



# State and Local Green Construction Regulations

---

October 2010

**Manufacturers of Emission Controls Association**  
[www.meca.org](http://www.meca.org)

## **INTRODUCTION**

While diesel engines are in every corner of society, from moving goods across the nation to helping to construct buildings and build roads we travel on, they also have the disadvantage of emitting significant amounts of air pollution that adversely impact human health and environment. Because of the lack of emission control regulations for off-road diesel construction equipment until 1996, diesel engines used in construction equipment are more polluting than those used for on-road applications. Realizing the tremendous public health benefits from cleaning up existing diesel construction equipment, many state and local governments have or are in the process of implementing regulations to retrofit existing diesel construction equipment with diesel emission control technologies.

This document summarizes some of these local regulations and highlights whether the regulation requires the retrofit of Tier 4 engines that are not equipped with OEM installed diesel particulate filters. You will note that in these regulations the interchangeable use of the terms Best Available Control Technology (BACT), Best Available Retrofit Technology (BART), or Best Available Technology (BAT). Unless otherwise defined, all three of these terms refer to diesel retrofit technologies installed on existing engines not originally equipped with diesel exhaust devices by the OEM.

### **1.0 ARB IN-USE OFF-ROAD EQUIPMENT STANDARDS**

ARB requires that all fleets operating in-use, off-road diesel vehicles in California must either meet fleet average emission requirements or repower and retrofit a given percentage of the fleet every year under the BACT compliance requirements of the regulation. Compliance requirements started in 2010 for large fleets, 2013 for medium fleets and 2015 for small fleet. In June 2009, the Board adopted legislatively driven amendments to the off-road regulation providing additional emission credits to fleets along with other flexibilities that effectively delayed the compliance requirements for most fleets by at least one to two years. In 2010, ARB proposed additional economic relief amendments to the off-road regulation that will further delay the need for fleets to retrofit off-road vehicles.

After March 1, 2020, if a large or medium fleet does not meet the NOx fleet average emission target rate, the fleet must continue to meet the minimum BACT turnover requirements and report annually until it meets the fleet average emission target rate. Starting on March 1, 2021 for large and medium fleets, and March 1, 2026 for small fleets, all vehicles in each fleet must be equipped with the highest level verified diesel emission control system (VDECS).

However, due to the economic recession, ARB is proposing revisions to the regulation that would delay implementation of the requirements by two years for all fleets and provide a compliance path that would not require retrofits with emission control devices. ARB is proposing that a fleet may meet the BACT requirements by retiring a vehicle, designating a vehicle as a permanent low-use vehicle, repowering a vehicle or rebuilding the engine to a more stringent emissions configuration, or applying a VDECS. The engine must meet Tier 2 standards

or higher to comply with the requirements. The proposed amendments to the regulation will go before the ARB Board for its consideration during its December 2010 Board hearing.

More information on the ARB in-use off-road equipment standards is available at: <http://www.arb.ca.gov/msprog/ordiesel/documents/finalregorder-current.pdf>. More information on the proposed revisions to the standard is available at: <http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm>.

**Retrofit Summary:** This regulation requires California owners of in-use off-road diesel fleet to meet fleet average requirements or install BACT. The regulation also requires all in-use off-road fleets to be equipped with VDECS (including Tier 4 engines) starting on March 1, 2021 for large and medium fleets, and March 1, 2026 for small fleets. However, ARB has proposed amendments to the regulation that would delay the implementation of the regulation by two years for all fleet and would eliminate the requirement to retrofit with VDECS if the engine meets Tier 2 standards or higher.

## 2.0 NEW YORK CITY LOCAL LAW 77

On December 22, 2003, Mayor Michael Bloomberg signed into law Local Law 77. The law requires any diesel powered off-road vehicle (50 hp and greater), that is owned, or operated by or on behalf of, or leased by a City agency be powered by ultra-low sulfur diesel fuel and use best available technology (BAT).

The New York City Department of Environmental Protection regularly publishes updated lists of BAT for various types of non-road vehicles and engines. The BAT is divided into categories to clarify the hierarchy of what constitutes BAT:

- Category I(a) is any properly installed and functioning DPF that achieves 85% or greater reduction in PM, and secondarily NO<sub>x</sub> that appears on either the EPA or ARB verified list.
- Category I(b) is any properly installed DPF from either the EPA or ARB verified list.
- Category I(c) is any filter that has undergone the VERT test procedure and appears as approved for continuous use on the VERT list or similar test procedures to those conducted by EPA/ARB and has demonstrated an 85% or greater reduction in PM emissions.
- Category II is any properly installed and functioning system using DOC or catalyzed flow through filter that primarily reduces PM emissions and secondarily NO<sub>x</sub> that appears on either the EPA or ARB verified lists for on-road and off-road engines or any properly installed flow through filter on the verified list and that produces the greater PM reduction but not less than a 50% PM reduction.
- Category III is any properly installed and functioning system using a DOC or any emulsified diesel fuel that appears on either the EPA or ARB verified lists for on-road or off-road engines that produce not less than a 25% reduction in PM emissions.

For new vehicles, BAT may be OEM installed control technology, provided that it provides the greatest reduction in PM above the PM standard that EPA has certified without increasing NOx. This BAT does not need to be on the EPA/ARB verified list.

More information on the NYC Local Law 77 is available at:  
<http://www.nyc.gov/html/dep/pdf/ll77.pdf>.

**Retrofit Summary:** This regulation requires the use of ULSD fuel and the use of BAT. This regulation requires Tier 4 engines that do not have emission control devices to be retrofitted with BAT, using the criteria above.

### **3.0 COOK COUNTY GREEN CONSTRUCTION ORDINANCE**

On May 28, 2009, Cook County, Illinois (greater Chicago), became the first county in the Midwest to adopt a Green Construction Ordinance. The ordinance will require all Cook County contractors working on public construction contracts budgeted at \$2 million or more to begin to use ultra-low sulfur diesel fuel for off-road vehicles and equipment immediately and phase-in the use of diesel retrofit technologies on uncontrolled on-road and off-road vehicles and equipment.

Beginning in mid-2011, prime contractors and subcontractors must install, at a minimum, Level 2 verified PM retrofits (minimum 50% reduction in diesel PM) on off-road equipment used in these publicly funded projects. Effective January 1, 2014, prime contractors must install Level 3 verified PM retrofits (minimum 85% reduction in diesel PM) on any on-road or off-road engines used in publicly funded projects or insure that the engine out emissions for PM are equal to or less than 0.01 g/bhp-hr. Subcontractors have until January 1, 2016 to install Level 3 verified PM retrofits on any on-road or off-road engines used in publicly funded projects.

More information on Cook County Green Construction Ordinance is available at:  
<http://www.cookcountyclerk.com/countyboard/DocumentLibrary/2009ordinances.pdf>.

**Retrofit Summary:** This regulation requires that the off-road vehicle PM emissions are less than or equal to 0.01 g/bhp-hr or the vehicle is equipped with a Level 3 emission control device. Tier 4 engines are not required to be retrofitted with emission control devices.

### **4.0 RHODE ISLAND DIESEL RETROFIT PROGRAM**

On June 10, 2010, the Rhode Island General Assembly passed one of the most comprehensive clean construction regulations in the nation. The House and the Senate passed the clean construction law as part of the state's Diesel Emissions Reduction Act, which aims to reduce emission from diesel engines through an anti-idling program, an ultra-low sulfur diesel (ULSD) fuel use requirement, and a retrofit program for school buses and construction equipment. The bill is sponsored by Senator Josh Miller (D-District 28). There is a House companion bill (H7850A) sponsored by Representative Ray Sullivan (D-District 29). Members of the Rhode Island General Assembly have been working on this bill for over three years,

gaining industry support only after convening a commission that conducted an in-depth review of the health, environmental, and economic implications of implementing a clean construction policy for large state projects.

