

FINAL DRAFT

Bid Specifications for Construction Waste Management and Recycling Services

**Dubuque County Historical Society
Mississippi River Discovery Center
Dubuque, Iowa**

July 2001

**DOCUMENT 00120
SUPPLEMENTARY INSTRUCTIONS TO BIDDERS:
CONSTRUCTION MATERIALS COLLECTION
AND RECYCLING SERVICES**

PART 1 GENERAL

DESCRIPTION

- A. The Owner requires the Waste Collection and Recycling Services Provider (Recycler) to efficiently collect and recycle construction materials from the Mississippi River Discovery Center (MRDC) Project. Efficient collection and recycling aspects to be considered for this Project include:
 - 1. Use of collection and handling systems that generate the highest value for materials recovered.
 - 2. Waste collection and recycling plan that recovers 70 percent or more of project waste materials.
 - 3. Full-cost accounting and tracking of all waste materials collected from project.
 - 4. Disposal of all non-recyclable waste materials in the Dubuque Metropolitan Landfill.

- B. The Recycler is encouraged to recommend additional recycling and resource efficient methods not mentioned in this document.

RELATED SECTIONS

- A. The following Documents and Sections describe specific areas where recycling and resource efficiency is to be incorporated into the Project.
 - 1. Section 01010 - Waste Management Summary of Work
 - 2. Section 01031 - Waste Management/Recycling Alternates
 - 3. Section 01060 - Waste Management Regulatory Requirements
 - 4. Section 01094 - Definitions
 - 5. Section 01200 - Waste Management Project Meetings
 - 6. Section 01300 - Submittals
 - 7. Section 01410 - Quality Control
 - 8. Section 01501 - Construction Site Pollution Prevention
 - 9. Section 01505 - Construction Waste Management
 - 10. Section 01780 - Contract Close-out

COST INFORMATION

- A. Cost information is to be provided by the Recycler in the "Waste Management Plan," described in Section 01505 - Construction Waste Management, for the following:
 - 1. Waste Disposal
 - 2. Recycling

EVALUATION OF WASTE MANAGEMENT & RESOURCE EFFICIENCY

- A. Evaluation of efficient collection and management of waste materials from the MRDC Project will be based on the specific goals stated below:
 - 1. Reuse, recycling and/or salvaging of 70 percent of MRDC project construction materials.
 - 2. Track all data on materials reused, recycled, salvaged and landfilled.
 - 3. Provide monthly reports on waste management and resource recovery efforts.
 - 4. Show a net savings in avoided disposal costs.

PART 2 MATERIALS AND PRODUCTS

A. At a minimum the following MRDC Project materials should be targeted for recovery:

1. Concrete
2. Cardboard
3. Metals (ferrous & non-ferrous)
4. Gypsum wallboard
5. Wood/Lumber (untreated)
6. Plastics (PET, HDPE)

PART 3 EXECUTION

- A. The Contractor will make an effort to generate the least amount of waste possible. The Contractor will ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors will be minimized.
- B. In an effort to minimize the amount of waste generated, the Contractor will employ existing company waste minimization techniques or the following techniques:
1. Source Separation.
 2. Return.
 3. Reuse and Salvage.
 4. Recycling.

END OF DOCUMENT 00120

**DIVISION 1
GENERAL REQUIREMENTS**

**SECTION 01010
WASTE MANAGEMENT SUMMARY OF WORK**

PART 1 – GENERAL

COORDINATION

- A. Waste Material Coordination: The Recycler shall coordinate disposal and recycling of materials with Contractor as required to conform to the Construction Waste Management Plan defined in Section 01505.

MEETINGS

- A. Contractor shall conduct Construction Waste Management meetings as outlined in Section 01200 - Waste Management Project Meetings. At a minimum, waste management goals and issues shall be discussed at the following meetings.
 - 1. Pre-bid meeting.
 - 2. Pre-construction meeting.
 - 3. Regular job-site meetings.
 - 4. Job safety meetings.

END OF SECTION 01010

**SECTION 01031
WASTE MANAGEMENT/RECYCLING ALTERNATES**

PART 1 - GENERAL

SUMMARY: ALTERNATE BIDS

- A. It is intended that references in the Bid Forms to "Waste Management/Recycling Alternate Bid" shall refer directly to this Section. Information included is provided for use of the bidders in completing their Bid Proposals and will not be repeated on the Bid Forms.

SCHEDULE OF ALTERNATES

- A. For each Waste Management/Recycling Alternate proposed, describe the recommended method for proper disposal of materials to be recycled or disposed of included in the Waste Management/Recycling Alternate.
- B. For each Waste Management/Recycling Alternate proposed, provide a waste management plan with the Bid. **SEE APPENDIX B FOR A SAMPLE WASTE MANAGEMENT PLAN FORM.**

END OF SECTION 01031

**SECTION 01060
WASTE MANAGEMENT
REGULATORY REQUIREMENTS**

PART 1 GENERAL

The Recycler shall be responsible for knowing and complying with regulatory requirements - Federal, State and Local - pertaining to legal disposal of all construction waste materials.

END OF SECTION 01060

SECTION 01094 DEFINITIONS

PART 1 GENERAL

WASTE MANAGEMENT DEFINITIONS

Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

Hazardous: Exhibiting the characteristics of hazardous sub-stances, i.e., ignitability, corrosivity, toxicity or reactivity.

Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitability, corrosivity, toxicity, or reactivity.

Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

Recycle: To remove a waste material from the Project site to another site for remanufacture into a new product for reuse by others.

Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

Return: To give back reusable items or unused products to vendors for credit.

Reuse: To reuse a construction waste material in some manner on the Project site.

Salvage: To remove a waste material from the Project site to another site for resale or reuse by others.

Sediment: Soil and other debris that has been eroded and trans-ported by storm or well production run-off water.

Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

Toxic: Poisonous to humans either immediately or after a long period of exposure.

Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

Volatile Organic Compounds (VOCs): Chemical compounds common in and emitted by many building products over time through outgassing: solvents in paints and other coatings; wood preservatives; strippers and household cleaners; adhesives in particleboard, fiberboard, and some plywoods; and foam insulation.

When released, VOCs can contribute to the formation of smog and can cause respiratory tract problems, headaches, eye irritations, nausea, and damage to the liver, kidneys, and central nervous system, and possibly cancer.

Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, return-able, recyclable, and reusable material.

Waste Management Plan: A Project-related plan for the collection, transportation, and disposal of the waste generated at the construction site. The purpose of the plan is to ultimately reduce the amount of material being landfilled.

