

MA 18P 2002040000000000106
NEW

State of Maine



Master Agreement

Effective Date: 03/01/20

Expiration Date: 02/28/22

Master Agreement Description: Culverts, HDPE DW and PP DW, Tri-State ME,NH,VT

Buyer Information

William Allen 207-624-7871 ext. NULL WJE.Allen@maine.gov

Issuer Information

Sharon Krechkin 207-624-3038 ext. sharon.krechkin@maine.gov

Requestor Information

Sharon Krechkin 207-624-3038 ext. sharon.krechkin@maine.gov

Agreement Reporting Categories

Authorized Departments

ALL

Vendor Information

Vendor Line #: 1

Vendor ID

VS0000007819

Vendor Name

Lane Enterprises, Inc

Alias/DBA

Vendor Address Information

825 Rte 67

Ballston Spa, NY 12020

US

Vendor Contact Information

Annette Bliss
518-885-4385 ext.
abliss@lane-enterprises.com

Commodity Information

Vendor Line #: 1

Vendor Name: Lane Enterprises, Inc

Commodity Line #: 1

Commodity Code: 91339

Commodity Description: Culverts, HDPE DW and PP DW, Tri-State ME,NH,VT

Commodity Specifications:

Commodity Extended Description: Culverts, HDPE DW and PP DW, Tri-State ME,NH,VT. Maine is the Lead State

Quantity 0.00000	UOM	Unit Price 0.000000
Delivery Days 15	Free On Board	
Contract Amount 0.00	Service Start Date	Service End Date
Catalog Name Lane Culverts	Discount 0.0000 %	
	Discount Start Date 03/01/20	Discount End Date 02/28/22

Please see authorized signatures displayed on the next page

Each signatory below represents that the person has the requisite authority to enter into this Contract. The parties sign and cause this Contract to be executed.

State of Maine - Department of Administrative and Financial Services

DocuSigned by:
Jaime C. Schorr 3/3/2020
6D6437754DD0459

Signature Date

Jaime C. Schorr, Chief Procurement Officer

and

Lane Enterprises, Inc

DocuSigned by:
Craig R. Shearer 3/3/2020
5576AB9AC3BB4A1...

Signature Date

Craig Shearer, New England Area Manager

RIDERS

<input checked="" type="checkbox"/>	The following riders are hereby incorporated into this Contract and made part of it by reference: (check all that apply)
<input checked="" type="checkbox"/>	Rider A – Scope of Work and/or Specifications
<input checked="" type="checkbox"/>	Rider B – Terms and Conditions
<input type="checkbox"/>	Rider C - Exceptions
<input checked="" type="checkbox"/>	Bid Cover Page and Debarment Form – Appendix A from RFQ
<input checked="" type="checkbox"/>	Municipality Political Subdivision and School District Participation Certification – Appendix D from RFQ
<input checked="" type="checkbox"/>	Price sheet (attach excel spreadsheet to post on website)
<input checked="" type="checkbox"/>	Bid Product Information

RIDER A
Scope of Work and/or Specifications
MA 200204-106

Commodity: Culverts, HDPE DW and PP DW, Tri-State ME,NH,VT

Master Agreement Competitive Bid RFQ: 17A 200113-207 – Maine is the lead state.

Contract Period: Through February 28, 2022. The State of Maine with vendor approval can opt to issue up to two (2) one (1) year extensions.

Vendor Contact Person: The vendor contact person will help consumers place orders, inquire about orders that have not been delivered, all shipping issues, quality issues and any issues pertaining to the Master Agreement (MA) contract. All orders not submitted through a Delivery Order will be sent through the vendor contact person. The vendor contact person for this MA is:

Name: Craig Shearer **Tel:** 607-684-7410 **Email:** cshearer@lane-enterprses.com

Prices: Prices will be held firm for the contract period.

Freight Charges: The vendor will only charge actual freight costs from the vendor to the delivery point. Any using department or agency can request actual bills of lading or invoices from freight companies for freight charge verification. If there is an overcharge, the vendor will be required to refund the balance of the freight charge plus administrative costs.

Quantities: It is understood and agreed that the MA will cover the actual quantities required by the State over the length of the contract.

Ordering Procedures: Delivery Orders (DO) will be created in AdvantageME for all orders over \$5000.00. If a DO is used, the DO will be emailed to the email address referenced on the MA as a .pdf file. Orders less than \$5000.00 can be placed using a State of Maine issued P-Card (credit card).

Using Departments: All State of Maine Departments can utilize this Master Agreement Contract. The primary using department will be The Department of Transportation.

Shipping Points: The items covered by this MA may be requested for and expect to be shipped to any State of Maine owned facility. The primary delivery points will be in Scarborough, Augusta, Washington, Dixfield, Solon, Charleston, Jonesboro, Presque Isle

Delivery: The vendor is responsible for the delivery of material in first class condition at the point of delivery, and in accordance with good commercial practice. The State shall not bear any responsibility for the goods in question until the State takes possession of them at the destination point of delivery.

Delivery Times: All deliveries must be made during normal working hours. Generally this is to mean between 8:00 am and 3:00 pm.

Delivery Notification: The vendor must notify the ordering department minimally two (2) business days in advance of delivery. If there is a scheduled holiday the vendor must provide minimally three (3) business days notice. Each State has their own holiday schedule and the vendor is responsible for obtaining these schedules. Deliveries attempted to be made without the required notification can be rejected and the State will not be held responsible for the extra delivery charges. If delivery occurs after normal working hours, acceptance or rejection shall be at the convenience of the State.

Delivered Items Condition: The items being delivered must in good condition upon arrival. The State shall not bear any responsibility for the goods in question until the State takes possession of them at the destination point of delivery. The pipe will be accepted or rejected at the time of delivery. The unloading shall be a mutual effort between State and Supplier. The State will not be responsible for the costs of material or return shipping costs for items returned due to poor condition.

Specifications

HDPE CULVERTS AND STORM DRAINS

DESCRIPTION. The work shall consist of furnishing and delivering culverts and underdrains (as applicable) of the following type:

High Density Polyethylene Pipe

HDPE, (Corrugated) High Density Polyethylene Pipe, Type S (smoothlined) and Underdrains

MATERIALS.

- a) Corrugated (High Density) Polyethylene Pipe and fittings shall conform to the latest revisions of AASHTO M 294, Type S or AASHTO M 252, Type SP as appropriate, Attachment B, and be approved for use by MaineDOT, NH DOT, and VTrans.
- b) Connections for high density polyethylene pipe shall be of a bell and spigot type joint with an O-ring rubber gasket meeting ASTM F477 placed on the spigot end. At least two (2) corrugations of the spigot end must insert into the bell end.
- c) Pipe shall be supplied in 10' and 20' lengths.
- d) Marking. All pipe furnished shall be clearly marked in an approved manner with the name or trademark of the pipe fabricator

ATTACHMENT B											
CIRCULAR CULVERT PIPE (NOMINAL WALL THICKNESS IN INCHES)											
DIAMETER	CORRUGATED METAL PIPE				SPIRAL RIB TYPE 1R AND B		PLASTIC PIPE		REINFORCED CONCRETE PIPE		
	OPTION I		OPTION I & III		OPTION I	OPTION I & III	OPTION I & III	OPTION III	OPTION I & III		
	M218	M274 (A)	M246 & FIBER BONDED	M197	M274 (A)	M197	M294 DUAL WALL PIPE STIFFNESS @ 5% DEFL.	M278	M170 CLASS III WALL A	M170 CLASS III WALL B	M170 CLASS III WALL C
12"	0.079	0.064	0.064	0.075			1.354	0.358	1 3/4	2	
15"	0.079	0.064	0.064	0.075			1.138	0.438	1 1/8	2 1/4	
18"	0.109	0.079	0.079	0.075	0.079	0.106	1.087		2	2 1/2	
21"	0.109	0.079	0.079	0.075	0.079	0.106			2 1/4	2 3/4	
24"	0.109	0.079	0.079	0.075	0.079	0.106	0.921		2 1/2	3	3 3/4
27"	0.109	0.079	0.079	0.105					2 5/8	3 1/4	4
30"	0.109	0.079	0.079	0.105	0.110	0.134	0.760		2 3/4	3 1/2	4 1/4
33"	0.109	0.079	0.079	0.105					2 1/8	3 3/4	4 1/2
36"	0.109	0.079	0.079		0.110	0.134	0.594		3	4	4 3/4
36" (1)			0.079	0.075							
42"	0.138	0.109	0.109				0.551		3 1/2	4 1/2	5 1/4
42" (1)			0.079	0.105	0.110						
48"	0.138	0.109	0.109				0.492		4	5	5 3/4
48" (1)			0.079	0.105	0.110						
54"	0.168	0.138	0.138						4 1/2	5 1/2	6 1/4
54" (1)			0.079	0.105	0.110						
60"	0.168	0.138	0.138						5	6	6 3/4
60" (1)			0.079	0.105	0.110						
66" (1)			0.079	0.135					5 1/2	6 1/2	7 1/4
72" (1)			0.109	0.135					6	7	7 3/4
78" (1)			0.109	0.164						7 1/2	8 1/4
84" (1)			0.109	0.164						8	8 3/4

Metal Pipe values are for 2 2/3" x 1/2" Corrugations unless diameter is followed by (1) which requires 3" x 1" Corrugations for Aluminum Pipes and 3" x 1" or 5" x 1" Corrugations for Steel Pipes. Option I Pipes shall only be used for entrances. Fill heights over 15 Ft may require larger metal gages.

M218 = zinc coated (galvanized) corrugated steel pipe
M274 = aluminum coated (type 2) corrugated steel pipe
M246 = polymer pre-coated galvanized corrugated steel pipe
Fiber Bonded = M.D.O.T. Spec. 707.04
M197 = Corrugated Aluminum Alloy Pipe
M278 = Polyvinyl Chloride Pipe

M170 = Reinforced Concrete Pipe
M294 = High Density Polyethylene Pipe

(A) Option I, M274 can be used for closed drainage Option III Pipe
(B) Spiral Rib Type 1R can be used for Smoothlined Pipe

**ATTACHMENT C
COUPLING BAND WIDTH REQUIREMENTS**

Nominal Corrugation (Inches)	Nominal Pipe Inside Diameter	Coupling Band Width (Inches)			
		Annular Corrugated Bands		Helically Corrugated Bands	
		M 196	M 36	M 196	M 36
1 1/2 X 1/4	6	10 1/2	10 1/2	7	7
2 2/3 X 1/2	12 - 84	10 1/2	10 1/2		
3 X 1	30 - 84	12		12	
5 X 1	36 X 84		20		

Helically corrugated pipe 12" diameter and larger shall have the ends rerolled to provide at least two annular corrugations.

