

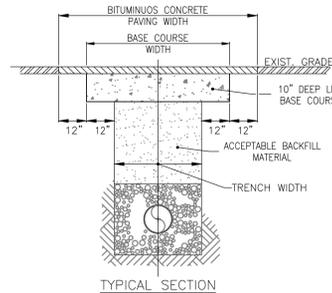
STONE BEDDING: STANDARD SPECIFICATIONS
BEDDING, HAUNCHING AND INITIAL BACKFILL SHALL UTILIZE STONE BEDDING WHICH SHALL CONSIST OF WASHED GRAVEL OR CRUSHED STONE CONFORMING TO THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE SIZE	PERCENT PASSING
1/2"	100
1"	90-100
No. 4	25-60
No. 8	0-10
(REF. AASHTO No.57)	0-5

BEDDING:
PRIOR TO PIPE INSTALLATION, CAREFULLY BRING THE 6" OF BEDDING MATERIAL TO GRADE ALONG THE ENTIRE LENGTH OF PIPE TO BE INSTALLED. LITTLE OR NO COMPACTION IS REQUIRED DUE TO THE ANGULAR NATURE OF THE PARTICLES. IF TRENCH BOTTOM CONDITIONS SO WARRANT, MORE THAN 6" OF BEDDING MAY BE REQUIRED, AS DIRECTED BY THE ENGINEER.

HAUNCHING:
CAREFULLY WORK, BY HAND, STONE BEDDING FROM THE EDGE OF THE TRENCH UP AND UNDER THE PIPE TO SUPPORT THE HAUNCHES. CONTINUE FILLING, BY HAND, TO THE SPRING LINE OF THE PIPE.

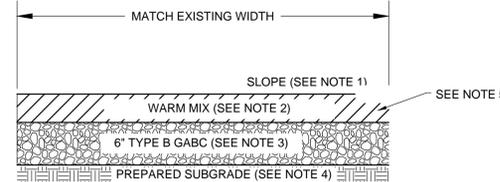
INITIAL BACKFILL:
CONTINUE WITH STONE BEDDING MATERIAL TO A DEPTH OF AT LEAST 6" ABOVE THE TOP OF THE PIPE. MECHANICAL PLACEMENT OF BEDDING IS ACCEPTABLE FOR INITIAL BACKFILL.
SEE TRENCH WIDTH AND BACKFILL DETAIL.



PIPE DIAMETER	TRENCH WIDTH	BASE COURSE WIDTH	BITUMINOUS CONCRETE PAVING WIDTH
6"	36"	60"	84"
8"	36"	60"	84"
10"	36"	60"	84"
12"	36"	60"	84"
15" (Includes 16")	42"	60"	84"
18"	42"	66"	90"
21" (Includes 20")	42"	66"	90"
24"	48"	72"	96"
27"	60"	84"	108"
30"	60"	84"	108"
33"	66"	90"	114"

TRENCH PAYMENT WIDTH

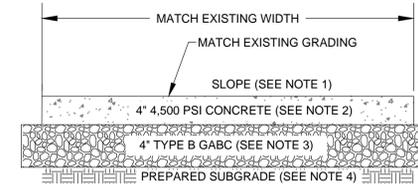
- NOTES:
- WHEN BOTTOM OF TRENCH IS IN ROCK, UNDERCUT 6" BELOW BOTTOM OF BARRREL AND REPLACE WITH TAMPED SUITABLE MATERIAL.
 - WHERE TWO TIER SHEETING IS AUTHORIZED BY THE ENGINEER, ALL WIDTHS SHALL BE INCREASED BY 3 FEET.
 - STONE BASE AND BACKFILL MUST BE COMPACTED IN 8" LIFTS AFTER PIPE IS COVERED 6".



- NOTES:
- MINIMUM CROSS SLOPE = 1%
MAXIMUM CROSS SLOPE = 2%
TYPICAL CROSS SLOPE = 1.5%
 - MATCH EXISTING PAVEMENT THICKNESS (2" MIN. ASSUMED) TYPE C WARM MIX, 160 GYRATIONS.
 - STONE AGGREGATE BELOW SITE PATH SHALL BE TYPE B GABC. THICKNESS OF GABC SHALL BE 6 INCHES.
 - PROOF ROLL SUBGRADE, COMPACT TO 95% DENSITY (ASTM D-1557)
 - SAWCUT, MILL AND OVERLAY AS NEEDED TO ACHIEVE DESIRED GRADES WITH 1 1/2" MINIMUM AND 2 1/2" MAXIMUM OVERLAY. SEAL JOINTS WITH HOT POURED BITUMASTIC SEALANT.

