



Nonconformance Report (NCR) Guidelines

April 2017

TABLE OF CONTENTS

SECTION 1 - Overview	3
SECTION 2 - Nonconformance Report (NCR) Preparation	4
SECTION 3 - Nonconformance Report Submission	9

Appendix A – NCR Template (Concrete)	
Appendix B – NCR Template (Bridge Steel)	
Appendix C – NCR Template (Non-Bridge Steel)	
Appendix D – Training Sign-In Sheet	

SECTION 1 - Overview

This guide outlines the procedure for submitting a Nonconformance Report (NCR) for items constructed for TxDOT projects. Nonconformances are defined as any deviation from TxDOT Specifications, not only damage to product. While it is the Fabricators' responsibility to recognize deficiencies and submit an NCR, TxDOT may also require an NCR through verbal conversations, email, or issuance of an Inspector Fabricator Memorandum (IFM).

To facilitate the NCR process and allow for a quicker response time to deficiencies, this document provides guidance regarding when to submit an NCR and what supplemental documentation is necessary.

This guide includes a list of nonconformances that commonly occur, from the time a member is fabricated until installation is complete; however, it is possible for unusual damage to occur. It is meant to be used in conjunction with repair guides such as the [TxDOT Concrete Repair Manual](#), [AASHTO/NSBA Steel Bridge Collaboration G2.2 Guidelines for Resolution of Steel Bridge Fabrication Errors](#), and other published repair documents and acceptable standard industry practices. The Fabricator may submit proposed repair procedures that differ from those in the previously mentioned documents. In those cases, TxDOT will work cooperatively with the Fabricator to develop an acceptable repair solution.

Typically, Fabricators accomplish repair work using materials appearing on TxDOT Material Producer Lists (MPLs); however, Fabricators may propose using an alternate material if they feel it will provide for the best repair in a specific application. The Engineer will review such requests on a case-by-case basis.

In case of discrepancies between TxDOT's requirements and manufacturers' instructions, notify TxDOT before proceeding with the repairs. Maintain current copies of the manufacturers' technical literature to ensure repair crews follow the proper procedures.

QC personnel must be present to observe repair implementation if the deficiency is significant enough that it warrants preparation of an NCR. They should also monitor repairs that do not require NCR submission often enough to be comfortable that repair crews are adhering to repair requirements.

When discrepancies become repetitive, prepare an NCR specifically addressing corrective actions. Repetitive discrepancies may include minor items not normally requiring an NCR.

Upon rejecting a major member (e.g., girder or bent cap), prepare an NCR, and, depending on the type of deficiency, include photographs.

It is critical that repair crews use appropriate repair materials and installation methods to ensure the long-term success of a repair. Even the best materials will not perform effectively unless each aspect of the repair is executed properly.

The Construction Division's Structural Materials Branch will update this guide when appropriate and is available for questions or additional information regarding a specific material or procedure proposed for addition.

SECTION 2 - Nonconformance Report (NCR) Preparation

The Fabricator is responsible for identifying and reporting deficient members fabricated for TxDOT or under TxDOT's Quality Assurance review. Submit an NCR to a TxDOT inspector no more than fourteen days after the deficiency occurs, to ensure that there is sufficient time for TxDOT to review the NCR or for the Fabricator to repair or refabricate the member. If the delivery date for a member is imminent, include information on Contractor verified delivery dates if there could potentially be an impact. It is the Fabricator's responsibility to notify TxDOT if a quick response is needed due to shipping constraints.

Include the following information in each NCR:

- Fabricator's name, address, and contact information;
- Submittal date;
- NCR number (See Section 3 for NCR naming convention.);
- IFM number, if applicable;
- Project information: project name, county, CSJ (control, section, and job numbers), project number, and project developer;
- Name of structure and location within structure;
- Member identification: member type, fabrication date, product/piece ID, erection mark, and design length or area;
- Description of the deficiency and where the member is in the fabrication process;
- Explanation of why the deficiency occurred;
- Proposed corrective action;
- Anticipated delivery date of the subject member(s) if there could be impacts caused by the time it takes to review, repair, or refabricate the deficient product;
- Corrective action implemented to prevent future occurrences of the same deficiency; and
- Signature from Fabricator's representative.

