

QUALITY CONTROL AND QUALITY ASSURANCE PLAN FOR STATE AND LOCAL JURISDICTION BRIDGE SAFETY INSPECTIONS

In order to insure that Oklahoma's bridges are being inspected and data is gathered in an accurate and consistent manner, it is necessary to implement quality control and quality assurance plans. For this purpose, quality control can be defined as the steps the inspecting agency and ODOT take to monitor that the inspections are performed correctly and the data collected is accurate. Quality assurance can be defined as the steps taken to insure that the work is being performed by qualified, quality inspectors and reviewers who are properly trained to perform the work.

QUALITY CONTROL

INTERNAL QUALITY CONTROL (by inspecting agency)

At least once every inspection cycle (24 months), the reviewing engineer (*the engineer who routinely reviews inspection reports*) for the inspecting agency (either Off- or On-System consulting firm) will randomly choose five (5) bridges to review in the field **for each team leader** (the reviewing engineer must be someone other than the team leader). The composition of these five bridges will be such that they represent a cross-section of bridge types inspected. It is strongly recommended that they include one of each of the following; a truss bridge, a timber girder bridge, a steel girder bridge, a concrete girder bridge (prestressed or regularly reinforced) and a bridge length concrete culvert. **One of these representative bridges will include a bridge that is rated three (3) tons (if available in the bridges inspected by the team leader).** This field review will consist of the reviewing engineer assessing the correctness and completeness of the inspection, including codings, elements and quantities, photos required by the contract as well as those needed to depict critical conditions, etc. This review should be done with the inspector so that any improper codings or procedures can be immediately corrected. The internal reviewer for the On-System ODOT team leaders shall be the team leader's supervisor (or supervisor's designee...in most cases the county bridge coordinator in each division).

The Bridge Division will develop a *Quality Control* plan for On-System ODOT inspectors. On- and Off-System consultant inspection firms shall develop their own *Quality Control* plan. As a minimum, the plan will include the following:

- Who the reviewing engineer will be. For smaller firms where the engineer is also the team leader, it may be necessary to trade out reviewing responsibilities with another small firm. The reviewing engineer will not be the same person as the team leader being reviewed.
- The reviewing engineer's experience and qualifications. This person should have extensive experience in the bridge safety inspection area and should be very familiar with inspection procedures and requirements.
- How the bridges to be reviewed are chosen.
- When the review will take place, so that an ODOT and/or FHWA official can attend if they choose.
- Specific items the review will include.

QUALITY CONTROL REPORT

Once the Quality Control Plan is approved by ODOT, the consultant or field division shall implement the plan. Following the field review, the consultant shall submit a report to the Bridge Division (with a copy to the appropriate field division) which contains the following:

- A copy of the inspection report of each bridge being reviewed, including any photographs, drawings, reports, etc., that are part of the inspection.
- The reviewer shall indicate on the inspection report copy any incorrect codings and corrections found during the field review.
- The reviewer shall summarize findings from the review, and provide a plan which will insure these mistakes will not take place in the future (i.e., in-house training, procedural changes, etc.).
- The Quality Control Report shall be stamped and signed by the reviewing engineer.

On-System ODOT team leaders shall be reviewed by their supervisor (or designee, *someone familiar with inspection procedures and codings*) in this same manner, with a written report and suggestions for correcting findings returned to the Bridge Division.

EXTERNAL QUALITY CONTROL (by ODOT)

Each inspecting agency shall be reviewed by ODOT in the field at least once during a two-year cycle. This review will be conducted by the persons in the field division county bridge coordinators office who are trained and are very familiar with inspection procedures and codings. It will consist of reviewing inspections of at least five (5) bridges in the field. These bridges will represent the different types of bridges commonly found in the counties inspected by that agency. As a minimum, one of each of the following bridge types should be reviewed; a truss bridge, a timber girder bridge, a steel girder bridge, a concrete girder bridge (prestressed or regularly reinforced) and a culvert. One of these representative bridges will include a bridge that is rated three (3) tons (if available). A Quality Control Report of the findings of this review shall be forwarded to the inspecting agency with a copy to the Bridge Division. In addition, the Bridge Division will randomly review four (4) inspecting agencies each year in the same manner. A copy of their findings will be forwarded to the inspecting agency and the appropriate field division.

