

Duraslot® Surface Drains



Durable, economical, corrosion-resistant
collection of surface runoff



A sensible alternative to metal and concrete

Since 1987, Duraslot® surface drains have been providing reliable storm water collection in applications ranging from residential driveways to multi-lane super highways.

The product is made from dual-wall corrugated polyethylene pipe with an aluminum slot mounted on top. It is designed to intercept sheet flows of water across paved or cleared areas. It is a cost-effective substitute for corrugated steel slotted drains, precast trench drains, or cast-in-place trench drains with steel or cast iron grates.

Duraslot drains use N-12® pipe, manufactured by Advanced Drainage Systems. An outer corrugated wall provides strength and durability, while the smooth interior lining gives exceptional hydraulics.

Physical details

- **Slot height:**
 - 2.5" for residential and pedestrian areas
 - 6" for H-20 loading in vehicular traffic areas
 - Taller slots are available on special order
 - Variable height slot to provide slope in the pipe invert at level grade (special order)

- **Pipe length:** 10 feet
- **Pipe diameter:** 4" through 36"
- **Slot opening:**
 - 1.25" wide in 4" diameter
 - 1.75" wide in 6" diameter and higher
- **Grate options:**
 - 1/2 - #13 galvanized steel (stock standard)
 - Open top without grate (available standard)
 - Other types of grating available on special order

System components

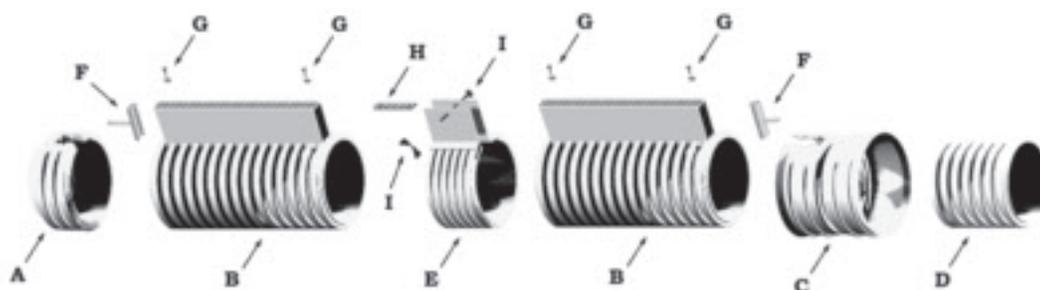
• **Coupler Band.** Connects Duraslot drain to Duraslot drain. A modified pipe band with angles extended up is used to clamp together the ends of the two slots being joined. A thumb-screw and wingnut fasten the band angles onto the ends of the slots. A Grate Connector is included.

• **Grate Connector.** Joins the grates at the ends of the slots, and can be easily removed to allow a hose to flush out the pipeline.

• **Pipe Adapter.** Connects Duraslot drain to N-12 pipe. A corrugated pipe coupler that is modified to accept Duraslot drain on one end and N-12 pipe on the other. A Grate Anchor is included.

• **End Cap.** Modified to close the upstream end of Duraslot drain. A Grate Anchor is included.

• **Grate Anchor.** Used at the end of each Duraslot run to close off the end of the slot, anchor the end of the grate into the concrete or asphalt surrounding the slot, and keep the grate in tension for added strength.



- A - End Cap
- B - Duraslot drain
- C - Pipe Adapter
- D - ADS N-12 pipe
- E - Coupler Band
- F - Grate Anchor
- G - .25" SPH Screw with Washer
- H - Grate Connector
- I - .3125" Thumbscrew with Wingnut

Applications

Duraslot drains are linear drains designed to capture sheet flow of water from sloping paved surfaces or cleared areas. They have the same inlet as corrugated steel pipe slotted drains. A 1.75" wide opening runs the length of the pipe, and special connectors provide for a continuous slot of virtually unlimited length. For curb and gutter applications, the inlet acts as an orifice, and the AISI Handbook* method can be used to determine hydraulic capacity.

