LUKE draily
construction company, inc.

construction managers | general contractors | design builders

SUBMITTAL REVIEW
Project # 417 The Residences at Echelon

Date:	September 29, 2017
Submittal Number:	33-4000-06-a Storm HDPE Piping
Sequence Number:	13
Subcontractor:	Kat Excavation Bart Fisher
Submit To:	NSPJ Architects Tim Hauschild

SUBMITTAL FOR APPROVAL

Job Name/No: 417 The Residences at Echelon

- [X] REVIEWED
- [ ] REVISE & RESUBMIT
- [ ] REVIEWED& NOTED
- [ ] REJECTED

Submittal received for general compliance with the Contract Documents. Contractor's review does not relieve sub/vendor of responsibility for dimension, quantities, accuracy or completion of submittals or from any responsibilities required by terms and conditions of Subcontract/PO with Luke Draily Construction Co., Inc.. Sub/Vendors shall follow all manufacturer installation instructions. Installing contractor shall be responsible to coordinate with trades for hookup, supports, routing, etc.

By: JDW Date:

Engineering Solutions — **Shop Drawing Review**

Project: RAE Date: 9/27/17

Submittal #: STORM By: MJS

- [x] APPROVED
- [ ] REJECTED
- [ ] APPROVED AS NOTED

75 NW Business Park Lane, Riverside, MO 64150 Tel: (816) 459-8531 Fax: (816) 459-8533
www.lukedraily.com

ADS N-12® ST IB PIPE (per ASTM F2648) SPECIFICATION

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

Pipe Requirements
ADS N-12 ST IB pipe (per ASTM F2648) shall have a smooth interior and annular exterior corrugations.
- 4- through 60-inch (100 to 1500 mm) 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 soil-tight and gaskets, when applicable, shall meet the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable wrap to ensure the gasket is free from debris. A joint lubricant supplied by the manufacturer shall be used on the gasket and bell during assembly.

Fittings
Fittings shall conform to ASTM F 2306. 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 ASTM F 2306.

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) diameters, 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 for a copy of the latest installation guidelines.

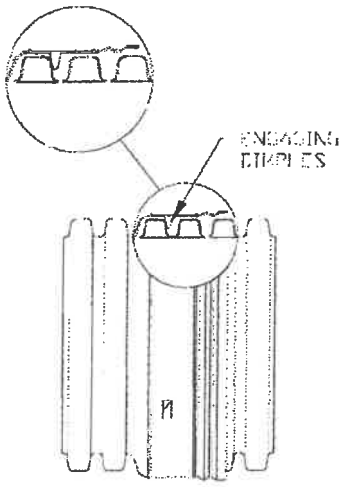
Pipe Dimensions

	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)	54* (1350)	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)	61 (1549)	67 (1702)
Perforations	All diameters available with or without perforations.													

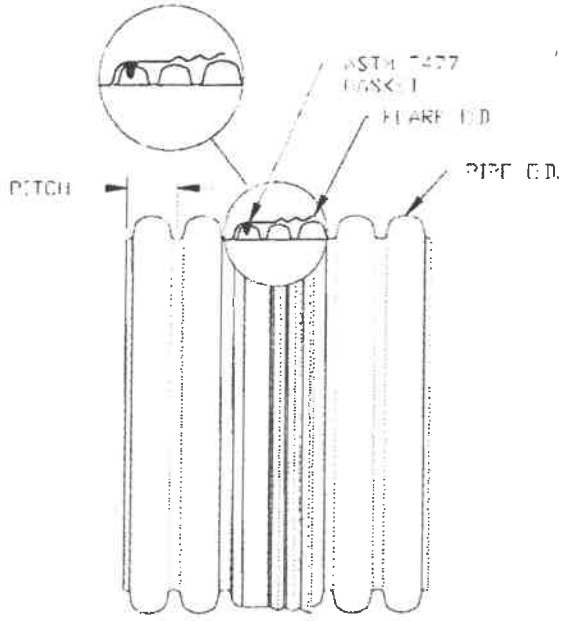
*Check with sales representative for availability by region.
**Pipe O.D. values are provided for reference purposes only, values stated for 12- through 60-inch are ± 1 inch. Contact a sales representative for exact values.