In addition to the field review, the inspecting agency's office procedures may be reviewed. This *may* include load rating procedures, filing procedures and bridge file content, consultants in-house quality control plan, procedures and results, consultant's procedures for notification and follow-up with bridge owners for load posting and closing of bridges as required by ODOT policies, etc.

QUALITY ASSURANCE

CONTINUING TRAINING

As part of this quality control/quality assurance process, some form of continuing training will be required for all team leaders and the reviewing engineer. As a minimum, this training will consist of the following:

- One training session will be held each year. Each team leader and each reviewing engineer will be required to attend one of these training sessions at least once every two years. Failure to do so will be grounds for disqualification of the team leader or firm as described below. *If necessary to avoid large numbers of scheduling conflicts, additional sessions may be scheduled.*
- Two test bridges will be identified, one in the western half and one in the eastern half of the state. Each attendee must inspect one of these bridges within one month before the training session, on his/her own.
- At the training session, each bridge will be reviewed and proper ratings discussed. Questions, answers and discussion will follow. Any questions and comments that attendees have should be brought to this session for discussion in an open forum, after

the inspections are reviewed. It is recommended that these questions and comments be sent to the Bridge Division prior to the session so that adequate time is available to fully develop answers. This training session should be limited to a half day. More time can be used if necessary. These training sessions will be held in the ODOT central office.

DISQUALIFICATION

When the inspection review indicates that a team leader and/or an inspecting agency continues to make the same or similar mistakes, omissions, etc., ODOT shall implement disqualification procedures as follows:

- Upon receiving ODOT's Quality Control Report, the inspecting agency shall address the findings of the report and take steps to correct the problems to insure they will not be repeated in the future.
- The team leader and inspecting agency will be placed on probation and reviewed again in six (6) months. This review will be conducted by a team consisting of the original reviewer, a field division representative, and a member of the FHWA, if they desire.
- If the same or similar mistakes are found during this second review, the inspecting agency and/or the team leader shall be given notification that they will be disqualified if these problems are not corrected and avoided in the future, and placed on a secondary probation period of three (3) months.
- The team leader and inspecting agency shall be reviewed again in three (3) months by the reviewing team. If the same or similar problems are found the inspecting agency and/or the team leader will be notified that they are hereby disqualified for a minimum of two years and will no longer be allowed to perform bridge safety inspections in the State until they have been requalified.
- A disqualified team leader and/or inspecting agency may be requalified after the two-year period if they indicate in a written report how they have corrected their deficiencies. Upon approval by ODOT, the team leader or inspecting agency shall be placed back on the qualified list.
- A disqualified team leader may also be requalified when he/she has retaken the training course "Safety Inspection of In-Service Bridges" and achieved a score of 70 percent or better on the examination given at the end of the course. Attendance in the entire course is mandatory for requalification (i.e., no "testing out").
- Henceforth, prospective team leaders taking the training course "Safety Inspection of In-Service Bridges" must attend the entire course and achieve a score of 70 percent or better on the examination given at the end of the course to be considered qualified.

REASONS FOR DISQUALIFICATION

Typical reasons for disqualification can be, but are not limited to, the following:

- Lack of proper follow-up with the bridge owner for critical findings, such as broken load carrying members, critical scour at foundations, vehicular impacts which could adversely effect load carrying members, bridges requiring closure, etc.
- Lack of follow-up with the bridge owner for correcting load posting deficiencies.
- Failure to correct findings from Quality Control or Quality Assurance reviews.
- Recurring miscoded critical inventory items such as NBI Items 36, 41, 43, 51, 53, 54, 92, 93, and 113.
- Recurring miscoded critical elemental items such as structural elements and smart flags. This can include improper or omitted element numbers, quantities and/or condition states.
- Failure to attend required continuing education sessions as outlined in this policy.
- Failure to submit completed inspection data and/or corrections in a timely manner.

The Oklahoma Department of Transportation has the final authority to carry out this disqualification process. The inspecting agency must agree to these procedures as part of any bridge safety inspection agreement before they will be allowed to perform any bridge safety inspections.