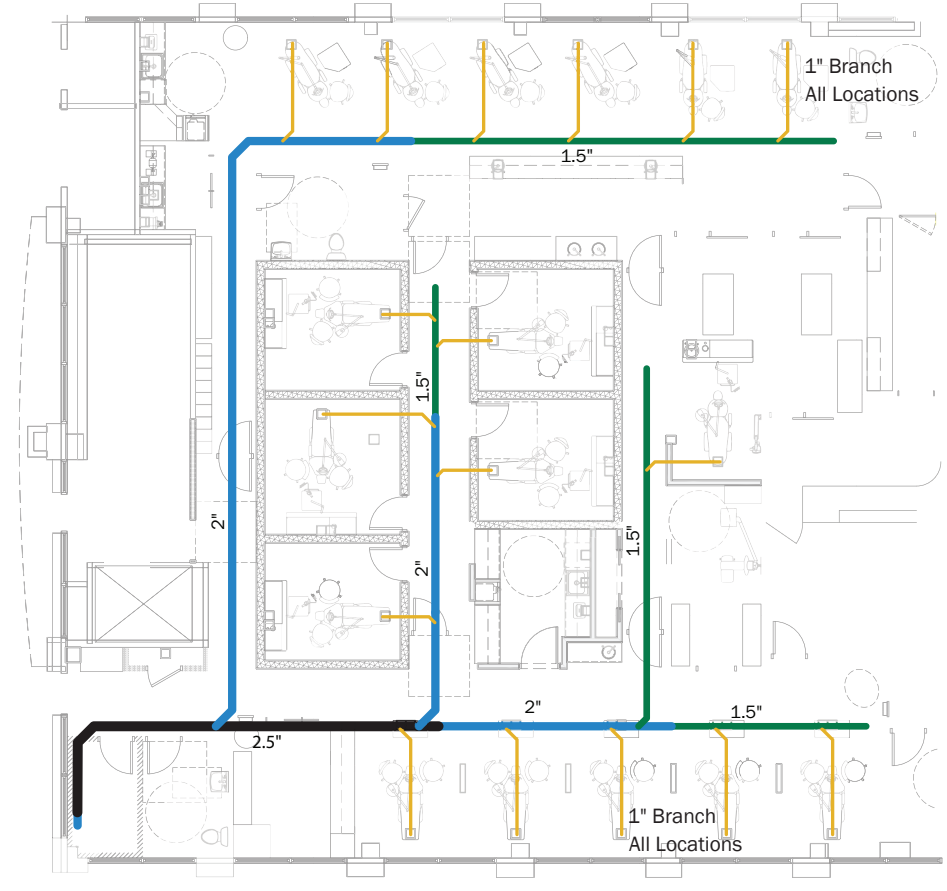
Pre-Installation Guide

A-dec DV Dry Vacuum Piping Layout

Contents



Note

This document contains recommendations for facility vacuum piping layout. This guide is to serve as a reference only. A-dec makes no claim to knowing local codes, local installation practices or specific facility construction. A-dec does not guarantee performance.

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For required regulatory information and the A-dec warranty, see the *Regulatory Information, Specifications, and Warranty* document (p/n 86.0221.00) available in the Resource Center at www.a-dec.com.

Product Service

Product service is available through your local authorized A-dec dealer. For service information, or to locate an authorized dealer, contact A-dec at 1.800.547.1883 in the USA and Canada or 1.503.538.7478 worldwide, or visit www.a-dec.com.

Product Models and Versions Covered in This Document

Model	Versions	Description
DV5, DV7, DV10, DV12	n/a	Dental Vacuum

Glossary of Terms

Air Velocity - Velocity refers to how fast the air is moving in a pipe, in distance, per unit of time. Dry Vacuum systems use air velocity to move liquids and solids through the piping system.

Backflow - An unwanted flow of suction liquid in the reverse direction. Prevented by proper piping design.

Below Grade - Piping that is below ground level either buried in a slab or in a basement.

CFM - Cubic Feet per Minute (cu ft/min). Unit that represents the flow of air.

Cleanout - A plumbing cleanout provides a convenient place to access a building's vacuum piping system to clear clogs and debris.

Double 45° - Using (2) 45° fittings to create a "sweep" 90°.

Dry Vacuum - A type of vacuum generating equipment that does not use water during operation.

DWV - Pipe fittings designed specifically for Drain, Waste, and Vent applications. These are the only type of fittings accepted for use in a vacuum system.

