Executive Order VR-209-A
VST Phase II EVR System with Clean Air Separator

Exhibit 2
System Specifications

This exhibit contains the installation, maintenance and compliance standards and specifications that apply to the VST Phase II EVR and the Franklin Fueling Systems Clean Air Separator System installed at a gasoline dispensing facility (GDF). All components must be installed, maintained, and operated in accordance with the specifications in the **ARB Approved Installation, Operation and Maintenance Manual** (IOM). Installation, maintenance and repair of system components, including removal and installation of such components in the course of any required tests, shall be performed by technicians certified by the appropriate manufacturer. Additional certifications may be required in accordance with local district requirements. Provided that there are no other local district requirements, a GDF owner/operator can remove and install nozzles, curb hoses, breakaways, and whip hoses without a manufacturer certification.

Nozzle

1. A vapor collection sleeve shall be installed on the nozzle at the base of the spout, as shown in **Figure 2B-1**.

2. The VST Models VST–EVR-NB and VST-EVR-NB-R nozzles have an integral vapor valve which prevents the loss of vapor from the underground storage tanks, ensures proper operation of the system and prevents the ingestion of air into the system. The performance of the nozzle vapor valve can be determined by items 2.1 or 2.2.

    2.1. The maximum allowable leak rate for the nozzle vapor path, as determined by TP-201.2B, shall not exceed 0.07 cubic feet per hour (CFH) at a pressure of two inches water column (2.00” WC)

    2.2. Verification of the integrity of the vapor valve can be performed on installed nozzles using the nozzle bag test procedure in Exhibit 7.

3. The gasoline flow rate of the nozzle shall be between six (6.0) and ten (10.0) gallons per minute as determined by the applicable provisions of section 6 or 7 of Exhibit 5 or by direct observation for 30 seconds minimum at the maximum hand held position.

Vapor Collection

1. The system pressure drop from the nozzle to the UST, as determined by TP-201.4 (Methodology 1) and Exhibit 6, shall not exceed the following:

    0.35 inches WC at a flow rate of 60 CFH of Nitrogen; and
    0.62 inches WC at a flow rate of 80 CFH of Nitrogen.

Coaxial Hoses

1. The maximum length of the curb hose, breakaway, and whip hose combined shall not exceed fifteen feet as measured from the base of the nozzle to the end of dispenser adapter or dispenser, as appropriate (reference Exhibit 1, Figure 1A-2).

2. The liquid removal rate shall not be less than five milliliters per gallon (5 ml/gal) as determined by Exhibit 5 when tested with a gasoline flow rate between six (6.0) and ten (10.0) gallons per minute. Liquid removal requirement is applicable to all grades of gasoline.

3. All hoses shall have a permanent marking indicating the liquid pick-up location.

4. Any hose configuration is allowed when installed in accordance with the IOM section titled "Phase II Coaxial EVR Balance Fuel Hose".

Breakaway Couplings

1. The VST breakaway couplings are non-reconnecting and shall be replaced following a drive-off.

Flow Limiter

1. No flow limiter is allowed for this system.

Clean Air Separator Pressure Management System

1. The Clean Air Separator (CAS) is a passive gasoline storage tank ullage pressure management system, with no electrical requirements. The Clean Air Separator vapor integrity shall be evaluated using the test procedure outlined in Exhibit 4 of the Executive Order.

2. The Clean Air Separator shall be installed within 100 feet from the vent line(s), and the associated piping shall be sloped 1/8" per foot minimum toward the vent line(s).

Pressure/Vacuum Vent Valves for Storage Tank Vents

1. All P/V vent valves shall be an ARB certified P/V valve for a Phase I system.

2. At least one pressure/vacuum (P/V) vent valve shall be installed on each tank vent. The maximum number of P/V vent valves allowed and P/V vent valve performance specifications are listed in the applicable Phase I EVR Executive Order. Vent lines may be manifold to minimize the number of P/V vent valves and potential leak sources, provided the manifold conforms to all applicable fire regulations. At least one P/V vent valve shall be installed on vents if a manifold is incorporated. **Figure 2B-3** or **2B-3H** shows a typical manifold configuration for a single P/V vent valve with the Clean Air Separator. If two or more P/V vent valves are desired, they shall be installed in parallel, so that each valve can

serve as a backup to the other if one should fail to open properly. **Figure 2B-4** or **2B-4H** shows a typical manifold configuration for two P/V vent valves installed in parallel with the Clean Air Separator. **Figure 2B-5** or **2B-5H** shows a typical manifold configuration for three P/V vent valves installed in parallel with the Clean Air Separator. **Figure 2B-6** or **2B-6H** shows a typical configuration for a P/V vent valve mounted on a single 3" vent line with the Clean Air Separator. Figures 2B-3, 2B-4, 2B-5 and 2B-6 apply to vertical CAS installations. Figures 2B-3H, 2B-4H, 2B-5H and 2B-6H apply to horizontal CAS installations.

Vapor Recovery Piping Configurations

NOTE: Vapor Return Piping shall meet the requirements specified in section 4.11 of CP-201.

1. Vapor Return and Vent Lines

   For facilities installed on or after April 1, 2003, all vapor return and vent lines shall be a minimum nominal internal diameter of 2 inches from the dispensers or the vent stacks to the first manifold. All lines after the first manifold and back to the underground storage tank shall have a minimum nominal internal diameter of 3 inches.

   Note: Facilities permitted by a local district prior to April 1, 2003 shall be required to meet the three inch diameter standard only upon facility modification which involves the addition, replacement, or removal of 50 percent or more of the buried vapor piping.

2. All vapor return lines shall have a minimum slope of 1/8 inch per foot from the dispenser riser to the riser of the UST. A slope of 1/4 inch or more per foot is recommended wherever feasible.

3. The dispenser shall be connected to the riser with either flexible or rigid material that is listed for use with gasoline. The dispenser-to-riser connection shall be installed so that any liquid in the lines will drain toward the storage tank. The internal diameter of the connector, including all fittings, shall not be less than one inch (1").

   Note: The dispenser-to-riser connection is defined as the piping connection between the dispenser piping and the inlet of the dispenser riser. A vapor shear valve may also be part of the riser connection.

4. There is no length restriction for the vapor return piping of the system as long as the system complies with the maximum pressure drop requirement, item 1 of the Vapor Collection section.

5. No product shall be dispensed from any fueling point at a GDF installed with the VST Phase II EVR System if there is a vapor line that is disconnected and open to the atmosphere.

6. No liquid condensate traps or bulk loading operations are allowed with this system.

Dispensers

1. The dispenser vapor piping must be sized adequately to meet the maximum pressure drop requirement, item 1 of the Vapor Collection section.

2. Dispenser vapor piping shall be installed so that any liquid in the lines will drain toward the dispenser riser.

Phase I System

1. The Phase I system shall be an ARB-certified system that demonstrates compliance with the static pressure decay test criteria contained in TP-201.3 and Exhibit 8.

