



TECHNICAL PROPOSAL REPORT

Agreement: E01654	Project Specific	Active
Name: I-81: Delano to McAdoo (Structure Rehabilitation/Replacement)	Selection Process: Modified	Initiating Org: Engineering District 5-0
Supplement: 5	Normal	Executed
Description: add additional work to perform Concrete Deck Coring and Preliminary Signing and Pavement Marking Plans under Part 2 - Preliminary Engineering and Final Signing and Pavement Marking Plans under Part 3 - Final Design for the I-81 Section 11B project		

Part 2 - Preliminary Engineering - I-81: Delano to McAdoo

Description

Preliminary Engineering and Environmental Documentation

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:

2.1.1

Task involves project management and administration activities during the preliminary engineering phase for the development of a bid package that will be let for the improvement of 12 structures and one culvert along Interstate 81 from Delano to McAdoo in Schuylkill County. Provide project management/administration services as described herein. Project manager will monitor and report on design team performance and project development, control project costs and coordinate the flow of information concerning the project.

The consultant shall provide construction cost updates as required by the Department. The consultant will thoroughly check all design submissions before submitting them to the Department for review. 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 consultant will be responsible for DBE progress, and all submissions prepared by the DBE will be submitted through the prime consultant's office. The prime consultant will be responsible for the accuracy and quality of the DBE work.

Limit attendees at meetings to only those needed to provide input and make decisions. Verify attendees with District prior to each meeting.

Complete bicycle and pedestrian checklist per DM1A, community context audit, and community impact assessment per SOL 438-03-04.

Provide electronic deliverables in compatible formats (Microsoft or Microstation) for completed preliminary engineering documents.

Provide cost containment information per DM1A at the start of the preliminary engineering phase and the 30% complete (DFV) stage. Justify cost increases when PMC approved costs are exceeded by 15%.

Include consultant hierarchy for each part of the Technical Proposal.

In the technical approach, specify if the task results in any Other Costs which are not standard costs (such as special equipment), or if Other Costs will be significant (such as numerous overnight stays) so that extraneous Other Costs items can be reviewed before submitting Price Proposal.

Submit all design final invoices within sixty days of the construction notice to proceed.

2.1.1.3

The project QC/QA plan is to be provided to the District one (1) month after NTP. Include sub-consultant QC/QA plans as appropriate.

Refer to SOL 431-04-01 for QA/QC guidelines.

2.1.1.5

The initial project Welcom Open Plan is to be provided to the District within two (2) weeks after NTP. Update Welcom Open Plan on a monthly basis for the duration of the project.

Revise / update and maintain the project schedule using Welcom Open Plan software including PennDOT developed/approved templates. The District will provide the original base template upon NTP of agreement. The schedule and its monthly updates shall be prepared as follows:

1. The initial schedule will be developed using the most recent PennDOT approved version of Welcom Open plan software including PennDOT developed/approved templates. Schedule will include "Responsible Party", WBS and OBS field information. Schedule will be submitted to PennDOT Portfolio Manager via email in back-up (".bk3") format for loading.
2. Schedule, if accepted, will be loaded into Welcom Home by District. All future schedule updating/progressing will be handled through Welcom Home.
3. All progress updates must be input/submitted via Welcom Home by the 1st of each month.

4. Recovery plans must be submitted to Project Manager by the 1st of each month for any project were the overall schedule is more then 15 days behind schedule.

2.1.1.7

Provide project status report as described herein.

In Supplement 5, this task is for additional Project Management/Administration associated with completion of the tasks included in Supplement 5 - Part 2. Update the Open Plan schedule accordingly.

Approach:

HDR will perform this task in accordance with the Department's scope of work.

Task 6 - 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.

2.4.1.1 - Horizontal Control (Preliminary Design)

This task consists of providing the horizontal control survey data as required for preliminary design.

2.4.1.2 - Vertical Control (Preliminary Design)

This task consists of providing the vertical control survey data as required for preliminary design.

2.4.1.3 - Survey Data Collection

This task consists of collecting the survey data as required for preliminary design.

2.4.1.4 - Structure Survey Data Collection

This task consists of collecting the bridge and hydrologic survey data as required for preliminary design.

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.

2.4.1.1 - Horizontal Control (Preliminary Design)**Guidance:**

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

Scope Deliverables:

1. Provide horizontal control.
2. Horizontal control network will be established and records completed. Horizontal control network design and requirements will be discussed with District Chief of Surveys.
3. Establish and stake horizontal alignment.
4. Provide line book in Form D-428.
5. Reference alignment (preferred method is by angle and distance see DM3 Fig. 3.2.14).