HVE - A High Volume Evacuator is a suction device that draws a large volume of air over a period of time. Flow requirement is approximately 1 user.

InHG / "HG / Inches of Mercury - Inch of mercury is a unit of measurement for vacuum. It is widely used in the dental industry. It is the vacuum level required to vertically lift a column of mercury 1 inch (25.4 mm) in height at the standard acceleration of gravity.

Inverted P-Trap - Branch lines connecting to overhead trunk tie into the top of the trunk to prevent backflow.

Junction Box - Connection box for all utilities to dental delivery unit. Generally floor or wall mounted. Details provided by equipment provider.

NFPA99 - The National Fire Protection Association (NFPA) establishes criteria for levels of health care services or systems based on risk to the patients, staff, or visitors in health care facilities to minimize the hazards of fire, explosion, and electricity. Dental Vacuum piping is covered under NFPA99 Level 3.

Nitrous (N_2O) Scavenging - A scavenging system, simply defined, is a means to collect and remove excess gases to prevent them from being vented back into the operating room. Flow requirement is approximately 1.5 CFM or 1/2 user.

Treatment Rooms- A highly specialized space configured to deliver dental treatment to patients while supporting all associated tasks performed by the dentist and auxiliaries.

Overhead - Vacuum piping system where the main trunk is suspended from the ceiling and runs above treatment rooms.

PVC Pipe - Abbreviation for polyvinyl chloride. White plastic pipe commonly used for plumbing and drainage.

Slope - Has the same meaning as pitch. It is generally accepted that 1/4" per 10' of pipe run is the minimum for proper slope on a Dental Vacuum Piping System.

SE (Saliva Ejector) - A narrow tubular device providing suction to draw saliva, blood, and debris from the mouth of a dental patient in order to maintain a clear operating field. Flow requirement is approximately 1/2 User.

Sweep - DWV elbows are usually long-radius ("sweep") types. To reduce flow resistance and solid deposits when the direction of flow is changed, they use a shallow curve with a large radius of curvature.

Trunk - In a complete Dental Vacuum Piping System, the main supply lines, the "trunks," provide suction to the general area where it will be used. Smaller-diameter tubing, the "branch" lines, provide connections to the point of use.

Wet Vacuum - Wet dental vacuum systems use water to create vacuum pressure. They require a lot of water to operate.

General Guidelines

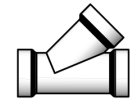
- Vacuum piping to be PVC or Type M copper per local code.
- Main trunk lines and headers to have a minimum slope of 1/4" per 10'.
- For main trunk lines longer than 50', increase in pipe size.
- No split wye on main trunk lines, use only a branch wye.
- Branch lines should be of equal length, where possible.
- Use DWV piping and fittings.
- If DWV fittings are not available, use double 45° elbow.
- Do NOT use tee, 4-way cross, or short elbow connectors.
- Do NOT use standard PVC 90° elbows.

Cleaning Vacuum Lines

Use only dental-specific vacuum line cleaner made for dry vacuum systems. Use only a non-foaming cleaner. No other cleaning agents, such as ultrasonic fluid, should be used in your vacuum lines.

NOTE Failure to comply with vacuum line cleaning guidance can decrease vacuum performance, including a complete loss of vacuum. Problems arising from the use of proper cleaning agents can affect the warranty.