N-12® ST IB (per ASTM F2648) JOINT SYSTEM

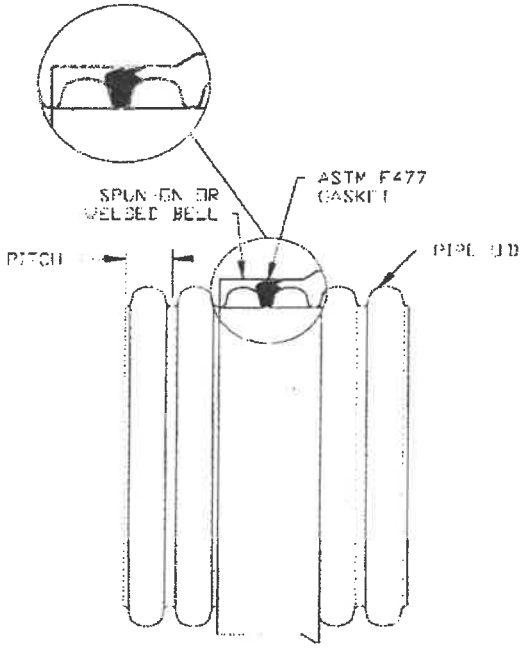
(Joint configuration & availability subject to change without notice. Product detail may differ slightly from actual product appearance.)



4" – 10"
(100 – 250 MM)



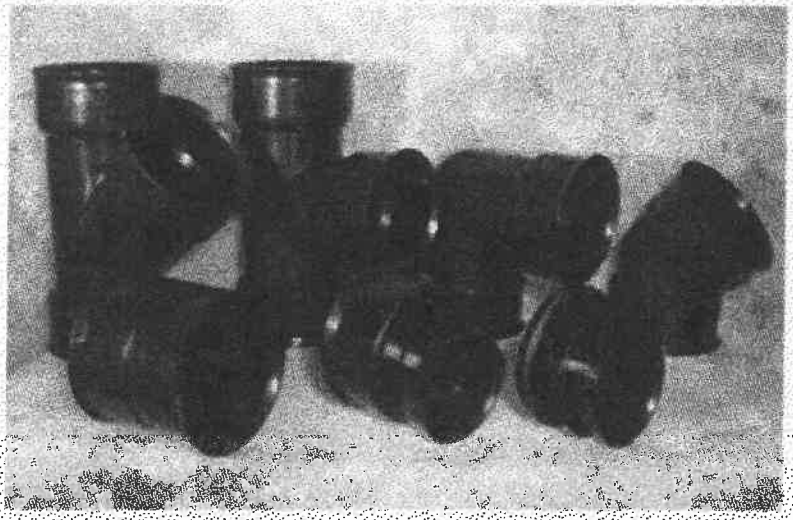
12" – 60"
(300 – 1500 MM)



4" – 60"
(100 – 1500 MM)

Small Diameter N-12® Pipe and Fittings

New line of pipe and fittings results in a water-tight or soil-tight HDPE piping system from 4" through 60".



Completing the HDPE system

Until now, specifiers have been forced to switch to other materials in pipe diameters under 15" to get soil- or water-tight performance. And, until now, the most commonly specified material for small-diameter drainage has been SDR-35 PVC pipe.

Now, ADS offers you a new line of 4" through 12" N-12® pipe and injection molded fittings* for maximum integrity in drainage service. This means that all the economy and performance benefits you've come to trust in polyethylene pipe can now be enjoyed in a complete 4" through 60" system.

The advantages of polyethylene

The superiority of HDPE over metal and concrete pipe has been well documented in the lab and in the field. But polyethylene also has some significant benefits over PVC pipe in smaller diameter applications:

- **Better impact strength.** HDPE is less brittle than PVC, particularly in cooler temperatures. N-12 survives the impact of rocks in the backfill and the rigors of cold weather handling.
- **No edge beveling.** N-12 pipe installs more quickly because there is no need to bevel the pipe edge when making the joint.
- **No special adapters.** With an all-polyethylene system, there is no requirement for special adapter fittings to join N-12 pipe to other materials.
- **Better chemical and abrasion resistance.** HDPE is virtually unaffected by acidic and alkaline solutions as well as by soil hydrocarbons.

** Injection molded fittings are not compatible with single wall corrugated HDPE pipe.*

Applications

The new line of small diameter pipe and fittings makes possible a complete drainage system from the top of the building to the storm sewer.

- Roof drains
- Foundation lines
- Collector pipe
- Roadway edge drains
- Construction site dewatering

Complete product selection

ADS offers a full complement of injection molded fittings (not welded fabrications) in 4" through 12" sizes. These fittings are available in both water-tight models which include an F477 gasket for attaching to the spigot end of the pipe, and soil-tight styles with cleats in the bells of the fittings.