Example NCRs for Concrete, Bridge Steel, and Non-Bridge Steel fabricators are included in Appendices A, B, and C, respectively, to give a clear understanding of what is expected to be documented.

Refer to the table on pages 7–8 for information on which attachments should be included to address the types of deficiencies that occur during fabrication or while the member is in storage.

In general, include the following attachments with all NCRs.

- Clear, color photographs of the deficiencies or damage. Include images from far enough away that the Engineer can determine the location and extent, and close-ups to show the severity.
- Diagrams detailing pertinent dimensions and locations of the deficiencies. In many cases it is more convenient to the Fabricator and preferable to the Engineer if information and dimensions are shown on photographs.
- Relevant sections of the contract plans, shop drawings, and erection sheets.
- Information on whether the deficiency or damage occurs over pedestrian or vehicular traffic (for concrete members).
- Technical data sheets on the proposed repair materials (if applicable).
- Any other documents needed to support the NCR.
- Sign-in sheet for any training that occurred due to the deficiency. (See Appendix D for example “Training Sign-In Sheet.”)

For fabricators of DMS-7380, “Steel Non-Bridge Member Fabrication Plant Qualification,” products, an NCR may not be required for the following items, provided TxDOT has received and approved a repair procedure:

- Notches/gouges on plates;
- Notches/gouges on bolt holes;
- Galvanizing coating repairs;
- Straightening of pole shafts after seam welding (mechanical and heat applied straightening), and
- Repair of seam weld melt through.

NCRs should also be submitted for unassigned stock and rejection of major members. **NCRs for unassigned stock are detailed as above**, except no repair information is needed, and the NCR needs to state that the member will be put into unassigned stock. Attachments for unassigned stock NCRs will include the corrected PC2 sheet, mix design, beam details, pictures, and E-Sheets. If this member was part of an original request for repair, the NCR number should be the same as its parent NCR, with the inclusion of a revision number. Otherwise, use a new NCR number.

Note: While an NCR is usually not needed to transfer product between projects, contact CST/M&P’s Structural Materials Branch to receive current transfer of product approval process document.

Document **NCRs for rejected beams** as above for unassigned stock, except include a statement of rejection in the body of the NCR, and only attach pictures and an updated PC2 stating the beam has been rejected on NCR X.

Submit the completed NCR to a TxDOT inspector. After checking the NCR for accuracy and thoroughness, one of the following will occur.

- If the information presented is agreeable, the TxDOT inspector will stamp, initial, and date each sheet. (Stamp and initial indicates items such as data sheets or engineering calculations are included.)
- If there are minor discrepancies or differences in opinion, the TxDOT inspector will provide handwritten clarifications before stamping, initialing, and dating.
- If there are significant errors or discrepancies, revise and resubmit the NCR to the TxDOT inspector.

Once agreed upon, the TxDOT inspector will return the stamped NCR for submittal to CST/M&P's Structural Materials Branch.

If the Fabricator and TxDOT inspector disagree on the circumstances outlined in an NCR and the differences in opinion cannot be resolved in a manner satisfactory to both sides, submit the unstamped NCR to the Engineer with the TxDOT inspector's notations explaining the points of contention. The Engineer will follow up with the local TxDOT inspector while reviewing the NCR.

	Concrete Nonconformance Reports – Required Attachments																			
	Fabricator-Generated Documents												Shop Drawings			Contract Drawings				
	PC-2/PC-7	Photographs (Far and Near)	Sketches	Concrete Mix Design	Concrete Design Report	Batch Tickets	Temperature Charts	Prime Contractor Letter or Email	Area Office Letter or Email	Repair Material Technical Product Data	Bearing Area Loss Spreadsheet/Sketch	Depth of Damage Measurements	Stressing Sheets	Fabrication Sheet(s)	Erection Sheet(s)	Bearing Pad Details	Bridge Layout	Abut/Bent Details	Bearing Details	Span Details
Spall, Honeycomb, Cracks	X	X	X			TBD	TBD	TBD		TBD		X		X	X		X			
Bearing Area Damage	X	X	X					TBD			X			X	X	X	X	X	X	X
Trimming/Cutting Beam Ends	X		TBD					TBD	TBD	TBD				X	X		X	X	X	
Concrete Material Issues	X	TBD		TBD	TBD	TBD	TBD							X	X		X			
Slump/Slump Flow Issues	X			X	X	X								X	X		X			
Rain in Concrete	X	X		X	X	X								X	X		X			
Concrete Temperature Issues	X			X		X	X							X	X		X			
Dimensional Issues (Length, Skew, Batter, etc.)	X	TBD	X					TBD	TBD	TBD				X	X	TBD	X	TBD	TBD	TBD
Sweep, Dogleg, or Misalignment	X	TBD	X					TBD	TBD					X	X		X			
Inserts or Embedments	X	TBD	X											X	X		X			
Strand or Reinforcement Placement	X	TBD	X											X	X		X			
Prestressing Issues	X											X	X	X			X			
Transferring a Product	***Contact CST/M&P Engineering staff for current transfer of product document***																			
Strand Debonding Failure	X	X	X							TBD		X		X	X		X			
Concrete Lack of Workability	X	X	X	TBD	TBD	TBD				TBD		X		X	X		X			

