

SPECIAL PROVISION FOR INVERT PAVING EXISTING CORRUGATED STEEL PIPE

Description

This Special Provision includes specifications for measuring and reporting culvert wall thickness, preparing the surface of the culvert invert, installing reinforcement and anchorage devices, and paving the invert with concrete, or other authorized material. This Special Provision applies to culverts suitable for man-entry.

Pipe Thickness Testing prior to construction

Measure pipe thickness at 10-foot intervals along the pipe, or intervals as approved by the Engineer to determine remaining metal thickness of pipe wall.

Measure thickness by direct measurement through deburred openings drilled or cut through the culvert, or by alternate method as approved by the Engineer.

Thickness measurements are to be taken and reported at clock positions 12, 3, 5, 6 (invert), 7, and 9. Additional clock positions may be required by the Engineer. Clock positions are taken facing the opening of the culvert, looking downstream.

Provide a table of thickness measurement results to the Engineer.

Plug test holes by welding patch material that conforms to corrugations over the hole. Test holes covered by invert paving or filled with grout need not be patched.

Grouting Host Pipe and Void Detection

As per Special Provision for Grouting Host Pipe Before Lining

Invert Paving

Engineer will determine the width of invert paving and shear connector placement based on Pipe Thickness Testing results. In cross section, limits of invert paving edges shall usually subtend a central angle of 120 degrees (to the 4 o'clock and 8 o'clock positions, but may extend to a maximum of 180 degrees or minimum of 90 degrees depending on extent of invert damage.

Weld 3/8" diameter x 2 1/2" long Welded Stud Shear Connectors (Nelson Studs or approved equal) per Standard Specification 1072-6. Weld only to sound metal where full strength can be achieved without burn-through. Welding shall be performed by personnel qualified by the Department and shall incorporate low hydrogen electrodes only. Number of shear connectors shall be 8 circumferentially, 4 on each side of invert trough. Shear connectors shall be welded to the corrugation crests equally spaced on both sides of the invert transversely, with minimum 3 inch circumferential spacing between studs. Minimum concrete cover above shear connectors shall be 1 1/2", and shear connectors shall have at least 1 1/2" of lateral concrete cover.

Tack weld 4" x 4" WWF per Standard Specification 1070-3, to bottom of culvert invert at 12" o/c each way. WWF is to overlap shear connectors, and have a minimum 4" clear cover from edge of concrete. WWF is to be lapped 6" minimum.

Before paving the invert, remove all coatings, corrosion, and other surface material until only base steel is exposed by sandblasting the portion of the culvert to be paved.

Minimum thickness of concrete must be measured over the crest of the corrugation.

Place 4" thick Class AA Slip Form concrete invert slab per Standard Specification 420 and 1000, to the width of invert paving provided by the Engineer, along the entire length of the culvert. Shape top edges of concrete to drain toward invert.

Prevent the flow of cementitious material and water from construction activities into waterways and drainage facilities.

Usage of shotcrete is per the discretion of the Engineer.

Measurement and Payment

Square Yards for Invert Paving payment will be calculated based on the average of width measurements taken with flexible tape pressed against the inside paved culvert surface at three locations determined by the Engineer, multiplied by the paved invert length along the flow line of the culvert. Anchorage devices, welded wire fabric, and other items are incidental. Pipe thickness testing is paid as addressed below.

Payment will be made under:

Pay Item

Pay Unit

Pipe Thickness Testing

Per Each Test Hole

Invert Paving

Square Yard of Finished Paving