Executive Order VR-202-D
Healy Phase II EVR System
Including Veeder-Root ISD

Exhibit 2
System Specifications

This exhibit contains the installation, maintenance and compliance standards and specifications that apply to the Healy Phase II EVR System Including Veeder-Root ISD installed in a gasoline dispensing facility. All components must be installed in accordance with the specifications in the **ARB Approved Installation, Operation and Maintenance Manual**. 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.

Nozzle

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

2. The Healy Model 900 nozzle has 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. Any dispenser that has a nozzle installed that is determined to have a defective vapor valve, as described in items 2.1 or 2.2 below, shall be immediately removed from service (including nozzle(s) on both sides of dispenser) and a call for repair made immediately.

   2.1. The maximum allowable leak rate for the nozzle vapor path, as determined by TP-201.2B, shall not exceed the following:

   0.038 cubic feet per hour (CFH) at a pressure of two inches water column (2.00” wc), and
   0.10 CFH at a vacuum of one hundred inches water column (-100.00” 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.

Vapor Collection

1. The V/L ratio of the system shall be **1.05 plus or minus 0.10 (0.95 to 1.15)**, measured at a flow rate between six and ten gallons per minute (6.0 – 10.0 gpm). *Any fueling point whose V/L ratio is determined to be at or below 0.80 shall be deemed defective and removed from service.* The V/L ratio shall be determined by using the test procedure in Exhibit 5 with the shut-off port excluded, or with an ARB approved alternate test procedure. See Section 7 of Exhibit 5 for guidance on V/L adjustment.

2. Inoperative vapor pumps, as determined by the ***ARB Approved Installation, Operation and Maintenance Manual***, constitute a defect.

3. For unihose dispensers, any modifications or repairs to the nozzle, hanging hardware or vacuum pump done to bring one fuel grade V/L into compliance at a fueling point invalidates the results of any previous fuel grade(s) tested before the alteration. All fuel grades at that fueling point shall be tested again to verify compliance.

Inverted Coaxial Hoses

1. The maximum length of the hose assembly, including hose adaptor, whip hose, breakaway, flow limiter (optional) and inverted coaxial hose, measured at the base of the nozzle, shall be no more than twenty (20) feet.

2. Any hose configuration is allowed.

Breakaway Couplings

1. Testing is required after reconnecting the breakaway to ensure proper operation and no observed leaks. The procedure for reconnecting breakaway and fueling point testing after a drive-off, referenced in Section 1.4 of Healy Systems Scheduled Maintenance, shall be conducted to verify that breakaway, hose and nozzle are operating properly after a drive-off.

Flow Limiters

1. Flow limiter is mandatory when the flow rate is greater than 10.0 gallons per minute to comply with U.S. EPA requirement.

Clean Air Separator Pressure Management System

1. The Clean Air Separator 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 this Executive Order.

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

    b. 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.

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 Gasoline Storage Tank Vents

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

2. At least one pressure/vacuum (P/V) vent valve shall be installed on each gasoline storage 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 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 piping requirements specified in section 4.11 of CP-201.

1. Vapor Return and Vent Lines

   a. 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 requiring exposing at least 50 percent of the underground vapor return piping.

After backfilling the vapor return and vent lines, the maximum pressure drop shall not exceed 0.5 inches WC at 60 cubic feet per hour as determined by TP-201.4, Dynamic Backpressure. The pressure drop shall be measured from the dispenser riser to the UST with pressure/vacuum vent valves installed and with the poppeted Phase I vapor connection open.

b. For existing installations, the maximum pressure drop through the system shall not exceed 0.5 inches WC at 60 cubic feet per hour as determined by TP-201.4, Dynamic Backpressure. The pressure drop shall be measured from the dispenser riser to the UST with the pressure/vacuum vent valves installed and with the poppeted Phase I vapor connection open.

Note: The V/L test from Exhibit 5 may be used to verify proper operation of the system, in lieu of measuring the pressure drop through the lines, provided that at least two gallons of product are introduced into the system through each dispenser riser, prior to the test.

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. The vapor return path from any dispenser riser to the underground storage tank shall be free of liquid or fixed blockage.

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 gasoline storage tank. The internal diameter of the connector, including all fittings, shall not be less than one-half inch (1/2”).

Note: The dispenser-to-riser connection is defined as the piping connection between the outlet of the vapor flow meter 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 of Item 1 (or the V/L option).

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

6. No liquid condensate traps are allowed with this system.

Dispenser Vapor Piping

1. Any dispenser with a dispenser piping test valve in the closed position shall be considered a defect.

2. The ball valve shall be installed between the test port and the vacuum pump. The ball valve and test port shall be located on the inlet side of the vacuum pump.

3. If the vapor flow meter is installed below the vapor shear valve, then a “Y” fitting for introducing liquid shall be installed below the vapor flow meter.

4. The vapor flow meter shall be installed on the down stream side of the vacuum pump.

5. The Vapor Pressure Sensor shall be installed into one of the dispensers at the GDF located closest to the underground storage tanks (If a row of dispensers are equal distance from the gasoline tank pad and within 10’ of each other, any dispenser can be used).

In-Station Diagnostics

1. The gasoline dispensing facility operator/owner shall comply with local district requirements, if any, following a warning by the Veeder-Root In-Station Diagnostics (ISD) system and a shut down of the submersible pumps to all gasoline tanks by the ISD systems.

2. Suggested Troubleshooting, found in Table 5-3 of the Veeder-Root In-Station Diagnostics ISD) Install, Setup, and Operation Manual (ARB Approved Installation, Operation, and Maintenance Manual), recommends that certain tests be conducted to verify the cause of the ISD warning or failure alarms. Districts may require that these tests or other tests specified by the districts be conducted in response to the ISD alarms.

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 the latest version of TP-201.3.

Maintenance and Alarm History Records

1. Each GDF operator/owner shall keep records of maintenance performed at the facility. Such records shall be maintained on site or in accordance with district requirements or policies. The records shall include the maintenance or test date, repair date to correct test failure, maintenance or test performed, affiliation, telephone number, name and Certified Technician Identification Number of individual conducting maintenance or test. Additional information may be required in accordance with local district requirements.

   Each GDF operator/owner shall keep records of all alarms detected by the ISD system. Alarm History records shall be maintained on site or in accordance with district requirements or policies. The records shall include the alarm date, the nature of the alarm, type of test and test date to verify the validity of ISD alarm, maintenance or repair date to correct the cause of the alarm, maintenance or repair performed to correct the cause of the alarm, affiliation, telephone number, name and Certified Technician Identification Number of individual conducting maintenance or test. Additional information may be required in accordance with local district requirements**.**

   An example of a GDF Maintenance and Alarm History Record is shown in **Figure 2B-15**.

2. Maintenance shall be conducted in accordance with Healy Systems Scheduled Maintenance document in ***ARB Approval Installation, Operation and Maintenance Manual***.

3. Reconnection of breakaways shall be included in the maintenance records.

Veeder-Root ISD System Specifications

TLS Console & ISD Software Version Number

The ISD audible alarm shall be installed at a location that is most likely to be occupied by the station attendant during normal station operation (ie. cash register) to hear the alarm. The TLS console shall be installed in a location that allows the RS232 port to be easily accessible, and if applicable, per district requirements, for use at anytime. A vacant RS232 serial port shall always be available to electronically download reports.

The presence of ISD and the ISD software version number can be verified on the TLS Console LCD screen by using the <STEP> key or by using the TLS Console <PRINT> key to print and review the latest ISD Daily Report. **See Figure 2B-7** and **2B-8** for TLS and ISD verification instructions.

The TLS Console must have a printer as well as an RS232 interface port.

If the TLS is equipped with security features which prohibit access to the TLS, instructions to override these security features shall be maintained on site in accordance with air district requirements and shall be available to the air district upon request.

Operability Test Procedure

The Veeder-Root ISD operability test procedure provided in Exhibit 9, and in section 4 of the ***ARB Approved Installation, Operation and Maintenance Manual***, shall be used at GDF sites to determine the operability of the Veeder-Root ISD system to comply with applicable performance standards and performance specification in CP-201. Testing the ISD equipment in accordance with this procedure will verify the proper selection, setup and operation of the TLS Console sensors and interface modules.

The Vapor Flow Meter

The Veeder-Root ISD system requires one Vapor Flow Meter per dispenser installed via the ***ARB Approved ISD Vapor Flow Meter Manual 577013-796, Rev. E for the Veeder-Root ISD System***. The Vapor Flow Meter shall be installed into dispensers listed in Exhibit 1 of this Executive Order in accordance with the ***ARB Approved Installation, Operation and Maintenance Manual***. The Vapor Flow Meter is an intrinsically safe sensor that is wired to the TLS Console Smart Sensor Module via a conduit dedicated to TLS Console low-voltage sensors. **Figure 2B-9** shows the ISD Vapor Flow Meter. **Figures 2B-13** and **2B-14** show the installation configuration.