Pipe with spiral corrugations shall have continuous helical lock seams

M 196 = Corrugated Aluminum Alloy Pipe

M 36 = Corrugated Steel Pipe

TYPES B & C UNDERDRAIN PIPE

Metal Pipe				Plastic Pipe Stiffness @ 5% Deflection			
Nominal Wall Thickness (Inches)				PVC Pipe		Polyethylene Pipe	
Diameter	M 218	M 274 M 246	M 197	M 278	ASTM F 949	M 294 SP Dual-Wall Unanchor	M 252 SP Dual-Wall Unanchor
Type "B" 6	0.064	0.052	0.048	46	50		60
Type "C" 12	0.079	0.064	0.075	46		50	
15	0.079	0.064	0.075	46		42	
18	0.079	0.064	0.075			40	
21	0.079	0.064	0.075				
24	0.079	0.064	0.075			40	
30	0.109	0.079	0.105				
36	0.109	0.079	0.105				

Coated Steel Pipe	Equivalents (Inches)
18 Gage =	0.052
16 Gage =	0.064
14 Gage =	0.079
12 Gage =	0.109
10 Gage =	0.138
8 Gage =	0.168

Aluminum Pipe	Equivalents (Inches)
18 Gage =	0.048
16 Gage =	0.06
14 Gage =	0.075
12 Gage =	0.105
10 Gage =	0.135
8 Gage =	0.164

RIDER B
TERMS AND CONDITIONS

- 1. DEFINITIONS:** The following definitions are applicable to these standard terms and conditions:
 - a. The term “Buyer” or “State” shall refer to the Government of the State of Maine or a person representing the Government of the State of Maine.
 - b. The term “Department” or “DAFS” shall refer to the State of Maine Department of Administrative and Financial Services.
 - c. The term “Bureau” or “BGS” shall refer to the State of Maine Bureau of General Services.
 - d. The term “Division” shall refer to the State of Maine Division of Purchases.
 - e. The term “Contractor”, “Vendor”, or “Provider” shall refer to the organization that is providing goods and/or services through the contract to which these standard terms and conditions have been attached and incorporated.
 - f. The term “Contract” or “Agreement” shall refer to the contract document to which these standard terms and conditions apply, taking the format of a Buyer Purchase Order (BPO) or Master Agreement (MA) or other contractual document that is mutually agreed upon between the State and the Contractor.

- 2. WARRANTY:** The Contractor warrants the following:
 - a. That all goods and services to be supplied by it under this Contract are fit and sufficient for the purpose intended, and
 - b. That all goods and services covered by this Contract will conform to the specifications, drawing samples, symbols or other description specified by the Division, and
 - c. That such articles are merchantable, good quality, and free from defects whether patent or latent in material and workmanship, and
 - d. That all workmanship, materials, and articles to be provided are of the best grade and quality, and
 - e. That it has good and clear title to all articles to be supplied by it and the same are free and clear from all liens, encumbrances and security interest.

Neither the final certificate of payment nor any provision herein, nor partial nor entire use of the articles provided shall constitute an acceptance of work not done in accordance with this agreement or relieve the Contractor liability in respect of any warranties or responsibility for faulty material or workmanship. The Contractor shall remedy any defects in the work and pay any damage to other work resulting therefrom, which shall appear within one year from the date of final acceptance of the work provided hereunder. The Division of Purchases shall give written notice of observed defects with reasonable promptness.

3. TAXES: Contractor agrees that, unless otherwise indicated in the order, the prices herein do not include federal, state, or local sales or use tax from which an exemption is available for purposes of this order. Contractor agrees to accept and use tax exemption certificates when supplied by the Division as applicable. In case it shall ever be determined that any tax included in the prices herein was not required to be paid by Contractor, Contractor agrees to notify the Division and to make prompt application for the refund thereof, to take all proper steps to procure the same and when received to pay the same to the Division.

4. PACKING AND SHIPMENT: Deliveries shall be made as specified without charge for boxing, carting, or storage, unless otherwise specified. Articles shall be suitably packed to secure lowest transportation cost and to conform to the requirements of common carriers and any

applicable specifications. Order numbers and symbols must be plainly marked on all invoices, packages, bills of lading, and shipping orders. Bill of lading should accompany each invoice. Count or weight shall be final and conclusive on shipments not accompanied by packing lists.

5. DELIVERY: Delivery should be strictly in accordance with delivery schedule. If Contractor's deliveries fail to meet such schedule, the Division, without limiting its other remedies, may direct expedited routing and the difference between the expedited routing and the order routing costs shall be paid by the Contractor. Articles fabricated beyond the Division's releases are at Contractor's risk. Contractor shall not make material commitments or production arrangements in excess of the amount or in advance of the time necessary to meet delivery schedule, and, unless otherwise specified herein, no deliveries shall be made in advance of the Division's delivery schedule. Neither party shall be liable for excess costs of deliveries or defaults due to the causes beyond its control and without its fault or negligence, provided, however, that when the Contractor has reason to believe that the deliveries will not be made as scheduled, written notice setting forth the cause of the anticipated delay will be given immediately to the Division. If the Contractor's delay or default is caused by the delay or default of a subcontractor, such delay or default shall be excusable only if it arose out of causes beyond the control of both Contractor and subcontractor and without fault of negligence or either of them and the articles or services to be furnished were not obtainable from other sources in sufficient time to permit Contractor to meet the required delivery schedule.

6. FORCE MAJEURE: The State may, at its discretion, excuse the performance of an obligation by a party under this Agreement in the event that performance of that obligation by that party is prevented by an act of God, act of war, riot, fire, explosion, flood or other catastrophe, sabotage, severe shortage of fuel, power or raw materials, change in law, court order, national defense requirement, or strike or labor dispute, provided that any such event and the delay caused thereby is beyond the control of, and could not reasonably be avoided by, that party. The State may, at its discretion, extend the time period for performance of the obligation excused under this section by the period of the excused delay together with a reasonable period to reinstate compliance with the terms of this Agreement.

7. INSPECTION: All articles and work will be subject to final inspection and approval after delivery, notwithstanding prior payment, it being expressly agreed that payment will not constitute final acceptance. The Division of Purchases, at its option, may either reject any article or work not in conformity with the requirements and terms of this order, or re-work the same at Contractor's expense. The Division may reject the entire shipment where it consists of a quantity of similar articles and sample inspection discloses that ten (10%) percent of the articles inspected are defective, unless Contractor agrees to reimburse the Division for the cost of a complete inspection of the articles included in such shipment. Rejected material may be returned at Contractor's risk and expense at the full invoice price plus applicable incoming transportation charges, if any. No replacement of defective articles of work shall be made unless specified by the Division.

8. INVOICE: The original and duplicate invoices covering each and every shipment made against this order showing Contract number, Vendor number, and other essential particulars, must be forwarded promptly to the ordering agency concerned by the Vendor to whom the order is issued. Delays in receiving invoice and also errors and omissions on statements will be considered just cause for withholding settlement without losing discount privileges. All accounts are to be carried in the name of the agency or institution receiving the goods, and not in the name of the Division of Purchases.

9. ALTERATIONS: The Division reserves the right to increase or decrease all or any portion of the work and the articles required by the bidding documents or this agreement, or to eliminate all or any portion of such work or articles or to change delivery date hereon without invalidating this Agreement. All such alterations shall be in writing. If any such alterations are made, the contract amount or amounts shall be adjusted accordingly. In no event shall Contractor fail or refuse to continue the performance of the work in providing of articles under this Agreement because of the inability of the parties to agree on an adjustment or adjustments.

10. TERMINATION: The Division may terminate the whole or any part of this Agreement in any one of the following circumstances:

- a. The Contractor fails to make delivery of articles, or to perform services within the time or times specified herein, or
- b. If Contractor fails to deliver specified materials or services, or
- c. If Contractor fails to perform any of the provisions of this Agreement, or
- d. If Contractor so fails to make progress as to endanger the performance of this Agreement in accordance with its terms, or
- e. If Contractor is adjudged bankrupt, or if it makes a general assignment for the benefit of its creditors or if a receiver is appointed because of its insolvency, or
- f. Whenever for any reason the State shall determine that such termination is in the best interest of the State to do so.

In the event that the Division terminates this Agreement in whole or in part, pursuant to this paragraph with the exception of 8(f), the Division may procure (articles and services similar to those so terminated) upon such terms and in such manner as the Division deems appropriate, and Contractor shall be liable to the Division for any excess cost of such similar articles or services.

11. NON-APPROPRIATION: Notwithstanding any other provision of this Agreement, if the State does not receive sufficient funds to fund this Agreement and other obligations of the State, if funds are de-appropriated, or if the State does not receive legal authority to expend funds from the Maine State Legislature or Maine courts, then the State is not obligated to make payment under this Agreement.

12. COMPLIANCE WITH APPLICABLE LAWS: Contractor agrees that, in the performance hereof, it will comply with applicable laws, including, but not limited to statutes, rules, regulations or orders of the United States Government or of any state or political subdivision(s) thereof, and the same shall be deemed incorporated herein by reference. Awarding agency requirements and regulations pertaining to copyrights and rights in data. Access by the grantee, the subgrantee, the Federal grantor agency, the Comptroller General of the United States, or any of their duly authorized representatives to any books, documents, papers and records of the Contractor which are directly pertinent to that specific contract for the purpose of making audit, examination, excerpts, and transcriptions. Retention of all required records for three years after grantees or subgrantees make final payments and all other pending matters are closed. Compliance with all applicable standards, orders, or requirements issued under section 306 of the Clean Air Act (42 U.S.C. 1857(h), section 508 of the Clean Water Act, (33 U.S.C. 1368), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR part 15). (Contracts, subcontracts, and subgrants of amounts in excess of \$100,000). Mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with Energy Policy and Conservation Act (Pub. L. 94-163, 89 Stat. 871).

13. INTERPRETATION: This Agreement shall be governed by the laws of the State of Maine as to interpretation and performance.