Maintenance Records

1. Each GDF operator owner shall keep records of alarms and maintenance performed at the facility. Such records shall be maintained on site in accordance with district requirements or policies. The records shall include alarm date and time, nature of the alarm, troubleshooting, maintenance or repair performed to validate and/or correct alarms, component, or system failures, date when maintenance or repair was conducted, name and Certified Technician Identification Number of individual conducting maintenance or test, affiliation, and telephone number. Additional information may be required in accordance with local district requirements. An example of a GDF maintenance and alarm record is shown in Figure 2B-7.

2. Maintenance shall be conducted in accordance with the Scheduled Maintenance section of the ARB Approved Installation, Operation, and Maintenance Manual.

Vapor Recovery Equipment Defects

The following is deemed a defect for the affected fueling point(s) or system.

1. The fueling point shall be removed from service when more than 30% of a nozzle face seal is missing (e.g., a triangular or similar shape in which greater than 2.5 inches of the faceplate circumference is missing (accumulated)).

2. The fueling point shall be removed from service when more than 0.375 square inches of a nozzle vapor collection sleeve is missing (e.g., a rectangular shape of greater than nine/sixteenth (9/16) inches or more on each side, a circular shape of eleven/sixteenth (11/16) inches or more in diameter, or a triangular shape of seven/eighth (7/8) inches on the side.

3. The fueling point shall be removed from service when the total slit length in the convolutions exceeds 18 inches as determined by direct measurements.

4. The fueling point shall be removed from service when a hose is found to have greater than 175 ml of gasoline in the vapor side as determined by sections 6.1 to 6.5 of Exhibit 5. Note: Prior to draining gasoline from the vapor side of the VST hose, use VST tool

P/N VST-STP-100 and plug the fuel spout. **Do not activate dispenser when draining gasoline from the vapor side of the VST hose.**

5. The fueling point shall be removed from service when VST system pressure drops exceeding the following conditions as determined by Methodology 1 of TP-201.4 and Exhibit 6:

   5.00 inches WC at a flow rate of 60 CFH of Nitrogen; and
   8.00 inches WC at a flow rate of 80 CFH of Nitrogen.

6. The fueling point shall be removed from service when the dispensing rate is greater than ten (10) gallons per minute (gpm) or less than five (5) gpm as determined by the applicable provisions of section 6 or 7 of Exhibit 5 or by direct observation for 30 seconds minimum at the maximum hand held position.

7. The fueling point shall be removed from service when any hose has a visible opening as determined by direct observation.

8. The fueling point shall be removed from service when the insertion interlock mechanism allows dispensing when the bellow is uncompressed as determined by direct observation or GDF-09 (see Vapor Recovery Defects List).

9. The fueling point shall be removed from service when the nozzle automatic liquid shut-off mechanisms malfunction in any manner as determined by EPO No. 26-F (See Vapor Recovery Defects List) or direct observation.

10. The fueling point shall be removed from service when any nozzle has a defective vapor valve as determined by Exhibit 7 or when the vapor valve has a leak rate that exceeds 0.07 cubic feet per minute at a pressure of two (2) inches WC as determined by TP-201.2B.

11. The fueling point or system shall be removed from service when any component required by this Executive Order is absent, installed improperly or disconnected as determined by direct observation.

12. A Clean Air Separator that fails the leak decay test outlined in Exhibit 4 shall be considered a defect.

13. Unless there is maintenance or testing being conducted on the Clean Air Separator, the four ball valves shall be locked in the positions shown in **Figure 2B-2** or **2B-2H** for normal Clean Air Separator operation. Figure 2B-2 applies to vertical CAS installations and Figure 2B-2H applies to horizontal CAS installations. A Clean Air Separator that is not in the proper operating configuration shall be considered a defect.

Figure 2B-1
Model VST-EVR- NB Nozzle

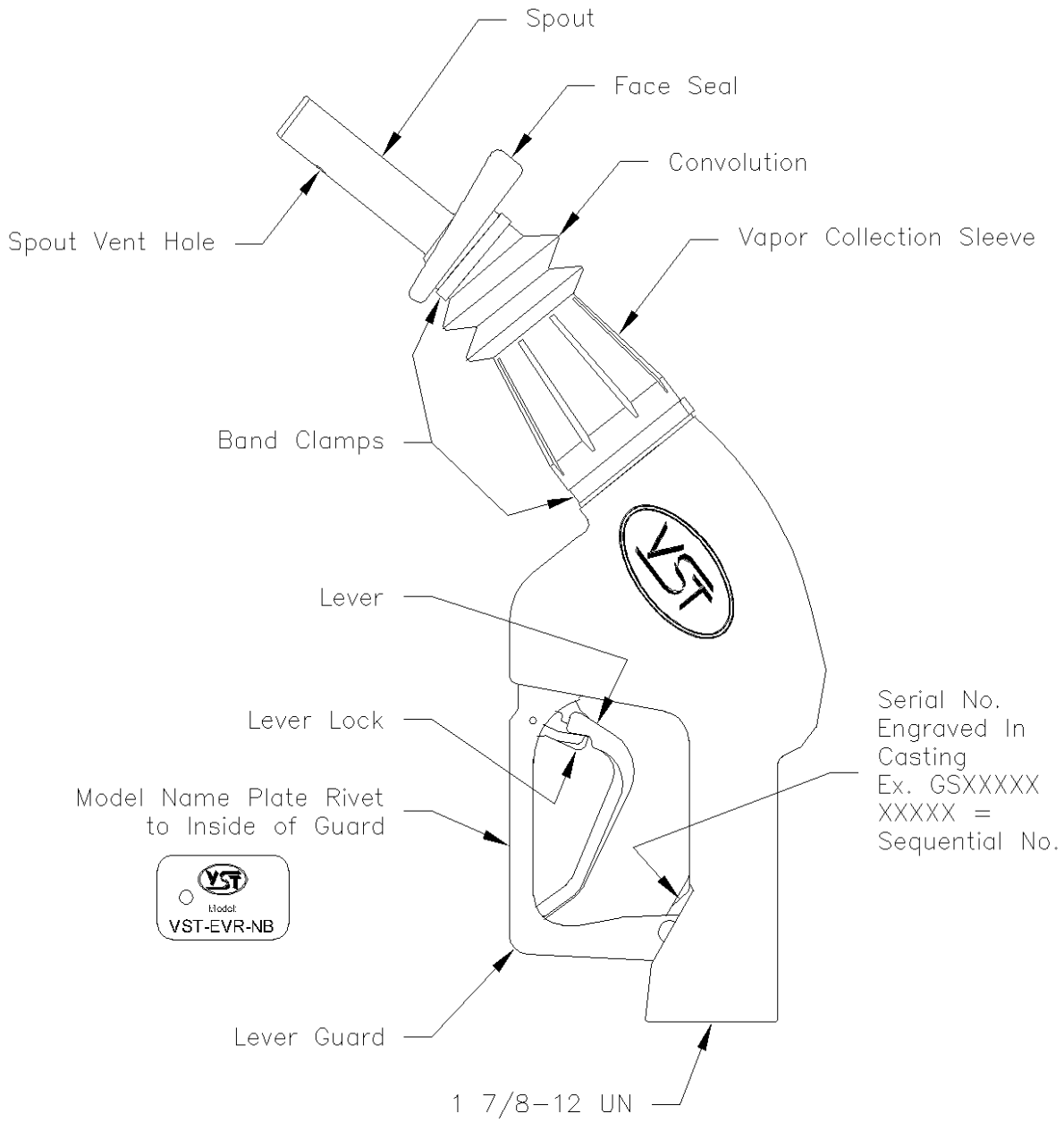

Figure 2B-2
Clean Air Separator Normal Operation Configuration

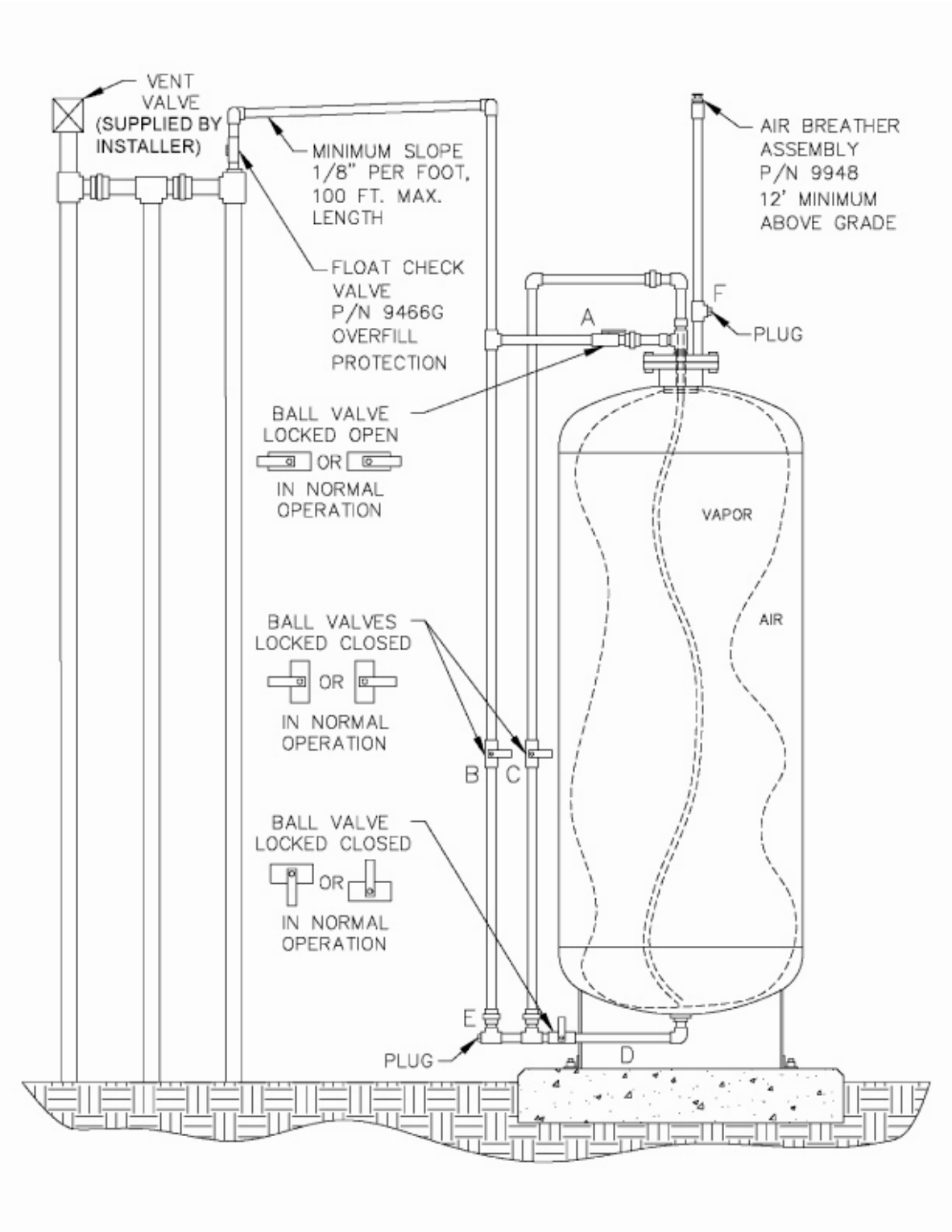

Figure 2B-2H
Clean Air Separator Normal Operation Configuration