The Vapor Pressure Sensor

The Veeder-Root ISD system requires one Vapor Pressure Sensor per GDF installed into one of the dispensers located closest to the gasoline tanks (If a row of dispensers are equal distance from the gasoline tank pad and within 10' of each other, any dispenser can be used) in accordance with the ***ARB Approved Installation, Operation and Maintenance Manual***. The Vapor Pressure sensor shall be installed into dispensers listed in Exhibit 1 of this Executive Order. The Vapor Pressure Sensor is an intrinsically safe sensor that is wired to the TLS Console Smart Sensor Module via a conduit dedicated to TLS Console low-voltage sensors. **Figure 2B-10** shows an ISD Vapor Pressure Sensor illustration. **Figures 2B-13** and **2B-14** show the installation configuration.

Dispenser Interface Module (DIM)

Existing Dispenser Interface Modules or DIM communication cards are used to interface to the dispenser Point Of Sale (POS) or controller system to gather fuel transaction data. The ISD Operability Test Procedure provided in Exhibit 9 and in Section 4 of the Veeder-Root ISD Install, Setup and Operation Manual can be used to verify the proper selection and setup of the Dispenser Interface Module. See **Figure 2B-11** for a typical Dispenser Interface Module Illustration.

Tank Inventory Probe Sensor

Existing Tank Inventory Probe sensors (one per gasoline storage tank) are used to measure the amount of vapor space in the Underground Storage Tanks (USTs). The ISD Operability Test Procedure can be used to verify the proper selection and setup of the Tank Inventory Probes. See **Figure 2B-12** for a typical Tank Inventory Probe Sensor.

Shutdown Control

The TLS Console must be wired per the ***Veeder-Root ISD Install, Setup and Operation Manual 557013-800, Rev. E*** of the ***ARB Approved Installation, Operation and Maintenance Manual*** such that it shall automatically prohibit the dispensing of fuel through shutdown of all the gasoline turbine pumps during a CP-201 ISD failure alarm or TLS Console ISD system power loss.

TLS Console Modules

The ISD Operability Test Procedure in Exhibit 9 and in section 4 of the Veeder-Root ISD Install, Setup, and Operation Manual of the ***ARB Approved Installation, Operation, and Maintenance Manual*** shall be used to verify the proper selection and setup of the TLS Console Modules.

Training Program

All Veeder-Root contractors must successfully complete the applicable Veeder-Root training program before they can install, startup, and service TLS Console equipment. Contractors must have up-to-date Level 1 certification to install the TLS Console ISD system. Contractors must have an up-to-date Level 2, 3 or 4 certification and the ISD certification to startup and service the ISD system. The schedule, fee and registration information for the Authorized Service Contractor (ASC) training program can be found at http://www.veeder.com.

To confirm TLS or ISD training a regulator should send an email to technicaltraining@gilbarco.com with the name (and company) of the ASC to obtain verification of the ASC TLS/ISD training status or call 800-997-7725 and press "*" to get to the Veeder-Root menu and "*" again to speak to a representative.

Maintenance

The TLS console, including interface modules, do not require scheduled maintenance. ISD System Self-Test Monitoring algorithms are designed to verify proper selection, setup and operation of the TLS console and sensors.

There is no recommended maintenance, inspection nor calibration for the Vapor Flow Meter or the Vapor Pressure Sensor. Servicing should be performed in response to warning or alarm conditions.

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Healy Phase II EVR System
Including Veeder-Root ISD

Exhibit 2
Figure 2B-1
Vapor Boot for Healy 900 Nozzle

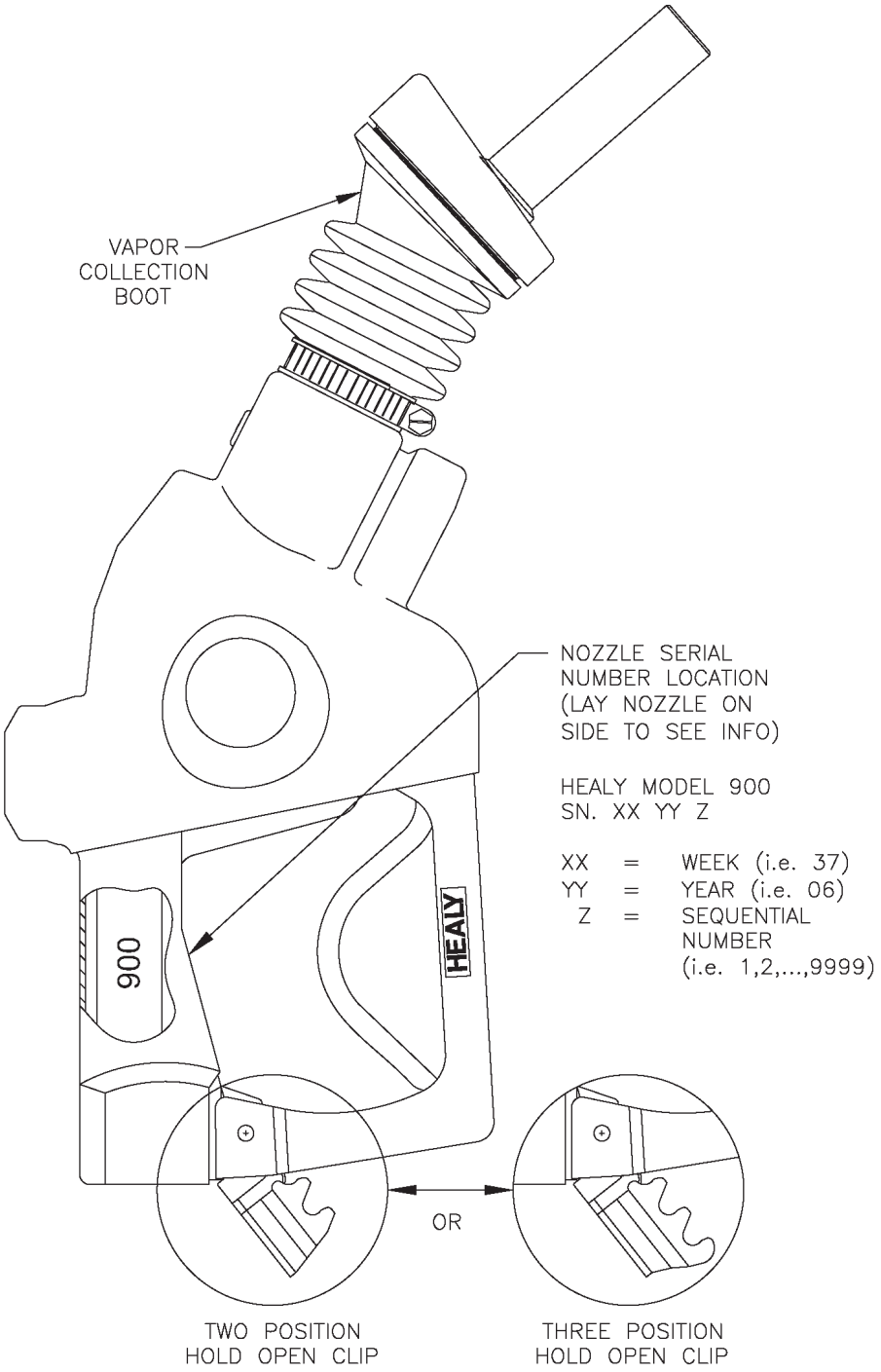

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Exhibit 2
Figure 2B-2
Clean Air Separator Normal Operation Configuration

