manual Part 2, which refers to Publication 242, Pavement Policy Manual for the preparation of final pavement design.

#### 2.10.2.3 - Roadway Plan

The submission will include the completion of the following work items:

1. Interchange Design
2. Intersection Design - Prepare pavement elevation plans to describe the horizontal and vertical geometry that cross sections cannot describe.

3. Airport Clearances - Review Part 77 of the Federal Aviation Regulations and adjust the design accordingly when the project is within 2 (3.2 km) miles of an operating airport. If the project is within 2 (3.2 km) miles of an operating airport, an Airport Clearance Submission to the FAA is required.

Prepare all the following work elements:

(Note: Plans listed below are highway design plans only and do not include also plans.)

1. Title sheet
2. Index/General Note Sheet
3. Typical Section Sheet (Location Map and General Notes)
4. Summary of Quantities Sheets
5. Tabulation of Quantities Sheets
6. Detail Plan Sheets
7. Profile Sheets
8. Contour, Grading, and Drainage Plans
9. Landscaping Plans
10. Cross Sections
11. Special Detail Sheets
12. Required Forms, Special Provisions and Estimates

### **Detail Task 1 - Roadway**

#### **Department Details:**

The consultant will perform the following tasks:

- Prepare a set of standard roadway construction plans and final cross sections for the approved line. Plans will be at a scale of 1"=25'.
- Show the limits of excavation for any bridge foundation on the roadway construction plan.
- Show sensitive environmental resources (i.e. wetlands, eligible historic properties, etc.) on the final construction plan.

Prepare and make separate submissions for the following items to be approved prior to finalizing the roadway plans:

- a. Pavement Design - Only minimal effort will be required for pavement design as approval for pavement design will occur during the preliminary design phase. Unforeseen changes would be the only reason any additional effort for pavement design would be necessary.
- b. Typical Section Submission - Typical Section approval will occur during the preliminary design phase; any effort necessary for typical sections will be minimal and initiated by some unforeseen change.
- c. Intersections - When intersections are involved in project design, procedures stated in Design Manual 1, Chapter 5, Section 14 shall be followed. Design will be in accordance with Design Manual 2 and AASHTO.
- d. Signing and Pavement Marking Plan (Separate plan to be included in construction plan).

e. Soil Erosion & Sediment Pollution Control Plan

f. Traffic Control Plan

g. Roadway Drainage Design - Design roadway drainage in accordance with Design Manual 2, Chapter 10 and Stormwater Management Guidelines. Prepare and submit a final drainage design report to the Department. Include all hydrologic and hydraulic computations (excluding those to be included as part of Preliminary Engineering, Task 11.0, Hydrologic and Hydraulic Report). Include plans showing drainage areas, flows, swale/ pipe sizes, inlet data, and invert elevations.

h. P.S. & E. Submission - The consultant will submit the final P.S.&E. Package on or prior to the scheduled Contract Management due date. Included in this package will be: Final Construction Plans; including Also Plans, Special Provisions, Cross Sections, Quantity Computations, and Final Cost Estimate; and any applicable Department forms (provide the original and one set of prints each). This task also includes the uploading of the contract document material into ECMS in cooperation with the District.

**Approach:**

CCJM agrees with the Departments Scope of Work. Our technical approach is as follows:

Upon receiving approval of the Design Field View, CCJM will update and complete the preliminary plans incorporating all the required design elements necessary to build the project and complete the roadway plans. The plans will be done in accordance with Design Manual Part 2M, Design Manual Part 3M, Publication 408M, PENNDOT Standard Drawings, and applicable AASHTO criteria.

The plans will address all comments received from previous reviews. The finalization of all preliminary design tasks will be required for completion of these plans.

The approved pavement design (from Preliminary Engineering) will be incorporated into typical sections on the final plans, and the appropriate item numbers will be incorporated into the tabulation sheets.