For interception of sheet flow, the inlet acts as a weir. Testing done by the Federal Highway Administration (FHWA) concluded that for inlets as narrow as one inch wide virtually all of a flow (0.04 cfs per foot of inlet) could be intercepted under most design conditions. Third party testing confirmed the FHWA conclusions, and developed "rule of thumb" capacities for 1.75" wide slots with and without grating:

1.75" open top slot => .065 cfs per foot of inlet

1.75" slot with grate => .046 cfs per foot of inlet

Typical applications for Duraslot drains include the following:

- Roadways
- Sidewalks
- Parking lots
- Plazas
- Loading docks
- Industrial floors
- Parks and athletic fields

* American Iron and Steel Institute Handbook of Steel Drainage and Highway Construction Products, 1994, pages 218-223, "Hydraulics of Storm Water Inlets"



Concrete floors



Residential driveways



Water treatment plant



Against roadway curbs, berms and medians



Commercial parking lots



Loading docks and maintenance facilities

Fabricated Fittings

Design flexibility is enhanced with a complete line of fabricated fittings in all standard pipe sizes. Styles include elbows in virtually any angle up to 90°, tees, wyes, reducing tees, and other fittings custom fabricated to your specifications.



Competitive Benefits

Duraslot surface drains offer a number of cost and performance benefits compared to corrugated metal, polymer trench drain and cast-in-place systems:

- **Reduced maintenance costs.**
- **Resilient materials.** Corrosion-resistant polyethylene and aluminum are impervious to most acids, storm water contaminants, and road salt.
- **Greater hydraulic efficiency.** Water flow through the smooth inner wall of polyethylene pipe is superior to corrugated steel pipe.
- **Lower installation costs.** Lightweight sections quickly and easily set in place with no heavy machinery or extra manpower.
- **Lower material costs.** Most cost-effective compared to other other systems that support vehicular traffic.
- **Longer lay lengths** compared to one-meter lengths of polymer trench drain, ten foot Duraslot drains speed installation time and make it much easier to maintain constant slope.
- **Impact-resistant polyethylene** withstands storage and handling. Durable construction provides no waste due to deformation or breakage.



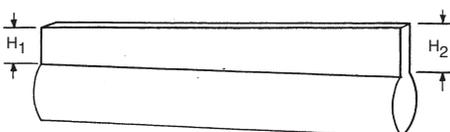
Heavy equipment is not required to set Duraslot drains in place. Long, lightweight sections and easy-to-use coupler bands cut installation time significantly.



Smooth inner wall N-12 pipe resists chemical attack and provides superior hydraulic flow compared to corrugated steel pipe.

Variable Height Slot

In addition to the standard fixed slot height style, Duraslot drains are available with a variable height slot to permit slope in the pipe invert when grade is level. The standard change in slot height is .625" per 10-ft. length (H_2 minus H_1 in drawing) providing an approximate 0.5% slope. Other slopes are also available and the product is delivered in sequentially numbered sections to facilitate installation. Slot heights of more than 30" have been installed. Contact ADS for complete product and installation details.



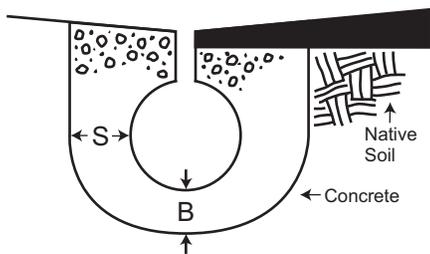
Variable height slot Duraslot drains can be ordered in sequentially numbered sections with maximum slot heights exceeding 30".

Installation Basics

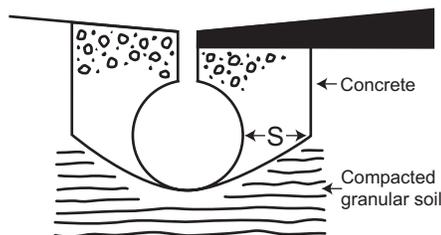
Duraslot surface drains are made from a flexible conduit designed to attain its structural strength utilizing ring compression derived from soil pressure. For this to occur, a minimum cover height of 12" is typically required with N-12 pipe in traffic applications. This cannot be achieved with Duraslot drains because the tops of the grates must be set to finish grade. Therefore, where vehicular traffic may be present, the drain must be backfilled with concrete to support the pipe and provide a non-eroding surface at the top of the slot where water enters the inlet.

Backfill requirements for the Duraslot drain depend on the type of loading on the drain:

• **Heavy traffic.** Completely surround the drain with concrete for critical loading applications such as frequent H-20 traffic on a highway. The S and B dimensions are typically 3" - 6" depending on specific project conditions (design layout, traffic patterns, soil properties, etc.).



