CIRCULAR LETTER

SECTION: **602.42 ERECTION OF STEEL STRUCTURES**
NUMBER: **602.42-01**
SUBJECT: **PRE-ERECTION CONFERENCE**
DATE: **JULY 1, 2009 (01/01/2010)**

A pre-erection conference on the project site should be held prior to erecting steel members for bridge construction. The conference should include: discussion on methods of erection; equipment utilized; traffic control; safety precautions; and any questions or concerns of those persons involved in the erection.

In addition to the Project Supervisor, the conference should include representation from the following:

1. The Contractor
2. The Erector
3. The Division of Structures
4. The Project Field Personnel

CIRCULAR LETTER

SECTION: **603.13 REPAINTING OF EXISTING STEEL STRUCTURES**
NUMBER: **603.13-01**
SUBJECT: **ABRASIVE BLASTING/WATERWASHING ACTIVITIES GUIDANCE**
DATE: **OCTOBER 2, 2015**

Requirements outlined in this guidance apply to all abrasive blasting/waterwashing activities that are organized or coordinated by TDOT District Operations Engineer, including: painting; blasting with sand, slag, steel shot or grit; and waterwashing of bridges. For each abrasive blasting/waterwashing project, the onsite TDOT District Operations Engineer shall ensure completion of the following:

(1) A minimum of two weeks prior to commencement of any project involving blasting/waterwashing of bridges or steel structures, the TDOT Environmental Facilities Compliance Office is notified of the project and schedule. The Division address and contacts are:

TDOT Environmental Facilities Compliance Office
Mr. Barry Brown, Manager
Suite 900 James K. Polk Bldg.
505 Deaderick Street
Nashville, TN 37243

Regional Environmental Coordinator

(2) On the first day that abrasive blasting/waterwashing begins, a "split" sample is collected and submitted for TCLP metals analysis (a "split" sample is defined as a sample that is collected directly from the sample that the contractor collects for testing). The TDOT Environmental Facilities Compliance Office shall arrange for the split sample to be collected/analyzed, and the onsite TDOT District Operations Engineer shall ensure collection of the sample.

(3) The TDOT Environmental Facilities Compliance Office receives a copy of the contractor's test results to compare with the results of Toxicity Characteristic Leaching Procedure (TCLP) metals analysis of the "split" sample. A copy of the test results from the contractor's sample shall be submitted to the TDOT Environmental Facilities Compliance Division within two weeks of receipt from the testing laboratory.

(4) Abrasive blasting/waterwashing wastes are not disposed onsite. These wastes are disposed as hazardous wastes per TN Rule 1200-1-11 or as special wastes per TN Rule 1200-1-7.

(5) The TDOT Environmental Facilities Compliance Office receives a copy of any Hazardous Waste Notification Form ("HN Form") submitted by the contractor to TDEC, if applicable. A copy of the HN Form shall be submitted to the TDOT Environmental Facilities Compliance Division at the same time the form is submitted to TDEC.

(6) The TDOT Environmental Facilities Compliance Office receives a copy of any Hazardous Waste Stream Report ("Attachment WS") that is submitted to TDEC by the TDOT contractor/subcontractor (typically submitted in conjunction with the HN Form). A copy of Attachment WS shall be submitted to the TDOT Environmental Facilities Compliance Office at the same time the form is submitted to TDEC.

(7) The TDOT Environmental Facilities Compliance Office is listed as the responsible facility on all waste manifests, using the address and contact information listed in item # 1, above.

(8) The TDOT Environmental Facilities Compliance Office receives copies of all hazardous waste manifests, non-hazardous waste manifests, or other shipping papers as appropriate. For hazardous waste manifests, the generator copy shall be submitted to the TDOT Environmental Facilities Compliance Office within two weeks of the date of waste shipment. The returned copy of the manifest from the treatment, storage, disposal facility (TSDF) shall be submitted to the TDOT Environmental Facilities Compliance Office within two weeks of receipt from the TSDF.