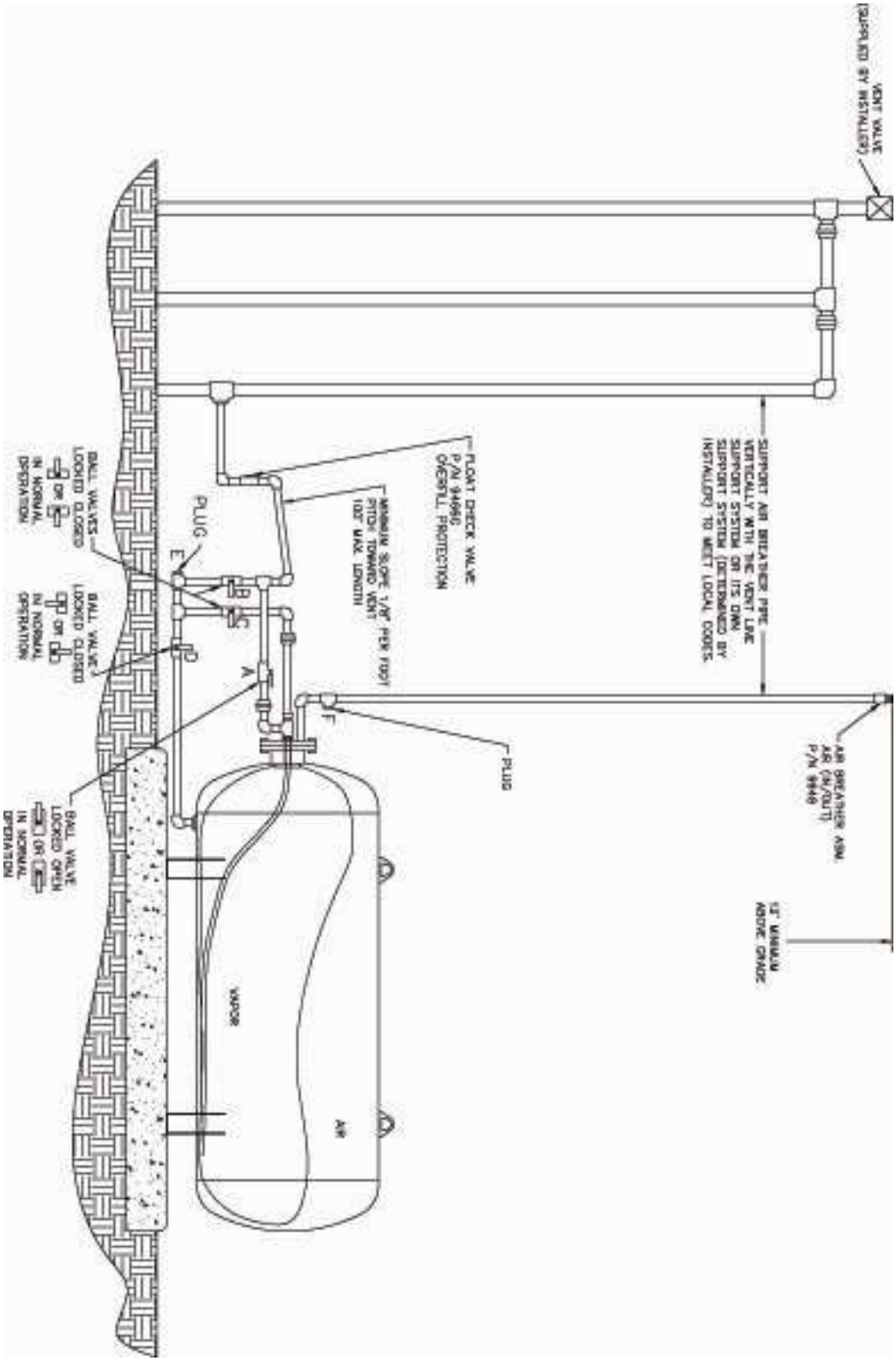

Figure 2B-3
Typical Installation of a Single P/V Vent Valve Manifold
with Healy Clean Air Separator

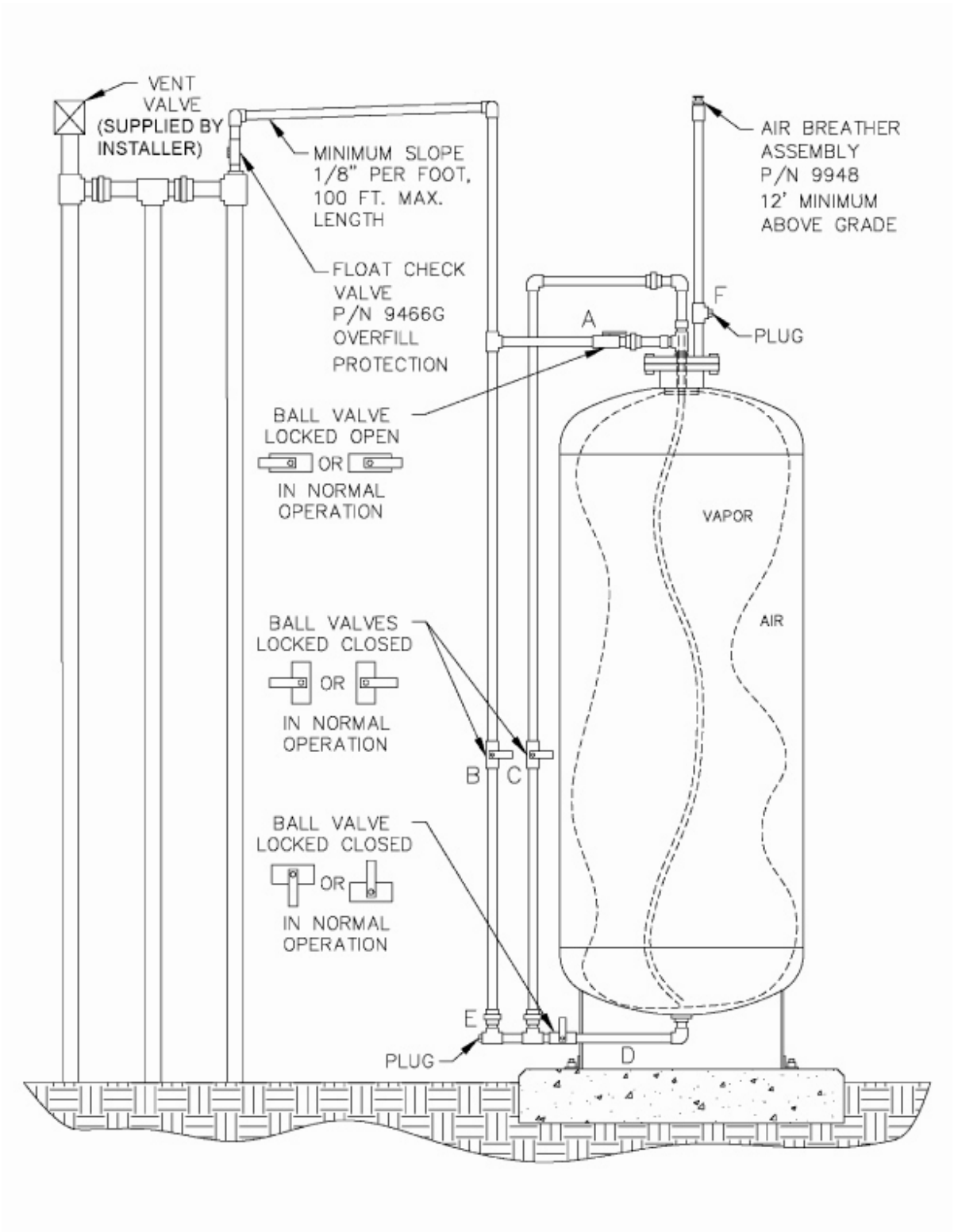

Figure 2B-3H
Typical Installation of a Single P/V Vent Valve Manifold
with Healy Clean Air Separator