DETAIL: REPLACEMENT PAVEMENT

SCALE: NONE



- NOTES:
- MINIMUM SIDEWALK CROSS SLOPE = 1%
MAXIMUM SIDEWALK CROSS SLOPE = 2%
 - STANDARD SIDEWALK SHALL BE 4 INCHES THICK. DEPRESSED AND TRANSITION SIDEWALK SHALL BE 6 INCHES THICK.
 - STONE AGGREGATE BELOW CONCRETE SIDEWALK SHALL BE TYPE B GABC. THICKNESS OF GABC SHALL BE 4 INCHES FOR STANDARD SIDEWALK AND 6 INCHES FOR DEPRESSED AND TRANSITION SIDEWALK.
 - PROOF ROLL SUBGRADE, COMPACT TO 95% DENSITY (ASTM D-1557)

DETAIL: REPLACEMENT SIDEWALK

SCALE: NONE

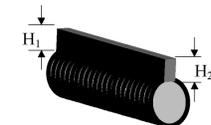
DETAIL: PIPE BEDDING

SCALE: NONE

DETAIL: TRENCH WIDTH AND BACKFILL

SCALE: NONE

DURASLOT® Variable Height Slot Table



DURASLOT Number	H ₁	H ₂	DURASLOT Number	H ₁	H ₂
(Dia.) - V1	2 1/2	3 1/8	(Dia.) * - V15	11 1/4	11 7/8
- V2	3 1/8	3 3/4	- V16	11 7/8	12 1/2
- V3	3 3/4	4 3/8	- V17	12 1/2	13 1/8
- V4	4 3/8	5	- V18	13 1/8	13 3/4
- V5	5	5 5/8	- V19	13 3/4	14 3/8
- V6	5 5/8	6 1/4	- V20	14 3/8	15
- V7	6 1/4	6 7/8	- V21	15	15 7/8
- V8	6 7/8	7 1/2	- V22	15 5/8	16 1/4
- V9	7 1/2	8 1/8	- V23	16 1/4	16 7/8
- V10	8 1/8	8 3/4	- V24	16 7/8	17 1/2
- V11	8 3/4	9 3/8	- V25	17 1/2	18 1/8
- V12	9 3/8	10	- V26	18 1/8	18 3/4
- V13	10	10 5/8	- V27	18 3/4	19 3/8
- V14	10 5/8	11 1/4	- V28	19 3/8	20

* Each piece will have a 3 or 4 digit number starting with pipe diameter.

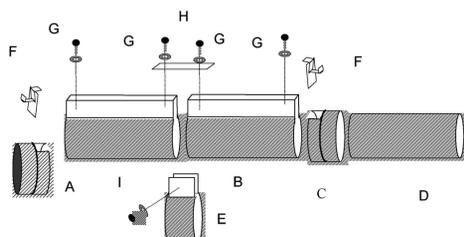
DURASLOT® With Variable Height Slot

DURASLOT® with a Variable Height Slot is available to provide slope in the pipe invert when grade is level. Standard 1/2% slope is readily available; other slopes can be made by special order.

Information and Design Guidelines

- Lengths remain at 10' 0" with change in slot height of 5/8" per length. This is a nominal 1/2% slope (actual slope is .52%).
- Maximum slot height should not exceed 1.5 times the pipe diameter before consulting the manufacturer.
- On the following drawing and table, H₁ and H₂ are nominal slot heights. These are minimums from corrugation center to grade.
- Light traffic applications can start with V1.
- Moderate traffic applications can start with V4.
- Heavy traffic applications can start with V7.
- A second spacer (on 6" centers) is utilized within the slot when H₁ reaches 8 3/4" (from V11 and up).
- Bands are made so that their band angles meet grade at each joint - i.e., the band between V9 and V10 would have 8 1/8" high band angles so that a continuous slot is maintained at the surface.
- A second thumbscrew is added when the band angle height reaches 8 3/4". A third thumbscrew is added when the height reaches 15".

Complete DURASLOT® Assembly Example



- A - DURASLOT End Cap
 - B - DURASLOT Pipe
 - C - DURASLOT Adapter
 - D - ADS N-12
 - E - DURASLOT Coupler Band
 - F - DURASLOT Grate Anchor
 - G - 1/4" SPHS x 3/4" Long w/ 1/4" Washer
 - H - DURASLOT Grate Connector
 - I - 5/16" - 18 Thumbscrew x 3" Long w/ 5/16" Wingnut
- One Grate Anchor (F) and SPHS/Washer (G) come with each End Cap (A) or Adapter (C).
Two SPHS/Washer (G), one Grate Connector (H), and one Thumbscrew/Wingnut (I) come with each Coupler Band (E).

