Dust Prevention and Control Manual

Adopted by Ordinance No. 44, 2016

City of Fort Collins

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1.0 Introduction

1.1 Title

The contents of this document shall be known as the Dust Prevention and Control Manual ("the Manual").

1.2 Purpose of Manual

The purpose of the Manual is to establish minimum requirements consistent with nationally recognized best management practices for controlling fugitive dust emissions and to describe applicable best management practices to prevent, minimize, and mitigate off-property transport or off-vehicle transport of fugitive dust emissions pursuant to Chapter 12, Article X of the Fort Collins City Code (§§12-150 *et. seq)* for specific dust generating activities and sources.

The purpose of Chapter 12, Article X of the Code is to protect the health, safety, and welfare of the public, including prevention of adverse impacts to human health, property, sensitive vegetation and areas, waters of the state, and other adverse environmental impacts and to prevent visibility impairment and safety hazards caused by emissions of particulate matter into the air from human activities.

1.3 Applicability

This Manual applies to any person who conducts, or is an owner or operator of, a dust generating activity or source, as defined in the Code and described in this Manual, within the City of Fort Collins, subject to the exclusion set forth in Code §12-150(b)(3).

1.4 Definitions

Abrasive blasting shall mean a process to smooth rough surfaces; roughen smooth surfaces; and remove paint, dirt, grease, and other coatings from surfaces. Abrasive blasting media may consist of sand; glass, plastic or metal beads; aluminum oxide; corn cobs; or other materials.

Additional best management practice shall mean using **at least one** additional measure if the required best management practices are ineffective at preventing off-property transport of particulate matter.

Additional requirements shall mean when applicable, any measure that is required, e.g., a dust control plan when project sites are over 5 acres in size.

Best management practice shall mean any action or process that is used to prevent or mitigate the emission of fugitive dust into the air.

Bulk materials transport shall mean the carrying, moving, or conveying of loose materials including, but not limited to, earth, rock, silt, sediment, sand, gravel, soil, fill, aggregate, dirt, mud, construction or demolition debris, and other organic or inorganic material containing particulate matter onto a public road or right-of-way in an unenclosed trailer, truck bed, bin, or other container.

Code shall mean the Fort Collins City Code, as amended from time to time.

Cover shall mean the installation of a temporary cover material on top of disturbed soil surfaces or stockpiles, such as netting, mulch, wood chips, gravel or other materials capable of preventing wind erosion.

Dust control measure shall mean any action or process that is used to prevent or mitigate the emission of fugitive dust into the air, including but not limited to the best management practices identified in this Manual.

Dust generating activity or source shall mean a process, operation, action, or land use that creates emissions of fugitive dust or causes off-property or off-vehicle transport. Dust generating activity or source shall include a paved parking lot containing an area of more than one half (1/2) acre.

Earthmoving shall mean any process that involves land clearing, disturbing soil surfaces, or moving, loading, or handling of earth, dirt, soil, sand, aggregate, or similar materials.

Fugitive dust shall mean solid particulate matter emitted into the air by mechanical processes or natural forces but is not emitted through a stack, chimney, or vent

Local wind speed shall mean the current or forecasted wind speed for the Fort Collins area as measured at the surface weather observation station KFNL located at the Fort Collins Loveland Municipal Airport or at Colorado State University's Fort Collins or Christman Field weather stations or as measured onsite with a portable or hand-held anemometer. The City will use anemometers whenever practicable.

Maximum speed limit shall mean the speed limit on public rights-of-way adopted by the City pursuant to Fort Collins Traffic Code adopted pursuant to City Code Section 28-16 for private roadways, a speed limit shall be established as appropriate to minimize off-site transportation of.

Mechanical blower shall mean any portable machine powered with an internal combustion or electric-powered engine used to blow leaves, clippings, dirt or other debris off sidewalks, driveways, lawns, medians, and other surfaces including, but not limited to, hand-held, back-pack and walk-behind units, as well as blower-vacuum units.

Off-property transport shall mean the visible emission of fugitive dust beyond the property line of the property on which the emission originates or the project boundary when the emission originates in the public right-of-way or on public property.

Off-vehicle transport shall mean the visible emission of fugitive dust from a vehicle that is transporting dust generating materials on a public road or right-of-way.

On-tool local exhaust ventilation shall mean a vacuum dust collection system attached to a construction tool that includes a dust collector (hood or shroud), tubing, vacuum, and a high efficiency particulate air (HEPA) filter.

On-tool wet dust suppression shall mean the operation of nozzles or sprayers attached to a construction tool that continuously apply water or other liquid to the grinding or cutting area by a pressurized container or other water source.

Open area shall mean any area of undeveloped land greater than one-half acre that contains less than 70 percent vegetation. This includes undeveloped lots, vacant or idle lots, natural areas, parks, or other non-agricultural areas. Recreational and multi-use trails maintained by the City are not included as an open area.

Operator or owner shall mean any person who has control over a dust generating source either by operating, supervising, controlling, or maintaining ownership of the activity or source including, but not limited to, a contractor, lessee, or other responsible party of an activity, operation, or land use that is a dust generating activity or source.

Particulate matter shall mean any material that is emitted into the air as finely divided solid or liquid particles, other than uncombined water, and includes dust, smoke, soot, fumes, aerosols and mists.

Required best management practices shall mean specific measures that are required to be implemented if a dust generating activity is occurring.

Sensitive area shall mean a specific area that warrants special protection from adverse impacts due to the deposition of fugitive dust, such as natural areas (excluding buffer zones), sources of water supply, wetlands, critical wildlife habitat, or wild and scenic river corridors.

Soil retention shall mean the stabilization of disturbed surface areas that will remain exposed and inactive for 30 days or more or while vegetation is being established using mulch, compost, soil mats, or other methods.

Stockpile shall mean any accumulation of bulk materials that contain particulate matter being stored for future use or disposal. This includes backfill materials and storage piles for soil, sand, dirt, mulch, aggregate, straw, chaff, or other materials that produce dust.

Storm drainage facility shall mean those improvements designed, constructed or used to convey or control stormwater runoff and to remove pollutants from stormwater runoff after precipitation.

Surface roughening shall mean to modify the soil surface to resist wind action and reduce dust emissions from wind erosion by creating grooves, depressions, ridges or furrows perpendicular to the predominant wind direction using tilling, ripping, discing, or other method.

Track-out shall mean the carrying of mud, dirt, soil, or debris on vehicle wheels, sides, or undercarriages from a private, commercial, or industrial site onto a public road or right-of-way.

Vegetation shall mean the planting or seeding of appropriate grasses, plants, bushes, or trees to hold soil or to create a wind break. All seeded areas must be mulched, and the mulch should be adequately crimped and or tackified. If hydro-seeding is conducted, mulching must be conducted as a separate, second operation. All planted areas must be mulched within twenty-four (24) hours after planting.