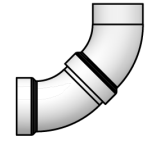
PVC Fitting Examples



Drain Waste Vent Wye

Drain Waste Vent Offset Wye

Drain Waste Vent Sweep 90° Elbow



Standard PVC Double 45° Elbows to Make 90°

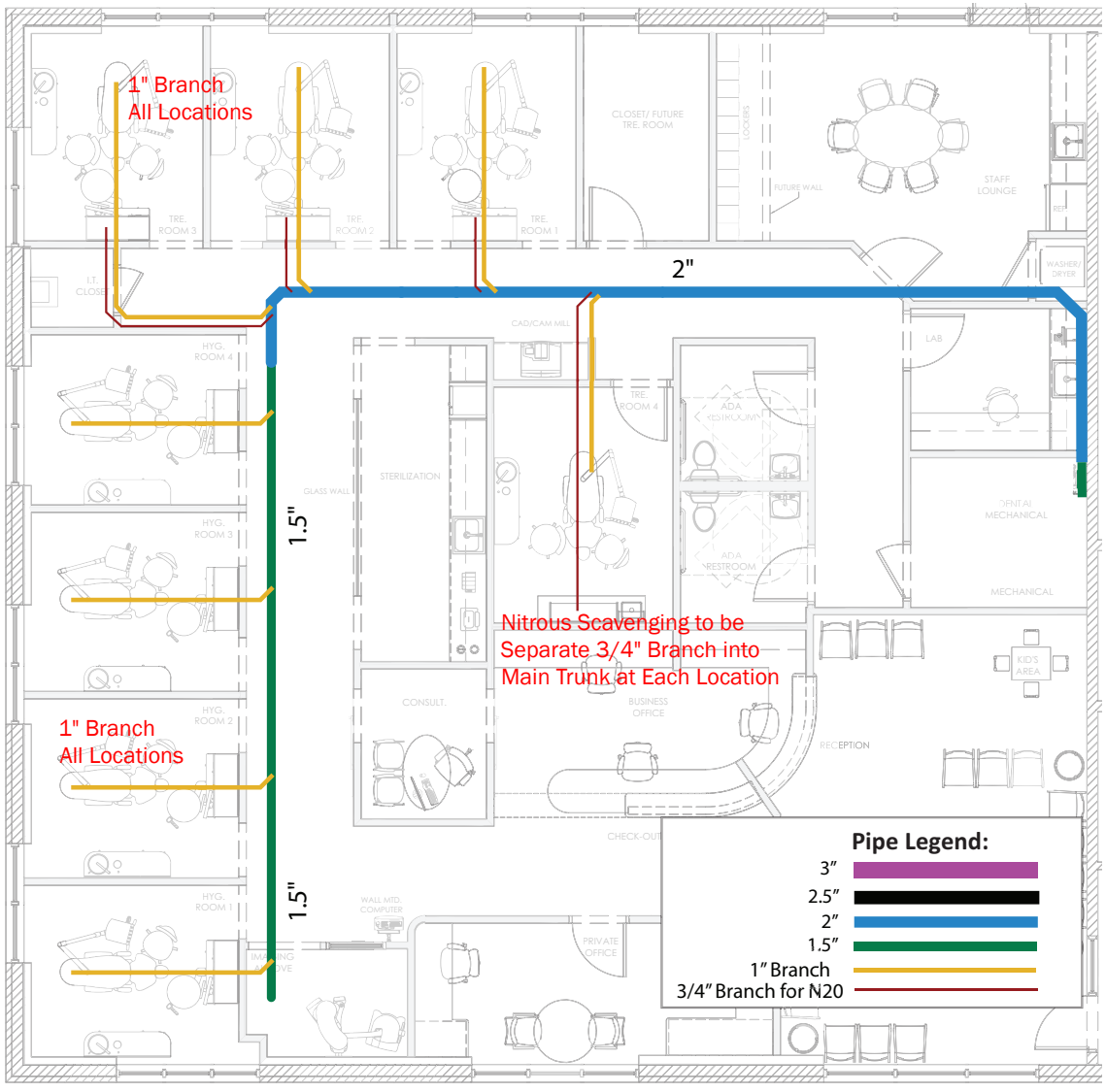
Do Not Use

Tee

4-Way Cross

Short Elbow

Main Trunk Line Sizing

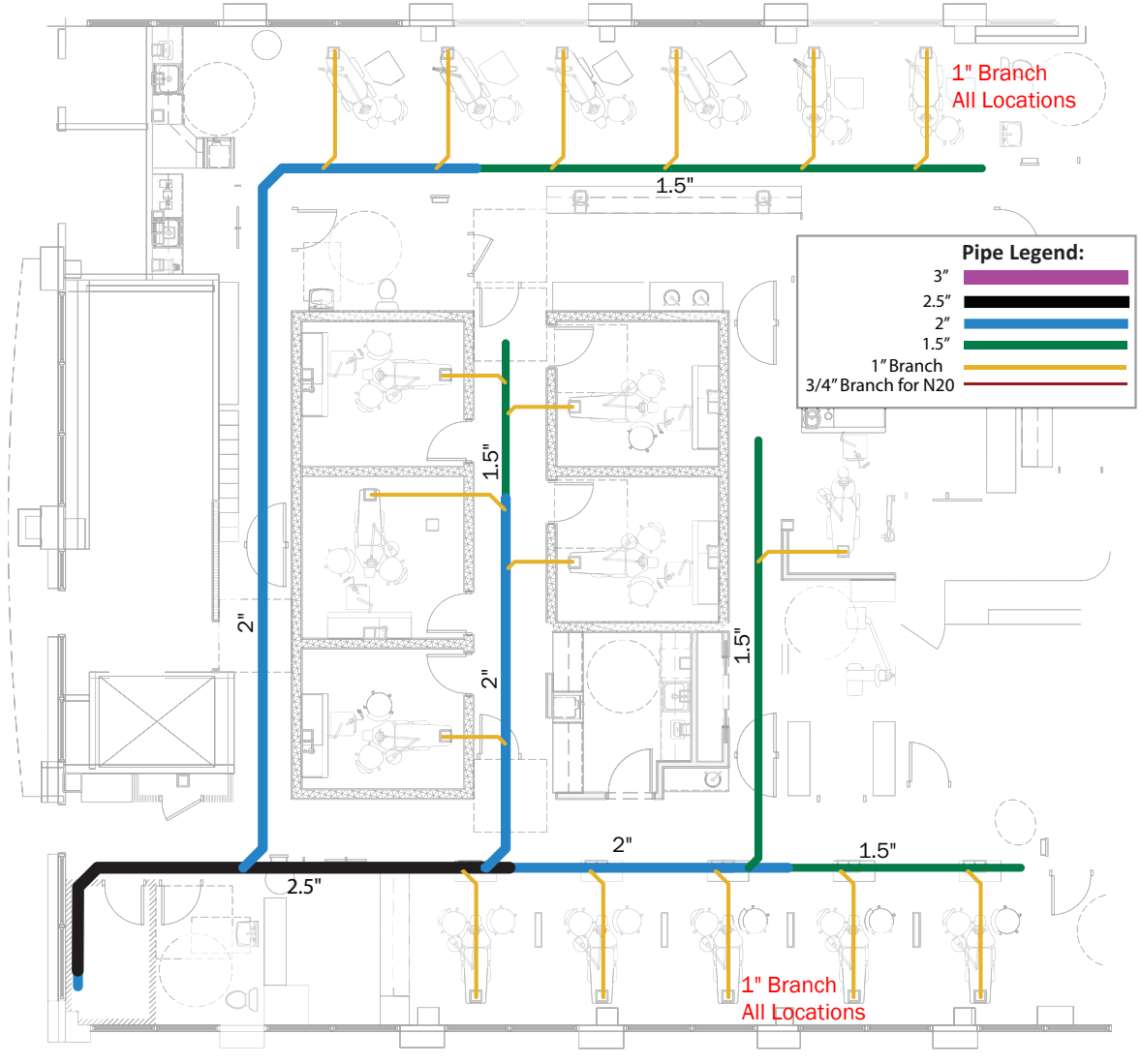


Main Trunk Sizing	
Number of Treatment Rooms	Minimum Size of Line
4	1.5"
8	2"
12	2.5"
16	3"
For offices designed with more than 16 treatments rooms, with extra large length runs or multiple branch trunk lines, contact A-dec Customer Service for piping size and layout advisement.	

Calculating Sizing

- Sizing applies to Overhead and Below Grade layouts.
- Using table above, count the number of treatment rooms starting with the furthest from the Mechanical Room.
- Every 4 Chairs, step up in size.
- Route Main Trunk for equal branch lengths (as much as possible, see #5 Branch in example. Extending slightly will not significantly impact performance).
- Reduce to 1.5" in Mechanical Room.
- Dual Vacuum: 2" connection in mechanical room.
- Optional: Add cleanout access at end of header. Plumber to choose access method.