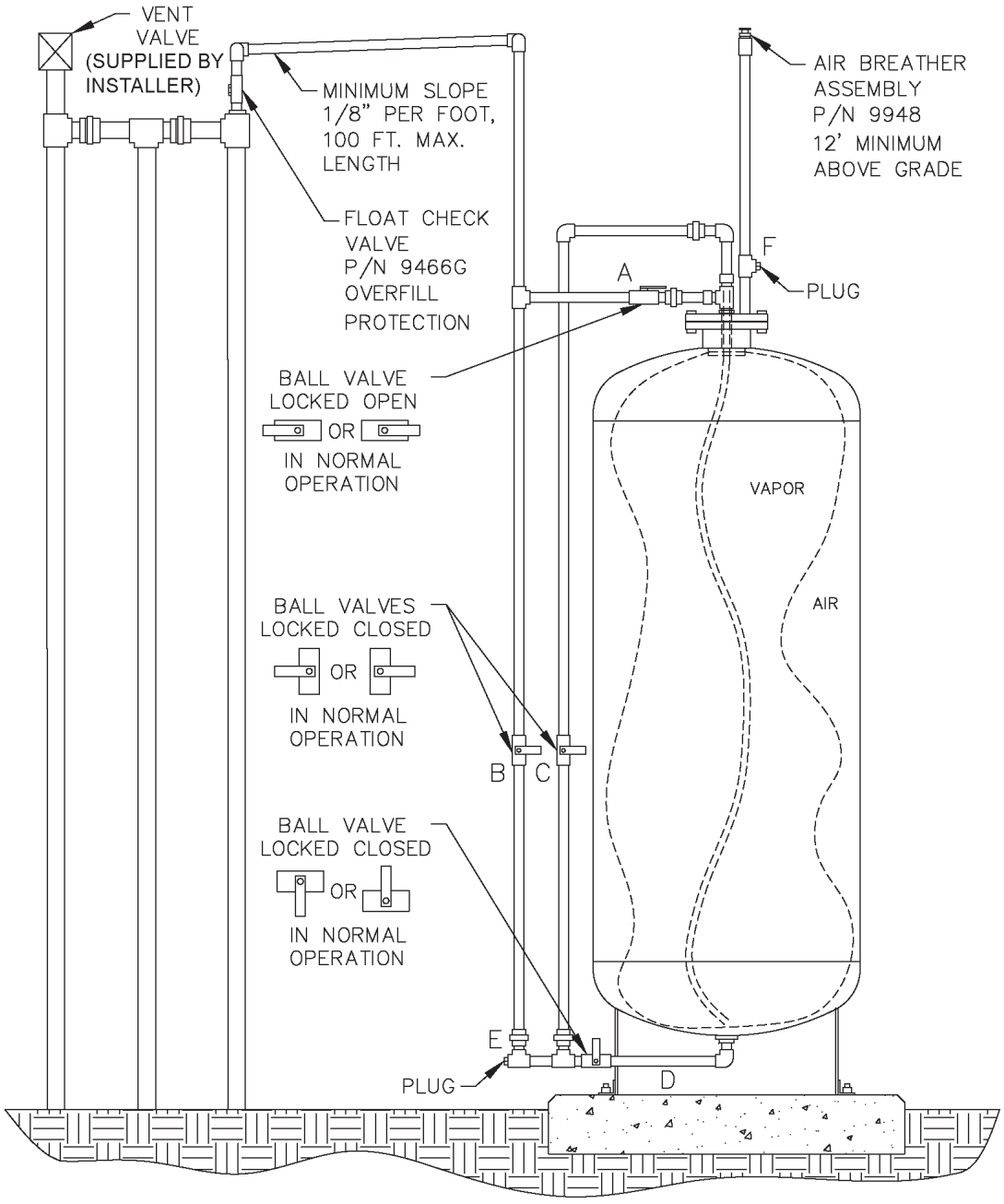

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Exhibit 2
Figure 2B-2H
Clean Air Separator Normal Operation Configuration

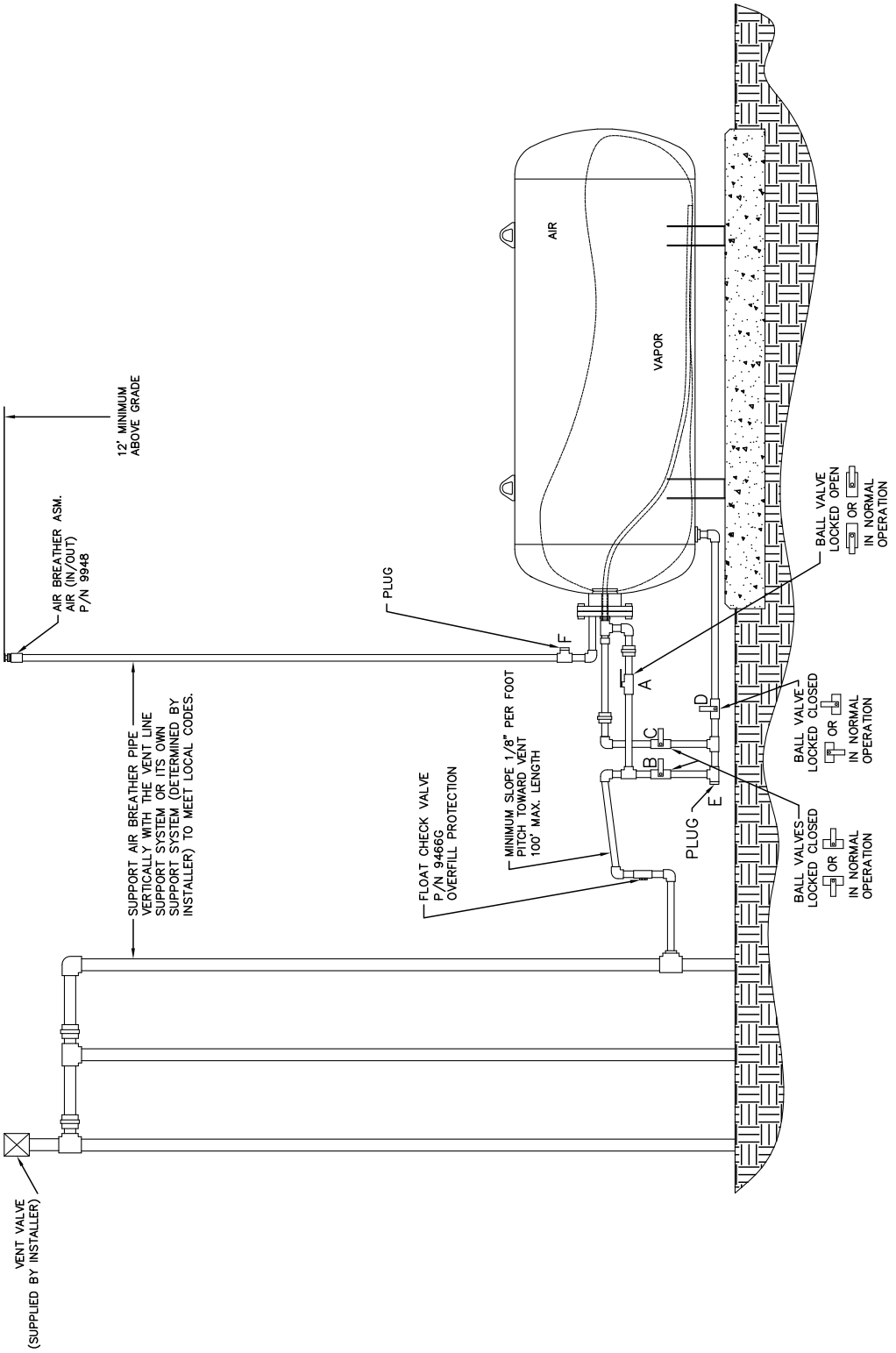

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Exhibit 2
Figure 2B-3
Typical Installation of a Single P/V Vent Valve Manifold with Healy Clean Air Separator

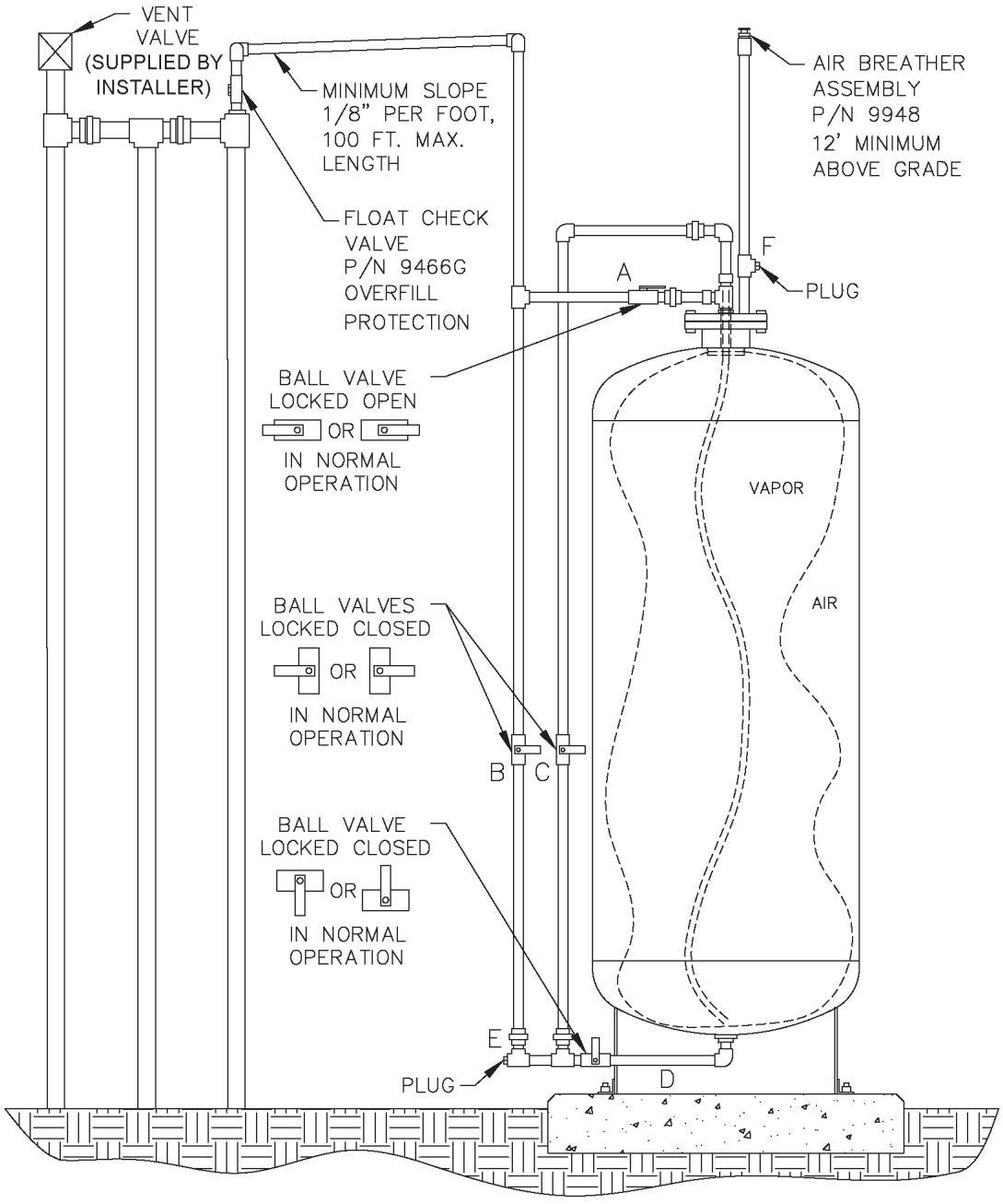

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Exhibit 2
Figure 2B-3H
Typical Installation of a Single P/V Vent Valve Manifold with Healy Clean Air Separator