Wet suppression shall mean the application of water by spraying, sprinkling, or misting to maintain optimal moisture content or to form a crust in dust generating materials and applied at a rate that prevents runoff from entering any public right-of-way, storm drainage facility or watercourse.

Wind barrier shall mean an obstruction at least five feet high erected to assist in preventing the blowing of fugitive dust, comprised of a solid board fence, chain link and fabric fence, vertical wooden slats, hay bales, earth berm, bushes, trees, or other materials installed perpendicular to the predominant wind direction or upwind of an adjacent residential, commercial, industrial, or sensitive area that would be negatively impacted by fugitive dust.

2.0 Fugitive Dust and the Problems it Causes

2.1 What is Fugitive Dust, Generally?

Dust, also known as particulate matter, is made up of solid particles in the air that consist primarily of dirt and soil but can also contain ash, soot, salts, pollen, heavy metals, asbestos, pesticides, and other materials. "Fugitive" dust means particulate matter that has become airborne by wind or human activities and has not been emitted from a stack, chimney, or vent. The Colorado Department of Public Health and Environment (CDPHE) estimates that more than 4,300 tons of particulate matter are emitted into the air in Larimer County annually. The primary sources of this particulate matter include construction activities, paved and unpaved roads, and agricultural operations.

The quantity of dust emitted from a particular activity or area and the materials in it can depend on the soil type (sand, clay, silt), moisture content (dry or damp), local wind speed, and the current or past uses of the site (industrial, farming, construction).

2.2 Why is the City Addressing Fugitive Dust?

Colorado state air regulations and Larimer County air quality standards generally require owners and operators of dust generating activities or sources to use all available and practical methods that are technologically feasible and economically reasonable in order to prevent fugitive dust emissions. However, state regulations and permitting requirements typically apply to larger stationary sources rather than to activities that generate dust. Larimer County fugitive dust standards apply only to land development.

Although state and county requirements apply to many construction activities, they do not address many sources of dust emissions and City code compliance officers do not have authority to enforce state or county regulations. Fort Collins is experiencing rapid growth and development that has contributed to local man-made dust emissions. The City has established Chapter 12, Article X of the Code (§§12-150-12-159) to address dust generating activities and sources that negatively impact citizens in Fort Collins.

2.3 Health and Environmental Effects

Dust particles are very small and can be easily inhaled. They can enter the respiratory system and increase susceptibility to respiratory infections, and aggravate cardio-pulmonary disease. Even short-term exposure to dust can cause wheezing, asthma attacks and allergic reactions, and may cause increases in hospital admissions and emergency department visits for heart and lung related diseases.

Fugitive dust emissions can cause significant environmental impacts as well as health effects. When dust from wind erosion or human activity deposits out of the air, it may impact vegetation, adversely affect nearby soils and waterways, and cause damage to cultural resources. Wind erosion can result in the loss of valuable top soil, reduce crop yields, and stunt plant growth.

According to the Environmental Protection Agency (EPA), studies have linked particulate matter exposure to health problems and environmental impacts such as:

- Health Impacts:
  - Irritation of the airways, coughing, and difficulty breathing
  - Reduced lung function and lung cancer
  - Aggravated asthma and chronic bronchitis
  - Irregular heartbeat and increases in heart attacks
- Environmental Impacts:
  - Haze and reduced visibility
  - Reduced levels of nutrients in soil

2.4 Nuisance and Aesthetics

Dust, dirt and debris that become airborne eventually settle back down to the surface. How far it travels and where it gets deposited depends on the size and type of the particles as well as wind speed and direction. When this material settles, it can be deposited on homes, cars, lawns, pools and ponds, and other property. The small particles can get trapped in machinery and electronics causing abrasion, corrosion, and malfunctions. The deposited dust can damage painted surfaces, clog filtration systems, stain materials and cause other expensive clean-up projects.

2.5 Safety Hazard and Visibility

Blowing dust can be a safety hazard at construction sites and on roads and highways. Dust can obstruct visibility and can cause accidents between vehicles and bikes, pedestrians, or site workers. Dust plumes can also decrease visibility across a natural area or scenic vistas. The “brown cloud”, often visible along the Front Range during the winter months, and the brilliant red sunsets that occur are often caused by particulate matter and other pollutants in the air.

3.0 Best Management Practices

This Manual describes established best management practices for controlling dust emissions that are practical and used in common practice to prevent or mitigate impacts to air quality from dust generating activities and sources occurring within Fort Collins. The objective of the dust control measures included in this Manual is to reduce dust emissions from human activities and to prevent those emissions from impacting others and is based on the following principles:

> ***Prevent*** – avoid creating dust emissions through good project planning and modifying or replacing dust generating activities.
>
> ***Minimize*** – reduce dust emissions with methods that capture, collect, or contain emissions.
>
> ***Mitigate*** – when preventing fugitive dust or minimizing the impacts are not feasible, the Manual provides specific measures to mitigate dust.

More specifically, the Manual establishes the following procedures for each dust generating activity outlined in this Chapter:

1. **Required Best Management Practices** – this section includes the specific measures that are required to be implemented if the dust generating activity is occurring. For example, high wind restrictions (temporarily halting work when wind speeds exceed 30 mph) are required best management practices for earthmoving, demolition/renovation, saw cutting or grind, abrasive blasting, and leaf blowing.
2. **Additional Best Management Practices** – this section includes additional measures if the required best management practices are ineffective at preventing off-property transport of particulate matter. **At least one** of the additional best management practices outlined in the Manual must be implemented on the site to be in compliance with the Manual and Code.
3. **Additional Requirements** – When applicable, additional measures are also required, e.g., a dust control plan when project sites are over 5 acres in size.

The **Dust Prevention and Control Checklist** included on page 31 of this Manual provides a "quick guide" to dust control BMPs covered in the following sections of the Manual.

3.1 Earthmoving Activities

Above: This figure illustrates earthmoving, which is an activity that can generate dust.

Dust emissions from earthmoving activities depend on the type and extent of activity being conducted, the amount of exposed surface area, wind conditions, and soil type and moisture content, including:

- Site preparation (clearing, grubbing, scraping)
- Road construction
- Grading and overlot grading
- Excavating, trenching, backfilling and compacting
- Loading and unloading dirt, soil, gravel, or other earth materials
- Dumping of dirt, soil, gravel, or other earth materials into trucks, piles, or receptacles
- Screening of dirt, soil, gravel, or other earth materials

Best Management Practices to Control Dust

(a) **Required Best Management Practices**: Any person, owner, or operator who conducts earthmoving that is a dust generating activity or source shall implement the following best management practices to prevent off-property transport of fugitive dust emissions:

(i) **Minimize disturbed area:** plan the project or activity so that the minimum amount of disturbed soil or surface area is exposed to wind or vehicle traffic at any one time.