Main Trunk Line Sizing Example



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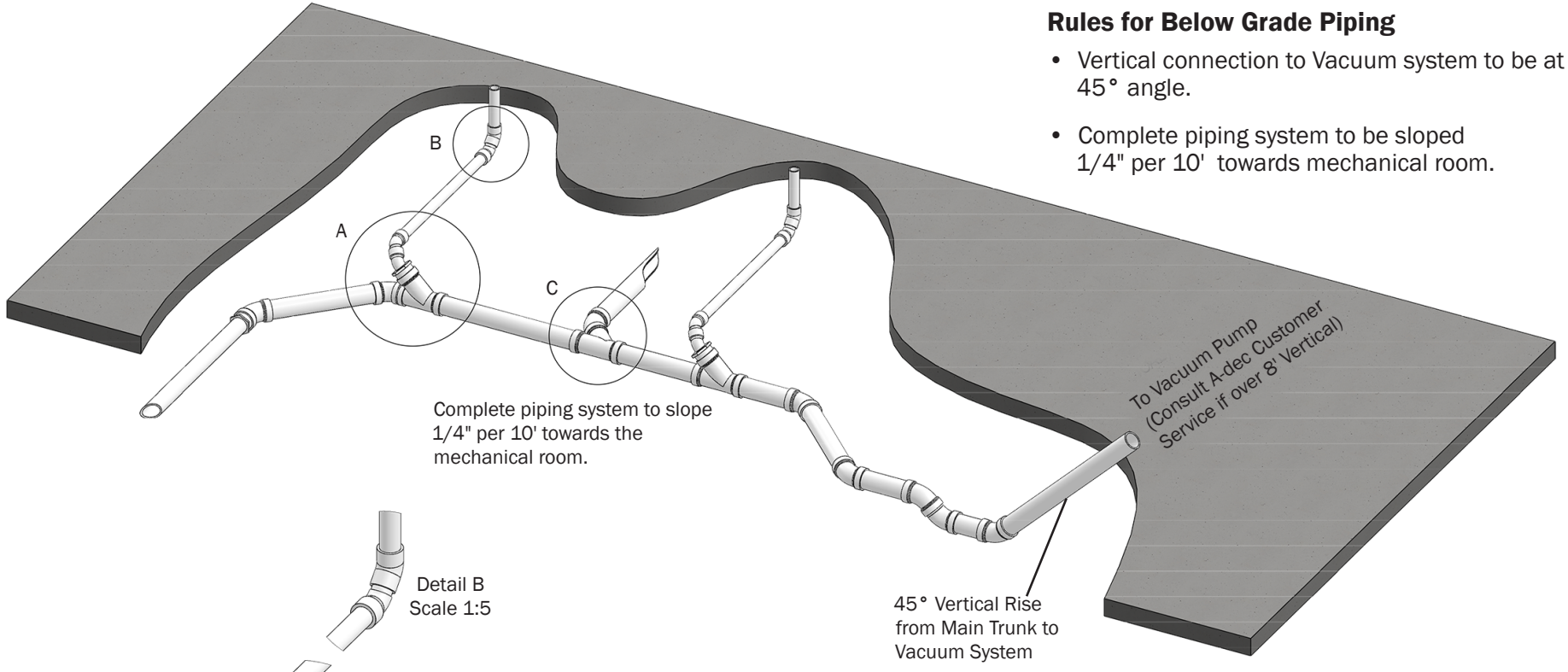
Multi-Branch

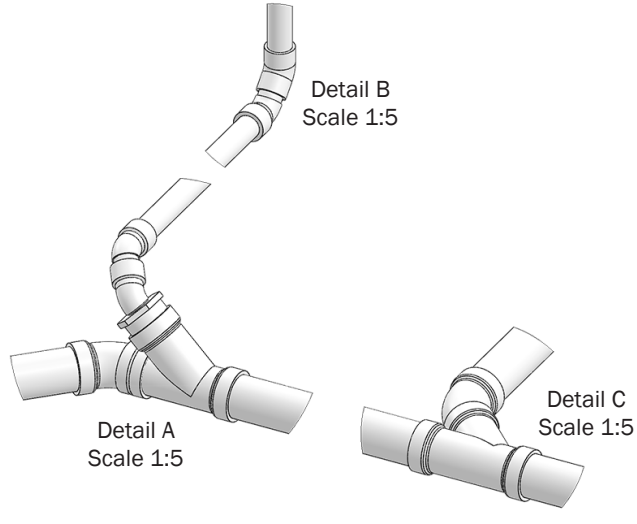
- Join Branch Trunk with Main Trunk using only DWV fittings.
- Using the table above, count the number of treatment rooms starting with the furthest from the mechanical room. Each Branch has its own count, adding to the total.
- Every 4 chairs, step up in size.
- Route Main Trunk and Branch Trunks for equal branch lengths (as much as possible; extending slightly will not significantly impact performance).
- Single Vacuum: Reduce to 1.5" in mechanical room.
- Dual Vacuum: 2" connection in mechanical room.
- Optional: Add cleanout access at the end of the header. Plumber to choose access method.

