Stormwater Management Systems

CORRUGATED STEEL PIPE: THE ANSWER TO A CHURCH'S PRAYERS

When the Trinity Assembly of God Church in Brooklandville, Md., wanted to expand its parking lot, it was faced with a prohibitively expensive problem with stormwater runoff. Corrugated steel pipe (CSP) came to the rescue.

The planned addition entailed expansion of the parking lot in an area restricted by the Baltimore Beltway (I-695) and expensive real estate. The land normally used for above-ground stormwater retention could not be used. CSP was selected due to its availability in large diameters, enabling it to handle large volumes of stormwater economically.

The primary retention system consisted of over 2,500' of 96" and 60" diameter CSP. Also incorporated on the job was 430' of 30" diameter, hydraulically efficient spiral rib pipe. CSP's flexibility proved especially helpful during installation of the corrugated manholes used for access to the 96" diameter pipe system. The 30" CSP fittings were prefabricated at Lane's manufacturing facility and simply put into place at the job site, reducing costs.

Substantial cost savings were also achieved by using the same equipment to excavate the trenches and install the 96" and 60" CSP, a choice not usually available with other materials. The design and installation of this underground system permitted construction of the required size parking lot for the needed expansion in a restricted land parcel, without the need for costly land acquisition. When you think savings, think corrugated steel pipe stormwater management systems.



LANE'S STORMWATER MANAGEMENT SYSTEMS: THE ECONOMICAL SOLUTION TO CONTROL STORMWATER RUNOFF

These systems maximize use of existing prime real estate and eliminate the poor aesthetics, hazards and risks of typical above-ground stormwater management ponds.

HAT YOU WANT ... WHERE YOU WANT IT ... WHEN YOU WANT IT.

BIG PIPE FOR BIG JOBS

The strength and versatility of corrugated steel pipe and fittings makes them easier to handle and install and more economical than concrete or other materials. Large pipe, up to 144" in diameter, can be shipped direct to the project. Even larger structures can be field-erected.

LANE DOES IT ALL

Since CSP is easily fabricated, system layouts can be custom-designed. Elbows, tees, manifolds, inlets and outlet control structures can all be fabricated from CSP. Lane craftsmen do it all — no subcontractors or job shops are necessary.

Perforated Pipe

Perforations in corrugated steel pipe permit the recharge of stormwater runoff into the natural groundwater table. Pipe can be partially or fully perforated with 3/8" holes, in both 2-2/3 and 5 x 1 corrugations. The number of holes per square foot depends on design requirements for exfiltration. Maximum perforation is 30 holes (3.3 square inches) per square foot of pipe surface.

SPECIALTY ITEMS

Lane fabricates trash racks, removable pumping stations, portable sediment tanks, sediment basins, oil/grit separators, dewatering devices, orifice plates, weir ladders and other accessories needed for the complete system.

SYSTEM DESIGN SOFTWARE

The National Corrugated Steel Pipe Association has developed software to minimize the engineering time required for the design of underground systems. The program develops an inflow hydrograph, stage storage and discharge relationships, routes the inflow hydrograph, designs the release structure and computes the outflow hydrograph. Please ask your Lane representative for more information.



INSTALLATION

Baltimore County, Maryland

This site for a new four-story office building is located in a rapidly growing area where real estate is very expensive. The project was designed to occupy land that would not drain properly unless a retention system was incorporated. The underground stormwater management system permitted construction of the required parking area for this size building, without the need for additional land acquisition.





Developers Depend on Lane: A Premier Supplier

Lane's experience in supplying over a thousand customdesigned and fabricated stormwater management systems is ready to serve you. Lane's representatives can assist you with concepts, system configurations, product details, material selection and specifications. All pipe and fittings are manufactured by Lane to strict quality standards.



