



Best Practices for Clean Diesel Construction

Successful Implementation of Equipment Specifications to Minimize Diesel Pollution

by Northeast Diesel Collaborative

Northeast
Diesel Collaborative
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Overview

Specifications for operating cleaner diesel equipment have become more prevalent as states, local governments, public agencies, and private entities have begun to require that clean diesel construction technologies and strategies be used on their sites. This document provides recommendations for successful implementation of specifications to minimize diesel pollution and exposure during construction. Such specifications are often referred to as Clean Diesel Equipment, Clean Diesel Construction or Clean Construction. In this document you will find steps to ensure effective communication and engagement by all parties associated with the construction project, links to resources, and checklists for the project owner/sponsor, construction manager and contractor.

Background

Diesel exhaust is a complex mixture of pollutants including particulate matter (soot), nitrogen oxides and volatile organic compounds which contribute to smog, acid rain, climate change, premature death and a range of health problems. Construction workers may have an increased risk of health related issues from occupational exposure to diesel exhaust. Additionally, diesel emissions may negatively impact communities around the construction site. Information about the health effects of diesel exhaust can be found at:

<http://www.mass.gov/dep/air/diesel/healthenv.htm>

Equipment rolling off production lines today emits dramatically less pollution than 10 years ago due to EPA regulations restricting the emissions from new engines. However, construction equipment often lasts more than 30 years. It is estimated that 2 million pieces of diesel equipment currently in use do not meet newer standards. Fortunately, in addition to the option to buy or rent new equipment that meets current standards, actions can be taken to reduce emissions from existing equipment. These actions include but are not limited to:

- Replacement of older equipment with equipment meeting the latest emission standards
- Repowering equipment (i.e. replacing older engines with newer, cleaner engines and leaving the body of the equipment intact)
- Retrofitting engines and equipment with exhaust control technologies
- Proper equipment maintenance
- Application of idle reduction strategies
- Utilizing cleaner fuels

Elements of Success

In order to successfully develop and implement Clean Diesel Equipment specifications, several elements should be considered:

- Well Written Specifications in the Bid Package
 - Objective, clear, and concise
 - Reporting systems are clearly delineated
 - Model contract specifications developed by the Northeast Diesel Collaborative can be found at:
<http://northeastdiesel.org/pdf/construction/NEDC-Construction-Contract-Spec.pdf>
- Organizational Support Across all Involved Entities
 - Visible and consistent support throughout all levels of management and workers at each level
 - Inclusion of clean diesel implementation metrics in performance reviews for personnel involved in clean construction to help ensure accountability
- Effective Communication
 - Creation and implementation of a communication plan to support effective clean diesel activities
 - Align strategy, process and personnel to meet the Clean Diesel Equipment requirements
 - Assurance that specifications are feasible and technology is reliable, such that:
 - Required Diesel Particulate Filters (DPF) or other technologies are available either through purchasing or renting new equipment or retrofitting existing vehicles/equipment
 - Required DPF or other technologies is verified by the US Environmental Protection Agency (USEPA) or the California Air Resources Board (CARB):
USEPA: <http://epa.gov/cleandiesel/verification/verif-list.htm>
CARB: <http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm>
 - Resources are available to help determine the best retrofit technology available for cleaning up existing diesel equipment
 - Clean Diesel Clearinghouse
<http://www.cleandieselclearinghouse.org/>
 - Diesel Engine Retrofits in the Construction Industry: A How To Guide
www.mass.gov/dep/air/diesel/conretro.pdf
 - Construction Fleet Inventory Guide
<http://www.epa.gov/cleandiesel/documents/420b10025.pdf>
 - Diesel Emissions Reduction Program (DERA): Technologies, Fleets and Projects Information
<http://www.epa.gov/cleandiesel/documents/420p11001.pdf>
- An Action Plan for Effective Implementation that Includes:
 - Creating a “Clean Diesel Team” with representatives from the Project Owner/Sponsor organization to coordinate from the pre-bid phase through to completion of the project
 - Implementing a timeline with action items for designated personnel
 - Pre-bid phase
 - Post-award phase
 - Leveraging opportunities and co-benefits to promote success, such as:
 - Regulations
 - Occupational exposure issues
 - Community health considerations
 - Positive image for company
 - Addressing community concerns including Environmental Justice issues

- Cost savings for idle reduction etc.
- Identifying and addressing possible barriers to success, such as:
 - Cost
 - Lack of knowledge (don't know the health risks)
 - Fear of new technology
 - Misinformation
 - Past practice/habit – disinclination to embrace change
- Delineating the roles of key personnel with Clean Diesel Responsibilities (see below)

The Process

All parties need to fully understand the Clean Diesel Equipment specifications and maintain ongoing communications from the development of the bid to the completion of the project. Early and consistent dialogue with key project personnel throughout the construction project increases the likelihood of successful implementation. It may also be helpful to acknowledge that Clean Diesel Equipment requirements typically represent a change from business as usual, and with the prospect of change often comes resistance. Implementing the best practices outlined in this document can help overcome that resistance.