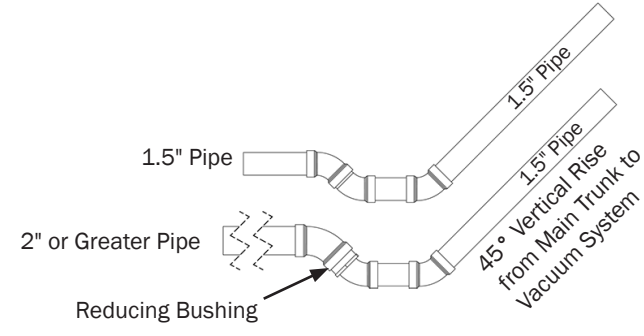
Below Grade Details for Branch Connection to Main Trunk



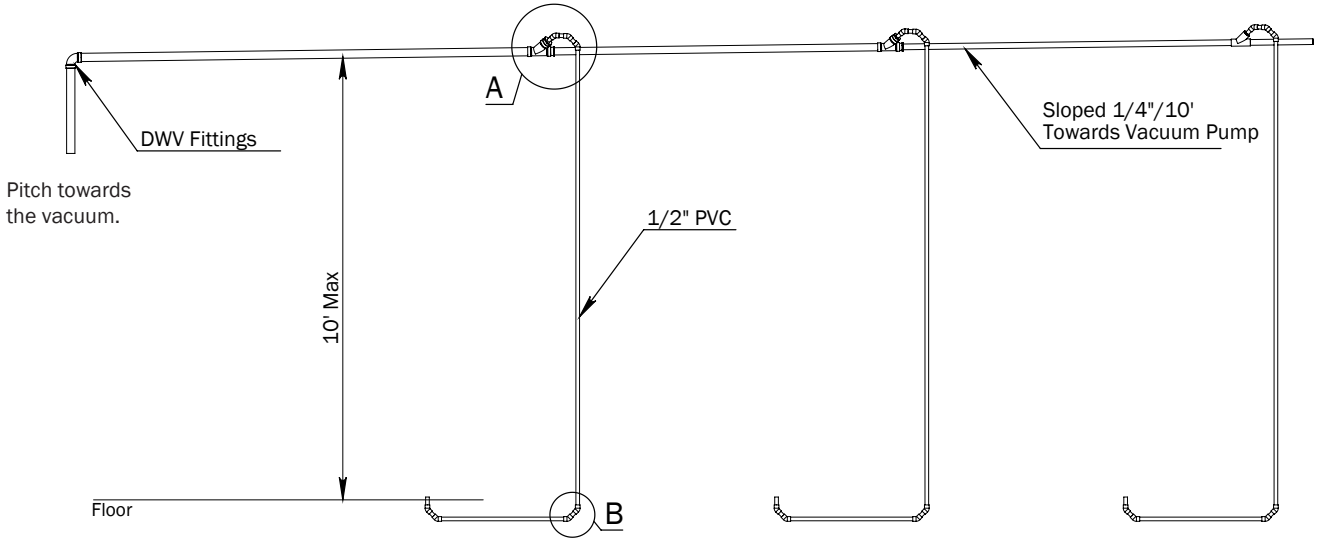
Rules for Below Grade Piping

- Vertical connection to Vacuum system to be at 45° angle.
- Complete piping system to be sloped 1/4" per 10' towards mechanical room.

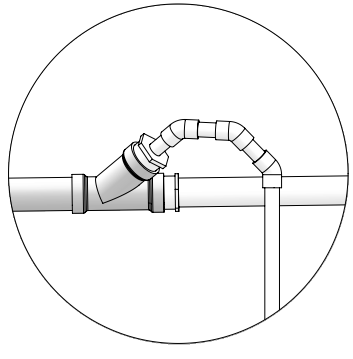




Overhead Details for Branch Connection to Main Trunk

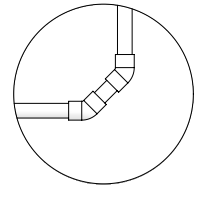


DETAIL A



Use overhead riser to
connect to header.
(Inverse P-trap
to prevent backflow.)

DETAIL B



All turns to be
two 45° elbows.

