

Quality Assurance/Quality Control Plan

BRF 6361(00)17-1, PCN 06H7

BRO 8006(00)17-2, PCN 06H8

BRF 6317(00)17-3, PCN 06H9

Prepared For:

Brookings County

Prepared By:

Banner Associates, Inc.

May 16, 2018

PROJECT INFORMATION

This Quality Assurance/Quality Control Plan (QA/QC PLAN) details the measures and procedures required to assure compliance with the quality assurance and acceptance provisions of the Bridge Improvement Grant construction contract for Project Nos. BRF 6361(00)17-1 [PCN 06H7], BRO 8006(00)17-2 [PCN 06H8], and BRF 6317(00)17-3 [PCN 06H9] with Brookings County, South Dakota. The work to be accomplished in this project consists of: two coat bridge deck polymer chip seal, filling paving notch, end block repairs, curb repairs, and steel bridge railing replacement.

PROJECT SPONSOR: Dick Birk, Highway Superintendent
Brookings County Highway Department
422 Western Avenue
Brookings, SD 57006

CONTRACT ADMINISTRATION: **Project Engineer and Construction Observer:**
Banner Associates, Inc.
409 22nd Avenue South, PO Box 298
Brookings, SD 57006

Field tests and Lab tests:
GeoTek Engineering & Testing Services, Inc.
909 East 50th Street North
Sioux Falls, SD 57104

RESPONSIBILITIES

Project Manager/Engineer

The Project Manager/Engineer, on behalf of the sponsor is the person with overall responsibility for contract administration of this project. The Project Manager/Engineer has the authority to take the necessary actions to monitor compliance with the contract documents.

Construction Observer

The responsibilities of the Construction Observer shall include monitoring all aspects of the job, sampling materials for acceptance, conducting tests on embankment and excavation areas, reviewing and analyzing all test results, assuring that work is within specification limits, advising the Contractor's Superintendent and Project Engineer of nonconformance and possible corrective actions, and measuring quantities for payment. The Construction Observer will be on site on a day to day basis when contractor is working and throughout all critical times when contractor is performing work.

Quality Acceptance Laboratory

GeoTek Engineering & Testing Services, Inc. will provide testing lab. Lab duties shall include sampling materials for acceptance and conducting tests on cover aggregate.

Personnel assigned to construction testing shall have received certified training. This personnel certification shall be in accordance with the SDDOT Materials Testing & Inspection Certification Program Manual.

All QA testing shall be performed by an accredited laboratory and a copy of the current accreditation shall be supplied to the Engineer and Owner, for approval, prior to submitting test results.

QUALITY ASSURANCE INSPECTION PROCEDURES

1. Quality Assurance Tests: A list of tests and certifications required by the contract specifications can be found in the attached Appendix A. The list includes the referenced specification section and testing requirements. All parties will be informed of their responsibilities. This information will be reviewed at the preconstruction conference and monitored throughout the project.
2. Submittals: The Engineer shall maintain a file containing certifications and submittals required by contract as provided by the contractor, as well as approvals from the Engineer.
3. GeoTek Engineering & Testing Services, Inc. will provide acceptance test reports to the Owner and Engineer as soon as the results are available, electronically. Typed copies shall be made available within one working day [delivered via electronic mail].
4. Material Test Reports: Material test results shall be verbally made available to the Owner and Engineer within one hour after the test report is completed and typed copies shall be made available within one working day [delivered via electronic mail].
 - Calibration check on equipment used to determine the noncompliance item, if applicable.
 - Confirmation of noncompliance through retesting and/or follow-up observations.
 - If a solution to the nonconformance issue is not reached in a reasonable time frame, additional qualified contractor personnel will be contacted to assist in identifying and correcting the problem.
 - If a severe nonconformance problem is detected and a reasonable solution cannot be implemented in a reasonable time frame, the Construction Superintendent will consult with the Project Engineer and the work will be suspended.
 - The work will not begin again until the Construction Superintendent and Project Engineer concur that a solution to the problem has been found and successfully implemented.
5. Test Reports Which Require Corrective Actions: Should test results or observations indicate noncompliance with the project contract, plans, or specifications, the following communication and follow-up action will be implemented, as applicable:
 - Verbal notification to the sponsor, Construction Superintendent, work area foreman and/or plant operator.
 - On restarting the work, the nonconforming testing element or observation will be monitored at an appropriate higher frequency for a reasonable amount of time, e.g. double the testing frequency listed.
 - After the area in noncompliance has been repaired, acceptance retesting will resume. The test reports will include the failed test number for tracking.

QUALITY ASSURANCE INSPECTION PROCEDURES (Cont.)

6. Daily Reports: The project manager or his representative will maintain a daily diary summarizing pertinent construction items. Items recorded shall include (as a minimum):
 - a. Date
 - b. Weather Conditions
 - c. Brief Summary of Work Performed
 - d. Number of workers on site
 - e. Type and Amount of Major Equipment being utilized
 - f. Running total of working/calendar days used on project
 - g. Significant Directives/Communication with contractor (e.g. regarding construction procedures or material quality)
 - h. Summary of QA tests performed that day
 - i. Arrival/Departure Time of On Site Inspection Staff
7. Bi-Weekly Reports: A summary of bi-weekly construction status shall be prepared and submitted to [owner] every [list day, e.g. Friday]. Report shall include summary of work completed in that 2 week period, summary of QA test results, discussion of any controversial issues that came up, and work anticipated during next reporting period. A sample report is included in Appendix B.
8. The resident observer and acceptance testing lab personnel shall maintain all acceptance test reports and provide copies to the owner/engineer as soon as results are available.
9. Banner Associates, Inc. will prepare a final project construction material testing and acceptance report that includes a summary of: all acceptance tests results, quantity of materials, and all bi-weekly reports. (Actual test reports will be available upon request). This will be submitted to the County with the final pay application.