The complete line, with item numbers, sizes, and the fabricated fittings they replace, is shown on page 2. ***Some Reducers, Tees and Wyes require a two-piece field assembly. These are described on page 3.***

ADS®

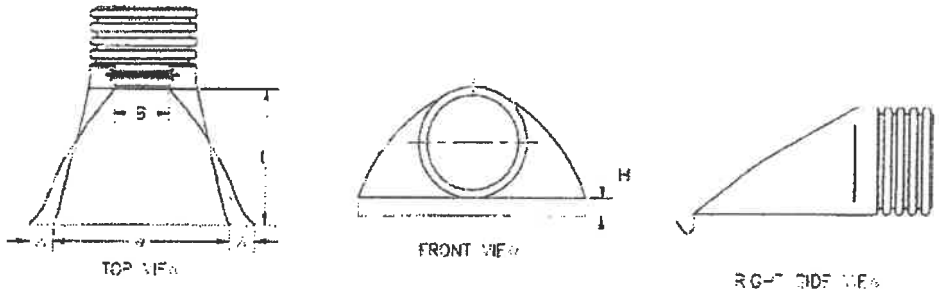
ADS FLARED END SECTION SPECIFICATION

Scope
This specification describes 12- through 36-inch (300 to 900mm) ADS Flared End Sections for use in culvert and drainage outlet applications.

Requirements
The invert of the pipe and the end section shall be at the same elevation. The ADS Flared End Section shall be high density polyethylene meeting ASTM D3350 minimum cell classification 213320C; contact manufacturer for additional cell classification information. When provided, the metal threaded fastening rod shall be stainless steel.

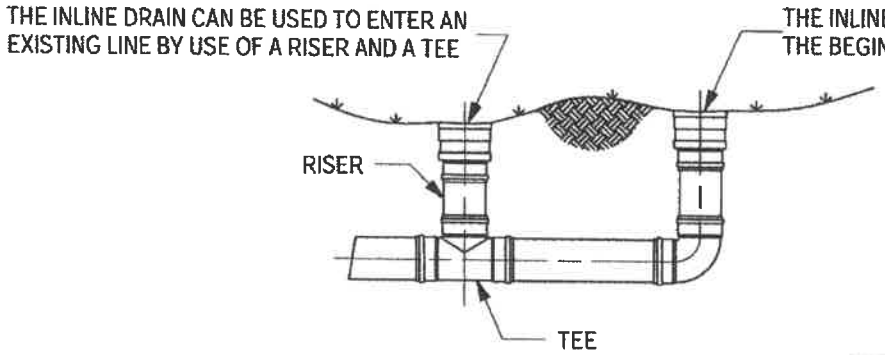
Installation
Installation shall be in accordance with ADS installation instructions and with those issued by state or local authorities. Contact your local ADS representative or visit www.ads-pipe.com for the latest installation instructions.

PIPE DIAMETER, in (mm)						
Diameter in (mm)	12 (300)	15 (375)	18 (450)	24 (600)	30 (750)	36 (900)
A in (mm)	6.5 (165)	6.5 (165)	7.5 (191)	7.5 (191)	7.5 (191)	7.5 (191)
B (max) in (mm)	10.0 (254)	10.0 (254)	15.0 (381)	18.0 (475)	22.0 (559)	25.0 (635)
H in (mm)	6.5 (165)	6.5 (165)	6.5 (165)	6.5 (165)	8.6 (218)	8.6 (218)
L in (mm)	25.0 (635)	25.0 (635)	32.0 (813)	36.0 (914)	58.0 (1473)	58.0 (1473)
W in (mm)	29.0 (737)	29.0 (737)	35.0 (889)	45.0 (1143)	63.0 (1600)	63.0 (1600)



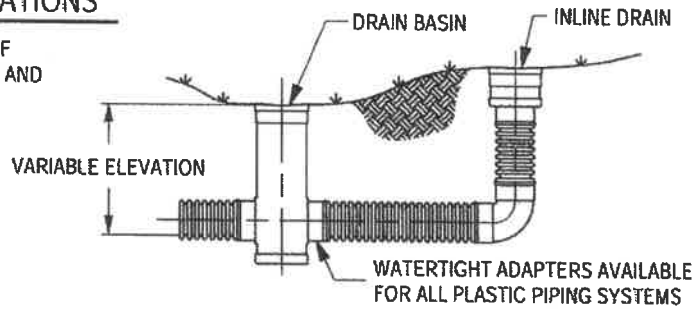
Product detail may differ slightly from actual product appearance.

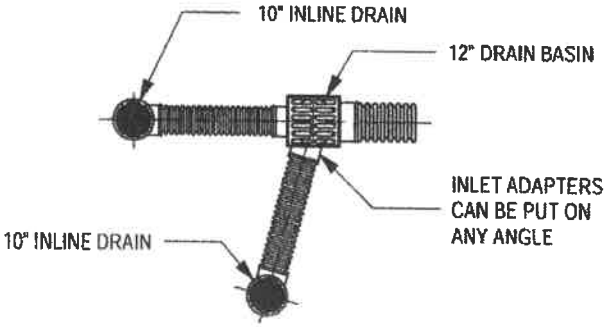
WHEN ARE INLINE DRAINS USED?



