# PHASE I DEMOLITON WASTE MANAGEMENT PLAN

# **NEW METRO HEADQUARTERS**

Contract # 902211

# FINAL REPORT

Submitted To:

Metropolitan Service District (Metro) 2000 S.W. First Avenue Portland, Or 97214

# Submitted By:

Palermini & Associates 815 S.E. Clatsop Portland, Oregon 97202 (503) 235-0137

March 23, 1992

# **TABLE OF CONTENTS**

PAGE

1

5

5

6

8

Α

В

С

D

E

F

G

Η

# SUMMARY

# I. WASTE MANAGEMENT PLAN DEVELOPMENT

Preliminary Waste Audit On-Site Coordination

II. KEY FINDINGS

# APPENDIX

Scope of Work Draft Findings Walk-through Audit - December 10, 1991 Draft Waste Reduction Plan - January 2, 1992 Draft Waste Reduction Plan - January 12, 1992 Draft Waste Reduction Plan - January 16, 1992 Targeted materials Waste Management Plan for Subcontractors Addendum for Construction Site Recycling Guide Construction site Recycling Guide

### SUMMARY

In early December, 1991, Metro decided to develop a "Waste Reduction Plan" for the renovation of the old Sears Building located at 524 NE Grand Avenue, Portland, Oregon. The building had been selected to house the new Metro Headquarters.

This project represents one of the first major attempts in the nation to quantify how much material can be recovered and recycled from the demolition and new construction phases of a large commercial structure.

The Request for Proposals for the new Metro Headquarters went out as a Design/Build package The specifications were outlined in the RFP and there was very vague language about requiring on-site recycling of construction debris. Budget had not been allocated within the design/build package for contractors to develop and implement a waste management plan or for Metro staff to assist in the development of a WMP. Therefore, contract bidders were not required to submit a waste management plan or detail which materials would be targeted for recycling or salvage during the demolition or new construction phases. When Metro staff first identified that they wanted to salvage useable items from the old Sears building and to recycle as much of the demolition debris as possible, the RFP had already gone out for bid.

Palermini & Associates (P&A) was retained to develop the waste management plan (WMP) for both the demolition and new construction phases of the renovation. Components of the plan included conducting a preliminary walk-through waste audit and review of proposed plans to identify the types and volumes of materials that could potentially be recovered, reused or recycled. (see Appendix A).

Additional tasks included conducting a brief survey of recycling companies and performing a cost/benefit analysis to determine which materials had the highest potential for recovery. P&A was also requested to attend discussions regarding the proposed waste reduction plan with the architectural team, construction company and Metro staff.

By the time the design/build team had been selected, Metro had contracted with P&A to develop the waste management plan (WMP) for the headquarters project. Metro was very anxious to get started on developing the WMP, and was anticipating potential conflicts with the chosen design/build team. Metro was concerned about the level of commitment on the design/build requirement for the selected contractor to do so. As it turned out, the selected contractor was already conducting a waste audit and had identified potential salvageable and demolition waste that could be recycled.

The design/build team of TVA/Cole and Hoffman Construction was selected to design and build the new Metro Headquarters.

Due to the extremely fast track of this project, the preliminary waste audit was done by P&A prior to discussions with the contractor, Hoffman Construction. Metro & P&A conducted an independent audit as did Hoffman Construction. Subsequently, a great deal of duplication in efforts took place as to what materials were feasible to salvage and recycle.

Many steps were taken in the preliminary stages of developing the waste management plan and major lessons were learned. Most importantly was the need to ask the right questions and to coordinate closely with the primary contractor as soon as possible. Other steps to take when requesting contractors to develop and implement a WMP and when outlining specifications for inclusion in an RFP are:

Develop explicit specification language for inclusion in the RFP package. Detail what level of salvage or on-site recycling of construction debris will be required.

Include in the contract documents the requirement for developing and implementing a WMP for both the primary contractor and subcontractors Clarify who is ultimately responsible for waste management.

2.

3.

Once the contractor has been selected, owner and contractor should conduct a walk-through of the building ( in the case a demolition project) or review preliminary drawings and discuss the proposed WMP. Determine:

What is the contractor's normal procedure for waste management.

How and where will the materials be recycled.

