



May 25, 2022

Ms. Stephanie Bortz, CFM
Stormwater Utility Manager
City of Doral Public Works Department
8401 NW 53 Terrace, Doral, FL 33166

Re: City of Doral Continuing Professional Services Agreement - RFQ # 2020-22
Sub Basin H8 Drainage Improvements - Pipe Material Substitution Letter
EAC Project No. 20067.LD01-04

Dear Ms. Bortz:

Pursuant to recent coordination efforts, **EAC Consulting, Inc. (EAC)** has completed the research, due diligence and review of the new exfiltration pipe material recommended for use as a replacement for the 42-inch diameter HDPE perforated exfiltration pipe proposed as part of the City's Bid No. 2021-031 - Stormwater Improvements at Sub Basin H-8 awarded by the City Council January 2021.

It is our understanding that the portion of the City's Bid No. 2021-031 requiring the installation of the 42-inch diameter HDPE perforated exfiltration pipe was not constructed due the unavailability of the pipe material as specified.

Accordingly, EAC has communicated directly with Mr. Josue Raudales, Territory Manager of Advanced Drainage Systems, Inc (ADS) (Josue.Raudales@ads-pipe.com) (786)374-5262) to investigate and determine acceptability of the HP (High Performance) Polypropylene pipe material as a suitable replacement for the HDPE Pipe.

It is our understanding that for pipes 36-inch in diameter and larger, ADS made the decision to switch all production for Miami-Dade County projects as follows:

- Solid: HP Storm only
- Perforated: HP Storm only (depending on diameter and yearly demand)

In our due diligence efforts and research, we found that the HP Storm pipe material similarly offers superior performance and strength and is FDOT approved for 100-year Design Service Life applications for both solid and perforated applications. Furthermore., the pipe offers significant benefits including ease and flexibility of installation.

Please find attached the following documents that support our decision to accept the substitution of the 42-inch diameter HDPE with the ADS manufactured 42-inch diameter HP (High Performance) Polypropylene perforated exfiltration pipe.

- Attachment No. 1: FDOT Pipe Approval
- Attachment No. 2: ADS HP Storm Pipe Specifications
- Attachment No. 3: HP Storm Pipe Benefits Narrative (including relevant excerpts from FDOT's Drainage Manual)

For any questions and or clarification related to this correspondence, please feel to contact me by phone or email madeife@eacconsult.com.

Sincerely,

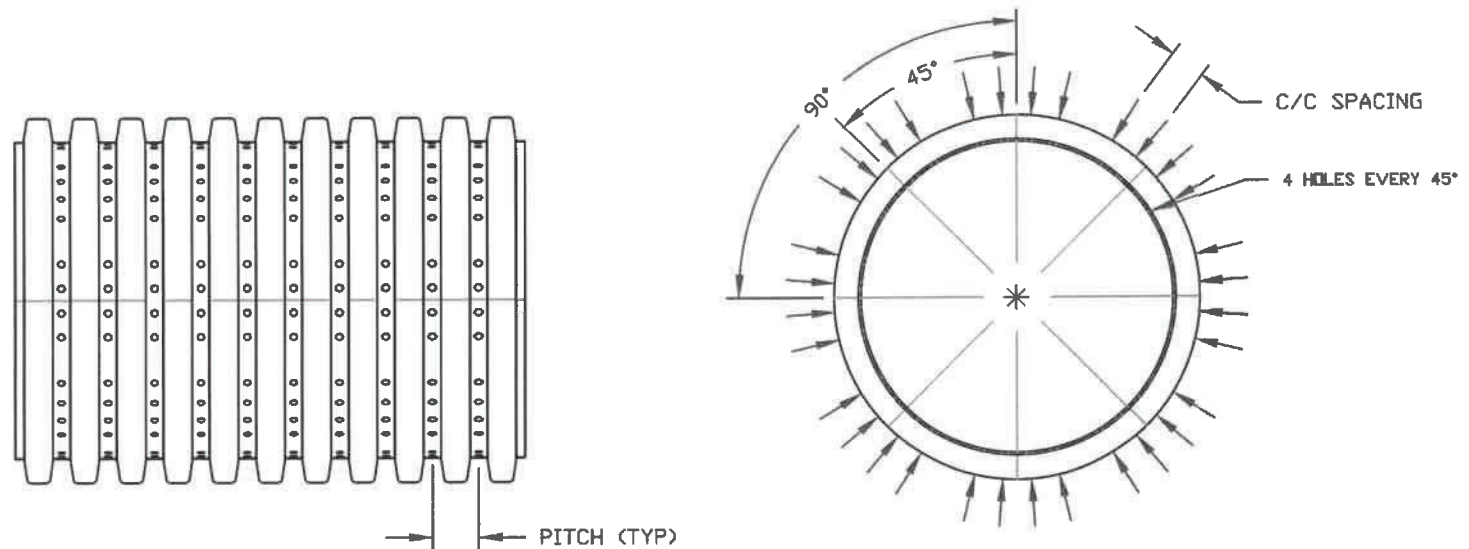
EAC Consulting, Inc.