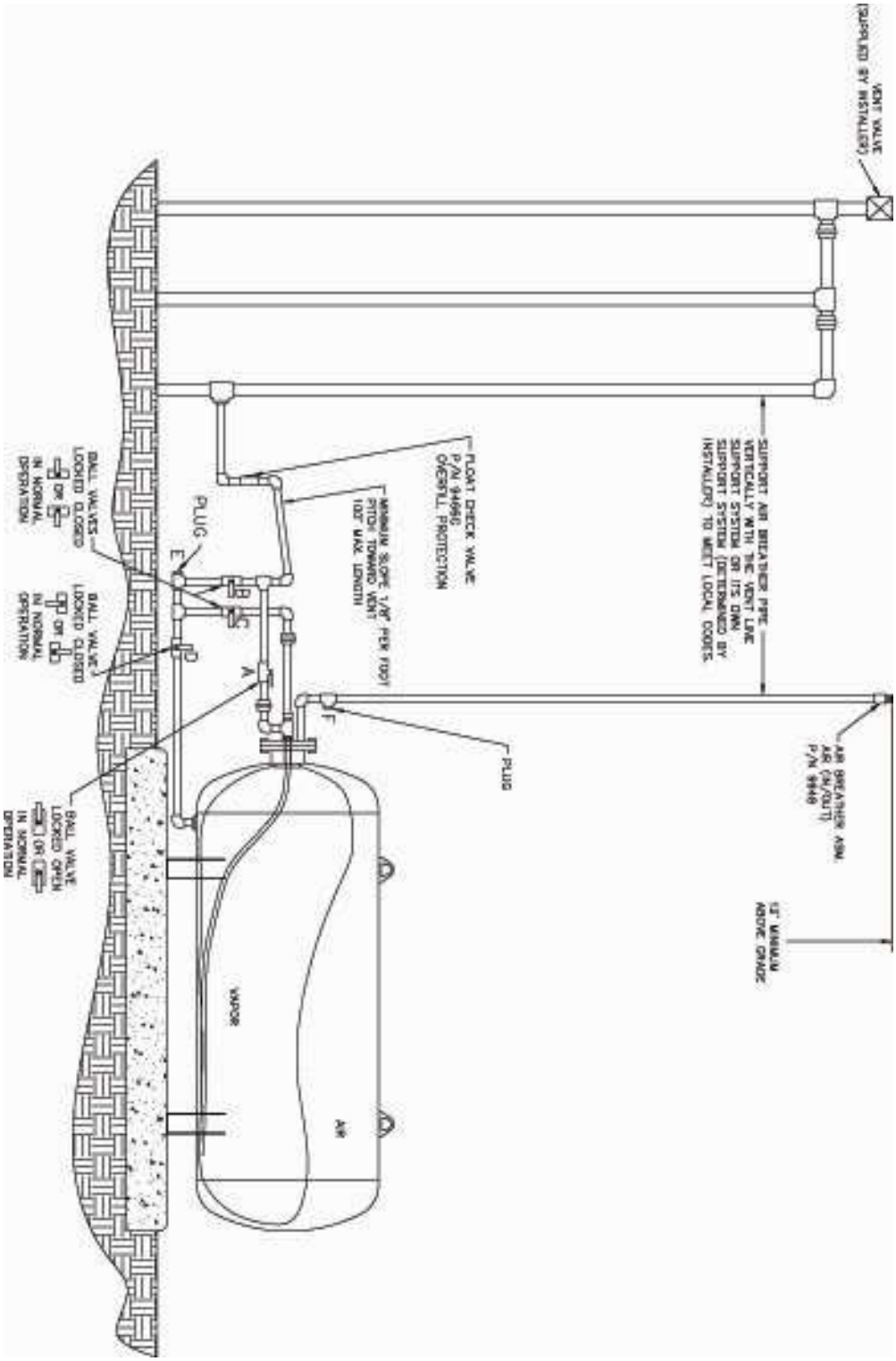

Figure 2B-4
Typical Installation of a Two P/V Vent Valve Parallel Manifold with Healy Clean Air Separator

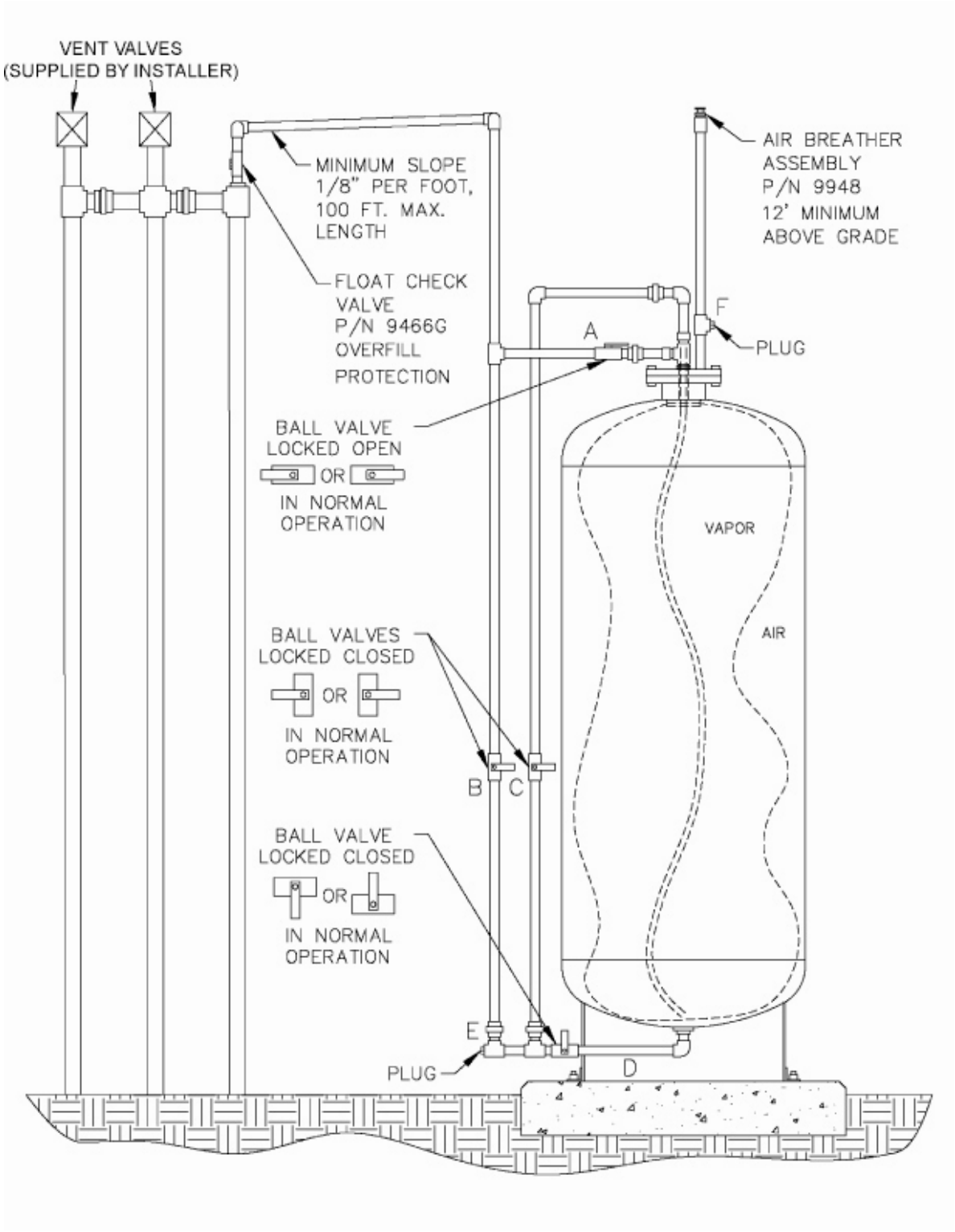

Figure 2B-4H
Typical Installation of a Two P/V Vent Valve Parallel Manifold with Healy Clean Air Separator

