

**STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION  
SUPPLEMENT 1078**

**QUALIFICATION AND EVALUATION OF STRUCTURAL STEEL FABRICATORS**

**July 19, 2002**

<b>1078.01</b>	<b>General</b>
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<b>1078.03</b>	<b>Fabricator Evaluation</b>
<b>1078.04</b>	<b>Quality Control Specialist Qualifications Level 1 through 6</b>
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**Appendix I: Facilities Inspection Check List**

**Appendix II: Rating Forms**

**Shop Drawing Rating Form**

**Material Test Report Rating Form**

**Fabrication Rating Form**

**Fracture Critical Fabrication Rating Form**

**Appendix III: Rating Calculations**

**1078.01 General.** Perform work according to item 513 using fabricators on the Pre-qualified Fabricators List in effect on the date of the Contract letting. Inform the DCE and the Office of Materials Management (OMM) of the selected fabricator.

The pre-qualification process, evaluation process and associated documentation requirements are listed in this specification. Fabricators shall make written request to the OMM for inspection of a fabrication facility. Fabricators with acceptable facilities, the required credentials and a reputation for similar and quality work, will be included on the qualified fabricator list at the assigned fabrication level. The OMM updates this list based on performance.

**1078.02 Levels of Fabrication Qualification.** The OMM assigns a fabrication level specified in 513.03 based upon the evaluation process specified in 1078.03.

**1078.03 Fabricator Evaluation.** The OMM evaluates fabricators requesting pre-qualification. The evaluation includes inspection of the facility, work history, sample work, and qualifications listed below.

- A. Facilities located within the continental limits of the United States
- B. Three reference letters from other State agencies or customers.
- C. List of bridge projects completed within the last three years.
- D. 

<u>Fabrication Level</u>	<u>AISC Certification</u>
SF	No AISC Category required
UF	No AISC category required
1	Category SBr with P1 endorsement ( See H)
2 thru 5	Category MBr with P1 endorsement ( See H)
6	Category MBr with P1 and F endorsements( See H)
- E. Welding procedure qualifications per 513.21.
- F. Qualified welders per 513.21.
- G. Inspection personnel meeting requirements of 1078.04 or 1078.05
- H. Instead of the specified AISC paint endorsement. The fabricator may establish a formal agreement with an independent painter meeting the qualifications of SSPC QP3. The OMM will evaluate the painter's facility for acceptance. The independent painter shall perform all painting work. All applicable ratings points will be reflected on the fabricator's performance rating. The independent painter shall perform all specified QC check points and provide a painting quality control specialist, Paint (QCS) meeting the requirements of 514.03. The fabricator's paint QCS shall be responsible for final acceptance of the structural steel members at the painter's facility.

I. Completion of fabricator questionnaire included in this specification (Appendix I)

**1078.04 Quality Control Specialist Qualifications; Level 1 through 6.** The fabricator shall designate at least one individual as a Fabrication Quality Control Specialist (QCS) and one as a Paint Quality Control Specialist or one person to serve both functions.

The Fabrication QCS and Paint QCS shall be full time employees of the fabricator, except level 1 and 2 fabricators may supply outside personnel meeting the required qualifications. Using outside personnel does not eliminate the requirement of full-time quality control.

The fabricator is responsible for providing supervisory personnel and any additional QC inspection personnel to ensure satisfactory materials and workmanship. Using production staff or additional QC staff for specific quality control functions does not eliminate the Fabrication and Paint QCS's responsibility for documentation, QC and final acceptance of fabricated components at required points.

A. The Fabrication QCS shall be certified as an AWS, CWI Inspector in accordance with the provisions of AWS QC-1, Standard for Qualification and Certification of Welding Inspectors and shall demonstrate an understanding of the plans and specifications pertaining to the project. The Fabrication QCS shall have the following duties:

1. Be responsible for inspecting the work at all quality control (QC) points described in Item 513 and this supplement.
2. Be responsible for documenting and accepting all inspection points listed in (Appendix II) for each main material piece showing conformance with the requirements of 513, 514, this supplement and other contract documents.
3. Be responsible for assuring all equipment is in working order and inspected at the required intervals.
4. Have direct authority to stop work and report non-conforming work to the Fabricator and inspector.
5. Have tools and equipment necessary to perform quality control (QC) on the

work.

6. Perform quality control full time until the work is complete and accepted by the inspector.
- B. The Paint Quality Control Specialist (QCS) shall be qualified as specified in 514.03.
  - C. The fabricator shall perform nondestructive testing (NDT) of weldments with personnel qualified in accordance with the American Society for Nondestructive Testings (ASNT) ANSI/ASNT SNT-TC-1A, Standard for Qualification and Certification of Nondestructive Testing Personnel. Only individuals qualified for NDT Level II may perform nondestructive testing. The fabricator shall perform nondestructive testing under the authority of the Fabrication QCS or the Fabrication QCS, if qualified, may perform the testing

The OMM will evaluate the qualifications of quality control specialist, NDT personnel and any other outside agency personnel. Notify the OMM if changes in the QC specialists or NDT staff are required.

**1078.05 Quality Control Specialist Qualification; Level SF and UF.** The fabricator shall designate one employee to perform the Quality control functions specified for the Fabrication QCS and Paint QCS. The employee is not required to be an AWS Certified Welding Inspector or formally trained in coating inspection, but shall understand the plans and specifications pertaining to the project.

**1078.061 Rating System, Level 1 through 6:**

- A. Material Acceptance Process

The OMM will inspect and release each project at the fabricators facility.