2.4.1.2 - Vertical Control (Preliminary Design)**Guidance:**

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

Scope Deliverables:

1. Provide vertical datum and note initial benchmarks.
2. Provide leveling notes in Form D-428, field book.
3. Establish a vertical control network by setting benchmarks within the project area by differential leveling, unless directed by the department to use trigonometric methods.
4. Traverse or mapping control points will be turned through on differential level runs before mapping is begun for the purpose of creating Digital Terrain Models along existing roadways, unless otherwise directed by the Department.
5. Benchmarks set will be no greater than one half mile apart and will be set on permanent objects not subject to movement.

2.4.1.3 - Survey Data Collection

Guidance:

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

Scope:

Provide survey data at intervals and widths necessary for the proper design for highways and structures.

Scope Deliverables:

1. Provide Survey data of items listed in Publication 122M for preliminary surveys including, but not limited to, utility facilities, roadway features, structures, topography features, obvious property corners, driveways, and buildings.
2. Provide survey data sufficient to establish geometry of intersecting streets and railroad crossings.
3. Establish control traverse and/or GPS Control Network.
4. Establish stations, bench levels, and references at proper intervals.
5. Record cross sectional information at proper intervals.
6. Reference control points as required.

2.4.1.4 - Structure Survey Data Collection

Guidance:

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

Scope Deliverables:

Provide survey data as required in Publication 122M at the required intervals and as defined in the department details for this task.

Detail Task 1 - Surveys

Department Details:

Field survey will be within the limits of work, which are specified in the project description section of this Scope of Work.

Follow current Department procedures in DM1C regarding Notice of Intent to Enter letters. In addition, notify each property owner of intent at least 48 hours prior to each entry.

All work will be accordance with Pub. 122M Department Survey Manual.

Perform the following survey tasks on this project:

Survey and stake the construction centerline and other baselines. Establish all control points (PI's, PC's, and PT's). The centerline will be stationed at 50-foot intervals on tangent and 25-foot intervals on curves. Obtain stream cross-sections at 50-foot intervals extending 500 feet upstream and

downstream of the existing structure (along the waterway). Survey will locate all existing features pertinent to the design of the project, including roads, bridges, streams, utilities, pavement markings, drainage structures, buildings, underground facilities, and signs. Obtain field elevations of existing features pertinent to the design of the project such as pavement, drainage facilities, manholes, floor elevations, etc. Topographic features will be located on properties involved in the right-of-way take, sufficient to enable preparation of the Right-of-Way plans.

Locate the boundaries of all wetlands identified within the project area. The boundaries will be established and marked in the field.

Establish permanent benchmarks along the proposed alignment, but placed outside the limits of construction. The benches will be based on USC&GS vertical datum.

The plan scale will be 1" = 25' on 22" x 34" plan sheets. The plan will show all topographic features such as pavement edges, inlets, headwalls, pipes, utilities, guide rail, fences, buildings, signs, sidewalks, trees and property corners, which would affect the proposed design or the estimating of quantities. Apparent property lines will be shown together with property owners names where right-of-way takes are anticipated.

The plan will be consistent with the requirements of Design Manual, Part 3.

In Supplement 4, provide field survey required for the design of repairs to the Lofty Creek culvert, and necessary for the preparation of ROW plans to obtain access to the Lofty Creek culvert.

In Supplement 5, transfer \$1500 in PDA Right of Entry costs to ODCs to cover costs associated with supplemental survey of the current SR 0081-09M paving project. The limits of the SR 0081-09M paving project overlap the limits of SR 0081-11B bridge preservation/rehabilitation/replacement project. The delayed completion of the SR 0081-09M paving project will require additional site visits to obtain the necessary survey data.

Approach:

Susquehanna Civil, Inc. will perform this task in accordance with the Department's scope of work.

Task 11 - 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 - Type, Size & Location Reports

Department Details:

Provide appropriate services to complete the tasks defined above.

Provide QA/QC checklists.

In Supplement 4, this task is for structure inspection of the Lofty Creek culvert for design purposes, and preparation of a TS&L for the Lofty Creek culvert repairs.

In Supplement 4, this task is also for the preparation of seismic analyses requested by Central Office for the Hazle Street bridge and the Ramp S bridge.

In Supplement 4, this task is also for the preparation of a revised TS&L for a single span bridge replacement on SR 8017 over Haddock Road.

In Supplement 5, this task is for additional work associated with concrete deck coring and associated lab testing and traffic control under Part 2 as defined below:

1. Perform material testing of the concrete decks of the eight (8) rehabilitation bridges. Extract three (3) concrete cores from each bridge deck to perform petrographic analysis, chloride content, and compressive strength testing. Perform compressive strength testing of one core, petrographic examination of one-half of one core, and chloride content testing of one-half of one core.
2. Perform concrete coring operations in accordance with ASTM C42 Obtaining and Testing Drilled Cores and Sawed Beams of Concrete. Repair core holes remaining as a result of the coring operations with a Bulletin 15 approved non-shrink grout.
3. Perform compressive strength tests in accordance with ASTM C42 Obtaining and Testing Drilled Cores and Sawed Beams of Concrete and ASTM C39 Compressive Strength of Cylindrical Concrete Specimens. All cores are to be trimmed, lapped to flat plane surfaces, capped, and tested in an air-dry condition.
4. Perform petrographic examinations in accordance with ASTM C856 Petrographic Examination of Hardened Concrete. Examine the specimens to ascertain information on the composition of the aggregate and cement paste as well as physical and chemical deterioration due to cyclic freezing,

alkali-silica reaction, alkali-carbonate reaction, and iron sulfide oxidation.

5. Perform chloride testing in accordance with ASTM C1218-99 Water-Soluble Chloride in Mortar and Concrete. Perform the chloride tests at the level of the deck reinforcement – approximately 3” and 7” from the top of the core.

6. Submit a material testing plan to the Department for review and approval prior to the start of the field work. Following conclusion of the material testing program, submit a letter report to the District documenting the test results.

7. Perform one air content test per bridge in accordance with the requirements of ASTM C457 – Standard Test Method for Microscopical Determination of Parameters of the Air-Void System in Hardened Concrete.

8. Submit a traffic control plan (for concrete deck coring) to the District Traffic Unit for review and approval prior to performing concrete deck coring.

In Supplement 5, transfer \$39,500 in PDA costs (Drilling \$3,500; Drilling Contract \$23,000; and Railroad Flagging \$13,000) to PDA costs (Concrete Deck Coring, MPT for Concrete Deck Coring, Lab Testing), ODCs, and labor associated with the concrete deck coring scope of work defined above.

Approach:

HDR will perform this task in accordance with the Department's scope of work.

Task 20 - Preliminary Pavement Marking Plan

Objective:

2.8.4 - Preliminary Pavement Marking Plan

This task consists of developing preliminary pavement marking plans in accordance with Publication 14M, Design Manual Part 3, the Manual on Uniform Traffic Control Devices, Traffic Standards (TC 7600 Series), and Publication 68 with guidance from the Pavement Marking Handbook.

Scope:

2.8.4 - Preliminary Pavement Marking Plan

Preliminary pavement marking plans will be developed depicting longitudinal lane lines and delineators on roadway sections. For interchange areas, pavement markings and delineators will be indicated for gore areas, islands, and other miscellaneous special markings. For intersections, the locations of stop bars, legends, and crosswalks will be indicated.

Plans will be prepared at an appropriate scale. The type, size, and color of pavement markings and delineators will be noted on the plans.

Specific details will not be developed.

The plan will include a title sheet with general notes and index map, blank tabulation sheets, and plan sheets for all roadway sections within the limits of work. Where roadway sections are consistent and repetitive, typical details may be developed to eliminate unnecessary and repetitive design sheets.

Detail Task 1 - Preliminary Signing and Pavement Marking Plan

Department Details:

In Supplement 5, this task is for additional work associated with development of the Preliminary Signing and Pavement Marking Plan under Part 2 as defined below:

1. A combined Preliminary Signing and Pavement Marking Plan in accordance with applicable Department Manuals and with the provisions of the standard scope of work above will be required.
2. The Preliminary Pavement Marking and Signing Plan is to include, but is not limited to, the following:
 - existing and proposed pavement markings
 - existing and proposed signing
 - proposed delineators
 - proposed raised pavement markers
 - tabulation of quantities (pertaining to the Signing and Pavement Marking Plan)
3. Develop preliminary signing in accordance with Publication 14M, Design Manual Part 3, Chapter 8; Publication 212 - 2006 Official Traffic Control Devices; Publication 111M, Traffic Standards (TC 8600 and 8700 series); Publication 236M, Handbook of Approved Signs; and Publication 108, Sign Foreman's Manual. The consultant will review all existing signs and update these signs in accordance with current design criteria.
4. The plans will depict destination, regulatory, warning, and information, and guide signs necessary to control and maintain traffic upon completion of construction. The plans will depict the approximate locations of signs, sign types, and sign messages.
5. Plans will be prepared at an appropriate scale. Areas requiring more detail may require a larger scale.
6. Show all necessary pavement markings such as edge line, centerline, gore area striping, delineation, etc. All specific items necessary will be tabulated and indicated on the plans for the various types of markings utilized.
7. Show all required stop bars, lane delineation, turn arrows, crosswalks and legends, etc. as needed.
8. Show all proposed sign messages and location for review and approval by the Departments's District 5-0 Office.
9. Ensure that all plans are prepared in accordance with the guidelines and format established in Design Manual, Part 3, Chapter 8 and Sign Manual, Part 1, Chapter 5 and Publication 111M. The consultant will review all existing signs and update these signs in accordance with current design criteria.