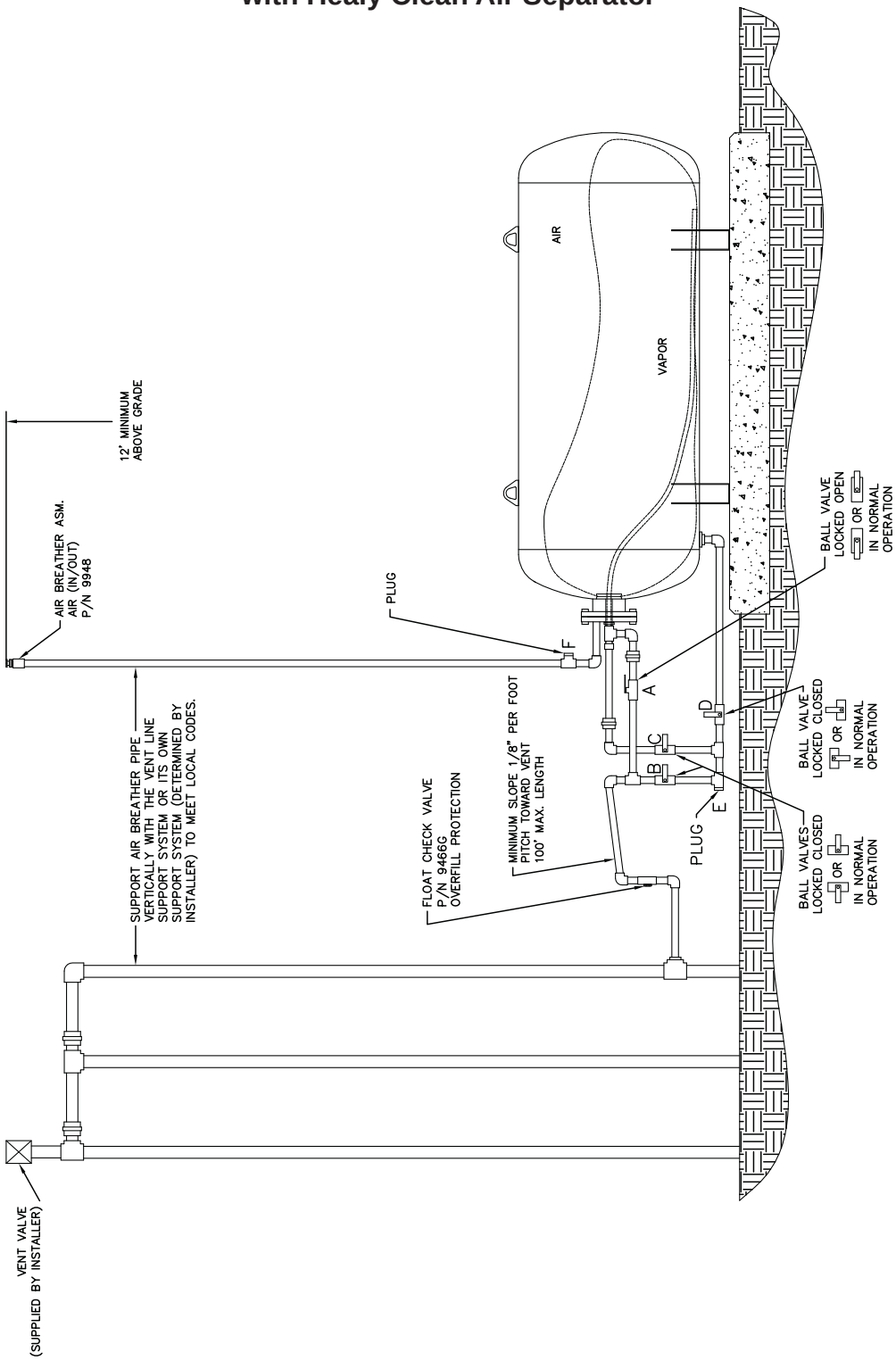

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Exhibit 2
Figure 2B-4
Typical Installation of a Two P/V Vent Valve Parallel Manifold with Healy Clean Air Separator

(This configuration requires additional P/V vent valves that are not supplied in the Healy installation kit)

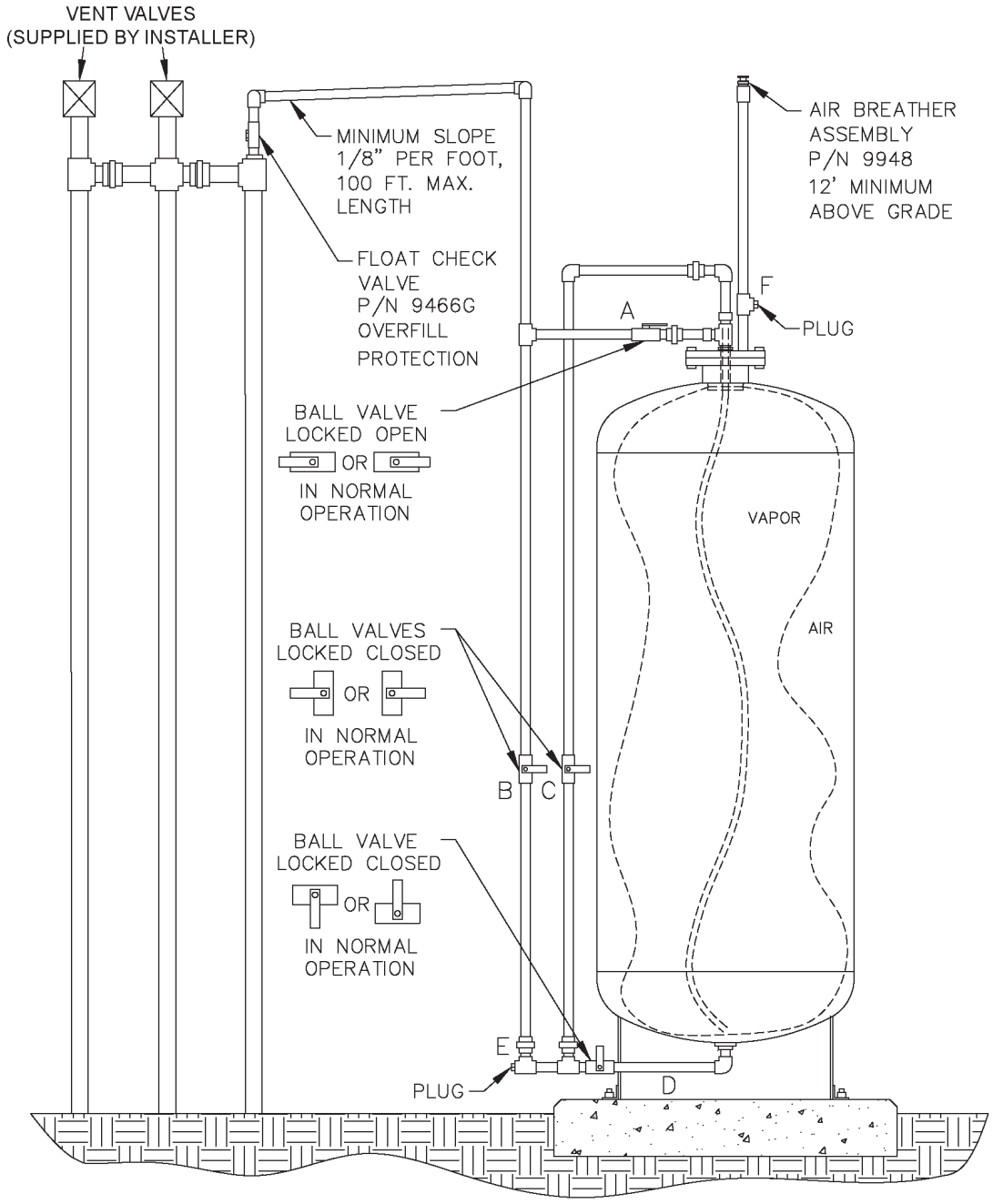

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Exhibit 2
Figure 2B-4H
Typical Installation of a Two P/V Vent Valve Parallel Manifold with Healy Clean Air Separator

(This configuration requires additional P/V vent valves that are not supplied in the Healy installation kit)