The fabricator shall be responsible for the following:

1. Supplying contractor accepted shop drawings and material test reports to the OMM according to 501.04 and 501.06.
2. Fabricating structural members.
3. Performing QC and providing documentation at specified check hold

or witness points according to Appendix II and as defined below.

After shop inspection acceptance, the fabricator shall ship members to the construction project and supply a TE-24 to the Engineer. Final acceptance will be based upon the Engineer's approval that the structural member can be successfully incorporated into the structure.

B. Quality Control Check Points

Check points require QC inspection and documentation by the fabricator before the fabrication process continues.

Hold points require QC inspection and documentation by the fabricator before QA inspection can be performed. The fabrication process can continue only after the QA inspection has been performed.

Witness points require concurrent QC inspection by the fabricator and QA inspection by The OMM to physically witness the welding or nondestructive testing.

C. Fabrication Levels 1 thru 5 Evaluation Process.

The OMM will perform the evaluation of product quality. Evaluation includes quality assurance reviews of: shop drawings, material test reports, QC documentation, and QA inspections. Rating forms associated with these evaluations are in Appendix II. Quality issues discovered in the field and associated with the fabricator's methods, are also evaluated.

Pre-qualified fabricators are provisional until they validate their quality by performing all check point inspections and the following hold or witness points: Radiographic hold point, Ultrasonic Inspection witness point, Magnetic Particle Inspection witness point, and final inspection hold point. The fabricator shall continue performing the above listed hold or witness points until the OMM has notified the fabricator that a passing rating was achieved on three consecutive projects.

After notification that the provisional status has been removed, the fabricator shall maintain work quality by performing all check point inspections. Final inspection will be the only required hold point.

A passing rating is 88% or more. Ratings below 88% are failing.

No fabricator shall have three failing ratings within any 12 month period. No Fabricator performing less than three projects in a 12 month period shall have three failing ratings within five consecutive jobs. Fabricators not meeting these requirements will be removed from the pre-qualified fabricator list for 12 months. The fabricator may be reinstated as a provisionally pre-qualified fabricator at the next lower qualification level after the 12 months disqualification. Reinstatement requires compliance to 1078.01 and 1078.03.

Any rating below 70 percent will cause immediate removal from the pre-qualified fabricators list for 12 months. Reinstatement is as described above.

Structural members shipped from the shop without prior hold point inspections or waiving of such inspection by the OMM, will result in a failing rating.

Qualified fabricators that have not performed work for the Department within a 12 month will be considered a provisional qualified fabricator for one project.

Fabricators are provision in levels 4 through 6 until passing ratings are achieved in those levels. Passing ratings achieved in lower levels only validate levels 1 thru 3.

#### D. Level 6 Evaluation Process

Provisional and qualified fabricators must validate their quality as specified for levels 1 through 5 plus perform witness points during the performance of fracture critical welding and Ultrasonic inspection of fracture critical welds as follows:

1. Provisional fabricators require OMM witnessing of 50% of each fracture critical weldment and 100% of the Ultrasonic inspection.
2. Qualified fabricators require OMM witnessing of 25% of each fracture critical weldment and 100% of the Ultrasonic inspection.

### **1078.062 Rating System Level UF:**

#### A. Level UF Material Acceptance Process

The OMM will inspect and accept each project at the fabricators facility.

The fabricator shall perform the following:

1. Supply contractor with shop drawings and material test reports according to 501.04(A) and 501.06(A).
2. Complete fabrication of the UF level fabricated members.
3. Perform quality control consisting of: verifying fabrication matches the shop drawings; verifying fabrication and coatings meet the contract requirements; and documenting per 1078.08.
4. Schedule inspections with the OMM.
5. Obtaining acceptance from the OMM inspector.

After fabricated members are accepted the fabricator shall supply the Engineer with a TE-24 for each shipment. Final acceptance will be based upon the Engineer's approval that the structural member can be successfully incorporated into the structure.

#### B. Level UF Evaluation Process

The OMM will perform the evaluation of product quality. Evaluation includes quality assurance reviews or audits of: shop drawings, material test reports, QC documentation, and QA inspections or audits. Quality issues discovered in the field and associated with the fabricator's methods are also evaluated.

Failure to conform to the material acceptance process will result in a written violation notice. The third violation in any 12 month period will disqualify the fabricator from the pre-qualified fabricator list for 12 months. The fabricator may be reinstated after the 12 month disqualification. Reinstatement requires compliance to 1078.01 and 1078.03

### **1078.063 Rating System Level SF:**

#### A. Level SF Material Acceptance Process

The fabricator shall perform for the following:

1. Coordinate shop drawings with the Contractor per 501.04(B)

2. Complete fabrication of Level SF standard fabricated members.
3. Certify material according to 501.06(B).
4. Perform quality control consisting of: verifying fabrication matches the shop drawings, verifying fabrication and coatings meet the contract requirements, and documenting per 1078.08.
5. Notify the OMM that the SF members are being shipped to the project.
6. Supply shop drawings along with a TE-24 to the Engineer.

Final acceptance will be based upon the Engineer's approval that the fabricated member can be successfully incorporated into the structure.

#### B. Level SF Evaluation Process

The OMM will audit the fabricator's work and documentation. The OMM reserves the right to audit any project. The minimum number of audits is one out of every ten completed projects produced by the fabricator. Fabricators new to the Department's quality assurance programs can expect more frequent audits

Failure to conform to the material acceptance process will result in a written violation notice. The third violation in any 12 month period will disqualify the fabricator from the pre-qualified fabricator list for 12 months. The fabricator may be reinstated after the 12 month disqualification. Reinstatement requires compliance to 1078.01 and 1078.03

**1078.07 Fabricator Rating or Violation Review Process.** The fabricator may appeal a performance rating or audit first to the OMM then to a board created by the Department.

