

CSP Inspection Guidelines

If inspections are required, they should be done at the production facility prior to shipping the product. An inspection report should be completed (see the example on page 3). The inspection report should be provided to the supplier and the customer within 24 hours of inspection. An inspection form in Excel is available from CSPI. The inspection has three main components: Visual Inspection, Measurements, and the Report.

Visual Inspection:

1. The pipe is to be inspected for coating deficiencies, with any deficiencies being marked for repair or rejection based on CSA G401. Also, during this initial visual inspection, look for any obvious profile or lock-seam defects throughout the length of the pipe.
2. Seam terminations are inspected to confirm that all meet provincial requirements.
3. All welds are inspected for visible defects, and confirmed to be re-coated with an approved coating
4. The cut ends shall be finished without significant burrs or sharp edges; and all cut edges to be re-coated with an approved coating.
5. The recorrugated end is inspected for full, smooth corrugations. Base metal shouldn't show any cracking or peeling, or will need to be repaired as per CSA G401 guidelines. The cut end should be square, with no saw cut mis-match to exceed 10mm.
6. The lock-seam needs to be visually inspected. The lock-seam can be inspected at any beveled end, or from a sample taken by the supplier during manufacturing. Lock seam overlapping sections should be in tight contact, contact should be tight with the retaining offset, and the lap measurement should be within CSA G401 tolerance.

Measurements:

1. Diameter should be checked at 3 locations per pipe section. The location of these measurements should be at either end of the pipe, and in the center. At each location, both the Rise and Span measurements need to be recorded. Where one end of the pipe is beveled, that measurement should be taken at least 1M in from the top of the bevel.
 - i) Average diameter not to exceed 0.5% tolerance per CSA G401
 - ii) Rise and Span not to exceed 2% variance for out-of-round per CSA G401
 - iii) Measurements should be taken as per provincial guidelines.
2. Length of each pipe section should be measured and recorded.
 - i) Using a mechanical tape measure, measure the invert length from the inside of the culvert
 - ii) Individual pipe sections not to exceed +50mm/-25mm tolerance per CSA G401
 - iii) Tolerance for overall installation is based on the number of pipe sections
3. The bevel length needs to be measured and recorded.
4. The "lap" measurement of the lock-seam needs to be measured and recorded.

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Report:

All measurements and visual inspection results need to be recorded. This should be done on an equivalent version of Page 3 with all relevant information.

The necessary information on the report is:

1. Job details: Project name, Date, Inspector name, Supplier name
2. Culvert Details: Diameter, Length, Wall thickness, Coating, Bevel Requirements, Corrugation Profile
3. Rise and Span measurement at 3 locations per pipe section
4. Average diameter at each measured location
5. Difference between Rise and Span at each measured location
6. Length of each pipe section
7. Length of the beveled section
8. Visual inspection approvals
9. Pictures taken throughout the inspection
10. Mill certification reports for the coils used, provided by the supplier.
11. Date and Signature

Notes:

1. Any additional fabrication not required under the guidelines for inspection can be arranged at the request of the customer and is subject to additional fees from the supplier.
2. The supplier should contact the customer, ahead of the anticipated completion date, to give adequate lead time to set up an inspection date. The supplier should have mill certification reports available at the time of inspection.
3. The inspector is subject to any site-specific safety policies such as wearing applicable PPE, participating in orientation, signing in and out upon arrival and departure, and allowing for a company escort while working in potentially hazardous areas.

| | | |
|--|--------------------|-----------------|
| (INSPECTION COMPANY LOGO HERE) Example Only | FILE NO.: XXXXXXXX | PAGE(S): 1 OF 1 |
| | DATE | |
| | INSPECTION BY | |
| | SUPPLIER | |

| | |
|--------------|--|
| PROJECT NAME | |
|--------------|--|

| | | | | |
|----------------|-------------------------|------|------------------------------|----------------------------------|
| CULVERT DESIGN | INSIDE DIAMETER (mm) | 1800 | CORRUGATION PROFILE (mm) | 125 x 25 |
| | INSTALLATION LENGTH (m) | 30 | WALL THICKNESS (mm) | 2.8 |
| | RECORRUGATED ENDS (Y/N) | Y | COATING | 610 gm/m ² GALVANIZED |
| | SLOPED END RATIO | 2:1 | NUMBER OF COUPLERS SUPPLIED | 6 |
| | REQ. BEVEL LENGTH (m) | 2.4 | MIN. BEVELED PIPE LENGTH (m) | 6 |

| MEASUREMENTS | | 0.5 % TOLERANCE | | | 1791 MIN | | VISUAL INSPECTION COMMENTS |
|--------------|------------|-----------------|------|------|------------------------------|-----------------------|----------------------------|
| | | 2% TOLERANCE | | | 36 MAX | | |
| SECTION | LENGTH (m) | LOCATION | RISE | SPAN | DIFFERENCE RISE VS SPAN (mm) | AVERAGE DIAMETER (mm) | |
| 1 | 9.02 | Bevel | 1804 | 1810 | 6 | 1807 | Weld satisfactory |
| | | Middle | 1809 | 1802 | 7 | 1806 | |
| | | Joint 1A | 1805 | 1807 | 2 | 1806 | |
| 2 | 6.02 | Joint 1A | 1802 | 1807 | 5 | 1805 | |
| | | Middle | 1799 | 1797 | 2 | 1798 | |
| | | Joint 1B | 1790 | 1798 | 8 | 1794 | |
| 3 | 5.99 | Joint 1B | 1785 | 1797 | 12 | 1791 | |
| | | Middle | 1797 | 1798 | 1 | 1798 | |
| | | Joint 1C | 1790 | 1801 | 11 | 1796 | |
| 4 | 9.01 | Joint 1C | 1794 | 1796 | 2 | 1795 | All seams passed |
| | | Middle | 1800 | 1798 | 2 | 1799 | |
| | | Bevel | 1800 | 1801 | 1 | 1801 | |
| 5 | | Example | 1780 | 1781 | 1 | 1781 | |
| | | Example | 1825 | 1830 | 5 | 1828 | |
| | | Example | 1825 | 1830 | 5 | 1828 | |
| 6 | | Example | 1781 | 1826 | 45 | 1804 | |
| | | Example | 1750 | 1850 | 100 | 1800 | |
| | | Example | 1780 | 1820 | 40 | 1800 | |
| 7 | | | | | | | |
| | | | | | | | |
| | | | | | | | |

| VISUAL INSPECTION | | Y/N | COMMENTS |
|-------------------|--|-----|------------------|
| FACILITY | Is facility certified to CSA G401 | Y | |
| | Other certifications if required | Y | |
| RECORRUGATED ENDS | Fully recorrugated | Y | |
| | No cracks in base metal | Y | |
| CUT EDGES | Ground, free of burrs | Y | |
| | Square, no saw cut mismatch greater than 10mm | Y | |
| | All cut edges have been re-coated with approved coating | Y | |
| WELDING | Welding process | Y | |
| | Seam inspection | Y | |
| | All welds have been sufficiently re-coated | Y | |
| MATERIAL | Mill markings present on material used | Y | |
| | Mill certificates reviewed and attached to report | Y | |
| | Coating free from defects | Y | |
| LOCK-SEAM | Inspected for defects, record lap measurement (mm) in comments | Y | 9mm lap recorded |
| COUPLERS | Correct quantity of couplers and bolts | Y | |
| | No coating defects | Y | |
| | Welds have been re-coated | Y | |

REPAIRS NEEDED OR REQUIREMENTS PRIOR TO SHIPPING:

INSPECTOR DATE