Final typical sections will be developed for all the roadways in accordance with Publication 10C, Design Manual 1C, and will indicate the approved pavement design, baseline location, lane widths, shoulder widths, cross slopes, base drains, guide rail, side slopes with seeding requirements, curbs, and any other pertinent data and required notes. Final typical sections will be submitted to the Department for review and approval, of all elements not finalized at the time of the initial approval during the preliminary design phase, as indicated in the Departments Scope of Work.

Traffic Control Plans will be included as ALSO plans.

Final roadway drainage design will be done in accordance with Design Manual Part 2, Chapter 10, and will include size and spacing of required inlets, pipe sizes and types including required number of alternates, ditch sizes and linings, outlet protections, pavement base drains, and the determination of proper pay items in regards to fill height requirements. All drainage features will be shown on the appropriate plans, profiles, cross-sections, and typical sections. Drainage Computations along with a copy of the plans depicting the drainage design will be submitted to the District for review. Upon completion of the District review and approval any comments received will be incorporated into the plans and computations, and final drainage quantities will be computed and incorporated into the tabulation sheets. For this project we are assuming that there will be only one inlet at the low end of the bridge.

Final roadway plans will be developed in accordance with Publication 14M, Design Manual Part 3. The development of these plans will include finalizing all horizontal and vertical geometry, construction limits, guide rail and barrier requirements, baseline references, tabulation of project coordinates, bench mark descriptions, incorporation of final drainage facilities, sheet cross references, development of special sections and details, calculation of all quantity computations and development of summary and tabulation sheets, and incorporation of all the Also Plans quantities and standard drawing references into the summary sheets and general notes as required.

CCJM will develop all required special provisions, construction cost estimate, assemble and bind all design and quantity computations and prepare a pre-bid construction schedule in WELCOM Open Plan.

### **Task 10 - Traffic Control Plan**

#### **Objective:**

##### 2.10.14 - Traffic Control Plan

This task is the development of the final traffic control plan. Publication 14M, Design Manual 3; the MUTCD and Publication 213 apply to this task.

#### **Scope:**

##### 2.10.14 - Traffic Control Plan

Phasing schemes, sign messages, and approximate locations of signs and traffic control devices should be approved at the Design Field View stage, prior to the development of the final plans.

The Traffic Control Plan will be a stand-alone plan and will include the following:

- Title sheet with general notes, location map, and pay item quantities,
- Tabulation of Traffic Control Devices,
- Typical-sections
- Narrative describing each stage and phase by stating the work to be performed and the traffic control to be implemented
- General plan layout
- Temporary road plan, typical-section and profile (if necessary)
- Temporary signal plan (if necessary)
- Temporary Highway Lighting (if necessary)
- Special Sign Details (if necessary)

The plan will also include, but will not be limited to, sign messages, sign sizes, general sign locations, tapers lengths, barricades, channelizing devices, impact attenuators, temporary pavement markings, temporary roadway locations, temporary highway lighting locations, detours, portable changeable message signs, and arrow boards. Detail of temporary roads cross-section and profile will be included as well as other details as appropriate.

If detours are necessary, the detour route(s) will be identified and driven to determine general safety issues and restrictions. State roads requiring a detour will utilize other State owned roadways. If detour routes formed from State owned roads are found to be unacceptable because of length or other reasons, then agreements between the State and municipalities will need to be developed to utilize local roadways. This scope does not include support activities needed to develop agreements between the State and municipalities.

In locations where pedestrian movements are prominent, either safe passage or restrictions will be addressed. Scope associated with construction temporary pedestrian structures and signals will be included in either the Amendments to the Standard Scope of Work or the Detailed Project

Approach.

Provide temporary highway lighting for limited access crossovers and at locations as directed by the District. Contact the Highway Lighting Unit in Harrisburg for design requirements. Submit the lighting design to the Highway Lighting Unit for approval prior to the release of the Traffic Control Plans to the District for PS&E Development.