What are the source-separation requirements for each material identified as recyclable. How will the site be layed out for source separation. What are the most efficient and cost effective mechanisms available to transport materials to the secondary markets or recyclers.

What method will be used to track the type, estimated quantity and how materials will be transported and disposed. Develop timelines for reports.

Developing an efficient waste management plan for the Metro project is an evolutionary process. Not all of the answers to the above questions were readily available and it took considerable coordination and cooperation between Metro, Hoffman, Allied Construction and P&A to get the process running smoothly.

3

# I. Waste Management Plan Development

## A. Preliminary Waste Audit

In early December, 1991 a preliminary walk-through waste audit was performed. Due to the lack of light and unfamiliarity with the building, and a lack of knowledge about the proposed plans for the demolition phase, it was very difficult to identify all of the types and quantities of potential recyclable or reusable materials. Subsequent visits provided additional information, but a lot of guesswork went into the draft findings for the December 10, 1991 report (see Appendix B). As of December 10, 1991, P&A had not yet met with Hoffman Construction to discuss what they had planned for the salvage and disposal of demolition debris for the Sears building.

P&A conducted a brief survey to determine the market value of those materials which had been determined to have recovery potential. Based on those findings, recommendations were made as to which materials (excluding salvageable) had the highest potential for recycling and what the cost benefits would be. The costs were listed as either the cost for disposal or the market reimbursement for the materials (see Appendix C). The major materials identified were:

• Exterior

Marblecrete Bricks Aluminum Concrete Scrap Metal

Interior

Light Fixtures Bricks Concrete (CMU & Clay Tile) Metal stud walls Wallboard (for fill) Ferrous and non-ferrous metals - ductwork, conduit & piping Ceiling Tile & Grid Vinyl floor covering Wood The draft WMP's (see Appendix D) were developed prior to discussion with Hoffman Construction. They too, were conducting a waste audit and doing actual take-offs for determining the quantity of material that had potential for recycling and had done a preliminary survey on both the market value and/or cost for disposal of identified materials. Many of the same materials had been identified by both P&A and Hoffman, but Hoffmanhad actually done quantity take-offs based on their preliminary demolition plans. This information would have been very useful to P&A in th early stages of developing the WMP.

On January 16, 1992, Metro staff, P&A and the construction team, TV/AArchitects and Hoffman Construction met for the first time to discuss the recycling potential for the project (see Appendix E). Hoffman indicated they were very committed to implementing on-site recycling for as many materials as possible. An on-site coordination meeting was scheduled for the following week with P&A, Hoffman and Metro staff.

B. On-Site Coordination

Hoffman, Metro and P&A met on January 21, 1992 to finalize which materials would be recycled and to determine the most effective and expeditious methods for coordinating the removal and delivery of the materials to the secondary markets. P&A submitted a spreadsheet listing the targeted materials, potential recycling companies and associated costs (Appendix F) Discussions also took place as to the most effective method to track the types and volumes of materials that would be recycled.

At this point, Hoffman had still not determined whether they were going to use a demolition contractor or do the exterior demolition in-house. A finalized waste management, plan could not be developed until those decisions were made. Options were discussed as to the most cost effectie method to dispose of th demolition waste. A contractor, who specializes in hauling and recycling demolition waste was asked to submit a bid for the hauling and recycling demolition waste was asked to submit a bid for the pick-up and hauling for both the exterior and interior demolition debirs. The contractor, has a facility that was able to take the mateial, grind it up and use it for road or landfill.

Prior to the selection of a demolition contractor, discussion took place with Metro staff and Hoffman about the possibility of using the St. Johns Landfill for disposal of all inert materials produced as a result of the demolition. Early problems developed because of a lcak of clear communication and clarification as to the type of material acceptable and the source separation requirements. For example, Hoffman pulled down all the wallboard with the

5

metal studs intact. The wallboard and studs were then placed in one large pile and pushed out of the building into a dumpster for hauling to St. Johns Landfill. Under normal circumstances, St. Johns would refuse the load because of the size and length of the metal studs.

Hoffman selected a demolition contractor, Allied Demolition, and arranged for all of the inert (concrete, wallboards, bricks, etc.) demolition material, both interior and exterior to be delivered to St. Johns for use in closing down the landfill.

