

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; the six digit section number cited is per CSI Masterformat™ 2004 and the five digit section number cited parenthetically is per CSI Masterformat™ 1995.

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SECTION 01 74 19 (SECTION 01351) – CONSTRUCTION WASTE MANAGEMENT

SPECIFIER NOTE:

This section includes requirements for waste management. This section represents data quality objectives and waste management consistent with ASTM D5792 for typical commercial construction. This section does not address environmental remediation, abatement, regulatory requirements, or requirements for environmental impact statements/reports. Edit to suit location and project.

EPA provides a Waste Reduction Model (WARM) to help solid waste planners and organizations track and voluntarily report greenhouse gas emissions reductions from several different waste management practices, including landfilling, recycling, incineration, composting, and source reduction.

EPA GreenScapes provides a Recycling and Reusing Landscape Waste Cost Calculator that estimates the cost and environmental benefits of four scenarios for handling hardscape and landscape wastes (concrete and asphalt, brick, lumber, and yard waste):

- Reusing all waste possible on-site, then recycling all waste possible that cannot be reused, and then disposing of waste remaining;
- Reusing all waste possible and disposing of waste remaining;
- Recycling all waste possible and disposing of waste remaining; and
- Disposing of all waste materials.

The calculator demonstrates that recycling and reusing landscape waste can offer significant savings compared to disposal, depending on a facility's material needs and proximity to recycling facilities. The calculator also estimates the environmental impacts avoided by reusing and recycling landscape materials instead of landfilling them as waste.

<http://www.epa.gov/epawaste/consERVE/rrr/greenscapes/tools/index.htm>

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Special requirements for waste management during **[deconstruction,] [renovation,]** construction operations.
 - a. Protect the environment, both on-site and off-site, during **[deconstruction,] [renovation,]** and construction operations.
 - b. Prevent environmental pollution and damage.
 - c. Maximize source reduction, reuse and recycling of solid waste.

B. Related Sections:

1. 01 30 00 (01300) - Administrative Requirements: Environmental Manager and Contractor training requirements.
2. 01 40 00 (01400) – Quality Requirements: Meetings and project coordination.
3. 01 78 53 (01780) – Sustainable Design Close-Out Documentation.
4. 02 41 13 (02220) – Selective Site Demolition

1.2 DEFINITIONS

- A. Definitions pertaining to sustainable development: As defined in ASTM E2114.

- B. Deconstruction: Disassembly of buildings for the purpose of recovering materials.

1.3 QUALITY ASSURANCE

- A. Maximize use of source reduction and recycling procedures.

SPECIFIER NOTE:

EO 13423 includes requirements for Federal Agencies to promote solid waste diversion and recycling programs in its facilities

Specifically, under the Sustainable Building requirements per Guiding Principle #5 Reduce Environmental Impact of Materials, EO13423 directs Federal agencies to “identify local recycling and salvage operations that could process site related waste” and, to “recycle or salvage at least 50 percent construction, demolition and land clearing waste, excluding soil, where markets or onsite recycling opportunities exist.”

Executive Order 13514; *Federal Leadership in Environmental, Energy, and Economic Performance*; was signed on October 5, 2009. <http://www.ofee.gov/execorders.asp> It expands upon the environmental performance requirements of EO 13423.

http://www1.eere.energy.gov/femp/regulations/printable_versions/eo13423.html

EO 13514 sets numerous Federal requirements in several areas, including:

- Divert at least 50% of non-hazardous solid waste by the end of fiscal year 2013.
- Increase the diversion of compostable and organic material from the waste stream.

Green building rating systems typically include strategies to reduce construction waste. USGBC-LEED™ v3, for example, includes credits for diversion of waste at 50 percent and at 75 percent by weight or volume. Recycling excavated soil and site debris are not recognized under the LEED program.

Green Globes – US also provides points for a construction, demolition, and renovation waste management plan.

- B. Diversion Goals: A minimum **[50] [75] [xxxx]** percent by weight of total project solid waste to be diverted from landfill.

1.4 PRECONSTRUCTION MEETING

- A. After award of Contract and prior to the commencement of the Work, schedule and conduct meeting with Owner and Architect to discuss the proposed Waste Management Plan and to develop mutual understanding relative to details of environmental protection.
1. Coordinate deconstruction with work of Section 02 41 13 (02220).

1.5 SUBMITTALS

- A. Solid Waste Management Plan: Not less than 10 days before the Pre-construction meeting, prepare and submit a Solid Waste Management Plan including, but not limited to, the following:
1. List of the recycling facilities, reuse facilities, municipal solid waste landfills and other disposal area(s) to be used. Include:
 - a. Name, location, and phone number.
 - b. Copy of permit or license for each facility.
 2. Identify materials that cannot be recycled or reused. Provide explanation or justification.
 3. Revise and resubmit Plan as required by Owner.
 - a. Approval of Contractor’s Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations.
- B. Progress Documentation: Document solid waste disposal and diversion. Include the quantity by weight of waste generated; waste diverted through sale, reuse, or recycling; and waste disposed by landfill or incineration. Identify landfills, recycling centers, waste processors, and other organizations that process or receive the solid waste.