(ii) **Reduce vehicle speeds:** establish a maximum speed limit or install traffic calming devices to reduce speeds to a rate to mitigate off-property transport of dust entrained by vehicles.

(iii) **Minimize drop height:** Drivers and operators shall unload truck beds and loader or excavator buckets slowly, and minimize drop height of materials to the lowest height possible, including screening operations.

(iv) **High winds restriction:** temporarily halt work activities during high wind events greater than 30 mph if operations would result in off-property transport.

(v) **Restrict access:** restrict access to the work area to only authorized vehicles and personnel.

(b) **Additional Best Management Practices:** In the event 3.1(a)(i)-(v) are ineffective to prevent off-property transport, the person, owner, or operator shall use **at least one** of the following best management practices:

(i) **Wet suppression:** apply water to disturbed soil surfaces, backfill materials, screenings, and other dust generating operations as necessary and appropriate considering current weather conditions, and prevent water used for dust control from entering any public right-of-way, stormwater drainage facility, or watercourse.

(ii) **Wind barrier**: construct a fence or other type of wind barrier to prevent wind erosion of top soils.

(iii) **Vegetation:** plant vegetation appropriate for retaining soils or creating a wind break.

(iv) **Surface roughening:** stabilize an active construction area during periods of inactivity or when vegetation cannot be immediately established.

(v) **Cover:** install cover materials during periods of inactivity and properly anchor the cover.

(vi) **Soil retention:** stabilize disturbed or exposed soil surface areas that will be inactive for more than 30 days or while vegetation is being established.

(c) **Additional requirements:** Any person, owner, or operator who conducts earthmoving that is a dust generating activity or source at a construction site or land development project with a lot size equal to or greater than five (5) acres also shall implement the following measures:

(i) **Dust Control Plan:** submit a plan that describes all potential sources of fugitive dust and methods that will be employed to control dust emissions with the development construction permit application or development review application (see Chapter 4 of this Manual). A copy of the Dust Control Plan must be onsite at all times and one copy must be provided to all contractors and operators engaged in dust generating activities at the site.

(ii) **Construction sequencing:** include sequencing or phasing in the project plan to minimize the amount of disturbed area at any one time. Sites greater than 25 acres in size may be asked to provide additional justification, revise the sequencing plan, or include additional best management practices.

3.2 Demolition and Renovation

Above: This photo illustrates restricting access (a required best management practice) and a wind barrier (an additional best management practice) for demolition and renovation activities.

Dust generated from demolition activities may contain significant levels of silica, lead, asbestos, and particulate matter. Inhalation of silica and asbestos is known to cause lung cancer, and exposure to even small quantities of lead dust can result in harm to children and the unborn.

In addition to complying with the dust control measures below, any person engaged in demolition or renovation projects must comply with applicable state and federal regulations for asbestos and lead containing materials and notification and inspection requirements under the State of Colorado Air Quality Control Commission's Regulation No. 8, Part B Control of Hazardous Air pollutants.

Best Management Practices to Control Dust

(a) **Required Best Management Practices**: Any person, owner, or operator who conducts demolition or renovation that is a dust generating activity or source shall implement the following best management practices to prevent off-property transport of fugitive dust emissions:

(i) **Asbestos and lead containing materials:** demolition and renovation activities that involve asbestos or lead containing materials must be conducted in accordance with *2012 International Building Code* (IBC), as adopted by the Code Sec. 5-26 and amended by Code Sec. 5-27 (59) (amending IBC §3602.1.1) and all other state and local regulations;

(ii) **Restrict access:** restrict access to the demolition area to only authorized vehicles and personnel;

(iii) **High winds restriction:** temporarily halt work activities during high wind events greater than 30 mph if operations would result in off-property transport; and

(iv) **Minimize drop height:** Drivers and operators shall unload truck beds and loader or excavator buckets slowly, and minimize drop height of materials to the lowest height possible, including screening operations.

(b) **Additional Best Management Practices:** In the event 3.2(a)(i)-(iv) are ineffective to prevent off-property transport, the person, owner, or operator shall use **at least one** of the following best management practices:

(i) **Wet suppression:** apply water to demolished materials or pre-wet materials to be demolished as necessary. Prevent water used for dust control from entering any public right-of-way, storm drainage facility, or watercourse.

(ii) **Wind barrier**: construct a fence or other type of wind barrier to prevent onsite dust generating materials from blowing offsite.

(c) **Additional requirements:**

(i) **Building permit compliance:** comply with all conditions and requirements under any building required pursuant to the Code and/or the Land Use Code.

Above: This photo illustrates reducing drop height, a required best management practice.

3.3 Stockpiles

Above: This photo illustrates wet suppression, an additional best management practice for stockpiles.

Stockpiles are used for both temporary and long-term storage of soil, fill dirt, sand, aggregate, woodchips, mulch, asphalt and other industrial feedstock, construction and landscaping materials. Fugitive dust can be emitted from stockpiles while working the active face of the pile or when wind blows across the pile. The quantity of emissions depends on pile height and exposure to wind, moisture content and particle size of the pile material, surface roughness of the pile, and frequency of pile disturbance.

Best Management Practices to Control Dust

(a) **Required Best Management Practices:** Any owner or operator of a stockpile that is a dust generating activity or source shall implement the following best management practices to prevent off property transport of fugitive dust emissions:

> (i) **Minimize drop height:** Drivers and operators shall unload truck beds and loader or excavator buckets slowly, and minimize drop height of materials to the lowest height possible, including screening operations.

(b) **Additional Best Management Practices:** In the event 3.3(a)(i) is ineffective to prevent off-property transport, the person, owner, or operator shall use **at least one** of the following best management practices:

> (i) **Wet suppression:** Apply water to the active face when working the pile or to the entire pile during periods of inactivity. Prevent water used for dust control from entering any public right-of-way, storm drainage facility, or watercourse.
>
> (ii) **Cover:** install cover materials during periods of inactivity and anchor the cover.
>
> (iii) **Surface roughening:** stabilize a stockpile during periods of inactivity or when vegetation cannot be immediately established.

(iv) **Stockpile location:** locate stockpile at a distance equal to ten times the pile height from property boundaries that abut residential areas.

(v) **Vegetation:** seed and mulch any stockpile that will remain inactive for 30 days or more.

(vi) **Enclosure:** construct a three-sided structure equal to or greater than the height of the pile to shelter the pile from the predominant winds.

(c) **Additional requirements:**

(i) **Stockpile permit compliance:** comply with all conditions and requirements under any stockpile permit required under the Code or the Land Use Code.

