OVERVIEW
C.U.'s recycling program has been in existence on the Boulder campus since 1976. CU recycling is a relatively unique program. It is the partnership of the Boulder Campus Administration, Facilities Management, and the UCSU-Student Government. From our experiences we have found that the design of a building has a big impact on the effectiveness of our recycling efforts. In a number of offices and buildings on campus we have seen lower participation rates due to inadequate space allotted for recycling containers in convenient locations for building users.

For the past seven years Facilities Management collections (part of CU Recycling) and UCSU have been actively pursuing "Built in Recycling" or "designing for recycling" in remodeling and construction projects on campus. In order to achieve this CU Recycling has developed a list of ideas to help planners and architects meet our objectives.

RECYCLING NEEDS FOR FOLLOWING AREAS:

Offices
Two square feet should be allocated for recycling and solid waste use by each desk in every office. One square foot for our Deskside Recycling Container (a two part recycling container for Office Pak on one side and Newspapers on the other side). This convenient recycling container is highly desirable by office personnel. The second square foot is for the traditional office trash can.

Copy Rooms and Computer Rooms
White Paper and/or Office Pak grades of paper are collected from copy rooms and white paper from computer rooms. In most locations we recommend floor space for larger recycling containers or for a recycling cabinet: 19" depth by 84" width and 33" inside height. This allows room for two recycling containers or one recycling container and one trash receptacle. We like this space to be along a wall near the copier or computer print out area. Large computer rooms will require a space of 3' depth by 5' width and needs a height space of at least 5'.

Vending Areas, Lounges, Kitchens
These areas tend to generate a lot of newspapers and commingled containers (glass, aluminum, plastic and steel cans) as well as regular trash. It is a good idea to allot 30" depth by 60" width, 37" height space along the wall (entry/exit door wall). This space allotment is for high occupancy vending and lounge areas. Inner departmental lounges and vending areas usually need a space of 28" deep by 60" wide and 34" high for the recycling containers. Additional space will be required for trash receptacles.

Classrooms
A space for a recycling cabinet along the entry/exit wall should be allocated in every classroom. This space must not block egress in or out of the room. The cabinet should hold three items: Newspapers, Commingled Containers and one section for trash. The cabinet size should be 19" depth by 84" width and 33" inside height. Openings on top of cabinet should be made for depositing recyclable-appropriate size for each item that will deposited. See Cabinet section listed below for more details.
Central Storage Rooms
In large buildings (buildings that will generate more than 1,000 pounds of recyclables per week), space is needed for a centralized storage area. This space will be used to store smaller amounts of recyclables collected from offices that will be placed into 95 gallon polycarts that will be collected on a weekly basis. A space of 4' x 8' is adequate in these types of locations.

Loading Areas and Outdoor Storage Areas
A 4’ x 8’ area is required for containers. A loading dock is preferable but not required. Access sufficient for large trucks with an 18’ body should be provided. Reinforced concrete pads are recommended at all loading docks to accommodate the weight of the recycling and trash trucks that will be servicing the building.

Trash Dumpsters/Containers (for non-recyclables)
Space will be allocated at loading dock for easy access for building occupants and custodial staff use. Size and type of dumpster should be cleared through Facilities Management's Solid Waste and Recycling Manager. A good estimate is to provide a 9' width by 12' length area of reinforced concrete pad, to accommodate a dumpster and the front tires of the trash truck area.

Recycling Cabinets
Increasingly, Campus departments wish to enhance the aesthetics of recycling locations within their areas by housing 2-3 containers within a cabinet with front-opening doors. Openings on top of the cabinet are for depositing recyclables. Another option is to have openings placed in the door of the cabinets rather than the cabinet top, which can be used as an additional workspace when necessary.

Cabinets should be installed in new construction or remodeling projects, at least one per floor. Cabinets need to hold at least two types of recyclables and have a space for a trash container. In some cases, all three containers will be used for recycling. Size of cabinets will be determined by expected usage of the space. Minimum cabinets size: 19" depth by 84" width and 33" inside height (this will hold our smaller 23 gallon containers). The cabinet needs to have three separate doors, one for each container. Color of cabinet is negotiable to help match building decor. Larger cabinets can be built to hold our larger container. Sizes of our containers: 55 gallon barrel is 25" in diameter and 37" high; Blue 40 gallon Square Brute 28" by 30" high; 95 gallon polycart 29" wide by 32" deep and 48" high. See cabinet diagram for opening dimensions.

