

Storm Water Quality Units Installation Guide

This guide details the proper installation of ADS Stormwater Quality Units. Installation with proper backfill materials, compaction levels, and placement procedures are essential to achieve long term system performance. These recommendations assume the drainage designer used design criteria available from ASTM D2321 and ADS. The designer should discuss installations involving conditions not covered by that document (poor soils, high loads, or other factors that may affect the performance of the system) with ADS Regional Engineers or Application Engineering through the nearest manufacturing location. All installations must comply with local, state, and federal regulations.

ADS polyethylene products and a well-constructed backfill envelope work together to support soil and live loads. Although backfill has special significance in applications involving high loads, it is important to take reasonable precautions during any pipe installation. Correct installation will ensure long-term trouble-free service for all types of pipe systems.

Backfill Material Selection

- Structural backfill material must be a Class I material described in Table 1.
- Native soil meeting Class II, III, or IVA, as described in Table 1, are NOT acceptable initial back fill materials. However, they may be used as final backfill once the initial backfill is placed and compacted.
- Class I materials shall be compacted to a minimum Standard Proctor Density of 95%.
- In regions where Class I backfill material may not be readily obtainable, flowable fill may be a suitable alternative. Where flowable fill is used, precaution must be taken to prevent flotation during installation.

Table 1
Acceptable Backfill Material and Compaction Requirements

Description	Soil Classification		Minimum	Maximum* Compaction
	ASTM D2321	ASTM D2487	Standard Density (%)	Layer Height
Flowable Fill	n/a	n/a	Dumped	**
Graded or crushed stone Crushed gravel	Class I	-	Compacted	12in. (300 mm)
Well-graded sand gravels, and gravel/sand mixtures; Poorly graded sand, gravels and gravel/sand mixtures; little or no fines	Class II	GW GP SW SP		Material Not Recommended
Silty or Clayey gravels, Gravels/sand/silt or gravels and/clay mixtures, silty, or clayey sands, sand/clay or sand/silt mixtures	Class III	GM GC SM SC		Material Not Recommended
Inorganic silts and low to medium plasticity clays; gravelly, sandy, or silty clays; some fine sands	Class IVA	ML CL		Material Not Recommended

* Layer Heights should not exceed one-half the pipe diameter. Layer heights may also need to be reduced to accommodate compaction method.

** Where flowable fill is used, precaution must be taken to prevent flotation.

Trench Construction

- Trench or ditch should be just wide enough to place and compact backfill around the entire pipe. A minimum width of OD + 36" (900 mm) but no greater than OD + 72" (1800 mm) is recommended. Trench width does not account for the bypass pipe, this estimate is for the main unit only. See Figure 1 for reference.
- As with any pipe, groundwater or seasonal high water tables may impede installation. De-watering is necessary for safe, efficient installation.
- Trench or ditch bottoms containing bedrock, soft muck or refuse, or other material unable to provide long-term pipe support are unacceptable.
- If a firm foundation is exposed, replace excavated material with acceptable backfill and compact as shown. As seen in Figure 2.
- Remove rock or unyielding material 1' (0.3m) below grade and 6" (150 mm) on either side of pipe.*
- Excavate soft areas approximately 2' (0.6m) below grade and three times pipe width.*
- If soft area remains after excavation or if native soil can migrate into backfill, use synthetic fabric (geotextile) to separate native soil from backfill.*
- For a flat bottom trench, the middle of bedding equal to 1/3 the pipe OD shall be loosely placed while the remainder shall be compacted in accordance with Table 1.

Figure 1

ADS Unit	Minimum D	Minimum W*
36" (900 mm)	4.5' (1.37 m)	6.5' (1.98 m)
42" (1050 mm)	5.0' (1.52 m)	7.0' (2.13 m)
48" (1200 mm)	5.5' (1.68 m)	7.5' (2.29 m)
60" (1500 mm)	7.5' (2.29 m)	8.5' (2.59 m)