The fabricator shall make a written appeal to the OMM within ten days of receiving the Department's performance rating or written violation notice.

The OMM will review the evidence and may revise the rating or violation. If a revision is not issued the fabricator may appeal to the Board.

The fabricator shall schedule an informal hearing with the OMM and the Board. The fabricator will have the opportunity to present their case. The department may present evidence or testimony in rebuttal.



The Board is comprised of the Deputy Director, Division of Highway Operations or his representative, the Administrator of The OMM or his representative and the Chief Structural Steel Inspector from the OMM.

The Board will hear appeals concerning the Fabricator's performance rating or written violation notice on a specific bridge bidding item. The board will not hear appeals for disqualification of a fabricator. The Board will issue its decision within fifteen days of the hearing.

**1078.08 Fabricator Documentation Responsibility.** The fabricator shall record and keep documentation records for each bid line number, concerning:

- A. Fabricator approval
- B. Shop drawing approval
- C. Material test reports
- D. Welding qualifications
- E. Quality control inspection
- F. Non-Destructive Testing of welds
- G. Coating system measurements
- H. Copies of independent painters documentation

The fabricator shall make documentation available for auditing, inspection and copying upon the department's request. The fabricator shall archive documentation for five (5) years past the date of final shipment.

The fabricator shall establish a documentation system that records all material quality checks, dimensional checks, weld inspection checks, coating inspection checks, etc. to validate that product quality meets the contract requirements. The fabricator shall review the QA rating forms (Appendix II) when establishing the documentation system. Evaluation of the fabricator's performance will include validation of the fabricator's documentation. This validation is intended to assure that inspection or auditing an individual component reflects the quality of all components.

The fabricator shall provide a letter of acceptance signed by the Quality Control Specialist for each QA inspection check point with a listing of each main member piece marks, dates of QC acceptance and specific check point data required in the QA rating forms.





## Appendix I

**OHIO DEPARTMENT OF TRANSPORTATION**  
**1980 West Broad Street, Columbus, Ohio 43223**  
**614-466-4082 / 614-752-4824 fax / john.randall@dot.state.oh.us**

### Fabricator Questionnaire

1. Company Name: \_\_\_\_\_
2. Address: \_\_\_\_\_
3. Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-Mail: \_\_\_\_\_
4. AISC Certification, enclose a copy of certification: \_\_\_\_\_
5. Company Representative
  - a. President: \_\_\_\_\_
  - b. Chief Engineer: \_\_\_\_\_
  - c. Shop Superintendent: \_\_\_\_\_
  - d. Fabrication Quality Control Specialist, enclose certifications: \_\_\_\_\_
  - e. Paint Quality Control Specialist, enclose certifications: \_\_\_\_\_
  - f. NDT Staff or Agency, enclose certifications: \_\_\_\_\_
6. Building Facilities:
  - a. Indoor heated fabrication area, length and width (ft): \_\_\_\_\_
  - b. Indoor heated paint area, length and width (ft): \_\_\_\_\_
  - c. Lay down assembly area, length and width (ft): \_\_\_\_\_
  - d. QA Inspection Office area meets specification 513: \_\_\_\_\_

7A. Lifting Equipment:

1. Overhead equipment maximum piece lifting capacity (Lbs.) \_\_\_\_\_
2. Mobile equipment maximum piece lifting capacity (Lbs.) \_\_\_\_\_

7B. Material Preparation:

1. Shearing and planed edges, comments: \_\_\_\_\_
2. Cutting, manual guided methods required for levels 1 thru 3, \_\_\_\_\_
3. Cutting Automated guided methods required for levels 4 thru 6, maximum length: \_\_\_\_
4. Bending processes available, comments: \_\_\_\_\_
5. Reentrant corners and rounding edges, comments: \_\_\_\_\_

7C. Welding Processes

1. Levels 1 and 2 must have SMAW, check for calibration paperwork: \_\_\_\_\_
2. Level 3 thru 6 must have SMAW and FCAW or SAW, check for calibration paperwork: \_\_\_\_\_  
\_\_\_\_\_
3. Electrode oven, check operation and calibration paperwork: \_\_\_\_\_
4. Level 6, flux hoppers check for calibration paperwork: \_\_\_\_\_
5. Current approved PQR, separate submission required. \_\_\_\_\_
6. Complete package of WPS, separate submission required. \_\_\_\_\_
7. Qualified welders, separate submission required. \_\_\_\_\_

7D. NDT Technicians or Agency:

1. Level 3 fabrication requirements:
  - a. Magnetic Particle Inspection(MPI): Dry powder with aluminum prods or probe check machine calibration per ASTM E709 each 6 month: \_\_\_\_\_
  - b. MPI ANSI/ASNT SNT-TC-1A Level II, enclose certifications: \_\_\_\_\_
2. Level 4 thru 6 fabrication requirements:
  - a. MPI as per level 3 above : \_\_\_\_\_
  - b. Ultrasonic Testing (UT) Equipment: AWS D1.5 section 6.15 and qualification 6.17: \_\_\_\_\_
  - c. UT ANSI/ASNT SNT-TC-1A Level II , enclose certifications: \_\_\_\_\_
  - d. Radiographic Testing (RT) Equipment: AWS D1.5 section 6.12 viewer: \_\_\_\_
  - e. Evaluation of production sample RT film and report per AWS D1.5 section 6.10: \_\_\_\_\_
  - f. RT ANSI/ASNT SNT-TC-1A Level II, enclose certifications \_\_\_\_\_