Solid Waste Disposal
One of the fastest and easiest ways to turn an attractive environment into an eyesore is with an accumulation of litter. Food, wrappers, newspapers, aluminum cans, and other debris will be carelessly scattered by the public and will quickly turn a beautifully landscaped area into an eyesore if litter and recycling receptacles are not provided.

- A combination of Litter & Recycling receptacles should be placed where they will be seen and easily accessed by public, without obstructing the easement. They can be grouped with other items such as seating or lighting columns, but not with plant containers. Built in or permanent receptacles for recycling "Commingled Containers" and "Newspapers" should be available at convenient points on campus along with litter receptacles. Only "after thought" recycling stations currently exist on campus. As plans proceed to expand this operation, Facilities Management Recycling and Solid Waste Operations, and the Facilities Management's Grounds
Division should be consulted regarding guidelines within this plan.

- Litter and recycling receptacles must be quite sturdy and have a capacity which is generous enough to avoid overstuffing and without the need for too-frequent emptying. In most cases they should be secured to the ground with a removable liner or bin inside the outer container.

- Materials which are suitable for construction include aggregate, precast concrete, metal, fiberglass wire mesh. Although the latter types are not as costly, concrete is recommended because its sturdiness and resistance to vandalism make replacement less likely. The concrete containers should be of a color and texture which blends in well with the surroundings.

Refer to Section 02870 for specific model numbers.

Disposal of trash from each building on campus, a problem related to litter disposal, is addressed by the following guidelines.

- Trash dumpsters should be located near the service entrance to each building, and they should be accessible to trucks by means of pavement of at least nine feet in width up to dumpster area and a 9-foot wide reinforced concrete pad (minimum of 6" deep concrete) that is 12 feet in length for the dumpster to sit on and for the front tires of the truck to rest on while dumping the dumpster.

- If gates are to be installed on the dumpster enclosure there must be a 10' wide opening (including the gate and any associated hardware) to allow the front end of the truck to enter the enclosure safely.

- All dumpsters shall be painted the standard "Western Brown" and located in primarily public spaces (e.g., along major pedestrian walkways, or loading docks), they should be screened by landscaping or walls.

- Space near or at loading docks needs to be provided for either built-in recycling stations to hold at least four (4) 95-gallon polycart containers or adequate space for these four polycarts to be located on the loading dock, without blocking easement.

- Space for a cardboard recycling container is also needed on or near docks. A footprint of 3' x 4' is sufficient.
The following guidelines are to be used by the design team for all UCB campus design projects. If the provisions herein have a cost impact to the project, the consultant must get specific approval, in writing, from the university representative prior to including them in the project design.

Section 1 - Waste Minimization in Design

- Building dimensions should correspond to optimal use of standard lumber dimensions. (i.e. using two-foot increments)

- Detailed framing layouts should be developed to avoid waste when ordering lumber.

- Lumber should be stored on level blocking under cover to minimize warping, twisting and waste.

- Excessively packaged materials and supplies should be avoided. However, be sure packaging is adequate to prevent damage and waste. Specify minimal packaging from suppliers.

- Drywall should be ordered in optimal dimensions to minimize cut-off waste. Drywall is
available in different lengths, and designed dimensions should correspond to standard sizes.

- Masonry materials, paints, solvents, and finishes should be carefully estimated to avoid waste.

Section 2 - Reuse at the Job Site

- In demolition and remodeling, evaluate whether salvaging used lumber is possible. Off-campus arrangements should be utilized for dimension lumber, beams, and timbers over 6'.

- Salvage usable bricks, blocks, tile, and other masonry materials from demolition, remodeling and construction. Store for future jobs or utilize off-campus salvage operations.

- During remodeling, separate metal radiators, grates, piping, aluminum siding, and old appliances for salvage or recycling.