During this same period, Hoffman suggested developing a "Waste Management Plan for Subcontractors" (see Appendix G) and including it in the subcontractors 'bidder packets. Metro and P&A agreed to develop a draft plan and submit it to Hoffman for suggestions and/or approval. Once approved by Hoffman, the worksheet was included in the actual subcontract document. Hoffman also included language in the subcontract that stated," Subcontractor is aware this is a Metro project and shall make every effort to cooperate with the Metro recycling program. Subcontractor shall attend an orientation meeting with the onsite Metro recycling personnel when starting Subcontractor shall also submit an itemized weight work at the jobsite. breakdown of how many tons/cyds of material are removed from the jobsite, how many of those tons/cyds were recycled and where the materials were recycled. Subcontractor shall turn in a copy of the Metro recycling worksheet at the orientation meeting. A sample copy of the Metro worksheet has been enclosed with the Subcontract for your use".

P&A conducted a survey of all secondary markets included in the "Construction Site Recycling Guide" and made revisions and updates accordingly. (Appendix H) Metro then took the updates and along with a map listing the facilities developed revised copies of the Guide (Appendix I) for use by subcontractors working on the Metro jobsite.

6

# APPENDIX

# II. KEY FINDINGS

Upfront communication and coordination with the primary contractor is essential to developing an effective waste management plan. The following suggestions should help in the early stages of implementing waste management plans for construction projects.

- A. Include specifications for the development and implementation of a waste management plan in the initial RFP bid package.
- B. Include in the contract documents the requirement for developing and implementing a WMP for both the primary contractor and subcontractors. Include waste management forms for use in subcontractor bid packages. Clarify who is ultimately responsible for waste management.
- C. Conduct a preliminary walk-through audit with prime contractor as soon as possible after contracts are signed. Review waste management plan with primary contractor.
- D. Coordinate with prime contractor to develop an effective tracking mechanism verify the types, estimated quantities and how the materials were transported and disposed.

7

### Appendix A

### Scope of Work

The following tasks shall be completed for the development of the "Waste Reduction Plan" for the renovation of the Sears Building located at 524 NE Grand Avenue, Portland Oregon.

Task 1.

- A. Conduct a walk-through waste audit to identify the types and <u>volumes</u> materials that can be potentially recovered during the demolition phase.
  - B. Review proposed construction plans and specs to identify the types and volumes of materials that can be potentially recovered during the new construction phase.

Task 2.

Conduct a brief survey to estimate the market value of materials identified as potentially recoverable for both the demolition and new construction phases. Perform a cost/benefit analysis to determine which materials should be included in the proposed "Waste Reduction Plan". The cost-benefit analysis will take into consideration the volume of materials that can be diverted from the landfills. Research will also be conducted to determine the most cost effective/expeditious methods for coordinating the removal and delivery of materials (for both demolition and new construction) to the secondary markets. This will include coordinating with salvage contractors for the reuse of such materials as doors, moldings, windows, plumbing materials, lighting fixtures, etc. from the demolition phase.

Task 3.

Develop a proposed "Waste Reduction Plan" that will include:

- A. Recommendations on which materials to target for recovery and an estimate of the amount of material that can be recovered.
- B. Methodology for the recovery of these materials.
  - 1. Setting up the site for efficient source separation.
  - 2. Coordination with secondary markets for pick-up or delivery of materials.
- C. Recommend at least one resource efficient building practice for incorporation into the project that would reduce the amount of waste generated.
- D. Estimate the cost/benefits for above items A, B and C. This will include an estimation of time and added staff needed to accomplish waste recovery goals for both demolition and construction phases.

Task 4.

Represent Metro's Waste Reduction section in the discussions about the proposed "Waste Reduction Plan" with the achitectural team. This will include partisipation in discussions about the antisipated impact of the plan on the site operations, budget and schedule. Work with Metro Staff and the architectural team to finalize the "Waste Reduction Plan" that will be implimented in the project.

Payment

JG:gbc

Contractor shall submit to Metro a monthly invoice that details services performed by contractor during the previous month. Invoices shall be sent to Jim Goddard, Solid Waste Department, Metro, 2000 S.W. First Avenue, Portland, Oregon 97201-5398. Metro shall pay vendor within thirty (30) days following receipt of an approved invoice from contractor.