(ii) **Erosion control plan compliance:** implement and comply with all conditions and requirements of the "Fort Collins Stormwater Criteria Manual, as adopted in Code Sec. §26-500; specifically, Volume 3 Chapter 7 "Construction BMPs". The Stormwater Criteria Manual may require the use of Erosion Control Materials, soil stockpile height limit of ten feet, watering, surface roughening, vegetation, silt fence and other control measures.

3.4 Street Sweeping

Left: This figure illustrates the use of a wet suppression and vacuum system, an additional best management practice for street sweeping.

Street sweeping is an effective method for removing dirt and debris from streets and preventing it from entering storm drains or becoming airborne. Regenerative air sweepers and mechanical sweepers with water spray can also be effective at removing particulate matter from hard surfaces.

Best Management Practices to Control Dust

(a) **Required Best Management Practices:** Any owner or operator that conducts sweeping operations or services on paved or concrete roads, parking lots, rights-of-way, pedestrian ways, plazas or other solid surfaces, and whose operations are a dust generating activity or source shall implement the following best management practices to prevent off-property transport of fugitive dust emissions:

> (i) **Uncontrolled sweeping prohibited:** the use of rotary brushes, power brooms, or other mechanical sweeping for the removal of dust, dirt, mud, or other debris from a paved public road, right-of-way, or parking lot without the use of water, vacuum system with filtration, or other equivalent dust control method is prohibited. Mechanical or manual sweeping that occurs between lifts of asphalt paving operations or due to preparation for pavement markings are excluded from this prohibition, due to engineering requirements associated with these operations.

(b) **Additional Best Management Practices:** In the event 3.4(a)(i) is ineffective to prevent off-property transport, the person, owner, or operator shall use **at least one** of the following best management practices:

> (i) **Wet suppression:** use a light spray of water or wetting agent applied directly to work area or use equipment with water spray system while operating sweeper or power broom. Prevent water used for dust control from entering any storm drainage facility or watercourse.
>
> (ii) **Vacuum system:** use sweeper or power broom equipped with a vacuum collection and filtration system.
>
> (iii) **Other method:** use any other method to control dust emissions that has a demonstrated particulate matter control efficiency of 80 percent or more.

3.5 Track-out / Carry-out

Above: This figure illustrates an installed grate (left) and a gravel bed (right), both of which are additional best management practices associated with track-out/carry-out.

Mud, dirt, and other debris can be carried from a site on the wheels or undercarriage of equipment and vehicles onto public roads. When this material dries, it can become airborne by wind activity or when other vehicles travel on it. This is a health concern and can cause visibility issues and safety hazards.

Best Management Practices to Control Dust

(a) **Required Best Management Practices:** Any owner or operator of any operation that has the potential to result in track-out of mud, dirt, dust, or debris on public roads and rights-of-way and whose operation is a dust generating activity or source shall implement the following best management practices to prevent off-property transport of fugitive dust emissions:

(i) **Contracts and standards:** comply with track-out prevention requirements and construction best management practices as set forth in the Code, City regulations or policies, as specified in applicable contract documents, and as set forth in the Fort Collins Stormwater Criteria Manual.

(ii) **Remove deposition:** promptly remove any deposition that occurs on public roads or rights-of-way as a result of the owner's or operator's operations. Avoid over-watering and prevent runoff into any storm drainage facility or watercourse.

(b) **Additional Best Management Practices:** In the event 3.5(a)(i)-(ii) are ineffective to prevent off-property transport, the person, owner, or operator shall use **at least one** of the following best management practices:

(i) Install rails, pipes, grate, or similar track-out control device.

(ii) Install a gravel bed track-out apron that extends at least 50 feet from the intersection with a public road or right-of-way.

(iii) Install gravel bed track-out apron with steel cattle guard or concrete wash rack.

(iv) Install and utilize on-site vehicle and equipment washing station.

(v) Install a paved surface that extends at least 100 feet from the intersection with a public road or right-of-way.

(vi) Manually remove mud, dirt, and debris from equipment and vehicle wheels, tires and undercarriage.

3.6 Bulk Materials Transport

Above: This figure illustrates covered loads, a required best management practice for bulk materials transport.

Haul trucks are used to move bulk materials, such as dirt, rock, demolition debris, or mulch to and from construction sites, material suppliers and storage yards. Dust emissions from haul trucks, if uncontrolled, can be a safety hazard by impairing visibility or by depositing debris on roads, pedestrians, bicyclists, or other vehicles.

Best Management Practices to Control Dust

(a) **Required Best Management Practices:** Any owner or operator of a dust generating activity or source for which vehicles used to transport bulk materials to and from a site within the City on a public or private road or on a public right-of-way shall prevent off-vehicle transport of fugitive dust emissions. To prevent off-vehicle transport of fugitive dust to and from the site, the owner or operator shall implement the following measures:

(i) **Cover Loads:** Loads shall be completely covered or all material enclosed in a manner that prevents the material from blowing, dropping, sifting, leaking, or otherwise escaping from the vehicle. This includes the covering of hot asphalt and asphalt patching material with a tarp or other impermeable material.

(ii) **Minimize drop height:** Drivers and operators shall load and unload truck beds and loader or excavator buckets slowly, and minimize drop height of materials to the lowest height possible, including screening operations.

(b) **Additional Best Management Practices:** In the event 3.6(a)(i)-(ii) are ineffective to prevent off-vehicle transport, the person, owner, or operator shall use **at least one** of the following best management practices:

(i) **Wet suppression:** apply water to bulk materials loaded for transport as necessary to prevent fugitive dust emissions and deposition of materials on roadways. Prevent water used for dust control from entering any public right-of-way, storm drainage facility, or watercourse.

(ii) **Other technology:** use other equivalent technology that effectively eliminates off-vehicle transport, such as limiting the load size to provide at least three inches of freeboard to prevent spillage.

Above: This figure illustrates minimizing drop heights, a required best management practice for bulk materials transport.

3.7 Unpaved Roads and Haul Roads

Left: This figure illustrates surface improvements on an unpaved road, an additional best management practice.

Road dust from unpaved roads is caused by particles lifted by and dropped from rolling wheels traveling on the road surface and from wind blowing across the road surface. Road dust can aggravate heart and lung conditions as well as cause safety issues such as decreased driver visibility and other safety hazards.

Best Management Practices to Control Dust

(a) **Required Best Management Practices:** Any owner or operator of an unpaved road located on a construction site greater than five acres on private property or an unpaved road used as a public right-of-way shall implement the following best management practices to prevent off-property transport of fugitive dust emissions:

(i) **Reduce vehicle speeds:** establish a maximum speed limit or install traffic calming devices to reduce speeds to a rate that prevents off-property transport of dust entrained by vehicles.

(ii) **Restrict access:** restrict travel on unpaved roads by limiting access to only authorized vehicle use.