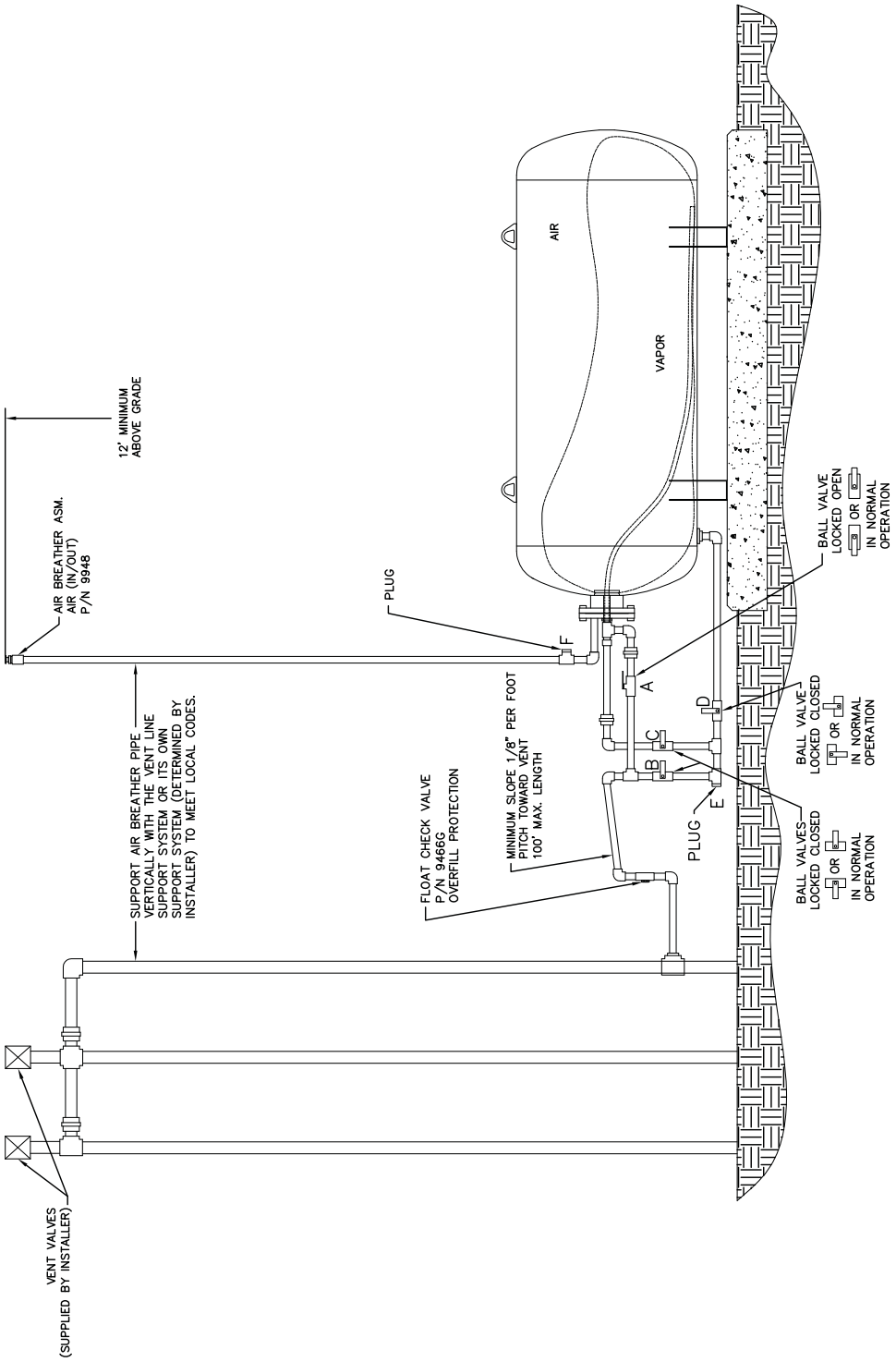

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Exhibit 2
Figure 2B-5
Typical Installation of a Three P/V Vent Valve Parallel Manifold with Healy Clean Air Separator

(This configuration requires additional P/V vent valves that are not supplied in the Healy installation kit)

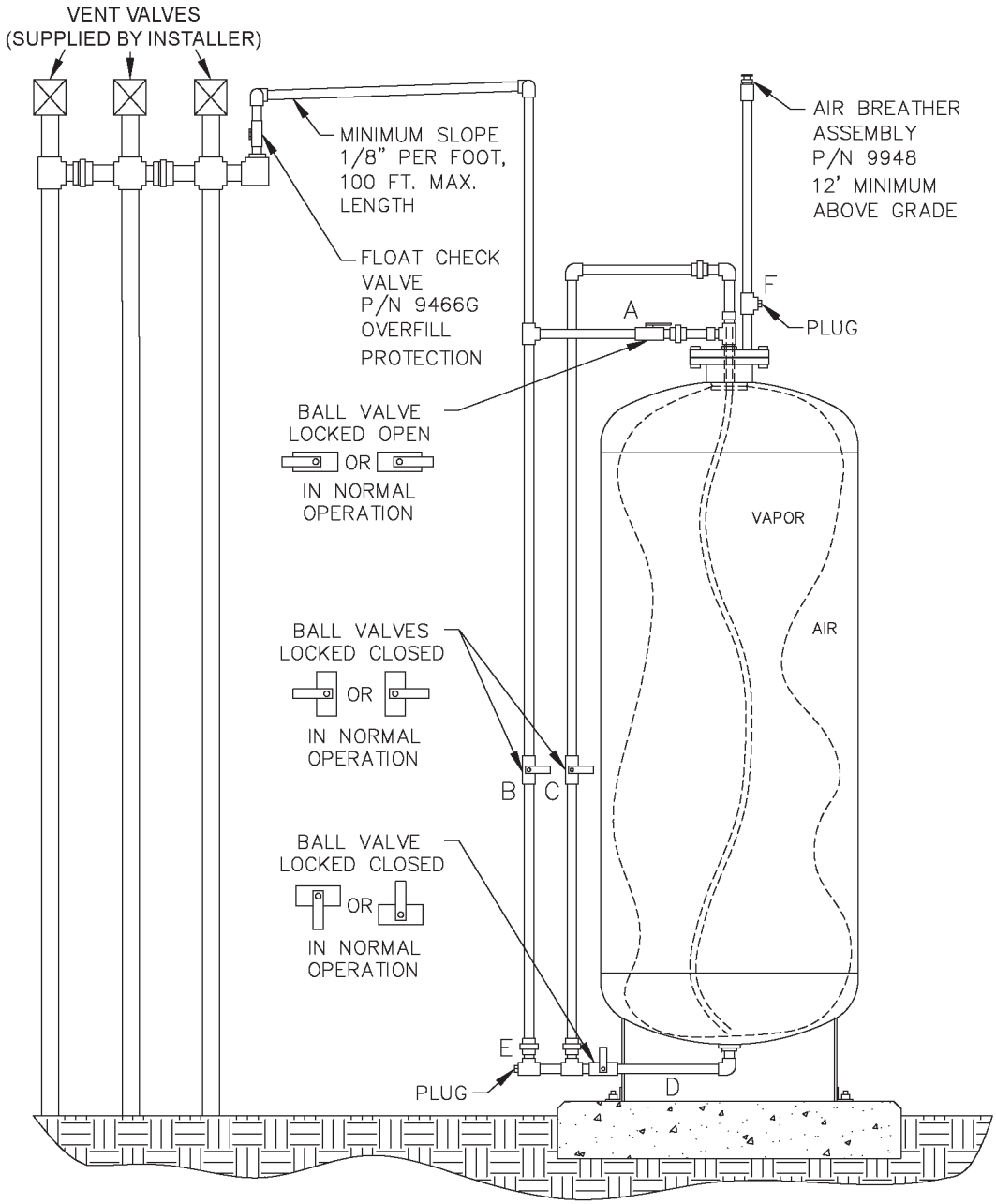

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Exhibit 2
Figure 2B-5H
Typical Installation of a Three P/V Vent Valve Parallel Manifold with Healy Clean Air Separator

(This configuration requires additional P/V vent valves that are not supplied in the Healy installation kit)