TYPICAL INSTALLATIONS

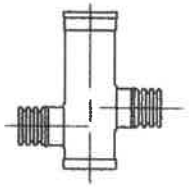
TYPICAL INSTALLATION OF NYLOPLAST DRAIN BASIN AND INLINE DRAIN



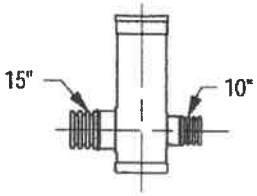


WHEN ARE DRAIN BASINS USED?

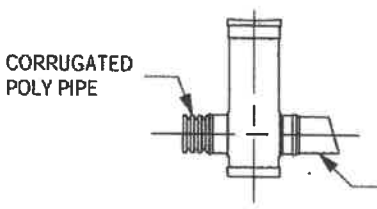
1: CHANGE ELEVATION



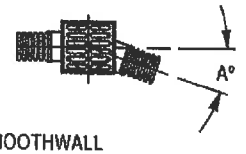
2: CHANGE DIAMETER



3: CHANGE PIPE



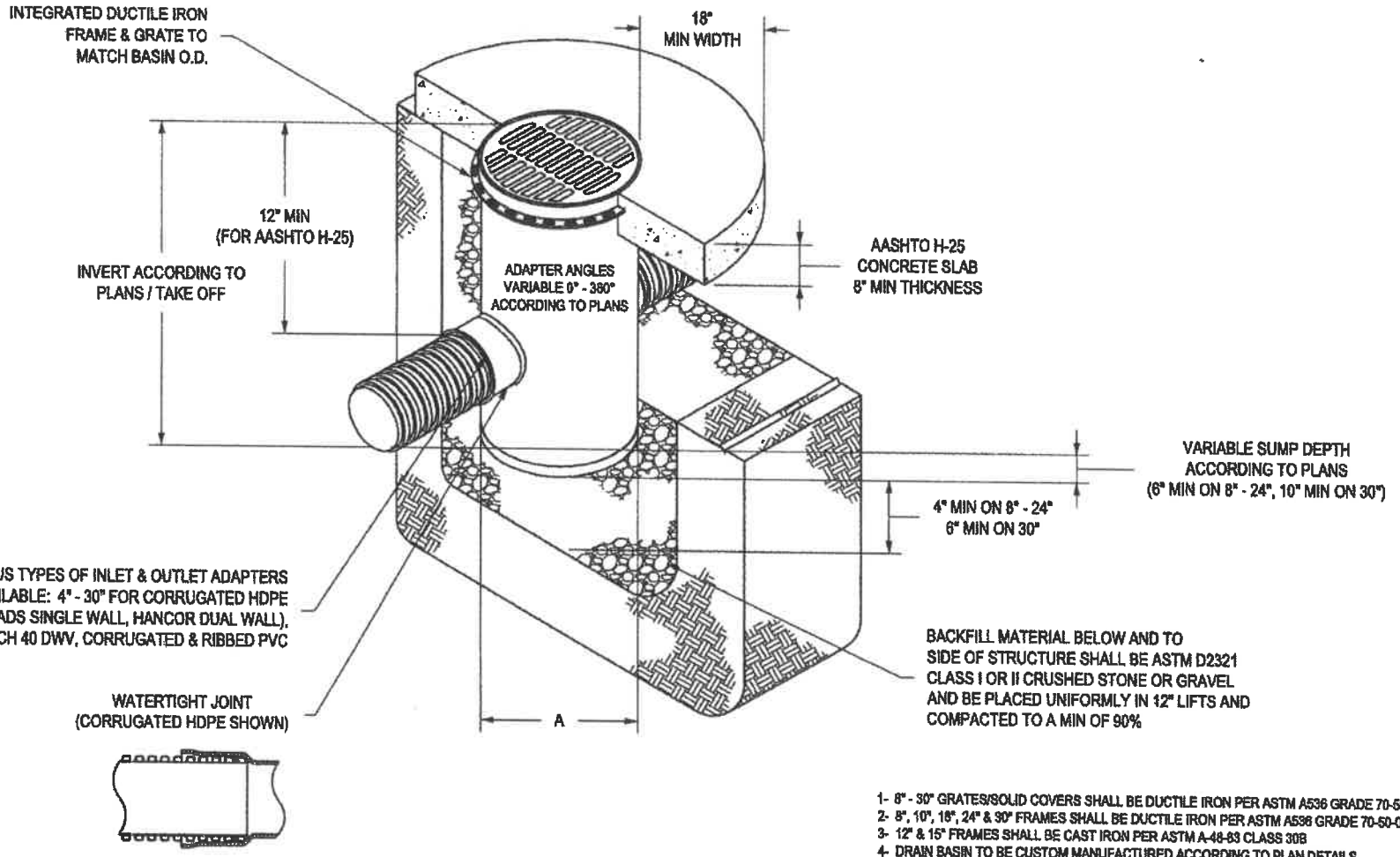
4: CHANGE DIRECTION



AVAILABLE IN SIZES 8" THROUGH 30".
ADAPT TO PIPE SIZES 4" THROUGH 30".

DRAWN BY AWA	MATERIAL	Nyloplast	3130 VERONA AVE BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-2490 www.nyloplast-us.com
DATE 10AUG00			
APPD BY CJA	PROJECT NO./NAME	TITLE	
DATE 10AUG00	DRAIN BASIN / INLINE DRAIN	8" - 30" TYPICAL INSTALLATION OPTIONS	
DWG SIZE A	SCALE 1:80 SHEET 1 OF 1	DWG NO. 7001-110-042	REV B

NYLOPLAST DRAIN BASIN



1- 8" - 30" GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2- 8", 10", 18", 24" & 30" FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3- 12" & 15" FRAMES SHALL BE CAST IRON PER ASTM A-48-83 CLASS 30B
4- DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
5- DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
6- FOR COMPLETE DESIGN AND PRODUCT INFORMATION: WWW.NYLOPLAST-US.COM
7- TO ORDER CALL: 800-821-6710

A	PART #	GRATE OPTIONS		
8"	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10"	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12"	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-25	SOLID AASHTO H-25
15"	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-25	SOLID AASHTO H-25

A	PART #	GRATE OPTIONS		
18"	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-25	SOLID AASHTO H-25
24"	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-25	SOLID AASHTO H-25
30"	2830AG	N/A	STANDARD AASHTO H-25	SOLID AASHTO H-25

DRAWN BY	EBC	MATERIAL	
DATE	1-23-06		
APPD BY	CJA	PROJECT NO./NAME	
DATE	1-23-06		
DWG SIZE	A	SCALE NTS SHEET 1 OF 1	DWG NO. 7001-110-144 REV A

Nyloplast
3130 VERONA AVE
BUFORD, GA 30518
PHN (770) 932-2443
FAX (770) 932-2460
