

Dust Control



Source: Jerico Services, Inc.

<u>BENEFITS</u>			
	L	M	H
Flow Control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Erosion Control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sediment Control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Runoff Reduction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flow Diversion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Description: Dust control is the practice of controlling fugitive dust that results from grading, demolition, hauling, and traffic on construction sites. Fugitive dust may cause offsite damage, health hazards, and traffic problems if preventive measures are not taken.

Typical Uses: Used in open, windy areas such as the tops of hills and on construction sites with exposed soil in open areas. Also used in locations where construction traffic is high, such as the entrance to the site. Dust control may also be applied to soil stockpiles.

Advantages:

- Low visibility conditions caused by airborne dust are minimized.
- Dust control methods are widely applicable.
- Most dust control methods are inexpensive and promote the growth of stabilizing vegetation.
- Most dust control methods are easy to install/apply and maintain.

Limitations:

- Some temporary dust controls must be reapplied or replenished on a regular basis.
- Some controls are expensive (e.g., chemical treatment), may be ineffective under certain conditions, or have their own associated impacts.
- If chemical dust control treatment is over-applied, excess chemicals could potentially cause both surface and groundwater contamination.
- Petroleum products should not be used for dust control as there is potential for stormwater pollution and groundwater contamination.

Longevity: Usually short term; actual time varies by method and weather conditions

SUDAS Specifications: Refer to [Section 9040, 2.15](#) and [3.20](#)

A. Description/Uses

Earth-moving activities comprise the major source of construction dust emissions, but traffic and general disturbance of the soil also generate significant dust emissions. Therefore, dust control should be used when open dry areas of soil are anticipated on the site.

Dust control measures include minimization of soil disturbance, spray-on adhesives, tillage, chemical treatment and water spraying, and ensuring trucks are tarped upon leaving the construction site. In many cases, measures incorporated into the project to prevent soil erosion by water will indirectly prevent wind erosion.

While there are a number of temporary alternatives for dust control, one option is to permanently modify the site to eliminate dust generation. Modifications could include measures such as covering exposed areas with vegetation, mulch, stone or concrete. For the purpose of this standard, the focus is on temporary dust control measures.

B. Design Considerations

While several different products and practices are available for dust prevention, the most important tool is proper planning. During the design phase, the site should be analyzed for potential dust problems and the work coordinated to minimize dust problems.

The first step is to identify construction entrances and haul roads and provide a stable surface by paving, providing rock, or by chemical stabilization. Construction traffic on unstabilized haul roads should be limited as much as possible. When necessary, construction traffic on unstabilized ground should be limited to low speed operations (15 mph or less).

Existing vegetation or crop residue should be left in place as long as possible. When possible, existing tree lines should be left in place to act as a windbreak.

When dust problems are anticipated or are occurring during construction, there are a number of methods and products available to temporarily stabilize the surface and suppress the dust. Selection of these products or practices depends on several factors, including soil type, climate, and the necessary duration of treatment.

- 1. Watering:** Spraying the surface of the ground with water is a readily available and highly effective method of suppressing dust, though very a short term one. Water trucks can provide onsite control of fugitive dust on haul roads and disturbed surfaces on an as-needed basis. The frequency of watering depends on several factors, including weather, soil type, and construction traffic. Water treatment is typically only effective for one-half hour to 12 hours. Water should be applied at a rate so that the soil surface is wet, but not saturated or muddy. If watering is to be employed at a construction site, it should be used in conjunction with a temporary gravel rock entrance, created to prevent mud from being spread on local streets.
- 2. Tillage:** (See [Section 7E-19 - Surface Roughening](#)). Large, open, disturbed areas should be deep plowed to bring dirt clods to the surface. As the wind blows across smooth disturbed ground, the entire surface is exposed to the wind, creating a high potential for suspending dust particles. When the surface is roughened, only the peaks of the surface are exposed to the wind. In addition, the clods lying on top of the ground help stabilize the surface. This is a temporary emergency measure that can be used as soon as dust generation starts. Plowing should begin on the windward side of the site and leave 6-inch furrows, preferably perpendicular to the prevailing wind direction, to gain the greatest reduction in wind erosion. Tillage is only applicable to flat areas.

- 3. Soil Stabilizers and Dust Suppressants:** These are chemicals applied on or mixed into the soil surface that maintain the moisture levels in exposed soils, or chemically bind the surface material to reduce fugitive dust emissions from the site. These products include:
- a. Calcium Chloride:** Maintains water levels in the surface layer by absorbing humidity out of the air. May be applied by mechanical spreader as loose, dry granules or flakes, or as a liquid solution. Generally requires one or two treatments per season. Calcium chloride treated soils can inhibit the growth of vegetation and runoff from these areas can pollute water bodies. Therefore, calcium chloride should not be applied to large areas for site-wide dust control. When used, calcium chloride applications should be restricted to haul roads, and small areas.
 - b. Lignosulfonate:** Derived from wood pulp, lignosulfonate is a byproduct of the paper industry and is often referred to as “tree sap.” It is applied as a liquid to the ground surface, and binds the surface particles together. Generally requires one or two treatments per season.
 - c. Soybean Oil (Soapstock):** Acidulated soybean oil soapstock is a by-product of the refining process of soybean oil. It is applied as an undiluted liquid to the ground surface and binds the surface particles together. Proper storage and transportation of soybean oil require that the material be kept at a constant temperature of 155 degrees Fahrenheit and continuously agitated. Application of the material may require special pumping equipment. These restrictions may limit the use of soybean oil for dust control. Generally requires one treatment per season.
- 4. Track-out Control:** (See [Section 7E-15 - Stabilized Construction Entrance](#)). Soil tracked out onto streets by construction vehicles eventually dries and creates a fugitive dust. A stabilized construction entrance should be provided to aid in removing soil from vehicles before they enter the roadway.

C. Application

Apply chemical controls at the manufacturer's specified rates and according to all federal, state, and local regulations governing their use. If a chemical dust control treatment is over-applied, excess chemicals could potentially cause both surface and groundwater contamination. Recommended application rates are listed in the table below. Chemical products must be stored, handled, and disposed of according to all applicable local, state, and federal regulations.

Table 7E-16.01: Recommended Application Rates for Dust Suppression Products

Product	Mixture	Application Rate ¹
Calcium chloride	Dry flake or liquid solution	1 lb/SY on anhydrous basis
Lignosulfonate	Diluted with water to 25% solids	1 gal/SY
Soybean oil (soapstock)	Undiluted	0.70 gal/SY

¹Application rates are approximate and may need to be adjusted based upon site conditions

Source: Bolander, 1999 and Morgan, 2005

D. Maintenance

All dust control methods are temporary and require periodic maintenance. Wetting the ground surface with water may be necessary several times a day during hot and dry weather. Other methods provide longer effectiveness, and may only need to be applied once or twice per year.