7E. Drilling and Punching Processes, check work in process meets 513 \_\_\_\_\_

7F. Shop Bolting:

1. Skidmore Tension Devise, calibrated yearly: \_\_\_\_\_
2. Inspection Torque Wrench: \_\_\_\_\_

7G. Coating:

1. Methods available for blast cleaning: \_\_\_\_\_
2. Grit and shot mixture, examine sample work for profile: \_\_\_\_\_
3. Methods available for painting: \_\_\_\_\_
4. Check for operation of painting and paint inspection equipment see 513 and 514 \_\_\_\_\_
5. Metallizing methods available or companies used: 100% Zinc wire, method: \_\_\_\_\_
6. Galvanizing Companies used: \_\_\_\_\_

## Appendix II

### STRUCTURAL STEEL SHOP DRAWING QA RATING

Proj. No.	Bid Item No.	Shop ID	Date Rated
Fabricator		Br. No.	

CONTRACTOR APPROVAL (5%) - 1 point ea.	Y	N	NA
The contractor's P.E. has stamped and approved each shop drawing.			
Contractor submitted documentation addresses any contract changes due to, but not limited to, field conditions, plan errors or fabrication issues.			
The contractor has field verified the existing structure per the contract.			
Total Contractor Approval	0	0	

PROJECT INFORMATION (1%) - 1 point ea.			
The project number is per the contract.			
All bid line numbers are shown per the contract and separated.			
The bridge county route and section is per the contract.			
Total Project Information	0	0	

FRAMING / ERECTION PLAN (5%) - 1 point ea.			
Main and secondary member piece marks correlate to individual details.			
Substructure skew is per the contract.			
Transverse or radial center to center main member spacing is per the contract.			
Bearings center lines are identified and located per contract.			
The field splice center lines are identified and located per contract.			
Special connections, including, but not limited to utilities, are identified and located per the contract.			
Section Views			
Secondary member work points are dimensioned where necessary to coordinate trades.			
Strut and diagonal cross frame legs are matched on each side of the web per the contract.			
Total Framing / Erection Plan	0	0	
GENERAL NOTES (4%) - 1 point unless noted	Y	N	NA
Specifications			
Welding specifications are per the contract.			

Design specifications are per the contract.			
Testing			
Charpy V Notch (CVN) is specified and designated on required pieces per the contract.(10)			
Non-destructive testing (NDT) is specified per the contract. (5)			
Coating			
The coating system is specified per the contract.			
Surface preparation is specified per the contract.			
The rounding of all sheared or flame cut edges and corners is specified.			
Coated and un-coated areas are detailed per the contract			
Total General Notes	0	0	
LAYDOWN AND ASSEMBLIES (30%) - 1 point unless noted			
Vertical Laydown			
A full length base line is from abutment to abutment. (10)			
Cambers are dimensioned vertically and horizontally from the baseline at points shown in the contract. At the minimum, these points shall be bearings, field splices and approx. span quarter points. (10)			
Vertical offsets are dimensioned to a consistent location on each member.			
Horizontal Laydown			
A full length base line is from abutment to abutment. (10)			
Dimensions are provided at Bearings, half span points and field splices to define the horizontal offset between the centerline of web and the full length base line. (10)			
Sub-Assemblies			
Transverse or longitudinal connections between main member diaphragms, floor beams or other main members are detailed to locate bearings and splices points to plan and elevation baselines. (10)			
Total Laydown and Assemblies	0	0	
MEMBER DETAILS (35%) - 1 point unless noted.			
All material types, quantities, grades and sizes are per the contract (30)			
Fracture critical plates are identified per AWS and the contract (25)			
Each main structural member has a camber diagram dimensioned at locations consistent with the contract. This includes approximate quarter span points. (10)			
Each curved main member has a sweep diagram with horizontal offsets at 10'-0" centers. (10)			
The bearing stiffeners are detailed to be plumb under full dead load. (15)			

The contract spacing for intermediate and connection stiffeners is not exceeded. (15)			
All stiffener clips, section views and end-fit conditions are per the contract. (15 )			
Flange and web width or thickness transitions are per the contract. (10 )			
Direction of plate rolling is correctly oriented (10)			
Re-entrant corners are detailed with a 1" minimum radius (5)			
End conditions, not limited to, integral or semi integral abutment details, flange clips, distances between end of member and center line of bearing or special fit-up are per the contract. (10)			
Main member cross-sections are dimensioned.			
Secondary members are detailed to account for bridge geometry and connection details.			
Total Members Details	0	0	
CONNECTION DETAILS (20%) - 1 point unless noted	Y	N	NA
Welding			
Shop and field weld sizes, terminations and other details are per the contract. (25)			
FC welds are identified by WPS number and FC designation per AWS and the contract. (25)			
Radiograph identification drawing or table is provided.			
Bolting			
The splice pattern, edge distance, and maximum gap are per the contract. (25)			
Bolt lengths, diameters, holes, types and coating are shown per the contract. (25)			
The system that produces high strength bolt holes is specified. (5)			
The match marking system is specified per contract.			
Total Connection Details	0	0	