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(CMP and S	MINIMUM ACCEPTABLE			PIPE ARCH* (Structural Plate Pipe Sizes)					
Diameter (inches)	Volume (Ft. ³ /Ft.)	Min. Cover Height	Installations			Shape* (Feet-inches)	Volume (Ft. ³ /Ft.)	Min. Cover Height	
12	12 .785						18-inch Corner Radius		
15 18 21 24 30 36 42 48	1.227 1.767 2.405 3.142 4.909 7.069 9.621 12.566	12"	Diamete	Pi	pe		$\begin{array}{c} 6\text{-}1 \times 4\text{-}7 \\ 6\text{-}4 \times 4\text{-}9 \\ 6\text{-}9 \times 4\text{-}11 \\ 7\text{-}0 \times 5\text{-}1 \\ 7\text{-}3 \times 5\text{-}3 \\ 7\text{-}8 \times 5\text{-}5 \\ 7\text{-}11 \times 5\text{-}7 \end{array}$	22 24 26 29 31 33 36	12"
54 60 66 72 78 84 90	15.904 19.635 23.758 28.27 33.18 38.49 44.18		-	→		Spacing	8-2 x 5-9 8-7 x 5-11 8-10 x 6-1 9-4 x 6-3 9-6 x 6-5 9-9 x 6-7 10-3 x 6-9	38 41 43 46 49 52 55	18″
96 102 108 114 120 126	50.27 56.74 63.62 70.88 78.54 86.59	18"	Up to 2 24" to 7 72" and La	24" 27" arger	1/2 D	12" ia. of Pipe 36"	10-8 x 6-11 10-11 x 7-1 11-5 x 7-3 11-7 x 7-5 11-10 x 7-7	58 61 64 68 71	
132 138 144 150 156	95.03 103.87 113.10 122.7 132.7		Pipe Arch Span				12-4 x 7-9 12-6 x 7-11 12-8 x 8-4 12-10 x 8-4 13-5 x 8-5 13-11 x 8-7	74 78 85 85 89 93	
162 168 174 180 186 192	143.1 153.9 165.1 176.7 188.7 201.1	24"					14-1 x 8-9 14-3 x 8-11 14-10 x 9-1 15-4 x 9-3 15-6 x 9-5 15-8 x 9-7	97 101 105 109 114 118	24
198 204 210 216	213.8 227.0 240.5 254.5			→	S]	pacing	16-5 x 9-11 16-7 x 10-1	122 126 131	30″
222	268.8 283.5		Pipe Arch	Span	S	pacing	31-in	ch Corner R	adius
234 240 246 252 258 264 270	298.6 314.2 330.1 346.4 363.1 380.1 397.6	30″	Up to 48" 48" to 72" 72 and Larger"		1/2 Sp	12" pan of Pipe 36"	$13-3 \times 9-4$ $13-6 \times 9-6$ $14-0 \times 9-8$ $14-2 \times 9-10$ $14-5 \times 10-0$ $14-11 \times 10-2$ $15-4 \times 10-4$	98 102 106 111 115 120 124	24"
276 282 288 294 300 312	415.5 433.7 452.4 471.4 490.9 530.9		backfill materials, placement and com practices. These minimums can be rec with the use of appropriate flowable f materials. (See Chapter 5 <u>Steel Draina</u> and Highway Construction Products.)			nd compaction n be reduced wable fill <u>Drainage</u> oducts.)	15-7 x 10-6 15-10 x 10-8 16-3 x 10-10 16-6 x 11-0 17-0 x 11-2	129 134 138 143 148	
							17-2 x 11-4 17-5 x 11-6	153 158	
(CMP Sizes - 1/2" Deep Corrugation)			(1" Deep Corrugation)			17-11 x 11-8 18-1 x 11-10 18-7 x 12-0	163 168 174	30″	
Shape* (inches)	Volume (Ft. ³ /Ft.)	Min. Cover Height	Shape* (inches)	Volt (Ft. ³	ume }/Ft.)	Min. Cover Height	18-9 x 12-2 19-3 x 12-4	179 185	
17 x 13 21 x 15 24 x 18 28 x 20 35 x 24 42 x 29	1.1 1.6 2.2 2.9 4.5 6.5 8.9 11.6 14.7 18.1 21.9 26.0	12"	53 x 41 60 x 46 66 x 51 73 x 55 81 x 59 87 x 63	11 15 19 23 27 32	.7 .6 .3 .2 .4	12"	19-6 x 12-6 19-8 x 12-8 19-11 x 12-10 20-5 x 13-0 20-7 x 13-2	191 196 202 208 214	36"
49 x 33 57 x 38 64 x 43 71 x 47			95 x 67 3 103 x 71 4 112 x 75 4 117 x 79 5		7.0 2.4 8.0	18″	* Pipe Arch shape dimensions s are for Span and Rise respect Note: This brochure is not intended for		ons shown spectively. ded for the
77 x 52 83 x 57			128 x 83 137 x 87 142 x 91	117 x / y 54 128 x 83 60 137 x 87 67 142 x 91 74		24″	design of detention or recharge systems for specific site conditions. A qualified civil engineer should be consulted for the design of such systems.		

Minimum covers are for H2O and H25 loadings only. Heavy construction loads may require additional cover. Minimum covers for H2O and H25 loads are measured from the top of the pipe to the bottom of flexible pavement, or top of reinforced rigid pavement.

Structural Plate Sizes -

Height of cover tables use the following design parameters: Unit Weight of Soil — 120 lbs. per cubic ft. Backfill compacted to AASHTO T-99 density of 90%; Yield Point of Steel — 33,000 psi. *In fine backfills, the use of geotextiles is recommended at pipe arch joints.

Materials used in the manufacture of stormwater management systems meet their applicable AASHTO and ASTM specifications.