TECHNICAL PROPOSAL REPORT

Agreement: E00978 **Project Specific** **Active**

Name: Statewide Bridge Inspection Quality Assurance

Selection Process: Modified
Initiating Org: Bureau of Design

Part 3 - On System Bridge Inspections & Ratings

Description

This part involves: bridge inspections, load ratings, office file reviews, summary reports, close out meetings and other miscellaneous requirements.

Task 1 - Other Structures Activities

Objective:

2.7.99
This includes any other necessary PennDOT structure activities for the project which are not otherwise covered under the standard structure tasks.

Scope:

2.7.99
Provide work as detailed by the Department. See Below.

Detail Task 1 - District Office File Review

Department Details:

Evaluate the bridge files in the District/Turnpike corresponding to the structures that will be reviewed in the field. The bridge file evaluation Form 3A (refer to Exhibit 3A in the QA Manual) shall be used to record results of each file review. The office evaluation shall include the following:

(a) General File Content - The QA Consultant verifies that the inspection file:
* Contains the latest field inspection forms (D-450 forms), load rating analysis and if applicable, posting recommendation.
* Contains as-built plans or sketches with sufficient information such as dimensions material sizes and properties etc. for load rating and restricted clearances.
* Contains photographs of bridge elevation and deck views and current photographs, as well as historical photographs, if appropriate, of any problem areas or other areas of concern.
* Data in BMS is in agreement with the latest D-450 forms and inspection data.
* All of the above items are legible and of sufficient clarity.
* Scoring for each bridge file will be assigned for completeness and accuracy.

(b) Inventory Items Documentation - Document completeness and compare selected BMS inventory items in the inspection file to the BMS printout. Verify the BMS data by a check mark above the data on the printout, or if there is a discrepancy enter the inspection file value on the printout. Refer to the QA Manual, 305.3 (Level II). QA Manual 206.2 Level I and 206.3 Level II are revised to include the following for the first cycle of this

contract; A15, A26, A30, A31, A35, B22, C05, C07, C12, C17, C18-A, C23, C35 and C36.

In accordance with Section 206.1 of the QA Manual, this list of Inventory Items may change in each subsequent QA Cycle at the discretion of BQAD.

Scoring for each bridge file will be assigned for completeness and accuracy.

(c) Condition/Appraisal Items Documentation - Document completeness and compare selected BMS condition/appraisal items in the inspection file to the BMS printout. Verify the BMS data by a check mark above the data on the printout, or if there is a discrepancy enter the inspection file value on the printout. Refer to the QA Manual, 306.4. (Level III). Verify that the D-450 Forms contain comments and/or narrative supporting the numeric ratings.

(d) Load Rating Analysis Documentation - Document completeness of analysis and compare BMS Inventory and Operating Ratings to the same items in the inspection file to the BMS printout. Verify the BMS data by a check mark above the data on the printout, or if there is a discrepancy enter the inspection file value on the printout. Check the complete load rating calculations. Refer to the QA Manual, 307.5 (Level IV).

For bridges where the analysis has had to account for section losses in steel, broken or deteriorated, prestressing strands or loss of concrete section, the QA team shall verify that accurate measurements and sketches are in the file and that the analysis properly accounts for same.

When a re-analysis has been recommended by the inspectors on Form D-450, the time period between the recommendation and the actual date of the analysis shall be recorded.

Office file information such as field sketches or field measurements that are used as part of the analysis should be copied and transferred to the QA inspectors for verification at the field inspection. This data should not be reviewed by QA inspectors before the field inspection.

(e) Posting Documentation and Compliance with Posting Policy - Verify that proper documentation for the posting is in the file. Verify the BMS data by a check mark above the data on the printout, or if there is a discrepancy enter the inspection file value on the printout. Check that the posting data is consistent with the Inventory and Operating Rating data. The field inspection portion of the QA verifies that signing in the field agrees with posting data in BMS. Refer to the QA Manual, 308.1 (d). (Level IV).

(f) Verify the Bridge Maintenance Needs (Form D-450M of the Inspection Forms) has been completed. Verify that the Major Improvement Need items on D-450M are present.

(g) Scour Assessment Documentation
* Observed Scour Assessment - Check Status of the District review (currently BMS 2L Screen)
* Scour Assessment value should agree with BMS item W06. If not, check for justification such as narrative regarding changes at the bridge site since that Scour Assessment was completed.
* Check that BMS items W06 and E29-A are in agreement.
* For bridges built after 1982, Scour Assessment should be based on theoretical scour calculations and/or scour countermeasures.
* Note any District information such as sketches, cross-sections or narrative.

* Countermeasures present?
* USGS Reports, W11-A files and office file information such as historical scour/flooding records or field sketches that are used as part of the Scour Assessment should be copied and transferred to the QA inspectors for verification and use at the field inspection. This data should not be reviewed by QA inspectors before the field inspection.

(h) Contact BQAD to obtain file copies of Shop Drawings referenced but not available at District Office.

Method of Measurement - Each
Each unit of work consists of the complete file reviews as described for the specified number of bridges in each organization for each cycle.

For payment purposes only, Task 1 is subdivided into two Subtasks:
Task 1.1 District file review for 15 State and 15 Local bridges.
Task 1.2 Turnpike file review for 15 Turnpike bridges.

Approach:

Mackin Engineering Company will perform evaluations of the District/Turnpike bridge files of the bridges that are to be inspected. This work will be performed in accordance with the Department's scope of work.

The District/Turnpike Office File Reviews will be conducted by a team of two certified CBSI inspectors; the team will be lead by a NBIS Certified team leader with a minimum of five years experience (we anticipate utilizing a team leader that is a registered Professional Engineer).

The Office File Reviews will include reviewing the following:

General File Content
Inventory Items Documentation
Condition Appraisal Items
Load Rating Analysis Documentation
Posting Documentation
Bridge Maintenance
Scour Assessment Documentation
Construction Plans / Shop Drawings

If the bridge plans are not available in the District Office, Mackin will contact Central Office to determine if they are available; if available Central Office will copy and forward a copy of the plans to Mackin

The team performing District/Turnpike bridge files reviews will not perform the field inspection for the bridges reviewed at the District/Turnpike.

Detail Task 2 - Turnpike Office File Review

Department Details:

See write up in Task 1.1

Approach:

Mackin Engineering Company will perform evaluations of the District/Turnpike bridge files of the bridges that are to be inspected. This work will be

performed in accordance with the Department's scope of work.