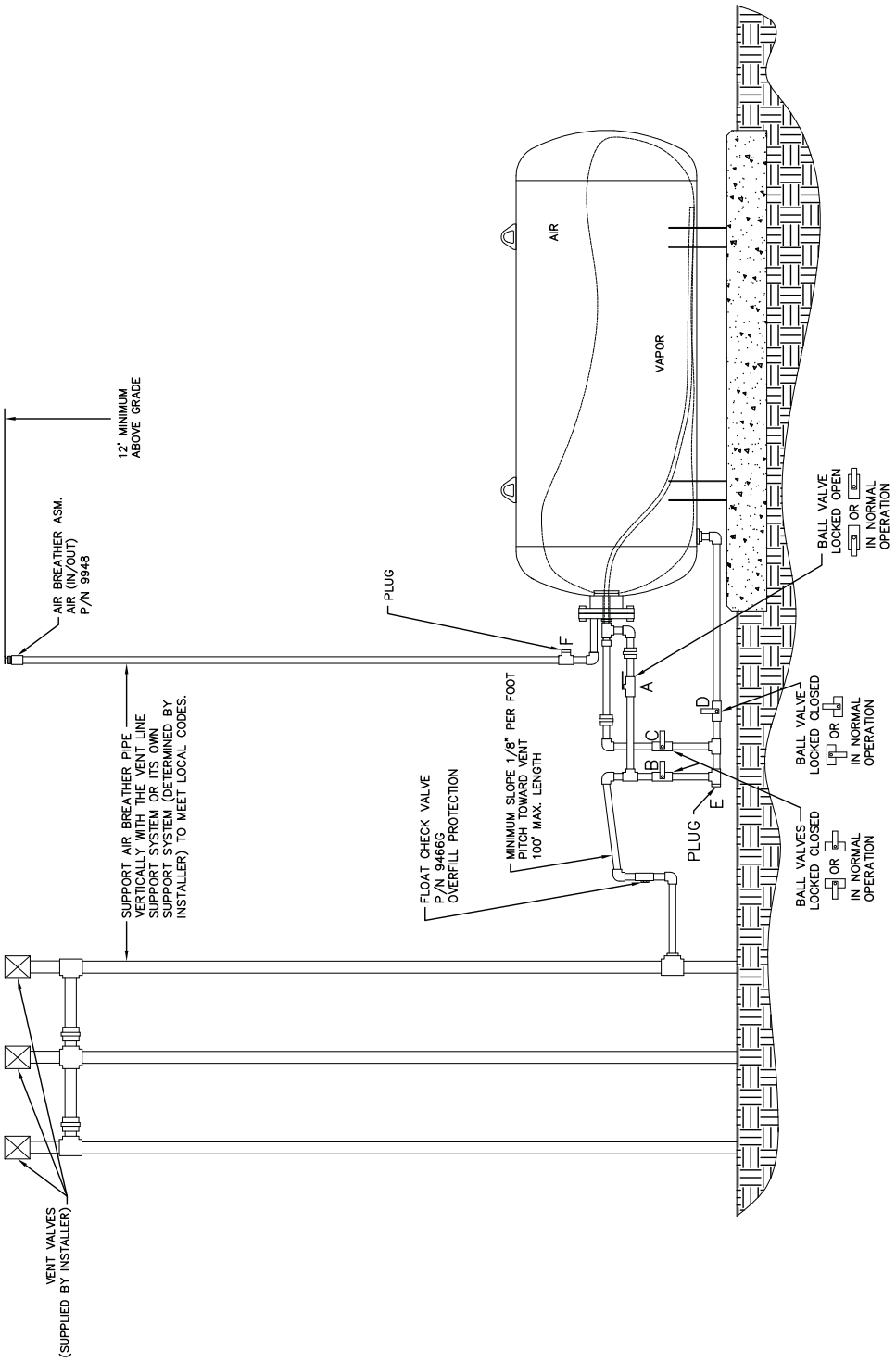

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Exhibit 2
Figure 2B-6
Typical Configuration of a P/V Vent Valve Mounted on a Single 3” Vent Line with the Clean Air Separator

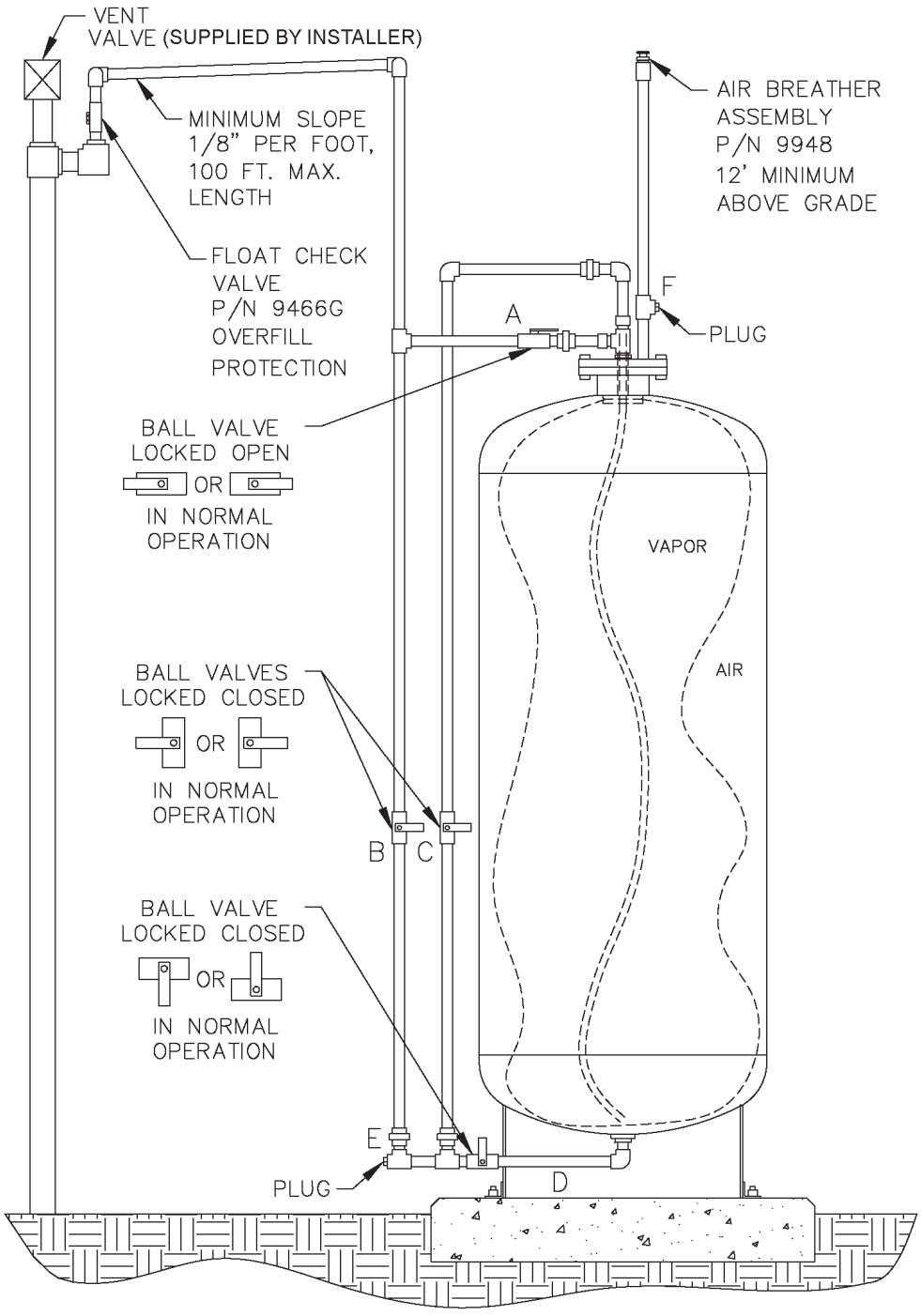

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Exhibit 2
Figure 2B-6H
Typical Configuration of a P/V Vent Valve Mounted on a Single 3” Vent Line with the Clean Air Separator