14. DISPUTES: The Division will decide any and all questions which may arise as to the quality and acceptability of articles provided and installation of such articles, and as to the manner of performance and rate of progress under this Contract. The Division will decide all questions, which may arise as to the interpretation of the terms of this Agreement and the fulfillment of this Agreement on the part of the Contractor.

15. ASSIGNMENT: None of the sums due or to become due nor any of the work to be performed under this order shall be assigned nor shall Contractor subcontract for completed or substantially completed articles called for by this order without the Division's prior written consent. No subcontract or transfer of agreement shall in any case release the Contractor of its obligations and liabilities under this Agreement.

16. STATE HELD HARMLESS: The Contractor agrees to indemnify, defend, and save harmless the State, its officers, agents, and employees from any and all claims and losses accruing or resulting to any and all contractors, subcontractors, material men, laborers and other persons, firm or corporation furnishing or supplying work, services, articles, or supplies in connection with the performance of this Agreement, and from any and all claims and losses accruing or resulting to any person, firm or corporation who may be injured or damaged by the Contractor in the performance of this Agreement.

17. SOLICITATION: The Contractor warrants that it has not employed or written any company or person, other than a bona fide employee working solely for the Contractor to solicit or secure this Agreement, and it has not paid, or agreed to pay any company, or person, other than a bona fide employee working solely for the Contractor any fee, commission, percentage, brokerage fee, gifts, or any other consideration, contingent upon, or resulting from the award for making this Agreement. For breach or violation of this warranty, the Division shall have the absolute right to annul this agreement or, in its discretion, to deduct from the Agreement price or consideration, or otherwise recover the full amount of such fee, commission, percentage, brokerage fee, gifts, or contingent fee.

18. WAIVER: The failure of the Division to insist, in any one or more instances, upon the performance of any of the terms, covenants, or conditions of this order or to exercise any right hereunder, shall not be construed as a waiver or relinquishment of the future performance of any such term, covenant, or condition or the future exercise of such right, but the obligation of Contractor with respect to such future performance shall continue in full force and effect.

19. MATERIAL SAFETY: All manufacturers, importers, suppliers, or distributors of hazardous chemicals doing business in this State must provide a copy of the current Material Safety Data Sheet (MSDS) for any hazardous chemical to their direct purchasers of that chemical.

20. COMPETITION: By accepting this Contract, Contractor agrees that no collusion or other restraint of free competitive bidding, either directly or indirectly, has occurred in connection with this award by the Division of Purchases.

21. INTEGRATION: All terms of this Contract are to be interpreted in such a way as to be consistent at all times with this Standard Terms and Conditions document, and this document shall take precedence over any other terms, conditions, or provisions incorporated into the Contract.

Appendix A

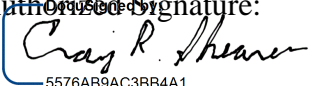
**STATE OF MAINE
DEPARTMENT OF ADMINISTRATIVE AND FINANCIAL SERVICES
DIVISION OF PROCUREMENT SERVICES**

BID COVER PAGE and DEBARMENT FORM

Bidder's Organization Name: Lane Enterprises, Inc.		
Chief Executive - Name/Title: Pat Collings - President		
Tel: (717)761-8175	Fax:	E-mail:
Headquarters Street Address: 3905 Hartzdale Dr.		
Headquarters City/State/Zip: Camp Hill, PA 17011		
<i>(provide information requested below if different from above)</i>		
Lead Point of Contact for Bid - Name/Title: Craig Shearer - New England Area Manager		
Tel: (607)684-7410	Fax:	E-mail: cshearer@lane-enterprises.com
Street Address: 825 Rte 67		
City/State/Zip: Ballston Spa, NY 12020		

By signing below Bidder affirms:

- Their bid complies with all requirements of this RFQ;
- This bid and the pricing structure contained herein will remain firm for a period of 180 days from the date and time of the bid opening;
- That no personnel currently employed by the Department or any other State agency participated, either directly or indirectly, in any activities relating to the preparation of the Bidder's proposal;
- That no attempt has been made or will be made by the Bidder to induce any other person or firm to submit or not to submit a proposal; and
- The undersigned is authorized to enter into contractual obligations on behalf of the above-named organization.

Name: Craig R. Shearer	Title: Area Manager
To have your bid accepted, this Appendix MUST have an actual wet signature or utilize DocuSign or Adobe Sign forms of electronic signature.	
Authorized Signature:  5576AB9AC3BB4A1...	Date: 1/28/20

Debarment, Performance, and Non-Collusion Certification

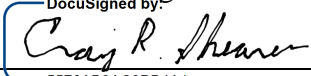
By signing this document, I certify to the best of my knowledge and belief that the aforementioned organization, its principals, and any subcontractors named in this proposal:

- a. Are not presently debarred, suspended, proposed for debarment, and declared ineligible or voluntarily excluded from bidding or working on contracts issued by any governmental agency.*
- b. Have not within three years of submitting the proposal for this contract been convicted of or had a civil judgment rendered against them for:

 - i. fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a federal, state or local government transaction or contract.*
 - ii. violating Federal or State antitrust statutes or committing embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;*
 - iii. are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or Local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and*
 - iv. have not within a three (3) year period preceding this proposal had one or more federal, state or local government transactions terminated for cause or default.**
- c. Have not entered into a prior understanding, agreement, or connection with any corporation, firm, or person submitting a response for the same materials, supplies, equipment, or services and this proposal is in all respects fair and without collusion or fraud. The above mentioned entities understand and agree that collusive bidding is a violation of state and federal law and can result in fines, prison sentences, and civil damage awards.*

- **Failure to provide this certification may result in the disqualification of the Bidder's proposal, at the discretion of the Department.**

To the best of my knowledge all information provided in the enclosed proposal, both programmatic and financial, is complete and accurate at the time of submission.

Name: Craig R. Shearer	Title: Area Manager
To have your bid accepted, this Appendix MUST have an actual wet signature or utilize Docu Sign or Adobe Sign forms of electronic signature.	
Authorized Signature: <small>DocuSigned by:</small>  <small>5576AB9AC3BB4A1...</small>	Date: 1/28/20

Appendix D

**STATE OF MAINE
DEPARTMENT OF ADMINISTRATIVE AND FINANCIAL SERVICES
DIVISION OF PROCUREMENT SERVICES**

**MUNICIPALITY POLITICAL SUBDIVISION and SCHOOL DISTRICT PARTICIPATION
CERTIFICATION**

**RFQ # 17A 200113-207
Culverts, Metal, HDPE, Reinforced HDPE, Tri-State ME, NH, VT**

The Division of Procurement Services is committed to providing purchasing opportunities for **municipalities, political subdivisions and school districts** in Maine by allowing them access, through our vendors, to our contract pricing. A bidder's willingness to extend contract pricing to these entities will be taken into consideration in making awards.

Will you accept orders from political subdivisions and school districts in Maine at the prices quoted?

Yes

Yes, with conditions as follows:

No

Name of Company:

Lane Enterprises, Inc.

Address:

825 Rte 67 Ballston Spa, NY 12020

Signature:

DocuSigned by:
Craig R. Shearer
5576AB9AC3BB4A1...

Date:

1/28/20

SUPPLIER PART NUMBER	SUPPLIER NAME	ITEM DESCRIPTION	EXTENDED DESCRIPTION	UNIT OF MEASURE	LIST PRICE	DELIVERY DAYS
HDIB000620SF	Lane Enterprises, Inc	Pipe HDPE, DW, Perf, N-12ST Bell/Spigot End,6 inch x 20 ft	High Density Polyethylene (HDPE), Dual Wall Perforated Storm	FT	1.81	15
HDIB000820SF	Lane Enterprises, Inc	Pipe HDPE, DW, Perf, N-12ST Bell/Spigot End,8 inch x 20 ft	High Density Polyethylene (HDPE), Dual Wall Perforated Storm	FT	3.03	15
HDIB001020SF	Lane Enterprises, Inc	Pipe HDPE, DW, Perf, N-12ST Bell/Spigot End,10 inch x 20 ft	High Density Polyethylene (HDPE), Dual Wall Perforated Storm	FT	4.05	15
HDIB001220SF	Lane Enterprises, Inc	Pipe HDPE, DW, Perf, N-12ST Bell/Spigot End,12 inch x 20 ft	High Density Polyethylene (HDPE), Dual Wall Perforated Storm	FT	4.68	15
HDIB001520SF	Lane Enterprises, Inc	Pipe HDPE, DW, Perf, N-12ST Bell/Spigot End,15 inch x 20 ft	High Density Polyethylene (HDPE), Dual Wall Perforated Storm	FT	6.43	15
HDIB001820SF	Lane Enterprises, Inc	Pipe HDPE, DW, Perf, N-12ST Bell/Spigot End,18 inch x 20 ft	High Density Polyethylene (HDPE), Dual Wall Perforated Storm	FT	8.63	15
HDIB002420SF	Lane Enterprises, Inc	Pipe HDPE, DW, Perf, N-12ST Bell/Spigot End,24 inch x 20 ft	High Density Polyethylene (HDPE), Dual Wall Perforated Storm	FT	13.88	15
HDIB003020SF	Lane Enterprises, Inc	Pipe HDPE, DW, Perf, N-12ST Bell/Spigot End,30 inch x 20 ft	High Density Polyethylene (HDPE), Dual Wall Perforated Storm	FT	21.09	15
HDIB003620SF	Lane Enterprises, Inc	Pipe HDPE, DW, Perf, N-12ST Bell/Spigot End,36 inch x 20 ft	High Density Polyethylene (HDPE), Dual Wall Perforated Storm	FT	26.41	15
HDIB004220SF	Lane Enterprises, Inc	Pipe HDPE, DW, Perf, N-12ST Bell/Spigot End,42 inch x 20 ft	High Density Polyethylene (HDPE), Dual Wall Perforated Storm Drainage 42 Inch Diameter, per AASHTO	FT	34.97	15
HDIB004820SF	Lane Enterprises, Inc	Pipe HDPE, DW, Perf, N-12ST Bell/Spigot End,48 inch x 20 ft	High Density Polyethylene (HDPE), Dual Wall Perforated Storm Drainage 48 Inch Diameter, per AASHTO	FT	41.85	15
HDIB006020SF	Lane Enterprises, Inc	Pipe HDPE, DW, Perf, N-12ST Bell/Spigot End,60 inch x 20 ft	High Density Polyethylene (HDPE), Dual Wall Perforated Storm Drainage 60 Inch Diameter, per AASHTO	FT	80.62	15
HDIB001220SP	Lane Enterprises, Inc	Pipe HDPE,DW,C-Perf,N-12ST Bell/Spigot End,12 inch x 20 ft	High Density Polyethylene (HDPE), Dual Wall (DW), C-Perf Pattern	FT	4.68	15
HDIB001520SP	Lane Enterprises, Inc	Pipe HDPE,DW,C-Perf,N-12ST Bell/Spigot End,15 inch x 20 ft	High Density Polyethylene (HDPE)	FT	6.43	15
HDIB001820SP	Lane Enterprises, Inc	Pipe HDPE,DW,C-Perf,N-12ST Bell/Spigot End,18 inch x 20 ft	High Density Polyethylene (HDPE)	FT	8.63	15
HDIB002420SP	Lane Enterprises, Inc	Pipe HDPE,DW,C-Perf,N-12ST Bell/Spigot End,24 inch x 20 ft	High Density Polyethylene (HDPE)	FT	13.88	15
HDIB003020SP	Lane Enterprises, Inc	Pipe HDPE,DW,C-Perf,N-12ST Bell/Spigot End,30 inch x 20 ft	High Density Polyethylene (HDPE)	FT	21.09	15
HDIB003620SP	Lane Enterprises, Inc	Pipe HDPE,DW,C-Perf,N-12ST Bell/Spigot End,36 inch x 20 ft	High Density Polyethylene (HDPE)	FT	26.41	15
HDIB004220SP	Lane Enterprises, Inc	Pipe HDPE,DW,C-Perf,N-12ST Bell/Spigot End,42 inch x 20 ft	High Density Polyethylene (HDPE)	FT	34.97	15
HDIB006020SP	Lane Enterprises, Inc	Pipe HDPE,DW,C-Perf,N-12ST Bell/Spigot End,60 inch x 20 ft	High Density Polyethylene (HDPE)	FT	80.62	15
HDPE001230S0	Lane Enterprises, Inc	Pipe-Drainage DW, Solid, N-12 Plain End, 12 inch x 30 ft	Dual Wall (DW)	FT	4.68	15
HDPE001530S0	Lane Enterprises, Inc	Pipe-Drainage DW, Solid, N-12 Plain End, 15 inch x 30 ft	Dual Wall (DW)	FT	6.43	15
HDPE001830S0	Lane Enterprises, Inc	Pipe-Drainage DW, Solid, N-12 Plain End, 18 inch x 30 ft	Dual Wall (DW)	FT	8.63	15
HDPE002430S0	Lane Enterprises, Inc	Pipe-Drainage DW, Solid, N-12 Plain End, 24 inch x 30 ft	Dual Wall (DW)	FT	13.88	15
HDPE003030S0	Lane Enterprises, Inc	Pipe-Drainage DW, Solid, N-12 Plain End, 30 inch x 30 ft	Dual Wall (DW)	FT	21.09	15
PPIB001220SF	Lane Enterprises, Inc	Pipe PP, DW, Perforated, 12 inch x 20 ft	Polypolyene Pipe, 12 Inch Diameter, Dual Wall, Perforated	FT	6.31	15
PPIB001520SF	Lane Enterprises, Inc	Pipe PP, DW, Perforated, 15 inch x 20 ft	Polypolyene Pipe, 15 Inch Diameter, Dual Wall, Perforated	FT	8.98	15
PPIB001820SF	Lane Enterprises, Inc	Pipe PP, DW, Perforated, 18 inch x 20 ft	Polypolyene Pipe, 18 Inch Diameter, Dual Wall, Perforated	FT	12.20	15
PPIB002420SF	Lane Enterprises, Inc	Pipe PP, DW, Perforated, 24 inch x 20 ft	Polypolyene Pipe, 24 Inch Diameter, Dual Wall, Perforated	FT	20.05	15
PPIB003020SF	Lane Enterprises, Inc	Pipe PP, DW, Perforated, 30 inch x 20 ft	Polypolyene Pipe, 30 Inch Diameter, Dual Wall, Perforated	FT	32.55	15
PPIB003620SF	Lane Enterprises, Inc	Pipe PP, DW, Perforated, 36 inch x 20 ft	Polypolyene Pipe, 36 Inch Diameter, Dual Wall, Perforated	FT	36.45	15
PPIB004220SF	Lane Enterprises, Inc	Pipe PP, DW, Perforated, 42 inch x 20 ft	Polypolyene Pipe, 42 Inch Diameter, Dual Wall, Perforated	FT	54.22	15
PPIB004820SF	Lane Enterprises, Inc	Pipe PP, DW, Perforated, 48 inch x 20 ft	Polypolyene Pipe, 48 Inch Diameter, Dual Wall, Perforated	FT	58.66	15
PPIB006020SF	Lane Enterprises, Inc	Pipe PP, DW, Perforated, 60 inch x 20 ft	Polypolyene Pipe, 60 Inch Diameter, Dual Wall, Perforated	FT	98.94	15
PPIB001220S0	Lane Enterprises, Inc	Pipe PP, DW, Unperforated, 12 inch x 20 ft	Polypolyene Pipe, 12 Inch Diameter, Dual Wall, Unperforated	FT	6.31	15
PPIB001520S0	Lane Enterprises, Inc	Pipe PP, DW, Unperforated, 15 inch x 20 ft	Polypolyene Pipe, 15 Inch Diameter, Dual Wall, Unperforated	FT	8.98	15
PPIB001820S0	Lane Enterprises, Inc	Pipe PP, DW, Unperforated, 18 inch x 20 ft	Polypolyene Pipe, 18 Inch Diameter, Dual Wall, Unperforated	FT	12.20	15
PPIB002420S0	Lane Enterprises, Inc	Pipe PP, DW, Unperforated, 24 inch x 20 ft	Polypolyene Pipe, 24 Inch Diameter, Dual Wall, Unperforated	FT	20.05	15
PPIB003020S0	Lane Enterprises, Inc	Pipe PP, DW, Unperforated, 30 inch x 20 ft	Polypolyene Pipe, 30 Inch Diameter, Dual Wall, Unperforated	FT	32.55	15
PPIB003620S0	Lane Enterprises, Inc	Pipe PP, DW, Unperforated, 36 inch x 20 ft	Polypolyene Pipe, 36 Inch Diameter, Dual Wall, Unperforated	FT	36.45	15
PPIB004220S0	Lane Enterprises, Inc	Pipe PP, DW, Unperforated, 42 inch x 20 ft	Polypolyene Pipe, 42 Inch Diameter, Dual Wall, Unperforated	FT	54.22	15
PPIB004820S0	Lane Enterprises, Inc	Pipe PP, DW, Unperforated, 48 inch x 20 ft	Polypolyene Pipe, 48 Inch Diameter, Dual Wall, Unperforated	FT	58.66	15
PPIB006020S0	Lane Enterprises, Inc	Pipe PP, DW, Unperforated, 60 inch x 20 ft	Polypolyene Pipe, 60 Inch Diameter, Dual Wall, Unperforated	FT	98.94	15
HDCP06	Lane Enterprises, Inc	Coupler, Split Band 6 inch	6 Inch Diameter	EA	4.51	15
HDCP12	Lane Enterprises, Inc	Coupler, Split Band 12 inch	12 Inch Diameter	EA	7.40	15

HDCP15	Lane Enterprises, Inc	Coupler, Split Band 15 inch	15 Inch Diameter	EA	10.25	15
HDCP18	Lane Enterprises, Inc	Coupler, Split Band 18 inch	18 Inch Diameter	EA	16.35	15
HDCP24	Lane Enterprises, Inc	Coupler, Split Band 24 inch	24 Inch Diameter	EA	22.90	15
HDCP30	Lane Enterprises, Inc	Coupler, Split Band 30 inch	30 Inch Diameter	EA	55.25	15



CMP SPECIFICATION GUIDE

PIPE MATERIAL

There are several ASTM specifications (AASHTO equivalents in parenthesis) used to identify the different CMP materials. Each specification makes provisions for the different corrugations and metal thicknesses available for CMP. Using height of cover tables the design engineer can relate the pipe size, corrugation and metal thickness to the varied structural and hydraulic parameters for the application. Each of the pipe specifications also makes use of an analogous classification system as follows:

Type I Round Pipe with Exterior and Interior Corrugations

Type IR Round Pipe with a Smooth Interior (i.e. Spiral Rib Pipe)

TYPE II Type I Pipe Reformed into a Pipe-Arch

Type IIR Type IR Pipe Reformed into a Pipe-Arch

Type III Type I Pipe with Class 1 or Class 2 Perforations

Once the pipe type, size, corrugation and metal thickness is determined the engineer can cite the desired ASTM standard to completely specify the piping material of choice:

Specify ASTM A760 (AASHTO M36) for a galvanized or aluminized coated steel pipe

Specify ASTM A849 (AASHTO M190) for asphalt-coated galvanized ASTM A760 pipe

Specify ASTM A762 (AASHTO M245) for a polymer-coated galvanized steel pipe

Specify ASTM B745 (AASHTO M196) for corrugated aluminum alloy pipe

Please refer to the *CMP Service Life Guide* for information and methods qualifying the selection of the appropriate corrugated steel pipe product.

PERFORATED PIPE

ASTM A760, A762 and B745 use a parallel classification system for perforated pipe depending on whether fully or partially (standard) perforated pipe is desired. Inherent in the classification systems are the size, spacing and placement of the perforations. Class 2 perforations provide a minimum open area of 3.3 in²/ft² of pipe surface.

Specify Class 1 perforations for partially perforated pipe to be used for subsurface drainage

Specify Class 2 perforations for fully perforated pipe to be used for subsurface disposal

JOINT PERFORMANCE

Each of the above-mentioned pipe standards also provides corresponding joint performance criteria based upon the ability of the joining system to control leakage and/or material infiltration.

Soil Tight¹ - resists infiltration of soil particles larger than those passing a No. 200 Sieve

Silt Tight – resists infiltration of soil particles equivalent to an apparent opening size (AOS) of 70

Leak Resistant - leakage limited to 200 gal/in-dia/mile/day at a defined pressure head from 0-25ft

Special Design - zero leakage for 10 min at a defined pressure head from 10-25ft in a laboratory setting

¹Soil tight joints are the default criteria for joint performance and will be used unless otherwise specified.

