This is a guidance document with sample specification language intended to be inserted into project specifications on this subject as appropriate to the agency's environmental goals. Certain provisions, where indicated, are required for U.S. federal agency projects. Sample specification language is numbered to clearly distinguish it from advisory or discussion material. Each sample is preceded by identification of the typical location in a specification section where it would appear using the SectionFormat™ of the Construction Specifications Institute.

SECTION 01 43 50 (SECTION 01435)– CONTINUAL IMPROVEMENT OF ENVIRONMENTAL QUALITY

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes:
1. Requirements for continual improvement of environmental performance during construction.
2. Requirements for coordination with continual improvement of Owner's environmental performance after construction.

B. Related Sections:
1. Section 01 30 00 (01300) - Administrative Requirements: Environmental Manager and Contractor training requirements.
2. Section 01 40 00 (01400) – Quality Requirements: Meetings and project coordination.

1.2 QUALITY ASSURANCE

SPECIFIER NOTE:
Executive Order 13423 includes a requirement for sustainable building strategies and for agency EMSs. It calls upon federal agencies to:
"implement within the agency environmental management systems (EMS) at all appropriate organizational levels to ensure (i) use of EMS as the primary management approach for addressing environmental aspects … (ii) establishment of agency objectives and targets to ensure implementation of this order, and (iii) collection, analysis, and reporting of information to measure performance in the implementation of this order;"
and, to "ensure that contracts … for contractor operation of government-owned facilities or vehicles require the contractor to comply with the provisions of this order with respect to such facilities or vehicles"

Many federal agencies have implemented EMSs with specific objectives and targets for environmental aspects and impacts. Contractors should coordinate with the specific objectives of the Owner's EMS. To facilitate the coordination, edit below to identify applicable provisions in the Owner's EMS.

A. Coordinate with Owner's Environmental Management System (EMS): **[Owner's EMS is available online; refer to xxxx.] [Owner's EMS identifies the following relevant environmental aspects, establishes certain operational controls to address those aspects and may set objectives to lessen the impact of those aspects; Contractor shall review applicable provisions in the Owner's EMS and coordinate environmental management of the project as appropriate.**
1. Owner's EMS priorities – aspects and associated actions (including objectives and targets) related to construction:
a. xxxx
b xxxx
x. xxxx]

B. Contractor shall maintain an Environmental Management System (EMS) acceptable to

Owner **[or equivalent commitment acceptable to Owner]**.

1.3 SUBMITTALS

A. Quality Assurance Submittals:

1. Documentation of Contractor's Environmental Management System (EMS): Submit one of the following:

SPECIFIER NOTE:
The International Organization for Standardization (ISO) Standard 14001, Environmental Management Systems – Requirements With Guidance For Use, is one of the most commonly recognized EMS protocols. It delineates a continual cycle of planning, implementing, reviewing and improving the processes and actions that an organization undertakes to meet its business and environmental goals. The concept of continual improvement recognizes that problems will occur. A committed organization learns from its mistakes and prevents similar problems from recurring.
Continual improvement may not always be feasible from start to finish of one construction project; nevertheless, contractors should continually look for and act on opportunities to improve the environmental performance of their operations.

a. Copy of Contractor's EMS Registration as per ISO 14001;

SPECIFIER NOTE:
At this time, having a formal EMS is not common for contractors. The following option should be carefully considered to allow for competitive bidding while still supporting the Federal broad commitment to an EMS approach.
For example, on some projects, a contractor's letter indicating awareness of the Owner's EMS and a commitment to follow the EMS as well as a commitment to continual improvement consistent with ISO 14001, may be satisfactory.

b. **[Contractor's letter outlining review of Owner EMS and commitment to conformance with the EMS and continual improvement consistent with ISO 14001.]**

c. **[Or equal as approved by Owner.]**

2. Documentation of Contractor's Environmental Impacts: Submit documentation for Contractor's operations as specified under Contractor's Environmental Aspects and Impacts.

B. Operation and Maintenance Submittals:

1. Documentation for Owner's Baseline EMS: Submit baseline documentation necessary for continual improvement of Owner's environmental performance after construction and related to Contractor's activities.