# December 10, 1991

# **DRAFT FINDINGS - METRO/SEARS BUILDING**

### **DEMOLITION PHASE**

Based on walk-through audit the following types and volumes of materials have been identified as having potential for recovery during the demolition phase.

Note: Some materials may not be recoverable due to asbestos or other hazardous material content. Also, some materials may not be recoverable due to the actual asbestos abatement.

### EXTERIOR

Marblecrete

There is approximately 62,832 sq. ft. of marblecrete attached to the outside facade with metal lath. This equates to 96.7 cubic yards.

The material is recyclable if it is not contaminated with wood or other materials.

Costs for Recycling (as per Eastside Recycling)

Clean:

### \$5.00/yard

\$483.50

\$9.863.40

Contaminated:, \$102.00/yard or \$68./ton

NOT YET DETERMINED:

Labor cost for removing marblecrete from lath and source separating.

### • BRICKS:

There are approximately 43,000 bricks that have been determined to be reusable or recyclable. Discussion with masonry contractors

indicates that these bricks are reusable and should not be ground up. Futher research will indicate the cost benefit of reuse in the present form over recycling with other masonry materials.

Not Yet Determined

Labor costs for removing bricks. Use of removed bricks.

# INTERIOR

Lighting Fixtures

There are approximately 2600 -2800 lighting fixtures with a combination of 2 bulb & 4 bulb. Approximately 250 of these light fixtures are covered with a grid of aluminum with metal casings that weigh 5 lbs. @. Approximately 30 fixtures have flat heavy acrylic coverings and 30 have curved acrylic coverings. There is approximately 2500 small acrylic side pieces.

The following lists the market prices paid for the aluminum and plastic.

Aluminum:

1,250 lbs x .28 cents

\$350.00

Acrylic Covers

802 lbs of plastic

(note: Denton Plastic will only pay for loads of plastic that weigh 2,000 lbs or more, but he will take them for free)

Not Yet Determined

Labor cost for dismantling fixtures.

# Lighting Ballasts

The removal of the lighting ballasts falls under hazardous waste abatement and will be dealt with by PDI. The removal and disposal will have to follow EPA guidelines and properly sealed in drums and shipped to a hazardous waste site such as Arlington.

Preliminary cost estimates as per Arlington

200 ballasts per drum.

\$70.00 disposal fee per drum

\$ 5.28 Oregon State Tax

\$75.28 total per drum

Estimated 12 drums @ \$75.28.

### \$941.00

Plus \$300 filing fee (or profile fee) for disposal

This does not include transportation which is estimated to be \$19.00 per drum plus a \$50. pick-up fee or \$278.00

Ceiling Tiles

Current information indicates that these contain asbestos.

Wallboard

A sample is currently being tested by a lab. Preliminary indications is that it will contain asbestos and or will be contaminated by the asbestos abatement.

Duct Work

Preliminary estimates indicate there is 1700 lineal feet or approximately 8,000 lbs. (assuming it is 12 gauge galvanized).

Current market prices paid for scrap metal is \$40/ton

4 tons x \$40.00 \$160.00

If the scrap metal is not recycled the cost to dispose at the landfill is \$68/ton or \$272.00

### Additional scrap metal

There is considerable scrap metal contained in the sprinkler systems, lathing materials holding the marblecrete up, structural framing etc.. - I was not able to estimate the total volume of this material at this time, but hope to come up with an approximate figure soon.

Salvage Materials

19	toliets	18	Entrance Doors/ complete
13	urinals	12	Interior Doors w/dampers
			(office type)
20	sinks	4	Interior Doors w/o dampers
2	utility sinks	6	(office type)
,		· 6	large doors off hinges

22 Bell lights 12' dia.(hanging from ceiling)

7 Bell lights 18" dia. (hanging from ceiling)

Not Yet Determined

What the market is for the above materials or if they should be donated to a salvage warehouse. The walk-through audit indicated that there is also a number of hallway doors, freight elevator doors and receiving doors (6) and another visit to the site is needed to determine the exact amount and shape these doors are considered to be in.