(9) The contractor/subcontractor provides disposal facility contact information (including facility name, installation ID number, location, mailing address, contact person and phone number) to the TDOT District Operations Engineer, or their designee, in a timely manner. Within two weeks of receipt of this information from the contractor/subcontractor, disposal facility contact information shall be sent to the TDOT Environmental Facilities Compliance Office for proper record keeping.

CIRCULAR LETTER

SECTION: **604.01 CONCRETE STRUCTURES - DESCRIPTION (GENERAL)**
NUMBER: **604.01-01**
SUBJECT: **REQUEST FOR MARKING REPAIR AREAS BY BRIDGE REPAIR DIVISION**
DATE: **OCTOBER 2, 2015**

When requesting inspection by the Structures Division for the purpose of locating and marking repair areas, the following procedures should be followed:

1. Notify the Region & Repair office a minimum of three (3) days in advance of the scheduled work.
2. The deck to be marked should be scarified (if required), cleaned and traffic control set up before the marking team arrives.
3. The Project Supervisor is to furnish one man to assist in marking the decks.

CIRCULAR LETTER

SECTION: **604.01 DEFINITIONS AND TERMS**
NUMBER: **604.01-03**
SUBJECT: **AMERICAN WELDING SOCIETY (AWS) – CERTIFICATION**
DATE: **OCTOBER 2, 2015**

All field welding must be in conformance with the American Welding Society (AWS) D1.5 Bridge Welding Code and accomplished by an AWS Certified Welder. Said certification must have been administered by a Certified Welding Inspector (CWI).

The following is a partial listing of companies currently staffed to administer AWS Certification Tests:

PSI (Pittsburgh Testing Laboratory), Nashville, TN
World Testing, Mt. Juliet, TN
American Industrial Testing & Analytical Laboratories, Memphis, TN
Quality Control & Inspections, Knoxville & Memphis, TN

For reference, a sample qualification record from the AWS D1.5 Bridge Welding Code is attached detailing the pertinent information needed on all certifications. The contractor/welder may have a different form than the one attached, however the information detailed on the form must include the information shown on the reference document. In addition, the Project Supervisor may be able to verify the Welder's Certification by entering the Certification Number on the AWS website (www.aws.org).

WELDER AND WELDING OPERATOR QUALIFICATION RECORD

Welder or welding operator's name_____ Identification no. _____
Welding process _____ Manual _____ Semiautomatic _____ Mechanized _____
Position _____
(Flat, horizontal, overhead or vertical—if vertical, state whether upward or downward)
In conformance with WPS no._____
Material specification _____
Thickness range this qualifies_____

FILLER METAL

Specification no. _____ Classification _____ F no. _____
Describe filler metal (if not covered by AWS specification)_____
_____
Is backing used? _____
Filler metal diameter and trade name _____ Flux for SAW or gas for GMAW or FCAW-G
_____ _____

VISUAL INSPECTION (6.26.1)

Appearance_____ Undercut _____ Piping porosity _____

Guided Bend Test Results

Type	Result	Type	Result

Test conducted by _____ Laboratory test no. _____
per _____ Test date_____

Fillet Test Results

Appearance_____ Fillet size _____
Fracture test root penetration _____ Macroetch _____
(Describe the location, nature, and size or any crack or tearing of the specimen.)
Test conducted by _____ Laboratory test no. _____
per _____ Test date_____

RADIOGRAPHIC TEST RESULTS

Film Identification	Results	Remarks	Film Identification	Results	Remarks

Test witnessed by _____ Test no._____
per _____

We, the undersigned, certify that the statements in this record are correct and that the welds were prepared and tested in conformance with the requirements of AASHTO/AWS D1.5M/D1.5, (_____) *Bridge Welding Code*.
(year)

