

THE MOST ADVANCED NAME IN DRAINAGE SYSTEMS



April 26, 2018

Erie Area Council of Governments  
Joint Municipal Purchasing Committee  
150 East Front Street, Suite 300  
Erie, PA 16507

Re: Erie Area COG # 2018-9 Bid Solicitation/Culvert and Drainage Pipe, Couplers and Tees

To Whom It May Concern:

We are pleased to submit the 2018 Erie Area Council of Governments #2018-9 Bid Proposal, along with the specifications requested.

The products listed on this proposal/contract are available from qualified Advanced Drainage Systems, Inc./Hancor distributors.

Respectfully,

A handwritten signature in black ink, appearing to read 'Judy Renaud', with a large, looping flourish at the end.

Judy Renaud  
Administrative Assistant-Sales  
Advanced Drainage Systems, Inc.  
Northeast Zone Office

c: John Hunter, District Manager  
Pete Cuda

**ERIE AREA COUNCIL OF GOVERNMENTS  
JOINT BIDDING COMMITTEE  
2018**

**BID # 2018 – 9**

**CULVERT AND DRAINAGE PIPE, COUPLERS AND TEES**

**PLEASE CONTACT JESSICA HORAN-KUNCO WITH QUESTIONS  
AT [JHKUNCO@ERIEAREACOG.ORG](mailto:JHKUNCO@ERIEAREACOG.ORG)  
OR (814) 454-1770**

**PROPOSAL FROM:**

**COMPANY:** Advanced Drainage Systems, Inc.

**ADDRESS:** 58 Wyoming Street

Ludlow, MA 01056

**CONTACT NAME:** Judy Renaud

**PHONE #:** 866-691-2715

**E-MAIL:** [judy.renaud@ads-pipe.com](mailto:judy.renaud@ads-pipe.com)

**DATE:** April 25, 2018

**ERIE AREA COUNCIL OF GOVERNMENTS'  
JOINT BIDDING COMMITTEE  
2018  
Form of Proposal**

**CMP, SDR 35, PVC Schedule 40 DRAINAGE PIPE**

I/We have investigated the availability of the materials, equipment or supplies specified and propose to furnish and deliver the items designated at the following prices:

Prices for an estimated **400 feet of Corrugated Metal Pipe delivered to Harborcreek Township** with bands as requested.

CMP 15" Pipe \$     No Bid     / ft      CMP bands     \$ No Bid     / each

CMP 12" Pipe \$     No Bid     / ft      CMP Bands     \$ No Bid     / each

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Prices for an estimated **450 feet of SDR 35 delivered to Lawrence Park Township.**

SDR 35 4" Pipe \$     No Bid     / ft      SDR 35 6"     \$ No Bid     /ft

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Prices for an estimated **750 feet of PVC Schedule 40 delivered to Greenfield and Lawrence Park Townships.**

PVC Schedule 40: 4" Pipe \$     No Bid     / ft      6"     \$ No Bid     /ft

**ERIE AREA COUNCIL OF GOVERNMENTS  
JOINT BIDDING COMMITTEE**

**FORM OF PROPOSAL  
2018**

**CULVERT AND DRAINAGE PIPE**

I/We have investigated the availability of the materials, equipment or supplies specified and propose to furnish and deliver the items designated at the following prices:

Prices should reflect the Total Volume of all municipalities seeking bids.

- 1) CORRUGATED POLYETHYLENE (HDPE) WITH 100% VIRGIN RESIN ROUND

**All prices for delivery**

Non-Integral Style: Advanced Drainage Systems, Inc. (AASHTO Plain-End Pipe)  
Manufacturer and Description

**Prices Per Foot for Smooth Interior Pipe**

<u>Size</u>	<u>Pipe</u>	<u>Priced Each:</u>		
		<u>Coupler</u>	<u>Tee</u>	<u>Elbow</u>
6"	\$ 1.49	\$ 1.86	\$ 16.34	\$ 12.84
8"	\$ 2.35	\$ 2.94	\$ 24.13	\$ 20.23
12"	\$ 3.80	\$ 4.75	\$ 81.97	\$ 55.44
15"	\$ 5.37	\$ 6.71	\$ 122.52	\$ 77.13
18"	\$ 7.41	\$ 9.26	\$ 171.89	\$ 108.20
24"	\$ 11.97	\$ 14.96	\$ 265.74	\$ 213.95
30"	\$ 18.05	\$ 36.10	\$ 536.25	\$ 442.80
36"	\$ 23.04	\$ 46.08	\$ 721.39	\$ 589.98

Integral Style: Advanced Drainage Systems, Inc. (AASHTO IB/Inline Bell Pipe)  
Manufacturer and Description