END OF SECTION 01094

**SECTION 01200
WASTE MANAGEMENT
PROJECT MEETINGS**

PART 1 GENERAL

CONSTRUCTION WASTE MANAGEMENT MEETINGS

- A. Recycler shall either conduct separate construction waste management meetings or discuss waste management goals and issues as part of the following regular meetings:
 - 1. Pre-bid meeting.
 - 2. Pre-construction meeting.
 - 3. Pre-fabrication meeting.
 - 4. Regular job-site meetings.
 - 5. Job safety meetings.
 - 6. Special Construction Waste Management meetings.
- B. Pre-Bid Meeting: The Owner requires, as part of the pre-bid meeting with all interested bidders prior to the Bid Date, a discussion of waste management goals established for the Project as outlined in Section 01505 - Construction Waste Management.
- C. Pre-Construction Meeting: Recycler shall include discussions on waste management requirements per Section 01505- Construction Waste Management in the pre-construction meeting.
- D. Pre-Fabrication Meeting: Recycler shall include discussions on waste management goals and requirements per Section 01505 –Construction Waste Management in all pre-fabrication meetings conducted with subcontractors or fabricators.
- E. Regular Job Meetings: Recycler shall include discussions on waste management requirements per Section 01505 –Construction Waste Management in the regular job meetings conducted during the course of the Project.
- F. Job Safety Meetings: Recycler shall include discussions on waste management requirements per Section 01505 – Construction Waste Management in the job safety meetings.

END OF SECTION 01200

**SECTION 01300
SUBMITTALS**

PART 1 GENERAL

SUBMITTALS

- A. Refer to Section 01505-Construction Waste Management for special submittal requirements.

CERTIFICATES

- A. Recycler shall submit a Summary of Solid Wastes Collected, weight tickets, in accordance with requirements of Section 01505 – Construction Waste Management.

END OF SECTION 01300

SECTION 01410 QUALITY CONTROL

PART 1 GENERAL

PROJECT / SITE CONDITIONS

- A. Field Measurements: Contractor is to verify that field measurements are as indicated on construction and/or shop drawings before confirming product orders or proceeding with work, in order to minimize waste due to excessive materials.

PACKING AND SHIPPING

- A. Shipping: Contractor shall coordinate the schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- B. Packing: Contractor shall arrange for the return of packing materials, such as wood pallets, where economically feasible.

PREPARATION

- A. Storage and Protection: Contractor shall designate receiving/storage areas for incoming material to be delivered according to installation schedule and to be placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Contractor shall store and handle materials in a manner as to prevent loss from weather and other damage. Keep materials, products, and accessories covered and off the ground, and store in a dry, secure area.
- C. Contractor shall prevent contact with material that may cause corrosion, discoloration, or staining.
- D. Contractor shall protect all materials and installations from damage by the activities of other trades.

INSTALLATION

- A. Contractor shall install product(s) per manufacturer's recommendations or accepted practices to reduce damage to or waste of materials by required replacement.

WASTE MANAGEMENT

- A. Source separation: Contractor shall separate, store, protect, and handle at the site identified recyclable and salvageable waste products in order to prevent contamination of materials and to maximize recyclability and salvageability of identified materials. Refer to the Waste Management Plan in Section 01505.
- B. Return: Contractor shall set aside and protect misdelivered and substandard products and materials and return to supplier for credit.
- C. Reuse and Salvage: Contractor shall set aside, sort, and protect separated products and materials for collection, reuse on site or off-site, and salvage by materials exchange or consult with Dubuque Metropolitan Area Solid Waste Agency to identify reuse options.
- D. Recycling: Recycler shall Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials. Refer to the Waste Management Plan in Section 01505.

END OF SECTION 01410

**SECTION 01501
CONSTRUCTION SITE
POLLUTION PREVENTION**

PART 1 GENERAL

NOISE, DUST, AND POLLUTION CONTROL

- A. Refer to Section 01505 - Construction Waste Management. In addition, comply with Owner's and local requirements for noise, dust, and pollution control.

BARRIERS AND ENCLOSURES

- A. Materials: Contractor shall reuse project construction waste materials, or provide materials for barriers and enclosures which are nonhazardous, recyclable, or reusable to the maximum extent possible.
 - 1. Barricades and Enclosures: Provide enclosures around piles of separated materials pursuant to the Waste Management Plan described in Section 01505 - Construction Waste Management.
 - 2. Locate enclosures out of the way of construction traffic. Provide adequate space for pick-up and delivery and convenience to subcontractors.

CLEANING

- A. Contractor shall control accumulation of waste materials and trash. Recycle or dispose of at locations approved by the Owner and in compliance with waste management procedures specified in Section 01505.
- B. Cleaning materials: Contractor shall use cleaning materials that are Nonhazardous and biodegradable, whenever possible.

PROTECTION

- A. After installation, Contractor shall provide coverings to protect products from damage due to traffic and construction operations. Remove coverings when no longer needed.
 - 1. Save plastic covering. At completion of Project, reuse if practical; if not, then recycle if local market exists.

END OF SECTION 01501

SECTION 01505 CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

REQUIREMENTS INCLUDED IN THIS SECTION

- A. Waste Management Goals.
- B. Waste Management Plan.
- C. Management Plan Implementation.
- D. Special Programs.

RELATED SECTIONS

- A. Document 00120-Supplementary Instructions to Bidders-Construction Materials Collection and Recycling Services.
- B. Section 01010 - Waste Management Summary of Work.
- C. Section 01031 - Waste Management / Recycling Alternates.
- D. Section 01060 - Waste Management Regulatory Requirements.
- E. Section 01094 - Definitions.
- F. Section 01200 - Waste Management Project Meetings.
- G. Section 01300 - Submittals.
- H. Section 01410 - Quality Control.
- I. Section 01501 - Construction Site Pollution Prevention.
- J. Section 01505 - Construction Waste Management.
- K. Section 01780 - Contract Close-out.

WASTE MANAGEMENT GOALS

- A. The Owner has established that this Project shall generate the least amount of waste possible and that processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors shall be employed.
- B. Of the inevitable waste that is generated, 70 percent or more of the waste materials as economically feasible shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized.
- C. With regard to these goals the Recycler shall develop, for the Owner's review and approval, a Waste Management Plan for this Project.

WASTE MANAGEMENT PLAN

- A. Draft Waste Management Plan: Recycler shall submit to the Owner a Waste Management Plan. **SEE APPENDIX B FOR A SAMPLE WASTE MANAGEMENT PLAN.**

At a minimum, the Waste Management Plan shall contain the following:

- 1. Analysis of the proposed jobsite waste to be collected.
- 2. Landfill options: The name of the landfill(s) where trash will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all Project waste in the landfill(s).
- 3. Alternatives to Landfilling: A list of each material proposed to be salvaged, reused, or recycled during the course of the Project, the proposed local market for each material, and the estimated net cost savings or additional costs resulting from separating and recycling (versus landfilling) each material. **SEE APPENDIX A - PREPARING ESTIMATES ON RECYCLING.**

"Net" means that the following have been subtracted from the cost of separating and recycling: (a) revenue from the sale of recycled or salvaged materials and (b) landfill tipping fees saved due to diversion of materials from the landfill. The list of these materials is to include, at minimum, the following materials:

- a. Corrugated cardboard.
- b. Clean dimensional wood.
- c. Plastic.
- d. Concrete.
- e. Stone.
- f. Concrete Masonry Units (CMU).