	Steel Nonconformance Reports – Required Attachments															
	Fabricator-Generated Documents										Shop Drawings		Contract Drawings			
	SS-2	Photographs (Far and Near)	Sketches	Extent of Damage/Measurements	Repair WPSs	Approved Repair Procedure	Signed/Sealed Engineering Calculations/Drawings	Prime Contractor Letter or Email	Area Office Letter or Email	NDT (RT, UT, MT)	Fabrication Sheet(s)	Erection Sheet(s)	Bridge Layout	Abut/Bent Details	Bearing Details	Span Details
Notches/Gouges*	X	X	X	X	If welded repair	X										
Tack Welds	X	X	X	X	X	X				X						
Bearing Stiffener End Seating	X	X	X	X							X	X	X	X	X	X
Repair of Base Metal	X	X		X	X	X				X						
Internal Defects (ESW)	X		X	X	X					X						
Improperly Fit/Welded Members	X	X	X	X	X	X					X	X	X			
Mislocated Holes	X		X		If welded repair	X	TBD				X					
Undersized Welds	X	X	X	X	X											
Incorrect Flange/Web Dimensions	X			X							X	X	X	TBD	TBD	X
Flange/Web Fit-Up Gap	X	X	X	X	X						X	X	X			
Kinks	X	X	X	X		X										
Short Bends	X	X		X							X	X	X	X	X	X
Excessive Web Buckle	X	X				X										
Incorrect Splice Location	X		X				X				X		X			

*NOTE: Fabricators of DMS-7370/7380 product who have an approved procedure for repair of notches and gouges may not need to submit an NCR.

SECTION 3 - Nonconformance Report Submission

Once an NCR is completed, scan and email the stamped copy to CST/M&P Engineering for review. Copy the TxDOT Area Supervisor and the local TxDOT inspector on the submittal.

When directed to forward an NCR or other information on a deficient member to a TxDOT Area Office, the Bridge Division, or other party, copy CST/M&P Engineers. Also notify CST/M&P Engineers if sending information to a structural engineering consultant or testing lab regarding a deficiency with a member fabricated for TxDOT.

The Fabricator's engineer [not the Engineer of Record (EOR)] will be responsible for reviewing NCRs that include fabrication errors or changes to ensure structural adequacy. The Fabricator's engineer will also be responsible for reviewing potentially structurally deficient members. The EOR must review the NCR for acceptance, at the Fabricator's expense, if the deficiency significantly changes the original design. TxDOT will perform final review and approval of all NCRs submitted regardless of Fabricator's engineering approval.

Either the QC Supervisor or the Fabricator's engineer must submit NCRs. No one on the production staff may prepare or submit the reports. The PDF filename should include the Fabricator's name, producer code, NCR number, and year (e.g., XYZ 999.01-15 for NCR number one in 2015 from Fabricator XYZ with producer code 999). Other information can also be included on a specific member type or deficiency. Email subject lines must contain the Fabricator name and NCR number.

Occasionally reports are not transmitted successfully to CST Headquarters due to excessive file size. Some external email systems do not automatically generate a failure notification when a message is not transmitted. In those cases, TxDOT is unaware that there is an NCR to review even though the Fabricator may be waiting on a response. Modern scanners can be configured to create a single PDF file of a manageable size (<10 MB), even when there are large numbers of photos and other attachments.