<u>Size</u>	<u>Pipe</u>
6"	\$ 1.57
8"	\$ 2.47
12"	\$ 4.00
15"	\$ 5.65

**ERIE AREA COUNCIL OF GOVERNMENTS  
JOINT BIDDING COMMITTEE  
FORM OF PROPOSAL  
2018**

**CULVERT AND DRAINAGE PIPE**

Integral Style (con't):

18"	\$ 7.80
24"	\$ 12.60
30"	\$ 19.00
36"	\$ 24.25
42"	\$ 35.00
48"	\$ 41.00
54"	\$ N/A
60"	\$ 79.00

- 2) OPTIONAL: CORRUGATED POLYETHYLENE (HDPE) WITH **RECYCLED RESIN CONTENT**  
ROUND **NOTE: Specify maximum recycled content 40 %**

Prices Per Foot for Smooth Interior Pipe

Non-Integral Style: Advanced Drainage Systems, (Inc. ASTM Plain-End Pipe)

Manufacturer and Description

<u>Size</u>	<u>Pipe</u>	<u>Per Coupler</u>	
6"	\$ 1.46	\$ 1.86	Ea.
8"	2.30	2.94	Ea.
12"	3.72	4.75	Ea.
15"	5.26	6.71	Ea.
18"	7.26	9.26	Ea.
24"	11.73	14.96	Ea.
30"	17.69	36.10	Ea.
36"	22.58	46.08	Ea.

**CORRUGATED POLYETHYLENE (HDPE) WITH RECYCLED RESIN CONTENT**

Integral Style: Advanced Drainage Systems, Inc. (ASTM IB/Inline Bell Pipe)

Manufacturer and Description

**NOTE: Specify maximum recycled content 40 %**

<u>Size</u>	<u>Pipe</u>
6"	\$ 1.54
8"	\$ 2.42
12"	\$ 3.92
15"	\$ 5.54

**ERIE AREA COUNCIL OF GOVERNMENTS  
JOINT BIDDING COMMITTEE**

**FORM OF PROPOSAL  
2018**

**CULVERT AND DRAINAGE PIPE**

Integral Style with Recycled content (con't)

18"	<u>\$ 7.64</u>
24"	<u>\$ 12.35</u>
30"	<u>\$ 18.62</u>
36"	<u>\$ 23.77</u>
42"	<u>\$ 34.30</u>
48"	<u>\$ 40.18</u>
54"	<u>\$ N/A</u>
60"	<u>\$ 77.42</u>

CORRUGATED POLYETHYLENE (HDPE) WITH 100% VIRGIN RESIN

OBLONG

Subsurface Drainage Wrapped With Filter Fabric\*:

	<u>Pipe</u>	<u>Coupler</u>	<u>End Cap</u>	<u>Outlet End</u>
12"	<u>\$ 2.35</u>	<u>\$ 11.85</u>	<u>\$ 11.85</u>	<u>\$ 26.96</u>
18"	<u>\$ 3.45</u>	<u>\$ 19.60</u>	<u>\$ 19.60</u>	<u>\$ 36.76</u>

ROUND

Perforated Drainage:

	<u>Unwrapped</u>	<u>Pipe Wrapped*</u>	<u>Coupler</u>	<u>End Cap</u>	<u>Tee</u>
4"	<u>\$ .37</u>	<u>\$ .51</u>	<u>\$ 1.64</u>	<u>\$ 2.15</u>	<u>\$ 3.44</u>
6"	<u>\$ .93</u>	<u>\$ 1.18</u>	<u>\$ 3.28</u>	<u>\$ 2.24</u>	<u>\$ 7.66</u>

\* With Class 1 Geotextile Filter Fabric

OPTIONAL: CORRUGATED POLYETHYLENE (HDPE) WITH RECYCLED RESIN CONTENT

OBLONG

Subsurface Drainage Wrapped With Filter Fabric\*:

	<u>Pipe</u>	<u>Coupler</u>	<u>End Cap</u>	<u>Outlet End</u>
12"	<u>\$ 2.35</u>	<u>\$ 11.85</u>	<u>\$ 11.85</u>	<u>\$ 26.96</u>

**ERIE AREA COUNCIL OF GOVERNMENTS  
JOINT BIDDING COMMITTEE**

**FORM OF PROPOSAL  
2018  
CULVERT AND DRAINAGE PIPE**

OBLONG Subsurface Drainage Wrapped With Filter Fabric\*(con't):

	<u>Pipe</u>	<u>Coupler</u>	<u>End Cap</u>	<u>Outlet End</u>
15"	\$ <u>N/A</u>	\$ <u>N/A</u>	\$ <u>N/A</u>	\$ <u>N/A</u>
18"	\$ <u>3.45</u>	\$ <u>19.60</u>	\$ <u>19.60</u>	\$ <u>36.76</u>

ROUND

Perforated Drainage:

	<u>Pipe</u>		<u>Coupler</u>	<u>End Cap</u>	<u>Tee</u>
	<u>Unwrapped</u>	<u>Wrapped*</u>			
4"	\$ <u>.37</u>	\$ <u>.51</u>	\$ <u>1.64</u>	\$ <u>2.15</u>	\$ <u>3.44</u>
6"	\$ <u>.93</u>	\$ <u>1.18</u>	\$ <u>3.28</u>	\$ <u>2.24</u>	\$ <u>7.66</u>

\* With Class 1 Geotextile Filter Fabric

NOTE: Specify Maximum Recycled Content:

Oblong 40 %  
Round 40 %

**Delivery Requirements: specify minimum quantities, related delivery requirements:**

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ERIE AREA COUNCIL OF GOVERNMENTS  
JOINT BIDDING COMMITTEE

FORM OF PROPOSAL  
2018  
CULVERT AND DRAINAGE PIPE

Accompanying this Proposal is a certified check/bid bond (circle one) in the amount of       \$500       dollars made payable to the Erie Area Council of Governments, which is agreed, shall be retained as liquidated damages if the undersigned fails to execute a Contract in conformity with the Contract Documents and furnish any specified bonds within ten (10) days after notification of award of the Contract to the undersigned. It is agreed that this Proposal may not be withdrawn for a period of sixty (60) days from the opening thereof.

I/We hereby certify that I/we have read, understand, and agree to all the conditions outlined in the Solicitation of Bids, Instructions to Bidders, Special Conditions, Detail Specifications, and all other parts of the Documents. I am/we are the only person(s) interested in the Proposal as principal(s). This Proposal is made without collusion with any person, firm or corporation.

*State of OHIO*  
*County of FRANKLIN*  
*Subscribe and swear to me*  
*before this 20th Day of April, 2018*  
ATTEST:

*Toni Ann DeLuca*  
Notary  
(Title)

(SEAL)

Company Advanced Drainage Systems, Inc.  
Address 58 Wyoming Street  
Ludlow, MA 01056  
Phone 866-691-2715  
E-Mail bob.klein@ads-pipe.com  
Signed *Robert M. Klein*  
Name Robert M. Klein  
(Type or Print)  
Title Executive Vice President-Sales  
Date 4/25/18



TONI ANN DeLUCA  
Notary Public, State of Ohio  
My Commission Expires 3-12-2020





# AIA Document A310™ – 2010

## Bid Bond

**CONTRACTOR:**

*(Name, legal status and address)*

ADVANCED DRAINAGE SYSTEMS, INC.  
4640 Trueman Blvd.  
Hillard, OH 43026-2438

**SURETY:**

*(Name, legal status and principal place of business)*

LIBERTY MUTUAL INSURANCE COMPANY  
175 Berkeley Street  
Boston, MA 02116

**OWNER:**

*(Name, legal status and address)*

ERIE AREA COUNCIL OF GOVERNMENTS  
150 East Front Street, Suite 300, Erie, PA 16507

**BOND AMOUNT:** Five Hundred and 00/100 Dollars  
(\$ 500.00)

**PROJECT:**

*(Name, location or address, and Project number, if any)*

Culvert and Drainage Pipe, Couplers and Tees Bid

Project Number, if any:

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

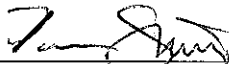
Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

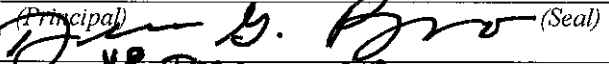
The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.


If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

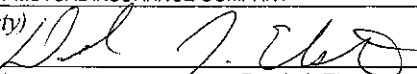
When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this 17th day of April, 2018

  
*(Witness)*

ADVANCED DRAINAGE SYSTEMS, INC.  
*(Principal)*  
  
*(Title)* VP Treasurer *(Seal)*

  
*(Witness)* Samantha Chierici

LIBERTY MUTUAL INSURANCE COMPANY  
*(Surety)*  
  
*(Title)* Derek J. Elston, Attorney in Fact *(Seal)*

**THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.**

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 7967667

Liberty Mutual Insurance Company  
The Ohio Casualty Insurance Company West American Insurance Company

**POWER OF ATTORNEY**

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Marcia K. Cesafsky; Derek J. Elston; Michelle Krebs; Ann Mullins; Christopher P. Troha; Aerie Walton

all of the city of Chicago, state of IL each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations; in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 26th day of December 2017



The Ohio Casualty Insurance Company  
Liberty Mutual Insurance Company  
West American Insurance Company

By: David M. Carey  
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss  
COUNTY OF MONTGOMERY

On this 26th day of December, 2017, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA  
Notarial Seal  
Teresa Pastella, Notary Public  
Upper Merion Twp., Montgomery County  
My Commission Expires March 28, 2021  
Member, Pennsylvania Association of Notaries