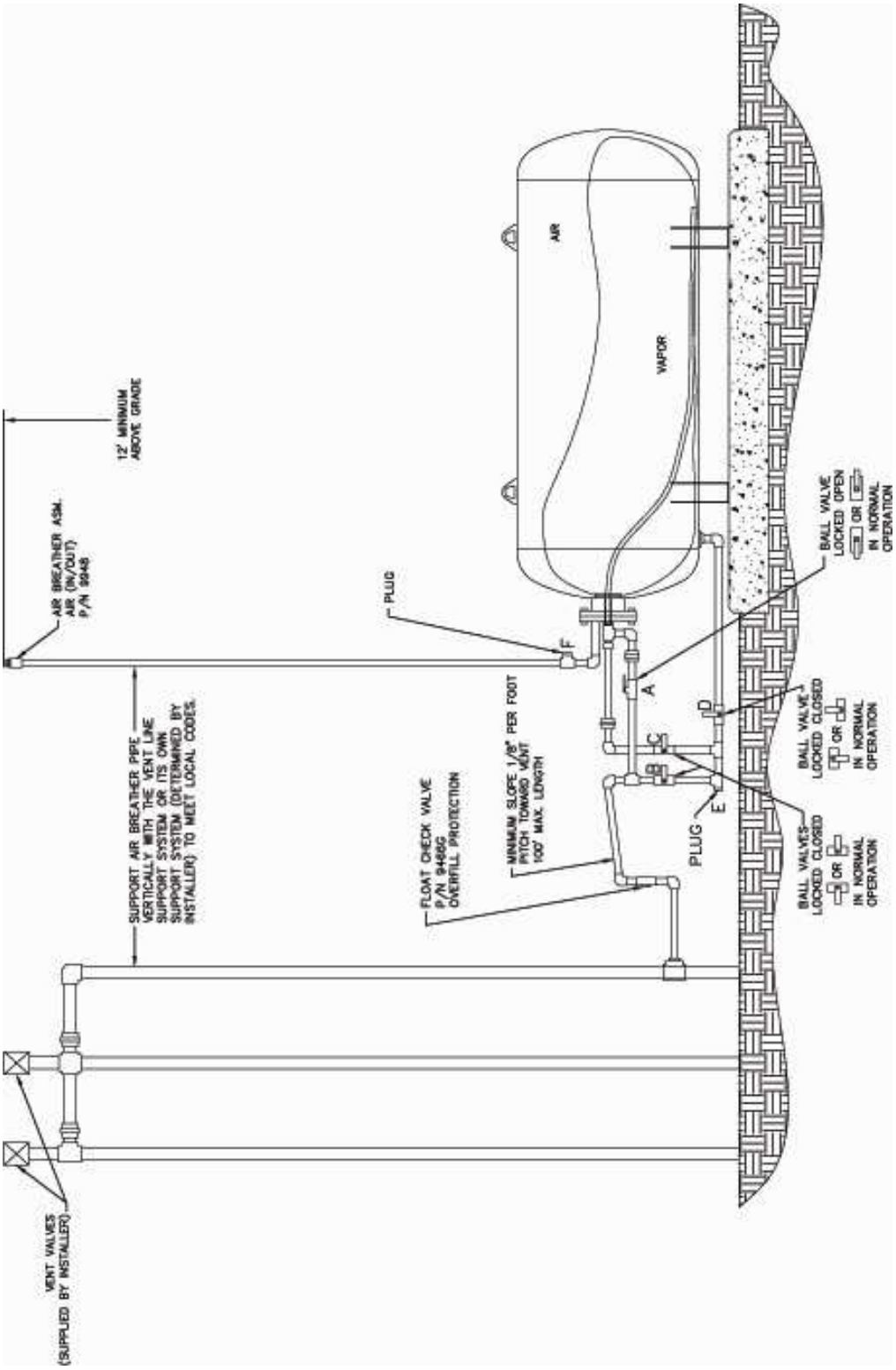

Figure 2B-5
Typical Installation of a Three P/V Vent Valve Parallel Manifold with Healy Clean Air Separator

