

SECTION 00 73 53.19

EMISSION CONTROL

PART 1 GENERAL

SECTION INCLUDES

- A. Requirements to control total particulate matter emissions from all diesel engines.
- B. Requirements for use of grid power and gasoline engines.
- C. Contractor and all Subcontractors shall comply with all applicable City, State, and Federal regulations and Specification requirements.

RELATED SECTIONS AND DOCUMENTS

None Noted

CITED STANDARDS

All motor vehicles and construction equipment (both on-highway and non-road) shall comply with all pertinent Local, State, and Federal regulations relative to exhaust emission controls and safety.

DEFINITIONS

- A. Class I, Class II, Class III, Class IV, and Class V: The federal non-road gasoline engine emissions certification levels of the same name as defined in 40 CFR §90.103.
- B. Non-road Engine: Internal combustion engine (including the fuel system) that is not used in a highway vehicle. This definition includes, but is not limited to, internal combustion engines used to power generators, compressors, or any similar equipment used in any construction program or project.
- C. Tier 2, and Tier 3: The federal non-road diesel engine emissions certification levels of the same name as defined in 40 CFR §89.112(a).
- D. Tier 4: The federal non-road diesel engine emissions certification levels of the same name as defined in 40 CFR §1039.101 and §1039.102.
- E. VERT: Research program sponsored by Swiss, German, and Austrian occupational health authorities which set forth certain performance criteria for particulate filters and other particulate matter (PM) emission control devices.

NOTED RESTRICTIONS

None Noted

QUALITY CONTROL

None Noted

SUBMITTALS

- A. Before any construction equipment, concrete delivery truck, concrete pumping truck is brought on-site the Contractor shall submit in writing to the Owner and Construction Manager, documentation that the engine meets the minimum of Tier 2 certification requirements and provide the following information using Table 1.

1. Contractor / Subcontractor name / address / contact person
2. Equipment data plate info, type, model, serial number
3. Engine data plate information, engine serial number, family number, make, model, and year of manufacture.
4. Retrofit type, serial number, make, model, manufacturer, EPA/California Air Resources Board (CARB) verification number, installation date,

Non-compliant equipment shall not be brought on-site. Equipment on arrival at the site shall be verified for compliance by the owner. Equipment shall not be operated at the site until a CU sticker is affixed to the construction equipment verifying that the equipment meets the requirement of the specification.

- B. The Contractor shall complete Table 1, provided at the end of this Section, and submit it monthly along with digital photographs that are cataloged and related to the Table information, of the equipment, within 5 days of month end to the Owner and Construction Manager; Table 1 in electronic format can be obtained from the Construction Manager. Submission shall include:

1. Completed, to date, Table 1
2. Engine hour meter reading and date
3. Equipment on site and off site dates
4. Monthly fuel log by date by equipment from fuel supplier.
5. Digital photographs numbered to match with the corresponding numbers on the completed Table for that particular equipment. Photographs shall include clear & sharp images of
 - a. Complete equipment
 - b. Equipment data plate
 - c. Engine data plate
 - d. Retrofit data plate
 - e. Retrofit installation
 - f. Equipment showing CU sticker number & fuel bar code

- C. Submit a Diesel Emission Mitigation Plan if work is required in close proximity (less than 50 feet) to sensitive receptors such as schools, hospitals, old age homes, fresh air intakes,

windows, etc. No construction shall proceed until a Diesel Emission Mitigation Plan is submitted in writing to and accepted by the Construction Manager.

- D. All reports shall be submitted in electronic format and hard copy.

DELIVERABLES

None Listed

PART 2 **PRODUCTS**

None Listed

PART 3 EXECUTION

3.01 ELECTRIC POWER

Electric power from the grid or fuel cell shall be used to the extent practicable. The Contractor shall ensure electric powered equipment is used in lieu of diesel or gasoline engines where practicable. Some examples are for fork trucks, dewatering pumps, compressors, welders, electric cranes, concrete saws.