- g. Metals (ferrous/non-ferrous) and metal banding from, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
 4. Meetings: A description of the regular meetings to be held to address waste management. Refer to Section 01200 – Waste Management Project Meetings.
 5. Materials Handling Procedures: A description of the means by which any waste materials identified in item (3) above will be protected from contamination, and a description of the means to be employed in recycling the above materials consistent with requirements for acceptance by designated facilities.
 6. Transportation: A description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site) and destination of materials.
- B. Resources for Development of Waste Management Plan: The following sources may be useful in developing the Waste Management Plan:
1. Recycling Haulers and Markets: APPENDIX C contains local haulers and markets for recyclable materials. This list is provided for information only and is not necessarily comprehensive; other haulers and markets are acceptable.
 2. Recycling Economics Information: APPENDIX A contains information that may be useful in estimating the costs or savings or recycling options.

WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Documentation: The Recycler shall be responsible for documenting results of the Waste Management Plan for the Project.
- B. Distribution: The Recycler shall distribute copies of the Waste Management Plan to the Job Site Foreman, each Subcontractor, the Owner, and the Architect.
- C. Instruction: The Contractor shall provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all subcontractors at the appropriate stages of the Project.
- D. Separation facilities: The Recycler shall lay out and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, and return. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.
- E. Hazardous wastes: Hazardous wastes shall be separated, stored, and disposed of according to local regulations.
- F. Application for Progress Payments: The Recycler shall submit with each Application for Progress Payment a Summary of Waste Generated by the Project. Failure to submit this information shall render the Application for Payment incomplete and shall delay Progress Payment. The Summary shall be submitted on a form acceptable to the Owner [SEE APPENDIX B] and shall contain the following information:
 1. The amount (in tons or cubic yards) of material landfilled from the Project, the identity of the landfill, the total amount of tipping fees paid at the landfill, and the total disposal cost. Include manifests, weight tickets, receipt, and invoices.
 2. For each material recycled, reused, or salvaged from the Project, the amount (in tons or cubic yards), the date removed from the jobsite, the receiving party, the transportation cost, the amount of any money paid or received for the recycled or salvaged material, and the net total cost or savings of salvage or recycling each material. Attach manifests, weight tickets, receipts, and invoices.

SPECIAL PROGRAMS

- A. The Contractor shall be responsible for final implementation of programs involving tax credits or rebates or similar incentives related to recycling, if applicable to the Project.
- B. Revenues or other savings obtained for recycling or returns shall accrue to the Recycler.

END OF SECTION 01505

**SECTION 01780
WASTE MANAGEMENT
CONTRACT CLOSE-OUT**

PART 1 GENERAL

FINAL CLEANING

- A. Cleaning Materials: Only nonhazardous cleaning materials shall be used in the final cleanup.
- B. Recycle, salvage, and return construction waste from Project in accordance with requirements in Section 01505.
- C. Arrange for pick-up of salvageable materials in accordance with the Waste Management Plan.
- D. Disposal Operations: Promptly and legally transport and dispose of any trash. Do not burn, bury, or otherwise dispose of trash on the Project site.

END OF SECTION 01780

DIVISION 2 WASTE MANAGEMENT SITEWORK

PART 1 GENERAL

RELATED SECTIONS

- A. Section 01501 Construction Site Pollution Prevention.
- B. Section 01505 Waste Management Construction Waste Management.

PART 2 PRODUCTS

ENVIRONMENTAL CONSIDERATIONS

- A. Where choices exist, preference is to be given to products and materials with recycled content or resource efficient characteristics.

PART 3 EXECUTION

WASTE MANAGEMENT

- A. Separate and recycle offcuts and waste materials in accordance with the Waste Management Plan and to the maximum extent economically feasible.
- B. Place materials defined as hazardous or toxic waste in designated containers.
- C. Return solvent and oil soaked rags for contaminant recovery and laundering or for proper disposal.
- D. Set aside and protect the surplus and uncontaminated waste materials. Deliver to or arrange collection by employees, individuals, or organizations for verifiable reuse or remanufacturing.
- E. Use the least toxic sealants, adhesives, sealers, and finishes necessary to comply with the requirements of this section.

RELATED SECTIONS

- A. Section 01045 Cutting and Patching.

02230 SITE CLEARING

- A. All trees and other vegetation designated for removal are to be ground, chipped, or shredded for mulching and composting.
- B. Provide on-site locations for as much excavated rock, soil, and vegetation as possible. Provide erosion control and seeding if not immediately used.
- C. Separate organic and inorganic material.
- D. Stockpile topsoil for final grading and landscaping. Provide erosion control and seeding if not immediately used.

02900 LANDSCAPING

ENVIRONMENTAL CONSIDERATIONS

- A. Integrated Pest Management is to be used for the control of undesirable insects. Broad spectrum pesticides are prohibited.
- B. Except where specified or approved by the Owner chemical landscape treatments are prohibited. Organic methods are to be used and exhausted before consideration of chemical treatments.

- C. Where choices exist, select landscaping that minimizes maintenance requirements and uses materials diverted from waste stream, for example, composted yard or food waste, tree trimmings, shredded paper, agricultural wastes and other organic waste materials.
- D. Assess suitability of site for application of pulverized gypsum waste as soil amendment. Apply gypsum waste in accordance with the results and specified landscape treatment.
- E. Protect existing and proposed landscape features, elements, and sites from damage or contamination. Coordinate with the work of other trades to reduce waste, for example, damage or loss caused by soil compaction, mixing of waste, overspray, or run-off from cleaning operations.

END OF DIVISION 2

DIVISION 3 CONCRETE

PART 1 GENERAL

RELATED SECTIONS

- A. Section 01501 Construction Site Pollution Prevention.
- B. Section 01505 Construction Waste Management.

PART 2 PRODUCTS

ENVIRONMENTAL CONSIDERATIONS

- A. Portland cement manufactured in a kiln fueled by hazardous waste shall be restricted.
 - 1. Supplier shall certify that no hazardous waste is used in the fuel mix or raw materials. OR:
 - 2. Supplier shall certify that the hazardous waste is neutralized by the manufacturing process and that no additional pollutants are discharged.
- C. The use as a form release agent of any substance that has not been specifically manufactured for that purpose is prohibited.

[FLY ASH AND SILICA FUME ARE INDUSTRIAL WASTE PRODUCTS KNOWN AS POZZOLANS WHICH CAN SUPPLEMENT OR PARTIALLY SUBSTITUTE FOR THE CEMENT CONTENT IN A CONCRETE MIX. FOR STANDARDS REFER TO ASTM C 618-91.]

PART 3 EXECUTION

WASTE MANAGEMENT

- A. Separate and recycle waste materials in accordance with the Waste Management Plan and to the maximum extent economically feasible.
- B. Place materials defined as hazardous or toxic waste in designated containers.
- C. Use the least toxic sealants, adhesives, sealers, and finishes necessary to comply with the requirements of this section.