This scope of work does not provide for a temporary traffic signal plan. If the implementation of the traffic control plan impacts a signalized intersection such that a temporary signal design is necessitated, the temporary signal plan will be incorporated into the traffic control plan. However, the scope of work for the temporary signal design will be provided in the Detailed Project Approach or in the Amendments to the Standard Scope of Work.

Specifications will include the description of the construction staging and phasing. Special provisions will also be written for traffic control devices outside the scope of the specifications included in the Publication 408M.

If required for boring and drilling work associated with geotechnical studies, the subconsultant will develop traffic control plans. Details of the design for these plans will be provided in the Detailed Project Approach.

#### **Detail Task 1 - Traffic Control Plan**

##### **Department Details:**

Revise Objective 2.10.14 to read:

This task is the development of the final traffic control plan. Publication 14M, Design Manual 3, Publication 212 (Official Traffic Control Devices), and Publication 213 (Work Zone Traffic Control) apply to this task.

This will be a continuation of work performed during the Preliminary Design phase.

This activity will include a separate plan and written narrative. All signs will be drawn (symbols will not be accepted) and the distance between signs will be shown on a 1"=25' minimum scale plan.

##### **Approach:**

CCJM concur with the scope of work as presented with the following clarifications:

CCJM will develop a final Traffic Control Plan (TCP) that complies with the Department scope. We will revise the preliminary MPT plan as per the District comments.

It is assumed that the bridge construction will be accomplished using a detour.

CCJM will conduct one field view to aid in the design

#### **Task 11 - Final Right-of-Way Plan**

**Objective:**

## 2.10.5 - Final Right-of-Way Plan

This task includes all work necessary to prepare the final R/W plan in accordance with Publication 14M, Design Manual Part 3.

**Scope:**

## 2.10.5 - Final Right-of-Way Plan

Right-of-Way Plans, when specified in the project scope of work, will be the basis for determining all property damages which are involved in the construction requirements of a highway project. They will also serve as the legal record of the location, the extent, and the character of any acquisition of Right-of-Way, Permanent Easements, and Temporary Easements by the Commonwealth.

The Right of Way Plan presentation format will be as specified in the project scope of work. The Right-of-Way Plan format could be either, or a combination of the following:

- A. Standard Right-of-Way Plan - For the authorization of acquisition of both total take and partial take property, for both Free Access and Limited Access highways.
- B. Final Plan - Reestablishes and/or authorizes the GAP Plan right-of-way, if necessary, and establishes right-of-way and authorizes acquisition of property requirements that were not included under the GAP Plan.
- C. Combination Plan - This plan combines both the Right-of-Way and Construction requirements on the drawings. This plan shall be acceptable only for small Federal Aid and 100% state-financed projects involving few properties with no relocation problems.
- D. Simplified Right-of-Way Plan - This plan is a simple one (1) or two (2) sheet Right-of-Way Plan, applicable to small projects, where construction is primarily within existing legal right-of-way where only a few properties are involved and the area of taking is minor.

The following are general tasks and their description for Right-of-Way Plan preparation:

- 1. Current Property Owner Record Research
- 2. Deed Plotting
- 3. Composite Deed Plot Matrix Map
- 4. Property Owner Name
- 5. Parcel Numbers
- 6. Right-of-Way Plan Preparation

The following are the basic requirements comprising Right-of-Way Plan preparations:

- 1. Title Sheet
- 2. Index Sheet
- 3. Location Map, General Notes, Etc., Sheets
- 4. Typical Sections
- 5. Summary of Project Coordinates
- 6. Summary of Required Right-of-Way Line Coordinates
- 7. Detail Plan Sheets

8. Profile Sheets
9. Property Plats
10. Right-of-Way Plan Revisions

### **Detail Task 1 - Final Right-of-Way Plan**

#### **Department Details:**

The consultant will finalize the right of way plan developed in Preliminary Engineering in accordance with all applicable Design Manuals and PA D.O.T. Strike-off Letter 430-98-26. Present no more than two plats per sheet. Verification of ownership will be rechecked just prior to the final submission. Verification must be within 30 days of recordation.