ADS DURASLOT® PIPE SPECIFICATION

Scope
This specification describes 4- through 36-inch (100 to 900 mm) ADS DURASLOT pipe for use in surface drain applications.

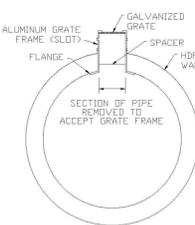
Pipe Requirements
DURASLOT pipe, as manufactured by Hall Construction Products and Services (HCPS) and distributed by ADS, Inc., shall have a smooth interior and annular exterior corrugations with an aluminum slot mounted longitudinally along the length of the pipe to accept the grate frame while maintaining the original pipe diameter.

- 4- through 10-inch (100 to 250mm) pipe shall meet AASHTO M252, Type S.
- 12- through 36-inch (300 to 900 mm) pipe shall meet AASHTO M294, Type S or ASTM F2306.
- Manning's "n" value for use in design shall be 0.012.

The aluminum grate frame shall be manufactured from 0.053" tempered commercial aluminum meeting the requirements of ASTM B209, consisting of two parallel plates separated by spacers separating the slot on 6" centers. The grate shall be #13 galvanized steel meeting the requirements of ASTM F1207, Type 2, Class 2. The grate shall have a diamond-shaped opening and be ADA compliant. The flange at the bottom of the aluminum grate shall be riveted to the pipe with a minimum of two rivets per linear foot.

Fittings
DURASLOT fittings shall be modified from fittings which conform to AASHTO M252, AASHTO M294, or ASTM F2306.

Installation
Installation shall be in accordance with HCPS recommended installation instructions. Contact your local ADS representative or visit www.ads-pipe.com for a copy of the latest installation guidelines.



DETAIL: DURASLOT® VARIABLE HEIGHT SLOT

SCALE: NONE

DETAIL: DURASLOT® ASSEMBLY EXAMPLE AND SPECIFICATIONS

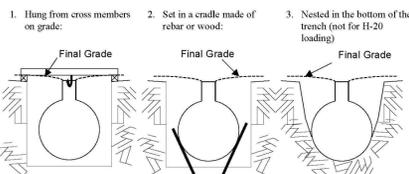
SCALE: NONE

DETAIL: DURASLOT® ADAPTER

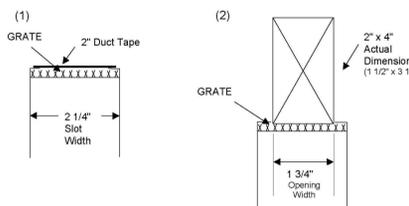
SCALE: NONE

DURASLOT® Drains - Installation Notes - 1.0

DURASLOT must first be set and secured in place - some methods that have been used:

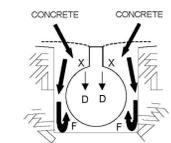


Before concrete is poured or asphalt is laid down, the slot opening should be covered to prevent it from being clogged. If you hang the DURASLOT, a good way to do this is to put 2" duct tape over the slot opening (1). If the pipe is sitting in a cradle or the trench bottom, a 2" x 4" can be set on the 2" edge on top of the grating (2).

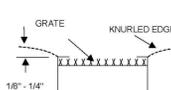


DURASLOT® Drains - Installation Notes - 2.0

When pouring concrete around DURASLOT, especially when the pipe is sitting in a cradle, pour down on the spot where the pipe meets the slot (X) [taking care to keep the slot upright]. This type of pour will provide some downward force (D) that will serve to keep the pipe from floating due to upward force (F) as the concrete fills the trench.



The top of the DURASLOT at the slot opening should always be set 1/8" to 1/4" below finished grade. This allows surface run-off to enter the inlet efficiently and protects the grate and flanges from snowplows and the like. A mason's tool can be used to knurl the edge after the tape or 2" x 4" has been removed.



It is important that all fittings and hardware are used when DURASLOT is installed. The product is designed as a system: all grate connectors and anchors must be used to keep the grate in tension, and to tie the ends of the grate into the concrete or asphalt. At the end of each run an end cap or adapter should always be utilized (these include the anchor). Only DURASLOT Couplers should be used to join sections of DURASLOT. See the Assembly Details or call HCPS at (518) 747-7047 with any questions.

