Plot Date: Feb 06, 2019 Plot Time: 7:25am File Name: W:\CadAtlantic Homes\2017-271-A CadAtlantic- Springbrook Sect 1\Design\CAD\17271-A_Construction Details.dwg, Layout: C8.4 By: sdowney

A.R.I.

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03205-M-0005-10

D-025 COMBINATION AIR VALVE FOR WASTEWATER SHORT VERTION

Installation

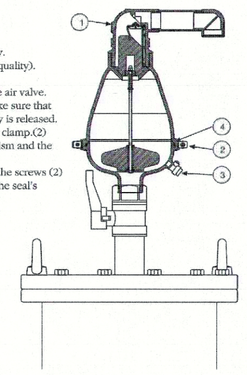
1) The wastewater air valve should be installed vertically on a riser on the crown of the pipeline.
2) An inlet isolating valve should be installed underneath the air valve.
3) Do not turn the plastic head (1) of the air valve, separately. It can cause a leakage.
4) To change the direction of drainage outlet, open the main body-clamp (2) and turn the air valve upper body.
5) For plastic flanges, fit protective washer for each bolt.

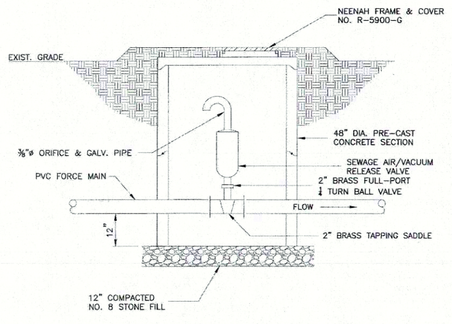
Warning! Do not remove or disassemble the air valve from pipeline before performing the following steps:
1) Turn off riser shut off valve.
2) Open up pressure release valve (3) located on the base of the D-025.
3) Remove valve from line only after ensuring that internal pressure in the valve has been released.

Periodic Maintenance

For air valve without back wash assembly.
(Each 6 months and according to liquid quality).

1) Shut the isolating valve underneath the air valve.
2) Open pressure relief valve (3) and make sure that internal pressure inside the air valve body is released.
3) Open and remove the two parts of the clamp.(2)
4) Pull out the top part,wash the mechanism and the inside of the air valve.
5) Reassemble the two parts and tighten the screws (2)
6) Pay attention to correct placement of the seal's O-Ring (4)
7) Re-open the inlet isolating valve.



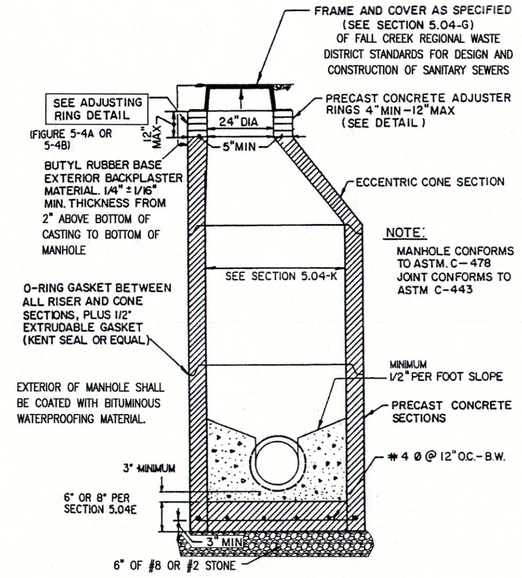


DETAIL - SEWAGE AIR RELEASE WITH PRE-CAST VALVE VAULT
SCALE: N.T.S.

AIR RELEASE VALVE VAULT NOTE:

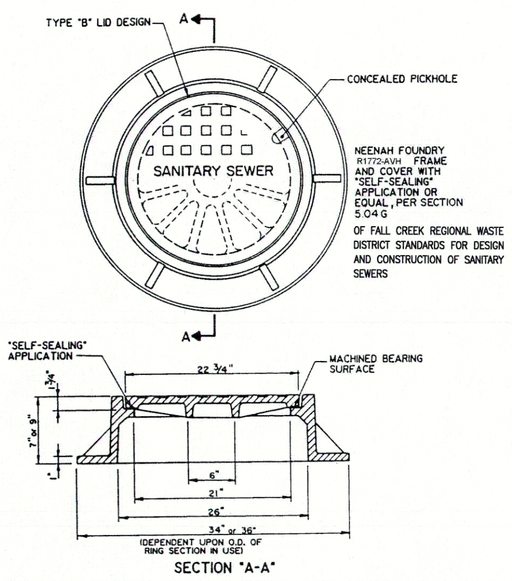
1. CONTRACTOR IS RESPONSIBLE FOR DETERMINING VALVE VAULT OVERALL HEIGHT (MIN. 5'-0" FROM TOP OF FORCEMAIN) WITH RESPECT TO FORCEMAIN CENTERLINE TO FACILITATE COMPLETE EQUIPMENT INSTALLATION.