Phase I: Pre-Award Phase

Together, the Project Owner/Sponsor and Construction Manager need to communicate the Clean Diesel Equipment requirements to potential contractors before the award. Prior to formally issuing a contract specification, the Project Sponsor/Owner may want to reach out to contracting associations to inform them of their commitment to Clean Diesel Equipment requirements.

The Project Owner/Sponsor and Construction Manager may also invite potential contractors to a pre-bid meeting to review the scope of work and project-specific requirements including Clean Diesel Equipment. The Project Owner/Sponsor can delineate the expectations for Clean Diesel Equipment to bidders at this time.

Project Owner/Sponsors can also ask for and obtain acceptance from the Contractor for the specification. All bids will then be submitted by Contractors with signed letters confirming that they have read and understand the clean diesel construction requirements.

Once a short list of potential contractors is determined, the Construction Manager can perform a scope review with the potential contractors to ensure they understand the Clean Diesel Equipment contract requirements. This process is similar to the pre-bid meeting; however, it consists of a more detailed review and would be done with each potential contractor separately. If possible, Clean Diesel Equipment should warrant a separate scope review meeting.

Phase II: Post-Award Phase

Once a qualified contractor is selected, he or she can hold a Clean Diesel Equipment kick-off meeting with the construction crew to review the clean construction requirements and go over the expectations of the Project Owner/Sponsor. The Contractor will want to include laborers, equipment operators and supervisors in this meeting.

After the kick-off meeting, the Construction Manager can work with the Contractor to ensure that all available information regarding emission control equipment vendors has been gathered, including the most current lead times necessary to obtain and install the required emission control equipment. This information will help ensure that the Contractor, Construction Manager and Project Owner/Sponsor are all on the same page and allow everyone to determine a realistic timeline to meet the Clean Diesel Equipment requirements. Resources such as those listed in the previous section are available to help determine the best retrofit technology available for reducing emissions from existing diesel equipment.

Developing a tracking system to ensure all equipment on site meets the specifications is also important. Creating scannable barcodes for each piece of equipment can prove to be very effective for large projects.

Roles of Key Personnel¹

- **Project Owner/Sponsor organization** *(See appendix A for sample Project Owner Checklist)*
 - Develops the Clean Diesel Equipment requirements
 - Includes Clean Diesel Equipment specifications in the bid package
 - Develops an action plan for effective implementation of Clean Diesel Equipment requirements
 - Hires/appoints a Construction Manager to monitor/enforce the Clean Diesel Equipment requirements
 - Conveys expectations to Construction Manager regarding Clean Diesel Equipment requirements
 - Works with the Construction Manager to develop a communication plan to ensure that the Construction Manager communicates effectively with the Contractor
 - Works with the Construction Manager to determine circumstances that can be leveraged to support implementation and barriers that need to be overcome
 - Responds to and resolves concerns raised during the project
 - Designates staff member(s) from the Project Owner/Sponsor organization to walk the site once a week with the Construction Manager and Contractor to ensure compliance. The representatives from the Project Owner/Sponsor organization may ask about any Clean Diesel Equipment construction or safety concerns that may have been raised on the site
 - Holds a meeting with the Construction Manager once a week to review tracking system and discuss the compliance status of Clean Diesel Equipment requirements
 - Requires Contractor to certify that staff and workers are properly trained in Clean Diesel Equipment requirements
 - The Project Owner/Sponsor organization can require a detailed tracking plan to demonstrate that the specifications are being met

- **Construction Manager** *(See Appendix B for sample Construction Manager Checklist)*
 - Demonstrates complete understanding of the Project Owner/Sponsor's requirements and expectations
 - Presents Clean Diesel Equipment requirements to potential contractor
 - Performs a scope review with potential Contractors to ensure they understand Clean Diesel Equipment contract requirements
 - Understands and responds to all of the comments and questions raised by the Contractor
 - Works with the Project Owner/Sponsor to determine circumstances that can be leveraged to support implementation and barriers that need to overcome

¹ Please note that this document should be used as a general guide, as the roles and responsibilities of the key personnel can vary based on the specific configuration of the involved parties.