The District/Turnpike Office File Reviews will be conducted by a team of two certified CBSI inspectors; the team will be lead by a NBIS Certified team leader with a minimum of five years experience (we anticipate utilizing a team leader that is a registered Professional Engineer).

The Office File Reviews will include reviewing the following:

General File Content
Inventory Items Documentation
Condition Appraisal Items
Load Rating Analysis Documentation
Posting Documentation
Bridge Maintenance
Scour Assessment Documentation
Construction Plans / Shop Drawings

If the bridge plans are not available in the District Office, Mackin will contact Central Office to determine if they are available; if available Central Office will copy and forward a copy of the plans to Mackin

The team performing District/Turnpike bridge files reviews will not perform the field inspection for the bridges reviewed at the District/Turnpike.

Detail Task 3 - Category A1 Inspection

Department Details:

Field Inspection and Report

The team performing the office file review for a given District\Turnpike will not perform the field inspection portion of this Task for that District\Turnpike. Office file information provided to the QA inspectors such as field sketches or field measurements that are used as part of the load rating analysis or the Scour Assessment should not be reviewed before inspection.

Field inspections shall use electronic data collection using Department provided software.

Perform an independent NBIS field inspection of the selected bridges, clearly defining and reporting the following:

(a) Verify and identify the structure using BMS (BMS2) description information. Refer to QA Manual, 205.3 (Level IV.)

(b) Color photographs (approximately 3" x 5") shall be used to supplement field inspection notes and drawings, and shall be sufficiently clear, properly identified, and indexed. General views depicting the bridge and showing the approach roadway and alignment, plus an elevation view, as well as photographs of defects or other significant features, including scour shall be included as part of the bridge inspection report. Photograph prints scanned from 35mm film or negatives meeting the above criteria are acceptable.

(c) Record inventory items for comparison to data on BMS printout.

(d) Record condition/appraisal ratings on E-Forms (I-Forms). Provide supporting narrative comments, photos and/or sketches as appropriate.

(e) List and prioritize maintenance/repair needs. Record Major Improvement Needs and conduct Maintenance Needs assessment.

(f) Provide maintenance and protection of traffic for field inspection activities.

(g) Take measurements and make sketches as needed for performing load rating analyses.

(h) Prepare sketches showing scour, streambed aggradations, degradation, debris, countermeasures, etc. After completing the field inspection and Forms D450E-G for bridges over water, review office file information for historical information (including the USGS Bridge Scour Assessment Report for the site, if available) that may amend the "snapshot picture" from the QA inspection.

Compare final QA ratings for W06 versus the USGS value and the last NBIS inspection rating. Compare final QA ratings for W11A and the last NBIS inspection rating.

(i) Use digital format to video the structures inspected, especially the out of tolerance items, for use at the Close-Out Meeting.

Video shall at a minimum include the following:

* Display sheet listing QA cycle, District, and BMS I.D.
* Near and far approach views.
* Bridge elevation view.
* Deck surface and traffic safety features views.
* Downstream and upstream views.
* Superstructure units and underneath of superstructure views.
* View of Substructure units and any scour problems if present.
* View of any out of tolerance items present.

Method of Measurement - Each
Each unit of work consists of the inspection of a bridge, as described herein.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 4 - Category A2 Inspection

Department Details:

See task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 5 - Category A3 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 6 - Category A4 - Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and

inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 7 - Category A5 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 8 - Category B1 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 9 - Category B2 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

.

Detail Task 10 - Category B3 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 11 - Category B4 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 12 - Category C1 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 13 - Category C2 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike

Summary Report (a separate report will not be submitted).

Detail Task 14 - Category C3 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 15 - Category C4 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 16 - Category D1 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 17 - Category D2 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 18 - Category D3 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will

circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 19 - Category D4 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 20 - Category D5 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 21 - Category A1 Load Rating Analysis

Department Details:

The QA load rating shall be performed independently of the previous load ratings. During the field review the QA team must obtain sufficient data to perform Level IV of load rating verification. All calculations are to be documented neatly using sketches as necessary and included in the QA records for each sample bridge. Refer to 208.5 (Level IV) of QA Manual.

Provide independent Inventory and Operating load ratings for H20, and ML80 loadings. Use Department software where appropriate. Supply complete copies of all analysis computations including either long-hand computations or PennDOT programs input and output with input preparation calculations. Other Department approved analysis or rating software may be used. Include any sketches and/or drawings necessary to accurately depict the members.

Compare the QA load ratings to those in the bridge file and highlight any differences. List any inaccuracies, omissions or errors. Comment on existing or required load postings. Be prepared to discuss differences in analysis results or methods at the Close-Out Meeting with each District, and Turnpike.

Method of Measurement - Each
Each unit of work consists of the load rating of a bridge, as described herein.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 22 - Category A2 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 23 - Category A3 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 24 - Category A4 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 25 - Category A5 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 26 - Category B1 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 27 - Category B2 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

It is anticipated that only one run will be required per analysis.

Detail Task 28 - Category B3 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 29 - Category B4 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 30 - Category C1 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 31 - Category C2 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated).

Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 32 - Category C3 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

It is anticipated that only one run will be required per analysis.

Detail Task 33 - Category C4 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 34 - Category D1 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 35 - Category D2 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 36 - Category D3 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 37 - Category D4 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 38 - Category D5 Load Rating Analysis

Department Details:

See Task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

" Bridge Analysis and Rating (BAR7)
" LFD Prestressed Concrete Girder Design and Rating
" Box Culvert design and Rating

Detail Task 39 - Category A1 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data

that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 40 - Category A2 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 41 - Category A3 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 42 - Category A4 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 43 - Category A5 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 44 - Category B1 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 45 - Category B2 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 46 - Category B3 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data

that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 47 - Category B4 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 48 - Category C1 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 49 - Category C2 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 50 - Category C3 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 51 - Category C4 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 52 - Category D1 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 53 - Category D2 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data

that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 54 - Category D3 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 55 - Category D4 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 56 - Category D5 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 57 - Category A1 Load Rating Analysis -subconsultant

Department Details:

See Task 1.21 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 58 - Category A2 Load Rating Analysis -subconsultant

Department Details:

See Task 1.21 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 59 - Category A3 Load Rating Analysis -subconsultant

Department Details:

See Task 1.21 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 60 - Category A4 Load Rating Analysis -subconsultant

Department Details:

See Task 1.21 for write up.

Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 61 - Category A5 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 62 - Category B1 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 63 - Category B2 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 64 - Category B3 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 65 - Category B4 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 66 - Category C1 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.

Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 67 - Category C2 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 68 - Category C3 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 69 - Category C4 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 70 - Category D1 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 71 - Category D2 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 72 - Category D3 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.

Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 73 - Category D4 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 74 - Category D5 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 75 - DIST Major Bridge (Length > 500`) Inspection Program Completeness Review

Department Details:

Complete a File Review for three (3) structures, with length greater than 500 feet, for each District. The review should focus on four main topics; Inventory, Inspection, Maintenance, Load Ratings. The bridges will be selected by the Department.

(a) Inventory: Perform a completeness review of the bridge file data. For file contents requirements, reference PennDOT Publication 238, Part IP, Chapter 8, Section 8.3, Individual Structure Inspection File Contents. The basic premise is to ascertain whether all data is present in the District/Turnpike files and whether it is easily accessible.
(b) Inspection: Perform a completeness review of the inspection report contents in order to ascertain whether the inspection has been carried out to meet requirements of PennDOT Publication 238, Chapter 2, relative to:
* Frequency of Inspections (Routine and Underwater)
* Intensity of Inspection
* Fatigue and Fracture (for FCM's
* Scour Evaluation
Review of inspections is to be limited to the last 6 years (3 regular inspection cycles). For bridges over water, specifically evaluate the completeness of the Scour Evaluation in accordance with PennDOT Publication 238, Chapter 2, Section 2.6 and the Scour Plan of Action (future item, currently under development by BQAD).
(c) Load Ratings: Perform a completeness review of the load rating analysis on file. Determine whether deterioration has been accounted for and that the controlling member has been properly identified. Evaluate whether the analysis has been updated in a timely manner based on the date of the last analysis or relative to recommendations and findings from the inspection report.
(d) Maintenance: Perform a completeness review of the recommended maintenance items relative to the findings in the inspection report. Evaluate whether the proper priority level has been assigned for each item and whether a proper follow-up action has been taken. (i.e. Has a work order been assigned or has the item been included on a Bridge Preservation or Improvement project.)
(e) Perform a field view of the bridge to assist in determining the completeness of data in the bridge files. These field views shall be completed by

the Project Manager or an engineer of equal experience relative to bridge inspection and analysis and who is approved for this work by BQAD. The PM shall review the office review findings in the field to determine an overall evaluation of the major bridge files. Recommendations for improving these records will be included.

The results of these reviews shall be recorded on standard forms to be developed by the consultant and approved by BQAD. These standard forms will be developed under Part V of this agreement. Completeness of each of the four (4) main components will be scored on a scale of 0 to xx with a total score of 100 points. A one (1) page report summarizing the results of these reviews shall be completed for each bridge with appropriate forms and included in the Summary Report for each District and the Turnpike.

Method of Measurement - Each
Each unit of work consists of the Inspection Program Completeness Review of a major bridge, as described herein.

Approach:

This task will be done in accordance with the Department scope of work. A checklist will be developed for the review of the major bridges. The checklist will be developed based on the existing checklist used for the Bridge File Evaluation and will identify if the file was complete and describe why or why not. Based on discussion with the Department, the report will consist of the check list.

Detail Task 76 - TPC Major Bridge (Length > 500`) Inspection Program Completeness Review

Department Details:

See task 1.76 for write up.

Approach:

See Task 1.75 for description of work task.

Detail Task 77 - Preparation of Draft Summary Reports for each District

Department Details:

Within forty-five (45) days from the completion of Tasks 1.1 thru 1.76 in a District or the Turnpike, the consultant shall submit:
(a) Three (3) copies of a Draft Summary Report containing the findings for that District's or Turnpike's bridges. Include summary spreadsheets showing comparisons between the QA results and the District or Turnpike files with in-tolerance percentages noted. Separate summary spreadsheets shall be prepared for Inventory Data Items, Inspection/Appraisal Items, Maintenance Items and Priority Level, Load Rating Analysis, and Observed Scour (includes W11-A, E29-A and W06). Spreadsheets have already been developed for Inspection/Appraisal, Load Rating Analysis and Observed Scour. Items E29-A and W06 will need to be added to the existing Observed Scour spreadsheet. The consultant will need to develop spreadsheets and a scoring system for Inventory Data Items and for Maintenance Items and Priorities. These spreadsheets will need to be approved for use by BQAD and will be developed under Part V of this agreement.
(b) One (1) set of copies of the field inspection reports, separately bound, which support the findings in the Draft Summary Report.
(c) Two (2) sets of copies of the load rating analysis reports, separately bound, with all relevant sketches and drawings which support the findings in the Draft Summary Report. The load rating analysis reports shall include a summary of reasons for any differences, a summary table comparing the load ratings, a copy of the file analysis, a copy of the file analysis with QA revisions marked in red and a copy of the QA analysis.

Method of Measurement - Each
Each unit of work consists of the preparation of a draft Summary Report for an organization in each cycle, as described herein.

Approach:

This work will be done in accordance with the Department scope of work. Additional spreadsheets and a scoring system will be developed (under Part V of this agreement) to evaluate Inventory Data items and Maintenance Items. These spreadsheets will be incorporated into the Draft Summary Reports.

Detail Task 78 - Preparation of Draft Summary Reports for the Turnpike

Department Details:

See task 1.77 for write up.

Approach:

See Task 1.78 for description of work task.

Detail Task 79 - Close-Out Meetings for each District

Department Details:

This Task includes attendance at Close-Out Meetings at each District and the Turnpike, conducting field views of the bridges, and preparation of Final Summary Reports.

(a) After receiving the Draft Summary Report, bound bridge inspection reports and bridge load rating analysis, the BQAD will arrange a Close-Out Meeting between the District/Turnpike, QA Consultant, local bridge owners and/or their inspection consultants, and BQAD to discuss the findings in the Draft Summary Report, inspections and analyses. The QA Consultant shall present an oral executive summary of the QA activity for the District/Turnpike. The QA Consultant's Project Manager will conduct the meeting based on the findings and QA Consultant is to produce draft minutes of the meeting within 7 workdays and final minutes within 7 workdays of receiving BQAD comments. The QA Consultant will prepare and submit a letter requesting clarification for any unresolved items from the meeting. This letter is to be sent to BQAD within 7 workdays of the Close-Out meeting.
(b) Prior to the Close-Out Meeting in the District, a field view will be conducted by the QA Consultant's Project Manager and the BQAD QA Project Manager, to review as many of the structures as deemed necessary by the number of deviations. After consulting with the QA Consultant, BQAD will determine the sites to visit. The time allotted for the field view and Close-Out meeting should be two and one-half days average for all the Districts. Some Districts will only require two days while others may require three depending on travel time and number and location of bridges requiring visitation. Additional photos and/or video may be required to further document reasons for deviations.
(c) The QA Consultant shall submit to BQAD for each District/Turnpike 3 copies of the Final Summary Report, 2 copies of the final bridge inspection evaluation reports, and 2 copies of the final load rating analysis computations. This submission shall incorporate all revisions from the Close-Out Meeting. These Final Summary Reports shall be submitted to BQAD within 4 weeks of resolution of any outstanding Close-Out Meeting issues. BQAD will require in addition an electronic submission (MS Word, Excel and scanned pages when necessary) of the above hardcopy submissions on CD-ROM. Video of the bridges shall be submitted on DVD (2 copies).

Method of Measurement - Each
Each unit of work consists of the Close-Out Meeting for an organization in each cycle, as described herein.

For payment purposes only, This task is subdivided into two Subtasks: District Close-Out Meeting and Turnpike Close-Out Meeting.

Approach:

This task will be performed by Mackin in accordance with the Department's scope of work

Detail Task 80 - Close-Out Meetings for the Turnpike

Department Details:

See task 1.79 for write up.

Approach:

This task will be performed by Mackin in accordance with the Department's scope of work

Detail Task 81 - Cycle Summary Reports Statewide for Districts

Department Details:

Cycle Summary Reports (one comprehensive report summarizing the review of all Districts and one for the Turnpike, comparing the review of the selected bridges to the statewide results) shall be completed within sixty (60) days from the completion of Task 1.77 & 1.78 work for all of the Districts and the Turnpike.

Each statewide and Turnpike Cycle Summary Report shall include at the minimum:
(a) An Executive Summary
(b) A summary of the total inspection effort for the cycle.
(c) Statistical and graphical comparison of the condition/appraisal items and statistical comparison of Inventory Items, Observed Scour, Maintenance Items and Load Rating Analysis.
(d) Conclusions based upon findings.
(e) Detailed recommendations that will improve the overall inspection program including both the bridge inspection training program and the BMS Coding Manual.
(f) Specific recommendations that will improve the load rating analysis method validity of rating.
(g) Specific recommendations that will improve the identification and prioritizing of maintenance/repair needs.
(h) Specific recommendations that will improve the proper coding of Inventory Data items.
(i) At the end of each cycle, QA consultant shall present the recommendations outlined in items 4, 5, and 6 above, at a meeting with BQAD in Harrisburg.
(j) Three (3) draft copies each of Statewide and Turnpike Cycle Summary Reports shall be forwarded to the BQAD for review and comments.
(k) Twenty (20) final copies of the Statewide Cycle Summary Report and five (5) final copies of the Turnpike Cycle Summary Report shall be forwarded to Bridge Quality Assurance Division, Bureau of Design for distribution.

In addition to above, the consultant shall also submit the final Statewide and Turnpike Cycle Summary Reports on CD-ROM using MS WORD and EXCEL.

Method of Measurement - Each
Each unit of work consists of the preparation of the Cycle Summary Report for an organization in each cycle, as described herein.

For payment purposes only, this task is subdivided into two subtasks:
* Cycle Summary Report Statewide for Districts
* Cycle Summary Report for Turnpike Bridges.

Approach:

This task will be performed by Mackin in accordance with the Department's scope of work

Detail Task 82 - Cycle Summary Report for Turnpike Bridges

Department Details:

See task 1.81 for write up.

Approach:

This task will be performed by Mackin in accordance with the Department's scope of work

Consultant Hierarchy

Business Partner	DBE Type	Supervising BP
Mackin Engineering Company	No	
Specialty Engineering, Inc	Yes	Mackin Engineering Company

Attachments

- E00978+SOW+-+Attachement.doc
- Personnel List.doc

Part 4 - Off System Bridge Inspections & Ratings

Description

This part involves: bridge inspections, load ratings, office file reviews, summary reports, close out meetings and other miscellaneous requirements.

Task 1 - Other Structures Activities

Objective:

2.7.99
This includes any other necessary PennDOT structure activities for the project which are not otherwise covered under the standard structure tasks.

Scope:

2.7.99
Provide work as detailed by the Department. See Below.

Detail Task 1 - District Office File Review

Department Details:

OFF SYSTEM

Evaluate the bridge files in the District/Turnpike corresponding to the structures that will be reviewed in the field. The bridge file evaluation Form 3A (refer to Exhibit 3A in the QA Manual) shall be used to record results of each file review. The office evaluation shall include the following:

(a) General File Content - The QA Consultant verifies that the inspection file:
* Contains the latest field inspection forms (D-450 forms), load rating analysis and if applicable, posting recommendation.

* Contains as-built plans or sketches with sufficient information such as dimensions material sizes and properties etc. for load rating and restricted clearances.
* Contains photographs of bridge elevation and deck views and current photographs, as well as historical photographs, if appropriate, of any problem areas or other areas of concern.
* Data in BMS is in agreement with the latest D-450 forms and inspection data.
* All of the above items are legible and of sufficient clarity.
* Scoring for each bridge file will be assigned for completeness and accuracy.

(b) Inventory Items Documentation - Document completeness and compare selected BMS inventory items in the inspection file to the BMS printout. Verify the BMS data by a check mark above the data on the printout, or if there is a discrepancy enter the inspection file value on the printout. Refer to the QA Manual, 305.3 (Level II). QA Manual 206.2 Level I and 206.3 Level II are revised to include the following for the first cycle of this contract; A15, A26, A30, A31, A35, B22, C05, C07, C12, C17, C18-A, C23, C35 and C36.

In accordance with Section 206.1 of the QA Manual, this list of Inventory Items may change in each subsequent QA Cycle at the discretion of BQAD.

Scoring for each bridge file will be assigned for completeness and accuracy.