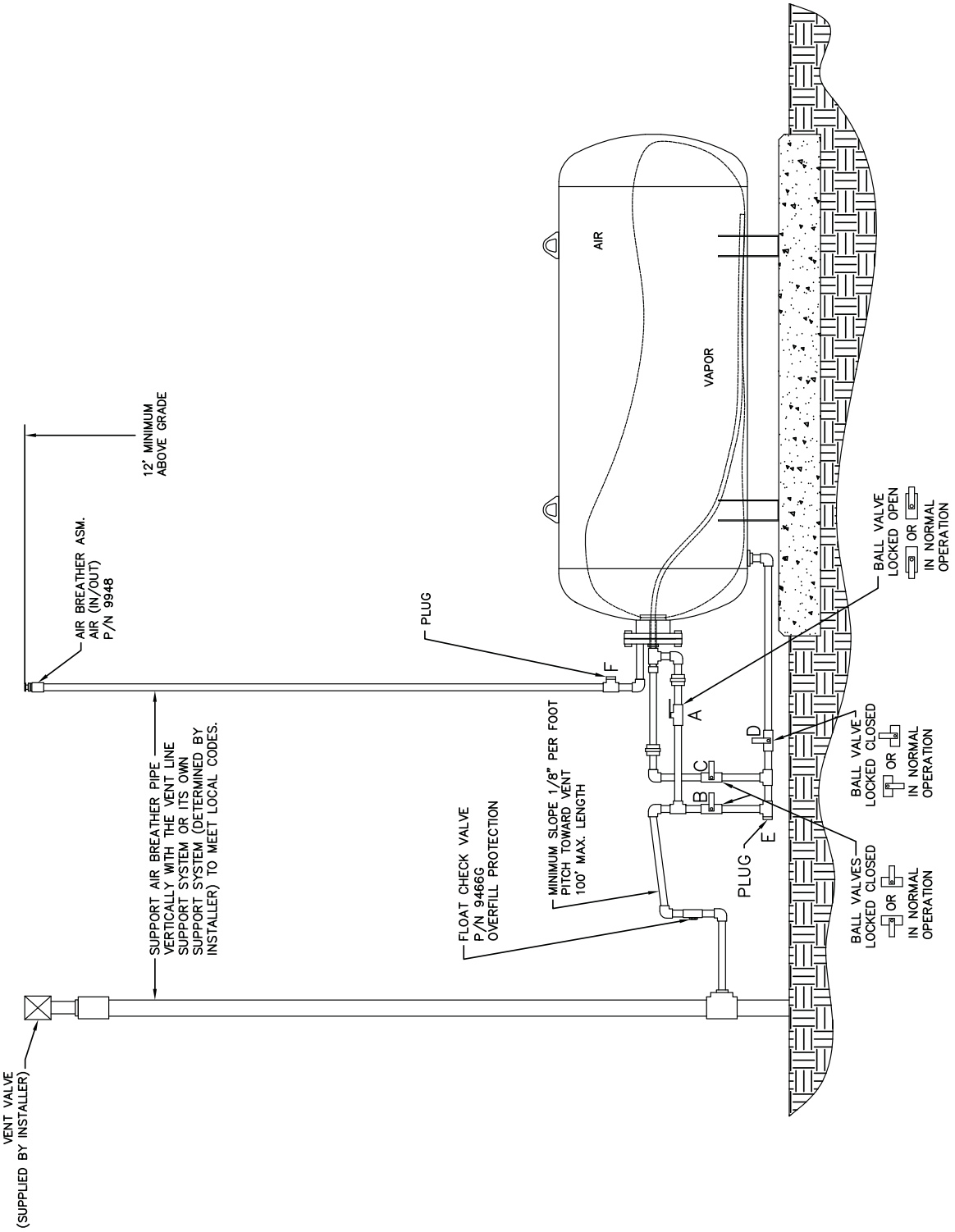

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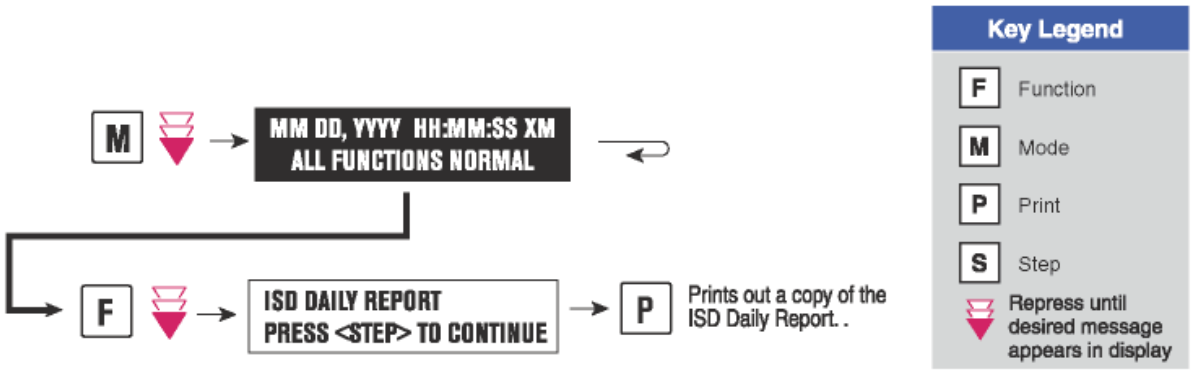
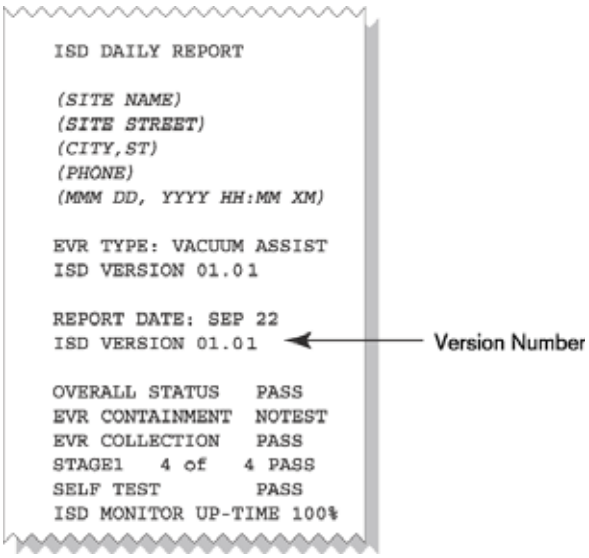
Exhibit 2
Figure 2B-7
Finding The Veeder-Root ISD Version Number

Use the TLS Console <FUNCTION> key to find the ISD Daily Report menu:



The ISD version number can be verified on the TLS Console LCD screen using the <STEP> key or by using the TLS Console <PRINT> key to print and review the latest ISD Daily Report:



Presence of the ISD Daily Report menu and correct ISD software version number is evidence that ISD is installed and activated in the TLS Console.

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Exhibit 2
Figure 2B-8
Standard TLS Console

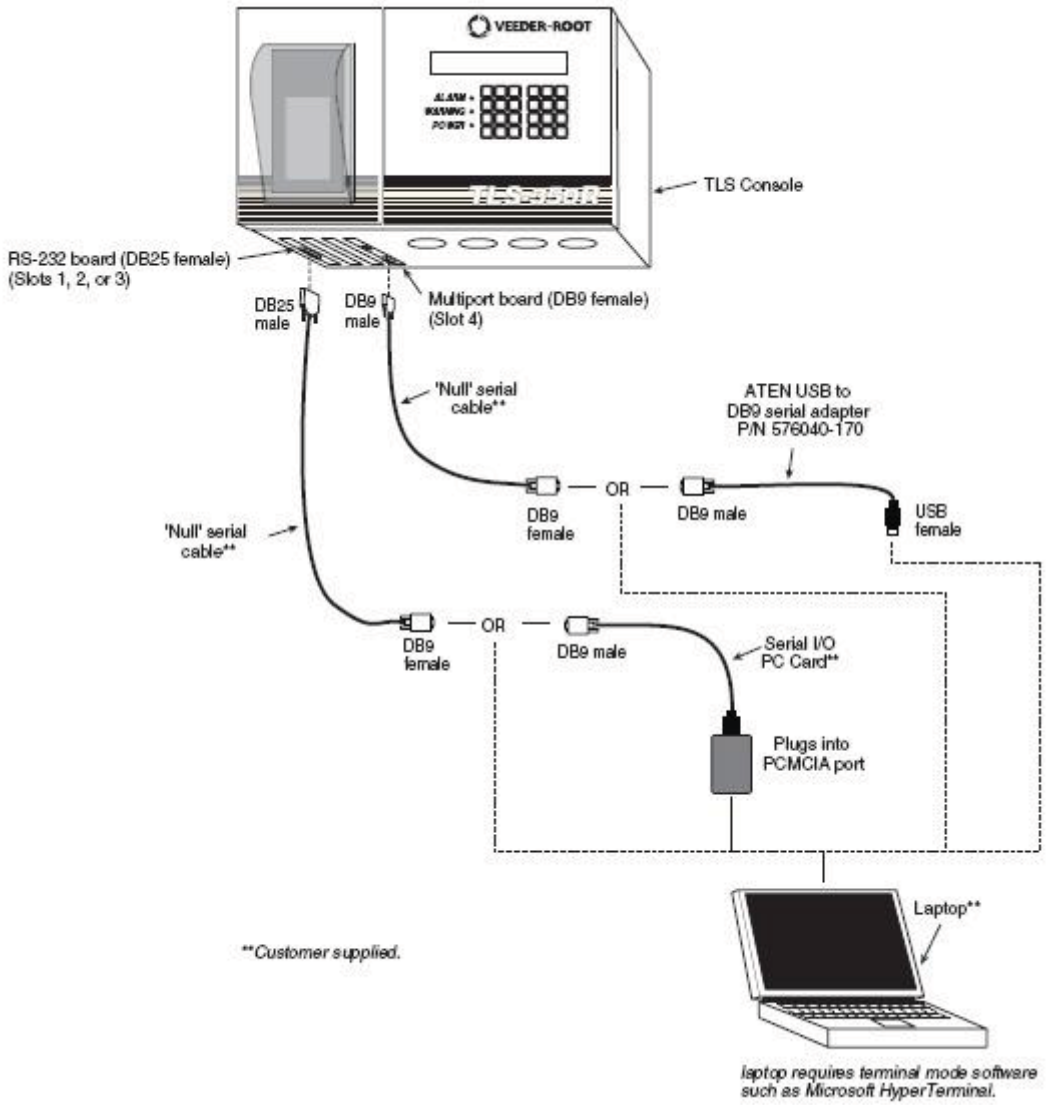

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Exhibit 2

Figure 2B-10
Veeder-Root 331946-001
Vapor Pressure Sensor

Figure 2B-9
Veeder-Root 331847-XXX
Vapor Flow Meter

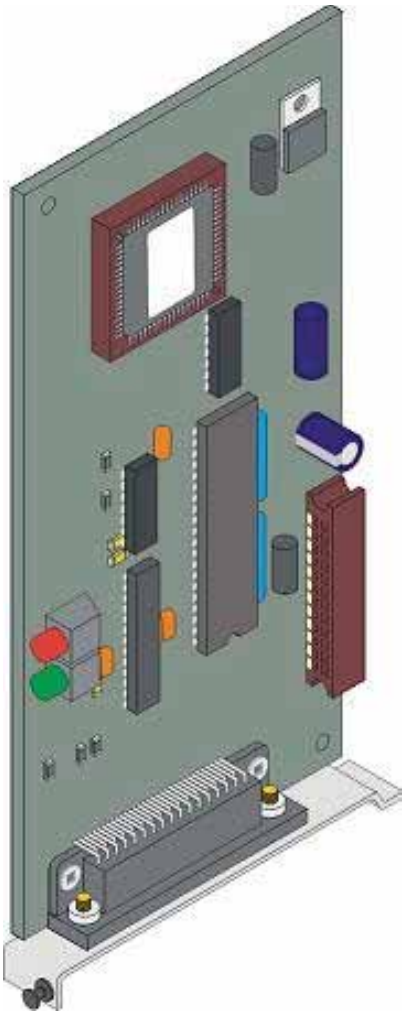

Figure 2B-11
Veeder-Root
Dispenser Interface Module
(DIM)