3.02 DIESEL ENGINES

A. All non-road diesel engines, on-road vehicles with auxiliary diesel power source and construction equipment powered by a diesel engine that is on the Project site shall be certified as stated:

1. Prior to model year 2012

- a. Engine horsepower ≥ 25 to < 50 shall be certified Tier 2 or better.
- b. Engine horsepower ≥ 50 to ≤ 750 shall be certified Tier 2 or 3 and retrofitted with passive or active Diesel Particulate Filter (DPF) that removes greater than 90% PM without increasing NOx. High performance engines that meet or exceed these specifications without further retrofit are also acceptable. Filters can be regenerated on the machine, on-site, or off-site. Any filter exchange program must be designed with complete traceability.

2. From model year 2013

- a. Engine horsepower ≥ 25 to < 75 shall be certified Tier 4 at a PM emission standard of 0.02 g/hp-hr.
- b. Engine horsepower ≥ 75 to ≤ 750 shall be certified Tier 4 at a PM emission standard of 0.01 g/hp-hr.

OR

- c. Engine horsepower ≥ 50 to ≤ 750 shall be certified Tier 2 or 3 and retrofitted with passive or active DPF that removes greater than 90% particulate matter without increasing NOx. High performance engines that meet or exceed these specifications without further retrofit are also acceptable. Filters can be regenerated on the machine, on-site, or off-site. Any filter exchange program must be designed with complete traceability.

3. From model year 2015

- a. Engine horsepower ≥ 750 shall be Tier 4 certified at a PM emission standard of 0.02 g/hp-hr for generator sets and at 0.03 g/hp-hr for all other engines.

B. The Contractor shall use ultra low sulfur diesel fuel (ULSD) with a maximum sulfur content of no more than 15 parts per million (ppm) sulfur by weight. Any equipment brought to site already fueled, shall have been fueled with ULSD.

C. The retrofit technology / retrofit emission control device shall be verified for use with non-road diesel engines by US EPA or CARB level 3.

- D. In the event DPF technology is technically not possible to install, Contractor shall request approval of the Owners engineer to use an alternative retrofit technology. Request shall be made in writing, 30 working days prior to use of equipment. Request shall
1. Document efforts made to implement DPF
 2. Document efforts made to source DPF
 3. Provide, in original, letters from EPA verified suppliers stating reasons for their inability to provide suitable DPF for the specific equipment and application
 4. Demonstrate selected alternative retrofit technology is next best to DPF in reducing PM emissions without increasing NOx.
- E. Equipment shall prominently display a message such as: "This machine is equipped with an air pollution control device and uses ULSD Fuel".

3.03 GASOLINE ENGINES

- A. All gasoline engines shall be:
1. Of Class I engine type (non-handheld with engine displacement lower than 255 cc) must be model year 2003 or newer;
 2. Of Class II engine type (non-handheld with engine displacement 225 cc or higher) must be model year 2005 or newer;
 3. Of Class III or IV engine type (handheld with engine displacement lower than 50 cc) must be model year 2005 or newer;
 4. Of Class V engine type (handheld with engine displacement 50 cc or higher) must be model year 2007 or newer.
- B. Gasoline powered non-road engines shall meet the latest emission standards for newly manufactured engines.

3.04 CONCRETE TRUCKS, PUMP TRUCKS, AND SOIL/ROCK DISPOSAL TRUCKS

- A. All ready-mix concrete delivery trucks, concrete pumping trucks, and soil/rock disposal trucks must be either retrofitted with a DPF or come equipped with an Original Equipment Manufacturer (OEM) emission control package meeting 2007 or newer model year on-highway engine certification levels for particulate matter emissions of 0.01 g/hp-hr (as per 40 CFR § 86.007-11).
- B. The contractor shall submit model year, engine controls, certification levels and vehicle identification number to the Construction Manager and obtain written clearance for the fleet of concrete delivery and pumping trucks and soil disposal trucks before any of these vehicles show up at the site.

3.05 FORKLIFTS AND ELECTRIC

- A. All forklifts shall be electric powered or non-diesel of model year 2004 or newer. This does not apply to Skylifts which must meet emission standards specified for non-road engines.
- B. As practicable, electric powered equipment such as electric scissor lifts and electric articulating forklifts shall be used.