(c) Condition/Appraisal Items Documentation - Document completeness and compare selected BMS condition/appraisal items in the inspection file to the BMS printout. Verify the BMS data by a check mark above the data on the printout, or if there is a discrepancy enter the inspection file value on the printout. Refer to the QA Manual, 306.4. (Level III). Verify that the D-450 Forms contain comments and/or narrative supporting the numeric ratings.

(d) Load Rating Analysis Documentation - Document completeness of analysis and compare BMS Inventory and Operating Ratings to the same items in the inspection file to the BMS printout. Verify the BMS data by a check mark above the data on the printout, or if there is a discrepancy enter the inspection file value on the printout. Check the complete load rating calculations. Refer to the QA Manual, 307.5 (Level IV).

For bridges where the analysis has had to account for section losses in steel, broken or deteriorated, prestressing strands or loss of concrete section, the QA team shall verify that accurate measurements and sketches are in the file and that the analysis properly accounts for same.

When a re-analysis has been recommended by the inspectors on Form D-450, the time period between the recommendation and the actual date of the analysis shall be recorded.

Office file information such as field sketches or field measurements that are used as part of the analysis should be copied and transferred to the QA inspectors for verification at the field inspection. This data should not be reviewed by QA inspectors before the field inspection.

(e) Posting Documentation and Compliance with Posting Policy - Verify that proper documentation for the posting is in the file. Verify the BMS data by a check mark above the data on the printout, or if there is a discrepancy enter the inspection file value on the printout. Check that the posting data is consistent with the Inventory and Operating Rating data. The field inspection portion of the QA verifies that signing in the field agrees with posting data in BMS. Refer to the QA Manual, 308.1 (d). (Level IV).

(f) Verify the Bridge Maintenance Needs (Form D-450M of the Inspection Forms) has been completed. Verify that the Major Improvement Need items on D-450M are present.

(g) Scour Assessment Documentation
* Observed Scour Assessment - Check Status of the District review (currently BMS 2L Screen)
* Scour Assessment value should agree with BMS item W06. If not, check for justification such as narrative regarding changes at the bridge site since that Scour Assessment was completed.
* Check that BMS items W06 and E29-A are in agreement.
* For bridges built after 1982, Scour Assessment should be based on theoretical scour calculations and/or scour countermeasures.
* Note any District information such as sketches, cross-sections or narrative.
* Countermeasures present?
* USGS Reports, W11-A files and office file information such as historical scour/flooding records or field sketches that are used as part of the Scour Assessment should be copied and transferred to the QA inspectors for verification and use at the field inspection. This data should not be reviewed by QA inspectors before the field inspection.

(h) Contact BQAD to obtain file copies of Shop Drawings referenced but not available at District Office.

Method of Measurement - Each
Each unit of work consists of the complete file reviews as described for the specified number of bridges in each organization for each cycle.

For payment purposes only, Task 1 is subdivided into two Subtasks:
Task 1.1 District file review for 15 State and 15 Local bridges.
Task 1.2 Turnpike file review for 15 Turnpike bridges.

Approach:

Mackin Engineering Company will perform evaluations of the District/Turnpike bridge files of the bridges that are to be inspected. This work will be performed in accordance with the Department's scope of work.

The District/Turnpike Office File Reviews will be conducted by a team of two certified CBSI inspectors; the team will be lead by a NBIS Certified team leader with a minimum of five years experience (we anticipate utilizing a team leader that is a registered Professional Engineer).

The Office File Reviews will include reviewing the following:

General File Content
Inventory Items Documentation
Condition Appraisal Items
Load Rating Analysis Documentation
Posting Documentation
Bridge Maintenance
Scour Assessment Documentation
Construction Plans / Shop Drawings

If the bridge plans are not available in the District Office, Mackin will contact Central Office to determine if they are available; if available Central Office will copy and forward a copy of the plans to Mackin

The team performing District/Turnpike bridge files reviews will not perform the field inspection for the bridges reviewed at the District/Turnpike.

Detail Task 2 - Turnpike Office File Review

Department Details:

See Task 1.1 for write up.

Approach:

Mackin Engineering Company will perform evaluations of the District/Turnpike bridge files of the bridges that are to be inspected. This work will be performed in accordance with the Department's scope of work.

The District/Turnpike Office File Reviews will be conducted by a team of two certified CBSI inspectors; the team will be lead by a NBIS Certified team leader with a minimum of five years experience (we anticipate utilizing a team leader that is a registered Professional Engineer).

The Office File Reviews will include reviewing the following:

General File Content
Inventory Items Documentation
Condition Appraisal Items
Load Rating Analysis Documentation
Posting Documentation
Bridge Maintenance
Scour Assessment Documentation
Construction Plans / Shop Drawings

If the bridge plans are not available in the District Office, Mackin will contact Central Office to determine if they are available; if available Central Office will copy and forward a copy of the plans to Mackin

The team performing District/Turnpike bridge files reviews will not perform the field inspection for the bridges reviewed at the District/Turnpike.

Detail Task 3 - Category A1 Inspection

Department Details:

Field Inspection and Report

The team performing the office file review for a given District\Turnpike will not perform the field inspection portion of this Task for that District\Turnpike. Office file information provided to the QA inspectors such as field sketches or field measurements that are used as part of the load rating analysis or the Scour Assessment should not be reviewed before inspection.

Field inspections shall use electronic data collection using Department provided software.

Perform an independent NBIS field inspection of the selected bridges, clearly defining and reporting the following:

(a) Verify and identify the structure using BMS (BMS2) description information. Refer to QA Manual, 205.3 (Level IV.)

(b) Color photographs (approximately 3" x 5") shall be used to supplement field inspection notes and drawings, and shall be sufficiently clear, properly identified, and indexed. General views depicting the bridge and showing the approach roadway and alignment, plus an elevation view, as well as photographs of defects or other significant features, including scour shall be included as part of the bridge inspection report. Photograph prints scanned from 35mm film or negatives meeting the above criteria are acceptable.

(c) Record inventory items for comparison to data on BMS printout.

(d) Record condition/appraisal ratings on E-Forms (I-Forms). Provide supporting narrative comments, photos and/or sketches as appropriate.

(e) List and prioritize maintenance/repair needs. Record Major Improvement Needs and conduct Maintenance Needs assessment.

(f) Provide maintenance and protection of traffic for field inspection activities.

(g) Take measurements and make sketches as needed for performing load rating analyses.

