

**REQUIREMENTS FOR CORRUGATED STEEL PIPE THICKNESS
AND PROTECTION AT NON-ABRASIVE SITES**

NOTE:


1. See Standard Drawing E 715-PSLC-03 for General Notes.

pH	≤ 4.0	4.5	5.0	5.5	6.0	6.5	≥7.0	Steel Conduit Type
Thickness required for 50-year Design Service Life	X	X	X	0.168	0.168	0.138	0.109	Zinc-Coated Corrugated Steel Pipe Zinc-Coated Corrugated Steel Pipe-Arch
	X	X	0.138	0.109	0.109	0.079	0.064	Zinc-Coated Corrugated and Steel Pipe w/Paved Invert Zinc-Coated Corrugated Steel Pipe-Arch w/Paved Invert Fully Bituminous-Coated and Lined Corrugated Steel Pipe Fully Bituminous-Coated and Lined Corrugated Steel Pipe-Arch
	X	X	0.138	0.109	0.109	0.079	0.064	Aluminum-Coated Type 2 Corrugated Steel Pipe Aluminum-Coated Type 2 Corrugated Steel Pipe-Arch
	0.109	0.109	0.079	0.064	0.064	0.064	0.064	Polymer Precoated Galvanized Corrugated Steel Pipe Polymer Precoated Galvanized Corrugated Steel Pipe-Arch
	0.111*	0.111*	0.111*	0.170	0.111	0.111	0.111	Structural Plate Steel Pipe Structural Plate Steel Pipe-Arch
	X	X	X	X	X	X	0.109	Zinc-Coated Spiral Ribbed Steel Pipe
	X	X	X	0.109	0.109	0.079	0.064	Zinc-Coated Spiral Ribbed Steel Pipe w/ Paved Invert
	X	X	X	0.109	0.109	0.079	0.064	Aluminum-Coated Type 2 Spiral Ribbed Steel Pipe
	0.109	0.109	0.079	0.064	0.064	0.064	0.064	Polymer Precoated Galvanized Spiral Ribbed Steel Pipe

* Concrete field paving required.

pH	≤ 4.0	4.5	5.0	5.5	6.0	6.5	≥7.0	Steel Conduit Type
Thickness required for 75-year Design Service Life	X	X	X	X	X	0.168	0.138	Zinc-Coated Corrugated and Spiral Ribbed Steel Pipe Zinc-Coated Corrugated Steel Pipe-Arch
	X	X	X	0.168	0.168	0.138	0.109	Zinc-Coated Corrugated Steel Pipe w/Paved Invert Zinc-Coated Corrugated Steel Pipe-Arch w/Paved Invert Fully Bituminous-Coated and Lined Corrugated Steel Pipe Fully Bituminous-Coated and Lined Corrugated Steel Pipe-Arch
	X	X	X	X	X	0.138	0.109	Aluminum-Coated Type 2 Corrugated Steel Pipe Aluminum-Coated Type 2 Corrugated Steel Pipe-Arch
	X	X	X	0.138	0.138	0.109	0.109	Polymer Precoated Galvanized Corrugated Steel Pipe Polymer Precoated Galvanized Corrugated Steel Pipe-Arch
	0.111*	0.111*	0.111*	0.218	0.111	0.111	0.111	Structural Plate Steel Pipe Structural Plate Steel Pipe-Arch
	X	X	X	X	X	X	0.109	Zinc-Coated Spiral Ribbed Steel Pipe w/ Paved Invert
	X	X	X	X	X	X	0.109	Aluminum-Coated Type 2 Spiral Ribbed Steel Pipe
	X	X	X	X	X	X	0.109	Polymer Precoated Galvanized Spiral Ribbed Steel Pipe
	X	X	X	X	X	X	0.109	Polymer Precoated Galvanized Spiral Ribbed Steel Pipe

* Concrete field paving required.

INDIANA DEPARTMENT OF TRANSPORTATION	
PIPE SERVICE LIFE CRITERIA NON-ABRASIVE SITES	
SEPTEMBER 2017	
STANDARD DRAWING NO. E 715-PSLC-01	
	<i>/s/ Elizabeth W. Phillips</i> 03/31/17 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ John Leckie</i> 04/10/17 CHIEF ENGINEER DATE


**REQUIREMENTS FOR CORRUGATED STEEL PIPE THICKNESS
AND PROTECTION AT ABRASIVE SITES**

NOTE:

1. See Standard Drawing E 715-PSLC-03 for General Notes.

pH	≤ 4.0	4.5	5.0	5.5	6.0	6.5	≥7.0	Steel Conduit Type	
Thickness required for 50-year Design Service Life	X			0.168	0.168	0.138	0.109	Zinc-Coated Corrugated Steel Pipe w/Paved Invert Zinc-Coated Corrugated Steel Pipe-Arch w/Paved Invert Fully Bituminous-Coated and Lined Corrugated Steel Pipe Fully Bituminous-Coated and Lined Corrugated Steel Pipe-Arch	
	X			0.138	0.109	0.109	0.079	0.064	Aluminum-Coated Type 2 Corrugated Steel w/Paved Invert Aluminum-Coated Type 2 Corrugated Steel Pipe-Arch w/Paved Invert
	0.109	0.109	0.079	0.064	0.064	0.064	0.064	Polymer Precoated Galvanized Corrugated Steel Pipe Polymer Precoated Galvanized Corrugated Steel Pipe-Arch	
	X			0.170	0.111	0.111	0.111	Structural Plate Steel Pipe w/Concrete Field Paving Structural Plate Steel Pipe-Arch w/Concrete Field Paving	
	X			X			0.109	Zinc-Coated Spriral Ribbed Steel Pipe w/ Paved Invert	
	X			0.109	0.109	0.079	0.064	Aluminum-Coated Type 2 Sprlal Ribbed Pipe w/ Paved Invert	
	0.109	0.109	0.079	0.064	0.064	0.064	0.064	Polymer Precoated Galvanized Spiral Ribbed Steel Pipe	

pH	≤ 4.0	4.5	5.0	5.5	6.0	6.5	≥7.0	Steel Conduit Type	
Thickness required for 75-year Design Service Life	X			X			0.168	0.138	Zinc-Coated Corrugated Steel Pipe w/Paved Invert Zinc-Coated Corrugated Steel Pipe-Arch w/Paved Invert Fully Bituminous-Coated and Lined Corrugated Steel Pipe Fully Bituminous-Coated and Lined Corrugated Steel Pipe-Arch
	X			X			0.138	0.109	Aluminum-Coated Type 2 Corrugated Steel Pipe w/Paved Invert Aluminum-Coated Type 2 Corrugated Steel Pipe-Arch w/Paved Invert
	X			0.138	0.138	0.109	0.109	Polymer Precoated Galvanized Corrugated and Steel Pipe Polymer Precoated Galvanized Corrugated Steel Pipe-Arch	
	X			0.218	0.111	0.111	0.111	Structural Plate Steel Pipe w/Concrete Field Paving Structural Plate Steel Pipe-Arch w/Concrete Field Paving	
	X			X			0.109	0.109	Aluminum-Coated Type 2 Sprlal Ribbed Pipe w/ Paved Invert
	X			X			0.109	0.109	Polymer Precoated Galvanized Spiral Ribbed Steel Pipe

INDIANA DEPARTMENT OF TRANSPORTATION	
PIPE SERVICE LIFE CRITERIA ABRASIVE SITES	
SEPTEMBER 2017	
STANDARD DRAWING NO. E 715-PSLC-02	
	<i>/s/ Elizabeth W. Phillips</i> 03/31/17 DESIGN STANDARDS ENGINEER DATE
	<i>/s/ John Leckie</i> 04/10/17 CHIEF ENGINEER DATE


GENERAL NOTES:

1. "X" entries in the table indicate that a thickness which satisfies the required design service life is not available.
2. The tabulated plate thickness for structural plate steel pipe and pipe-arches reflects the required thickness for the top and side plates. If the tabulated plate thickness is less than 0.280 in. the bottom plates shall be of the next greater available thickness.
3. Corrugated aluminum alloy pipe and pipe-arches and aluminum alloy structural plate pipe and pipe-arches are acceptable with the minimum thickness required to satisfy cover conditions for all non-abrasive sites with a structure pH \geq 5.0.
4. Corrugated aluminum alloy pipe and pipe-arches with bituminous paved invert and aluminum alloy structural plate pipe and pipe-arches with concrete field paving are acceptable with the minimum thickness required to satisfy cover conditions for all abrasive sites with a structure pH \geq 5.0.
5. Service life criteria apply only to reinforced concrete, corrugated metal, and structural plate metal pipe. Other materials which conform to the designated pipe type and height of cover parameters are acceptable for installation.
6. Service life criteria do not apply to Type 4 pipe.

**REQUIREMENTS FOR REINFORCED CONCRETE
PIPE PROTECTION**

Pipe Slope	Minimum pH to Attain Design Service Life	
	50 Year	75 Year
Less than 3%	4.0	4.5
3% to 10%	4.5	5.0
Greater than 10%	5.0	5.5

For a structure pH lower than the minimums listed above, reinforced concrete pipe shall not be used.

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PIPE SERVICE LIFE CRITERIA											
SEPTEMBER 2017											
STANDARD DRAWING NO. E 715-PSLC-03											
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