The Final ROW Plan Submissions must include:

1. Final ROW Plan – One file containing the entire plan
2. Project Summary Data (one file that includes the following):
  - a. Project Description
  - b. Traffic Control (include copy of detour if applicable)
  - c. Estimation of Construction Duration (using seasons, not specific dates)
  - d. Summary of Utility Impacts
  - e. Estimated Costs/Funding
3. Copy of Cross Sections – One file containing all cross sections
4. Copy of Deeds – One file containing all deeds

\* All documents referenced above are to be submitted as pdf's.

Any Revised ROW Plan Submissions must include:

1. Revised ROW Plan – one file containing the entire plan
2. Detailed sheet-by-sheet summary of revisions
3. Justification of plan change (request from ROW unit, plan error/omission, design modification, etc.)

\* The revised ROW plan is to be submitted as a pdf. Items 2 and 3 can be included in the email transmitting the plan.

#### **Approach:**

CCJM and REI affirm the scope as presented and will collaborate for this task.

CCJM will revise the Right of Ways Plans, with PLS services provided by REI, to address comments from the preliminary plan check. The Final Right of Way Plan and accompanying plot plans will be sealed and signed by a professional land surveyor (P.L.S.). Copies of relevant supporting documentation used in the development of the existing property and right-of-way lines including deeds, subdivision plans, utility agreements, etc. will be submitted to PennDOT District 9-0 along with the final Right-of-Way Plan.

REI will perform courthouse research and deed/ownership verification.

All deliverables will be provided electronically and, when in pdf format, will follow the District 9-0 electronic document submission standards.

It is assumed that a mylar Title Sheet will be required in order to record the Plans.

## **Task 12 - Final Plan Checks**

### **Objective:**

2.10.28 - Final Plan Checks

This task is the time required to attend/perform all final plan checks.

### **Scope:**

2.10.28 - Final Plan Checks

The Final Plan Check is performed by representatives of: Bureau of Design - Field Liaison Engineer, District Engineer/Administrator, and Consultant.

The Field Liaison Engineer is in charge of the Final Plan Check and prepares a Plan Review Report on any items which are not correct at the time of the Final Plan Check.

The District Engineer/Administrator provides qualified personnel to perform all required design review; prepares Form 407, Form D-444D and a list of Structural Special Provisions, and notifies the Field Liaison Engineer when the plans will be ready for the Final Plan Check.

The Consultant is required to have the plans adequately checked prior to the Final Plan Check, and will have the Project Engineer and adequate design personnel to make any required corrections, present at the Final Plan Check. It is expected that all required corrections will be made by the Consultant prior to leaving the Final Plan Check.

### **Detail Task 1 - Final Plan Checks**

#### **Department Details:**

This task is the time required to attend/ perform all plan checks. Assume a total of four plan checks (Preliminary Right-of-Way Plan Check, Final Right-of-Way Plan Check, Preliminary Construction Plan Check, and Final Construction Plan Check).

A preliminary construction plan check and a preliminary right of way plan check (in consultant's office) will be held during the early stages of final design and the final construction plan check and final right of way plan check will be held prior to the PS&E submission to Central Office.

Consultant will make any necessary changes. This activity will be completed in accordance with Design Manual 1, Chapter 5, Section 26. For the final construction plan check and the final right of way plan check to be held in the District Office, provide one engineer and one draftsman for one day for each check.

The last sentence under Scope 2.10.28 is deleted and revised as follows: It is expected that all required corrections will be made by the consultant within two weeks following the final plan check.