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Exhibit 2
Figure 2B-12
Tank Inventory Probe Sensor

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Exhibit 2
Figure 2B-13

Typical Installation of the Veeder-Root Vapor Pressure Sensor & Vapor Flow Sensor

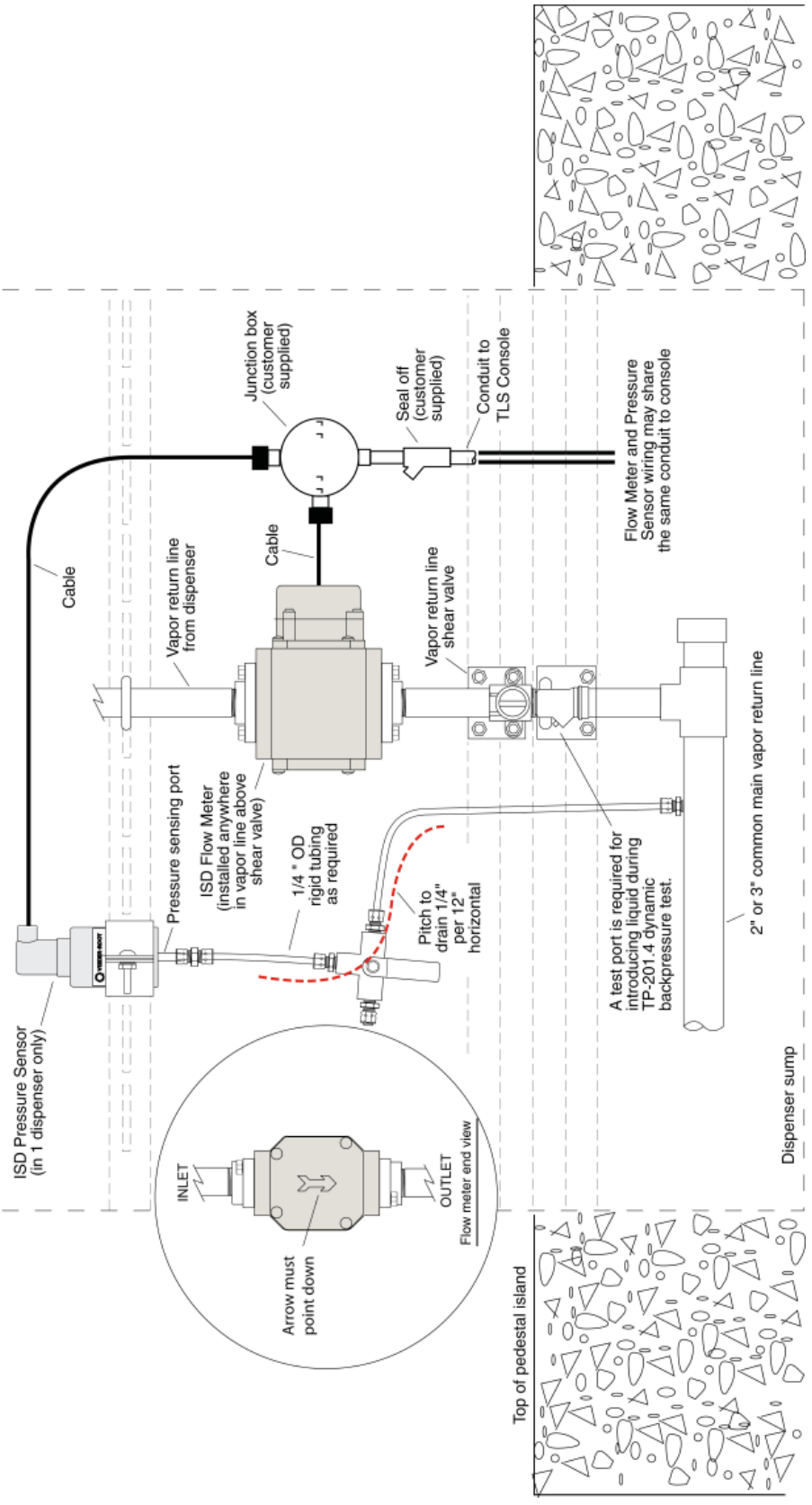

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Exhibit 2
Figure 2B-14
Typical Installation of the Veeder-Root Vapor Pressure Sensor and Vapor Flow Sensor

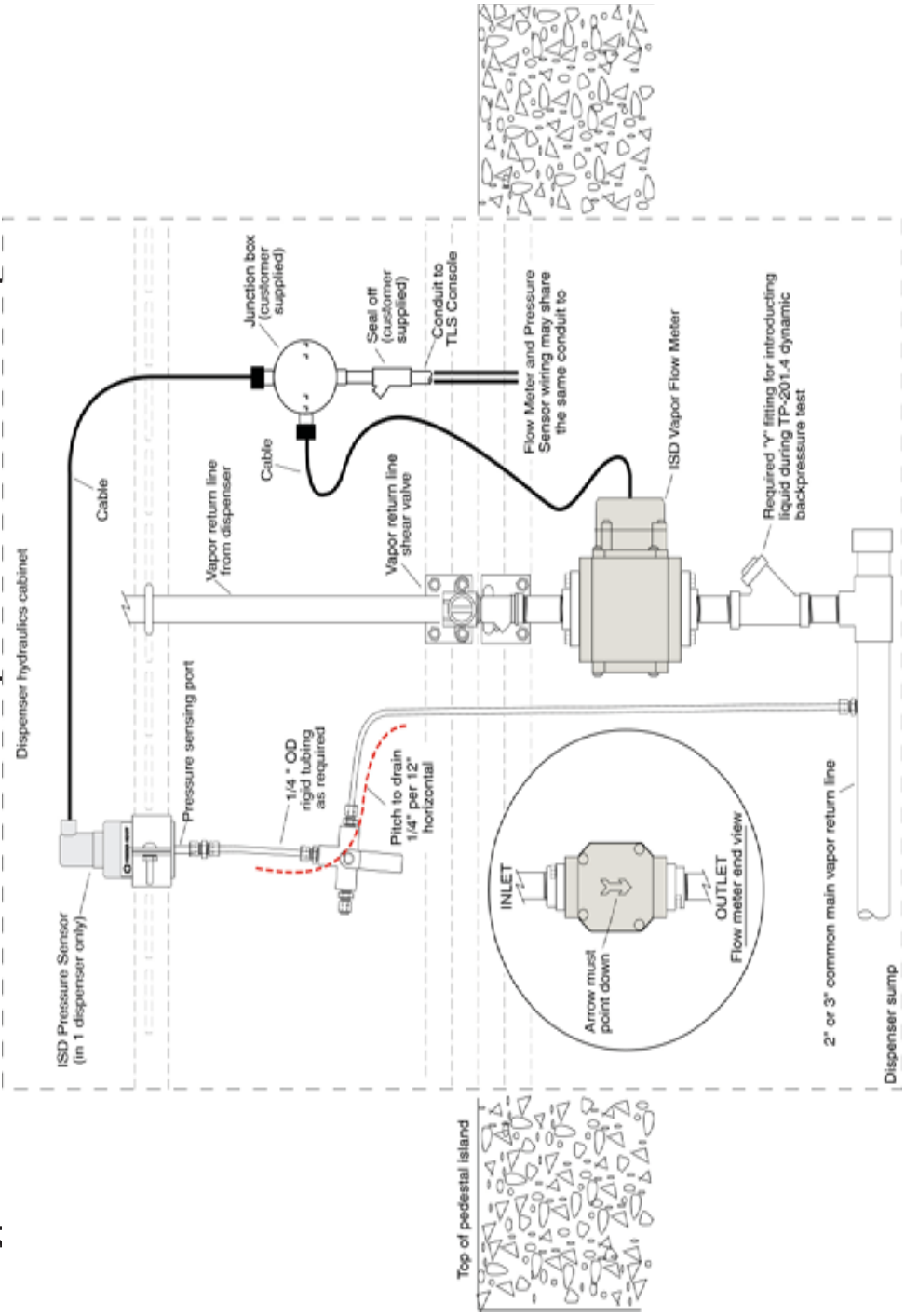

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Exhibit 2
Figure 2B-15
Example of a GDF Maintenance and Alarm History Record

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	Affiliation	Name and Technician ID number of Individual Conducting Maintenance or Test	Telephone Number