SPECIFIC SECTIONS

03300 CAST-IN-PLACE CONCRETE

- A. Use reusable forms to the maximum extent economically feasible. Clean all forms immediately after removal.
- B. Incorporate crushed concrete or masonry materials in sub-base to the maximum extent economically feasible in accordance with sub-base specifications.
- C. Before concrete pours, designate locations or uses for excess concrete. Options include: additional paving, post footing anchorage, swale rip-rap reinforcing, mud slab, flowable fill, footing bottom, retaining wall footing ballast, storm structure covers, underground utility pipe kickers, storm pipe flared end section, toe wash protection, and shoulder and toe outfall restraints for temporary erosion pipes.
- D. Before concrete pours, designate a location for cleaning out concrete trucks. Options include:
 - 1. Company owned site for that purpose (meeting environmental standards).
 - 2. Remote on-site area to be paved later in project.
 - 3. Location designated by Contractor.

END OF DIVISION 3

DIVISION 4 MASONRY

PART 1 GENERAL

SYSTEM DESCRIPTION

RELATED SECTIONS

- A. Section 01501 Construction Site Pollution Prevention.
- B. Section 01505 Construction Waste Management.

PART 2 PRODUCTS

ENVIRONMENTAL CONSIDERATIONS

- A. Materials used in the manufacture of masonry CMU's shall incorporate bottom ash, fly ash, and recycled aggregate, whenever possible.

PART 3 EXECUTION

WASTE MANAGEMENT

- A. Separate and recycle waste materials in accordance with the Waste Management Plan and to the maximum extent economically feasible.
- B. Place materials defined as hazardous or toxic waste in designated containers.
- C. Fold up metal banding, flatten, and place in designated area for recycling.
- D. Collect wood packing shims and pallets and place in designated area.
- E. Place unused mixed mortar in designated locations where lower strength mortar meets the requirements for bulk fill, for example, use as retaining wall footing ballast, cavity fill at grade, or under-ground utility pipe kickers.
- F. Separate masonry waste and place in designated area for use as structural fill.
- G. Separate selected masonry waste and excess for landscape uses, either whole or crushed as ground cover.
- H. Protect all installed masonry from damage and staining. Cover immediate ground area with materials that do not compromise termite treatment.
- I. Use the least toxic sealants, adhesives, sealers, and finishes necessary to comply with the requirements of this section.

END OF DIVISION 4

DIVISION 5 METALS

PART 1 GENERAL

DELIVERY, STORAGE, AND HANDLING

- A. Store materials in a safe, dry, above ground location.
- B. Prevent contact with material that may cause corrosion, discoloration, or staining.

RELATED SECTIONS

- A. Section 01501 Construction Site Pollution Prevention.
- B. Section 01505 Construction Waste Management.

PART 2 PRODUCTS

ENVIRONMENTAL CONSIDERATIONS

- A. Where choices exist, preference is to be given to products and materials with recycled content or resource efficient characteristics.

PART 3 EXECUTION

WASTE MANAGEMENT

- A. Separate and handle general construction waste in accordance with the Waste Management Plan.
- B. Separate for recycling and place in designated containers the following metal waste in accordance with the Waste Management Plan and local recycler standards: steel, iron, galvanized steel, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
- C. Fold up metal banding, flatten, and place in designated area.
- D. Use the least toxic primers and sealers necessary to comply with the requirements of this section.

END OF DIVISION 5

DIVISION 6 WOOD AND PLASTICS

PART 1 GENERAL

RELATED SECTIONS

- A. Section 01501 Construction Site Pollution Prevention.
- B. Section 01505 Construction Waste Management.

PART 2 PRODUCTS

ENVIRONMENTAL CONSIDERATIONS

- A. Where hardwoods or tropical or endangered woods are specified, only those with written certification of sourcing from sustainably managed forests will be accepted.
- B. Where choices exist, preference is to be given to products and materials with recycled content or resource efficient characteristics.

PART 3 EXECUTION

WASTE MANAGEMENT

- A. Separate corrugated cardboard in accordance with the Waste Management Plan and place in designated areas for recycling.
- B. Do not burn scrap at the project site.
- C. Separate wood waste in accordance with the Waste Management Plan and place in designated areas in the following categories for recycling:
 - 1. Solid wood/ softwood/ hardwood.
 - 2. Composite wood, (for example, plywood, OSB, LVL, I-Joist, parallel strand, MDF, particleboard).
 - 3. Treated, painted, or contaminated wood.
- D. Separate wood waste in accordance with the Waste Management Plan and place in designated areas on site.
- E. Set aside damaged wood for acceptable alternative uses, for example use as bracing, blocking, cripples, or ties.
- F. Sequence work to minimize use of temporary HVAC to dry out building and control humidity.
- G. Use the least toxic sealants, adhesives, sealers, and finishes necessary to comply with the requirements of this section.

SPECIFIC SECTIONS

06100 ROUGH CARPENTRY

06150 WOOD DECKING

06185 STRUCTURAL GLUE-LAMINATED TIMBER

ENVIRONMENTAL CONSIDERATIONS

- A. Store, protect, handle, and install prefabricated structural elements strictly in accordance with manufacturer's instructions. Keep products off the ground and protected. Pay particular attention to requirements for stacking, lifting, bracing, cutting, notching, and special fastening requirements.
- B. Fold up metal banding, flatten, and place in designated area for recycling.
- C. Store separated reusable wood waste convenient to cutting station and area of work.

06402 INTERIOR ARCHITECTURAL WOODWORK.

- A. All substrate materials to be manufactured without the use of urea formaldehyde additives or permanently sealed to prevent outgassing.
- B. Use non-toxic sealants, adhesives, sealers, and finishes.

END OF DIVISION 6

**DIVISION 7
THERMAL AND MOISTURE PROTECTION**

PART 1 GENERAL

RELATED SECTIONS

- A. Section 01501 Construction Site Pollution Prevention.
- B. Section 01505 Construction Waste Management.

PART 2 PRODUCTS

ENVIRONMENTAL CONSIDERATIONS

- A. Where choices exist, preference is to be given to products and materials with recycled content or resource efficient characteristics. In the selection of the products and materials of this section preference shall be given to those with the following characteristics:
 - 1. Water based.
 - 2. Water soluble.
 - 3. Water clean-up.
 - 4. Non-flammable.
 - 5. Biodegradable.
 - 6. Low Volatile Organic Compound (VOC) content.
 - 7. Manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
 - 8. Manufactured without compounds which contribute to smog in the lower atmosphere.
 - 9. Does not contain methylene chloride.
 - 10. Does not contain chlorinated hydrocarbons.
 - 11. Recycled content: Post-consumer or Post-industrial Waste.

PART 3 EXECUTION

WASTE MANAGEMENT

- A. Separate corrugated cardboard in accordance with the Waste Management Plan and place in designated areas for recycling.
- B. Fold up metal banding, flatten, and place in designated area for recycling.
- C. Return solvent and oil soaked rags for contaminant recovery and laundering or for proper disposal.
- D. Use the least toxic sealants, adhesives, sealers, and finishes necessary to comply with the requirements of this section.