DURASLOT® Drains - Shipping & Handling

Most DURASLOT orders ship LTL from the HCPS plant in Hudson Falls, NY, zip: 12803. The majority of these orders consist of only one size of pipe. For this type of order HCPS will bundle the ten foot lengths into groups of 2-5 pieces, weighing from 65# - 155# (5 pes. of 4" - 3 pes. of 12"). Pipe of 15" diameter or larger is shipped individually. These orders generally arrive in a box trailer and are best unloaded by hand - two men can easily handle all bundles.

The bundles are held together by the wire which is sandwiched between two layers of duct tape to protect the plastic pipe. The customer should be aware that the tape will not tear, the wire needs to be cut. When pipe is sent LTL, the fittings and hardware are generally sent UPS. These will usually arrive a day or two before the pipe. The UPS package(s) will have all the paperwork (packing list, copy of the bill of lading, order copy, assembly details, and installation notes) except the original bill of lading which comes with the pipe.

For orders with more than one pipe size (example- dealer stock), when possible, HCPS will nest smaller pipe in larger pipe. As this starts to get heavy, we will build a pallet or skid which allows the customer to unload by forklift. Some fittings may be included on the pallet, but generally fittings and hardware will still go UPS. The paperwork will be in the UPS box; the customer should be reminded to keep the order copy to check against the material on the pallet(s) or skid(s) when it arrives.

For Truckload Deliveries: When an order for a truckload of DURASLOT is loaded, all fittings and hardware goes with that truck. The fittings are generally strapped to the upper level of a step-deck trailer, and the hardware is boxed separately. The pipe will be stacked in four piles, ten feet long on 4" x 4" cross pieces. These allow nylon slings to be slid under the stack and wrapped around it. The whole 10-foot pile can be unloaded by a crane or any machine that can use the nylon slings to lift the pile off the truck. Metal chains or any other material which could damage the pipe are not recommended for lifting DURASLOT off any truck. We also do not recommend using a forklift for unloading DURASLOT off the truck. We also do not recommend using a forklift for DURASLOT that is not on a pallet or skid. DURASLOT should never be pushed off the side of the truck - it is not flexible like regular HDPE pipe!

Approximate Truckload Quantities		
Dia.	2 1/2" Slot	6" Slot
4"	10,000'	X
6"	4,000'	3,600'
8"	3,240'	2,960'
12"	1,280'	1,200'
15"	X	1,000'
18"	X	760'
24"	X	440'
30"	X	360'
36"	X	280'

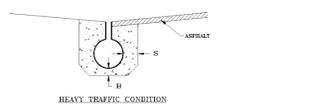
(X) - not a standard size - check with HCPS

DURASLOT® Installation Practices

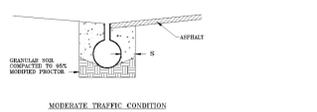
DURASLOT surface drains are made from a flexible conduit, which is designed to attain its structural strength utilizing ring-compression derived from soil pressure. For this to occur, a minimum height of cover is required. Since this is not possible, the drain must be filled with concrete to allow it to accept vehicular traffic. This is true of any pipe with an inlet mounted on top to form this type of surface drain. The pipe cannot function in the manner for which it was designed when it is installed this close to the surface. The concrete-filled trench provides the actual structure for this type of design.

Following are some of the most often utilized installation details for DURASLOT surface drains.

(A) Heavy Traffic - completely surrounded by concrete for critical loading applications. This would include frequent high-speed H-20 traffic, such as a highway. The dimensions "A" and "B" are generally 3" to 6" depending on the specific conditions for the project (design layout, traffic patterns, soil properties, etc.)



(B) Moderate Traffic - surrounded by concrete to below the center of the pipe. This type of installation has been used when traffic loads are not as heavy (i.e., retail parking lots, against curbs, etc.). The soil below the pipe and concrete must be high quality and well compacted.



DETAIL: DURASLOT® SHIPPING AND INSTALLATION

SCALE: NONE

DETAIL: 15" DURASLOT® END CAP

SCALE: NONE

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DOVER, DE 19901

PROJECT #FD-15-128
DELAWARE STATE UNIVERSITY
ALUMNI STADIUM DRAINAGE UPGRADES
CITY OF DOVER-KENT COUNTY-DELAWARE

DATE: 9 MARCH 2016
SCALE: NONE
PROJECT NO. 9564.CQ
SHEET: 2 OF 3