- Serviceable cabinets, light fixtures, bathtubs, sinks, mortar mix, hardware, nails, screws and plumbing fittings and supplies should be used for future jobs or arrangements made with off-campus recycling and salvage operations.

- Set aside lumber and plywood/OSB cut-offs that can be used later as fire blocking, spacers in header construction, etc.

- Large drywall scraps should be set aside during hanging for use as filler pieces in areas such as closets.

- Reuse joint compound buckets for tool or material storage by clients or crews.

- Left over bundled shingles can be saved for future jobs or arrangements for off-campus recycling and salvage operations should be utilized

- Clean concrete chunks, old brick, broken blocks, and other masonry rubble should be buried on-site during foundation back-filling where practical.

Section 3 - Demolition / Construction Staging

- Branches and trees from brush clearing should be delivered to one of several off-campus facilities or collection arrangements made through a private hauling service.

- Corrugated cardboard boxes should be flattened and delivered to CU’s recycling facility or arrangements should be made for collection.

- Containers for recyclable food and beverage containers will be provided and collected by CU Recycling. Contact CU Recycling at 492-8307 before operations begin to have container(s) sited.
• During construction, separate metals for recycling, including copper piping, wire and flashing; aluminum siding, flashing and guttering; iron and steel banding from bundles, nails and fasteners, galvanized flashing and roofing, and rebar. and deliver to CU’s scrap metal facility or arrange for scrap metal collection.

• Serviceable wood pallets should be delivered to CU's recycling facility. or arrangements should be made for collection.

• Clean wood waste (pallets, non-treated dimensional, trim, sheathing, engineered wood) suitable for grinding should be kept separate and arrangements should be made for collection.

• Unused portions of Paints, Stains, Solvents and Sealants should be saved for future jobs. Such materials should not be disposed of in landfill containers. Note: Disposal information about hazardous materials, and safer alternatives, can be obtained from CU's Environmental Health and Safety department.

• Old nickel cadmium batteries from portable power tools should be stored in approved containers. Contact CU’s Environmental Health and Safety department for disposal information.

Section 4 - Recycling Provisions in Design

The University of Colorado seeks to increase its recycling efforts by "designing for recycling" in remodeling and construction projects on campus. The following description and checklist is provided to help planners and architects meet this objective. Floor plans must be reviewed by Facilities Management Recycling Operations to assure adequate, code-compliant space for both recycling and trash containers in each of the following building areas prior to approval of plans.

OFFICES
CU's Facilities Management department provides a two-part deskside recycling container for each office. No additional floor space is required for these types of containers.

COPY ROOMS AND COMPUTER ROOMS
Floor space of approximately 21" x 72" is required for recycling cabinets. Building occupant is responsible for providing these cabinets. Openings in which to deposit recyclables are located either on the door or on the top of the cabinet. If openings are placed in the door cabinet tops can be used for work space.

VENDING AREAS OR KITCHENS
Requirements are similar to copy and computer rooms above.

CENTRAL STORAGE ROOMS
These areas are used to centralize and store smaller amounts of recyclables from offices into 55-gallon drums or 90-gallon carts for weekly collection. A space of 3' x 7' is required in central storage rooms. If a central storage room opens to a loading dock or to the outside of the building, centralized recycling containers can be placed there instead.
LOADING DOCKS AND OUTDOOR SERVICE AREAS
A 3' x 7' area is required for recycling containers. Access sufficient for trucks with a 12' van body should be provided. Additional space is required for non-recyclable trash dumpsters. Trash Dumpsters. Trash containers' size and type should be planned through Facilities Management department.

Section 5 - Recycled Products Use in Construction

CU Recycling has a directory of local suppliers for building materials and supplies in each of the following categories. Contact CU Recycling for the most current listings.