Rules for Overhead Piping

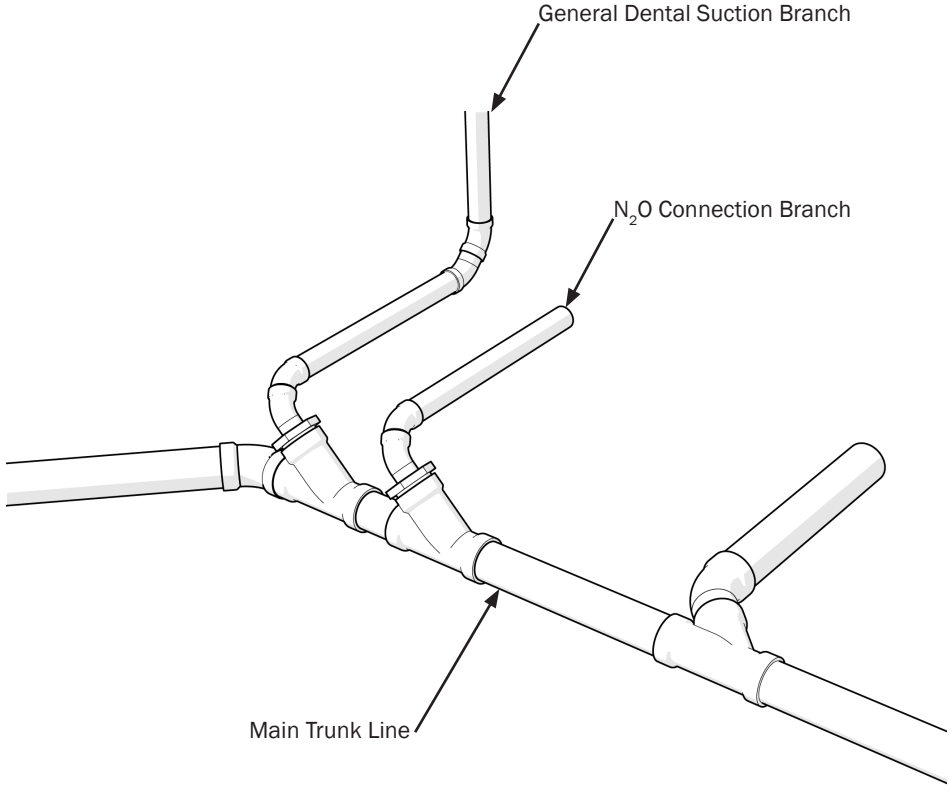
- Overhead Main Trunk height must be kept as low as possible.
- Vertical Branch must be 1/2" PVC.
- Branch must connect into Main Trunk per DETAIL A. Use DWV fittings and do not tee.
- Operators must be trained to allow air to move liquid before closing HVE/SE.

Nitrous Oxide (N_2O) Scavenging

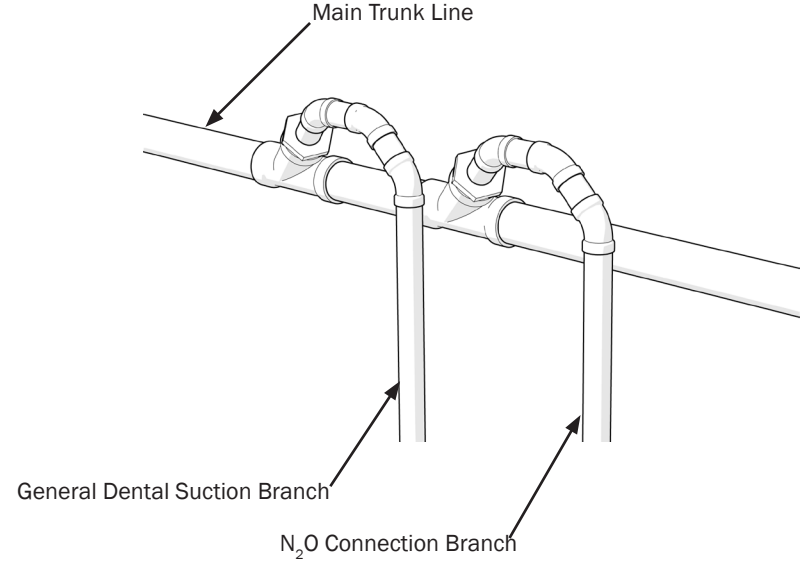
Rules for Nitrous Oxide Scavenging

- Must have a separate branch dedicated to N_2O Scavenging
- Applies to Below Grade or Overhead piping

Below Grade Piping



Overhead Piping



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