(b) **Additional Best Management Practices:** In the event 3.7(a)(i)-(ii) are ineffective to prevent off-property transport, the person, owner, or operator shall use **at least one** of the following best management practices:

(i) **Wet suppression:** apply water to unpaved road surface as necessary and appropriate considering current weather conditions, and prevent water used for dust control from entering any public right-of-way, storm drainage facility, or watercourse.

(ii) **Surface improvements:** install gravel or similar materials with sufficient depth to reduce dust or pave high traffic areas.

(iii) **Access road location:** locate site access roads away from residential or other populated areas.

3.8 Parking Lots

Above: This figure illustrates an unpaved parking lot in Fort Collins.

This section applies to paved and unpaved areas where vehicles are parked or stored on a routine basis and includes parking areas for shopping, recreation, or events; automobile or vehicle storage yards; and animal staging areas.

Best Management Practices to Control Dust- Unpaved Parking Lots

(a) **Required Best Management Practices:** Any owners or operator of an unpaved parking lot greater than one-half acre shall use **at least one** of the following best management practices to prevent off-property transport of fugitive dust emissions

(i) **Surface improvements:** install gravel or similar materials with sufficient depth to reduce dust or pave high traffic areas.

(ii) **Vegetation:** plant vegetation appropriate for retaining soils or creating a wind break.

(iii) **Wet suppression:** apply water as necessary and appropriate considering current weather conditions to prevent off-property transport of fugitive dust emissions. Prevent water used for dust control from entering any public right-of-way, storm drainage facility, or watercourse.

(iv) **Wind barrier:** construct a fence or other type of wind barrier.

(v) **Reduce vehicle speeds:** establish a maximum speed limit or install traffic calming devices to reduce speeds to a rate that prevents off-property transport of dust entrained by vehicles.

(vi) **Restrict access:** restrict travel in parking lots to only those vehicles with essential duties and limit access to hours of operation or specific events.

Best Management Practices to Control Dust- Paved Parking Lots

(a) **Required Best Management Practices:** An owner or operator of a paved parking lot greater than one-half acre and shall use **at least one** of the following best management practices to prevent off-property transport of fugitive dust emissions.

(i) **Maintenance:** repair potholes and cracks and maintain surface improvements.

(ii) **Mechanical sweeping:** Sweep lot with a vacuum sweeper and light water spray as necessary to remove dirt and debris. Avoid overwatering and prevent runoff from entering any public right-of-way, storm drainage facility, or watercourse.

(iii) **Reduce vehicle speeds:** establish a maximum speed limit or install traffic calming devices to reduce speeds to a rate that prevents off-property transport of dust entrained by vehicles.

(iv) **Restrict access:** restrict travel in parking lots to only those vehicles with essential duties and limit access to hours of operation or specific events.

Above: This photo represents improving the surface of a parking area, which is one measure to comply with the Manual.

3.9 Open Areas and Vacant Lots

Left: This photo represents adding vegetation by hydroseeding, which is one measure to comply with the Manual.

Open areas are typically not a significant source of wind-blown dust emissions if the coverage of vegetation is sufficient or soil crusts are intact. However, if soils in open areas are disturbed by vehicle traffic, off-highway vehicle use, bicycling or grazing, or if they have become overpopulated by prairie dogs, dust emissions can become a problem.

Best Management Practices to Control Dust

(a) **Required Best Management Practices:** Any owner or operator of an open area greater than one-half acre shall use **at least one** of the following best management practices to stabilize disturbed or exposed soil surface areas that are intended to or remain exposed for 30 days or more and to prevent off-property transport of fugitive dust emissions:

(i) **Vegetation:** plant vegetation appropriate for retaining soils or creating a wind break.

(ii) **Cover:** install cover materials over exposed areas during periods of inactivity and properly anchor the cover.

(iii) **Surface roughening:** stabilize an exposed area during periods of inactivity or when vegetation cannot be immediately established.

(iv) **Soil retention:** stabilize disturbed or exposed soil surface areas that will be inactive for more than 30 days or while vegetation is being established, using mulch, compost, soil mats, or other methods.

(v) **Wet suppression:** apply water to disturbed soil surfaces as necessary and appropriate considering current weather to prevent off-property transport of fugitive dust emissions. Prevent water used for dust control from entering any public right-of-way, storm drainage facility, or watercourse.

(vi) **Wind barrier:** construct a fence or other type of wind barrier to prevent wind erosion of top soils.

3.10 Saw Cutting and Grinding

Above: This photo illustrates concrete cutting and how the activity can generate dust.

Cutting and grinding of asphalt, concrete and other masonry materials can be a significant short-term source of fugitive dust that may expose workers and the public to crystalline silica. Inhalation of silica can cause lung disease known as silicosis and has been linked to other diseases such as tuberculosis and lung cancer. Using additional best management practices during cutting and grinding operations can significantly reduce dust emissions.

Best Management Practices to Control Dust

(a) **Required Best Management Practices:** Any person, owner, or operator that cuts or grinds asphalt, concrete, brick, tile, stone, or other masonry materials and whose operations are a dust generating activity or source shall use the following best management practices to prevent off-property transport of fugitive dust emissions:

(i) **Restrict access:** prevent the public from entering the area where dust emissions occur.

(ii) **High winds restriction:** temporarily halt work activities during high wind events greater than 30 mph if operations would result in off-property transport.

(iii) **Equipment and work area clean up:** use wet wiping, wet sweeping, or vacuuming with HEPA filtration for equipment and work area clean up and do not cause dust to become airborne during clean up.

(iv) **Slurry clean up:** prevent water used for dust control or clean up from entering any public right-of-way, storm drainage facility, or watercourse by using containment, vacuuming, absorption, or other method to remove the slurry, and dispose of slurry and containment materials properly. Follow additional procedures prescribed in the Fort Collins Stormwater Criteria Manual or contract documents and specifications.

(b) **Additional Best Management Practices:** In the event 3.10(a)(i)-(iv) are ineffective to prevent off-property transport, the person, owner, or operator shall use **at least one** of the following best management practices:

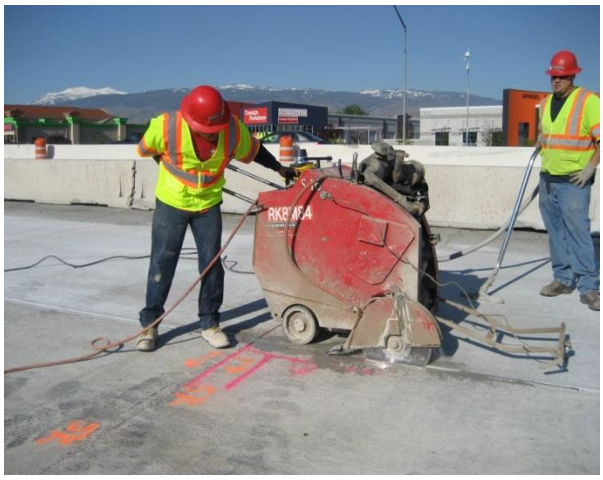
(i) **On-tool local exhaust ventilation:** use a tool-mounted dust capture and collection system.