*Does not account for bypass pipe, this estimate is for the main unit only

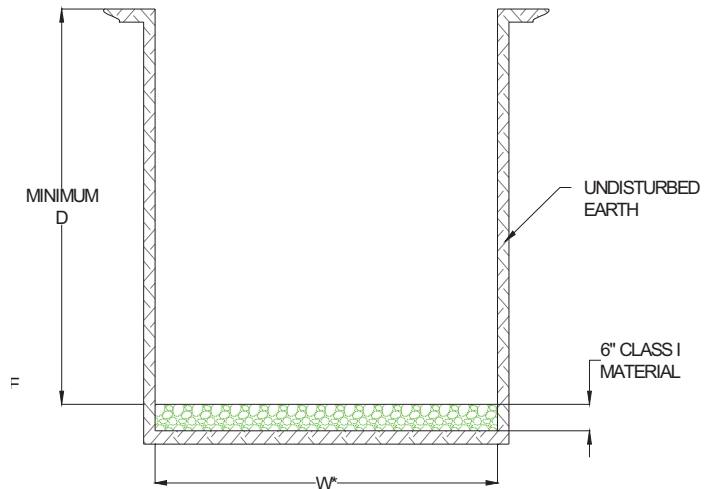
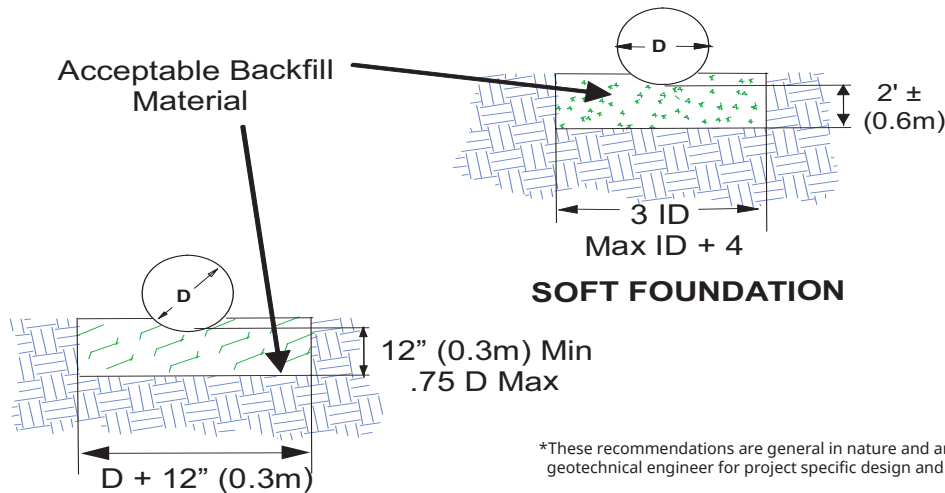


Figure 2



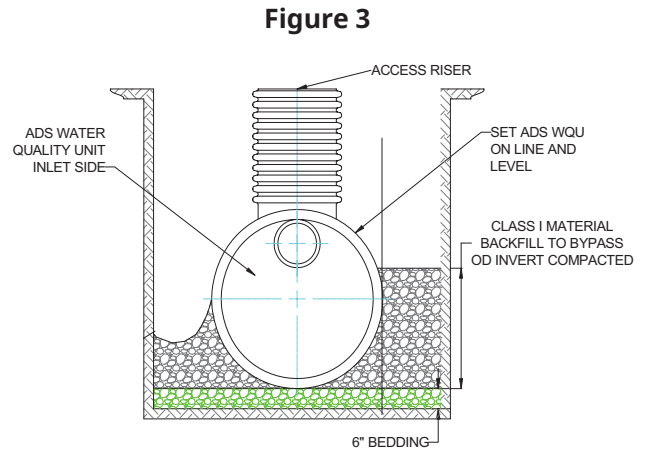
*These recommendations are general in nature and are not meant to be specific. Consult a geotechnical engineer for project specific design and installation recommendations.

ROCK OR UNYIELDING MATERIAL

Backfill Envelope Construction

Placing Unit and Initial Backfill

- Utilize care when lowering unit into the trench. Handle using nylon slings and two pick points. Do not use slings around risers.
- Place and compact Class I backfill in layers to meet requirements of Table 1.
- When the unit consists of two sections, place the downstream section first. Properly lube the bell and spigot to connect and home the remaining section.



Connection the Bypass

- Start on the downstream end by connecting the outlet fitting – be sure to match the inverts of the unit outlet and bypass pipe.
- The bypass pipe of the ADS WQU is designed to convey the peak storm water flow of the storm line. For example, at a 1% slope, peak flow rates for the bypass are as follows:

Diameter in. (mm)	CFS	L/S
12 (300)	4	100
15 (375)	7	190
18 (450)	11	300
24 (600)	24	660
30 (750)	44	1200

Diameter in. (mm)	CFS	L/S
36 (300)	72	1900
42 (1050)	110	2900
48 (1200)	160	4200
60 (1500)	280	7600

- Bypass fittings can be connected using the same couplers as the main storm sewer pipe. Couplers may be split couplers, gasketed split couplers, bell-bell couplers or welded couplers.

Figure 4

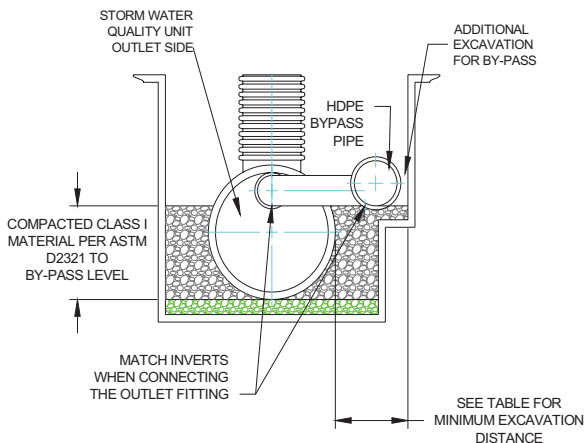


Figure 5

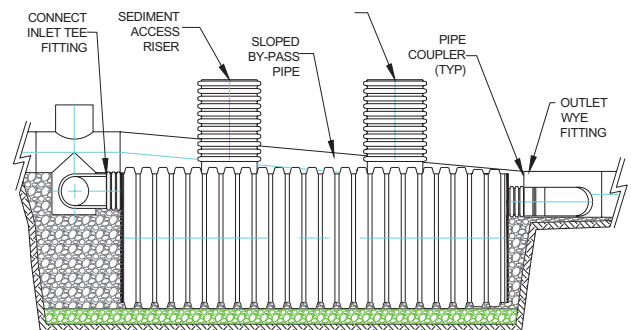


Table 2

Bypass Pipe Diameter in. (mm)								
12 (300)	15 (375)	18 (450)	24 (600)	30 (750)	36 (900)	42 (1050)	48 (1200)	60 (1500)
41 (1025)	44 (1200)	49 (1225)	56 (1375)	64 (1600)	71 (1775)	78 (1925)	85 (2125)	100 (2475)

- Distance from outside diameter of SWQU (trench side) to bypass outer trench wall are provided in table 2 (see detail above for distance reference).
- Continue backfill with Class I material to 12" (300 mm) above the Water Quality Unit (24" [600 mm] for 60" [1500 mm] units). See Table 2.
- Place and compact initial backfill in layers around pipe to at least 12" (300 mm) above the crown.
- Avoid impacting pipe or separator unit with compaction equipment.
- Final backfill and compaction should be appropriate for anticipated loading.
- Fill unit with water to the top of the sediment weir plate once backfill is placed and compacted 12" above the unit.

Final Cover and Riser Extensions

- For non-traffic loading, H=12" (300 mm) for 36" (900 mm), 42" (1050 mm), and 48" (1200 mm) units measured from the top of the unit to the bottom of bituminous pavement or top of rigid pavement. H=24" (600 mm) for 60" (1500 mm) units.
- For traffic loading, H=24" (600 mm) for 36" (900 mm), 42" (1050 mm), 48" (1200 mm), and 60" (1500 mm) units measured from the top of the unit to the bottom of bituminous pavement or top of rigid pavement.
- If sufficient cover is provided, no further precautions are required.
- If sufficient cover is not provided, mound and compact material over pipe to provide minimum cover needed for load during construction. Final backfill and compaction should be appropriate for anticipated loading. As seen in Figure 6 and 7 below.

Figure 6

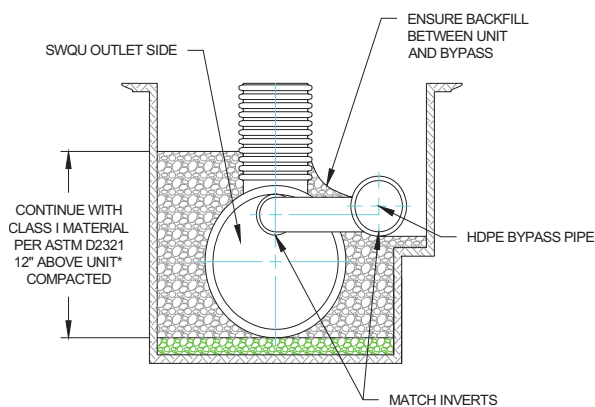


Figure 7