SPECIFIC SECTIONS

07210 BUILDING INSULATION

ENVIRONMENTAL CONSIDERATIONS

- A. Plan and coordinate the insulation work to minimize the generation of offcuts and waste. Sequence the work to maximize use of insulation offcuts and waste.
- B. Where choices exist in the provision of glass fiber insulation, preference is to be given to the following characteristics:
 - 1. Suppliers who take back waste for reuse or recycling.

07313 METAL SHINGLES
07531 EPDM SINGLE-PLY MEMBRANE ROOF
07610 SHEET METAL ROOFING
07620 SHEET METAL FLASHING AND TRIM

- A. Separate metal waste in accordance with the Waste Management Plan and place in designated areas for recycling.

07920 JOINT SEALANTS

- A. Close and seal tightly all partly used sealant containers and store protected in well ventilated fire-safe area at moderate temperature.
- B. Place used sealant tubes and other containers in areas designated for hazardous materials.

END OF DIVISION 7

DIVISION 8 DOORS AND WINDOWS

PART 1 GENERAL

RELATED SECTIONS

- A. Section 01501 Construction Site Pollution Prevention.
- B. Section 01505 Construction Waste Management.

PART 2 PRODUCTS

ENVIRONMENTAL CONSIDERATIONS

- A. Where choices exist, preference is to be given to products and materials with recycled content or resource efficient characteristics.

PART 3 EXECUTION

WASTE MANAGEMENT

- A. Provide covered storage area to protect materials and products from sunlight, moisture, staining, and impact or other damage.
- B. Separate corrugated cardboard in accordance with the Waste Management Plan and place in designated areas for recycling.
- C. Place materials defined as hazardous or toxic waste in designated containers.
- D. Use the least toxic sealants, adhesives, sealers, and finishes necessary to comply with the requirements of this section.
- E. Close and seal tightly all partly used sealant containers and store protected in well ventilated fire-safe area at moderate temperature.
- F. Place used sealant tubes and other containers in areas designated for hazardous materials.

SPECIFIC SECTIONS

08110 STEEL DOORS AND FRAMES

08211 FLUSH WOOD DOORS

08311 ACCESS DOORS AND FRAMES

08331 OVERHEAD COILING DOORS

08361 SECTIONAL OVERHEAD DOORS

08710 DOOR HARDWARE

- A. Separate wood and metal spreader bars for reuse or recycling.
- B. Separate protective materials for reuse or recycling.

08550 WOOD WINDOWS

08800 GLAZING

08840 EXHIBIT TANK GLAZING

08900 GLAZED ALUMINUM CURTAIN WALLS

- A. Separate protective materials for reuse or recycling.

END OF DIVISION 8

DIVISION 9 FINISHES

PART 1 GENERAL

RELATED SECTIONS

- A. Section 01501 Construction Site Pollution Prevention.
- B. Section 01505 Construction Waste Management.

PART 2 PRODUCTS

ENVIRONMENTAL CONSIDERATIONS

- A. In the selection of paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, preference will be given to those with the following characteristics:
 - 1. Water based.
 - 2. Water soluble.
 - 3. Water clean-up.
 - 4. Non-flammable.
 - 5. Biodegradable.
 - 6. Low Volatile Organic Compound (VOC) content.
 - 7. Does not contain methylene chloride.
 - 8. Does not contain chlorinated hydrocarbons.

PART 3 EXECUTION

WASTE MANAGEMENT

- A. Separate waste materials in accordance with the Waste Management Plan and to the maximum extent economically feasible.
- B. Place materials defined as hazardous or toxic waste in designated containers.
- C. Return solvent and oil soaked rags for contaminant recovery and laundering or for proper disposal.
- D. Use the least toxic sealants, adhesives, sealers, and finishes necessary to comply with the requirements of this section.
- E. Set aside and protect surplus waste finish materials and uncontaminated finish materials. Deliver to or arrange collection by employees, individuals, or organizations for reuse.
- F. Close and seal tightly all partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.
- G. Place used sealant and adhesive tubes and containers in areas designated for hazardous waste.

SPECIFIC SECTIONS

09215 PLASTER

09250 GYPSUM BOARD

09260 GYPSUM BOARD ASSEMBLIES

09265 GYPSUM BOARD SHAFT-WALLASSEMBLIES

- A. Separate clean waste gypsum products from contaminants for recycling. Do not include wood, plastic, metal, asphalt impregnated gypsum board, or any gypsum board coated with glass fiber, vinyl, decorative paper, or other finish. Place in designated area and protect from moisture and contamination.

- B. Clean waste gypsum products are to be recycled by:
 - 1. Hauling to gypsum board manufacturer in lieu of landfill.
 - 2. Hauling to alternative use manufacturer in lieu of landfill.
 - 3. Pulverizing and applying on-site as soil amendment in accordance with landscape specifications.
 - 4. Protect granular material from moisture.

- C. Separate metal waste in accordance with the Waste Management Plan and place in designated areas for recycling or reuse.

09310 TILE

09644 WOOD BLOCK FLOORING

09650 RESILIENT SHEET FLOORING

09671 RESINOUS FLOORING

09680 CARPET

- A. Set aside and protect offcuts and remainders greater than 2 square feet for re-use, for example, by owner, Habitat for Humanity, schools, or animal shelter.

09900 PAINTING

09945 MULTICOLORED INTERIOR COATINGS

09960 HIGH-PERFORMANCE COATINGS

09975 HIGH-TEMPERATURE-RESISTANT COATINGS

- A. Where choices exist, preference is to be given to coatings which have the following characteristics:
 - 1. Water based.
 - 2. Require water clean up.
 - 3. Low in Volatile Organic Compounds (VOC).
 - 4. Do not contain toxic metal pigments.

- B. Do not use kerosene or any such organic solvents to thin or clean up water based paints.

- C. Do not dispose of paints or solvents by pouring on the ground. Place in designated containers for proper disposal.

- D. Where paint recycling is available, collect all waste paint by type and provide for delivery to recycling or collection facility.

END OF DIVISION 9

DIVISION 10 SPECIALTIES

PART 1 GENERAL

RELATED SECTIONS

- A. Section 01501 Construction Site Pollution Prevention.
- B. Section 01505 Construction Waste Management.

PART 2 PRODUCTS

ENVIRONMENTAL CONSIDERATIONS

In the selection of materials and products, preference shall be given to those with the following characteristics:

- 1. Recycled content: Post-consumer or Post-industrial Waste.
- 2. Factory applied coatings.
- 3. Powder based coatings.
- 4. Coatings with low Volatile Organic Compound (VOC) content.

PART 3 EXECUTION

WASTE MANAGEMENT

[CORRUGATED CARDBOARD IS ONE OF THE LARGEST SOURCES OF CONSTRUCTION WASTE. CHECK YOUR SPECIFIC PROJECT LOCATION FOR RECYCLING OPTIONS AND REGULATIONS.]