3.06 ENGINE AND EMISSION CONTROLS MAINTENANCE

- A. The contractor and subcontractor shall:
 - 1. Ensure that each engine is well maintained and not consuming lubricating oil at a rate greater than that specified by the engine manufacturer.
 - 2. Ensure low ash lubricating oil is used.
 - 3. Inspect the filters and exhaust systems for leaks, damage or other condition that may impair their operation as specified by the filter manufacturer.
 - 4. Monitor warning lights associated with each filter and service the filter when a warning light illuminates as specified by the filter manufacturer.
 - 5. Maintain and remove soot / ash from all filters at least as often as specified by the filter manufacturer.
 - 6. Report on filter maintenance activity.
 - 7. Maintain their equipment properly.

3.07 TRUCK STAGING

- A. The Contractor shall establish truck-staging zones for vehicles waiting to load or unload material at the Work Site. Such zones shall be located with consideration to the potential impact of diesel emissions on abutters and the general public.

3.08 IDLING

- A. Idling time shall be limited to three consecutive minutes for delivery and dump trucks and all other diesel powered equipment except as follows:
 - 1. When a “mobile source” is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control. Waiting in a line is not considered traffic conditions.
 - 2. When it is necessary to operate heating, cooling or auxiliary equipment installed on the “mobile source” when such equipment is necessary to accomplish the intended use of the “mobile source”. As a general rule, idling to keep the operator warm is not acceptable; operators shall dress for the conditions and/or use safe battery-powered electric heating.
 - 3. To bring the “mobile source” to the manufacturer’s recommended operating temperature.

4. When the outdoor temperature is below twenty (20) degrees Fahrenheit.
5. When the “mobile source” is being repaired.

3.09 SENSITIVE RECEPTORS

- A. The Contractor shall ensure that diesel powered engines are located away from fresh air intakes, air conditioners, and windows to the extent practicable.
- B. Large emission sources and activities such as concrete trucks and pumps, shall be located away from residential buildings, schools and playgrounds to the extent practicable

3.10 FUEL SUPPLIERS

- A. The blank fuel log with hour-meter readings must be completed by the contractor. All contractors are required to utilize fuel companies that are capable of delivering ultra low sulfur diesel fuel to the site and providing the documentation on fuel consumption by using a bar code system.
- B. In order to comply with the fuel log submission, ultra low sulfur fuel should be procured from sources that have their operation set up to provide bar code tracking, reporting, and have the following attributes:
 1. Have the ability to provide fuel delivery in quantity, quality, and when needed.
 2. Have an adequate supply of fuel trucks with radio communication.
 3. Have fuel trucks that are fire department approved.
 4. Have all fuel trucks equipped with an automated system using barcode to identify and report by individual machine, date, time, and quantity.
 5. Have fuel trucks equipped with a metering device.
 6. Have the ability to generate weekly or monthly reports.
- C. As an example, fuel companies familiar with and capable of providing fuel and reports using a bar code system are:
 1. Petroskan Ltd (a division of century petroleum)
 2. Taylor Oil Company

TABLE 1

	Contractor	EQUIPMENT / MACHINE					Owner	Responsible Party	ENGINE							FUEL		CU sticker number
		Equipment Description	Equipment Manufacturer	Equipment Model	Equipment Serial No.	Equipment Year Mfg.			Engine Manufacturer	Engine Model	Engine Family No.	Year Manufactured	Engine Serial No.	HP at RPM	Tier	Ultra low sulfur diesel (gallons)	Fuel sticker #	
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

	RETRO														On Site		Off site	
	Contractor	Equipment Description	Retro Manufacturer	Retro Type	Retro Model	Regeneration Temperature	% Reduction PM	Retro Part No.	Retro Serial No.	Retro Life in Hours	EPA/CARB/VERT Approval	DPF ship date	DPF Installation Date	Hourmeter Reading on installation date	Date	Hourmeter Reading	Date	Hourmeter Reading
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		