The legislation, which will be sent to the Governor for approval, requires heavy-duty diesel vehicles contracted on behalf of the state with federal funds to be equipped with emission control devices, reimbursable through federal project funds starting in 2013; to comply with the state anti-idling law, limiting idling to 5 minutes; and to be fueled with ULSD. Starting on January 1, 2013, on-road and off-road heavy-duty diesel vehicles contracted with the state using federal money (in whole or in part) must be powered by engines with Level 3 emission control devices. If the Rhode Island Department of Environmental Management finds that no Level 3 emission control technologies have been verified or are not appropriate for use on the particular engine, Level 2 verified devices must be required. If neither Level 3 nor Level 2 devices have been verified and are not appropriate for use on particular engines, Level 1 verified devices must be used. In addition, contractors must establish staging zones so that the diesel vehicles are away from the general public or sensitive receptors, such as hospitals, schools, and residential neighborhoods. All costs for the purchase and installation of the emission control technologies for a specific project will be fully reimbursed from the project funds within 60 days of the technology installation if the device is installed within 30 working days after the vehicle is brought onto the project site.

More information on the Rhode Island Diesel Retrofit Program is available at: <http://www.rilin.state.ri.us/BillText10/SenateText10/S2440Aaa.pdf>.

**Retrofit Summary:** This regulation would require off-road heavy-duty diesel vehicles contracted with the state using federal money be installed with Level 3 emission control devices. It is unclear if Tier 4 engines will need to be retrofitted with emission control devices.

## **5.0 SAN FRANCISCO CLEAN CONSTRUCTION ORDINANCE**

In 2007, San Francisco's Board of Supervisors adopted the "Clean Construction" ordinance to reduce air pollution from public works projects in the City. The Clean Construction ordinance will apply to city-contracted major construction projects, defined as projects that take 20 days or more of cumulative work to complete; and those major projects that require use of "high-use" vehicle or diesel equipment (20 or more hours during any portion of the project). Starting on March 2009, contractors performing major public works projects in San Francisco must:

- Use biodiesel in the off-road vehicles and equipment used on the job. The fuel must be at least a 20% blend of biodiesel (B20), but can be as high as 100% (B100); and
- Use the most "effective verified diesel emission control strategy" (best available control technology). The diesel off-road vehicle and equipment must meet EPA Tier 2 standards. As an alternative to Tier 2 standards, high-use equipment can comply with the ordinance by installing best available emission controls device for PM and NOx, such as DOCs, DPFs and SCRs.

Grants to assist in compliance with this ordinance may be available through the Carl Moyer program.

More information on San Francisco Clean Construction Ordinance is available at: [www.sfgov.org/site/uploadfiles/bdsupvrs/ordinances07/o0070-07.pdf](http://www.sfgov.org/site/uploadfiles/bdsupvrs/ordinances07/o0070-07.pdf).

**Retrofit Summary:** This regulation requires the installation of emission control technologies on off-road diesel vehicles to meet EPA Tier 2 standards. Tier 4 engines are not required to be retrofitted with emission control technologies.

## 6.0 ILLINOIS DOT CLEAN CONSTRUCTION REQUIREMENTS

The Illinois Department of Transportation (IDOT) will require that certain off-road diesel equipment used in state-funded construction projects be retrofitted with emission control devices starting on June 11, 2010. These requirements were established last year in response to an Executive Order signed by Governor Pat Quinn (D) in April 2009. The specification requires the installation of U.S. EPA- or ARB-verified Level 2 devices (or verification by a manufacturer's certification that the retrofit will provide a 50% reduction in PM) on Tier 0 and Tier 1 off-road diesel engines.

The clean construction requirements will be phased-in according to the following schedule:

- In the first year, the requirements will apply only to prime contractors and for equipment rated at 600 hp and greater.
- Beginning the second year, the requirements will apply to prime contractors and subcontractors and for equipment 100 hp and greater.
- Beginning the third year, the requirements will apply to prime contractors and subcontractors and for equipment 50 hp and greater.

The provision is only applicable in areas of the state designated as being in nonattainment for ozone and/or fine particulate matter. Exemptions will be made for large cranes and other equipment where no retrofit device is available. For more information, contact IDOT's Mike Renner at: (217) 782-6667 or [Mike.Renner@illinois.gov](mailto:Mike.Renner@illinois.gov).

**Retrofit Summary:** This regulation requires the installation of Level 2 devices on Tier 0 and Tier 1 off-road diesel engines. Tier 4 engines are not required to be retrofitted with emission control devices.