- A. Separate corrugated cardboard in accordance with the Waste Management Plan and place in designated areas for recycling.
- B. Separate and recycle waste materials in accordance with the Waste Management Plan and to the maximum extent economically feasible.
- C. Place materials defined as hazardous or toxic waste in designated containers.
- D. Supplier is to take back shipping and packing materials for re-use or recycling to the maximum extent economically feasible.
- E. Use the least toxic sealants, adhesives, sealers, and finishes necessary to comply with the requirements of this section.

END OF DIVISION 10

DIVISION 11 EQUIPMENT

PART 1 GENERAL

RELATED SECTIONS

- A. Section 01501 Construction Site Pollution Prevention.
- B. Section 01505 Construction Waste Management.

PART 2 PRODUCTS

ENVIRONMENTAL CONSIDERATIONS

- A. In the selection of equipment, preference will be given to those with the following characteristics:
 - 1. High energy efficiency.
 - 2. Low water consumption.
 - 3. Does not generate hazardous or toxic waste.

PART 3 EXECUTION

WASTE MANAGEMENT

[CORRUGATED CARDBOARD IS ONE OF THE LARGEST SOURCES OF CONSTRUCTION WASTE. CHECK YOUR SPECIFIC PROJECT LOCATION FOR RECYCLING OPTIONS AND REGULATIONS.]

- A. Separate corrugated cardboard in accordance with the Waste Management Plan and place in designated areas for recycling.
- B. Separate and recycle cut-offs and waste materials in accordance with the Waste Management Plan and to the maximum extent economically feasible.
- C. Place materials defined as hazardous or toxic waste in designated containers.
- D. Return solvent and oil soaked rags for contaminant recovery and laundering or for proper disposal.
- E. Supplier is to take back shipping and packing materials for re-use or recycling to the maximum extent economically feasible.

END OF DIVISION 11

DIVISION 12 FURNISHINGS

PART 1 GENERAL

RELATED SECTIONS

- A. Section 01501 Construction Site Pollution Prevention.
- B. Section 01505 Construction Waste Management.

PART 2 PRODUCTS

ENVIRONMENTAL CONSIDERATIONS

In the selection of furnishings, preference shall be given to those with the following characteristics:

- 1. Recycled content: Post-consumer or Post-industrial Waste.
- 2. Factory applied coatings.
- 3. Powder based coatings.
- 4. Coatings with low Volatile Organic Compound (VOC) content.

PART 3 EXECUTION

WASTE MANAGEMENT

[CORRUGATED CARDBOARD IS ONE OF THE LARGEST SOURCES OF CONSTRUCTION WASTE. CHECK YOUR SPECIFIC PROJECT LOCATION FOR RECYCLING OPTIONS AND REGULATIONS.]

- A. Separate corrugated cardboard in accordance with the Waste Management Plan and place in designated areas for recycling.
- B. Separate and recycle cut-offs and waste materials in accordance with the Waste Management Plan and to the maximum extent economically feasible.
- C. Place materials defined as hazardous or toxic waste in designated containers.
- D. Supplier is to take back shipping and packing materials for re-use or recycling to the maximum extent economically feasible.
- E. Containers and packing materials which are reusable, such as shipping blankets, are to be used in the delivery of the products and materials of this section.

END OF DIVISION

DIVISION 15 MECHANICAL

PART 1 GENERAL

RELATED SECTIONS

- A. Section 01501 Construction Site Pollution Prevention.
- B. Section 01505 Construction Waste Management.

PART 2 PRODUCTS

ENVIRONMENTAL CONSIDERATIONS

Where choices exist in the selection of solvents, lubricants, and other fluids, preference is to be given to those with the following characteristics:

- 1. Water based.
- 2. Water soluble.
- 3. Water clean-up.
- 4. Low Volatile Organic Compound (VOC) content.

Where choices exist in the selection of systems, refrigerants, and gases, preference is to be given to those with the following characteristics:

- 1. Manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
- 2. Manufactured without compounds which contribute to smog in the lower atmosphere.

PART 3 EXECUTION

WASTE MANAGEMENT

- A. Separate and recycle cut-offs and waste materials in accordance with the Waste Management Plan and to the maximum extent economically feasible.
- B. Place materials defined as hazardous or toxic waste in designated containers.
- C. Return solvent and oil soaked rags for contaminant recovery and laundering or for proper disposal.
- D. Use the least toxic sealants, adhesives, lubricants, sealers, and finishes necessary to comply with the requirements of this section.
- E. Close and seal tightly all partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.
- F. Place used sealant and adhesive tubes and containers in areas designated for hazardous waste.

END OF DIVISION 15

DIVISION 16 ELECTRICAL

PART 1 GENERAL

RELATED SECTIONS

- A. Section 01501 Construction Site Pollution Prevention.
- B. Section 01505 Construction Waste Management.

PART 2 PRODUCTS

ENVIRONMENTAL CONSIDERATIONS

In the selection of electrical materials and equipment, preference will be given to those with the following characteristics:

- 1. High energy efficiency.
- 2. Components do not contain or generate hazardous or toxic materials.

PART 3 EXECUTION

WASTE MANAGEMENT

CORRUGATED CARDBOARD IS ONE OF THE LARGEST SOURCES OF CONSTRUCTION WASTE. CHECK YOUR SPECIFIC PROJECT LOCATION FOR RECYCLING OPTIONS AND REGULATIONS.

- A. Separate corrugated cardboard in accordance with the Waste Management Plan and place in designated areas for recycling.
- B. Separate and recycle cut-offs and waste materials in accordance with the Waste Management Plan and to the maximum extent economically feasible.
- C. Place materials defined as hazardous or toxic waste in designated containers.
- D. Return solvent and oil soaked rags for contaminant recovery and laundering or for proper disposal.
- E. Use the least toxic sealants, adhesives, lubricants, sealers, and finishes necessary to comply with the requirements of this section.

END OF DIVISION 16

APPENDIX A

Information for Bidders: Preparing Estimates on Recycling

I. Estimating the amount of recyclable waste: generation rates

One method of estimating the generation of different types of waste is to get average figures of waste generation for different construction materials. The following are estimates by material:

Corrugated cardboard 7.5% of commercial construction waste (10% of residential construction waste) is scrap corrugated cardboard.

Dimensional lumber and pallets 18% of commercial construction waste (25% of residential construction waste) is scrap dimensional lumber and pallets.

Metals 4.5% of commercial construction waste (1% of residential construction waste) is scrap metal.

Gypsum wallboard: 1/2 pound per square foot of commercial floor area (1 pound per square foot of residential floor area) becomes scrap.

Concrete 15% of commercial construction waste (4.5% of residential construction waste) is scrap concrete.

(Sources: "A New Methodology for Quantifying Construction Waste", Peter Yost and John M. Halstead, in *Sustainable Construction: Proceedings of the First International Conference of CIB TG 16* (1994), University of Florida College of Architecture; *Construction Materials Recycling Guidebook — A Guide to Reducing and Recycling Construction and Remodeling Waste*, Metropolitan Council of the Twin Cities Area, 1993.)