(ii) **On-tool wet suppression:** use a tool-mounted water application system.

(iii) **Vacuuming:** use a vacuum equipped with a HEPA filter simultaneously with cutting or grinding operations.

(iv) **Wet suppression:** use a water sprayer or hose simultaneously with cutting or grinding operations.

(v) **Enclosure:** conduct cutting or grinding within an enclosure with a dust collection system or temporary tenting over the work area.



Above: These photos illustrate how dust generated from cutting can be minimized by applying on-tool wet suppression, an additional best management practice associated with saw cutting and grinding.

3.11 Abrasive Blasting

Above: This photo illustrates abrasive blasting without dust mitigation in place.

Abrasive blasting is used to smooth rough surfaces; roughen smooth surfaces; and remove paint, dirt, grease, and other coatings from surfaces. Abrasive blasting media may consist of sand; glass, plastic or metal beads; aluminum oxide; corn cobs; or other materials. Abrasive blasting typically generates a significant amount of fugitive dust if not controlled. The material removed during abrasive blasting can become airborne and may contain silica, lead, cadmium or other byproducts removed from the surface being blasted.*

Best Management Practices to Control Dust

(a) **Required Best Management Practices:** Any person, owner, or operator who conducts outdoor abrasive blasting or indoor abrasive blasting with uncontrolled emissions vented to the outside and whose operations are a dust generating activity or source shall implement the following best management practices to prevent off-property transport of fugitive dust emissions:

(i) **Restrict access:** prevent the public from entering the area where dust emissions occur.

(ii) **High winds restriction:** temporarily halt work activities during high wind events greater than 30 mph if operations would result in off-property transport.

(iii) **Equipment and work area clean up:** use wet wiping, wet sweeping, or vacuuming with HEPA filtration for equipment and work area clean up and do not cause dust to become airborne during clean up.

(iv) **Slurry clean up:** prevent water used for dust control or clean up from entering any public right-of-way, storm drainage facility, or watercourse by using containment, vacuuming, absorption, or other method to remove the slurry, and dispose of slurry and containment materials properly.

(b) **Additional Best Management Practices:** In the event 3.11(a)(i)-(iv) are ineffective to prevent off-property transport, the person, owner, or operator shall use **at least one** of the following best management practices:

(i) **Enclosure:** conduct abrasive blasting within an enclosure with a dust collection system or temporary tenting over the work area.

(ii) **Wet suppression blasting:** use one of several available methods that mix water with the abrasive media or air during blasting operations.

(iii) **Vacuum blasting:** conduct air-based blasting that uses a nozzle attachment with negative air pressure to capture dust.

(iv) **Abrasive media*:*** select less toxic, lower dust-generating blasting media.

** Blasting on surfaces that contain lead paint or wastes from sand blasting that contain hazardous materials may be subject to additional state and federal requirements.*

Above: This photo illustrates wet suppression blasting, an additional best management practice.

3.12 Mechanical Blowing

Above: This photo illustrates mechanical blowing without dust mitigation in place.

Mechanical blowers are commonly used to move dirt, sand, leaves, grass clippings and other landscaping debris to a central location for easier pick-up and removal. Mechanical blowing with a leaf blower can be a significant source of fugitive dust in some situations and can create nuisance conditions and cause health effects for sensitive individuals. Mechanical blowing can re-suspend dust particles that contain allergens, pollens, and molds, as well as pesticides, fecal contaminants, and toxic metals causing allergic reactions, asthma attacks and exacerbating other respiratory illnesses.

Best Management Practices to Control Dust

(a) **Required Best Management Practices:** Any person, owner, or operator who operates a mechanical leaf blower (gas, electric, or battery-powered) in a manner that is a dust generating activity or source shall use the following best management practices as necessary to prevent off-property transport of fugitive dust emissions

(i) **Low speed:** use the lowest speed appropriate for the task and equipment.

(ii) **Operation:** use the full length of the blow tube and place the nozzle as close to the ground as possible.

(iii) **High winds restriction:** temporarily halt work activities during high wind events greater than 30 mph if operations would result in off-property transport.

(b) **Additional Best Management Practices:** In the event 3.11(a)(i)-(iii) are ineffective to prevent off-property transport, the person, owner, or operator shall use **at least one** of the following best management practices:

(i) **Alternative method:** use an alternative such as a rake, broom, shovel, manually push sweeper or a vacuum machine equipped with a filtration system.

(ii) **Prevent impact:** do not blow dust and debris off-property or in close proximity to people, animals, open windows, air intakes, or onto adjacent property, public right-of-way, storm drainage facility, or watercourse.

(iii) **Minimize use on dirt:** minimize the use of mechanical blower on unpaved surfaces, road shoulders, or loose dirt.

(iv) **Wet suppression:** use a light spray of water, as necessary and appropriate considering current weather conditions, to dampen dusty work areas. Prevent water, dirt, and debris from entering any storm drainage facility, or watercourse.

(v) **Remove debris:** remove and properly dispose of blown material immediately.

Above: These photos illustrate alternative methods to mechanical blowing that can minimize dust generation.

4.0 Dust Control Plan for Land Development Greater Than Five Acres

A dust control plan is required for all development projects or construction sites with greater than five (5) acres in size. If the project is required to obtain a development construction permit, then the dust control plan shall be submitted with the development review application or the development construction permit application. A copy of the dust control plan shall be available onsite at all times for compliance and inspection purposes.

For dust control plans associated with a Development Construction Permit (DCP) issued by the City, applications for the DCP are available online at www.fcgov.com/developmentreview/applications.php. The dust control plan may be submitted on the Dust Control Plan Form included in Chapter 4 of this Manual or other equivalent format and shall include the following information:

- Project name and location.
- Name and contact information of property owner.
- Project start and completion dates.
- Name and contact information of the developer, general contractor, and each contractor or operator that will be engaged in an earthmoving activity.
- Total size of the development project or construction site in acres.
- A description of the project phasing or sequencing of the project to minimize the amount of disturbed surface area at any one time during the project.
- A list of each dust generating activity or source associated with the project.
- A list of each best management practice and engineering control that will be implemented for each dust generating activity or source.
- A list of additional best management practices that will be implemented if initial controls are ineffective.
- A signed statement from the property owner, developer, general contractor, and each contractor or operator engaged in an earthmoving activity acknowledging receipt of the Dust Control Plan and an understanding of and ability to comply with the best management practices in the plan.

DUST CONTROL PLAN

PROJECT INFORMATION

Project Name	
Project Location	
Start and Completion Dates	

Total Size of Project Site *(acres)*		**Maximum disturbed surface area at any one time** *(acres)*	

Property Owner *name, address, phone, e-mail*		**Developer** *name, address, phone, e-mail*
General Contractor *name, address, phone, e-mail*		**Subcontractor or Operator** *of a dust generating activity or source* *name, address, phone, e-mail*
Subcontractor or Operator *of a dust generating activity or source* *name, address, phone, e-mail*		**Subcontractor or Operator** *of a dust generating activity or source* *name, address, phone, e-mail*

PROJECT PHASING OR SEQUENCING

Provide a description of how this project will be phased or sequenced to minimize the disturbed surface area. Attach phasing plan or map if available.

DUST CONTROL PLAN CERTIFICATION

I certify the information and attachments contained in this Dust Control Plan are true and correct to the best of my knowledge and that I and the project's subcontractors have received a copy of this Dust Control Plan and acknowledge my understanding of and ability to comply with best management practices for controlling fugitive dust emissions. I hereby permit City officials to enter upon the property for the purpose of inspection of any dust generating activity or source for which I am the responsible person, owner, or operator.

Name: ____

Title: ____________________________________ Role on project: _________________________________

Address: ____ Phone: ___________________________

Signature: ____ Date: ____________________

* *

List of Subcontractors:

Title: ____________________________________ Role on project: _________________________________

Title: _____________________________________ Role on project: _________________________________

Title: ____________________________________ Role on project: _________________________________

Title: _____________________________________Role on project: _________________________________

Title: _____________________________________Role on project: _________________________________

Title: ____________________________________ Role on project: _________________________________

Title: ____________________________________ Role on project: _________________________________

Title: ____________________________________ Role on project: _________________________________

Dust Prevention and Control Checklist

Instructions:

For projects over 5 acres, in addition to developing a Dust Control Plan (see chapter 4 of the manual), place an X in each box indicating all best management practices (BMPs) that will be implemented for each activity. Fully shaded boxes are required BMPs, hatched boxes are additional BMPs.

For projects less than 5 acres, the BMPs for bulk materials transport and saw cutting/grinding are required; other BMPs are listed for use as a guide for preventing and controlling dust.

Dust Generating Activity ⇨ /Best Management Practice ⇩	Earthmoving	Demolition/ Renovation	Stockpile	Street Sweeping	Track-out / Carry-out	Bulk Materials Transport	Unpaved Roads and Haul Roads	Unpaved Parking Lot *	Paved Parking Lot*	Open Area*	Saw Cutting or Grinding	Abrasive Blasting	Mechanical Blowing
Abrasive media												◪	
Asbestos or lead materials		■											
Construction sequencing	◪												
Cover	◪		◪							■			
Cover Load						■							
Enclosure			◪								◪	◪	
Equipment & work area clean up											■	■	
Erosion control plan			◪										
High winds restriction	■	■									■	■	■
Location			◪				◪						
Mechanical blowing techniques													■
Minimize disturbed area	■												
Minimize drop height	■	■	■			■							
On-tool local exhaust ventilation											◪		
On-tool wet suppression											◪		
Other method				◪		◪			◪				◪
Reduce vehicle speeds	■						■	■	■				
Remove deposition					■								◪
Restrict access	■	■					■	■	■		■	■	
Slurry clean up											■	■	
Soil retention	◪									■			
Stockpile permit			◪										
Surface improvements							◪	■					
Surface roughening	◪		◪							■			
Sweeping									■				
Track-out prevention system					◪								
Uncontrolled sweeping prohibited				■									
Vacuum				◪							◪	◪	
Vegetation	◪		◪					■		■			
Wet suppression	◪	◪	◪	◪		◪	◪	■		■	◪	◪	◪
Wind barrier	◪	◪						■		■			

*Note that in the parking lot and open area standards, only select one of the required BMPs to be in compliance.

5.0 Resources

5.1 Cross Reference to Codes, Standards, Regulations, and Policies

Earthmoving Activities

Fort Collins Land Use Code Article 3 General Development Standards §3.2.2 Access, Circulation and Parking.

Fort Collins Land Use Code Article 3 General Development Standards §3.4.1(N) Standards for Protection During Construction.

Fort Collins Land Use Code Article 3 General Development Standards §3.4.2 Air Quality.

Fort Collins City Code, Chapter 5 Buildings and Building Regulations, Section 5-27 (59) §3602.1.1 Building demolitions.

Fort Collins City Code Chapter 20 Nuisances, Article 1 In General, §20-1 Air pollution nuisances prohibited.

Fort Collins City Code Chapter 23 Public Property §23-16. Permit required; exception in case of emergency.

Fort Collins City Code Chapter 26 Utilities, Article VII Stormwater Utility, §26-498 Water quality control.

Fort Collins Stormwater Criteria Manual, Volume 3, Chapter 7, Section 1.3 Policy, Standards and Submittal Requirements, §1.3.3.e.5.

Fort Collins Stormwater Criteria Manual – Fact Sheet SM-1 Construction Phasing/Sequencing and Fact Sheet EC-1 Surface Roughening.

Larimer County Land Use Code §8.11.4. Fugitive dust during construction.

State of Colorado, Air Quality Control Commission, 5 CCR 1001-3, Regulation No. 1, §III.D.2.b Construction Activities.

OSHA Safety and Health Regulations for Construction 29 CFR Part 1926.55 Gases, vapors, fumes, dusts, and mists.

Demolition and Renovation

Fort Collins Land Use Code, Division 2.7 Building Permits §2.7.1

Fort Collins City Code, Chapter 5 Buildings and Building Regulations, Section 5-27 (59) §3602.1.1 Building demolitions.

Fort Collins City Code Chapter 20 Nuisances, Article 1 In General, §20-1 Air pollution nuisances prohibited.

Fort Collins City Code Chapter 26 Utilities, Article VII Stormwater Utility, §26-498 Water quality control.

State of Colorado, Air Quality Control Commission, Regulation Number 8, Part B Control of Hazardous Air Pollutants, 5 CCR 1001-10.

Stockpiles

Fort Collins Land Use Code, Division 2.6 Stockpiling Permits and Development Construction Permits §2.6.2.

Fort Collins Land Use Code §2.6.3 (K) Stockpiling Permit and Development Construction Permit Review Procedures.

Fort Collins City Code Chapter 20 Nuisances, Article 1 In General, §20-1 Air pollution nuisances prohibited.

Fort Collins City Code Chapter 26 Utilities, Article VII Stormwater Utility, §26-498 Water quality control.

Fort Collins Stormwater Criteria Manual Volume 3, Chapter 7, Section 1.3 Policy, Standards and Submittal Requirements, §1.3.3.e.7.

Fort Collins Stormwater Criteria Manual - Fact Sheet MM-2 Stockpile Management.