1. Document on form in Appendix A of this Section, or similar form as approved by Owner.
2. With each Application for Payment, submit updated Documentation for solid waste disposal and diversion.
3. With each Application for Payment, submit manifests, weight tickets, receipts, and invoices specifically identifying the Project and waste material.

SPECIFIER NOTE:

EO 13423 directs Federal agencies to "provide reports on agency implementation of this order to the Chairman of the Council [on Environmental Quality] on such schedule and in such format as the Chairman of the Council may require; and ... provide information and assistance to the Director of the Office of Management and Budget, the Chairman of the Council, and the Federal Environmental Executive.

Refer to <http://www.wbdg.org/sustainableEO>

Additionally, under the Sustainable Building requirements per Guiding Principle #2 Optimize Energy Performance, EO 13423 directs Federal agencies to "Enter data and lessons learned from sustainable buildings into the High Performance Buildings Database." <http://femp.buildinggreen.com/>

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http://www1.eere.energy.gov/femp/regulations/printable_versions/eo13423.html

EO 13514 sets numerous Federal requirements in several areas, including:

- Federal agency heads must designate a senior management official to serve as Senior Sustainability Officer accountable for agency conformance, reporting to the Chair of the Council on Environmental Quality (CEQ) and the Director of the Office of Management and Budget (OMB). The Senior Sustainability Officer shall prepare targets for agency-wide reductions in 2020 for greenhouse gas (GHG) emissions and shall prepare and submit a multi-year Strategic Sustainability Performance Plan.
- Agency efforts and outcomes in implementing EO 13514 must be transparent and disclosed on publicly available Federal Web sites.
- OMB must prepare scorecards providing periodic evaluation of Federal agency performance. Scorecard results must be published on a publicly available Web site.

Documentation of environmental procedures can assist in required Agency reports.

- C. Record Submittals: With Record Submittals as specified in Section 01 78 53 (01780), submit the following:
 1. Summary of solid waste disposal and diversion. Submit on form in Appendix A of this Section, or similar form as approved by Owner.

PART 2 - PRODUCTS

PART 3 EXECUTION

3.1 SOLID WASTE MANAGEMENT

- A. Develop and implement a waste management program in accordance with ASTM E1609 and as specified herein.
- B. Collection: Implement a recycling/reuse program that includes separate collection of waste materials of the following types as appropriate to the project waste and to the available recycling and reuse programs in the project area:
 1. Land clearing debris.
 2. Asphalt.
 3. Concrete and Masonry.
 4. Metal.
 - a. Ferrous.

5. Wood, nails and staples allowed.
6. Debris.
7. Glass, colored glass allowed.
8. Paper.
 - a. Bond.
 - b. Newsprint.
 - c. Cardboard and paper packaging materials.
9. Plastic.
10. Ceiling Tiles

SPECIFIER NOTE:

Plastics reclaimed during construction are typically packaging materials. Depending on the recycling facilities servicing the project, it may or may not be necessary to separate plastic materials by type.

Society of Plastic Inc. resin codes are easily recognized by the consumer. These are the numerical designations within chasing arrows. At the present time there is not a separate resin code for PLA (bio-resins). PLA (bio-resins) are classified as #7 (Other). Nor are there specific indications for additives or blends. The Society of Plastics resin code symbols are common for plastic packaging materials; for example:



ASTM D1972 standard specifies a resin code that provides substantially more information regarding the plastic resin, including blends and additives. ASTM D1972 labeling protocols are not common for packaging materials; however, they are recognized and utilized in the construction industry and other industry sectors. Many construction products are labeled according to ASTM D1972. Such detailed information is anticipated to be necessary data for future deconstruction (and recycling) efforts. Therefore, plastic construction products and plastic components of assemblies should be labeled in accordance with ASTM D1972. Example for a polypropylene containing 30 mass percentage of mineral powder use:

>PP-MD30<

If construction includes deconstruction and reclamation of plastic construction products, it may be necessary to sort plastics according to ASTM D1972 designations. Edit to suit project.

- a. Type 1: Polyethylene Terephthalate (PET, PETE).
 - b. Type 2: High Density Polyethylene (HDPE).
 - c. Type 3: Vinyl (Polyvinyl Chloride or PVC).
 - d. Type 4: Low Density Polyethylene (LDPE).
 - e. Type 5: Polypropylene (PP).
 - f. Type 6: Polystyrene (PS).
 - g. Type 7: Other. Use of this code indicates that the package in question is made with a resin other than the six listed above, or is made of more than one resin listed above, and used in a multi-layer combination.
10. Gypsum.
 11. Non-hazardous paint and paint cans.
 12. Carpet.
 13. Insulation.
 14. Others as appropriate.