Manufacturer or Contractor _____

Authorized By_____

Form N-5 Date _____

Form N-5—Welder and Welding Operator Qualification Record

WELDING PROCEDURE SPECIFICATION (WPS)
PREQUALIFIED ☐ QUALIFIED BY TESTING ☐
or PROCEDURE QUALIFICATION RECORDS (PQR) Yes ☐
AASHTO/AWS D1.5 Qualification Type 5.12.1 ☐ – 5.12.2 ☐ – 5.12.4 ☐

Contractor/
Organization _____
Welding Process(es) _____
Type: Manual ☐ Semiautomatic ☐
Mechanized ☐ Automatic ☐
Tandem ☐ Parallel ☐

JOINT DESIGN USED
Single ☐ Double Weld ☐
Backing: Yes ☐ No ☐ Material _____
Root Opening _____ Root Face Dimension _____
Groove Angle _____ Radius (J–U) _____
Backgouging: Yes ☐ No ☐ Method _____
Root Treatment _____

BASE METALS
Material Spec. _____
Type or Grade _____
Thickness: Groove _____ Fillet _____
Diameter (Pipe) _____

FILLER METALS
AWS Specification _____
AWS Classification _____
Manufacturer Trade Name _____

SHIELDING
Flux _____ Mfg. Trade Name _____
Electrode-Flux (Class) _____
Gas Composition _____
Flow Rate _____ Gas Cup Size _____

Identification _____
Revision _____ Date _____ By _____
Authorized by _____ Date _____
Supporting PQR No.(s) _____

POSITION
Position of Groove _____ Fillet _____
Vertical Progression: Up ☐ Down ☐

ELECTRICAL CHARACTERISTICS
Transfer Mode (GMAW): Globular ☐ Spray ☐
Current: AC ☐ DCEP ☐ DCEN ☐ Pulsed ☐
Electrical Stick Out _____
Other _____

TECHNIQUE
Stringer or Weave Bead _____
Multi-pass or Single Pass (per side) _____
Number of Electrodes _____
Electrode Spacing: Longitudinal _____
Lateral _____ Angle _____
Interpass Cleaning _____

PREHEAT
Preheat Temp., Min. _____
Interpass Temp., Min. _____
Interpass Temp., Max. _____

POSTWELD HEAT TREATMENT
Temp. _____ Hold Time _____
Heating/Cooling Rate _____

HEAT INPUT
Calculated Heat Input Value: kJ/in ☐ kJ/mm ☐
Max. Heat Input _____ Min. Heat Input _____

WELDING PROCEDURE

Pass or Weld Layer(s)	Process	Filler Metals	Current		Volts	Travel Speed	Joint Details
		Diam.	Type & Polarity	Amps or Wire Feed Speed			

Form N-2

Form N-2—Sample Welding Procedure Specification

CIRCULAR LETTER

SECTION: **601.01 DESCRIPTION (GENERAL)**
NUMBER: **604.01-04**
SUBJECT: **STAKE OUT OF STRUCTURES**
DATE: **JULY 1, 1992**

Prior to commencing construction on a bridge, project personnel shall check the stake out of the structure by using either an alternate method or checked by an independent party. All stake out data shall be made a part of the project records.

CIRCULAR LETTER

SECTION: **604.03 CLASSIFICATION, PROPORTIONING AND QUALITY ASSURANCE OF CONCRETE**
NUMBER: **604.03-01**
SUBJECT: **CONCRETE DELIVERY TICKETS**
DATE: **APRIL 1, 2009**

When concrete is delivered to a project, it is the TDOT Inspector's responsibility to verify that the concrete delivery ticket includes the information specified in Section 604 of the Standard Specifications and/or Section 600 of the Supplemental Specifications.

The inspector should also verify the Batch Time and note the Discharge Time on the ticket. He/she should sign the ticket and keep a copy for the project records.