State of Colorado, Air Quality Control Commission, 5 CCR 1001-3, Regulation No. 1, §III.D.2.c Storage and Handling of Materials.

Street Sweeping

Fort Collins City Code Chapter 20 Nuisances, Article 1 In General, §20-1 Air pollution nuisances prohibited.

Fort Collins City Code Chapter 26 Utilities, Article VII Stormwater Utility, §26-498 Water quality control.

Fort Collins Stormwater Criteria Manual - Fact Sheet SM-7 Street Sweeping and Vacuuming.

Track-out/Carry-out

Fort Collins Traffic Code, Part 1407 Spilling loads on highways prohibited.

Fort Collins Land Use Code §5.2.1 Definitions *Maintenance (of a newly constructed street).*

Fort Collins City Code: Chapter 20 – Nuisances, Article V - Dirt, Debris and Construction Waste, §Sec. 20-62. Depositing on streets prohibited.

Fort Collins City Code Chapter 26 Utilities, Article VII Stormwater Utility, §26-498 Water quality control.

Fort Collins Stormwater Criteria Manual, Volume 3, Chapter 7, Section 1.3 Policy, Standards and Submittal Requirements, §1.3.3.e.8.

Fort Collins Stormwater Criteria Manual – Fact Sheet SM-4 Vehicle Tracking Control.

Fort Collins Stormwater Criteria Manual – Fact Sheet SM-7 Street Sweeping and Vacuuming.

State of Colorado, Air Quality Control Commission, 5 CCR 1001-3, Regulation No. 1, §III.D.2.a.(ii).(B) General Requirements.

Bulk Materials Transport

Fort Collins Traffic Code, Part 1407 Spilling loads on highways prohibited.

Fort Collins City Code Chapter 20 Nuisances, Article 1 In General, §20-1 Air pollution nuisances prohibited.

Fort Collins City Code Chapter 26 Utilities, Article VII Stormwater Utility, §26-498 Water quality control.

State of Colorado, Air Quality Control Commission, 5 CCR 1001-3, Regulation No. 1, §III.D.2.f Haul Trucks.

Colorado Revised Statutes. 42-4-1407 Spilling loads on highways prohibited.

Unpaved Roads and Haul Roads

Fort Collins City Code Chapter 20 Nuisances, Article 1 In General, §20-1 Air pollution nuisances prohibited.

Fort Collins City Code Chapter 26 Utilities, Article VII Stormwater Utility, §26-498 Water quality control.

State of Colorado, Air Quality Control Commission, 5 CCR 1001-3, Regulation No. 1, §III.D.2.a Roadways and §III.D.2.e Haul Roads.

Parking Lots

Fort Collins City Code Chapter 20 Nuisances, Article 1 In General, §20-1 Air pollution nuisances prohibited.

Fort Collins City Code Chapter 26 Utilities, Article VII Stormwater Utility, §26-498 Water quality control.

Open Areas and Vacant Lots

Fort Collins City Code Chapter 20 Nuisances, Article 1 In General, §20-1 Air pollution nuisances prohibited.

Fort Collins City Code Chapter 26 Utilities, Article VII Stormwater Utility, §26-498 Water quality control.

Saw Cutting and Grinding

Fort Collins City Code Chapter 20 Nuisances, Article 1 In General, §20-1 Air pollution nuisances prohibited.

Fort Collins City Code Chapter 26 Utilities, Article VII Stormwater Utility, §26-498 Water quality control.

Fort Collins Stormwater Criteria Manual – Fact Sheet SM-12 Paving and Grinding Operations.

Colorado Department of Transportation Standard Specifications for Road and Bridge Construction, Section 208.04 Best Management Practices for Stormwater.

Abrasive Blasting
Fort Collins City Code Chapter 20 Nuisances, Article 1 In General, §20-1 Air pollution nuisances prohibited.

Fort Collins City Code Chapter 26 Utilities, Article VII Stormwater Utility, §26-498 Water quality control.

Mechanical (Leaf) Blowing
Fort Collins City Code Chapter 20 Nuisances, Article 1 In General, §20-1 Air pollution nuisances prohibited.

Fort Collins City Code Chapter 26 Utilities, Article VII Stormwater Utility, §26-498 Water quality control.

5.2 City of Fort Collins Manuals and Policies

Fort Collins Stormwater Criteria Manual http://www.fcgov.com/utilities/business/builders-and-developers/development-forms-guidelines-regulations/stormwater-criteria

City of Fort Collins Parks and Recreation Environmental Best Management Practices Manual 2011, Chapter Four: Best Management Practices for Construction http://www.fcgov.com/parks/pdf/bmp.pdf

City of Fort Collins Building Design and Construction Standards, Oct. 2013
http://www.fcgov.com/opserv/pdf/building-design-standards2.pdf?1390850442

City of Fort Collins, *Recommended Species and Application Rates of Perennial Native Upland Grass Seed for Fort Collins, Colorado*.

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http://www.arb.ca.gov/msprog/mailouts/msc0005/msc0005.pdf

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Sandblasting and Other Air-based Blasting Fact Sheet, Minnesota Pollution Control Agency, Dec. 2011.

Protecting Workers from the Hazards of Abrasive Blasting Materials, OSHA Fact Sheet.

California Air Resources Board, Abrasive Blasting Program.
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Saw Cutting

OSHA Fact Sheet on Crystalline Silica Exposure
https://www.osha.gov/OshDoc/data_General_Facts/crystalline-factsheet.pdf

State of New Jersey – Dry Cutting and Grinding Fact Sheet
http://www.state.nj.us/health/surv/documents/dry_cutting.pdf

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http://www.cdc.gov/niosh/topics/silica/cutoffsaws.html

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Unpaved Roads, Parking Lots, and Open Areas

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USDA BioPreferred Catalog: Dust Suppressants
http://www.biopreferred.gov/BioPreferred/faces/catalog/Catalog.xhtml

USGS Columbia Environmental Research Center Project: Environmental Effects of Dust Suppressant Chemicals on Roadside Plant and Animal Communities,
http://www.cerc.usgs.gov/Projects.aspx?ProjectId=77

Street Sweeping

U.S. Department of Transportation, Federal Highway Administration, *Stormwater Best Management Practices: Street Sweeper Fact Sheet*. http://environment.fhwa.dot.gov/ecosystems/ultraurb/3fs16.asp

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Demolition and Renovation

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Earthmoving Activities

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EPA – Stormwater Best Management Practices: Wind Fences and Sand Fences
http://water.epa.gov/polwaste/npdes/swbmp/Wind-Fences-and-Sand-Fences.cfm

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Managing Fugitive Dust: A Guide for Compliance with the Air Regulatory Requirements for Particulate Matter Generation, Michigan Department of Environmental Quality. March 2014.

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