(h) Prepare sketches showing scour, streambed aggradations, degradation, debris, countermeasures, etc. After completing the field inspection and Forms D450E-G for bridges over water, review office file information for historical information (including the USGS Bridge Scour Assessment Report for the site, if available) that may amend the "snapshot picture" from the QA inspection.

Compare final QA ratings for W06 versus the USGS value and the last NBIS inspection rating. Compare final QA ratings for W11A and the last NBIS inspection rating.

(i) Use digital format to video the structures inspected, especially the out of tolerance items, for use at the Close-Out Meeting.

Video shall at a minimum include the following:

* Display sheet listing QA cycle, District, and BMS I.D.
* Near and far approach views.
* Bridge elevation view.
* Deck surface and traffic safety features views.
* Downstream and upstream views.
* Superstructure units and underneath of superstructure views.
* View of Substructure units and any scour problems if present.
* View of any out of tolerance items present.

Method of Measurement - Each
Each unit of work consists of the inspection of a bridge, as described herein.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 4 - Category A2 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 5 - Category A3 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms

(anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 6 - Category A4 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 7 - Category A5 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

.

Detail Task 8 - Category B1 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 9 - Category B2 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 10 - Category B3 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a

proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 11 - Category B4 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 12 - Category C1 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 13 - Category C2 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 14 - Category C3 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 15 - Category C4 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a

proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 16 - Category D1 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 17 - Category D2 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 18 - Category D3 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 19 - Category D4 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 20 - Category D5 Inspection

Department Details:

See Task 1.3 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

The inspections will be performed by a team of two qualified degreed engineers who meet or exceed the NBIS qualifications for team leader and inspector. We anticipate that the lead inspector will be a registered professional engineer.

Based on discussions with the Department in preparation for the project technical and price proposals, it is our understanding that the inspection will not consist of a "hands on" inspection of every component of the bridge; however the inspection will comprehensive in that it will provide a

proper justification for the QA coding. Previously completed eforms will be provided to the inspectors during their inspection; the eforms (anticipated for state owned bridges) will be update in the field. The BMS print outs will be provided to the inspectors in the field; the inspectors will circle any out of tolerance items in red on the BMS forms. The report for each bridge will be complied and submitted with the District/Turnpike Summary Report (a separate report will not be submitted).

Detail Task 21 - Category A1 Load Rating Analysis

Department Details:

The QA load rating shall be performed independently of the previous load ratings. During the field review the QA team must obtain sufficient data to perform Level IV of load rating verification. All calculations are to be documented neatly using sketches as necessary and included in the QA records for each sample bridge. Refer to 208.5 (Level IV) of QA Manual.

Provide independent Inventory and Operating load ratings for H20, and ML80 loadings. Use Department software where appropriate. Supply complete copies of all analysis computations including either long-hand computations or PennDOT programs input and output with input preparation calculations. Other Department approved analysis or rating software may be used. Include any sketches and/or drawings necessary to accurately depict the members.

Compare the QA load ratings to those in the bridge file and highlight any differences. List any inaccuracies, omissions or errors. Comment on existing or required load postings. Be prepared to discuss differences in analysis results or methods at the Close-Out Meeting with each District, and Turnpike.

Method of Measurement - Each
Each unit of work consists of the load rating of a bridge, as described herein.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 22 - Category A2 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated).

Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 23 - Category A3 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 24 - Category A4 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 25 - Category A5 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 26 - Category B1 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 27 - Category B2 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 28 - Category B3 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 29 - Category B4 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 30 - Category C1 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 31 - Category C2 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 32 - Category C3 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 33 - Category C4 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)

* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 34 - Category D1 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 35 - Category D2 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 36 - Category D3 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or

finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 37 - Category D4 Load Rating Analysis

Department Details:

See Task 1.21 for write up

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 38 - Category D5 Load Rating Analysis

Department Details:

See task 1.21 for write up.

Approach:

Mackin Engineering Company will perform this task in accordance with the Department's scope of work.

It is anticipated that either the bridge load ratings will be performed using the either the ASD or LFD method (no LRFD ratings are anticipated). Standard PennDOT analysis software will be utilized to perform the bridge load ratings; no analyzes which require significant hand computations or finite element analyses are anticipated. The following PennDOT analysis programs will be utilized to perform the analyses:

* Bridge Analysis and Rating (BAR7)
* LFD Prestressed Concrete Girder Design and Rating
* Box Culvert design and Rating

Detail Task 39 - Category A1 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 40 - Category A2 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 41 - Category A3 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 42 - Category A4 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 43 - Category A5 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 44 - Category B1 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 45 - Category B2 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 46 - Category B3 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 47 - Category B4 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 48 - Category C1 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 49 - Category C2 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 50 - Category C3 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 51 - Category C4 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 52 - Category D1 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 53 - Category D2 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 54 - Category D3 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 55 - Category D4 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 56 - Category D5 Inspection -subconsultant

Department Details:

See Task 1.3 for write up.

Approach:

Specialty Engineering Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Mackin will coordinate with Specialty on each of their work tasks. Mackin will perform all project management related activities with Specialty. It is imperative that Mackin's and Specialty's inspection, analysis and report procedures are identical. In order to achieve consistency Mackin will develop all inspection, analysis and report procedures and train all Mackin and Specialty staff in these procedures. We anticipate that the training will occur at Mackin's Pittsburgh Office.

Following the District/Turnpike Office File review for each of the District's that Specialty will be working in, Mackin will forward a copy of the data that Specialty will require for their inspection; including a copy of the BMS print outs, a partial replica and a copy of the bridge load rating. Mackin will review each of Specialty's report prior to incorporating them into the District Draft Summary Report.

Mackin will perform a review of Specialty's field operations - we anticipate two times during the life of the contract.

Detail Task 57 - Category A1 Load Rating Analysis -subconsultant

Department Details:

See Task 1.21 for write up.

Approach:

Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 58 - Category A2 Load Rating Analysis -subconsultant

Department Details:

See Task 1.21 for write up.

Approach:

Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 59 - Category A3 Load Rating Analysis -subconsultant

Department Details:

See Task 1.21 for write up.

Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 60 - Category A4 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 61 - Category A5 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 62 - Category B1 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 63 - Category B2 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 64 - Category B3 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 65 - Category B4 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.

Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 66 - Category C1 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 67 - Category C2 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 68 - Category C3 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 69 - Category C4 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 70 - Category D1 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 71 - Category D2 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.

Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 72 - Category D3 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 73 - Category D4 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 74 - Category D5 Load Rating Analysis -subconsultant

Department Details:
See Task 1.21 for write up.
Approach:
Specialty Engineering, Inc. will perform this task in accordance with the Department's and Mackin's scopes of work.

Detail Task 75 - DIST Major Bridge (Length > 500`) Inspection Program Completeness Review

Department Details:

Complete a File Review for three (3) structures, with length greater than 500 feet, for each District. The review should focus on four main topics; Inventory, Inspection, Maintenance, Load Ratings. The bridges will be selected by the Department.

(a) Inventory: Perform a completeness review of the bridge file data. For file contents requirements, reference PennDOT Publication 238, Part IP, Chapter 8, Section 8.3, Individual Structure Inspection File Contents. The basic premise is to ascertain whether all data is present in the District/Turnpike files and whether it is easily accessible.
(b) Inspection: Perform a completeness review of the inspection report contents in order to ascertain whether the inspection has been carried out to meet requirements of PennDOT Publication 238, Chapter 2, relative to:
* Frequency of Inspections (Routine and Underwater)
* Intensity of Inspection
* Fatigue and Fracture (for FCM's
* Scour Evaluation
Review of inspections is to be limited to the last 6 years (3 regular inspection cycles). For bridges over water, specifically evaluate the completeness of the Scour Evaluation in accordance with PennDOT Publication 238, Chapter 2, Section 2.6 and the Scour Plan of Action (future item, currently under development by BQAD).

(c) Load Ratings: Perform a completeness review of the load rating analysis on file. Determine whether deterioration has been accounted for and that the controlling member has been properly identified. Evaluate whether the analysis has been updated in a timely manner based on the date of the last analysis or relative to recommendations and findings from the inspection report.
(d) Maintenance: Perform a completeness review of the recommended maintenance items relative to the findings in the inspection report. Evaluate whether the proper priority level has been assigned for each item and whether a proper follow-up action has been taken. (i.e. Has a work order been assigned or has the item been included on a Bridge Preservation or Improvement project.)
(e) Perform a field view of the bridge to assist in determining the completeness of data in the bridge files. These field views shall be completed by the Project Manager or an engineer of equal experience relative to bridge inspection and analysis and who is approved for this work by BQAD. The PM shall review the office review findings in the field to determine an overall evaluation of the major bridge files. Recommendations for improving these records will be included.

The results of these reviews shall be recorded on standard forms to be developed by the consultant and approved by BQAD. These standard forms will be developed under Part V of this agreement. Completeness of each of the four (4) main components will be scored on a scale of 0 to xx with a total score of 100 points. A one (1) page report summarizing the results of these reviews shall be completed for each bridge with appropriate forms and included in the Summary Report for each District and the Turnpike.

Method of Measurement - Each
Each unit of work consists of the Inspection Program Completeness Review of a major bridge, as described herein.

Approach:

This task will be done in accordance with the Department scope of work. A checklist will be developed for the review of the major bridges. The checklist will be developed based on the existing checklist used for the Bridge File Evaluation and will identify if the file was complete and describe why or why not. Based on discussion with the Department, the report will consist of the check list.

Detail Task 76 - TPC Major Bridge (Length > 500`) Inspection Program Completeness Review

Department Details:

See task 1.75 for write up.

Approach:

See Task 1.75 for description of work task.

Detail Task 77 - Preparation of Draft Summary Reports for each District

Department Details:

Within forty-five (45) days from the completion of Tasks 1.1 thru 1.76 in a District or the Turnpike, the consultant shall submit:
(a) Three (3) copies of a Draft Summary Report containing the findings for that District's or Turnpike's bridges. Include summary spreadsheets showing comparisons between the QA results and the District or Turnpike files with in-tolerance percentages noted. Separate summary spreadsheets shall be prepared for Inventory Data Items, Inspection/Appraisal Items, Maintenance Items and Priority Level, Load Rating Analysis, and Observed Scour (includes W11-A, E29-A and W06). Spreadsheets have already been developed for Inspection/Appraisal, Load Rating Analysis and Observed Scour. Items E29-A and W06 will need to be added to the existing Observed Scour spreadsheet. The consultant will need to develop spreadsheets and a scoring system for Inventory Data Items and for Maintenance Items and Priorities. These spreadsheets will need to be approved for use by BQAD and will be developed under Part V of this agreement.
(b) One (1) set of copies of the field inspection reports, separately bound, which support the findings in the Draft Summary Report.

(c) Two (2) sets of copies of the load rating analysis reports, separately bound, with all relevant sketches and drawings which support the findings in the Draft Summary Report. The load rating analysis reports shall include a summary of reasons for any differences, a summary table comparing the load ratings, a copy of the file analysis, a copy of the file analysis with QA revisions marked in red and a copy of the QA analysis.

Method of Measurement - Each
Each unit of work consists of the preparation of a draft Summary Report for an organization in each cycle, as described herein.

Approach:

This work will be done in accordance with the Department scope of work. Additional spreadsheets and a scoring system will be developed (under Part V of this agreement) to evaluate Inventory Data items and Maintenance Items. These spreadsheets will be incorporated into the Draft Summary Reports.

Detail Task 78 - Preparation of Draft Summary Reports for the Turnpike

Department Details:

See task 1.77 for write up.

Approach:

See Task 1.78 for description of work task..

Detail Task 79 - Close-Out Meetings for each District

Department Details:

This Task includes attendance at Close-Out Meetings at each District and the Turnpike, conducting field views of the bridges, and preparation of Final Summary Reports.

