SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

METHOD 1.2

SAMPLE AND VELOCITY TRAVERSE FOR STATIONARY SOURCES WITH SMALL STACKS OR DUCTS

OFFICE OF OPERATIONS
TECHNICAL SERVICES DIVISION
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1. Overview

1.1 Principle

To make a representative measurement of pollutant emissions and/or total volumetric flow rate from a stationary source with small stacks or ducts, two measurement sites are required. One is for actual emission sampling and the other is for gas velocity measurement. The gas velocity is measured using a standard Pitot tube downstream of the emission sampling site. The straight run of duct between the sampling and velocity measurement sites allows the flow profile, temporarily disturbed by the presence of the sampling probe, to redevelop and stabilize.

1.2 Applicability

This method applies to flowing gas streams in stacks and ducts less than about 0.3 m (12 in.) in diameter, or 0.07 m^2 (113 $in.^2$) in cross sectional area, but equal to or greater than about 0.10 m (4 in.) in diameter, or 0.0081 m^2 (12.57 $in.^2$) in cross sectional area.

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2. Field Procedure

2.1 Selection of Measurement Site

In small diameter stacks or ducts the conventional Pitot assembly (consisting of an S-type Pitot tube attached to a sampling probe, equipped with a nozzle and thermocouple) blocks a significant cross section of the duct and prevents a true traverse. Therefore actual emission sampling and gas velocity measurement are done at two different locations in the duct.

2.1.1 Particulate Measurement

Select a particulate measurement site located preferably at least eight stack or duct diameters downstream and ten diameters upstream from any flow disturbances. Locate the velocity

measurement site eight diameters downstream of the particulate measurement site (see Figure 1.2-1). If such locations are not available, select an alternative particulate measurement site at least two diameters downstream and two and one-half diameters upstream from any flow disturbance. Then locate the velocity measurement site two diameters downstream from this particulate measurement site. For rectangular stacks or ducts an equivalent diameter shall be calculated following the equation in Method 1.1, Section 2.1.

2.1.2 Velocity Measurement (Non-Particulate)

When only velocity measurements are required select a site located at least eight stack or duct diameters downstream and two diameters upstream from any flow disturbances. If such locations are not available, select an alternative site at least two diameters downstream and one-half diameter upstream of any flow disturbances.

2.2 Determination of the Number of Traverse Points

2.2.1 Particulate Measurements

Determine the distance between the velocity and sampling sites and the distances to the nearest upstream and downstream disturbances. Divide each distance by the stack diameter or equivalent diameter to determine the distances in terms of stack diameters. From Figure 1.1-1 of Method 1.1 determine the number of traverse points corresponding to each of these three distances. Choose the highest of the three numbers of traverse points so that for circular stacks the number is a multiple of four; for rectangular stacks use one of the numbers shown in Table 1 of Method 1.1.

2.2.2 Velocity Measurements (Non-Particulate)

When only velocity measurements are required determine the number of traverse points from Figure 1.1-2 of Method 1.1 and

follow the same procedure for particulate sampling.

2.3 Cross Sectional Layout

For cross sectional layout see Method 1.1, Section 2.3.

2.4 Verification of Parallel (Non-Cyclonic) Flow

To verify the absence of cyclonic flow follow Method 1.1, Section 2.4

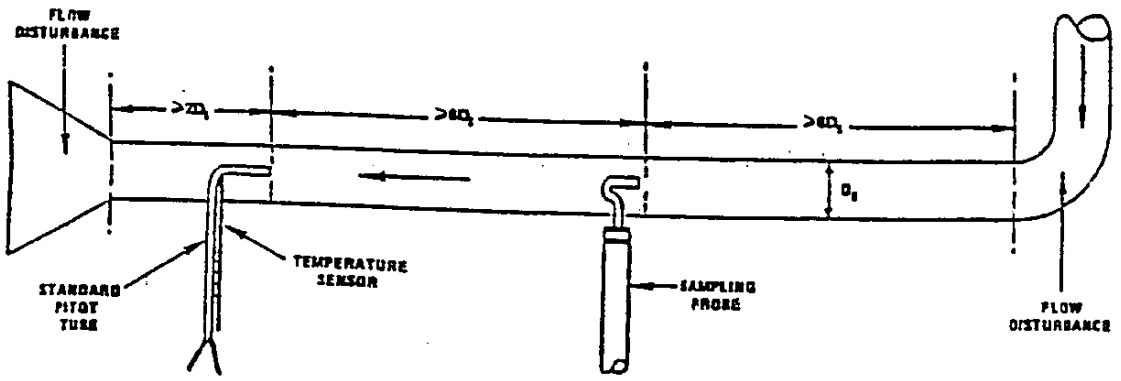

Figure 1.2-1
Recommended Sampling Arrangement for Small Ducts