- Recycled Concrete
- Backfill Material
- Non-Asphalt Waterproofing
- Framing Materials (engineered lumber, LPI joists, etc.)
- Structural Alternatives to Wood Framing
  - Steel
  - Concrete
- Sheathing
- Floor Systems
- Roofing
- Insulation
- Interior Walls
- Interior Floors
  - Carpeting
  - Tile
- Finishes
  - Low VOC paints
  - Water-based finishes
  - Recycled Content Paint
- Adhesives

Section 6 - Occupant Training
Contractor shall submit a report summarizing the waste reduction and recycling utilized during the project, recycling provisions adhered to, as well as the types of recycled products used in construction. Report will be incorporated in a training/orientation program for building occupants highlighting environmental features of the project and its contractors.
CU Recycling Operations

CU Recycling’s facility is located on Stadium Drive, East of the Dal Ward Team Center (see map below). The facility is open for the delivery of recyclables 7:30 - 4:00 Monday - Friday. Materials collected at the recycling facility, along with instructions for proper preparation of the recyclable materials are detailed below. It is important to call the facility before materials are delivered to assure it is open and can accept large amounts of materials (greater than 95 gallon capacity carts). Phone numbers to reach recycling staff: 492-4706, 492-5321, 492-8307.

Corrugated Cardboard Boxes
must be emptied of all non-cardboard material, and flattened

Mixed Paper
Includes most types of paper and paper packaging. Contaminants which must be removed include trash, glass, plastic, and metals.

Office Paper
Includes white and light colored typing, writing, and copy paper. Contaminants which must be removed include trash, glass, plastic, metals, glue-bound materials, newspaper, carbon paper, and deep-dyed “astrobright” paper.

Newspaper
Includes newsprint and inserted advertisements. Contaminants which must be removed include trash, glass, plastic, metals, glue-bound materials, carbon paper, and deep-dyed “astrobright” paper, and office paper.

Consumer Containers
Includes food and beverage containers made from glass, aluminum, steel, and plastic. Plastic containers must have narrow top and be marked with a #1 or #2 on the bottom of the container. Contaminants which must be removed include trash, paper, and food.

CU Recycling is also able to place and collect containers at the job site. Materials collected for recycling at the site are usually limited to consumer containers, newspaper, and office paper. Call 492-8307 for details.

Location of CU’s Recycling Facility
## Off-Campus Recycling and Salvage Operations

<table>
<thead>
<tr>
<th>Material</th>
<th>Company</th>
<th>Location/ Phone</th>
<th>Accept</th>
<th>Pick-up</th>
<th>Sell</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appliances</td>
<td>Colorado Appliance Recycling, Inc.</td>
<td>Thornton / 289-3515</td>
<td>X (fee)</td>
<td>X (fee)</td>
<td></td>
<td>All major appliances. Fix and sell some, recycle parts.</td>
</tr>
<tr>
<td>Building materials</td>
<td>Rocky Mountain Salvage Outlet</td>
<td>Longmont / 651-0761</td>
<td>X</td>
<td></td>
<td></td>
<td>Discounted materials.</td>
</tr>
<tr>
<td>Building Materials</td>
<td>Rayback Plumbing Supply</td>
<td>Boulder / 442-3285</td>
<td>X (fee)</td>
<td></td>
<td>X</td>
<td>Plumbing, HVAC, cabinets, architectural items.</td>
</tr>
<tr>
<td>Cardboard, containers</td>
<td>Eco-Cycle</td>
<td>Boulder / 444-6634</td>
<td></td>
<td></td>
<td></td>
<td>Standard household-type recycling.</td>
</tr>
<tr>
<td>Concrete, Asphalt</td>
<td>Allied Recycled Aggregates</td>
<td>Commerce City / 289-3366</td>
<td>X (fee)</td>
<td></td>
<td></td>
<td>No tipping fee for clean asphalt.</td>
</tr>
<tr>
<td>Concrete, Asphalt</td>
<td>Oxford Recycling</td>
<td>Englewood / 762-1160</td>
<td>X (fee)</td>
<td>X (fee)</td>
<td></td>
<td>No contaminated material.</td>
</tr>
<tr>
<td>Concrete, Asphalt, Masonry</td>
<td>Recycled Materials Company. Inc.</td>
<td>Arvada / 432-2736</td>
<td>X (fee)</td>
<td></td>
<td></td>
<td>Incoming &lt; 10% dirt, no concrete in asphalt, no wood,</td>
</tr>
<tr>
<td>Non-ferrous metals</td>
<td>Western Aluminum Recycling</td>
<td>Boulder / 447-0252</td>
<td>X (pays)</td>
<td></td>
<td></td>
<td>Limited collection service.</td>
</tr>
<tr>
<td>Pallets</td>
<td>You Call We Haul!</td>
<td>Longmont / 772-8983</td>
<td>X (fee)</td>
<td></td>
<td></td>
<td>Standard-size pallets collected free of charge; others $1.</td>
</tr>
<tr>
<td>Wood waste, Yard waste</td>
<td>Renewable Fiber</td>
<td>Englewood / 798-1292</td>
<td></td>
<td></td>
<td></td>
<td>Sells landscape materials.</td>
</tr>
<tr>
<td>Wood/Yard Waste, Cardboard, Carpet Pad, Concrete/Asphalt, Metal Appliances</td>
<td>Browning Ferris Industries</td>
<td>Commerce City / 574-4500</td>
<td>X (fee)</td>
<td></td>
<td></td>
<td>Places, collects, dumpsters, roll-offs.</td>
</tr>
</tbody>
</table>