FIGURE 5-11



STANDARD MANHOLE FOR PIPE SIZES 8" thru 24" (Straight Thru)

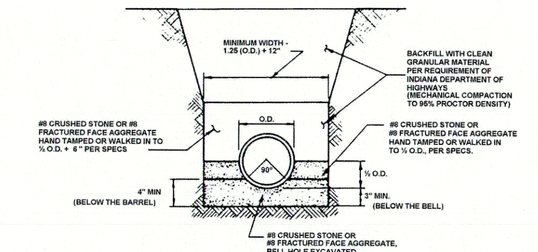
FIGURE 5-1



SECTION "A-A"

SANITARY SEWER MANHOLE FRAME & COVER - STANDARD MANHOLE

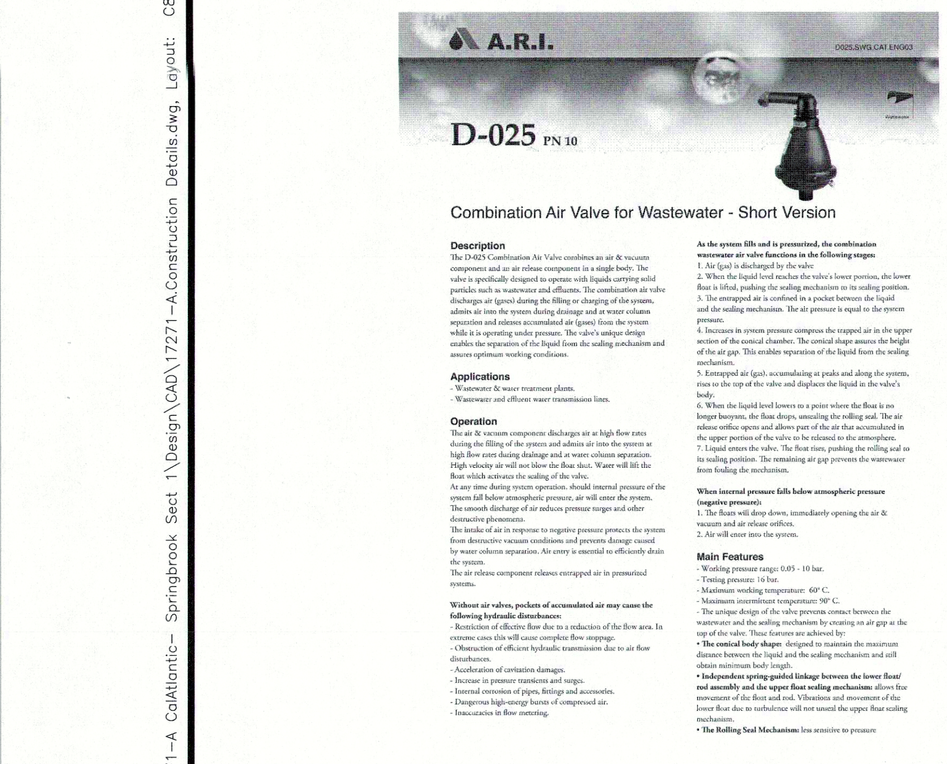
FIGURE 5-7



PIPE SIZE	8" TO 15"	18" & OVER
BEDDING BELOW THE PIPE BARREL	O.D. / 4 MIN. = 4"	O.D. / 4 MAX. = 9"

SEMI-RIGID PIPE BEDDING DETAIL (PVC Composite Pipe & Ductile Iron Pipe)

FIGURE 7-2



Description

The D-025 Combination Air Valve combines an air & vacuum components and an air release components in a single body. The valve is specifically designed to operate with liquids carrying solid particles such as wastewater and effluents. The combination air valve discharges air (gases) during the filling or charging of the system, admits air into the system during drainage and at water column separation and releases accumulated air (gases) from the system while it is operating under pressure. The valve's unique design enables the separation of the liquid from the sealing mechanism and assures optimum sealing conditions.

Applications

- Wastewater & sewer treatment plants.
- Wastewater and effluent water transmission lines.

Operation

The air & vacuum components discharges air at high flow rates during the filling of the system and admits air into the system at high flow rates during drainage and at water column separation. High velocity air will not blow the float shut. Water will fill the float which activates the sealing of the valve.
At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will enter the system. The smooth discharge of air reduces pressure surges and other destructive phenomena.
The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents drainage caused by water column separation. Air entry is essential to efficiently drain the system.
The air release component releases entrapped air in pressurized systems.