### **MISCELLANEOUS -**

Sprinklers Water mains Mis. scrap metal or piping Electrical wiring Copper tubing Interior brick work Metal door and window casing in office section Door frames (where doors have been removed)

# New Construction

Need to see more specific specifications for materials (i.e., exterior sheathing material - interior materials)

Still formulating recommendations for materials to be recovered during new construction phase. But preliminary materials are:

> concrete wood

packaging materials (i.e., cardboard, plastic) scrap metal wallboard (gypsum) January 2, 1991

To:Jim GoddardFrom:Debbi Palermini

'Re:

Waste Reduction Plan for Sears Building

Jim, I decided that the draft waste management plan had too many holes and I needed to answer a few questions before it would make any sense. The following are a few of the questions I am still fuzzy on. After these questions are answered, I will finish up the plan and present it to you on Monday, January 6.

Who is the audience for the waste reduction plan? Metro or Hoffman. How do we want to present this to Hoffman? Do we just want to develop a plan or do we want to develop a plan in coordination with Hoffman's existing business practice.

Examples of sections for the waste reduction plan are listed below. Each section would list the estimated quanity of material, identify available secondary markets, methods for recovery and site set-up, estimated cost savings over traditional disposal methods, projected timeline, and other as identifed. Can you think of other line items we should include?

A. Salvage 'Contractors '

Hippo Bid

Other

B. Interior Recovery

Remaining materials not taken by salvage contractors (i.e., doors, plumbing

Page 2 -

fixures, etc.) Ferrous Metals (duct work)

- Non-ferrous Metals(copper, aluminum, etc.)
- Electrical
- Machinery??
- Lighting Fixture Materials
- Interior red brick
- Sprinklers/water piping
- Other
- Exterior Recovery

C.

2.

- Exterior Doors
- Glass
- Brick both red and white
- Concrete/Marblecrete
  - Metals
- Asphalt
- D. New Construction Phase
- Have they done their own site analysis to determine what they can recycle? Should we coordinate with them?
- 3. What is the current demolition time-line?

Iron piping - a de jain

January 12, 1991

Draft Waste Reduction and Recovery Plan for the renovation of the Sears Building located at 524 NE Grand Avenue, Portland, Oregon.

draft

#### **PHASE I - DEMOLITION** I.

The following list will identify those materials that have been identified as having potential for recovery during the demolition phase. The list will also indicate the current market value for the materials, in some cases an estimate of the amount of material that can be recycled and suggested methods for recovery.

#### Interior Salvage A.

A detailed list of salvageable materials has been identified and will be removed and purchased by salvage contractors. The list is attached. Remaining materials will be donated to local non-profits or can be recycled accordingly.

#### **Remaining Interior Materials B.** <sup>•</sup>

1. Plastics

Plastic can be disposed of for free when taken to Denton Plastic. Bins could be placed inside the Sears Building to collect the plastic remaining from the remediation of the lighting ballasts.

Approximately 80% of the plastic is recoverable.

Cost savings will accrue from not having to pay a tipping fee of \$68/ton. Hoffman could deliver plastic to Denton, thus also saving on the hauling fee.

Builer Equipment

M

All of the duct work, scrap iron and metal has the potential to be recovered. HUAC Promis - depends on Hypman Plane

Current market rate for scrap metal is \$40/ton. (source: Schnitzer Steel).

Some secondary market contractors will come onsite and take material at no cost. Material must be cut to certain lengths and be source separated.

Potential savings are accrued by not paying tipping or hauling fees.

3. Non-Ferrous Metals

а.

# Aluminum

Aluminum grids are found on the lighting fixtures. Along with the plastic, the aluminum could be recovered during or after the remediation of the lighting ballasts. Bins could also be placed near the remediation and the aluminum could be recycled.

Estimates for recovery depend on the decision to use extra labor to take the grids apart and source separate the sheet metal from the aluminum.

Current market rate for aluminum is .28 cents/lb. (source: Mt. Hood Metals).

1 wire

b. Copper

Aid

Rolph Fibert

Specialized Specialized

HI. 10no soleter er pain

solder rpart, 10.74+/.0.

All of the copper piping has the potential to be recycled.

Current market rates for copper is .80 cents/lb (source: Mt. Hood Metals).

Interior Bricks

All of the interior red bricks are recyclable.

Current market rates are .20-.25 cents a brick delivered to secondary market.

Need about land touc about land

Pumilite Building Products) (source:

Cost savings accrue by not paying a tipping fee and money received for bricks will more than pay for cost of hauling to secondary market.

#### Exterior Materials B.

Swith destricts

### Marblecrete

The outside facade is marblecrete attached to metal lath. The marblecrete is 100% recyclable if source separated and is not contaminated with other mateials.

Costs for tipping at a concrete recycler is \$1.00/yard Dwham Costs for tipping a contaminated load is \$102.00/yard.

There is still a hauling fee which is estimated at \$130+ for a 30-yard dumpster if a standard waste disposal company is used.

Scrap Metal 2.

There is a metal framing system that holds the marblecrete Twohing fimingle All of this material is potentialy recyclable. up.

Current market value is \$40/ton. Source separated and delivered to a secondary market such as Schnitzer Steel.

There is no market value in the white bricks at this time. An add could be placed in such publications as the Nickel Ads and given away. This would reduce the need to take the and the landfill.

4. Exterior canopy.

The canopy surrounding the building contains copper flashing which is recyclable. The canopy itself is

comprised of a concrete based material with wood framing. It is difficult at this time to determine the potential to source separate the material for recycling.

5. Exterior glass

The exterior glass can be recycled if care is taken in the demolition phase.

Further research and discussions with Hoffman will determine the cost benefits to reusing the glass on-site or source separating and recycling.

6. Exterior Doors

The doors can be dismantled and used for scrap metal and the glass recycled.

### II. PHASE II - NEW CONSTRUCTION

The following waste materials can be recycled during the new construction phase.

Coordination with secondary markets will determine the most cost-efficient manner to set up the site for recovery.

Wood:

Α.

Currently a 40-yard dumpster costs \$400 to haul and dump at a local landfill.

A 40-yard dumpster with clean, source separated wood can be recycled for \$140.

Concrete:

Clean, source separated concrete or asphalt can be dumped at local area recyclers at a cost from \$2.90 - \$14.00/yard.

Contaminated loads are \$68/ton. This does not

1 Porpro totas small change og 1 tom nete og rephalt fine - include the hauling fee which is usually \$130 up.

Cardboard: Most waste haulers will pick up cardboard at no charge and not charge for bins to collect the cardboard on site.

Current prices for delivery to a secondary market is \$20-25/ton.

Sheetrock:

ck: Secondary markets are charging \$30 up/per ton to accept clean, source separated gypsum.

Scrap Metal: Current market rate for scrap metal is \$40/ton.

Based on the construction schedule, a detailed plan for recovery of waste generated on the construction site can be developed.

Need FOR THURSDAY Appendix & References 1) Format for final package 2) Plan for each material 3) Scheduling 4) Plan of tracking

Misc HUAC + Boiler Electrical Switch Gear Back-up Generator Fire Sprinklers

January 16, 1991

Draft Waste Reduction and Recovery Plan for the renovation of the Sears Building located at 524 NE Grand Avenue, Portland, Oregon.

### I. PHASE I - DEMOLITION

The following list will identify those materials that have been identified as having potential for recovery during the demolition phase. The list will also indicate the current market value for the materials, in some cases an estimate of the amount of material that can be recycled and suggested methods for recovery.

## A. Interior Salvage

A detailed list of salvageable materials has been identified and will be removed and purchased by salvage contractors. The list is attached. Remaining materials may be donated to local non-profits or can be recycled accordingly.

### **B.** Remaining Interior Materials

1. Plastics

Plastic can be disposed of for free when taken to Denton Plastic. Bins could be placed inside the Sears Building to collect the plastic remaining from the remediation of the lighting ballasts.

Approximately 80% of the plastic is recoverable.

Cost savings will accrue from not having to pay a tipping fee of \$68/ton. Hoffman could deliver plastic to Denton, thus also saving on the hauling fee.

2. Ferrous Metals

All of the duct work, scrap iron and metal ... has the potential to be recovered.

Current market rate for scrap metal is \$40/ton. (source: Schnitzer Steel).

Current market rate for iron piping is \$48/ton

Some secondary market contractors will come onsite and take material at no cost. Material must be cut to certain lengths and be source separated.

Potential savings are accrued by not paying tipping or hauling fees.

Note: HVAC removal depends on Hoffman plans -Boiler equipment Diesel genrator

3. Non-Ferrous Metals

a. Aluminum

Aluminum grids are found on the lighting fixtures. Along with the plastic, the aluminum could be recovered during or after the remediation of the lighting ballasts. Bins could also be placed near the remediation and the aluminum could be recycled.