PIPE JOINING SYSTEMS

Typical joining systems included in the pipe standards involve wrap-around type metal bands with appropriate connecting hardware. Depending on the pipe size the connecting bands may be a one or two-piece assembly. Since pipe corrugations are typically helical the pipe standards allow the pipe ends to be reformed into annular corrugations to better engage certain coupling bands. The annular corrugated ends are reformed with a 2 $\frac{2}{3}$ "x $\frac{1}{2}$ " corrugation. Some of the more common connecting bands include the following:



CMP SPECIFICATION GUIDE

Corrugated Bands - annular corrugated bands for pipe with annular corrugated ends
 Partially Corrugated Bands - flat bands with one annular corrugation along each edge
 Dimple Bands - bands with dimple projections in annular rows
 Flat Bands - bands with no corrugations or projections

Specify plain metal connecting bands (i.e. no fabric or gasket) for soil tight performance
Specify metal connecting bands with a fabric wrap for silt tight performance
Specify metal bands with an ASTM D1056 gasket for leak resistant and special design joints

CMP INSTALLATION

Corrugated metal pipe (CMP) is a flexible pipe material that derives structural rigidity from the strength and relative stiffness of the backfill envelope. The backfill-culvert interaction attained defines the ability of CMP to withstand service loads. Installation specifications illustrating backfill envelopes, addressing appropriate backfill material selection, and identifying proper compaction guidelines help ensure acceptable levels of backfill-culvert interaction are realized:

ASTM A798 Practice for Installing Factory-Made Corrugated Steel Pipe for Sewers
 ASTM B788 Practice for Installing Factory-Made Corrugated Aluminum Culverts and Storm Sewer Pipe
 AASHTO LRFD Bridge Construction Specifications, Section 26, Metal Culverts
 AREMA Manual for Railway Engineering, Section 4.12, Assembly and Installation of Pipe Culverts

CMP STRUCTURAL DESIGN

Standard methods of structural analysis are generally based on research adopted by AASHTO. Standards with slight variations have also been adopted by ASTM. The railway industry, represented by AREMA, maintains distinct material and design standards to ensure railway live loading (E80) and its effects are appropriately managed. The following standards are listed with the qualifying remark that the AASHTO method is, for all intents and purposes, used exclusively outside railway applications.

ASTM A796 Practice for Structural Design of Corrugated Steel Pipe, Pipe-Arches, and Arches for Storm and Sanitary Sewers and Other Buried Applications
 ASTM B790 Practice for Structural Design of Corrugated Aluminum Pipe, Pipe-Arches, and Arches for Culverts, Storm Sewers, and Other Buried Conduits
 ASTM A998 Practice for Structural Design of Reinforcements for Fittings in Factory-Made Corrugated Steel Pipe for Sewers and Other Applications
 AREMA Manual for Railway Engineering, Section 4.9, Design Criteria for Corrugated Metal Pipes
 AASHTO LRFD Bridge Design Specifications, Section 3, Loads and Load Factors
 AASHTO LRFD Bridge Design Specifications, Section 12, Buried Structures and Tunnel Liners

CMP SPECIFICATION EXAMPLE

Pipe shall be a 16 Gage 48-in Diameter Aluminized-Coated Corrugated Steel Pipe with a 2 $\frac{3}{8}$ "x $\frac{1}{2}$ " corrugation in accordance with ASTM A760 for Type I pipe. Pipe joints shall meet the soil tight performance criteria of ASTM A760 and installation shall conform to Section 26 of the AASHTO LRFD Bridge Construction Specifications.

SUPPLEMENTAL PUBLICATIONS

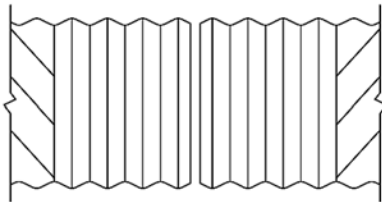
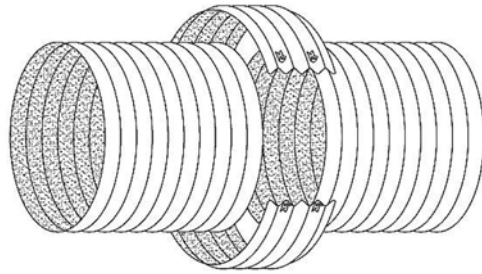
NCSPA Corrugated Steel Pipe Design Manual
 NCSPA Service Life Selection Guide (www.ncspa.org)
 AREMA Manual for Railway Engineering, Section 4, Culverts



CMP CONNECTION GUIDE

PIPE JOINING SYSTEMS

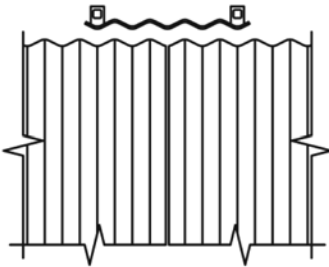
Standard pipe joining systems involve wrap-around style metal bands with connecting hardware. Connecting bands change from a one-piece to a two-piece assembly beginning with 60-in diameter CMP.



Pipe corrugations are helically formed but pipe standards allow the pipe ends to be reformed into annular corrugations to better engage certain coupling bands. Regardless of the actual pipe corrugation used the annular corrugated ends are reformed with a $2\frac{3}{8}$ " x $\frac{1}{2}$ " corrugation.

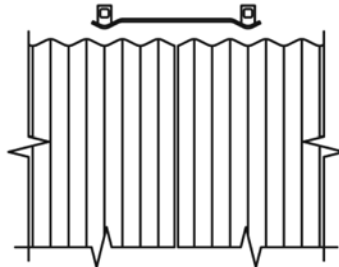
CORRUGATED BANDS

Annular corrugated bands are available in nominal widths of 7, 12 and 24 inches.



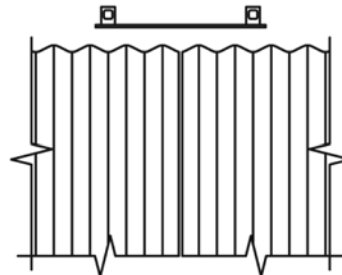
PARTIALLY CORRUGATED BANDS

Flat bands with one annular corrugation along each edge are available in nominal widths of 7 and 12 inches.

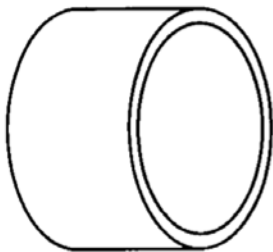


FLAT BANDS

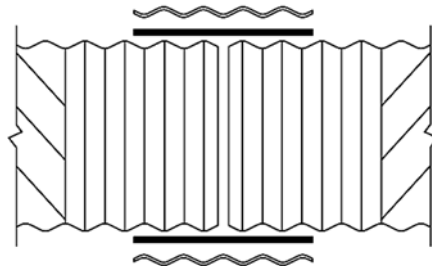
Bands with no corrugations or projections are available in nominal widths of 7, 12 and 24 inches.



Dimple Bands (not shown) are bands with dimple projections in annular rows. Along with flat bands they may be used on pipe with helical ends (i.e. ends that have not been reformed with annular corrugations). Dimple bands are available for 12 through 54 inch CMP.



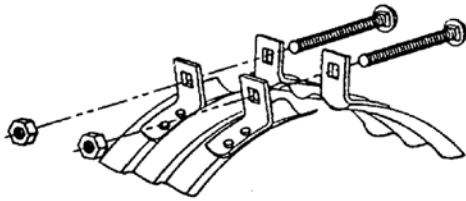
Sleeve Gaskets are typically a $\frac{3}{8}$ " thick neoprene material. The gaskets slide over the pipe ends and underlay the connecting band to enhance the leak resistance quality of the joint. Sleeve gaskets are available in 7, 12 and 24 inch widths.





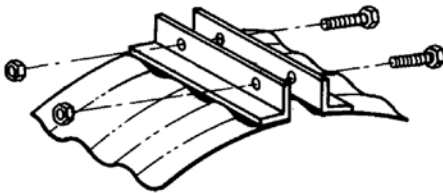
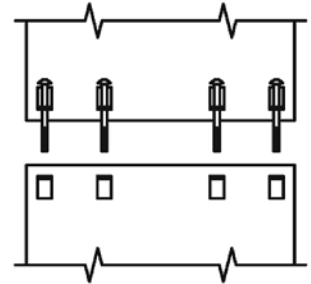
CMP CONNECTION GUIDE

Connecting Band Hardware is available in the different configurations shown below:



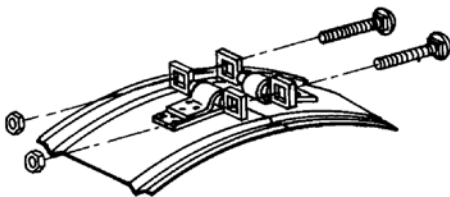
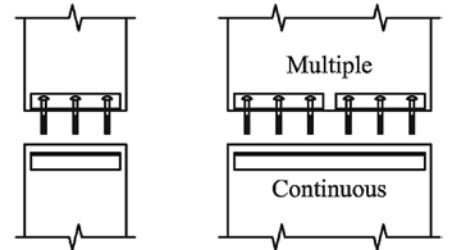
STANDARD LUG CONNECTOR

Assembly typically uses the dual lug configuration (left). The multiple lug configuration (right) is for 24-in wide bands.



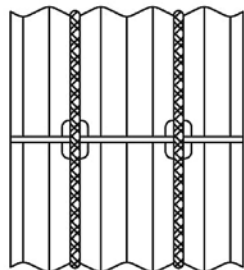
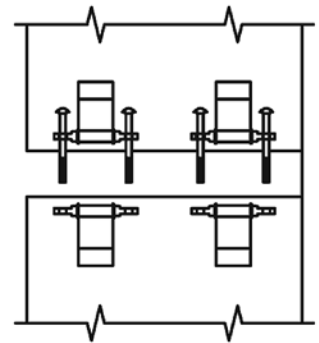
ANGLE CONNECTOR

Assembly uses the two-bolt configuration for 7-in bands (left), a three-bolt configuration for 12-in bands (right), and a six-bolt configuration for 24-in bands (far right).