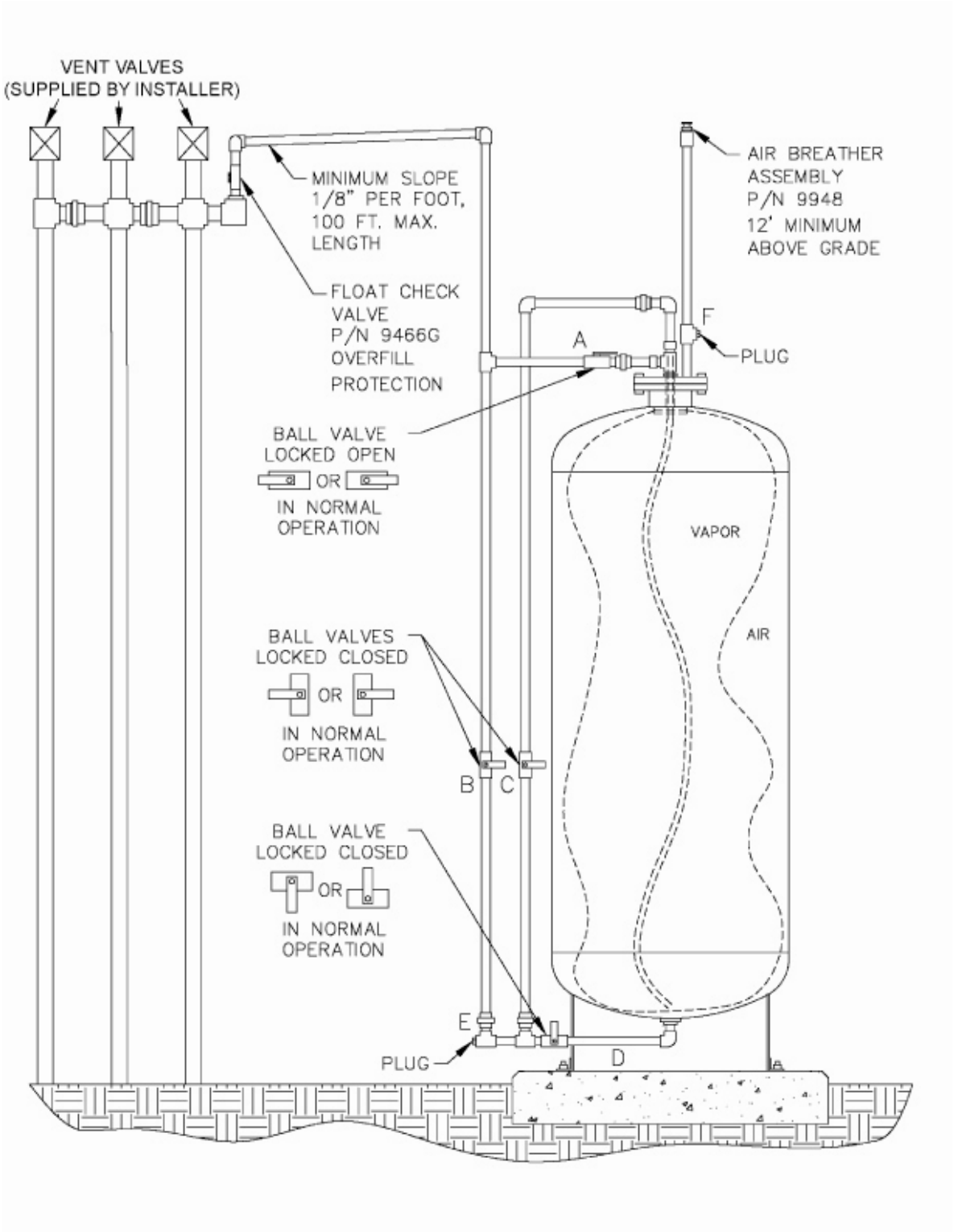

Figure 2B-5H
Typical Installation of a Three P/V Vent Valve Parallel Manifold with Healy Clean Air Separator

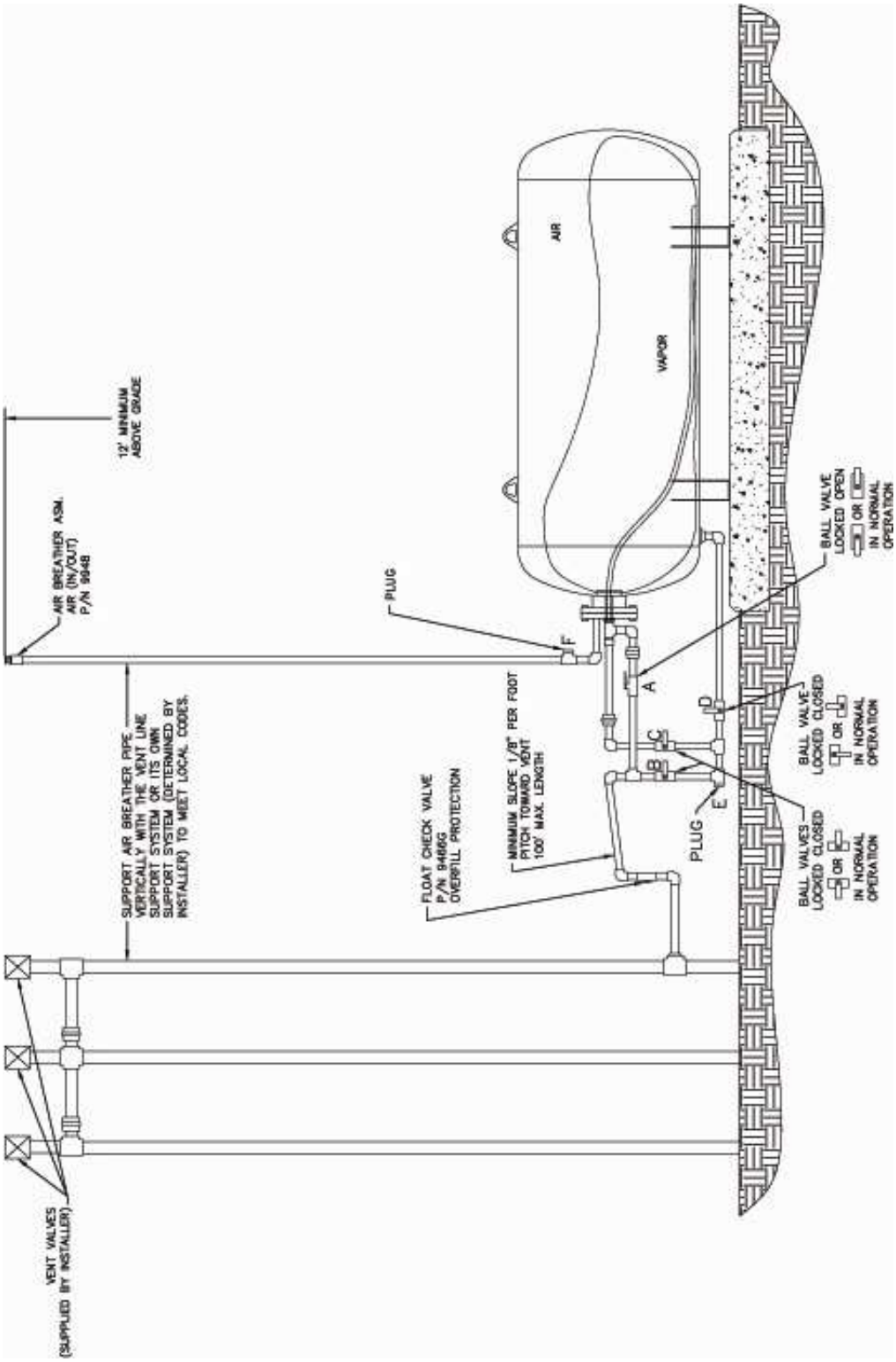

Figure 2B-6
Typical Configuration of a P/V Vent Valve Mounted on a Single 3" Vent Line with the Healy Clean Air Separator