SPECIFIER NOTE:

Identify local recycling centers and waste haulers. Sources for this information include state solid waste offices and environmental protection agency (EPA) regional offices - waste management division. List centers that accept material identified above for recycling/reuse.
The following are examples.

- C. Recycling/Reuse: Maximize recycling and reuse of materials.
 - 1. Recycling/Reuse on project site: **[Coordinate with Architect.] [As indicated on Drawings.] [Items to be reused include: xxxx.]**
 - 2. Recycling/Reuse off project site: The following is a partial list for Contractor's information only. For more information, contact the State Department of Environmental Quality and the local Integrated Solid Waste Management Office.
 - a. Habitat for Humanity, a non-profit housing organization that rehabilitates and builds housing for low-income families. Sites requiring donated materials vary. Contact the national hotline (800) HABITAT.
 - b. Materials For The Arts (MFA) sponsored by the Department of Cultural Affairs. MFA is a materials exchange that accepts waste and excess materials from private donors and distributes them to various non-profit art organizations throughout the City. **Contact xxxxxxxxxxxxxxxx.**
 - c. Michigan Department of Environmental Quality; 517-373-1322.
 - d. Michigan Recycling Coalition (MRC). The MRC is an organization whose members consist of recycling coordinators and professionals in Michigan; 517-485-WRIN (9746) or 517-371-7073.
 - e. California Materials Exchange (CAL-MAX) Program sponsored by the California Integrated Waste Management Board; (916) 255-2369.
- D. Handling:
 - 1. Clean materials that are contaminated prior to placing in collection containers. Deliver materials in accordance with recycling or reuse facility requirements (e.g., free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to recycling process).
 - 2. Arrange for collection by or delivery to the appropriate recycling or reuse facility.
 - 3. Hazardous Waste and Hazardous Materials: Handle in accordance with applicable regulations. Coordinate with Section 01 41 00 (01411).

SPECIFIER NOTE:

Avoid composting diseased vegetation and animal waste (from carnivorous animals) in situ. Because the operations of commercial composting facilities are monitored and controlled to maintain the high temperatures required in the thermophillic phase of composting (the thermophillic phase of the average residential composting pile is only 4 - 7 days and relies on thermophillic bacteria that function at 104 degrees -170 degrees F and that are extremely efficient at processing compostables) commercial composting can accept diseased vegetation and, in many cases, all types of animal waste. However, composting in situ is not generally so well controlled. If temperatures in the pile do not get hot enough to kill the undesirable organisms, those organisms can re-infest new vegetation when the compost is applied.

- E. Composting: In accordance with State Extension Service recommendations and as follows:
 - 1. Moisture content: Maintain between 35 percent and 60 percent.
 - 2. Carbon to nitrogen (C/N) ratio: Maintain at approximately 30 to 1 by weight.
 - 3. Do not compost meat or dairy products on site.

SPECIFIER NOTE:

Changes to the material properties of a plastic within a compost unit can affect the degradation of other materials and the resulting composition and appearance of the composed material. Edit below to suit location and project.

- 4. Where the proposed Waste Management Plan incorporates composting of plastics, assess the potential effect of each type of plastic to be included on the composting process in accordance with ASTM D6002.

END OF SECTION

SPECIFIER NOTE:
 The summary below identifies those material categories represented in the federal Construction Waste Management Database. The Database contains information on companies that haul, collect and process recyclable debris from construction projects. Created in 2002 by GSA's Environmental Strategies and Safety Division to promote responsible waste disposal, the Database is a free online service for those seeking companies that recycle construction debris in their area. Recyclers of construction and demolition waste may list their services in the Database at no charge. Refer to: www.wbdg.org/tools/cwm.php
 The summary below is listed in alphabetical order, consistent with the federal Database. Edit list as appropriate to project.

Appendix A

SUMMARY OF SOLID WASTE DISPOSAL AND DIVERSION

Project Name: _____ Project Number: _____

Contractor Name: _____ License Number: _____

Contractor Address: _____

Solid Waste Material	Date Material Disposed/ Diverted	Amount Disposed/ Diverted (ton or cubic yard)	Municipal Solid Waste Facility (name, address, & phone number)	Recycling/ Reuse Facility (name, address, & phone number)	Comments (if disposed, state why not diverted)
Appliances					
Asphalt					
Cardboard					
Carpet					
Concrete					
Gypsum Drywall					
Land Clearing/Soil					
Masonry					
Metals: Ferrous					
Metals: Non-ferrous					
Mixed/Co-mingled Waste					
Plastic					
Roofing: Asphalt-based					
Roofing: EPDM					
Salvaged/Surplus Materials for Reuse					
Wood: Landclearing Debris					
Wood: Scrap Lumber					
Ceiling Tiles					
Other:					

Whole Building Design Guide
Federal Green Construction Guide for Specifiers

Signature: _____ Date: _____