The outside aluminum grid also has potential to recycled.

Estimates for recovery depend on the decision to use extra labor to take the grids apart and source separate the sheet metal from the aluminum.

Current market rate for aluminum is .28 cents/lb. (source: Mt. Hood Metals).

b. Copper

All of the copper piping and wire has the potential to be recycled.

Current market rates for copper is .80 cents/lb

(source: Mt. Hood Metals).

Interior Bricks

All of the interior red bricks are recyclable.

Current market rates are .20-.25 cents a brick delivered to secondary market. (source: Pumilite Building Products)

Cost savings accrue by not paying a tipping fee and money received for bricks will more than pay for cost of hauling to secondary market.

# C. Exterior Materials

Marblecrete

The outside facade is marblecrete attached to metal lath. The marblecrete is 100% recyclable if source separated and is not contaminated with other mateials.

Costs for tipping at a concrete recycler is \$0.00 - 5.00/yard Costs for tipping a contaminated load is \$102.00/yard.

There is still a hauling fee which is estimated at \$130+ for a 30-yard dumpster if a standard waste disposal company is used.

2. Scrap ' Metal

There is a metal framing system that holds the marblecrete up. All of this material is potentialy recyclable.

Current market value is \$40/ton. Source separated and delivered to a secondary market such as Schnitzer Steel.

Or material may be picked up by a scrap metal recycler.

3. Exterior white bricks

There is no market value in the white bricks at this

time. An add could be placed in such publications as the Nickel Ads and given away. This would reduce the need to take the ... material to the landfill.

4. Exterior canopy.

The canopy surrounding the building contains copper flashing which is recyclable. The canopy itself is comprised of a concrete based material with wood framing. It is difficult at this time to determine the potential to source separate the material for recycling.

5. Exterior glass

The exterior glass can be recycled if care is taken in the demolition phase.

Further research and discussions with Hoffman will determine the cost benefits to reusing the glass on-site or source separating and recycling.

6. Exterior Doors

**A**.

The doors can be dismantled and used for scrap metal and the glass recycled.

# II. PHASE II - NEW CONSTRUCTION

The following waste materials can be recycled during the new construction phase.

Coordination with secondary markets will determine the most cost-efficient manner to set up the site for recovery.

Wood: Currently a 40-yard dumpster costs \$400 to haul and dump at a local landfill.

A 40-yard dumpster with clean, source separated

# wood can be recycled for \$140.

Concrete:

Clean, source separated concrete or asphalt can be dumped at local area recyclers at a cost from \$0.00 - \$14.00/yard.

Contaminated loads are \$52.00 - \$68/ton. This does not include the hauling fee which is usually \$130 up.

Source: Hillsboro Landfill Durham Wood

Cardboard: Most waste haulers will pick up cardboard at no charge and not charge for bins to collect the cardboard on site.

> Current prices for delivery to a secondary market is \$20-25/ton.

Sheetrock:

Secondary markets are charging \$30 up/per ton to accept clean, source separated gypsum.

Scrap Metal: Current market rate for scrap metal is \$40/ton.

Based on the construction schedule, a detailed plan for recovery of waste generated on the construction site can be developed.

January 21, 1992

# MATERIALS TARGETED FOR RECYCLING DURING DEMOLITION PHASE

Questions for Don

- 1. How do you typically get rid of materials? Will you be using a hauler (i.e., Waste management or MDC or can we set up with most cost effective method (i.e. coordination with secondary market) Can you self haul?
- 2. Bins for source separation? Do you have access? We can get them supplied by hauler or we can work with individual secondary markets.

Appendix

3. Who will source separate?

4. Construction schedule?

5. Sub-contractor recycling clause

Incorporate clause requiring recycling where viable secondary market exists

Verification of recyling(report secondary market, type and quanity of materials recycled cost reimbursement?)