Without air valves, pockets of accumulated air may cause the following hydraulic disturbances:
- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Acceleration of corrosion damages.
- Increase in pressure transients and surges.
- Internal extrusion of pipes, fittings and accessories.
- Dangerous high-energy bursts of compressed air.
- Inaccuracies in flow metering.

As the system fills and is pressurized, the combination wastewater air valve functions in the following stages:
1. Air (gas) is discharged by the valve.
2. When the liquid level reaches the valve's lower portion, the lower float is lifted, pushing the sealing mechanism to its sealing position.
3. The entrapped air is confined in a pocket between the liquid and the sealing mechanism. The air pressure is equal to the system pressure.
4. Increases in system pressure compress the trapped air in the upper section of the conical chamber. The conical shape assures the height of the air gap. This enables separation of the liquid from the sealing mechanism.
5. Entrapped air (gas) accumulating at peaks and along the system, rises to the top of the valve and displaces the liquid in the valve's body.
6. When the liquid level lowers to a point where the float is no longer buoyant, the float drops, unsealing the rolling seal. The air release orifice opens and allows part of the air that accumulated in the upper portion of the valve to be released to the atmosphere.
7. Liquid enters the valve. The float rises, pushing the rolling seal to its sealing position. The remaining air gap prevents this wastewater from fouling the mechanism.

When internal pressure falls below atmospheric pressure (negative pressure):
1. The floats will drop down, immediately opening the air & vacuum and air release orifices.
2. Air will enter into the system.

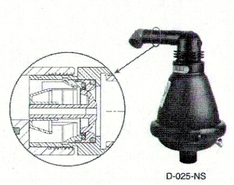
Main Features

- Working pressure range: 0.05 - 10 bar.
- Testing pressure: 16 bar.
- Maximum working temperature: 60° C.
- Maximum intermittent temperature: 90° C.
- The unique design of the valve prevents contact between the wastewater and the sealing mechanism by creating an air gap at the top of the valve. These features are achieved by:
- **The conical body shape**, designed to maximize the maximum diameter between the liquid and the sealing mechanism and still obtain minimum body length.
- **Independent spring-guided linkage between the lower float/ rod assembly and the upper float sealing mechanism:** allows free movement of the float and rod, Vibrations and movement of the lower float due to turbulence will not unseat the upper float sealing mechanism.
- **The Rolling Seal Mechanism:** less sensitive to pressure

differentials than a direct float seal. It accomplishes this by having a comparably large orifice for a wide pressure range (up to 10 bar).
- **Funnel-shaped lower body:** designed to ensure that residual wastewater mainer will fall back into the system and has control over by the main pipe.
- All lower metal parts made of stainless steel. Float made of composite materials.
- 1 ½" threaded discharge outlet enables connection of a vent pipe.
- Dynamic design allows for high capacity air discharge while preventing premature closure.
- The ball valve can be opened to release trapped pressure and drain the valve body prior to maintenance and for back-flushing during maintenance.

Valve Selection
- These valves are available in 2", 3", and 4" with a BSP/NPT male threaded connection or flanged, standard upon request.
- Valve is manufactured in reinforced nylon, also available in stainless steel or ductile iron.
- With a One-way, Out-only attachment, allows for air discharge only, prevents air intake.
- With a Vacuum Breaker, In-only attachment, allows for air intake only, prevents air discharge.
- With a Non-Slam discharge-throttling attachment, allows for free air intake, throttles air discharge.

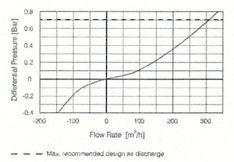
Note
- The D-025 air valve is intended for use with raw wastewater. For use with aggressive liquids, please consult with our application engineers or with the marketing dept.
- For best suitability, it is recommended to send the fluid chemical properties along with the valve request.
- Upon ordering, please specify: model, size, working pressure, thread and flange standard and type of liquid.



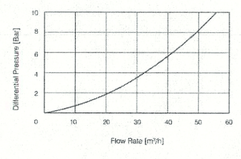
D-025 Non-Slam Single Orifice Add-on Component Data Table

Nominal Size	Discharge orifice	Total NS area	NS orifice	Switching point	Flow at 0.4 bar
2" (50mm)					
3" (80mm)	37.5 mm	12.6 mm²	4 mm	Spring loaded normally closed	17.5 m³/h
4" (100mm)					