1.4 CONTINUAL IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE DURING CONSTRUCTION

SPECIFIER NOTE:
An Environmental Management System (EMS) is founded upon continual improvement; therefore, even if a specific demonstration of continual improvement is not feasible from start to finish on one construction project; general progress and continual improvement is considered inherent in the contractor's operations under an EMS.
An EMS is a set of processes and practices that enable an organization to reduce its environmental impacts and increase its operating efficiency.
Executive Order 13148: Greening the Government Through Leadership in Environmental Management required that by April of 2002, each Federal agency implement EMS pilot projects at selected facilities and by December 31, 2005, implement EMSs at all appropriate agency facilities. On January 24, 2007, a new Executive Order replaced EO 13148. The EO requires, among other things, that by 2010 the number of

Federal operations that implement environmental management systems increase to at least 2,500 - up from about 1,000 as of 01/2007. http://www.whitehouse.gov/news/releases/2007/01/20070124-2.html
For information regarding federal agencies' development and use of EMSs for their operations, refer to http://www.epa.gov/ems.
The Associated General Contractors of America (AGC) has developed an EMS guide for the construction industry; *Constructing An Environmental Management System: Guidelines and Templates for Contractors* (available from AGC).

A. Contractor's Environmental Management System (EMS): Contractor shall maintain an EMS **[in accordance with] [consistent with]** ISO 14001, EPA National Environmental Performance Track, or approved equal.

SPECIFIER NOTE:
Fundamental to an EMS are the concepts of Environmental Aspects and Impacts. Environmental Aspects are elements of an organization's activities, products or services that can interact with the environment. Environmental Impacts are changes to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services. Thus, the activity of vehicle maintenance may have an environmental aspect of releasing VOCs during refueling which would have an associated environmental impact of deteriorating air quality.
EPA's Sector Strategies Program uses collaborative partnerships to promote widespread improvement in environmental performance with reduced administrative burden. This includes investigating availability of data to report on a set of construction industry environmental performance indicators such as: compliance, pollutant emissions, reuse and recycling of construction & demolition debris, EMS implementation, Performance Track membership, and green building (LEED, GBI, etc.) certifications. Refer to the Construction chapter of the Sector Strategies Performance Report.

B. Contractor's Environmental Aspects, Impacts and Controls: Monitor environmental aspects and impacts of Contractor's operations related to the Work of this Contract as per Contractor's and Owner's EMS (including identification and pursuit of controls on and mitigation of adverse impacts) and as follows:

SPECIFIER NOTE:
Most air emissions from the construction sector come from non-road mobile sources (e.g., construction equipment such as excavators, off-highway trucks, and portable generators) and construction processes (e.g., grading and asphalt paving). Diesel engines power many construction vehicles and equipment. Currently there are approximately 2 million pieces of diesel-powered construction equipment in operation in the U.S. These engines are a major source of air pollution, particularly emissions of nitrogen oxides (NOX) and particulate matter (PM). Diesel exhaust also contains sulfur, which contributes to sulfur oxide (SOX) emissions.
EPA regulations require stringent emissions standards for new diesel engines and cleaner fuels used by these engines. However, diesel engines on existing equipment will not be subject to the new regulations, yet they may remain in operation for another 25 to 30 years. Fortunately, there are many options available for reducing emissions from existing diesel engines. EPA's National Clean Diesel Campaign provides information on advanced technologies to control emissions as well as other options such as cleaner fuels, idle control, and equipment maintenance strategies. For more information, please see: http://www.epa.gov/cleandiesel/construction/. For information on low-cost strategies, see http://www.epa.gov/sectors/construction/.

1. Climate Change and Air Pollution Control: Environmental aspects of and controls on Contractor operations related to climate change include Greenhouse Gas (GHG) emissions associated with construction equipment. Environmental aspects of and controls on Contractor operations related to criteria air pollutants include particulate matter (PM) and nitrogen oxides (NOx) emissions associated with construction equipment.
   a. Impact Documentation:
      1) Construction Equipment- General: Document number, type of construction equipment, type of technology applied, model year,

and year the emission reduction action occurs. Document fuel type and fuel efficiency for each.

a) For diesel powered equipment, indicate number and type of construction equipment that utilizes emission control technologies complying with 2008 pollution requirements for new diesel engines.