Another method is to look at generation rates from similar projects. Several studies have been conducted on the amount of recyclable waste generated on commercial and multi-family residential construction projects:

- Construction of a 5,000-square foot restaurant

Construction of this restaurant generated 12,344 pounds of waste, or 2.46 pounds per square foot. This waste included the following recyclable materials:

Wood 7,440 pounds (61% of the waste)
Cardboard 1,414 pounds (11% of the waste)
Gypsum wallboard 500 pounds (4% of the waste)

(Source: *Characterization of Construction Site Waste* (1993), Metro Solid Waste Department, Portland OR)

- Construction of a 17-unit apartment complex using pre-cut lumber packages Construction of this apartment complex resulted in 28,434 pounds of waste, or 2 pounds per square foot. This waste included the following recyclable materials:

Wood 16,169 pounds (57% of the waste)
Cardboard 917 pounds (3% of the waste)
Gypsum wallboard 6,997 pounds (25% of the waste)

(Source: *Characterization of Construction Site Waste* (1993), Metro Solid Waste Department, Portland OR)

- Six commercial renovation projects. These six commercial renovation projects averaged the following percentages of recyclable materials:

Untreated dimensional wood 5% of all project waste
Cinderblock 19% of all project waste
Concrete without rebar 22% of all project waste
Ferrous scrap 5% of all project waste

(Source: "What's in a Building?", *Demolition Age*, September 1993)

- Construction of one residential low-rise building and one commercial low-rise building Construction of these two buildings generated the following percentages of recyclable materials:

Wood from the residential 31% of all project waste
 Wood from the commercial 8% of all project waste

(Source: Metropolitan Toronto Waste Composition Study, 1991, cited in *Construction Waste & Demolition Debris Recycling . . . A Primer* (1993) Solid Waste Association of North America (Silver Spring MD)

II. Estimating the amount of recyclable waste: conversion figures

Mixed Waste	350 lbs/cu yd 0.175 tons/cu yd 5.7 cu yds/ton
Wood	300 lbs/cu yd 0.15 tons/cu yd 6.7 cu yds/ton
Cardboard	100 lbs/cu yd 0.05 tons/cu yd 20 cu yds/ton
Gypsum wallboard	500 lbs/cu yd 0.25 tons/cu yd 4 cu yds/ton
Rubble	1400 lbs/cu yd 0.7 tons/cu yd 1.4 cu yds/ton

(Source: *Resource Efficient Building* (1994), Metro Solid Waste Department, Portland, OR

III. Tips on reducing the cost of recycling

- Schedule containers for collecting recyclables only when needed. For example, rent a collection container for cardboard only during the latter part of construction, when the majority of cardboard waste is generated.
- Be sure to understand the market specifications so that recyclable materials are not rejected. For example, some markets for clean wood waste accept only dimensional lumber; others also accept plywood, particle board, and oriented strand board.
- Encourage scrap dealers to be flexible when possible. For example, a scrap metal dealer who initially refused to accept metal bands from around lumber was convinced to accept them when they were repeatedly folded and hit with a hammer, then put into an empty 5-gallon plastic bucket, so as to create a more dense item for transportation. (Creating these more dense bundles of metal bands also had the advantage of cutting down on injuries at the construction site.)

IV. Estimating the cost of waste management encompassing recycling

The following steps will help arrive at an estimate of the cost of construction waste management which involves recycling certain materials.

• Step One: Estimate Total Project Waste and Amounts of Recyclable Materials.

(1) Estimate the Total Project Waste in cubic yards (cy). (1) cy _____
 (Use information from previous comparable projects.)

For each material to be recycled, estimate the amount of waste to be recycled. If necessary, use typical percentages of commercial construction waste provided in section I above and multiply percentage by Total Project Waste in line (1) above. Add lines as necessary.

- (2a) Recyclable material #1 (identify): _____(2a) _____ cy
- (2b) Recyclable material #2 (identify): _____(2b) _____ cy
- (2c) Recyclable material #3 (identify): _____(2c) _____ cy
- (2d) Recyclable material #4 (identify): _____(2d) _____ cy
- (2e) Recyclable material #5 (identify): _____(2e) _____ cy
- (2f) Recyclable material #6 (identify): _____(2f) _____ cy

(2) Add the total cubic yards in (2a) through (2f) above
to get the Total Recyclable Materials Amount (2) _____ cy

(3) Subtract line (2) from line (1) to get the Non-recyclable
Material Amount (3) _____ cy

• Step Two: Estimate the cost of waste management if you use one recycling hauler.

(4) If you use a hauler to collect all waste and sort
out the recyclables and recycle them, then record the
cost per cubic yard for this service (including all hauling,
container rental, and tipping fee charges). (4) \$ _____ /cy

(5) Multiply the cost from line (4) by line (1) to get the
**Net Total Cost of Waste Management using one
hauler who separates out recyclables.** (5) \$ _____ cy

• Step Three: Estimate the cost of recycling if you separate materials on site and have them hauled separately to market. (This is an alternative to Step Two.)

Estimate the cost of transporting to market each recyclable material you plan to transport using an outside hauler who provides containers. Add lines as necessary.

(6a) Divide cubic yards of one recyclable material
(identify) _____ from line (2) by container
capacity, round off to nearest whole number (___),
and multiply by container hauling cost. Add cost
of container rental if not included in hauling cost. (6a) \$ _____

(6b) Divide cubic yards of another recyclable material
(identify) _____ from line (2) by container
capacity, round off to nearest whole number (___),
and multiply by container hauling cost. Add cost
of container rental if not included in hauling cost. (6b) \$ _____

(6c) Divide cubic yards of another recyclable material
(identify) _____ from line (2) by container
capacity, round off to nearest whole number (___),
and multiply by container hauling cost. Add cost
of container rental if not included in hauling cost. (6c) \$ _____

(6) Add lines (6a) through (6c). (6) \$ _____

Estimate the cost of transporting to market each recyclable
material you plan to transport to market yourself. Add
lines as necessary.

(7a) Divide cubic yards of recyclable material
(identify) _____ from line (2) by per load
capacity, round off to nearest whole number (___),
multiply by hours per trip (___) and per hour labor
and trucking costs (\$___). (7a) \$ _____

(7b) Divide cubic yards of recyclable material
(identify) _____ from line (2) by per load
capacity, round off to nearest whole number (___),
multiply by hours per trip (___) and per hour labor
and trucking costs (\$___). (7b) \$ _____

(7c) Divide cubic yards of recyclable material

(identify) _____ from line (2) by per load capacity, round off to nearest whole number (___), multiply by hours per trip (___) and per hour labor and trucking costs (\$___).

(7c) \$ _____

(7) Add lines (7a) through (7c)

(7) \$ _____

Estimate the amount of revenue to be received from selling each material in lines (8a) through (8c). Add lines as necessary.