CIRCULAR LETTER

SECTION: **604.05 PRECAST PRESTRESSED BRIDGE DECK PANELS**
NUMBER: **604.05-01**
SUBJECT: **POST ERECTION BRIDGE DECK PANEL DEFICIENCY CHECK**
DATE: **OCTOBER 2, 2015**

After pouring a bridge deck which has precast deck panels, the Project Supervisor should request the Structures Division to review and report any deficiencies found in the deck panels prior to final acceptance.

When a report indicates deficiencies, the Project Supervisor should notify the Regional Operations Engineer and the Contractor, in writing, of the type of deficiencies. A decision will be made advising of necessary corrective action to take. The project will not be accepted as complete until all necessary repair work has been completed.

CIRCULAR LETTER

SECTION: **604.16 CONCRETE STRUCTURES**
NUMBER: **604.16-01**
SUBJECT: **BRIDGE DECK CONSTRUCTION CHECKLIST**
DATE: **OCTOBER 2, 2015**

The following pages contain a checklist procedure to be followed before, during and after bridge deck pours and a list of factors that adversely affect deck construction.

PAGE 1
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

CONTRACT _____ CONTRACTOR _____

PROJECT _____ BRIDGE NUMBER _____

REFERENCE _____ STATION NUMBER _____

COUNTY _____ LANE (IF APPL) _____

BRIDGE DECK CONSTRUCTION CHECK LIST
TO BE COMPLETED BEFORE, DURING AND AFTER BRIDGE DECK POURS

****
****
****

THIS REPORT IS TO COMPLETED BY THE
APPROPRIATE PROJECT PERSONNEL
AND COPIES SENT TO
THE CONTRACTOR
AND
MAINTAINED IN
THE PROJECT FILES FOR REVIEW

****
****
****

BRIDGE DECK CONSTRUCTION
PRE-POUR CHECKLIST

CONTRACT	_____	CONTRACTOR	_____
PROJECT	_____	STRUCTURE	_____
REFERENCE	_____	STATION	_____
COUNTY	_____	LANE/SPAN	_____

1. Check forms:
   a. Clean, free of major defects. _____
   b. Mortar tight. _____
   c. Line and grade. _____
   d. Structurally adequate to insure minimum settlement in deck or overhang. _____

2. Check rebar:
   a. Clean. _____
   b. Dimensionally correct. _____
   c. Supported per specs and Standard Drawing STD-9-1. _____
      Note: Overhang may require different supports.
   d. Document rebar quantities in field book. _____

3. Check screed rails and headers for line and grade. _____

4. Check screed for camber, insure is correct for template. _____

5. Make dry run with screed, check for correct slab thickness and rebar clearance. Document thickness and clearances in field book.
   Note: Check mechanical condition of screed. _____

6. Check access to site for concrete trucks, have equipment on hand for towing, grading, etc., if required. _____

7. Check concrete plant:
   a. Up-to-date scales check. _____
   b. Check concrete trucks to be sure on approved list, all revolution counters and water gauges working, and load does not exceed mixing capacity. _____
   c. Insure enough approved trucks available to maintain required pouring rate. _____
   d. Insure adequate supply of aggregates, cement, and additives are on hand for deck pour. _____

8. Check to be sure Contractor has scheduled enough personnel to handle pour, including equipment mechanics. _____

BRIDGE DECK CONSTRUCTION (Cont'd)
PRE-POUR CHECKLIST

9. Have Contractor verify the availability and operability of all necessary equipment, including finishing machines, continuous water source or portable tanks, water distribution equipment, two work bridges, vibrators, sprayers, 12 ft. straightedge and appropriate backup items. _____

10. Obtain material certifications for the curing compound and burlap, and for the polyethylene where applicable. Check to be sure an adequate supply of these curing materials is available. _____

11. Where placement by pumping requires more than one setup, obtain proposed plan from the Contractor showing the locations of the pumping equipment, the location(s) of the leading edge of the concrete pour while repositioning the pumping equipment and a realistic time for each work delay anticipated while repositioning pumping equipment. _____