Preapproved Repair Procedures

Fabricators may submit standard repairs for approval. Most of these repairs include engineered procedures that require an engineering seal from the manufacturer. For concrete members, this may include remedial installation of form hangers, weld clips, and lifting/handling devices. For structural steel, standard repairs might include correction of flange tilt or camber correction by heat.

Submit proposed procedures to CST Headquarters. It may be necessary to prepare an NCR in order to implement a preapproved procedure. If the deficiency is considered reoccurring, the local TxDOT inspector can request an NCR be submitted to address the issue even though preapproval for the repair has been given.

Keep up-to-date copies of the manufacturers' technical material, including engineering seals, to ensure that repairs are being performed as required.

APPENDIX

Appendix A

NCR TEMPLATE (Concrete)

Name of Plant
Address, Phone Number, Etc.

June 20, 2015

Mr. Joseph Roche, P.E.
Texas Department of Transportation
125 East 11th Street
Austin, Texas 78701

Re: Harris County (county)
01234-56-789 (CSJ)
NH 2007(123) (Project number)
(Include IFM number, if applicable)

Non-Conformance Report
NCR PC 123-09-15
IFM PC 123-03-15

Mr. Roche:

We have prepared this report to address defects in the following precast Type C beam(s): Include the type of member being addressed if it is not obvious from the erection mark. Fill in each cell for the member(s) being addressed in the NCR. Substitute "Design Area" for "Design Length" when applicable.

Casting Date	Casting ID	Erection Mark	Design Length
June 16, 2015	A-1	CW-1 thru CW-3	80'

Provide a detailed description of the deficiency. These Type C beams sustained vertical cracks near midspan as a result of improper detensioning techniques. The vertical cracks web out near the top surface on members CW-1 and CW-2, which caused the concrete to delaminate and spall in the top flanges. The location and widths of the cracks are shown on the attached diagrams.

Provide a detailed explanation of why the deficiency occurred. The cracks appeared to have been caused because we did not place saddles on the members prior to detensioning the strands even though our calculations showed that the uplift exceeded half of the members' dead weight. The damage was worsened because too much heat was used to cut the hold-down strands, resulting in very quick releases.

Include a proposed repair solution. In most cases, it will only be necessary to select a repair material and procedure from the manuals listed in Section 2. Include step-by-step repair procedures to address unique procedures or repair materials. Due to the extent

of the damage, we have rejected member CW-1. We will recast that beam in the near future. We request that you accept member CW-3 as cast because the vertical cracks should close upon application of the dead loads after it has been erected. If the cracks do not close sufficiently, our repair crew will visit the jobsite and inject them with epoxy. We propose to repair member CW-2 as outlined in Sections 2.3 (Major Spall) and Section 3.2 (Batched Concrete) of the *TxDOT Concrete Repair Manual*.

Include the proposed level of QC inspection during repair implementation. Due to the extent of the repairs that will be performed on member CW-2, a QC PCI Level III inspector will check the patch after it has been prepared by the repair crew to ensure that all damaged concrete has been removed and that the areas around the exposed steel reinforcement are adequate. The QC inspector will also observe the patching operations, including surface preparation, patching, and initiation of moist curing.

Provide a clear, detailed plan regarding how you intend to prevent similar deficiencies in the future. Please note that TxDOT is only interested in the planned solutions and changes; it is not necessary to include that you have reprimanded your production crew or discussed these issues with your QC staff. In order to prevent similar damage in the future, we will require that our Production Superintendent check with QC personnel to ensure that strand uplift calculations have been run. When necessary, we will place saddles on the beams prior to releasing the strands and hold-down points. Additionally, our Production Superintendent has already worked with each crewmember to make sure they know how to properly release hold-downs using a slow burn.

Please do not hesitate to call if you need any additional information or have questions.

Sincerely,

John Q. Fabricator
Title

Attachment: *List attachment(s), if any.*

cc: TxDOT Area Supervisor

Appendix B

**NCR TEMPLATE
(Bridge Steel)**

Name of Shop
Address, Phone Number, Etc.