A handwritten signature in blue ink, appearing to read "Michael Adeife", is written over the company name.

Michael Adeife, P.E.
Senior Vice President

Cc: File, H. Higgins, PE, E. Rodriguez, PE
Encl. (3)

HP FDOT FRENCH DRAIN PERF. PATTERN



DESIGN APPROVED
FLORIDA DEPARTMENT OF TRANSPORTATION

DATE: 02/28/2020
BY: Jeff Green
State Drainage Engineer

HP PERF. DATA			
PIPE DIAMETER	HOLE SIZE	C/C SPACING	PITCH
12"	0.375"	1"	1.9"
15"	0.375"	1.5"	2.6"
18"	0.375"	1.5"	2.6"
24"	0.375"	2"	3.3"
30"	0.375"	2"	4.1"
36"	0.375"	2"	5.2"
42"	0.375"	2"	5.2"
48"	0.375"	2"	5.2"
60"	0.375"	2"	6"

ADS PLAN PRESENTATION DISCLAIMER: "ADVANCED DRAINAGE SYSTEMS, INC. ("ADS") HAS PREPARED THIS DRAWING BASED ON THE INFORMATION PROVIDED BY THE DESIGN ENGINEER FOR THE SPECIFIC PROJECT. THIS DRAWING IS INTENDED TO DEPICT THE NECESSARY ADS COMPONENTS FOR COMPLIANCE WITH THE ENGINEER'S DESIGN AND/OR LAYOUT. ADS HAS NOT PERFORMED ANY ENGINEERING SERVICES ON THIS PROJECT. NOR HAS ADS INDEPENDENTLY VERIFIED THE INFORMATION SUPPLIED BY THE DESIGN ENGINEER. THE DESIGN ENGINEER SHOULD REVIEW THE DRAWING TO INSURE THAT IT IS IN COMPLIANCE WITH THE SPECIFIC DESIGN PROJECT."

ADS STANDARD DETAILS DISCLAIMER: "ADVANCED DRAINAGE SYSTEMS, INC. ("ADS") HAS PREPARED THIS STANDARD DETAIL TO DEMONSTRATE ADS' RECOMMENDED INSTALLATION OF ITS PRODUCTS FOR THE DEPICTED APPLICATION. IN ADDITION TO ADS' RECOMMENDATIONS, THERE MAY BE OTHER NATIONAL, STATE, OR LOCAL SPECIFICATIONS THAT ARE PERTINENT TO THIS APPLICATION. ADS' STANDARD DETAIL IS NOT INTENDED TO SUPERSEDE ANY NATIONAL, STATE, OR LOCAL SPECIFICATIONS, AND ADS' RECOMMENDS THAT THOSE REQUIREMENTS BE REVIEWED AND CONSULTED PRIOR TO THE INSTALLATION OF ADS' PRODUCTS. ADS HAS NOT AUTHORIZED, AND IT BEARS NO RESPONSIBILITY FOR, ANY REVISIONS, ALTERATIONS, OR DEVIATIONS FROM THIS STANDARD DETAIL."



HP FDOT FRENCH DRAIN

DESIGNED BY
RJS 1/20/15

APPROVED BY

DESIGNED BY

REVISIONS

BY	DATE
DAF	2/13/2018

DWG. SCALE: NTS

ADS HP STORM (EP) 12"- 60" PIPE SPECIFICATION

Scope

This specification describes 12- through 60-inch (300 to 1500 mm) ADS HP Storm pipe for use in gravity-flow storm drainage applications.

Pipe Requirements

ADS HP Storm pipe shall have a smooth interior and annular exterior corrugations.