• **Moderate traffic.** Surround the drain with concrete to below the center of the pipe. Used where vehicular traffic is moderate (retail parking lots, driveways, against curbs, etc.).

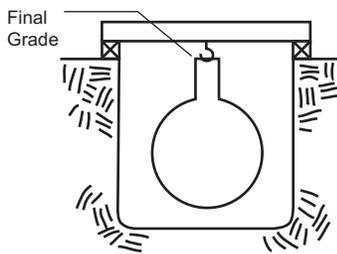


• **Residential/pedestrian traffic.** Concrete, asphalt, or soil concrete slab at grade for non-vehicular installations (patios, sidewalks, against foundations, landscaping projects, etc.).

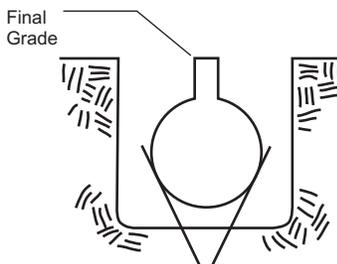


Installation Notes

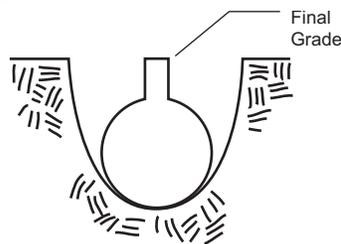
1. Duraslot drains may be set and secured in place using one of the following methods:



a. Hung from cross members on grade



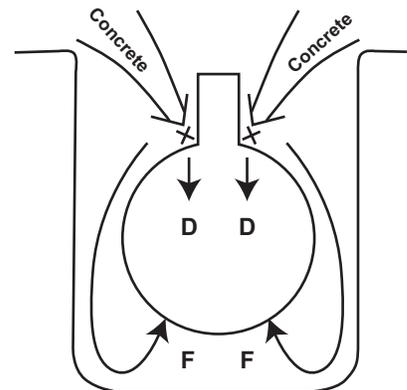
b. Set in a cradle made of rebar or wood



c. Set in the trench bottom (not for H-20 loading)

2. Cover the slot opening to prevent clogging with poured concrete or asphalt. The easiest way to protect the slot is to cover it with 2" duct tape. An alternate method is to place a 2 x 4 on the 2" edge on top of the slot.

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



4. The top of the slot opening should always be set 0.25" - 0.50" below finished grade. This allows surface runoff to enter the inlet efficiently while protecting the grate and flanges from possible damage from snowplows or other traffic. A mason's tool can be used to round the edge after the protective tape or 2 x 4 is removed from the slot opening.

5. Duraslot drains are designed as a system, and it is important that the supplied fittings and hardware are used during installation. Grate connectors and anchors keep the grate in tension and tie the ends of the grate into the concrete or asphalt. Anchors and end caps or adapters should always be used at the end of a run. Use only Duraslot coupler bands to join sections of Duraslot drain (see page 2).

Duraslot Pipe Specification

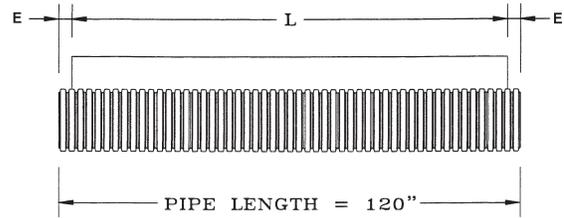
Scope

This specification describes 4" to 36" (100 to 900mm) ADS Duraslot pipe for use in surface drain applications.

Pipe Requirements

ADS Duraslot pipe 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" to 10" (100 to 250mm) pipe shall meet AASHTO M252, Type S.
- 12" to 36" (300 to 900mm) 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 0.063" tempered commercial aluminum, consisting of two parallel plates separated by spaces spanning the slot on 6" centers. The grating shall be 1/2" - #13 galva-



nized steel. The flange at the bottom of the aluminum grate shall be riveted to the pipe with a minimum of two rivets per linear foot.

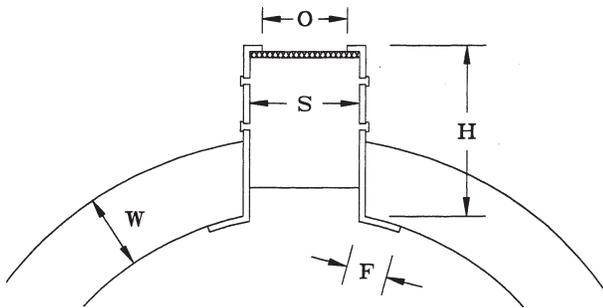
Fittings

Pipe fittings shall conform to AASHTO M252, AASHTO M294, or ASTM F2306.