By: Teresa Pastella  
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

**ARTICLE IV – OFFICERS** – Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

**ARTICLE XIII – Execution of Contracts – SECTION 5. Surety Bonds and Undertakings.** Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

**Certificate of Designation** – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

**Authorization** – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 17th day of April, 2018



By: Renee C. Llewellyn  
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

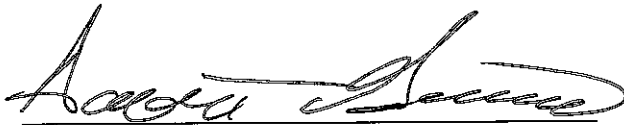
To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

ACKNOWLEDGEMENT BY SURETY

STATE OF ILLINOIS  
COUNTY OF WILL

On this 17th day of April, 2018, before me, Aaron D. Griffin, a Notary Public, within and for said County and State, personally appeared Derek J. Elston to me personally known to be the Attorney-in-Fact of and for Liberty Mutual Insurance Company and acknowledged that s/he executed the said instrument as the free act and deed of said Company.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid County, the day and year in this certificate first above written.



Notary Public in the State of Illinois  
County of Will



## ADS FILTER SOCK SPECIFICATION

### Scope

This specification describes 2- through 24-inch (50- to 600 mm) ADS SOCK synthetic wrap.

### Filter Fabric Requirements

The ADS SOCK shall meet the requirements of ASTM D6707.

ADS sock products as listed on this specification meet Ontario Provincial Standard Specification 1860, Material Specifications for Geotextiles, dated March 1998.

### Filter Fabric Properties

Property	Test Method	
Material	-	Polyester
Fabric	-	Knitted
Permittivity (min.)	ASTM D4491	5.5 sec <sup>-1</sup>
Puncture Resistance (min.)	ASTM D6241	1000 N
AOS (max.)	ASTM D4751	0.600 mm 30 U.S. Sieve
FOS (max.)	CAN/CGSB-148.1, M10-94	450 microns
Mass (relaxed)	ASTM D3887	3.0-3.9 oz/yd <sup>2</sup>
Mass (applied minimum)		2.7-3.5 oz/yd <sup>2</sup>
Thickness (min.)	ASTM D4491	24.0 mils
Permeability (K) (min.)	ASTM D4491	0.390 cm/sec
Burst Strength (min.)	ASTM D3887	830 kpa
Air Permeability (min.)	ASTM D737	700 ft <sup>3</sup> /ft <sup>2</sup> /min
Water Flow Rate (min.)	ASTM D4491 (2" constant head)	300 gal/min/ft <sup>2</sup>
Yarn Denier	-	150
Specific Gravity	-	1.3
Melt Temperature	-	450° F

## ADS SINGLE WALL HIGHWAY PIPE SPECIFICATION

### Scope

This specification describes 3- through 24-inch (75 to 600 mm) single wall high density corrugated polyethylene highway pipe, for use in gravity-flow land drainage applications.

### Pipe Requirements

ADS single wall high density corrugated polyethylene highway pipe shall have annular interior and exterior corrugations.

- 3- through 10-inch (75 to 250 mm) pipe shall meet AASHTO M252, Type C or CP.
- 12- through 24-inch (300 to 600 mm) pipe shall meet AASHTO M294, Type C or CP.

### Joint Performance

Joints for 3- to 24- inch (75 – 600 mm) shall be made with split or snap couplings. Standard connection shall meet the soil-tightness requirements of AASHTO M252 or M294. Gasketed connections shall incorporate a closed-cell synthetic expanded rubber gasket meeting the requirements of ASTM D1056 Grade 2A2. Gaskets, when applicable, shall be installed by the pipe manufacturer.

### Fittings

Fittings shall conform to AASHTO M252 or AASHTO M294.

### Material Properties

Pipe and fittings shall be made of virgin polyethylene compounds that comply with the cell classification 424420C for 4- through 10-inch (100 to 250mm) diameters, or 435400C for 12- through 24-inch (300 to 600mm) diameters, as defined and described in ASTM D3350, except that carbon black content should not exceed 4%. The 12- through 24-inch (300 to 600mm) virgin pipe material shall comply with the notched constant ligament-stress (NCLS) test as specified in Sections 9.5 of AASHTO M294.

### Installation

Installation shall be in accordance with ASTM D2321 and ADS recommended installation guidelines with the exception that minimum cover in trafficked areas for 3- through 24-inch (75 to 600 mm) diameters shall be one foot (0.3 m). Maximum fill heights depend on embedment material and compaction level; please refer to Technical Note 2.03. Contact your local ADS representative or visit our website at [www.ads-pipe.com](http://www.ads-pipe.com) for a copy of the latest installation guidelines.