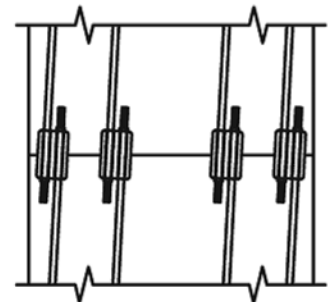
BAR AND STRAP CONNECTOR

Assembly typically consists of the single-strap configuration (left). The multi-strap configuration (right) can be used for 12-in wide bands when specified.



ROD & LUG (1/2" Ø SILO ROD & LUG)

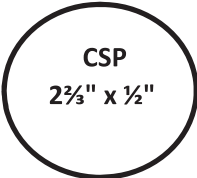
Assembly typically consists of the dual rod configuration (left), and may be used on corrugated and partially corrugated bands. The multiple rod configuration (right) is used for 24-in corrugated bands only.



The AASHTO live load vehicle is either the **design truck** (two 32,000 pound axles spaced 14-ft apart) or the **design tandem** (two 25,000 pound axles spaced 4-ft apart). The vehicle that produces the greater pressure at the depth investigated is used for design. The design truck is commonly known as the HS20 truck.



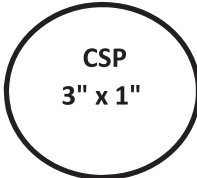
Corrugated Steel Pipe (CSP)
AASHTO LRFD Cover Heights
 Soil density 120 pcf



Diameter (in)	Min Cover (ft)	Maximum Cover Height (ft)				
		16ga	14ga	12ga	10ga	8ga
12	1.00	218	272	382		
15	1.00	174	218	305		
18	1.00	145	181	254	327	
21	1.00	124	155	218	280	
24	1.00	108	136	190	245	
30	1.00	87	108	152	196	
36	1.00	72	90	127	163	
42	1.00	62	77	108	140	171
48	1.00	54	67	95	122	150
54	1.00		60	84	109	133
60	1.00			76	98	120
66	1.00				89	109
72	1.00				81	99
78	1.00					88
84	1.00					76



Corrugated Steel Pipe (CSP)
AASHTO LRFD Cover Heights
 Soil density 120 pcf

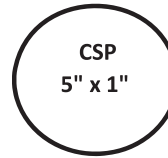


Diameter (in)	Min Cover (ft)	Maximum Cover Height (ft)				
		16ga	14ga	12ga	10ga	8ga
48	1.00	62	78	109	141	173
54	1.00	55	69	97	125	153
60	1.00	49	62	87	112	138
66	1.00	45	56	79	102	125
72	1.00	41	51	72	94	115
78	1.00	38	47	67	86	106
84	1.00	35	44	62	80	98
90	1.00	32	41	58	75	92
96	1.00		38	54	70	86
102	1.06		36	51	66	81
108	1.13			48	62	76
114	1.19			45	59	72
120	1.25			43	56	68
126	1.31				53	65
132	1.38				51	62
138	1.44				48	59
144	1.50					57

¹Minimum cover for 14ga and heavier. The 16ga minimum cover for 90" is 1.1-ft.



Corrugated Steel Pipe (CSP)
AASHTO LRFD Cover Heights
Soil density 120 pcf

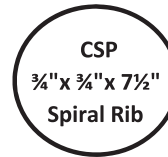


Diameter (in)	Min Cover (ft)	Maximum Cover Height (ft)				
		16ga	14ga	12ga	10ga	8ga
48	1.00	55	69	97	125	153
54	1.00	49	61	86	111	136
60	1.00	44	55	78	100	123
66	1.00	40	50	70	91	111
72	1.00	36	46	64	83	102
78	1.00	33	42	59	77	94
84	¹ 1.00	31	39	55	71	87
90	¹ 1.00	29	36	51	66	81
96	1.00		34	48	62	76
102	1.06		32	45	58	72
108	1.13			43	55	68
114	1.19			40	52	64
120	1.25			38	50	61
126	1.31				47	58
132	1.38				45	55
138	1.44				43	53
144	1.50					50

¹Minimum covers for 14ga and heavier. The respective 16ga minimum covers for 84" and 90" are 1.1 and 1.2-ft.



Corrugated Steel Pipe (CSP)
AASHTO LRFD Cover Heights
Soil density 120 pcf



Diameter (in)	Min Cover (ft)	Maximum Cover Height (ft)			
		16ga	14ga	12ga	10ga
15	1.00	114	160		
18	1.00	95	133	222	
21	1.00	81	114	190	
24	1.00	71	100	166	
30	1.00	57	80	133	
36	1.00	47	66	111	
42	1.00	40	57	95	
48	1.00	35	49	83	
54	¹ 1.00	² 31	44	73	
60	1.00		39	66	96
66	1.00		² 36	60	87
72	1.00			55	80
78	1.00			50	74
84	1.00			² 47	68
90	1.00				64
96	1.00				² 59
102	1.06				² 52

¹Minimum cover for 14ga and heavier. The 16ga minimum cover for 54" is 1.1-ft.
²Trench installation only. Embankment installations may be used for the heavier gages.



Corrugated Steel Pipe (CSP)
AASHTO LRFD Cover Heights
Corner bearing capacity 4 ksf
Soil density 120 pcf

CSP Pipe-Arch
2 $\frac{2}{3}$ " x $\frac{1}{2}$ "

Span x Rise (in)	Equiv Dia (in)	Min Gage	Min Cover (ft)	Max Cover (ft)
17 x 13	15	16	1.9	12
21 x 15	18	16	2.0	12
24 x 18	21	16	1.9	12
28 x 20	24	16	2.0	12
35 x 24	30	16	2.0	12
42 x 29	36	16	2.0	12
49 x 33	42	14	2.0	12
57 x 38	48	12	2.0	11
64 x 43	54	12	2.0	11
71 x 47	60	10	2.0	11
77 x 52	66	8	2.0	12
83 x 57	72	8	2.0	12



Corrugated Steel Pipe (CSP)
AASHTO LRFD Cover Heights
Corner bearing capacity 4 ksf
Soil density 120 pcf

CSP Pipe-Arch
3" x 1"

Span x Rise (in)	Equiv Dia (in)	Min Gage	Min Cover (ft)	Max Cover (ft)
53 x 41	48	14	2.0	11
60 x 46	54	14	2.0	20
66 x 51	60	14	1.2	20
73 x 55	66	14	1.2	20
81 x 59	72	14	1.5	16
87 x 63	78	14	1.5	16
95 x 67	84	14	1.5	16
103 x 71	90	14	1.5	16
112 x 75	96	12	1.5	16
117 x 79	102	12	1.5	16
128 x 83	108	10	1.5	16
137 x 87	114	10	1.6	16
142 x 91	120	10	1.6	16

¹Manufacturing limitations include a 14 gage minimum for 3" x 1" Pipe-Arch



Corrugated Steel Pipe (CSP)
AASHTO LRFD Cover Heights
Corner bearing capacity 4 ksf
Soil density 120 pcf

CSP Pipe-Arch
5" x 1"

Span x Rise (in)	Equiv Dia (in)	¹ Min Gage	Min Cover (ft)	Max Cover (ft)
53 x 41	48	12	2.0	11
60 x 46	54	12	1.2	20
66 x 51	60	12	1.2	20
73 x 55	66	12	1.2	20
81 x 59	72	12	1.5	16
87 x 63	78	12	1.5	16
95 x 67	84	12	1.5	16
103 x 71	90	12	1.5	16
112 x 75	96	12	1.5	16
117 x 79	102	12	1.5	16
128 x 83	108	10	1.5	16
137 x 87	114	10	1.6	16
142 x 91	120	10	1.6	16

¹Manufacturing limitations include a 12 gage minimum for 5" x 1" Pipe-Arch



Corrugated Steel Pipe (CSP)
AASHTO LRFD Cover Heights
Corner bearing capacity 4 ksf
Soil density 120 pcf

CSP Pipe-Arch
¾" x ¾" x 7½"
Spiral Rib Pipe

¹ Span x Rise (in)	Equiv Dia (in)	Min Gage	Min Cover (ft)	Max Cover (ft)
20 x 16	18	16	1.6	15
23 x 19	21	16	1.7	14
27 x 21	24	16	1.8	13
33 x 26	30	16	1.8	13
40 x 31	36	16	1.9	13
46 x 36	42	16	1.8	13
53 x 41	48	² 16	1.9	13
60 x 46	54	14	1.3	20
66 x 51	60	² 14	1.3	20
73 x 55	66	12	1.3	20
81 x 59	72	² 12	1.5	16
87 x 63	78	10	1.5	16
95 x 67	84	10	1.5	16
103 x 71	90	² 10	1.5	16

¹ASTM A760 makes provisions for two additional sizes: 112" x 75" and 117" x 79".

²Trench installation only. Embankment installations may be used for the heavier gages.



Corrugated Aluminum Alloy Pipe (CAAP)
 For Alclad Alloy 3004-H32 ($F_u = 27$ ksi, $F_y = 20$ ksi)
 AASHTO LRFD Cover Heights
 Soil density 120 pcf

CAAP
 2 3/8" x 1/2"

Diameter (in)	Min Cover (ft)	Maximum Cover Height (ft)				
		16ga	14ga	12ga	10ga	8ga
12	1.00	132				
15	1.00	105	132			
18	1.00	88	110	154		
21	1.00	75	94	132		
24	1.00	65	82	115		
30	1.00		65	92		
36	1.00		54	76	99	121
42	1.00			65	84	103
48	1.00			57	74	90
54	1.00			50	65	80
60	1.00				54	68
66	1.00					56
72	1.00					45



Corrugated Aluminum Alloy Pipe (CAAP)
 For Alclad Alloy 3004-H32 ($F_u = 27$ ksi, $F_y = 20$ ksi)
 AASHTO LRFD Cover Heights
 Soil density 120 pcf

CAAP
 3" x 1"

Diameter (in)	Min Cover (ft)	Maximum Cover Height (ft)				
		16ga	14ga	12ga	10ga	8ga
30	1.00	60	76			
36	1.00	50	63	88		
42	1.00	43	54	75		
48	1.00	37	47	66	88	104
54	1.00	33	42	58	78	93
60	1.00	29	37	52	71	83
66	1.00	27	34	48	64	76
72	1.00	24	31	44	59	69
78	1.00		28	40	54	64
84	1.00			37	50	59
90	1.00			35	47	55
96	1.00			32	44	52
102	1.06				41	49
108	1.13				38	46
114	1.19					42
120	1.25					38

¹Minimum cover for 14ga and heavier. The 16ga minimum covers for 54", 60" and 66" are 1.1, 1.2 and 1.3-ft, respectively.
²Minimum cover for 12ga and heavier. The 16ga and 14ga minimum covers are 1.4 and 1.1-ft, respectively.
³Minimum cover for 12ga and heavier. The 14ga minimum cover is 1.2-ft.