Each certificate received, sample taken, or test made shall be recorded, managed, and used as described in the South Dakota Department of Transportation Materials Manual Minimum Samples and Test Requirements (MSTR).

The following tests and certifications are required:

Section 460, Structural Concrete

Concrete Patching Material.

- (1) Tier 2.
- (2) Certification.
Item used must be from approved products listed in construction plans.
- (3) Acceptance.
Documented visual inspection.

Epoxy-Resin Adhesive.

- (1) Tier 2.
- (2) Certification.
A Certificate of Compliance is required for each type and source.
- (3) Acceptance.
None required.

Section 460, Structural Concrete (Cont.)Epoxy Coated Dowel Bars.

(1) Tier 2.

(2) Certification.

From a certified supplier: None required.

From a non-certified supplier and for all epoxy coated bars: A Certified Copy of the Mill Test Report showing the chemical analysis and physical properties for each heat or lot number shall be furnished. Deliveries to the project shall be identified by heat numbers, using metal or weather and wear resistant tags wired to the bundles.

A Certificate of Compliance stating that the epoxy coating, the coating process, & the quality/production report(s) conform to specifications.

NOTE: The reinforcing steel shall not be placed in the work until records or certifications have been received or tests made.

(3) Acceptance.

One sample, two 24 in. lengths, per source, per project from a randomly selected size, representing not more than 3 sizes or 3 heat numbers to be tested for physical properties in the Central Laboratory for all bars (Excludes black steel listed on the Approved Products List).

NOTE: Do not submit bars larger than #8 for testing.

From a certified supplier and for uncoated bars: Documented visual inspection for rust scales, proper grade markings, and signs of mishandling.

From a non-certified supplier and for all epoxy coated bars: Documented visual inspection on delivery to the project including heat number, size, length, shape, and condition of shipment. On epoxy coated bars, check for voids, holes, cracks, and handling and shipping damage to epoxy coatings.

Each bundle of steel shall be marked with a metal or weather and wear resistant tag showing the heat number(s) represented. The tags shall be secured to the appropriate bundles so the heat numbers can be checked against the shipping papers and the Certified Mill Test Reports

Section 460, Structural Concrete (Cont.)

Curing Materials.

Liquid Membrane Curing Compound.

- (1) Tier 2.
- (2) Certification.
From Approved Products List: None required.
Not from Approved Products List: Certificate of Compliance
- (3) Acceptance.
One 8 oz. sample in a plastic or glass container per type, lot, and source.

NOTE: Material must be properly mixed to disperse all settlement just prior to sampling. Sampling shall occur from the end of the spray nozzle.

Burlap.

- (1) Tier 3.
- (2) Certification.
None required.
- (3) Acceptance.
Documented inspection.

Film (Sheet Materials Including Water Proof Paper, Polyethylene Sheeting, White Burlap-Polyethylene Sheeting, etc.).

- (1) Tier 3.
- (2) Certification.
None required.
- (3) Acceptance.
Documented inspection.

Section 470, RailingNuts and Washers.

- (1) Tier 2.
- (2) Certification.
Certified Copy of the Mill Test Report.
- (3) Acceptance.
Documented measurements and visual inspection.

Structural Steel Bridge Rail.

- (1) Tier 1.
- (2) Certification.
A Certified Copy of the Mill Test Report showing the chemical and physical tests for each heat or lot number. Also, shop fabrication inspector's report certifying that material used is represented by the mill test.
- (3) Acceptance.
Documented measurements and visual inspection.

Section 480, Reinforcing SteelGalvanic Anode.

- (1) Tier 2.
- (2) Certification.
Item used must be from approved products listed in construction plans.
- (3) Acceptance.
Documented visual inspection.

Epoxy Coated Reinforcing Bars.

- Refer to requirements for Section 460, Structural Concrete, Epoxy Coated Dowel Bars listed above.

Section 491, Bridge Deck Polymer Chip SealPolymer.

- (1) Tier 2.
- (2) Certification.
Item must be on Approved Products List.
- (3) Acceptance.
Contractor performed pull off test as specified in Section 491 of the Specifications.

Aggregate.

- (1) Tier 2.
- (2) Certification.
Certified Analysis.
- (3) Acceptance.
Moisture Content.
One per Structure. (DOT-35)

Concrete Patching Material.

- (1) Tier 2.
- (2) Certification.
A Certificate of Compliance is required for each type and source.
- (3) Acceptance.
Documented visual inspection. Material shall comply with requirements of 491.2.A of the Specification.

Curing Materials.

- Refer to requirements for Section 460, Structural Concrete, Curing Materials listed above.

Section 632, Highway Signs and Delineators

Steel Sign Posts.

- (1) Tier 2.

- (2) Certification.
Umbrella Certificate. (DOT-99)

NOTE: If records are audited, the Contractor must produce a Certified Copy of the Mill Test Report.

- (3) Acceptance.
Documented measurements and visual inspection, as applicable, for coating, weight per foot (Per meter), hole spacing, etc.

Section 633, Pavement Marking

Glass Beads.

- (1) Tier 3.

- (2) Certification.
None required.

- (3) Acceptance.
One sample per type, source & lot. Three 4# cement cans as per SD 508. None required if less than 20 gal. of paint is used on a project.

Traffic Marking Paint.

- (1) Tier 2.

- (2) Certification.
A Certificate of Compliance is required per type, source & lot. (It may be in the form of a manufacturer's certified analysis from the label on the container.)

- (3) Acceptance.
One 1 pt. sample per type, source & lot. None required for contract quantities less than 20 gal.