SPECIFIER NOTE:
The Greenhouse Gas Protocol Initiative (GHG Protocol) aims at harmonizing GHG accounting and reporting standards internationally to ensure that different trading schemes and other climate related initiatives adopt consistent approaches to GHG accounting. The GHG Protocol is a broad international coalition of businesses, non-governmental organizations (NGOs), government and inter-governmental organizations. It operates under the umbrella of the World Business Council for Sustainable Development (WBCSD) and the World Resources Institute (WRI), and brings together leading experts on greenhouse gas emissions to develop internationally accepted accounting and reporting standards. Refer to http://www.ghgprotocol.org/templates/GHG5/layout.asp?MenuID=849.
The GHG Protocol calculator addresses CO2 from mobile combustion; refer to: http://www.ghgprotocol.org/templates/GHG5/layout.asp?type=p&MenuId=OTAx.
The Climate Leaders protocols addresses not only CO2, but also CH4, N2O, and HFCs.
The EPA Climate Leaders program (http://www.epa.gov/climateleaders/index.html) is a corporate-level voluntary reporting program whereby corporations establish a goal and then inventory their emissions as a way to track progress towards achieving their goal. The inventory guidance for calculating corporate level emissions are based on the WRI/WBCSD GHG Protocol, although slight modifications may be made to reflect the specific objectives of the Climate Leaders Program. Climate Leaders also strives to ensure that the default emission factors presented in the Climate Leaders Guidance are consistent with the emission factors that EPA uses in the Inventory of U.S. GHG Emissions and Sinks.
Climate Leaders has a guidance document for estimating GHG emissions from mobile combustion applicable to off-road- refer to: http://www.epa.gov/climateleaders/docs/mobilesourceguidance.pdf

2) GHG emissions: Document estimated GHG emissions of equipment used on the project. Calculate GHG emissions from mobile combustion in accordance with the EPA Climate Leaders protocols http://www.epa.gov/climateleaders/resources/ Indicate quantity of fuel by type used and provide estimate for comparison to industry standard.

SPECIFIER NOTE:
The USGBC is developing a draft for a Clean Diesel LEED Credit. The intent of the credit is to reduce particulate matter (PM) and nitrogen oxides (NOx) emissions from diesel construction equipment. The draft requirements include: employing an idle reduction policy, implementing a preventative maintenance plan, utilizing the cleanest diesel fuel available (such as ultra-low sulfur diesel) and either reducing PM from 90% of all diesel engines onsite by an average minimum of 20% (50% for an additional credit) or using equipment meeting EPA's most stringent emissions standards at the time in 50% of all diesel engines onsite.
EPA and the California Air Resources Board (CARB) have retrofit technology verification programs that evaluate the emissions performance of advanced emissions control technologies and engine rebuild kits. A list of EPA verified technologies is available at: http://www.epa.gov/otaq/retrofit/verif-list.htm . CARB's verification program can be found at: http://www.arb.ca.gov/diesel/verdev/verdev.htm.

3) Air Pollution Control: Document the current emissions of the equipment. Calculate the emissions reduced with the selected option applied to the equipment in accordance with the Diesel Emissions Quantifier (www.epa.gov/cleandiesel) protocols. Indicate the change in emissions.

SPECIFIER NOTE:

EPA's Office of Compliance publishes the Managing Your Environmental Responsibilities: A Planning Guide for Construction and Development (the MYER Guide). This assistance tool reflects significant input from stakeholders and is a product of joint effort by the industry, states, other federal agencies, non-governmental organizations and EPA. The MYER Guide contains self-audit checklists and detailed discussion/case studies on major environmental areas affecting the construction industry. It is designed to help the construction industry understand which environmental regulations apply to them, and it can be used during different phases of a construction project.

2. Water Stewardship: Environmental aspects of and controls on Contractor operations related to water stewardship include quantity and quality of discharges to surface water and ground water.
   a. Impact Documentation: Document compliance with requirements of the National Pollutant Discharge Elimination System (NPDES) and/or the State Pollutant Discharge Elimination System (SPDES). **[Provide copy of Contractor's completed MYER Guide Stormwater Self-Audit Checklist.] [Provide copy of Contractor's completed MYER Guide Dredge And Fill/Wetlands (Section 404) Self-Audit Checklist.]**

SPECIFIER NOTE:
The MYER guide includes abatement checklists for asbestos and lead removal. If project includes abatement requirements, edit as appropriate to include abatement checklists.