### Pipe Dimensions

	Nominal Diameter, in (mm)									
Pipe I.D. in (mm)	3 (75)	4 (100)	5 (125)	6 (150)	8 (200)	10 (250)	12 (300)	15 (375)	18 (450)	24 (600)
Pipe O.D.* in (mm)	3.6 (91)	4.6 (117)	5.8 (147)	7.0 (178)	9.5 (241)	12.0 (305)	14.5 (368)	18.0 (457)	22.0 (559)	28.0 (711)

\*Pipe O.D. values are provided for reference purposes only, values stated for 12 through 24-inch are  $\pm 1$  inch. Contact a sales representative for exact values

\*\*All diameters available with or without perforations.

## ADS SINGLE WALL HEAVY DUTY PIPE SPECIFICATION

### Scope

This specification describes 3- through 24-inch (75 to 600 mm) ADS single wall high density corrugated polyethylene heavy duty pipe for use in gravity-flow land drainage applications.

### Pipe Requirements

ADS single wall high density corrugated polyethylene heavy duty pipe shall have annular interior and exterior corrugations.

- 3- through 24-inch (75 to 600 mm) pipe shall meet ASTM F667.

### Joint Performance

Joints for 3- to 24- inch (75 – 600 mm) shall be made with split or snap couplings. Standard connections shall meet the requirements of the ASTM F667. Gasketed connections shall incorporate a closed-cell synthetic expanded rubber gasket meeting the requirements of ASTM D1056 Grade 2A2. Gaskets, when applicable, shall be installed by the pipe manufacturer.

### Fittings

Fittings shall conform to ASTM F667.

### Material Properties

Pipe and fitting material shall be high density polyethylene conforming with the minimum requirements of cell classification 323410C or 333410C as defined and described in the latest version of ASTM D3350.

### Installation

Installation shall be in accordance with ASTM D2321 and ADS recommended installation guidelines, with the exception that minimum cover in trafficked areas for 3- through 24-inch (75 to 600 mm) diameters shall be one foot (0.3 m). Maximum fill heights depend on embedment material and compaction level; please refer to Technical Note 2.03. Contact your local ADS representative or visit our website at [www.ads-pipe.com](http://www.ads-pipe.com) for a copy of the installation guidelines.

### Pipe Dimensions

	Nominal Diameter, In (mm)									
Pipe I.D. in (mm)	3 (75)	4 (100)	5 (125)	6 (150)	8 (200)	10 (250)	12 (300)	15 (375)	18 (450)	24 (600)
Pipe O.D.* in (mm)	3.6 (91)	4.6 (117)	5.8 (147)	7.0 (178)	9.5 (241)	12.0 (305)	14.5 (368)	18.0 (457)	22.0 (559)	28.0 (711)

\*Pipe O.D. values are provided for reference purposes only, values stated for 12 through 24-inch are ±1 inch. Contact a sales representative for exact values

\*\*All diameters available with or without perforations.

## ADS ADVANEDGE® PIPE SPECIFICATION

### Scope

This specification describes 12- and 18-inch (300 and 450 mm) ADS AdvanEDGE oblong corrugated pipe for use in subsurface drainage applications.

### Product Requirements

ADS AdvanEDGE shall have annular interior and exterior corrugations.

- 12- and 18-inch (300 to 450 mm) shall meet ASTM D7001.

ADS AdvanEDGE outside dimensions shall be 1.5" thick by 12.5" wide or 1.5" thick by 18.5" wide. AdvanEDGE shall have internal bracing adjoining each long wall to prevent crushing under typical loading. AdvanEDGE shall be made available with or without an external geotextile wrap.

### Material Properties

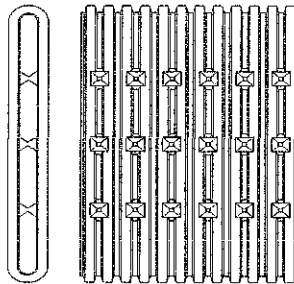
All pipe and fittings shall be made of polyethylene with a minimum cell classification of 424420C as defined and described in the latest version of ASTM D3350.

### Perforations

Nominal Pipe Size, in (mm)	12 (300)	18 (450)
Slot Length (avg), in (mm)	1.125 (29)	1.125 (29)
Slot Width (avg), in (mm)	0.125 (3.2)	0.125 (3.2)
Water Inlet Area (approx.), in <sup>2</sup> /ft	15	20

### Filter Fabric

Fabric Properties	Test Method	Minimum Average Roll Values
Grab Tensile Strength (lbs.) (weakest principle direction)	ASTM D4632	120
Grab Elongation (%) (weakest principle direction)	ASTM D4632	60
Trapezoidal Tear (lbs.) (weakest principle direction)	ASTM D4533	40
Puncture (lbs.)	ASTMD4833	30
Permittivity (sec <sup>-1</sup> )	ASTM D4491	0.7
AOS (U.S. Sieve Size)	ASTM D4751	60
U.V. Resistance	ASTM D4355	70



## ADS SB2® PIPE SPECIFICATION

### Scope

This specification describes ADS SB2 pipe available in 8- and 10-inch (200 and 250 mm) diameters for use in on-site waste disposal applications.

### Pipe Requirements

ADS SB2 pipe shall have a corrugated interior and corrugated exterior a pre-installed septic fabric.

- 8- and 10-inch (200 and 250 mm) pipe shall meet the requirements of ASTM F667.
- There shall be two ½ inch (12.7 mm) holes 120 degrees apart on the length of the pipe.
- The 8-inch (200 mm) and 10-inch (250mm) pipe shall have 1.0 square inches per foot of open area.

### Joint Performance

Pipe shall be joined with internal or external snap couplers covering at least two full corrugations on each end of the pipe.

### Fittings

Fittings shall conform to ASTM F667.

### Material Properties

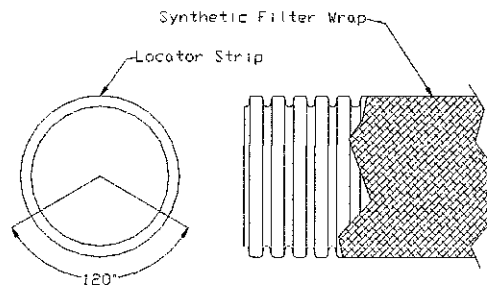
Pipe material shall be high density polyethylene conforming with the minimum requirements of cell classification 424410C as defined and described in the latest version of ASTM D3350; or ASTM D1248 Type III, Class C, Category 4, Grade P33.

### Filter Fabric Properties

Material	Nylon (100%)
Fabric	Spun Bond
Fiber Size (denier per filament)	5
Weight (ounces per yd <sup>2</sup> , ASTM D3776)	0.85
Burst Strength (pounds per in <sup>2</sup> , ASTM D3786)	28
Air Permeability (CFM per ft <sup>2</sup> , ASTM D737)	650
Equivalent Opening Size (Army Corps of Engineers, W 02215)	50
Water Flow Rate (gal/min/ft <sup>2</sup> , ASTM D4491)	163
Melt Temperature (ASTM D3786)	218° C (425° F)

### Installation

Installation shall be in accordance with ADS recommended installation instructions and those issued by a local health department. For leachfield applications, installation shall be in accordance with ASTM F481 and as regulated by regional, state, and local agencies. Proper authorization for specific applications and designs should be obtained prior to installation to ensure suitability in certain locales. Contact your local ADS representative or visit our website at [www.ads-pipe.com](http://www.ads-pipe.com) for a copy of the installation guidelines.





## ADS N-12® WT IB PIPE (PER ASTM F2648) SPECIFICATION

### Scope

This specification describes 4- through 60-inch (100 to 1500 mm) ADS N-12 WT IB pipe (per ASTM F2648) for use in gravity-flow land drainage applications.

### Pipe Requirements

ADS N-12 WT IB pipe (per ASTM F2648) shall have a smooth interior and annular exterior corrugations.

- 4- through 60-inch (100 to 1500 mm) pipe shall meet ASTM F2648.
- Manning's "n" value for use in design shall be 0.012.

### Joint Performance

Pipe shall be joined using a bell & spigot joint meeting ASTM F2648. The joint shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly. 12- through 60-inch (300 to 1500 mm) diameters shall have an exterior bell wrap installed by the manufacturer.

### Fittings

Fittings shall conform to ASTM F2306. Bell and spigot connections shall utilize a spun-on or welded bell and valley or saddle gasket meeting the watertight joint performance requirements of ASTM F2306.

### Field Pipe and Joint Performance

To assure watertightness, field performance verification may be accomplished by testing in accordance with ASTM F2487. Appropriate safety precautions must be used when field-testing any pipe material. Contact the manufacturer for recommended leakage rates.

### Material Properties

Material for pipe production shall be an engineered compound of virgin and recycled high-density polyethylene conforming with the minimum requirements of cell classification 424420C (ESCR Test Condition B) for 4- through 10-inch (100 to 250 mm) diameters, and 435420C (ESCR Test Condition B) for 12- through 60-inch (300 to 1500 mm) diameters, as defined and described in the latest version of ASTM D3350, except that carbon black content should not exceed 4%. The design engineer shall verify compatibility with overall system including structural, hydraulic, material, and installation requirements for a given application.

### Installation

Installation shall be in accordance with ASTM D2321 and ADS recommended installation guidelines, with the exception that minimum cover in trafficked areas for 4- through 48-inch (100 to 1200 mm) diameters shall be one foot (0.3 m) and for 60-inch (1500 mm) diameter the minimum cover shall be 2 ft. (0.6 m) in single run applications. Backfill for minimum cover situations shall consist of Class 1 (compacted) or Class 2 (minimum 90% SPD) material. Maximum fill heights depend on embedment material and compaction level; please refer to Technical Note 2.02. Contact your local ADS representative or visit our website at [www.ads-pipe.com](http://www.ads-pipe.com) for a copy of the latest installation guidelines.

### Pipe Dimensions

	Nominal Diameter, In (mm)												
Pipe I.D. in (mm)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)	15 (375)	18 (450)	24 (600)	30 (750)	36 (900)	42 (1050)	48 (1200)	60 (1500)
Pipe O.D.* in (mm)	4.8 (122)	6.9 (175)	9.1 (231)	11.4 (290)	14.5 (368)	18 (457)	22 (559)	28 (711)	36 (914)	42 (1067)	48 (1219)	54 (1372)	67 (1702)

\*Pipe O.D. values are provided for reference purposes only, values stated for 12 through 60-inch are ±1 inch. Contact a sales representative for exact values

## ADS N-12® ST IB PIPE (PER AASHTO) SPECIFICATION

### Scope

This specification describes 4- through 60-inch (100 to 1500 mm) ADS N-12 ST IB pipe (per AASHTO) for use in gravity-flow land drainage applications.

### Pipe Requirements

ADS N-12 ST IB pipe (per AASHTO) shall have a smooth interior and annular exterior corrugations.

- 4- through 10-inch (100 to 250 mm) pipe shall meet AASHTO M252, Type S or SP.
- 12- through 60-inch (300 to 1500 mm) pipe shall meet AASHTO M294, Type S or SP, or ASTM F2306.
- Manning's "n" value for use in design shall be 0.012.

### Joint Performance

Pipe shall be joined using a bell & spigot joint meeting the requirements of AASHTO M252, AASHTO M294, or ASTM F2306. The joint shall be soil-tight and gaskets for diameters 12- through 60-inch, shall meet the requirements of ASTM F477. For diameters 4- through 10-inch, the joint shall be soil-tight using an engaging dimple connection. Gaskets shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly.

### Fittings

Fittings shall conform to AASHTO M252, AASHTO M294, or ASTM F2306. Bell and spigot connections shall utilize a spun-on or welded bell and valley or saddle gasket meeting the soil-tight joint performance requirements of AASHTO M252, AASHTO M294, or ASTM F2306.

### Material Properties

Virgin material for pipe and fitting production shall be high density polyethylene conforming with the minimum requirements of cell classification 424420C for 4- through 10-inch (100 to 250 mm) diameters, and 435400C for 12- through 60-inch (300 to 1500 mm) diameters, as defined and described in the latest version of ASTM D3350, except that carbon black content should not exceed 4%. The 12- through 60-inch (300 to 1500 mm) virgin pipe material shall comply with the notched constant ligament-stress (NCLS) test as specified in Sections 9.5 and 5.1 of AASHTO M294 and ASTM F2306, respectively.

### Installation

Installation shall be in accordance with ASTM D2321 and ADS recommended installation guidelines, with the exception that minimum cover in trafficked areas for 4- through 48-inch (100 to 1200 mm) diameters shall be one foot. (0.3 m) and for 60-inch (1500 mm) diameter the minimum cover shall be 2 ft. (0.6 m) in single run applications. Backfill for minimum cover situations shall consist of Class 1 (compacted), Class 2 (minimum 90% SPD) or Class 3 (minimum 95% SPD) material. Maximum fill heights depend on embedment material and compaction level; please refer to Technical Note 2.01. Contact your local ADS representative or visit our website at [www.ads-pipe.com](http://www.ads-pipe.com) for a copy of the latest installation guidelines.

### Pipe Dimensions

	Nominal Diameter, in (mm)												
Pipe I.D. in (mm)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)	15 (375)	18 (450)	24 (600)	30 (750)	36 (900)	42 (1050)	48 (1200)	60 (1500)
Pipe O.D.* in (mm)	4.8 (122)	6.9 (175)	9.1 (231)	11.4 (290)	14.5 (368)	18 (457)	22 (559)	28 (711)	36 (914)	42 (1067)	48 (1219)	54 (1372)	67 (1702)

\*Pipe O.D. values are provided for reference purposes only, values stated for 12 through 60-inch are ±1 inch. Contact a sales representative for exact values

\*\*All diameters available with or without perforations.

## ADS N-12<sup>®</sup> PLAIN END PIPE (PER ASTM F2648) SPECIFICATION

### Scope

This specification describes 4- through 60-inch (100 to 1500 mm) ADS N-12 plain end pipe (per ASTM F2648) for use in gravity-flow land drainage applications.

### Pipe Requirements

ADS N-12 plain end pipe (per ASTM F2648) shall have a smooth interior and annular exterior corrugations.

- 4- through 60-inch (100 to 1500 mm) pipe shall meet ASTM F2648.
- Manning's "n" value for use in design shall be 0.012.

### Joint Performance

Pipe shall be joined with coupling bands covering at least two full corrugations on each end of the pipe. Standard connections shall meet or exceed the soil-tight requirements of ASTM F2648.

Gasketed connections shall incorporate a closed-cell synthetic expanded rubber gasket meeting the requirements of ASTM D1056 Grade 2A2. Gaskets, when applicable, shall be installed by the pipe manufacturer.

### Fittings

Fittings shall conform to ASTM F2306.

### Material Properties

Material for pipe production shall be an engineered compound of virgin and recycled high density polyethylene conforming with the minimum requirements of cell classification 424420C (ESCR Test Condition B) for 4- through 10-inch (100 to 250 mm) diameters, and 435420C (ESCR Test Condition B) for 12- through 60-inch (300 to 1500 mm) diameters, as defined and described in the latest version of ASTM D3350, except that carbon black content should not exceed 4%. The design engineer shall verify compatibility with overall system including structural, hydraulic, material, and installation requirements for a given application.

### Installation

Installation shall be in accordance with ASTM D2321 and ADS recommended installation guidelines, with the exception that minimum cover in trafficked areas for 4- through 48-inch (100 to 1200 mm) diameters shall be one foot (0.3 m) and for 60-inch (1500 mm) diameter the minimum cover shall be 2 ft. (0.6 m) in single run applications. Backfill for minimum cover situations shall consist of Class 1 (compacted) or Class 2 (minimum 90% SPD) material. Maximum fill heights depend on embedment material and compaction level; please refer to Technical Note 2.02. Contact your local ADS representative or visit our website at [www.ads-pipe.com](http://www.ads-pipe.com) for a copy of the latest installation guidelines.

### Pipe Dimensions

		Nominal Diameter, in (mm)											
Pipe I.D. in (mm)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)	15 (375)	18 (450)	24 (600)	30 (750)	36 (900)	42 (1050)	48 (1200)	60 (1500)
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\*\*All diameters available with or without perforations.

## ADS N-12® PLAIN END PIPE (PER AASHTO) SPECIFICATION

### Scope

This specification describes 4- through 60-inch (100 to 1500 mm) ADS N-12 plain end pipe (per AASHTO) for use in gravity-flow land drainage applications.

### Pipe Requirements

ADS N-12 plain end pipe (per AASHTO) shall have a smooth interior and annular exterior corrugations.

- 4- through 10-inch (100 to 250 mm) pipe shall meet AASHTO M252, Type S or SP.
- 12- through 60-inch (300 to 1500 mm) pipe shall meet AASHTO M294, Type S or SP, or ASTM F2306.
- Manning's "n" value for use in design shall be 0.012.

### Joint Performance

Pipe shall be joined with coupling bands covering at least two full corrugations on each end of the pipe. Standard connections shall meet or exceed the soil-tight requirements of AASHTO M252, AASHTO M294, or ASTM F2306.

Gasketed connections shall incorporate a closed-cell synthetic expanded rubber gasket meeting the requirements of ASTM D1056 Grade 2A2. Gaskets, when applicable, shall be installed by the pipe manufacturer.

### Fittings

Fittings shall conform to AASHTO M252, AASHTO M294, or ASTM F2306.

### Material Properties

Virgin material for pipe and fitting production shall be high density polyethylene conforming with the minimum requirements of cell classification 424420C for 4- through 10-inch (100 to 250 mm) diameters, and 435400C for 12- through 60-inch (300 to 1500 mm) diameters, as defined and described in the latest version of ASTM D3350, except that carbon black content should not exceed 4%. The 12- through 60-inch (300 to 1500mm) virgin pipe material shall comply with the notched constant ligament-stress (NCLS) test as specified in Sections 9.5 and 5.1 of AASHTO M294 and ASTM F2306 respectively.

### Installation

Installation shall be in accordance with ASTM D2321 and ADS recommended installation guidelines, with the exception that minimum cover in trafficked areas for 4- through 48-inch (100 to 1200 mm) diameters shall be one foot. (0.3 m) and for 60-inch (1500 mm) diameter the minimum cover shall be 2 ft. (0.6 m) in single run applications. Backfill for minimum cover situations shall consist of Class 1 (compacted), Class 2 (minimum 90% SPD) or Class 3 (minimum 95%) material. Maximum fill heights depend on embedment material and compaction level; please refer to Technical Note 2.01. Contact your local ADS representative or visit our website at [www.ads-pipe.com](http://www.ads-pipe.com) for a copy of the latest installation guidelines.

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\*\*All diameters available with or without perforations.