**Y= yes, N= no, NA = not applicable [No partial points are available for a Y, N or NA selection]**

	Y	N	(Y+N)	Section %	{ Y/(Y+N)xSection %}
Contractor Approval	0	0	0	5	0.00
Project Information	0	0	0	1	0.00
Framing or Erection Plan	0	0	0	5	0.00
General Notes	0	0	0	4	0.00
Laydown and Assemblies	0	0	0	30	0.00
Member Details	0	0	0	35	0.00
Connection Details	0	0	0	20	0.00
Fabricator	Rating for Performance of Shop Drawings				0.00%

<b>REVISIONS</b>	<b>Y/N/NA</b>	<b>Date Req'd</b>
Revisions requested by QA Inspector		
Revisions requested by QA Shop Drawing Rater		

**FABRICATOR \_\_\_\_\_ RATING FOR TEST REPORTS**

**Project:** \_\_\_\_\_ **Bid line No.:** \_\_\_\_\_ **Shop ID.:** \_\_\_\_\_ **Bridge No.:** \_\_\_\_\_

**Rater/Date:** \_\_\_\_\_ **Reviewer/Date:** \_\_\_\_\_

<b>I. General Project Information</b>		<b>Y</b>	<b>N</b>	<b>NA</b>
1.	Project number is shown (1 point)			
2.	Bid line number is called out (1 point)			
3.	Bridge number is specified (1 point)			
4.	Name of fabricator is identified (1 point)			
5.	Bid line numbers are separated (1 point)			
6.	Material test reports are cross referenced to drawing piece marking system (2 point)			

<b>II. Complete Mill Test</b>				
1.	All materials shown on the shop drawings have test reports and shippers (30 points)			
2.	Test reports meet all contract requirements; CMS, ASTM, CVN and/or Fracture Critical. (35 points)			
3.	The producing mill is domestic (15 points)			
4.	Test reports show material size, shape, & length (4 points)			
5.	Test reports show grade of steel (3 points)			
6.	Material quantity is shown on the Test Reports (2 points)			
7.	Test reports show mill's name (2 points)			
8.	Test reports show purchaser of material (2 points)			

<b>III. TEST REPORTS RATING TOTAL</b>				
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Y = yes, N = no, NA = not applicable      No partial points are available for a yes, no or not applicable section.

<b>V. FOLLOW-UP SEQUENCE FOR INCOMPLETE MILL TEST</b>		<b>Date Performed</b>	<b>Date Due</b>	<b>Result</b>
1.	Fax and Phone call to the Contractor requesting incomplete information.			
2.	Non-compliance letter and phone call to Contractor 15 days after sending fax.			
3.	IOC to District after 10 days from sending non-compliance letter.			
4.	District action performed.			

**FABRICATOR:** \_\_\_\_\_ **RATING FOR SHOP FABRICATION**

**Project:** \_\_\_\_\_ **Bid line No.:** \_\_\_\_\_ **Shop ID:** \_\_\_\_\_ **Level:** \_\_\_\_\_

**Rater/Date:** \_\_\_\_\_ **Reviewer/Date:** \_\_\_\_\_

<b>Check, Hold or Witness Point Descriptions for Levels of Fabrication 1 thru 5</b>			
<b>Fabricator Administration/ Coordination</b>	<b>Yes No</b>		
Contractor accepted shop drawings received per contract, record date (1 point)			
Prefabrication Meeting, record date ( information only)			
Fabrication Start, record date ( information only)			
Contractor accepted material test reports received per contract, record date ( 1 point)			
<b>ASTM A709, Grade, Physical &amp; Chemical Requirements, CVN Check point one (1)</b>	<b>Y</b>	<b>N</b>	<b>NA</b>
<b>:Fabrication Quality Control Specialist acceptance by cover letter listing piece marks and dates</b>			
Heat number and member description (1 point)			
Physical Requirements: Fy (psi), Fu (psi) Elongation% ( 6 points)			
CVN minimum average energy( ft lb.) (3 point)			
Chemical Requirements (3 point)			
Heat No. Steel Stamped and matched to Mill Test Reports per 513.09 prior to release or abrasive blasting (1 point)			
<b>ASTM A6 Quality and permissible Variations: Check Point two (2) Fabrication Quality Control Specialist acceptance by cover letter listing piece marks and dates.</b>			
ASTM A6, Permissible variations in cross-section (1 point)			
ASTM A6, Permissible variations in Straightness & Storage (1 point)			
ASTM A6 and 513.10, Surface indications, Pitting due to rusting (1 point)			
ASTM A6, Laminar indications (1 point)			
<b>Material Preparation per AWS D1.5, AASHTO and 513: Check Point three (3) Fabrication Quality Control Specialist acceptance by cover letter listing piece marks and dates</b>			
Cutting beyond ( inside) the prescribed lines AWS 3.2.2 (1 point)			
Cutting roughness AWS 3.2.2 (1 point)			
Occasional notches AWS 3.2.2 (1 point)			
Cut Edge Discontinuities AWS 3.2.3 (1 point)			
Reentrant corners AWS 3.2.4 and Radii of Beam copes 3.2.5 (1 point)			
Rounding of edges main members AWS 3.2.9 (1 point)			
Shearing distortion 513.12 (1 point)			
Bending , 90 degrees to rolling direction, visual inspection look for cracks AASHTO (1 point)			
<b>Cambering and Sweep of Individual Main Members per 513.11, AWS and AASHTO: Check Point four (4) Fabrication Quality Control Specialist acceptance by cover letter listing piece marks and dates.</b>			