Approach:

HDR will perform this task in accordance with the Department's scope of work.

Consultant Hierarchy

Business Partner	DBE Type	Supervising BP
HDR Engineering, Inc.	No	

Susquehanna Civil, Inc.	Yes	HDR Engineering, Inc.
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Attachments
No records found.

Part 3 - Final Design - I-81: Delano to McAdoo

Description

Final Design Services

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:

2.1.1

Task involves project management and administration activities during the final design phase for the development of a bid package that will be let for the replacement of 5 bridges, rehabilitation of 8 bridges, and repairs to 2 culverts along Interstate 81 from Delano to McAdoo in Schuylkill County. Provide project management/administration services as described herein. Project manager will monitor and report on design team performance and project development, control project costs and coordinate the flow of information concerning the project.

The consultant shall provide construction cost updates as required by the Department. The consultant will thoroughly check all design submissions before submitting them to the Department for review. 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 consultant will be responsible for DBE progress, and all submissions prepared by the DBE will be submitted through the prime consultant's office. The prime consultant will be responsible for the accuracy and quality of the DBE work.

Limit attendees at meetings to only those needed to provide input and make decisions. Verify attendees with District prior to each meeting.

Comply with the Department's QA/QC guidelines.

Continue evaluation of bicycle and pedestrian checklist per DM1, community context audit, and community impact assessment.

Provide electronic deliverables in compatible formats (Microsoft or Microstation) for completed preliminary engineering documents.

Provide cost containment information per DM1A during final design (75% complete); or annually (which ever comes first); at the PS&E stage (95%). Provide a detailed cost justification for cost increases when PMC approved costs are exceeded by 15%.

In the technical approach, specify any Other Costs which are not standard costs so that extraneous other costs items can be reviewed before submitting Price Proposal.

Submit all design final invoices within sixty days of the construction notice to proceed.

Complete environmental due diligence for clean fill determinations for design in accordance with Pub. 282.

In Supplement 5, this task is for additional Project Management/Administration associated with completion of the tasks included in Supplement 5 - Part 3. Update the Open Plan schedule accordingly.

Approach:

HDR will perform this task in accordance with the Department's scope of work.

Task 16 - 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 - Final Signing and Pavement Marking Plan

Department Details:

In Supplement 5, this task is for additional work associated with development and completion of the Final Signing and Pavement Marking Plan under Part 3 as defined below:

1. A combined Final Signing and Pavement Marking Plan in accordance with applicable Department Manuals and with the provisions of the standard scope of work above will be required.
2. The Final Pavement Marking and Signing Plan is to include, but is not limited to, the following:
 - existing and proposed pavement markings
 - existing and proposed signing
 - proposed delineators
 - proposed raised pavement markers
 - tabulation of quantities (pertaining to the Signing and Pavement Marking Plan)
3. Develop final signing in accordance with Publication 14M, Design Manual Part 3, Chapter 8; Publication 212 - 2006 Official Traffic Control Devices; Publication 111M, Traffic Standards (TC 8600 and 8700 series); Publication 236M, Handbook of Approved Signs; and Publication 108, Sign Foreman's Manual. The consultant will review all existing signs and update these signs in accordance with current design criteria.
4. The plans will depict destination, regulatory, warning, and information, and guide signs necessary to control and maintain traffic upon completion of construction. The plans will depict the approximate locations of signs, sign types, and sign messages.
5. Plans will be prepared at an appropriate scale. Areas requiring more detail may require a larger scale.
6. Show all necessary pavement markings such as edge line, centerline, gore area striping, delineation, etc. All specific items necessary will be tabulated and indicated on the plans for the various types of markings utilized.
7. Show all required stop bars, lane delineation, turn arrows, crosswalks and legends, etc. as needed.
8. Show all proposed sign messages and location for review and approval by the Departments's District 5-0 Office.
9. Ensure that all plans are prepared in accordance with the guidelines and format established in Design Manual, Part 3, Chapter 8 and Sign Manual, Part 1, Chapter 5 and Publication 111M. The consultant will review all existing signs and update these signs in accordance with current design criteria.
10. Provide special provisions for signing and pavement marking, as needed.

Approach:

HDR will perform this task in accordance with the Department's scope of work.

Consultant Hierarchy

Business Partner

DBE Type

Supervising BP

HDR Engineering, Inc.

No

Attachments

No records found.

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