www.nyloplast-us.com

TITLE
DRAIN BASIN WITH STANDARD GRATE
QUICK SPEC INSTALLATION DETAIL

STEEL END SECTION SPECIFICATION

1.0 General:

1.1 This specification covers steel end sections used on the inlet and outlet ends of corrugated steel pipe, concrete pipe, and HDPE pipe.

1.2 The galvanized material used in the fabrication of the end sections shall conform to the applicable material requirements of AASHTO M 218 and ASTM A 929, or other pre-approved AASHTO or ASTM material specifications. All fabrication of the product shall occur within the United States of America.

1.3 The end sections shall be manufactured to show careful finished workmanship.

1.3.1 There shall be no loosely formed seams.

1.3.2 There shall be no ragged shear edges.

1.3.3. The markings on the sheets as received from the steel supplier shall be legible.

1.3.4 The metallic coating on the end section shall not be bruised, broken or otherwise damaged. If there is damage to the coating it shall be repaired in accordance with ASTM A 780.

2.0 Design:

2.1 Sizes shall be as shown on the plans.

2.2 Gages shall be as shown in the manufacturer's brochure unless shown differently on the plans.

2.3 The end sections shall attach to the pipe by means of a strap or rod unless shown otherwise on the plans.

2.4 The end sections shall have the standard toe plate. If shown on plans the end sections shall have the optional toe plate extension.

3.0 Installation:

3.1 The end sections shall be installed in a careful workmanship like manner.

3.2 The strap or rod shall be securely tightened around the pipe.

3.3 The toe wall shall be placed in narrow trench. The invert of the end section shall be supported evenly by the bedding.

3.4 The alignment of the end section shall match that of the pipe.

3.5 The installation shall be completed by proper compaction of the backfill around the end section.

CONTECH® CONSTRUCTION PRODUCTS INC.

SPECIFICATION
STEEL END SECTION

DRAWN BY: J.M.E.	REV. BY: M.J.O.	SCALE:
DATE: 09-18-92	DATE: 7-27-00	1008815D