- 12- through 60-inch (300 to 1500 mm) pipe shall meet ASTM F2881 or AASHTO M330
- 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 ASTM F2881 or AASHTO M330. The joint shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477. Gasket 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 F2881 or AASHTO M330. Bell and spigot connections shall utilize a welded or integral bell and valley or inline gaskets meeting the watertight joint performance requirements of ASTM D3212.

Field Pipe and Joint Performance

To assure watertightness, field performance verification may be accomplished by testing in accordance with ASTM F1417 or ASTM F2487. Appropriate safety precautions must be used when field-testing any pipe material. Contact the manufacturer for recommended leakage rates.

Material Properties

Polypropylene compound for pipe and fitting production shall be impact modified copolymer meeting the material requirements of ASTM F2881, Section 5 and AASHTO M330, Section 6.1.

Installation

Installation shall be in accordance with ASTM D2321 and ADS recommended installation guidelines, with the exception that minimum cover in traffic areas for 12- through 48-inch (300 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 2.04. Contact your local ADS representative or visit our website at www.ads-pipe.com for a copy of the latest installation guidelines.

Pipe Dimensions

Nominal Pipe I.D. in (mm)	12 (300)	15 (375)	18 (450)	24 (600)	30 (750)	36 (900)	42 (1050)	48 (1200)	60 (1500)
Average Pipe I.D. in (mm)	12.2 (310)	15.1 (384)	18.2 (462)	23.5 (597)	30.2 (767)	36.0 (914)	42.0 (1067)	47.9 (1217)	59.9 (1521)
Average Pipe O.D. in (mm)	14.5 (368)	17.7 (450)	21.4 (544)	27.6 (701)	35.5 (902)	41.5 (1054)	47.4 (1204)	54.1 (1374)	67.1 (1704)
Minimum Pipe Stiffness * @ 5% Deflection #/in./in. (kN/m ²)	75 (517)	60 (414)	56 (386)	50 (345)	46 (317)	40 (276)	35 (241)	35 (241)	30 (207)

*Minimum pipe stiffness values listed; contact a representative for average values.



Objective

- Speed; productivity – twice as fast
- Safety; light weight materials
- Performance; sanitary sewer joint spec
- Profit





High Performance HP Pipe

Higher Pipe Stiffness

- Reduced deflection & ease of install

Superior Joint Performance

- Water tight ASTM D3212-10.8 psi lab test
- Two (2) gaskets = extra safety factor
- Inline bell and spigot = no bell holes
- 20-foot lay lengths = fewer joints

Outstanding Durability

- Excellent corrosion & abrasion resistance
- High impact resistance

Cost Effective

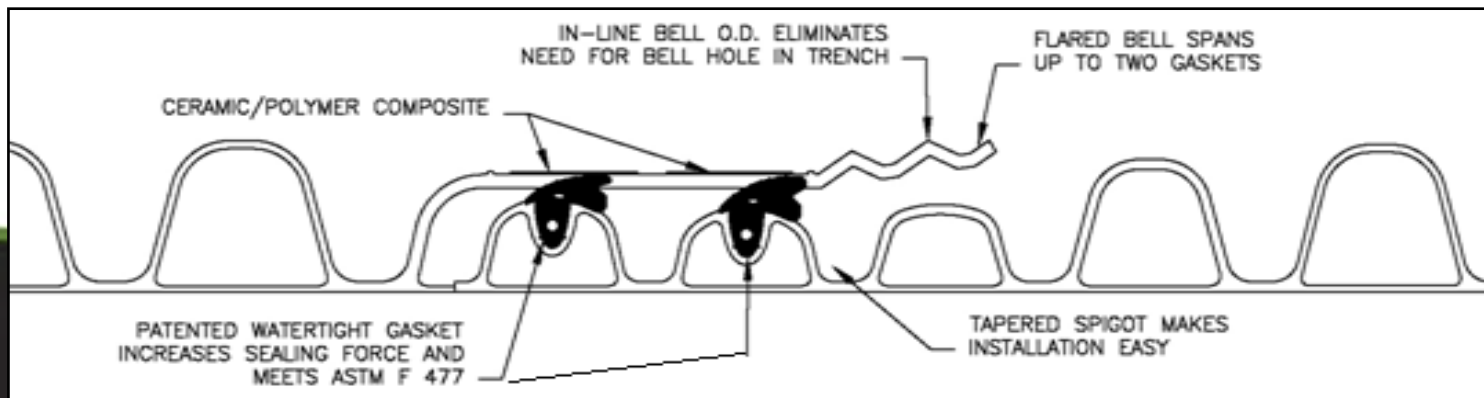
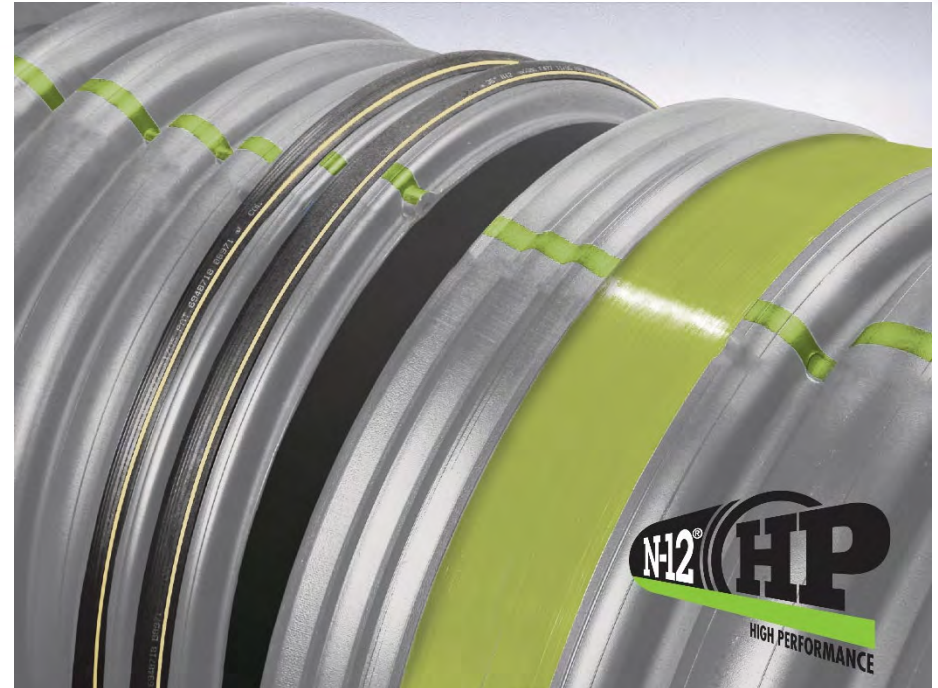
- Long-term performance for less cost





Joint Integrity

- Extended Bell with Fiberglass Polymer Composite Reinforcement
 - Provides larger sealing area
- Two Gaskets on Spigot
 - Shipped on pipe & shrink wrapped for protection
 - Lowers risk for leaks due to construction errors and joint offsets
- Tapered Bell-n-Spigot Design
 - No need to excavate for bell holes



**ASTM F477
Gasket**



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION



DRAINAGE MANUAL

**OFFICE OF DESIGN, DRAINAGE SECTION, JANUARY 2020
TALLAHASSEE, FLORIDA**

For side drains, the hydraulic design considers a one-size design. If a material type is inappropriate, it must be eliminated as an option in the plans.

In addition, the hydraulic evaluation must verify that the standard joint performance, as required by the **Standard Specification 430-4.1** will be sufficient. For situations where the minimum joint performance as required by the **Standard Specifications** is not sufficient, provide special provisions to specify the proper joint in the plans. For example, a pump station with a small-diameter pressurized storm drain should use a high-pressure joint. (Note: Joints are tested and rated by the State Materials Office.)

6.5 PIPES WITHIN WALLED EMBANKMENT SECTIONS

Wall Zone pipes are defined as pipes, existing or proposed, that are: (1) within or adjacent to embankment retaining walls, (2) connected to inlets that are within embankment retaining walls, or (3) beneath a bridge substructure element, such as an end bent or pier. Refer to Appendix D for wall types and criteria.

6.6 CULVERT MATERIAL TYPES

The types of culvert materials to consider for the various culvert applications are listed below.

Extend existing culverts (side drains, storm drains, and cross drains) with the existing pipe material. In the event that the existing pipe material is no longer produced, use the most similar material available, i.e., extend fiber reinforced concrete pipe with concrete pipe (RCP or NRCP).