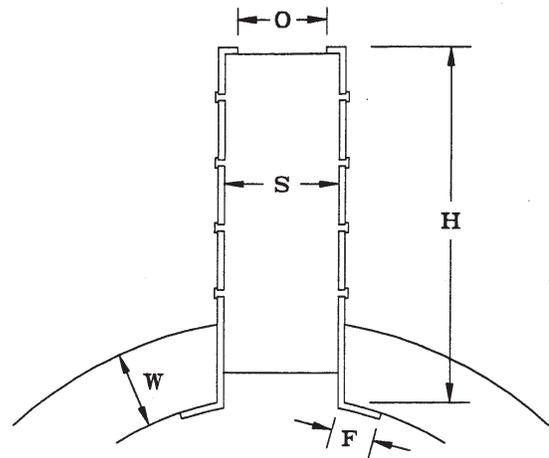
Installation

Contact your local ADS representative for a copy of the installation guidelines from Duraslot.

Physical Dimensions



2.5" Slot shown with 1/2" - #13 Galvanized Grating



6" Slot shown without Grating (Open Top)

	Pipe Diameter									
	4"	6"	8"	10"	12"	15"	18"	24"	30"	36"
H (2.5" Nominal Slot)	2.75" *	3" *	3" *	3"	3.5" *	3.75"	4"	4.75"	5"	5.25"
H (6" Slot)	6.25"	6.5" *	6.5" *	6.5"	7" *	7" *	7" *	7.25"	8.25"	8.25"
W (Corrugation Height)	0.34"	0.46"	0.61"	0.73"	1.15"	1.30"	1.57"	1.86"	2.55"	2.85"
F (Flange Length)	0.5"	0.75"	0.75"	0.75"	0.75"	0.75"	0.75"	1"	1"	1"
O (Opening Width)	1.25"	1.75"	1.75"	1.75"	1.75"	1.75"	1.75"	1.75"	1.75"	1.75"
S (Slot Width)	1.75"	2.25"	2.25"	2.25"	2.25"	2.25"	2.25"	2.25"	2.25"	2.25"
L (Drain Grate Length)	118"	118"	118"	118"	116"	116"	116"	116"	116"	116"
E (Pipe End Length)	1"	1"	1"	1"	2"	2"	2"	2"	2"	2"

* In-stock standard sizes

Case Histories

Interstate Highway Median

For a construction project on I-87 in Westchester County, New York, over two miles of drainage lines were required for the temporary crossovers in the highway median. In the past, corrugated metal slot drain had always been specified for this type of project, but in this instance, Duraslot was accepted as a substitute.

New York DOT and Thruway Authority officials were persuaded that Duraslot drains could not only provide the same structural strength as metal, but the plastic pipe's superior hydraulics would create better flow in this extremely flat terrain. The installing contractors appreciated the product's lighter weight, and the easier and safer methods of connecting the sections together.



More than 11,000 ft. of 15" Duraslot drains were installed on the project. Contractors estimated that installation time was reduced by at least 20%, saving not only project costs, but also the time traffic would be backed up due to crossover construction.

Pedestrian Parkway

The city of Pembroke Pines, Florida, was building a large new park with several athletic fields. Drainage was required in the areas of heavy pedestrian traffic, and corrugated metal slotted drain was originally specified for this purpose.

After learning of the strength, superior flow, and corrosion resistance of the plastic alternative, the engineer changed not only the surface drain specification to Duraslot, but also the remainder of underground drainage to ADS N-12 pipe and Nyloplast® catch basins.



A total of 1,540 ft. of Duraslot 12" drain with a 2.5" slot height were installed.

Entrance Boulevard

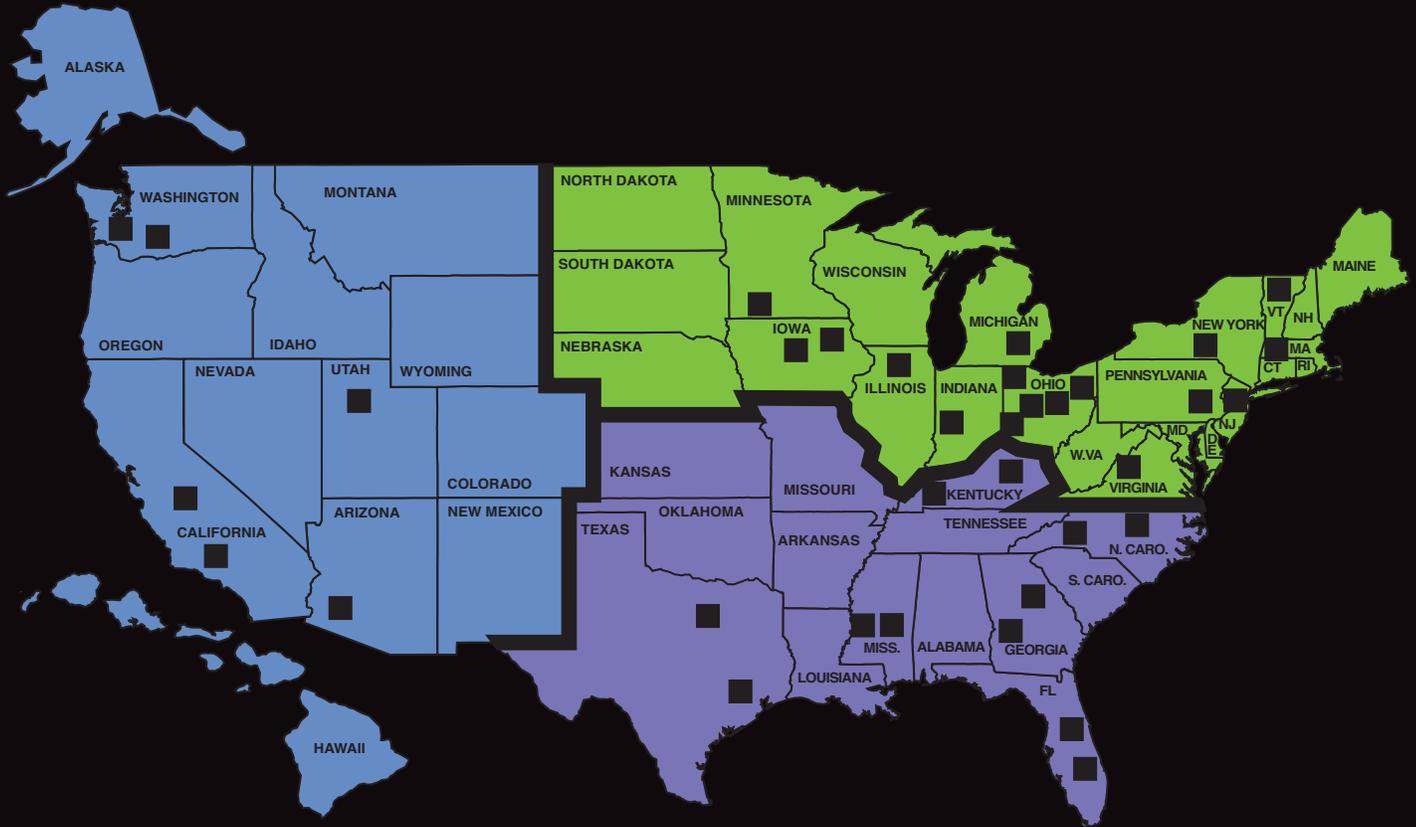
One of the first right-of-way plastic pipe installations allowed by the city of Chula Vista, California, occurred on the entrance to the West Coast Olympic Training Facility in that city.

Traditionally, bituminous-coated steel slot drain was specified for municipal roadways, but engineers for this project decided to give Duraslot drains a try. More than 1,000 ft. of 18" Duraslot drain were installed at the curb to collect sheet flow from a long sloping curve in the entrance boulevard.

The contractor was extremely pleased with the product, reporting that it cost slightly less than metal, and was lighter in weight and much cleaner to handle than the coated steel. Delivery time for Duraslot drains was noticeably quicker than for the metal pipe, as was installation time, due to the ease with which the plastic could be cut, set in place, and clamped together.



ADS Sales and Service Locations



Customer Service Centers

- **MIDWEST/
NORTHEAST**
LONDON, OH
1-800-733-9554
- **SOUTHERN**
FRANKLIN, TN
1-800-733-9987
- **WESTERN**
VANCOUVER, WA
1-800-733-8523
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