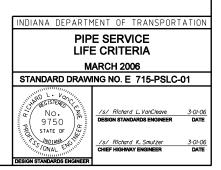
REQUIREMENTS FOR CORRUGATED STEEL PIPE THICKNESS AND PROTECTION AT NON-ABRASIVE SITES

pН	≤4.0	4.5	5.0	5.5	6.0	6.5	≥7.0	Steel Conduit Type
Th:-1	X	X	X	0.168	0.168	0.138	0.109	Zinc Coated Corrugated Steel Pipe Zinc Coated Corrugated Steel Pipe-Arch
Thickness required for 50 year Design		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	
Service Life	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

* -- Concrete field paving required

pН	≤4.0	4.5	5.0	5.5	6.0	6.5	≥7.0	Steel Conduit Type
-	X	X	X	X	X	0.168	0.138	Zinc Coated Corrugated Steel Pipe Zinc Coated Corrugated Steel Pipe-Arch
required for 75 year 0.168 0.168 0.138 0.109 Zinc Coated Corrug. Zinc Coated Corrug. Fully Bituminous Co		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						
Service Life	X	X	X		\times	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

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

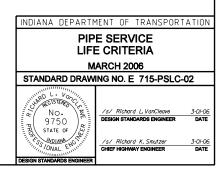


REQUIREMENTS FOR CORRUGATED STEEL PIPE THICKNESS AND PROTECTION AT ABRASIVE SITES

pН	≤4.0	4.5	5.0	5.5	6.0	6.5	≥7.0	Steel Conduit Type
Thickness required for 50 year		0.168 0.		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	
Design Service	Design		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
Life	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	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

pН	≤ 4.0	4.5	5.0	5.5	6.0	6.5	≥7.0	Steel Conduit Type
Thickness required 0.138 2inc Coated C Fully Bitumino		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						
Design	X	X	X	X	X	0.138 0.1		Aluminum Coated Type 2 Corrugated Steel Pipe w/Paved Invert Aluminum Coated Type 2 Corrugated Steel Pipe-Arch w/Paved Invert
Service Life		X	X	0.138	0.138	0.109	0.109	Polymer Precoated Galvanized Corrugated Steel Pipe Polymer Precoated Galvanized Corrugated Steel Pipe Arch
	X	X	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

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



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≥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

PIPE SERVICE LIFE CRITERIA

JANUARY 1998

STANDARD DRAWING NO. E 715-PSLC-03



/s/Anthony L. Uremovich 7-27-99
DESIGN STANDARDS ENGINEER DATE

/s/ Firooz Zandi

DETAILS PLACED IN THIS FORMAT

CHIEF HIGHWAY ENGINEER ORIGIANLLY APPROVED