June 20, 2015

Mr. Joseph Roche, P.E.
Texas Department of Transportation
125 East 11th Street
Austin, Texas 78701

Re: Harris County (county)
01234-56-789 (CSJ)
NH 2007(123) (Project number)
(Include IFM number, if applicable)

Non-Conformance Report
NCR PC 123-09-15
IFM PC 123-03-15

Mr. Roche:

We have prepared this report to address defects in the following: *Include the type of member being addressed. Fill in each cell for the member(s) being addressed in the NCR.*

Fabrication Date	Erection Mark	Member Length	Defect Location
June 15, 2015	1165-A	125' 6"	7' 6" from ME NS

Provide a detailed description of the deficiency and where the member is in process. 7 ft. 6 in. of the NS web plate was cut flat instead of having cut camber.

Provide a detailed explanation of why the deficiency occurred. When the material was cut the torch went out and did not cut the last 7'6" of the web. When the torch was reset to finish cutting the web it was not placed into the CNC program by the operators causing the web to be cut straight, without camber. This error was found after the web was removed from the cutting table.

Include a proposed repair solution. In most cases, it will only be necessary to select a repair material and procedure from the manuals listed in Section 2. Include step-by-step repair procedures to address unique procedures or repair materials. We would like to remove a 20-ft. section of the web and splice on a new 20-ft. section with the proper camber cut into it.

Include the proposed level of QC inspection during repair implementation. Since the web has not been attached to the flanges at this time and only requires the web plate to be repaired, a CWI-certified QC inspector will verify the dimensions before cutting the web plate, as well as the final repair. RT will be performed on the final weld once the web is repaired.

Provide a clear, detailed plan regarding how you intend to prevent similar deficiencies in the future. Please note that TxDOT is only interested in the planned solutions and changes; it is not necessary to include that you have reprimanded your production crew or discussed these issues with your QC staff. In order to prevent similar damage in the future, we will require that any time the flame is extinguished, the operator will contact his supervisor to recheck the information entered into the CNC machine for accuracy. The QC and production team have been retrained. (See attached training document.)

Please do not hesitate to call if you need any additional information or have questions.

Sincerely,

John Q. Fabricator
Title

Attachment: Training sign in sheet from June 16, 2015 *List attachment(s), if any.*

cc: TxDOT Area Supervisor

Appendix C

NCR TEMPLATE (Non-Bridge Steel)

Name of Shop
Address, Phone Number, Etc.

June 20, 2015

Mr. Joseph Roche, P.E.
Texas Department of Transportation
125 East 11th Street
Austin, Texas 78701

Re: Harris County (county)
01234-56-789 (CSJ)
NH 2007(123) (Project number)
(Include IFM number, if applicable)

Non-Conformance Report
NCR PC 123-09-15
IFM PC 123-03-15

Mr. Roche:

We have prepared this report to address defects in the following: *Include the type of member being addressed. Fill in each cell for the member(s) being addressed in the NCR.*

Fabrication Date	Type of Product	Description	Qty
June 15, 2015	0686 Traffic Signal Pole	TSP W/48FT MAST ARM	1 Ea

Provide a detailed description of the deficiency and where the member is in process.
Longitudinal weld seam has a 2-in. lack of fusion located 2 ft. from the top of the assembly.
(Attach diagrams and photographs for clarity.)

Provide a detailed explanation of why the deficiency occurred. The weld defect was caused by possible misalignment or contamination during welding of the seam.

Include a proposed repair solution. In most cases, it will only be necessary to select a repair material and procedure from the manuals listed in Section 2. Include step-by-step repair procedures to address unique procedures or repair materials. We propose to remove the lack of fusion and to weld the area in question per TxDOT-approved WPS.

Include the proposed level of QC inspection during repair implementation. Once repaired the area will be magnetic particle inspected to ensure the repair was successful and CWI inspected.

Provide a clear, detailed plan regarding how you intend to prevent similar deficiencies in the future. Please note that TxDOT is only interested in the planned solutions and changes; it is not necessary to include that you have reprimanded your production crew or discussed these issues with your QC staff. Seam welds are visually inspected as a part of the existing process and will continue to be monitored. Any questionable areas will be evaluated for conformance.

Please do not hesitate to call if you need any additional information or have questions.

Sincerely,

John Q. Fabricator
Title

Attachment: *List attachment(s), if any.*

cc: TxDOT Area Supervisor

Appendix D

Training Sign-In Sheet

Training Subject/Description:

Date of training:

Trainer:

Printed Name & Title	Signature