12. Require the Contractor to designate which of the pumping configurations listed in Subsection 604.17(a) will be used at the end of the discharge line. No exceptions are to be made, other than alternative equipment proposed under Subsection 105.17 and approved in writing by the Division of Structures under the conditions of that Subsection. _____

13. Have the Contractor designate his/her authorized representative who will be present and have the authority to represent the Contractor during the bridge deck pour. _____

14. Hold Pre-Pour Conference to coordinate and confirm above items.
Note: Place copy of Pre-pour conference minutes in project files. _____

INSPECTOR _____

TITLE _____

DATE _____

BRIDGE DECK CONSTRUCTION
CHECKLIST DURING POUR

Answer "Yes" or "No" except as noted and elaborate on "No" answers.

1. Are all concrete trucks on the approved list? _____

2. Is plastic concrete checked several times behind screed for slab depth and rebar cover and documented? _____

3. Do pour, finishing operations and deck finish comply with specifications? _____

4. Do checks of the pour rate indicate it is satisfactory? (at least 20'/hr. along roadway) _____

5. Has the deck been straight-edged and any deficiencies corrected? _____

6. Are required tests on concrete made and the data recorded in book and on tickets? _____

7. Is the amount of curing compound checked both before use and after deck pour to determine quantity used? Compute rate and show here in $ft.^2/gal$. _____

8. Is the curing compound applied as soon as the water sheen disappears from the surface of the concrete? _____

9. From a work bridge, is damp burlap placed as soon as surface will support the burlap without undue marring of the concrete? _____

10. After placement, is the burlap immediately wet with a misty spray and kept wet thereafter with a continuously fed soaker hose? _____

11. Is the burlap properly anchored to provide full protection to the concrete? _____

INSPECTOR _____

TITLE _____

DATE _____

BRIDGE DECK CONSTRUCTION
POST POUR CHECKLIST

1. Check curing process every day to be sure deck is kept wet.
   Note: Suggest checking early A.M., midday, and late P.M., at a minimum. _____

2. Check bridge deck for deficiencies using 12' straightedge and/or profilograph as required by specifications and have contractor make necessary corrections. _____

3. Review "Pre-Pour" and "During Pour" checklists and observations, give written instructions to Contractor concerning any unsatisfactory conditions of deficiencies to insure these are not repeated on next pour. _____

4. Place copy of all checklists, Pre-Pour Conference minutes, and instructions to Contractor in project file. _____

INSPECTOR _____

TITLE _____

DATE _____

FACTORS THAT ADVERSELY AFFECT DECK CONSTRUCTION

I. Failure to Conduct Proper Pre-pour Inspections
   a. Inadequate use of pre-pour conferences.
   b. Insufficient checking of screed ordinates, header profiles, screed rail profiles, condition of equipment, forming, slab thickness and bar reinforcement cover.
   c. Non-compliance with Section 511 of the Special Provisions and insufficient knowledge of current contract documents.
   d. Inadequate dry run with screed to check slab thickness and bar reinforcement cover.
   e. Failure to take strong positive corrective action.
   f. Failure to observe and adhere to plan notes requiring that all elevations and dimensions on structures to be widened be verified in the field prior to ordering materials.

II. Condition of Equipment
   a. Poor Maintenance.
   b. Inadequate backup system.
   c. Inability to vary speed of screed strike-off mechanism and travel speed of screed independently.
   d. Lack of adequate review of equipment condition.

III. Improper Use of Screeds
   a. Failure to keep concrete raked down in front of screed.
   b. Failure to make more than one pass with a longitudinal screed.
   c. A & B above adversely affects deck profile and deck finish.

IV. Failure to Meet the Minimum Required Concrete Placement Rates
   a. Concrete Supply Problems
      i. Inadequate delivery
      ii. Failure to receive a uniform or consistent concrete mix.
   b. Concrete Placement Problems
      i. Inability to strike-off concrete in a timely fashion in order to straightedge and achieve corrective work that may be necessary.
      ii. Failure to achieve adequate final finish and curing.
      iii. Failure to achieve a reasonable concrete placement rate contributes to shy deck thickness and bar reinforcement cover.