- Oversees and enforces Clean Diesel Equipment requirements on site
- Participates in an internal meeting with his or her supervisors once a week to discuss the compliance status of Clean Diesel Equipment construction requirements
- Holds a meeting with the Contractor once a week to ensure compliance with the Clean Diesel Equipment requirements and to address any related issues that may have occurred on site
- Conducts daily site inspections

- **Contractor** *(See Appendix C for sample Contractor Checklist)*
 - Reviews the Clean Diesel Equipment requirements thoroughly
 - Procures the necessary equipment to minimize diesel emissions for each covered piece of construction equipment
 - Requests clarification on any unclear specifications
 - Consistently reinforces to the crew the importance of the Clean Diesel Equipment site policy
 - Conducts training for all staff and workers as required in the contract documents
 - Includes Clean Diesel Equipment practices in daily 'tool box' talks
 - Includes Clean Diesel Equipment practices in means and methods
 - Submits reports on the Clean Diesel Equipment requirements and equipment inventories as listed in the specifications

For further information, please visit: <http://northeastdiesel.org/construction.html>

Appendix A: Sample Project Owner/Sponsor Checklist

Pre-Award Phase Tasks	
Has support been secured from management for Clean Diesel Equipment specifications?	
Has a set of Clean Diesel Equipment requirements been agreed upon by management and staff?	
Have the Clean Diesel Equipment requirements been determined to be achievable? (i.e., equipment, technology and/or vendor availability)	
Have all state or local regulatory requirements for Clean Diesel Equipment been identified?	
Has a clear, concise Clean Diesel Equipment specification been written and included in the bid package?	
Have circumstances been leveraged to support implementation and barriers to be overcome been identified?	
Has a Construction Manager with Clean Diesel Equipment compliance responsibilities been chosen?	
Does the Construction Manager have adequate knowledge and experience with Clean Diesel Equipment requirements?	
Has a pre-bid meeting been held to communicate requirements to potential contractors?	
Have all potential contractors submitted signed letters confirming that they have read and understand the Clean Diesel Equipment construction requirements?	
Post-Award Phase Tasks	
Has a kick-off meeting been held to review the Clean Diesel Equipment requirements?	
Has a team of representatives been assembled to perform weekly site visits and hold weekly meetings with the Construction Manager?	
Has a tracking system been developed and is it being properly implemented?	
Has Clean Diesel Equipment training been conducted for all staff and workers?	
Are all issues on site regarding Clean Diesel Equipment requirements being adequately addressed by the construction manager?	
Is the construction manager collecting reports on Clean Diesel Equipment requirements from the Contractor?	

Appendix B: Sample Construction Manager Checklist

Pre-Award Phase Tasks	
Has the Project Owner/Sponsor clearly defined the Clean Diesel Equipment requirements and expectations for this project?	
Can the Clean Diesel Equipment requirements be presented to contractors in a clear and concise manner?	
Have local vendors for Clean Diesel Equipment and technology been identified?	
Have local vendors indicated any issues or extended lead times for obtaining and installing emission control technologies?	
Has a pre-bid meeting been held to communicate requirements to potential contractors?	
Have all of the potential contractors' questions or concerns regarding the Clean Diesel Equipment requirements been addressed?	
Has a scope review been performed on the potential contractors to ensure understanding of the Clean Diesel Equipment requirements?	
Post-Award Phase Tasks	
Has a kick-off meeting been held to review the Clean Diesel Equipment requirements?	
Have all of the potential contractors' questions or concerns regarding the Clean Diesel Equipment requirements been addressed?	
Has a tracking system been developed and is it being properly implemented?	
Are site inspections being conducted daily?	
Are weekly meetings being held with supervisors to discuss the status of the Clean Diesel Equipment requirements?	
Are weekly meetings being held with the Contractor to discuss the status of the Clean Diesel Equipment requirements?	
Are all issues on site regarding Clean Diesel Equipment requirements being adequately addressed?	
Is the Contractor submitting reports on Clean Diesel Equipment requirements and equipment inventories as listed in the specifications?	
Is the data in the Contractor's reports accurate and consistent with what is present on site?	

Appendix C: Sample Contractor Checklist

Pre-Award Phase Tasks	
Have the Clean Diesel Equipment requirements and expectations for this project been read thoroughly?	
Has a pre-bid meeting been attended?	
Have all questions or concerns regarding the Clean Diesel Equipment requirements been addressed?	
Have local vendors for Clean Diesel Equipment and technology been identified?	
Have local vendors indicated any issues or extended lead times for obtaining and installing emission control technologies?	
Has a signed letter confirming that the Clean Diesel Equipment requirements have been read and understood been submitted?	
Post-Award Phase Tasks	
Has a kick-off meeting been attended to review the Clean Diesel Equipment requirements?	
Have all questions or concerns regarding the Clean Diesel Equipment requirements been addressed?	
Is the tracking system being properly implemented?	
Has Clean Diesel Equipment training for all staff and workers been conducted?	
Are Clean Diesel Equipment practices being included in daily 'tool box' talks?	
Are weekly meetings being held with the Construction Manager to discuss the status of the Clean Diesel Equipment requirements?	
Are all issues on site regarding Clean Diesel Equipment requirements being adequately addressed?	
Is all data on Clean Diesel Equipment requirements and equipment inventories as listed in the specifications being collected?	
Has the data collected been compiled into reports to be submitted to the Construction Manager?	