(8a) Multiply cubic yards of recyclable material identified in line (7a) by market price per cubic yard for that material (\$___). (Use conversion table in section II above if necessary).

(8a) \$ _____

(8b) Multiply cubic yards of recyclable material identified in line (7b) by market price per cubic yard for that material (\$___). (Use conversion table in section II above if necessary).

(8b) \$ _____

(8c) Multiply cubic yards of recyclable material identified in line (7c) by market price per cubic yard for that material (\$___). (Use conversion table in section II above if necessary.)

(8c) \$ _____

(8) Add lines (8a) through (8c).

(8) \$ _____

(9) Subtract line (8) from line (7).

(9) \$ _____

(10) Estimate the number of extra hours needed to sort and monitor separated waste (___) and multiply by per hour labor cost (\$___).

(10) \$ _____

(11) Estimate the cost of disposing of nonrecyclable waste by multiplying the Nonrecyclable Material Amount from line (3) above by the cost per cubic yard of disposing of this waste in a landfill, including container rental, transportation, labor, and landfill tipping fee. (Use conversion figures in section II above if necessary.)

(11) \$ _____

(12) Add lines (6), (9), (10) and (11) to get the **Net Total Cost of Waste Management using source separation and recycling.**

(12) \$ _____

• Step Four: For comparison, calculate the cost of landfilling all project waste.

(13) Divide Total Project Waste in (1) above by container capacity, round off to nearest whole number ____, and multiply by container hauling cost (\$___) to get Cost of Landfilling: \$_____.

Add all costs for container rental and all tipping fees if not included in hauling cost to get **Cost of Landfilling All Project Waste.**

(13) \$ _____

APPENDIX C

Recycling Haulers and Markets

CORRUGATED CARDBOARD:

Alter Scrap Processing
Contact: Mike Hopper

180 Harrison
Dubuque, IA
Phone: 583-1731

BFI Recyclery
Contact: Steve

1755 Radford Rd
Dubuque, IA
Phone: 583-1330

Metal Processors
Jim Durr

1210 Lincoln Av
Dubuque, IA
319 582-6779

CLEAN DIMENSIONAL WOOD:

Addoco Pallet
Contact: Steve

12640 Industrial Ct
Peosta, IA
Phone: 557-1555

Dubuque Hardwoods
Contact: Bob Miller

E 5th St Extension
Dubuque, IA
Phone: 582-0587

CONCRETE/CONCRETE MASONRY UNITS (CMU):

Solid Fill Sites: DMASWA Landfill
Contact: Tom @ NC

14501 Hwy 20 West
Dubuque, IA
Phone: 557-1838

BEVERAGE CONTAINERS (\$0.05)

Matod Can Company Redemption Center
Contact: Bob

5150 Wolff Rd
Dubuque, IA
Phone: 557-1888

LAND CLEARING DEBRIS

Bill Miller Logging Inc
Contact: Bill

308 E. 4th St.
Dubuque, IA
Phone: 583-9441

STONE

Solid Fill Sites: DMASWA Landfill
Contact: Tom @ NC

14501 Hwy 20 West
Dubuque, IA
Phone: 557-1838

PLASTIC BUCKETS (5 GALLON)

Bacon Recycling
Contact: Curtis Bacon

31173 283rd Ave
Hopkinton, IA 52237
Phone: 319 926-2442

PAPER (Miscellaneous)

BFI Recyclery
Contact: Steve

1755 Radford Rd
Dubuque, IA
Phone: 583-1330

GYPSUM/SHEETROCK: *(When crushed or ground gypsum/sheetrock can be used as landfill daily cover material or as a soil amendment.)*

Solid Fill Sites: DMASWA Landfill
Contact: Tom @ NC

14501 Hwy 20 West
Dubuque, IA
Phone: 557-1838

METALS (ferrous/non-ferrous)/METAL BANDING: *(stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.)*

Alter Scrap Processing
Contact: Mike Hopper

180 Harrison
Dubuque, IA
Phone: 583-1731

Blum Company

411 E 15th St
Dubuque, IA
Phone: 582-4209

Key City Recycling

3270 Dodge
Dubuque, IA
Phone: 582-2388

Moor's Salvage

3604 CTH "H"
Keiler, WI 53812
Phone: 608-568-7678

Tri-State Recycling

19018 Heber Rd
Dubuque, IA
Phone: 582-2250

Enviro-Trading Co.
Contact: Michelle Mihalakis

196 Kaufmann Ave
Dubuque, IA 52001
Phone: 584-8985

Metal Processors
Contact: Jim Durr

1210 Lincoln Ave
Dubuque, IA
Phone: 582-6779

WASTE MANAGEMENT AND RECYCLING BID FORM

TO: EnviroConn Consulting
 1273-66TH Street
 West Des Moines, Iowa 50266

Dubuque County Historical Society
 3rd Street & Ice Harbor
 Dubuque, Iowa 52001

We/I _____ (Individual)
 (Partnership)
 (Corporation)

have received the Bid Documents, titled, **Mississippi River Discovery Center Construction Waste Management & Recycling Plan**, dated July 13, 2001, which includes the Waste Specification Manual and Appendices. We/I have examined both the documents and the site and submit the following bid(s):

BID NO. 1 - COST OF WASTE MANAGEMENT USING ONE RECYCLING HAULER WHO SEPERATES OUT RECYCLABLES OFF-SITE

We/I will perform all services requested in the Bid Document for the sum of (Line 5 from APPENDIX A) _____ Dollars (\$ _____) (figures)

BID NO. 2 - COST OF WASTE MANAGEMENT USING ON-SITE SOURCE SEPERATION AND RECYCLING

We/I will perform all services requested in the Bid Document for the sum of (Line 12 from APPENDIX A) _____ Dollars (\$ _____) (figures)

BID NO. 2 - COST OF LANDFILLING ALL PROJECT WASTE

We/I will perform all services requested in the Bid Document for the sum of (Line 13 from APPENDIX A) _____ Dollars (\$ _____) (figures)

PROJECT SCHEDULE

Construction is scheduled to begin on **July XX, 2001** and be completed by March 2003. The Bidders will be required to include all required costs to meet the project timeframe in the base bid.

CONTRACT PROVISIONS

By submitting this Bid the Undersigned agrees that, if this Bid is accepted within thirty (30) days after bid opening, the bidder will be liable to the Owner for damages the Owner may suffer by failure of the Undersigned to enter forthwith into a Contract and deliver the necessary services within 60 days after notice of Contract award.

ACCEPTANCE

In submitting this bid, We/I agree:

- To hold this offer open thirty (30) days from the bid closing date.
- To accept all provisions of the Project Bid Document.
- To into and execute an Agreement, if awarded, within seven (7) days after acceptance of this bid.
- To perform the services in accordance with the Project Bid Document.
- To complete services within the project timeframe specified herein.

Name of Firm	Signature	(Individual) (Partnership) (Corporation)
Address	Title	
City State Zip	Date	(Partnership)