Application	Materials to be Considered
Cross Drain French Drain Side Drain Storm Drain	Aluminized Steel Aluminum Concrete (all approved types) Corrugated Polyethylene (60" maximum) Steel Reinforced Polyethylene (120" Maximum) Polyvinyl Chloride (42" maximum) Polypropylene (60" maximum) Galvanized Steel
Gutter Drain	Corrugated Aluminized Steel ($n > 0.020$) Corrugated Aluminum ($n > 0.020$) Corrugated Steel ($n > 0.020$)

Vertical Drain	Ductile Iron (In saline environments, consider fiberglass reinforced pipe with welded joints, F949 PVC, and steel pipe)
Wall Zone Pipes	Polyvinyl Chloride (42" maximum) Polypropylene (60" maximum) Steel

Present the acceptable pipe materials for side drains, storm drains, and cross drains in the plans. The **FDM** illustrates a method of presenting the acceptable pipe materials in the plan.

6.7 JACK AND BORE

When installing drainage structures using jack and bore, use the casing as the carrier pipe except under railroads or in higher-pressure designs. You can find information on calculating pipe thickness for corrosion resistance in the **Culvert Service Life Estimator** (2013 version or later) and in the **Drainage Design Guide**.

6.8 DOCUMENTATION

The documentation for optional pipe materials will justify eliminating material types. Include, at a minimum, the following:

1. Design Service Life required
2. Soil and water corrosion indicators used in estimating service life
3. Estimates of service life at cross drains and at various locations of storm drain systems
4. Structural evaluation (comparison of maximum and minimum cover heights to actual cover height).

Modification for Non-Conventional Projects:

The above documentation in Section 6.8 will be required only for the pipe materials selected for use. Document the selected materials on one of the following: Summary of Drainage Structures Sheets, Optional Materials Sheet, or the plan sheets during design.

Table 6-1: Culvert Material Applications and Design Service Life

Application		Storm Drain		Cross Drain		Side Drain ⁴	Gutter Drain	Vertical Drain ¹⁰	Wall Zone Pipe ¹¹	French Drain		
Highway Facility (see notes)		Minor	Major	Minor	Major	All	All	All	All	Replacement will Impact the Roadway ⁵		Other
										Minor	Major	All
Design Service Life →		50	100	50	100	25	25 ⁶	100	100	50	100	50
Culvert Material		An * indicates suitable for further evaluation										
PIPE	Corrugated Aluminum Pipe	*	*	*	*	*	*			*	*	*
	Corrugated Steel Pipe	*	*	*	*	*	*			*	*	*
	Corrugated Aluminized Steel	*	*	*	*	*	*			*	*	*
	Spiral Rib Aluminum Pipe	*	*	*	*	*				*	*	*
	Spiral Rib Steel Pipe	*	*	*	*	*				*	*	*
	Spiral Rib Aluminized Steel	*	*	*	*	*				*	*	*
	Steel Reinforced Concrete Pipe	*	*	*	*	*				*	*	*
	Non-reinforced Concrete Pipe	*	*	*	*	*				*	*	*
	Polyethylene Pipe – Class I	*		*		*				*		*
	Polyethylene Pipe – Class II ⁸	*	*	*	*	*				*		*
	Polypropylene Pipe PP	*	*	*	*	*			*	*	*	*
	Steel Reinforced Polyethylene Pipe	*	*	*	*	*						
	Polyvinyl-Chloride Pipe ⁷	*	F949	*	F949	*		F949	*	*	F949	*
	Fiberglass Pipe							*				
	Steel pipe (per Spec 556-2.1)							*	*			
	Ductile Iron Pipe (per Spec 556-2)							*				
STRUCTURAL PLATE	Structural Plate Aluminum Pipe	*	*	*	*	*						
	Structural Plate Alum. Pipe-Arc	*	*	*	*	*						
	Structural Plate Steel Pipe	*	*	*	*	*						
	Structural Plate Steel Pipe-Arch	*	*	*	*	*						
BOX	Aluminum Box Culvert	*	*	*	*	*						
	Concrete Box Culvert CBC	*	*	*	*	*			*			
	Steel Box Culvert	*	*	*	*	*						

Table notes are on the following page.



Flexible Pipe Production Facility Listing

FDOT State Materials Office, 5007 N.E. 39th Avenue, Gainesville, FL 32609 (352) 955-6600

DISTRICT 5

FPP-01 **ADVANCED DRAINAGE SYSTEMS (WINTER GARDEN FL)**

Company: Advanced Drainage Systems, Inc.

Contact: Danny Ferry

Email: danny.ferry@ads-pipe.com

Phone: (407) 654-3989

Fax:

Physical Address:

Mailing Address:

115 W Crown Point Rd
Winter Garden, FL 34787

115 W Crown Point Rd
Winter Garden, FL 34787

QC Plan Status: Quality Control Plan ACCEPTED 3/2/2020

AASHTO M330 - Type S/SP Class I 12- 60" CLASS I CORRUGATED POLYPROPYLENE PIPE

AASHTO M294V - Type S Class II 12- 60" CLASS II CORRUGATED HDPE PIPE

AASHTO M294V - All Types Class I 2- 60" CLASS I CORRUGATED HDPE PIPE



Joint Assembly

Home Mark on Pipe



Correct Interior Assembly





HP Pipe Stiffness

Benefits

- Reduces Circumferential Deflection
- Increases Longitudinal Beam Strength
 - Easier to handle & install
 - Easier to backfill under the haunch area
 - Reduces sags / misalignment in line & grade





Outstanding Chemical & Corrosion Resistance

- Inert material
- Not affected by hydrogen sulfide gas or sulfuric acid
- Inert to “hot” / corrosive soils



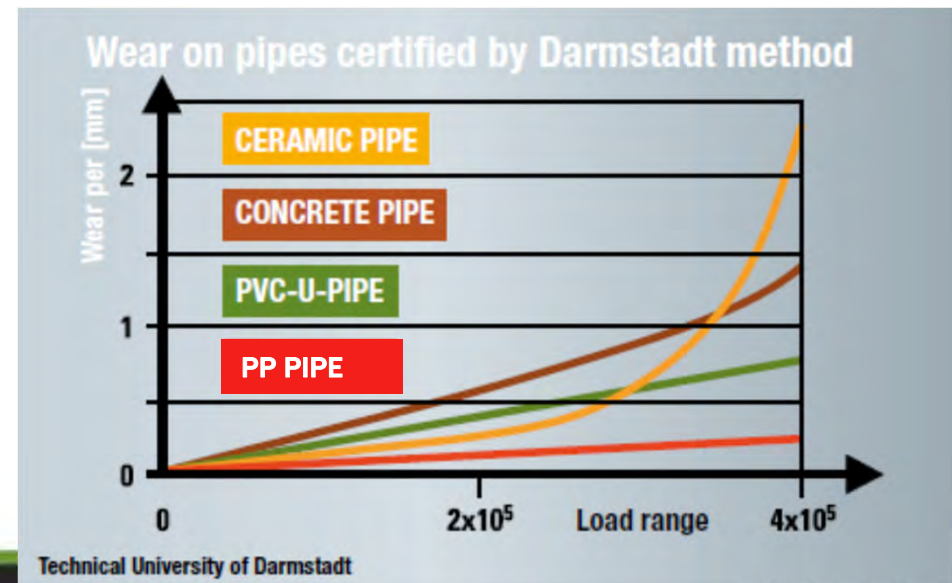
Excellent Abrasion Resistance

Impact Resistance

- More impact resistant than PVC
- Copolymer in PP acts as “shock absorber”



Note: PP properties eliminate costs associated with damage from handling / storage





Delivery Comparison







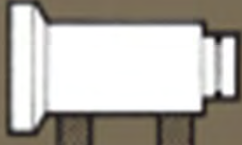
Jobsite Staging Comparison

Stockpiling

Do



Do



Support on Barrel

Don't



Support on Bell





Jobsite Staging Comparison





Gasket Prep Comparison

RCP

Field Installed
Gasket

Preparation & Jointing

Doing This



Carefully clean all dirt and foreign substances from the jointing surfaces of the bell or groove end of pipe.



Lubricate bell jointing surface liberally. Use a brush, cloth, sponge or gloves to cover entire surface. Only approved lubricant should be used.



Carefully clean spigot or tongue end of pipe, including the gasket recess.



Lubricate the spigot of the pipe, including the gasket recess. Lubricate the o-ring gasket thoroughly before it is placed on the spigot or tongue.



Place a clean, dry o-ring gasket onto a clean, dry spigot. Lubricate the gasket once it is placed on the spigot.



Fill the gasket carefully. Equalize the rubber gasket stretch by running a smooth, round object, inserted between gasket and spigot, around the entire circumference several times.



Align bell and spigot of pipes to be joined. Before forcing the joint, check that the gasket is in contact with the entry taper around the entire circumference. Make sure pipe is aligned.

Prevents This



Improperly prepared bell jointing surface may prevent bedding of the pipe.



A bell not lubricated or improperly lubricated may cause gasket to roll and possibly damage the bell.



Improperly prepared spigot and gasket recess may prevent gasket from sealing properly.



Gasket may twist out of recess, and excessive force will be required to push the pipe to the home position if lubricant is insufficient.



Unequal stretch could cause benching of gasket and may cause leaks in the joint or crack the bell.



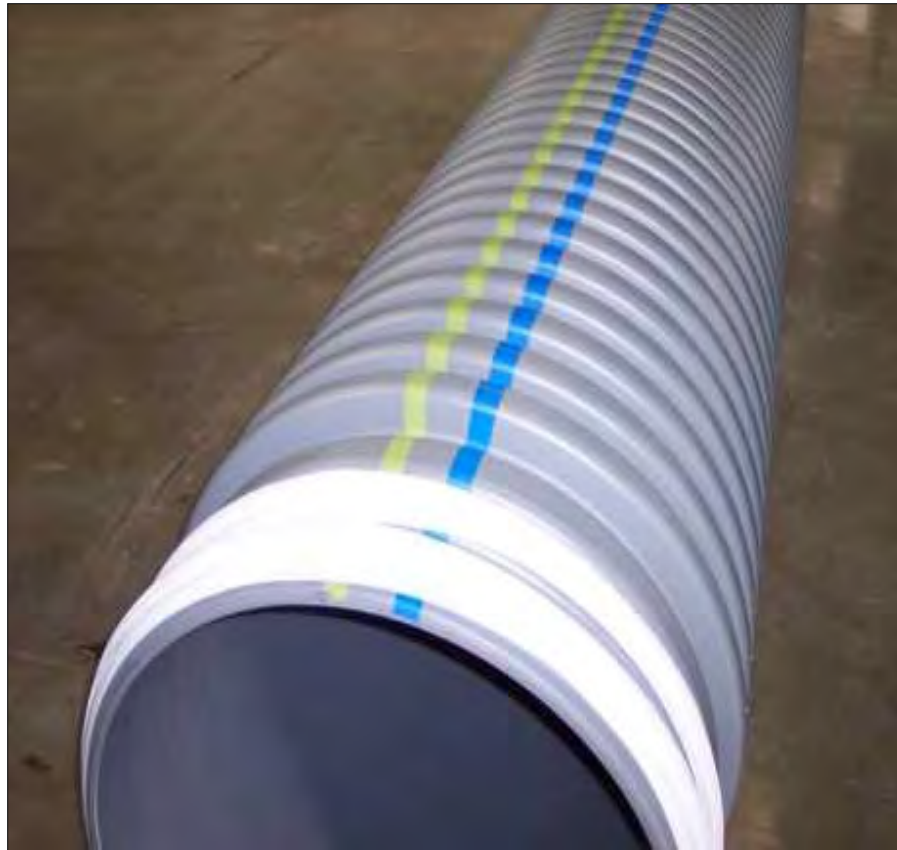
Improper alignment can dislodge gasket causing leaks or possibly break the bell.





Gasket Prep Comparison

Factory Installed
Gasket





Joint Comparison RCP vs HP

- RCP = 8' lay lengths
- HP = 20' lay lengths
- 20,000'
- RCP = 2,500 joints
- HP = 1,000 joints
- Fewer leakage concerns





Installation Comparison

RCP

Inside Dia.	Pounds/FT
18"	168
24"	264
30"	384
36"	524
42"	686
48"	867
60"	1295



HIGH PERFORMANCE

Inside Dia.	Pounds/FT
18"	6.4
24"	11
30"	15.4
36"	19.8
42"	26.8
48"	31.3
60"	45.2





RS Means, Installation Rates

RCP

Pipe Size (in.)	Installation Rate (ft/day)	
	Default	
12	150	
15	150	
18	132	
24	100	
30	88	
36	72	
42	72	
48	64	
60	48	



HP Storm


Pipe Size (in.)	Installation Rate (ft/day)	
	Default	
12	340	
15	300	
18	275	
24	250	
30	200	
36	180	
42	175	
48	170	
60	150	





Why use ADS HP Pipe?



	HP Pipe	RCP
<u>S</u> peed	✓	
<u>S</u> afety	✓	
<u>P</u> erformance	✓	
<u>P</u> rofit	✓	