(a) After receiving the Draft Summary Report, bound bridge inspection reports and bridge load rating analysis, the BQAD will arrange a Close-Out Meeting between the District/Turnpike, QA Consultant, local bridge owners and/or their inspection consultants, and BQAD to discuss the findings in the Draft Summary Report, inspections and analyses. The QA Consultant shall present an oral executive summary of the QA activity for the District/Turnpike. The QA Consultant's Project Manager will conduct the meeting based on the findings and QA Consultant is to produce draft minutes of the meeting within 7 workdays and final minutes within 7 workdays of receiving BQAD comments. The QA Consultant will prepare and submit a letter requesting clarification for any unresolved items from the meeting. This letter is to be sent to BQAD within 7 workdays of the Close-Out meeting.
(b) Prior to the Close-Out Meeting in the District, a field view will be conducted by the QA Consultant's Project Manager and the BQAD QA Project Manager, to review as many of the structures as deemed necessary by the number of deviations. After consulting with the QA Consultant, BQAD will determine the sites to visit. The time allotted for the field view and Close-Out meeting should be two and one-half days average for all the Districts. Some Districts will only require two days while others may require three depending on travel time and number and location of bridges requiring visitation. Additional photos and/or video may be required to further document reasons for deviations.
(c) The QA Consultant shall submit to BQAD for each District/Turnpike 3 copies of the Final Summary Report, 2 copies of the final bridge inspection evaluation reports, and 2 copies of the final load rating analysis computations. This submission shall incorporate all revisions from the Close-Out Meeting. These Final Summary Reports shall be submitted to BQAD within 4 weeks of resolution of any outstanding Close-Out Meeting issues. BQAD will require in addition an electronic submission (MS Word, Excel and scanned pages when necessary) of the above hardcopy submissions on CD-ROM. Video of the bridges shall be submitted on DVD (2 copies).

Method of Measurement - Each
Each unit of work consists of the Close-Out Meeting for an organization in each cycle, as described herein.

For payment purposes only, this task is subdivided into two Subtasks:
Task 1.79 District Close-Out Meeting.
Task 1.80 Turnpike Close-Out Meeting.

Approach:

This task will be performed by Mackin in accordance with the Department's scope of work

Detail Task 80 - Close-Out Meetings for the Turnpike

Department Details:

See task 1.79 for write up.

Approach:

This task will be performed by Mackin in accordance with the Department's scope of work

Detail Task 81 - Cycle Summary Report for Statewide

Department Details:

Cycle Summary Reports (one comprehensive report summarizing the review of all Districts and one for the Turnpike, comparing the review of the selected bridges to the statewide results) shall be completed within sixty (60) days from the completion of Task 1.77 & 1.78 work for all of the Districts and the Turnpike.

Each statewide and Turnpike Cycle Summary Report shall include at the minimum:
(a) An Executive Summary
(b) A summary of the total inspection effort for the cycle.
(c) Statistical and graphical comparison of the condition/appraisal items and statistical comparison of Inventory Items, Observed Scour, Maintenance Items and Load Rating Analysis.
(d) Conclusions based upon findings.
(e) Detailed recommendations that will improve the overall inspection program including both the bridge inspection training program and the BMS Coding Manual.
(f) Specific recommendations that will improve the load rating analysis method validity of rating.
(g) Specific recommendations that will improve the identification and prioritizing of maintenance/repair needs.
(h) Specific recommendations that will improve the proper coding of Inventory Data items.
(i) At the end of each cycle, QA consultant shall present the recommendations outlined in items 4, 5, and 6 above, at a meeting with BQAD in Harrisburg.
(j) Three (3) draft copies each of Statewide and Turnpike Cycle Summary Reports shall be forwarded to the BQAD for review and comments.
(k) Twenty (20) final copies of the Statewide Cycle Summary Report and five (5) final copies of the Turnpike Cycle Summary Report shall be forwarded to Bridge Quality Assurance Division, Bureau of Design for distribution.

In addition to above, the consultant shall also submit the final Statewide and Turnpike Cycle Summary Reports on CD-ROM using MS WORD and EXCEL.

Method of Measurement - Each
Each unit of work consists of the preparation of the Cycle Summary Report for an organization in each cycle, as described herein.

For payment purposes only, this task is subdivided into two subtasks:
Task 1.80 Cycle Summary Report for Statewide Bridges.
Task 1.81 Cycle Summary Report for Turnpike Bridges.

Approach:

This task will be performed by Mackin in accordance with the Department's scope of work

Detail Task 82 - Cycle Summary Report for Turnpike

Department Details:

See task 1.81 for write up.

Approach:

This task will be performed by Mackin in accordance with the Department's scope of work

Consultant Hierarchy

Business Partner	DBE Type	Supervising BP
Mackin Engineering Company	No	
Specialty Engineering, Inc	Yes	Mackin Engineering Company

Attachments

No records found.

Part 5 - QA Inspection related services

Description

Other QA Inspection related studies and services

Task 1 - Other Structures Activities

Objective:

2.7.99
This includes any other necessary PennDOT structure activities for the project which are not otherwise covered under the standard structure tasks.

Scope:

2.7.99
Provide work as detailed by the Department. See Below.

Detail Task 1 - Other Inspection Related Studies

Department Details:

This phase of the project will consist of other inspection QA related studies and services as directed by the Department and will occur simultaneously with the work in Parts III & IV throughout the QA Contract. Assignments for the work in this part will be made via letter from the Director, Bureau of Design. This other work may include but not be limited to:

(1) Rewriting or revising the Quality Assurance Manual to provide a fully updated version of this Publication 240, and incorporating all current policies and procedures.

(2) Developing new initiatives in quality assurance for inspection planning, inspection staffing, bridge ratings, analysis methodologies, scour assessments, bridge data management, and other areas.

(3) Developing benchmarking for inspection activities and/or data.

Approach:

Mackin will work with the Department to develop new initiatives in quality assurance for inspection planning, inspection staffing, bridge ratings, analysis methodologies, bridge data management and other areas.

Mackin will work with the Department in developing new initiatives in relating to bridge inspection procedures. Several opportunities exist in the following areas:
* Performing a thorough review of Pub 240 with respect to current policies and manuals.
* Establishing analysis criteria for the load rating of prestressed concrete beams
* Buoyancy of box beams
* Developing more a specific method of prioritizing maintenance items - many items are continually "carried through" from inspection to inspection and never performed.
* Enhancing the BMS system to effectively work with the Bridge Preservation Programmatic Agreement

The above items are only worthwhile if the proposed revisions and enhancements are effectively disseminated through out the inspection community; we will offer to assist the Department in this effort by participating in the Bridge Inspection Refresher Classes and also working with the Department in possibly developing a web site (or enhancing the current Department site) such that the inspection community is provided access to current updates.

Consultant Hierarchy

Business Partner	DBE Type	Supervising BP
Mackin Engineering Company	No	

Attachments

No records found.

You are currently logged in as **Kerry M. Stotler**.

Release: 3.0
Session size: 499.3k

PennDOT | Home | Site Map | Help | Pennsylvania

Copyright © 2009 Pennsylvania Department of Transportation. All Rights Reserved.

Fri May 22 08:04:58 EDT 2009
Official ECMS Date/Time

PennDOT Privacy Policy