Corrugated Aluminum Alloy Pipe (CAAP)
 For Alclad Alloy 3004-H32 ($F_u = 27$ ksi, $F_y = 20$ ksi)
 AASHTO LRFD Cover Heights
 Soil density 120 pcf

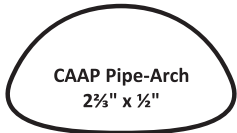
CAAP
 3/4" x 3/4" x 7 1/2"
 Spiral Rib

Diameter (in)	Min Cover (ft)	Maximum Cover Height (ft)			
		16ga	14ga	12ga	10ga
15	1.00	56	77		
18	1.00	46	64		
21	1.00	40	55		
24	1.00	34	48	77	
30	1.25	27	38	62	
36	1.50	² 22	31	51	
42	1.75		² 27	44	
48	2.00			38	54
54	2.00			34	48
60	2.00			³ 30	43
66	2.00				39
72	2.18				³ 36

¹ASTM B745 makes provisions for two additional sizes, 78" and 84".
²Trench installation only. Embankment installations may be used for the heavier gages (10 gage max).



Corrugated Aluminum Alloy Pipe (CAAP)
 For Alclad Alloy 3004-H32 ($F_u = 27$ ksi, $F_v = 20$ ksi)
AASHTO LRFD Cover Heights
 Corner bearing capacity 4 ksf
 Soil density 120 pcf

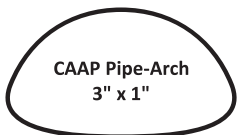


'Span x Rise (in)	Equiv Dia (in)	Minimum Gage	Minimum Cover (ft)	Maximum Cover (ft)
17 x 13	15	16	1.9	12
21 x 15	18	16	2.0	12
24 x 18	21	16	1.9	12
28 x 20	24	14	2.0	12
35 x 24	30	14	2.0	12
42 x 29	36	12	2.0	12
49 x 33	42	12	2.0	12
57 x 38	48	10	2.0	11
64 x 43	54	10	2.0	11
71 x 47	60	8	2.0	11

¹ASTM B745 makes provisions for two additional larger sizes: 77"x 52" and 83"x 57".



Corrugated Aluminum Alloy Pipe (CAAP)
 For Alclad Alloy 3004-H32 ($F_u = 27$ ksi, $F_v = 20$ ksi)
AASHTO LRFD Cover Heights
 Corner bearing capacity 4 ksf
 Soil density 120 pcf

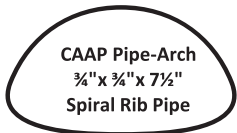


'Span x Rise (in)	Equiv Dia (in)	Minimum Gage	Minimum Cover (ft)	Maximum Cover (ft)
53 x 41	48	16	2.0	11
60 x 46	54	16	1.3	20
66 x 51	60	16	1.3	20
73 x 55	66	14	1.3	20
81 x 59	72	12	1.5	16
87 x 63	78	12	1.5	16
95 x 67	84	12	1.5	16
103 x 71	90	10	1.5	16
112 x 75	96	8	1.6	15
117 x 79	102	8	1.6	16

¹ASTM B745 makes provisions for three additional larger sizes: 128"x 83", 137"x 87" and 142"x 91".



Corrugated Aluminum Alloy Pipe (CAAP)
 For Alclad Alloy 3004-H32 ($F_u = 27$ ksi, $F_v = 20$ ksi)
AASHTO LRFD Cover Heights
 Corner bearing capacity 4 ksf
 Soil density 120 pcf



'Span x Rise (in)	Equiv Dia (in)	Minimum Gage	Minimum Cover (ft)	Maximum Cover (ft)
20 x 16	18	16	1.6	15
23 x 19	21	16	1.7	14
27 x 21	24	16	1.8	13
33 x 26	30	16	1.8	13
40 x 31	36	14	1.9	13
46 x 36	42	² 14	1.9	13
53 x 41	48	12	2.0	13
60 x 46	54	² 12	2.0	20
66 x 51	60	10	2.0	20
73 x 55	66	² 10	2.2	20

¹ASTM B745 makes provisions for one additional size, 81"x 59".
²Trench installation only. Embankment installations may be used for the heavier gages (10 gage max).

Corrugated Steel Pipe (Galvanized and Aluminized)

Approximate Handling Weights by Gage (lbs/ft)

Corrugation	Dia. (in)	18 Gage	16 Gage	14 Gage	12 Gage	10 Gage	8 Gage
1½"x ¼"	6	4	5				
	8	5	6				
	10	7	8				
2½"x ½"	12	8	10	12	16		
	15	10	12	15	20		
	18	12	15	18	24		
	21	14	17	21	29		
	24	15	19	24	33	41	
	27		22	27	37	47	
	30		24	30	41	52	
	36		29	36	49	62	75
	42		34	42	57	72	87
	48		38	48	65	82	100
	54			54	73	92	112
	60				81	103	124
	66				89	113	137
72					123	149	
78						161	
5"x 1"	48		39	48	65	83	100
	54		44	54	73	93	114
	60		48	59	81	104	126
	66		53	65	89	114	138
	72		58	71	97	123	150
	78		62	77	105	134	163
	84		68	83	113	144	175
	90		72	88	121	154	187
	96		77	94	129	165	201
	102		82	100	136	174	212
	108			106	145	186	225
	114			112	153	195	238
	120				161	206	250
126				172	217	263	
132				180	228	276	
138				187	238	289	
144					248	303	
¾"x ¾"x 7½"	15		13	16			
	18		15	19	26		
	21		18	22	30		
	24		20	25	34		
	27		22	27	38		
	30		25	30	42		
	33		27	33	46		
	36		30	36	50		
	42		34	42	58		
	48		39	48	66	83	
	54		44	54	74	94	
	60		49	60	82	104	
	66			66	90	114	
	72			72	99	124	
	78			78	107	135	
	84				115	145	
	90				123	155	
96				131	165		
102				139	176		
108					186		
114					196		
120					206		

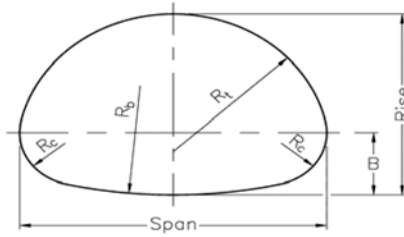
Corrugated Aluminum Alloy Pipe

Approximate Handling Weights by Gage (lbs/ft)

Corrugation	Dia. (in)	16 Gage	14 Gage	12 Gage	10 Gage	8 Gage
2 $\frac{2}{3}$ "x 1 $\frac{1}{2}$ "	12	3.2	4.0	5.5		
	15	3.9	4.9	6.8		
	18	4.7	5.9	8.1		
	21	5.4	6.8	9.4		
	24	6.2	7.8	10.7	13.8	
	27	7.0	8.7	12.1	15.4	
	30	7.8	9.6	13.4	17.1	
	36		11.5	16.0	20.5	
	42			18.6	23.8	
	48			21.2	27.2	32.7
	54			23.8	30.5	36.7
	60				33.9	40.8
	66				37.2	44.8
	72					48.8
	78					52.9
	84					56.9
3"x 1"	30	8.9	11.2	15.5	19.9	
	36	10.7	13.4	18.5	23.7	
	42	12.4	15.5	21.5	27.5	
	48	14.1	17.7	24.5	31.4	37.8
	54	15.8	19.9	27.5	35.2	42.4
	60	17.6	22.0	30.5	39.0	47.0
	66	19.3	24.2	33.5	42.9	51.7
	72		26.3	36.5	46.7	56.2
	78		28.5	39.5	50.5	60.8
	84		30.7	42.5	54.3	65.4
	90			45.4	58.2	70.0
	96			48.4	62.0	74.6
	102			51.4	65.8	79.3
	108			54.4	69.7	83.9
114			57.4	73.5	88.5	
120			60.4	77.3	93.1	
3 $\frac{3}{4}$ "x 3 $\frac{3}{4}$ "x 7 $\frac{1}{2}$ "	15	4.1	5.1			
	18	4.9	6.1			
	21	5.7	7.1			
	24	6.5	8.0	11.0		
	27	7.2	9.0	12.5		
	30	8.0	10.0	13.9		
	33	8.8	10.9	15.2		
	36	9.6	11.9	16.6		
	42	11.3	14.0	19.3		
	48		15.9	22.0	28.2	
	54		17.9	24.7	31.7	
	60			27.4	35.1	
	66			30.1	38.6	
	72			32.9	42.0	
78				45.4		
84				48.6		



CORRUGATED METAL PIPE (CMP)
PIPE-ARCH SIZES AND LAYOUT DETAILS



Pipe-Arch with 2 $\frac{2}{3}$ " x 1 $\frac{1}{2}$ " Corrugations

Equivalent Diameter (in)	Design		Waterway				
	Span (in)	Rise (in)	Area (ft ²)	B (in)	R _c (in)	R _t (in)	R _b (in)
15	17	13	1.1	4 $\frac{7}{8}$	3 $\frac{1}{2}$	8 $\frac{7}{8}$	25 $\frac{3}{8}$
18	21	15	1.6	4 $\frac{7}{8}$	4 $\frac{1}{2}$	10 $\frac{1}{2}$	33 $\frac{3}{8}$
21	24	18	2.2	5 $\frac{1}{2}$	4 $\frac{7}{8}$	11 $\frac{1}{2}$	34 $\frac{3}{8}$
24	28	20	2.9	6 $\frac{1}{2}$	5 $\frac{1}{2}$	14	42 $\frac{1}{2}$
30	35	24	4.5	8 $\frac{1}{2}$	6 $\frac{1}{2}$	17 $\frac{1}{2}$	55 $\frac{1}{2}$
36	42	29	6.5	9 $\frac{1}{2}$	8 $\frac{1}{2}$	21 $\frac{1}{2}$	66 $\frac{1}{2}$
42	49	33	8.9	11 $\frac{1}{2}$	9 $\frac{1}{2}$	25 $\frac{1}{2}$	77 $\frac{1}{2}$
48	57	38	11.6	13	11	28 $\frac{1}{2}$	88 $\frac{1}{2}$
54	64	43	14.7	14 $\frac{1}{2}$	12 $\frac{1}{2}$	32 $\frac{1}{2}$	99 $\frac{1}{2}$
60	71	47	18.1	16 $\frac{1}{2}$	13 $\frac{1}{2}$	35 $\frac{1}{2}$	110 $\frac{1}{2}$
66	77	52	21.9	17 $\frac{1}{2}$	15 $\frac{1}{2}$	39 $\frac{1}{2}$	121 $\frac{1}{2}$
72	83	57	26.0	19 $\frac{1}{2}$	16 $\frac{1}{2}$	43	132 $\frac{1}{2}$