3. Toxicity: Environmental aspects of and controls on Contractor operations related to toxicity include activities that may contaminate the site and that may impact the IAQ of the project.
   a. Impact Documentation: Document compliance with requirements of Section 01 57 19.13 (01354) – Environmental Management. **[Provide copy of Contractor's completed MYER Guide Oil Spill Prevention Self-Audit Checklist.]** Document compliance with requirements of Section 01 57 19.11 (01352) – Indoor Air Quality (IAQ) Management.

4. Habitat Loss: Environmental aspects of and controls on Contractor operations related to habitat loss include activities that may affect the health of ecosystems.
   a. Impact Documentation: Document limits of site disturbance. Document plant communities and wildlife habitats. Include site plan and construction progress photographs. Provide area calculations for: total area of site, area of construction operations, area remaining undisturbed by construction operations, and area restored to native habitat.
5. Resource Conservation: Environmental aspects of and controls on Contractor operations related to resource conservation include use of construction materials and management of construction and demolition debris.
   a. Impact Documentation: Document compliance with requirements of Section 01 74 19 (01351) – Waste Management.

1.5 CONTINUAL IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE AFTER CONSTRUCTION

SPECIFIER NOTE:
Operation and Maintenance affects environmental quality, including durability and performance efficiencies. In order to facilitate continual improvement of environmental quality after construction – during the operation and maintenance of the building – it is helpful to develop a baseline of environmental aspects and impacts.
Where green building rating programs are utilized, they may help establish a useful baseline.
ASTM E2432 provides guidance on sustainability relative to buildings, including the concept of continual improvement.

A. Establishing Baseline: Consistent with ASTM E2432 statement of continual improvement, develop a baseline of the building**[s]** for use by Owner in Owner's facility

EMS and in support of continual improvement of environmental performance. Acceptable baseline shall include:

SPECIFIER NOTE:
GBI – Green Globes™ offers an online and interactive rating tool for builders to assess their environmental performance and to track continual improvement. Green Globes for Design/New Construction assesses design and projected performance. Green Globes for Continual Improvement of Existing Buildings uses an online rating system to create a baseline of actual performance. Based on results, it provides recommendations for continual improvement and the means to track progress. Refer to http://www.thegbi.org/greenglobes/continualimprovement.asp.

1. **[GBI - Green Globes for Continual Improvement: Determine building rating (Design/New Construction), input actual performance data into online tracking tool for subsequent use by Owner.]**

SPECIFIER NOTE:
USGBC – LEED® NC (new construction) documents the projected environmental performance of a new building during construction and at the time construction is complete. USGBC also has a LEED tool for Existing Buildings (LEED-EB). These tools can be used to track and plan for the continual improvement of buildings.

2. **[USGBC-LEED: Determine building rating and forward documentation to Owner.]**

SPECIFIER NOTE:
GSA requires completed new buildings to apply for the ENERGY STAR Building Label within one year after reaching 95 percent occupancy. Refer to December 13, 2002 Memorandum for all Real Property Leasing Activities for additional information.
If design achieves a rating of 75 or higher, provide Statement of Energy Design Intent (SEDI) generated from Target Finder to document results. Architect of Record submits the SEDI to EPA and receives the "Designed to Earn the ENERGY STAR" graphic to place on drawings to show that the energy use for the design is projected to meet EPA criteria for energy efficiency

3. **[EPA Energy Performance Rating: Provide ENERGY STAR target using EPA Target Finder. Use Target Finder to rate estimated energy use for the completed design.]**

4. **[xxxx]**.

B. Baseline Documentation:
   1. Baseline Data: Provide data on environmental performance of building at time of construction complete in accordance with green building rating program indicated.
   2. Instructions for Use: Provide instructions for **[annual] [biannual] [periodic] [xxxx]** updates of environmental performance of building. Where baseline utilizes online tool, include instructions for access.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION