

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

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				0.168	0.168	0.138	0.109	Zinc Coated Corrugated Steel Pipe Zinc Coated Corrugated Steel Pipe-Arch	
				0.138	0.109	0.109	0.079	0.064	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
				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	

\* -- 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						0.168	0.138	Zinc Coated Corrugated Steel Pipe Zinc Coated Corrugated Steel Pipe-Arch
				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
						0.138	0.109	Aluminum Coated Type 2 Corrugated Steel Pipe Aluminum Coated Type 2 Corrugated Steel Pipe-Arch
				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

\* -- Concrete field paving required  
Refer to Standard Drawing E 715-PSLC-03 for General Notes.

INDIANA DEPARTMENT OF TRANSPORTATION	
PIPE SERVICE LIFE CRITERIA MARCH 2006	
STANDARD DRAWING NO. E 715-PSLC-01	
	/s/ Richard L. VanCleave 3-01-06 DESIGN STANDARDS ENGINEER DATE
DESIGN STANDARDS ENGINEER	/s/ Richard K. Smutzer 3-01-06 CHIEF HIGHWAY ENGINEER DATE

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

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				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
			0.138	0.109	0.109	0.079	0.064	Aluminum Coated Type 2 Corrugated Steel Pipe 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
				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

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						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
						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
				0.138	0.138	0.109	0.109	Polymer Precoated Galvanized Corrugated Steel Pipe Polymer Precoated Galvanized Corrugated Steel Pipe Arch
				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

Refer to Standard Drawing E 715-PSLC-03 for General Notes.

INDIANA DEPARTMENT OF TRANSPORTATION	
PIPE SERVICE LIFE CRITERIA	
MARCH 2006	
STANDARD DRAWING NO. E 715-PSLC-02	
	/s/ Richard L. VanCleave 3-01-06 DESIGN STANDARDS ENGINEER DATE
	/s/ Richard K. Smutzer 3-01-06 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	

**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 to only 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.

INDIANA DEPARTMENT OF TRANSPORTATION	
<b>PIPE SERVICE LIFE CRITERIA</b>	
JANUARY 1998	
<b>STANDARD DRAWING NO. E 715-PSLC-03</b>	
	DETAILS PLACED IN THIS FORMAT 7-27-99
	/s/ Anthony L. Uremovich 7-27-99 DESIGN STANDARDS ENGINEER DATE
	/s/ Firooz Zandi 7-27-99 CHIEF HIGHWAY ENGINEER DATE
DESIGN STANDARDS ENGINEER	ORIGINALLY APPROVED 1-02-98