Cambering or Straightening, Mechanical or Thermal shop procedures posted (1 point)			
1150 degrees F pyrometric sticks (follow shop procedure) (5 points)			
location and shape of heats or jack points( follow shop procedure) (1 point)			
location and number of support blocks ( follow shop procedure) (1 point)			
Thermal, Natural Cooling ( follow shop procedure) (5 points)			
Straightness and camber are per 513.11 ( 5 points)			
<b>Complete Penetration Welding per AWS, 513.21 and AASHTO: Check Point five (5) Fabrication Quality Control Specialist acceptance by frequent audits and documentation of listed data for each splice and dates.</b>			
Size, grade , piece mark and locations of parts to be fitted (1 point)			
Clean scale, moisture, grease & foreign material per AWS 3.2.1 (2 point)			
Groove weld fit up tolerance, AWS 3.3 (2 point)			
Shop Welding Procedure ( WPS) with ODOT approval date posted at work stations (1 point)			
Welders and tackers are qualified (5 point)			
Flux and electrode per WPS (1 point)			
Joint geometry tolerances per AWS figure 2.4 (2 point)			
Preheat Temperature (F) and Shop Temperature(F) (5 point)			
Amperage ( Amps),Voltage (Volts),Travel Speed (IPM) (5 point)			
Back gouge and cleaning per AWS 3.2.6 (5 point)			
Visual inspection width, thickness AWS 3.6.3 (5 point)			
Visual inspection surface finish AWS 3.6.4 125 uin. (2 point)			
<b>Radiographic Inspection per AWS, 513.25 and AASHTO: Check Point six (6), Hold Point provisional fabricators. Fabrication Quality Control Specialist acceptance by cover letter listing piece marks , dates and with technician's reports.</b>			
Radiographic inspection 100% flange butt welds and back up bar splices( OA review required) acceptable film per AWS D1.5 section 6.8 thru 6.12 and CMS 513.25 (5 point)			
Radiographic inspection web butt welds, top & bottom 1/3 ( OA review required) acceptable film per AWS D1.5 section 6.8 thru 6.12 and CMS 513.25 (5 point)			
Radiographic inspection 100% longitudinal stiffeners butt welds ( OA review required) acceptable film per AWS D1.5 section 6.8 thru 6.12 and CMS 513.25 (5 point)			
Radiographic inspection 25% longitudinal web ( OA review required) acceptable film per AWS D1.5 section 6.8 thru 6.12 and CMS 513.25 (5 point)			

<b>Ultrasonic Inspection per AWS, 513.25 and AASHTO: Check Point seven (7), Witness Point, provisional fabricators. Fabrication Quality Control Specialist acceptance by cover letter listing piece marks , dates and with technician's reports.</b>			
Ultrasonic inspection 25% of complete penetration T or corner joints subject to compression or shear. (100% QA witness) acceptable process per AWS D1.5 section 6.13 thru 6.25, 12.16 and CMS 513.25 (5 points)			
Ultrasonic inspection 100% of complete penetration T or corner joints subject to tension or reversal of stress.(100% QA witness) acceptable process per AWS D1.5 section 6.13 thru 6.25, 12.16 and CMS 513.25 (5 points)			
<b>Fillet Welds per AWS, 513 and AASHTO: Check Point eight (8), Fabrication Quality Control Specialist acceptance by frequent audits, documentation of listed data for each member and dates.</b>			
Size, grade , piece mark and locations of parts to be fitted (1 point)			
Clean scale, moisture, grease & foreign material per AWS 3.2.1 (1 point)			
Standard fillet weld fit up tolerance, 1/16" AWS 3.3 (1 point)			
Shop Welding Procedure (WPS) with ODOT approval date posted at work stations. (1 point)			
Welders and tackers qualified (5 point)			
Flux and electrodes per WPS (1 point)			
Preheat Temperature (F) and Shop Temperature(F) (5 points)			
Amperage (Amps),Voltage (Volts) and Travel Speed (IMP) (5 points)			
Visual inspection weld size and profile, AWS 3.6 (10 point)			
<b>Stiffener Fitting per AWS, 513 and AASHTO: Check Point nine (9) Fabrication Quality Control Specialist acceptance by cover letter listing piece marks and dates.</b>			
Bearing Stiffener, mill fit @ bearing, tight fit @ other end, 513.13 (5 point)			
Intermediate Stiffener without cross frames, tight fit at tension flange, 513.13 (5 point)			
Connection Stiffener weld fit at both flanges 513.13 (2 point)			
Clearance between clipped stiffener corners and fillets on rolled beams (1 point)			
<b>Magnetic Particle Inspection per AWS, 513.25 and AASHTO: Check Point ten (10), Hold and Witness point for provisional fabricators. Fabrication Quality Control Specialist acceptance by cover letter listing piece marks, dates and with technicians report's.</b>			
Magnetic Particle Inspection 10% of flange to web welds and girder ends after trimming, Dry powder prod method or yoke method. (100% QA witness during MPI inspection with provisional fabricators) acceptable procedure per AWS D1.5 section 6.7.6 thru 6.7.7 and CMS 513.25 (5 point)			