Pipe-Arch with 3" x 1" and 5" x 1" Corrugations

Equivalent Diameter (in)	Nominal Span x Rise (in)	Design		Waterway			
		Span x Rise (in)	Area (ft ²)	B (in)	R _c (in)	R _t (in)	R _b (in)
48	53 x 41	53 x 41	11.7	15 $\frac{1}{2}$	10 $\frac{3}{16}$	28 $\frac{1}{16}$	73 $\frac{1}{16}$
54	60 x 46	58 $\frac{1}{2}$ x 48 $\frac{1}{2}$	15.6	20 $\frac{1}{2}$	18 $\frac{3}{8}$	29 $\frac{1}{2}$	51 $\frac{1}{2}$
60	66 x 51	65 x 54	19.3	22 $\frac{1}{2}$	20 $\frac{1}{2}$	32 $\frac{1}{2}$	56 $\frac{1}{2}$
66	73 x 55	72 $\frac{1}{2}$ x 58 $\frac{1}{2}$	23.2	25 $\frac{1}{2}$	22 $\frac{1}{2}$	36 $\frac{1}{2}$	63 $\frac{1}{2}$
72	81 x 59	79 x 62 $\frac{1}{2}$	27.4	23 $\frac{1}{2}$	20 $\frac{1}{2}$	39 $\frac{1}{2}$	82 $\frac{1}{2}$
78	87 x 63	86 $\frac{1}{2}$ x 67 $\frac{1}{2}$	32.1	25 $\frac{1}{2}$	22 $\frac{1}{2}$	43 $\frac{1}{2}$	92 $\frac{1}{2}$
84	95 x 67	93 $\frac{1}{2}$ x 71 $\frac{1}{2}$	37.0	27 $\frac{1}{2}$	24 $\frac{1}{2}$	47	100 $\frac{1}{2}$
90	103 x 71	101 $\frac{1}{2}$ x 76	42.4	29 $\frac{1}{2}$	26 $\frac{1}{2}$	51 $\frac{1}{2}$	111 $\frac{1}{2}$
96	112 x 75	108 $\frac{1}{2}$ x 80 $\frac{1}{2}$	48.0	31 $\frac{1}{2}$	27 $\frac{1}{2}$	54 $\frac{1}{2}$	120 $\frac{1}{2}$
102	117 x 79	116 $\frac{1}{2}$ x 84 $\frac{1}{2}$	54.2	33 $\frac{1}{2}$	29 $\frac{1}{2}$	59 $\frac{1}{2}$	131 $\frac{1}{2}$
108	128 x 83	123 $\frac{1}{2}$ x 89 $\frac{1}{2}$	60.5	35 $\frac{1}{2}$	31 $\frac{1}{2}$	63 $\frac{1}{2}$	139 $\frac{1}{2}$
114	137 x 87	131 x 93 $\frac{1}{2}$	67.4	37 $\frac{1}{2}$	33	67 $\frac{1}{2}$	149 $\frac{1}{2}$
120	142 x 91	138 $\frac{1}{2}$ x 98	74.5	39 $\frac{1}{2}$	34 $\frac{1}{2}$	71 $\frac{1}{2}$	162 $\frac{1}{2}$

Spiral Rib Pipe-Arch with 3 $\frac{3}{4}$ " x 7 $\frac{1}{2}$ " Corrugations

Equivalent Diameter (in)	Design		Waterway				
	Span (in)	Rise (in)	Area (ft ²)	B (in)	R _c (in)	R _t (in)	R _b (in)
18	20	16	1.7	5 $\frac{1}{2}$	5	10 $\frac{1}{2}$	27 $\frac{1}{2}$
21	23	19	2.3	5 $\frac{1}{2}$	5 $\frac{1}{2}$	11 $\frac{1}{2}$	34 $\frac{1}{2}$
24	27	21	3.0	6 $\frac{1}{2}$	5 $\frac{1}{2}$	13 $\frac{1}{2}$	40 $\frac{1}{2}$
30	33	26	4.7	8 $\frac{1}{2}$	7 $\frac{1}{2}$	16 $\frac{1}{2}$	51 $\frac{1}{2}$
36	40	31	6.7	10 $\frac{3}{8}$	8 $\frac{1}{2}$	20 $\frac{1}{2}$	62 $\frac{1}{2}$
42	46	36	9.2	12 $\frac{1}{2}$	9 $\frac{1}{2}$	23 $\frac{1}{2}$	73
48	53	41	12.1	14	11 $\frac{1}{2}$	26 $\frac{1}{2}$	83 $\frac{1}{2}$
54	60	46	15.6	20 $\frac{1}{2}$	18 $\frac{1}{2}$	29 $\frac{1}{2}$	51 $\frac{1}{2}$
60	66	51	19.3	22 $\frac{1}{2}$	20 $\frac{1}{2}$	32 $\frac{1}{2}$	56 $\frac{1}{2}$
66	73	55	23.2	25 $\frac{1}{2}$	22 $\frac{1}{2}$	36 $\frac{1}{2}$	63 $\frac{1}{2}$
72	81	59	27.4	23 $\frac{1}{2}$	20 $\frac{1}{2}$	39 $\frac{1}{2}$	82 $\frac{1}{2}$
78	87	63	32.1	25 $\frac{1}{2}$	22 $\frac{1}{2}$	43 $\frac{1}{2}$	92 $\frac{1}{2}$
84	95	67	37.0	27 $\frac{1}{2}$	24 $\frac{1}{2}$	47	100 $\frac{1}{2}$
90	103	71	42.4	29 $\frac{1}{2}$	26 $\frac{1}{2}$	51 $\frac{1}{2}$	111 $\frac{1}{2}$
96	112	75	48.0	31 $\frac{1}{2}$	27 $\frac{1}{2}$	54 $\frac{1}{2}$	120 $\frac{1}{2}$
102	117	79	54.2	33 $\frac{1}{2}$	29 $\frac{1}{2}$	59 $\frac{1}{2}$	131 $\frac{1}{2}$



HD100 PIPE

PRODUCT

LANE'S HD100 PIPE is a dual wall high density polyethylene (HDPE) pipe with a smooth interior and corrugated exterior manufactured for all drainage applications. Integrated bell and spigot couplers are provided on nominal 20' pipe lengths with diameters ranging from 6" to 60". Manning's roughness coefficient (i.e. Manning's n value) is conservatively factored to 0.012 for in-service design.

PIPE STANDARDS

LANE'S HD100 PIPE is certified and marked as AASHTO M252 pipe for diameters 6" to 10" and AASHTO M294 pipe for diameters 12" to 60".

JOINT PERFORMANCE

Bell and spigot joints with a factory-installed gasket on the spigot (elastomeric seal per ASTM F477) meet the watertight requirements of ASTM D3212 (laboratory pressure tested at 10.8 psi).

RAW MATERIAL

Virgin HDPE resins used for pipe production are documented by a certificate of analysis (i.e. third party certification) indicating the resin meets the cell classification requirements of AASHTO M252/M294 as defined by ASTM D3350.

SERVICE LIFE

LANE'S HD100 PIPE exceeds the AASHTO pipe material standards by using 100% virgin HDPE resins with enhanced long-term properties. Lane's higher material standards are aimed to ensure a minimum 100-year service life. Raw material and finished pipe are routinely tested to ensure consistency with the industry parameters used to establish 100-year service life.

CERTIFICATION

All HD100 pipe products with the Lane logo and the AASHTO marking are manufactured, tested and supplied in accordance with the National Transportation Product Evaluation Program (NTPEP), a division of AASHTO. Under this program Lane certifies that products (resin or pipe) it produces meets or exceeds the requirements of AASHTO M252/M294. An administrator, AASHTO Materials Reference Library (AMRL), validates Lane's certification through annual audits, testing, inspection and review of Lane's QC program.

MANUFACTURER'S WARRANTY

Lane ensures, certifies and documents that HD100 shipped to the job site meets the above claims and standards, and warranties the product is free of any material or workmanship defects.

HDPE Modulus of Elasticity (psi)	
Minimum	
Initial	110,000
50-yr	22,000
75-yr	21,000
100-yr	20,000

HDPE Tensile Strength (psi)	
Minimum	
Initial	3,00
50-yr	900
75-yr	900
100-yr	800

ASTM D3350 Cell Classification	
Minimum	
Dia. 6 to 10-in	424400C
Dia. 12 to 60-in	435400C

HD100 Pipe Offerings in Accordance with AASHTO M252/M294 Include:

- Fittings (manifolds, tees, elbows, et al.)
- Partially Perforated Pipe (Class 1 Perforations)
- Fully Perforated Pipe (Class 2 Perforations)

Installation in Accordance with ASTM D2321 or AASHTO Bridge Construction Specifications, Section 30.

See also Lane's HD100/HD100EC Pipe Installation Guide for minimum and maximum allowable cover depths.



Nominal Pipe ID (in)	6	8	10	12	15	18	24	30	36	42	48	60
Nominal Pipe OD (in)	7.05	9.40	12.00	14.50	17.50	21.50	28.00	34.50	41.00	47.50	54.50	66.71
Average Handling Weight (lb/ft)	1.25	2.00	2.50	3.75	5.50	7.50	12.00	17.50	21.25	28.75	32.50	43.83
Nominal Lay Length (ft-in)	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	20-0	19-6
Average Pipe Stiffness (psi)	61.5	62.0	64.1	56.9	50.2	49.8	41.0	35.6	27.8	24.0	22.1	17.1
AASHTO Minimum Pipe Stiffness (psi)	49.3	49.3	49.3	50.0	42.0	40.0	34.0	29.0	22.5	21.0	20.0	15.0