V. Failure to Read and Have Current Knowledge of Contract Documents

VI. Lack of Sufficiently Trained and Experienced Personnel on the Part of the Department of Transportation and the Contractor.

CIRCULAR LETTER

SECTION: **604.21 DEFECTIVE CONCRETE**
NUMBER: **604.21-01**
SUBJECT: **EVALUATION OF LOW STRENGTH CONCRETE**
DATE: **OCTOBER 2, 2015**

Subsection 604.21 of the Standard Specifications grants the Engineer the discretionary authority of allow concrete which fails to meet the design strength to remain in place, subject to the price adjustment set out in Subsection 604.31 and provided its durability is good and it is considered structurally adequate. To aid in administering this provision, the Division of Structures has prepared the Low Cylinder Evaluation Guide (LCEG) shown on page two of this circular letter.

In concordance with the LCEG, test results for low strength concrete are to be processed as follows:

1. Cast in place concrete within the tolerances permitted by the LCEG may be accepted by the Regional Construction Office provided the concrete is considered durable and structurally sound.

   A completed Concrete Cylinder Strength Evaluation Form is to be sent for information to the Division of Materials and Tests in Nashville, and to the FHWA on non-exempt Federal-aid projects. The Contractor is to be advised in writing of the action taken.

   On the Concrete Cylinder Strength Evaluation Form under "REGION" it should be noted that the concrete represented by the low cylinders is considered structurally adequate and may remain in place subject to the adjustment in contract price provided in Subsections 604.21 and 604.32. The statement "As noted above", or similar wording, should be written under "Proposed Disposition"; and "Not Applicable (N/A)" should be written on the approval lines at the bottom of the form.
2. Test results for cast-in-place concrete with strength less than permitted by the tolerances in the LCEG are to be submitted for approval to the Headquarters Construction Division in accordance with our past practices.
3. Test results for precast or prestressed products below the specified design values shown on the Approved Shop Drawings are to be submitted to the Division of Materials and Tests in Nashville for evaluation and coordination with the Division of Structures, and with the FHWA on non-exempt Federal-aid projects.

   The Concrete Cylinder Strength Evaluation Form, modified as applicable, may be used to process low test results for precast or prestressed concrete products.

LOW CYLINDER EVALUATION GUIDE

BRIDGE/STRUCTURE MEMBER	STRUCTURAL REVIEW REQUIRED
CIP Concrete Except as Noted	Notes 1 and 2 (CIP)
	Notes 2 and 3 (PC), (PS)
Bridge Railing and Median Barriers	1.40 MPa (200 psi)
Bridge Deck & Diaphragms	3.45 MPa (500 psi)
Concrete Girders	0.70 MPa (100 psi)
Concrete Girders, Panels & Piles (PC or PS)	Note 3
Bent Caps and Columns	1.40 MPa (200 psi)
Bent Footings	3.45 MPa (500 psi)
Abutment Walls & Wings	1.40 MPa (200 psi)
Retaining Walls & Footings	1.40 MPa (200 psi)
Box Bridge Slabs & Walls	1.40 MPa (200 psi)
Box Bridge Slabs & Walls (PC)	Note 3
Expansion Joint Concrete Repair	3.45 MPa (500 psi)
Culvert Headwalls (Precast) and other Miscellaneous Precast Items	Note 3

NOTES

1. If concrete test cylinder breaks for cast-in-place (CIP) members fall below the specified values shown in the plans by more than these values, an evaluation will be required in the Division of Structures.
2. Design values are based on 20.7 MPa (3,000 psi) concrete, except bridge decks are 27.6 MPa (4,000 psi). See shop drawings for precast (PC) and prestressed (PS) members.
3. Any test cylinder breaks below the values shown on approved shop drawings for precast (PC) or prestressed (PS) members will be evaluated by the Nashville Office of Materials and Tests.