Magnetic Particle Inspection 10% of Bearing Stiffener Welds, Dry powder prod method or yoke method. (100% QA witness during MPI inspection with provisional fabricators) acceptable procedure per AWS D1.5 section 6.7.6 thru 6.7.7 and CMS 513.25 (5 point)			
<b>Shop Laydown per AWS, 513, and AASHTO: Check Point eleven (11) Fabrication Quality Control Specialist acceptance by frequent audits, documentation of listed data for each member and dates.</b>			
Hole patterns, size, spacing, gage, accuracy per CMS 513.19 (2 point)			
Hole deburring per CMS 513.19 (1 point)			
Blocking horizontal & vertical dimensions @ bearings, after all welding is complete. 1/8" + or - per CMS 513.11 (5 point)			
Blocking camber dimensions @ points specified, after all welding is complete 513.11 (5 point)			
Sweep or Horizontal curvature of curved members, after all welding is complete 3/8" top to bottom and 1/8"/10'-0" AWS 3.5 and 513.11			
Fitup at bolted splice, 1/4" max gap 513.16			
Shop applied bolts, nuts and washers accepted by TE-24			
Shop installed bolts calibration devise periodically examined per 513.20			
Shop Bolts tightened per 513.20			
Flatness at bearing seats, after all welding is complete AWS 3.5.1.9 (2 point)			
<b>Cleaning per 514, SSPC and ASTM: Check Point twelve (12) Fabrication Quality Control Specialist acceptance by documentation of listed data for each member and dates.</b>			
Shop solvent cleaning per SSPC-SP1 where necessary (5 point)			
Shop grinding edges 1/16", material thicker than 1 1/2" shall be checked for removal of the heat effected zone. (1 point)			
Shop blast cleaned SSPC-SP10, Automated process: Five(5) each recorded readings at random locations on one member out of five of the main members and One(1) recorded reading for every ten pieces of all secondary material with replica tape ASTM D4417 method C, 1.5 to 3.5 mil profile , 514 (10 point)			
Shop blast cleaned SSPC-SP10, Manual process: five(5) each recorded readings at random locations for each main member and one(1) recorded reading for every ten pieces of all secondary material with replica tape ASTM D4417 method C, 1.5 to 3.5 mil profile, 514 (10 point)			
Steel, Ambient (Dry bulb) and Wet bulb Temperatures, Humidity and Dew Point recorded prior to blasting and at the start of each shift (5 degree F above dew point). (2 point)			
Abrasive produces angular profile (1 point)			
Abrasive mix for oil contamination start of each shift (1 point)			
Removal of abrasives & residue by vacuum or double blowing (5 point)			

Test blow air for oil or other contaminants. Blotter test for 30 seconds at the start of each shift. Not required with vacuum (1 point)			
Condition all fins slivers and burred or sharp edges per ASTM A6. Re-blast to 1.5 to 3.5 mil profile, unless conditioned area is less than one square foot per main member (1 point)			
<b>Painting per 514, SSPC and ASTM: Check Point thirteen (13). Painting Quality Control Specialist acceptance by documentation of listed data for each member and dates.</b>			
Time and dates between blasting and painting (1 point)			
Ambient temperature & humidity ( minimum 40° F and 5° F above dew point) (5 point)			
Temperature of paint storage location (max/ min) (2 point)			
Paint TE-24, manufactures name and lot numbers (2 point)			
Painter mixes paint with a high shear mixer and strains (5 point)			
Painter is checking operation of automated agitation system with every new paint batch (5 point)			
Prime inside of bolt holes, behind stiffener clips (5 point)			
Prime thickness 3 to 5 mils: 3 gage readings for each spot measurement with 5 spot measurements in each 100 square foot (see additional instructions with paint system notes)(10 point)			
Workman like finish; mud cracking, holidays, pores, runs or sags. (5 point)			
Prime has dried sufficiently prior to handling (1 point)			
<b>Cleaning ASTM A709 Grade 50W steel (A588) Check point fourteen (14). Painting Quality Control Specialist acceptance by documentation of listed data for each member and dates.</b>			
Shop solvent cleaning per SSPC-SP1 where necessary (5 point)			
Shop grinding edges 1/16"(1 point)			
Shop blast fascia members cleaned SSPC-SP6 achieved			
Abrasive mix for oil contamination start of each shift (1 point)			
Removal of abrasives & residue by vacuum or double blowing (1 point)			
Test blow air for oil or other contaminants. Blotter test for 30 seconds at the start of each shift. Not required with vacuum (1 point)			
Condition all fins slivers and burred or sharp edges per ASTM A6. Re blast to 1.5 to 3.5 mil profile, unless conditioned area is less than one square foot per main member (1 point)			
<b>Repair procedures, QA Inspection: Hold point fifteen (15), Required for all Fabricators. Fabrication Quality Control Specialist acceptance by documentation of listed data for each repaired member and dates.</b>			
QC/ documentation describing problem and proposed repair method (1 point)			
QA /The Office of Structure Engineering acceptance of the proposed repair methods (1 point)			
Fabricator follows repair methods ( 2 points)			



NDT acceptance by QC and QA/The Office of Structure Engineering ( 2 points)			
Contractor acceptance and The Office of Structure Engineering received Shop drawings revised to show as built condition ( 1 point)			
<b>Final Shop, Shipping or Storage, QA Inspection: hold Point sixteen (16), Required for all Fabricators. Fabrication Quality Control Specialist presents member and required QC documentation from check points 1 thru 15 for QA acceptance.</b>			

NA = Not Applicable, No partial points are available for a Yes, No or NA answer

Sum of { Y/(Y + N) x Section % }

Fabricator Administration \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 1 = \_\_\_\_

Check Point 1 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 15 = \_\_\_\_

Check Point 2 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 1 = \_\_\_\_

Check Point 3 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 1 = \_\_\_\_

Check Point 4 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 1 = \_\_\_\_

Check Point 5 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 15 = \_\_\_\_