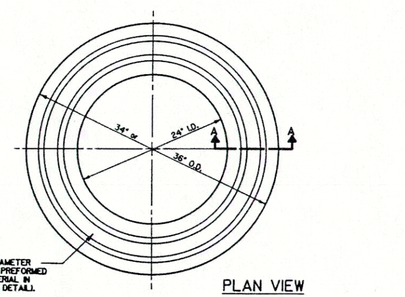
AIR AND VACUUM FLOW RATE



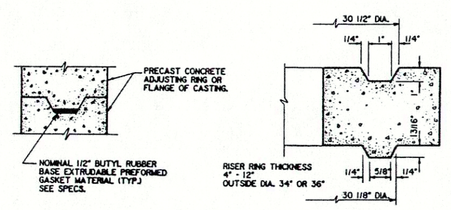
AUTOMATIC AIR RELEASE FLOW RATE



— — — Max. recommended design air discharge



PLAN VIEW

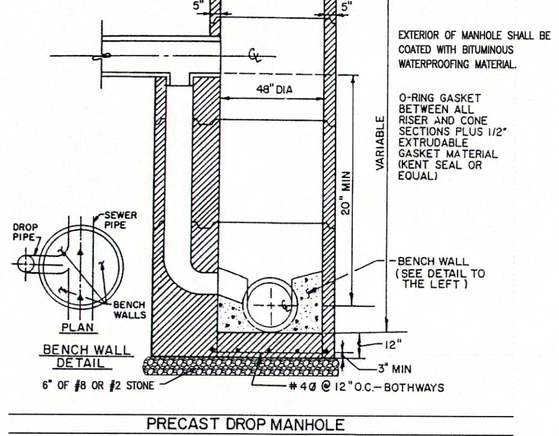


GASKET DETAIL

SECTION "A-A"

ADJUSTING RING

FIGURE 5-4A

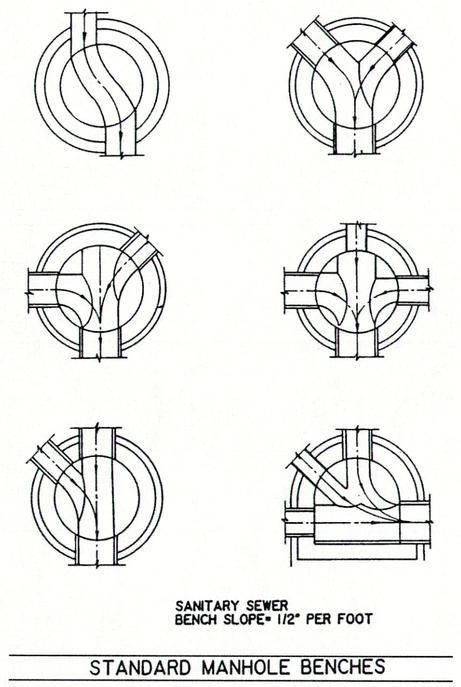


PRECAST DROP MANHOLE

FIGURE 5-8

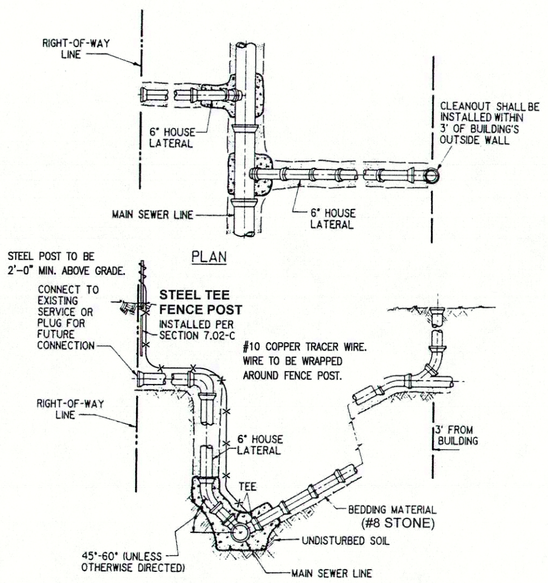
SERVICE CONNECTION FOR SHALLOW SEWERS (LESS THAN 15' DEEP)

FIGURE 7-4



STANDARD MANHOLE BENCHES

FIGURE 5-6



SERVICE CONNECTION FOR DEEP SEWERS (15' DEEP AND OVER)

FIGURE 7-5

PIPE SIZE	8" TO 15"	18" & OVER
BEDDING BELOW THE PIPE BARREL	O.D. / 4 MIN. = 4"	O.D. / 4 MAX. = 9"

FLEXIBLE PIPE BEDDING DETAIL PVC & HDPE Pipe

FIGURE 7-1

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REVISIONS

DATE	DESCRIPTION	BY
02/05/19	REVISIONS PER CLIENT AND COUNTY COMMENTS	HWC

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INDIANAPOLIS - TERRE HAUTE
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SPRINGBROOK SECTION 1A
SANITARY SEWER DETAILS

SEAN M. DOWNEY
REGISTERED
No. 10200309
STATE OF INDIANA
PROFESSIONAL ENGINEER

DRAWN BY	
TD	
CHECKED BY	JOB NUMBER
SD	2017-271-A
DATE	
NOVEMBER 8, 2018	
SCALE	
AS SHOWN	
SHEET	

C8.4
SANITARY SEWER DETAILS