## 7.0 PITTSBURGH “CLEAN AIR ACT OF 2010”

The Council of the City of Pittsburgh is in the process of adopting a new regulation that would reduce diesel particulate matter and other diesel pollutant emissions from diesel construction equipment. Starting on January 1, 2011, the legislation would require contractors working on city-subsidized projects to use new or retrofitted equipment to reduce diesel emissions. The contractors will be required to use:

- Low sulfur diesel fuel in diesel powered on-road and off-road vehicles used on the project site;
- Starting on January 1, 2011, all on-road diesel vehicles on the project site must be installed with Best Available Retrofit Technology (verified EPA or ARB technology that achieves reductions in PM emissions at the highest classification level for verified diesel emission control strategies for PM that is applicable to the particular engine and application) that is properly maintained and operational.
- Starting on January 1, 2013, all off-road diesel vehicles on the project site must be installed with Best Available Retrofit Technology that is properly maintained and operational.

More information on this is available at:

<http://pittsburgh.legistar.com/LegislationDetail.aspx?ID=665363&GUID=61CB7424-FE95-4A21-8368-F53F9EE4BC1B>.

**Retrofit Summary:** This regulation would require that all off-road diesel vehicles on the project site must be installed with BART starting on January 1, 2013. It is unclear if Tier 4 engines would need to be retrofitted with emission control device.

## 8.0 NEW JERSEY DIESEL RETROFIT PROGRAM

The state of New Jersey implemented a regulation that requires the installation and use of best available retrofit technologies in diesel-powered commercial buses, solid waste vehicles that are publicly-owned or used to perform solid waste services under a public contract, and publicly-owned on-road vehicle and publicly-owned off-road vehicles with at least 175 hp.

The regulation applies to anyone who owns off-road equipment and must retrofit the diesel equipment with Best Available Retrofit Technology (BART). The equipment must be retrofitted with BART no less stringent than Level 3 (reduce PM emissions by 85%) for off-road equipment higher than 175 hp. BART installation requirements do not apply to engines that are rated from 175-750 hp and were certified to a PM standard of 0.015 g/bhp-hr, or rated above 750 hp and were certified to a PM emissions standard of 0.03 g/bhp-hr phased in from 2011 to 2015.

The off-road equipment owner may repower or rebuild the engine in off-road diesel equipment to achieve at least as great a PM emission reduction by weight as Level 3. The repowered or rebuilt engine must be a certified configuration that meets a PM emission standard that is equal to or lower than the amount of diesel PM emissions that would otherwise be emitted from the vehicle or equipment when using the required BART. In the case of a repowered

engine, the removed engine must be permanently placed out of service. Additionally, the manufacturer's brake horsepower rating for the repowered or rebuilt engine may exceed the brake horsepower rating of the existing engine by no more than 10%.

More information on the New Jersey Diesel Retrofit Program is available at:  
<http://www.nj.gov/dep/aqm/sub32%20090807.pdf>.

**Retrofit Summary:** This regulation requires installation of Level 3 device on off-road diesel vehicles or must meet PM standard of 0.015 g/bhp-hr for 175-750 hp engines and 0.03 g/bhp-hr for engines rated above 750 hp. Tier 4 engines are not required to be retrofitted with emission control devices.

## **9.0 MASSACHUSETTS DIESEL RETROFIT PROGRAM**

The Massachusetts Department of Environmental Protection (MassDEP) requires contractors working on projects financed by the State Revolving Fund (SRF) to install retrofit pollution control devices on their construction equipment. The SRF program provides financial assistance for municipal wastewater treatment and drinking water infrastructure projects. Starting in 2001, the SRF program required that diesel oxidation catalyst (DOC) be installed in at least half of the construction equipment used in SRF projects. In 2002, the retrofit requirement expanded to encompass all equipment. In January 2008, MassDEP amended the retrofit requirements to apply only to engines rated 50 hp or greater that will be used on a project site for 30 days or more.

The DOC must be verified by the U.S. EPA or ARB. DOCs are not required to be installed on Tier 4 construction engines because they are equipped with manufacturer-installed emission control devices and emit much less PM than older engines.

More information on the Massachusetts Diesel Retrofit Program is available at:  
<http://www.mass.gov/dep/water/wastewater/diesel.htm>.

**Retrofit Summary:** This regulation requires installation of EPA verified DOCs on construction equipment used in SRF projects. Tier 4 engines are not required to be retrofitted with DOCs.