Check Point 6 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 17 = \_\_\_\_

Check Point 7 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 15 = \_\_\_\_

Check Point 8 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 7 = \_\_\_\_

Check Point 9 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 3 = \_\_\_\_

Check Point 10 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 7 = \_\_\_\_

Check Point 11 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 3 = \_\_\_\_

Check Point 12 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 3 = \_\_\_\_

Check Point 13 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 3 = \_\_\_\_

Check Point 14 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 1 = \_\_\_\_

Check Point 15 \_\_\_\_ (Y) / \_\_\_\_ (Y + N) X 7 = \_\_\_\_

Summation Fabricator rating for performance of QA Inspection = \_\_\_\_

**FABRICATOR \_\_\_\_\_ RATING FOR SHOP FABRICATION LEVEL 6 (FCM)**

**Project:** \_\_\_\_\_ **Bid Line No.:** \_\_\_\_\_ **Shop ID:** \_\_\_\_\_

**Rater/Date:** \_\_\_\_\_ **Reviewer/Date:** \_\_\_\_\_

Check, Hold or Witness Point Descriptions for Levels of Fabrication 6 Fracture Critical. Supplement to Fabricator Rating Levels 1 through 5. Add or modify the following for Fracture critical materials or welds.			
ASTM A709, Grade, Physical & Chemical Requirements, CVN Check point one (1) :Fabrication Quality Control Specialist acceptance by cover letter listing piece marks and dates	Yes	No	NA
CVN minimum average energy( ft lb.) P frequency (10 point)			
<b>Material Preparation per AWS D1.5, AASHTO and 513: Check Point three (3) Fabrication Quality Control Specialist acceptance by cover letter listing piece marks and dates</b>			
Heat Bending , 90 degrees to rolling direction, visual inspection look for cracks AWS 12.12 (10 point)			
<b>Complete Penetration Welds per AWS, 513.21: Hold and Witness Point Five (5) Fabrication Quality Control Specialist acceptance by witnessing: Provisional qualified fabricators require Office of Materials Management witnessing of 50% of each fracture critical weld and qualified fabricators require 25%</b>			
Welders and tackers are qualified for FCM (2 point)			
Flux and electrodes per WPS, Lot testing of Flux and electrodes, Temperature of Flux oven (2 points)			
Preheat Temperature (F) and shop temperature (F) (3 point)			
<b>Ultrasonic Inspection per AWS, 513 and AASHTO: Hold and witness point, Seven (7) Fabrication Quality Control Specialist acceptance by witnessing: Provisional and qualified fabricators require Office of Materials Management witnessing of 100% of the fracture critical welds ultrasonic inspection.</b>			
Ultrasonic inspection 100% of complete penetration butt welds in FCM tension or reversal of stress flanges or back up bars.(100% QA witness) acceptable process per AWS D1.5 section 6.13 thru 6.25, 12.16 and CMS 513.25 (5 points)			
Ultrasonic inspection 25% of complete penetration butt welds in FCM compression flange or back up bar.(100% QA witness) acceptable process per AWS D1.5 section 6.13 thru 6.25, 12.16 and CMS 513.25 (5 points)			
Ultrasonic inspection 25% of complete penetration T or corner joints FCM subject to compression or shear. (100% QA witness) acceptable process per AWS D1.5 section 6.13 thru 6.25, 12.16 and CMS 513.25 (5 points)			

Ultrasonic inspection 100% of complete penetration T or corner joints FCM subject to tension or reversal of stress.(100% QA witness) acceptable process per AWS D1.5 section 6.13 thru 6.25, 12.16 and CMS 513.25 (5 points)			
<b>FCM Repair procedure per AWS 12.17 hold and witness point Five-A (5A) Fabrication Quality Control Specialist acceptance by witnessing: Provisional qualified fabricators require Office of Materials Management witnessing of 50% of each fracture critical weld and qualified fabricators require 25%.</b>			
Sketch of discontinuity with member piece mark and location on member (1 point)			
QA witness of discontinuity for determination of critical or non critical repairs (2 point)			
Noncritical repair, WPS and repair procedure pre approved ( 1 point)			
Critical repair, WPS and repair procedure approved for each repair by The Office of Structure Engineering (2 point)			
Welders and tackers, are qualified for FCM(1 point)			
Preheat temperature prior to air carbon arc (1 point)			
Grind surfaces to be welded smooth and bright (1 point)			
Flux and electrode per WPS (1 point)			
lot testing, Check Temperature of Flux oven			
Joint geometry tolerances per AWS figure 2.4 (2 point)			
Preheat Temperature (F) and shop temperature (F) (1 point)			
Amperage ( Amps), Voltage (Volts) and Travel Speed (IPM) (1 point)			
Visual inspection width, thickness AWS 3.6.3 (2 point)			
Visual inspection surface finish AWS 3.6.4 125 uin. (2 point)			
Visual inspection weld size and profile, AWS 3.6 (2 point)			
Non destructive testing as specified by repair procedure( 5 points)			

### **Fabricator Rating: Summation of Appendix II check lists**

Fabricator Rating For Performance Of Shop Drawings \_\_\_\_\_ x 20% = \_\_\_\_\_

Fabricator Rating For Performance Of Test Reports \_\_\_\_\_ x 20% = \_\_\_\_\_

Fabricator Rating For Performance Of Shop Fabrication \_\_\_\_\_ x 60% = \_\_\_\_\_

Fabricator Rating \_\_\_\_\_ = \_\_\_\_\_

Fabricator Rating District's Construction Comments