**Details on CU Recycling’s Web Site:**
http://www.colorado.edu/cure

*Valid November, 1997. Please call company for possible changes in services and fees.*
Procedures for Interaction with University of Colorado Recycling Services

Part 1 Waste Minimization in Design.

1.1 Facilities Planning shall be involved in the review and acceptance of plans for compliance to waste minimization practices as specified in Section 1 of this appendix.

Part 2 Reuse at the Job Site.

2.1 Plans for reuse of appropriate materials as specified in Section 2 of this appendix be shall be submitted to the University of Colorado Recycling Services department for review and approval (492-8307).

Part 3 Demolition / Construction Staging

3.1 Plans for recovering recyclable and/or reusable materials as specified in Section 3 of this appendix shall be submitted to the University of Colorado Recycling Services Department for review and approval (492-8307).

Part 4 Recycling Provisions in Design

4.1 Plans for recycling containers integral to the building as specified in Section 4 of this appendix shall be submitted to Facilities Management Recycling Operations office for review and approval (492-5321).

Part 5 Recycled Products Use

5.1 Plans for utilizing recycled products as specified in Section 5 of this appendix shall be submitted to Facilities Planning for UCB code compliance review and approval as well as to the UCB Project Manager for cost estimate review and approval.

Part 6 Occupant Training

6.1 A report summarizing the waste reduction and recycling utilized during the project, recycling provisions adhered to, as well as the types of recycled products used in construction shall be submitted to the University of Colorado Recycling Services department (492-8307) at the completion of the project.
Work Order Recycling Questionnaire

Memorandum

TO:  
FROM:  
SUBJECT: Work Order Number _____

DATE:  

This memorandum is to request additional information for Work Order # ____. This form is to help the University of Colorado's Recycling Services / Facilities Management department assist you in ensuring compliance with the waste reduction and recycling requirements of your project.

Please return this questionnaire to CU Recycling by ________. If you have any questions or require additional time, please contact us at 492-8307. Thank you.

____________________________________________________

Project Description (please complete)

1. Project Building(s) ____________________________________________________________
2. Area of Project __________________ square feet
3. Anticipated dollar amount of project $ ____________________
4. Existing user of the project area _____________________________________________
5. Intended user of the project area _____________________________________________
6. Existing use or occupancy of project area _____________________________________
7. Intended use or occupancy of project area _____________________________________
8. Proposed materials for construction __________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

9. Types of subcontractors/trades involved in the project

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

Name ________________________________________________________________________
Company _____________________________________________________________________
Phone ___________________ FAX ________________________
Reporting Form

This reporting form should summarize the waste reduction and recycling utilized during the project, recycling provisions adhered to, as well as the types of recycled products used in construction. It shall be submitted to the University of Colorado Recycling Services department at the completion of the project.

Project _______________________________________________________

Work Order Number ______________

Name________________________________________________________

Company_____________________________________________________

Phone ________________________ FAX __________________________

Waste Minimization in Design

Building dimensions corresponded to optimal use of standard lumber dimensions. (i.e. using two-foot increments)

Detailed framing layouts were developed to avoid waste when ordering lumber.

Lumber was stored on level blocking under cover to minimize warping, twisting and waste.