#### **Approach:**

CCJM will provide all of the required plans and supporting documents for the final plan checks as indicated in Design Manual Part 1A. Prior to the final plan check, CCJM will have conducted a thorough in house QA/QC review of the entire PS&E package to assure the plans have been prepared in accordance with Publication 14M, Design Manual Part 3 and the special provisions in accordance with Publication 51M, Contract Proposal Preparation Guide, and that all the information is clearly, accurately, and consistently presented between the required components.

CCJMs Project Manager and/or the appropriate lead designers will attend the meetings as requested, and be available to answer any questions on plan or design development.

All comments will be properly documented and distributed to all those in attendance, and will also be included with the PS&E submission. Following the review meetings, CCJM will incorporate the changes and comments into the plans, specifications, computations and estimates as requested. CCJM will submit all follow-up review submissions as requested within the required scheduled time.

### **Task 13 - Coordinate Constructability Review**

#### **Objective:**

##### 2.1.2 - Coordinate Constructability Review

This task is the coordination of the constructibility review team throughout design development.

#### **Scope:**

##### 2.1.2 - Coordinate Constructability Review

The constructibility review team will be established at the beginning of the project. Constructibility reviews will be conducted periodically throughout the design process. The reviews will be performed to identify potential construction problem areas, possible cost savings, means to expedite construction, and alternate methodologies. The review will focus on the following issues:

- \* Evaluate MPT vs. Construction Sequence
- \* Set mandatory sequence logic where necessary
- \* Detect potential problem areas
- \* Avoid ambiguities
- \* Limit inefficient and impractical design features
- \* Evaluate coordination between design sections, where applicable
- \* Avoid omissions and overlaps by reviewing specifications vs. plan and plan vs. plan

#### **Detail Task 1 - Coordinate Constructability Review**

##### **Department Details:**

Using Welcom Open Plan Software, the consultant will perform construction CPM scheduling to determine a realistic construction schedule for completing the project on time and within budget. The CPM will address the work activities required for all phases of construction. This will include work activities required to construct the roadway and bridge in accordance to the construction sequence required by the Traffic Control Plan and the E&S Plan. Construction phasing will be used to determine intermediate milestones and the construction completion date.

The consultant will present the CPM to PENNDOT's review committee to verify the constructibility, time constraints, etc. and resolve any questions and/ or scheduling issues that may arise. The presentation will take place at the District Office prior to PS&E. The consultant will make any

necessary revisions or adjustments to the schedule resulting from the review meeting and submit the revised CPM to the Department with the PS&E submission.

Provide a separate CPM for any necessary utility relocation.

**Approach:**

CCJM will develop a Construction CPM Schedule in Open Plan addressing all the work activities required for all phases of construction, and provide plans, special provisions and other documents as required to conduct the Constructability Review.

CCJMs Project Manager and other appropriate design engineers will attend the Constructability Review. The CPM will be presented to members of the Departments review committee in Open Plan format prior to PS&E. A separate CPM will be provided for any necessary utility relocation. Minutes of the meeting will be prepared and distributed to all those in attendance.

The CPM schedule will be revised to address all comments received in the review meeting prior to submitting the schedule to the Department with the PS&E submission

**Consultant Hierarchy**

**Business Partner**

**DBE Type**

**Supervising BP**

C.C. Johnson & Malhotra, P.C.	Yes	
Raudenbush Engineering, Inc.	Yes	C.C. Johnson & Malhotra, P.C.

**Attachments**

*No records found.*

**Part 3 - Services During Construction, Big Cove Tannery**

**Description**

Services During Construction, Big Cove Tannery

**Task 1 - Shop Drawing Review**

**Objective:**

2.11.2 - Shop Drawing Review

This task involves the coordination, review and approval of shop drawings submitted by the contractor in accordance with Publication 10/10A, Design Manual 1/1A.

**Scope:**

2.11.2 - Shop Drawing Review

Review and approve shop drawings following the procedures in Design Manual Part 1A.

**Detail Task 1 - Shop Drawing Review**

**Department Details:**

Follow Design Manual 4, Part A, Policies and Procedures, Section 1.10.2 and the PennDOT Engineering District 9-0 Bridge Unit's policy titled "Bridge Shop and Working Drawing Preparation and Review Procedures". The policy is available in the attachments section. Also available in the attachments are the District 9-0 guidelines for creating Adobe PDF's.

Provide a maximum ten (10) working day turnaround on shop and working drawings.

**Anticipated Shop Drawing Reviews:**

Prestressed Beams  
SIP Forms

**Anticipated Working Drawing Reviews:**

Demolition Plan  
Temporary Shoring  
Beam Erection Plan  
Beam Overhang Plan

**Approach:**

CCJM will expeditiously review and distribute the project shop drawings in accordance with directions from the District and guidelines given in Design Manual, Part 1A and Design Manual, Part 4. Shop drawing reviews will follow the procedures listed in Design Manual, Part 4 and applicable Strike-Off Letters.

CCJM will review all shop drawings required for fabrication of structural materials and components. Our review process will include checking geometry and principal dimensions, and verifying material and fabrication conformance with the contract plans, specifications and standards. Shop drawing review status logs will be maintained to ensure an efficient checking procedure and to incorporate changes as they occur. Direct coordination with the fabricator will be required.

The original shop drawing submissions will be sent directly to CCJM and will be reviewed, stamped, signed and returned to the Contractor within ten (10) calendar days of receipt. Revised shop drawings will be reviewed and returned to the Contractor within seven (7) calendar days of receipt of the resubmission. Copies of all submissions will be distributed as noted in Design Manual 4, Part a, Section 1.10.2. CCJM will thoroughly document all correspondence relating to the shop drawing reviews and keep the District and the Inspector-In-Charge informed of all events through this process.

**Task 2 - Construction Consultation****Objective:**

2.11.3 - Construction Consultation

This task is coordination with the contractor prior to issuance of the notice to proceed.

**Scope:**

2.11.3 - Construction Consultation

Upon contract execution, issue a Notice-to-Proceed letter and coordinate the scheduling of a pre-construction meeting.

**Detail Task 1 - Construction Consultation**

**Department Details:**

The consultant will provide construction consultation for the design portion of the bridge and approach roadways, intersections, etc.

The consultant will document all notices from the contractor and PennDOT concerning design problems. The consultant will provide solutions as necessary and will provide details, plans, quantities, etc. to PennDOT (2 copies) and contractor (2 copies). Consultant design errors are not eligible for compensation under this part.

Include two representatives to attend a preliminary construction bid meeting, a preliminary construction consultation meeting, and three field trips to the construction site.

**Approach:**

CCJM will provide consultation services as requested by the District during the construction of the project. These services include coordination and scheduling of a pre-construction meeting, review of the construction plans with the Contractor and the Project Engineer at a construction consultation meeting and the attendance at two (2) field site meeting. CCJM will have provide two (2) representatives to attend a pre-bid meeting, a construction consultation meeting, and two (2) field site meetings to review the project, answer questions, and take an active role in the meetings.

CCJM will document all notices from the Contractor and PENNDOT concerning plan interpretations or design problems, and we will provide necessary solutions to all parties, including details, plans, quantities, etc.

Any changes to the approved Traffic Control Plan that are requested by the Contractor will be made by CCJM and reviewed and approved by the District.

In the event of a Contractor redesign, CCJM will expeditiously review the design alternate, check the design calculations, and comment to the Department with recommendations on acceptance of the redesign. We will document all correspondence relating to the Contractor redesign and keep the District informed.

**Consultant Hierarchy**

**Business Partner**

**DBE Type**

**Supervising BP**

C.C. Johnson & Malhotra, P.C.

Yes

**Attachments**

***No records found.***

You are currently logged in as **Roland L. Rode**.