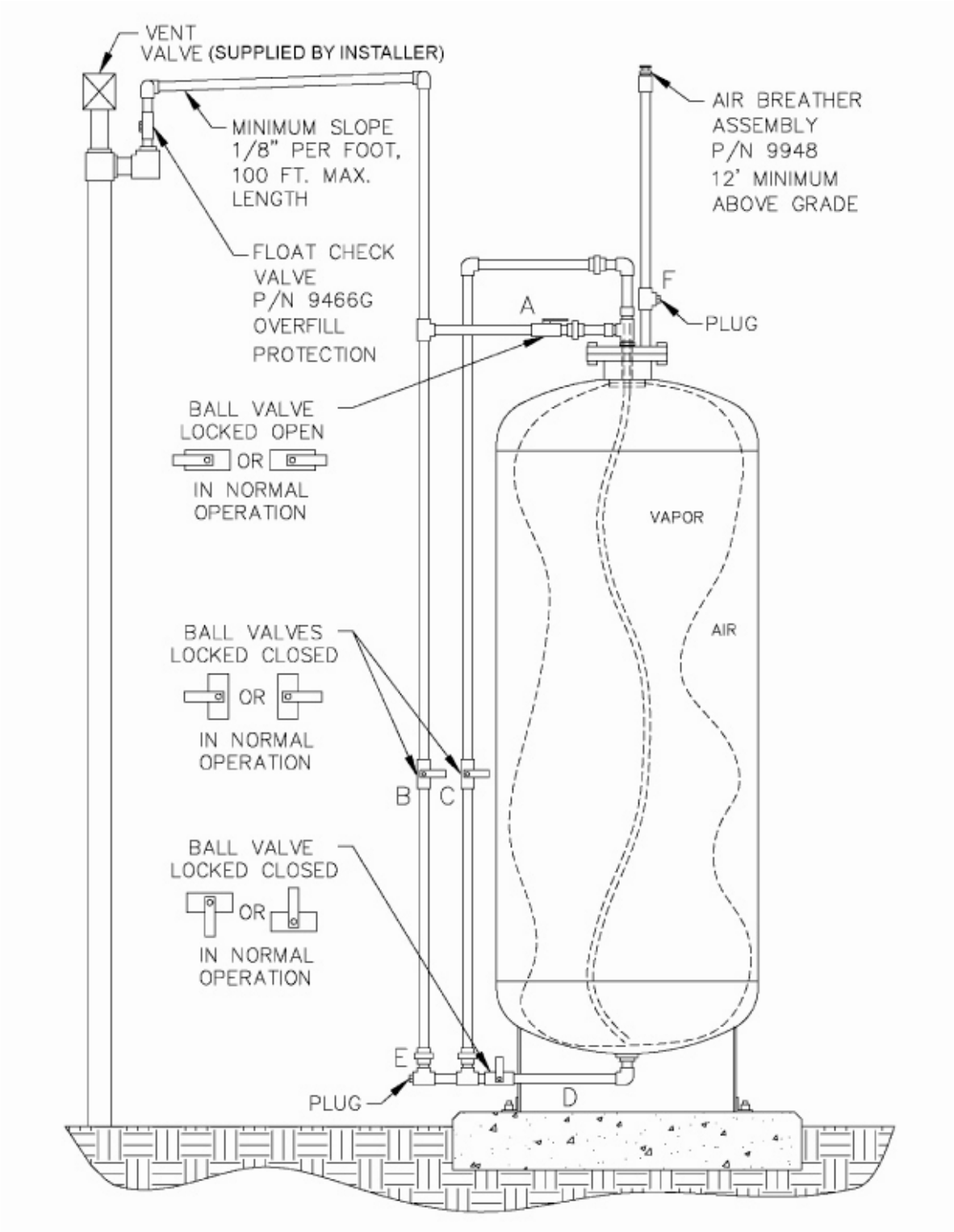

Figure 2B-6H
Typical Configuration of a P/V Vent Valve Mounted on a Single 3" Vent Line with the Healy Clean Air Separator

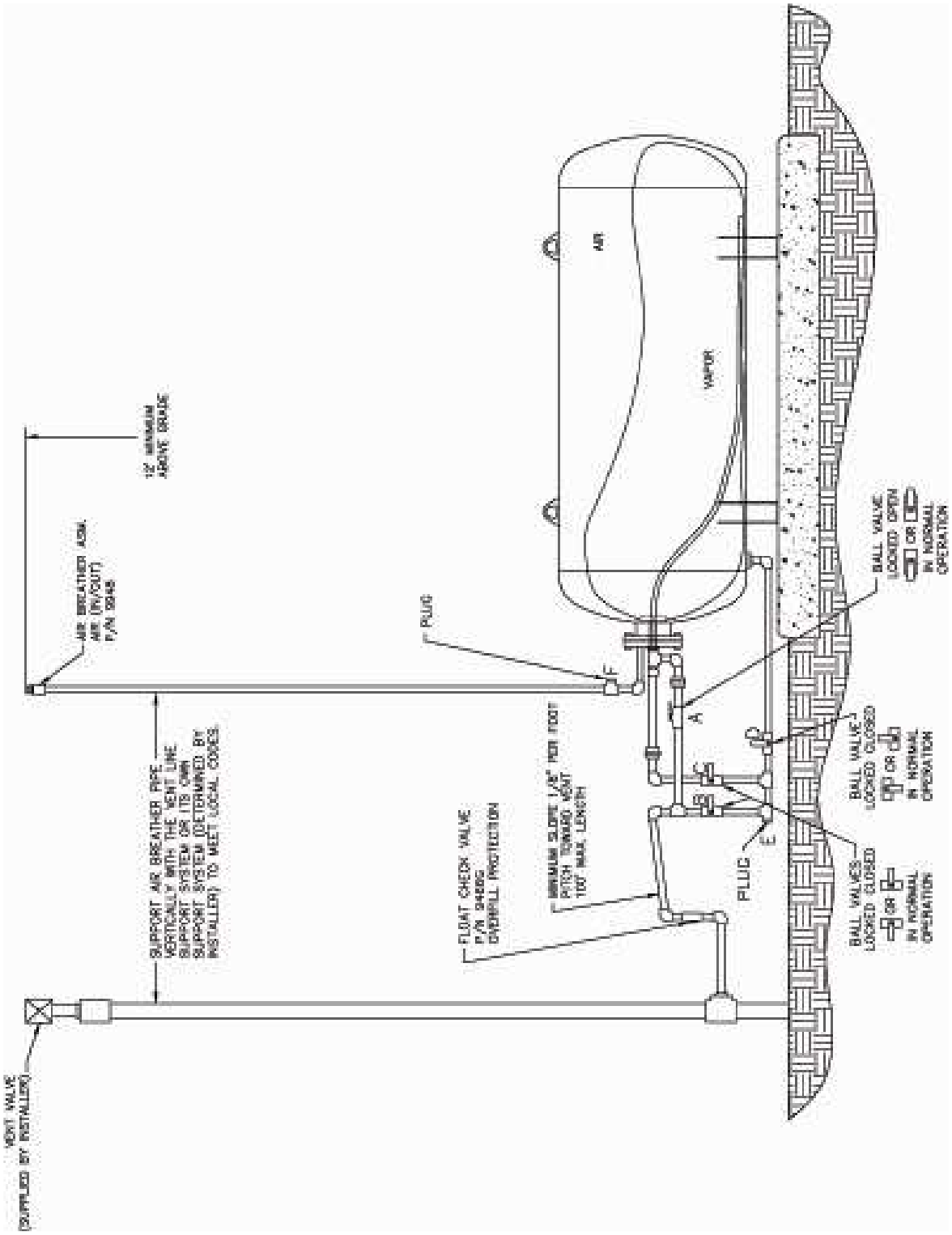

Figure 2B-7
Example of a GDF Maintenance Record and Alarm History Record

Date of Maintenance/ Test/Inspection/Failure/ alarm history (including date and time of maintenance call)	Repair Date To Correct Test Failure	Maintenance/Test/Inspection Performed and Outcome/Action Taken in Response to Alarm	Affiliation	Name and Technician ID Number of Individual Conducting Maintenance or Test	Telephone Number