Excessively packaged materials and supplies were avoided.

Drywall was ordered in optimal dimensions to minimize cut-off waste.

Masonry materials, paints, solvents, and finishes were carefully estimated to avoid waste.

Reuse at the Job Site

Used dimension lumber, beams, and timbers over 6’ were salvaged.

Usable bricks, blocks, tile, and other masonry materials were salvaged from demolition, remodeling and construction.

During remodeling, metal radiators, grates, piping, aluminum siding, and old appliances were separated for salvage or recycling.

Serviceable cabinets, light fixtures, bathtubs, sinks, mortar mix, hardware, nails, screws and plumbing fittings and supplies were used for future jobs or arrangements made with off-campus recycling and salvage operations.
Lumber and plywood/OSB cut-offs were used later as fire blocking, spacers in header construction, etc.

Large drywall scraps were set aside during hanging for use as filler pieces in areas such as closets.

Joint compound buckets were reused for tool or material storage by clients or crews.

Left over bundled shingles were saved for future jobs or arrangements for off-campus recycling and salvage operations were utilized.

Clean concrete chunks, old brick, broken blocks, and other masonry rubble were buried on-site during foundation back-filling where practical.

**Demolition / Construction Staging**

Branches and trees from brush clearing were mulched and/or composted.

Corrugated cardboard boxes were flattened and delivered to CU’s recycling facility or arrangements were made for collection.

Containers for recyclable food and beverage containers were provided and collected by CU Recycling.

During construction, separate metals for recycling, including copper piping, wire and flashing; aluminum siding, flashing and guttering; iron and steel banding from bundles, nails and fasteners, galvanized flashing and roofing, and rebar and were recycled.

Serviceable wood pallets were delivered for reuse or mulching/composting.

Clean wood waste (non-treated dimensional, trim, sheathing, engineered wood) suitable for grinding was kept separate and arrangements were made for collection.

Unused portions of Paints, Stains, Solvents and Sealants were saved for future jobs. Such materials were not be disposed in landfill containers.

Old nickel cadmium batteries from portable power tools were stored in approved containers and disposal arrangements made with CU’s Environmental Health and Safety department.
Recycling Provisions in Design

Date of review by Facilities Management Recycling Operations ______________________

**Offices**
Space allocated? __________________________
container(s) used __________________________

**Copy Rooms and Computer Rooms**
Space allocated? __________________________
container(s) used __________________________

**Vending Areas, Lounges, Kitchens**
Space allocated? __________________________
container(s) used __________________________

**Classrooms**
Space allocated? __________________________
container(s) used __________________________

**Central Storage Rooms**
Space allocated? __________________________
container(s) used __________________________

**Loading Areas and Outdoor Storage Areas**
Space allocated? __________________________
container(s) used __________________________

**Trash Dumpsters/Containers (for non-recyclables)**
Space allocated? __________________________
container(s) used __________________________
Recycled Products Use in Construction

Recycled Concrete
Product(s) Used ____________________________
Supplier(s) ____________________________________

Backfill Material
Product(s) Used ____________________________
Supplier(s) ___________________________________

Non-Asphalt Waterproofing
Product(s) Used ____________________________
Supplier(s) ___________________________________

Framing Materials (engineered lumber, LPI joists, etc)
Product(s) Used ____________________________
Supplier(s) ___________________________________

Structural Alternatives to Wood Framing
Product(s) Used ____________________________
Supplier(s) ___________________________________

Sheathing
Product(s) Used ____________________________
Supplier(s) ___________________________________

Floor Systems
Product(s) Used ____________________________
Supplier(s) ___________________________________

Roofing
Product(s) Used ____________________________
Supplier(s) ___________________________________

Insulation
Product(s) Used ____________________________
Supplier(s) ___________________________________
Interior Walls
Product(s) Used _________________________________________
Supplier(s) _____________________________________________

Interior Floors
Product(s) Used _________________________________________
Supplier(s) _____________________________________________

Finishes
Product(s) Used _________________________________________
Supplier(s) _____________________________________________

Adhesives
Product(s) Used _________________________________________
Supplier(s) _____________________________________________

Resources for Additional Information