### Page 2

MATERIALS	SEC. MARKET	I DISPOSAL METHOD	LAULING 	Tipping Fee	OTY	REIMBURSEMENT
~		, , ,	• • • • • • •			,
Concrete w/rebar -	Durham	Self-haul/hauler	• •	\$1/yd	•	
Concrete w/o rebar	Durham	Self-haul/hauler	· ·	\$1/yd	• •	• •
Rubble & Cut Slabs Marblecrete	Durham Durham	n n ′ n ⁻n		\$1/yd \$1/yd		
Brick Red White CMV & Clay tile	Pumilite Durham Durham*	Self haul/hauler Self haul/hauler Self haul/hauler		\$1/yd. \$1/yd. +	 hauting c	<b>25 @</b> :ost
Drywall	Ask K.Leahy	1		-		
Scrap Metal (Ductwork, etc.)	Schnitzer	Self haul/haul	er			\$40.00/ton
Carpet & Pad	None	Landfill	• 	:		
Iron Piping (Sprinklers)	Schnitzer	Self haul/haul	er			\$48.00/ton
Lights Plastic Aluminum	Hazardous Was Denton Plastic (see other)	ste Self haul	· · · · · ·	Free	,	
Scrap Metal	Schnitzer	Self haul/haul	er		•	\$40.00/ton

Palermini & Associates 1/21/92

PAGE 3	•					-
MATERIALS	SEC.MARKET	I DISPSOAL METHOD	HAULING COST	TIPPING	QTY.	REIMBURSEMENT
Vinyl Floor Covering	Durham	Self haul/hauler	• •	\$1/yd		· · · ·
Glass	• •	·				
Exterior Canopy				, . ,		-
Exterior Doors	· · · · · · · · · · · · · · · · · · ·	•	· •	•	•	•
Roofing	Durham	Self haul/hauler	•	\$1/yd		
Machinery HVAC & Boile	ers-	· · · · ·		•		· · · · ·
Aluminum	Mt. Hood Metals	Self haul/hauler				.28/1b
Conduit	· · ·	· · · ·	,	•		
Copper Pipes	Mt. Hood Metals	Self haul/hauler				.80/lb
Ceiling Tile	Durham?		•			
	•	•				· · ·

Palermini & Associates 1/21/92

### WASTE MANAGEMENT PLAN FOR SUBCONTRACTORS

Appendix G

Metro is requesting that all subcontractors prepare a waste management plan by completing the following form for wastes produced as a result of work performed on the new Metro Headquarters job site. Metro requires that subcontractors recycle wastes when there is a viable recycling company available, but will not accept surcharges for compliance costs above and beyond those included in the subcontractor bids.

Time onstruction Site Recycling Guide" is attached to the bid packet to assist in preparation of bids. Metro will provide technical assistance to the subcontractor to develop and implement the waste management plan. Subcontractors will be required to provide proof of proper disposal as a result of work performed on the Metro Headquarters site. This proof will be documented by an invoice or receipt from a recycling company, disposal site or disposal company that indicates the quantity (weight or volume) date and type of material recycled or disposed. This information is to be submitted with normal invoice packages.

COMPANY	NAME.	· · · · · ·	CONTACT:	:		
ADDRESS.		 `	PHONE:	•		· •
, ,				5	•	

Please fill out the following waste management form for submittal with bid. The form will help to identify the type, estimated quantity and how the materials will be transported and disposed. If you have any questions regarding the form or recycling and disposal, please call Jim Goddard at Metro, 221-1646, Ext. 141.

Circle the materials that will be produced, estimate the quantity, list how the materials will be transported and circle where the materials will be taken.

MATERIAL -	ESTIMATED QUANTITY	DISPOSAL METHOD	RECYCLING COMPANY OR DISPOSAL SITE (If self-haul)		
Concrete, Brick,	yds <sup>3</sup> tons	self-haul or Hauler Name:	Durham Porter Yet Lakeside	Hillsboro St. Johns Landfill Other:	
Clean Wood Framing Scraps	yds <sup>3</sup> , tons	self-haul or Hauler Name:	American Container Bredl Durhám Smurfit Wastech Wood Exchange East County Recycling Knez	McFarlane's Grimms Hillsboro Lakeside MDC Other:	
Drywall	yds <sup>3</sup> tons	self-haul or Hauler Name:	Knez	United Pacific Other:	
Corrugated cardboard	yds <sup>3</sup> tons	self-haul or Hauler Name:	EZ Recycling Farwest Fibers KB Recycling Wastech	East County Recycling Oregon Paper Other:	
Metals (i.e, ferrous and electrical, plumbing, and HVAC scrap)	yds <sup>3</sup> tons	self-haul or Hauler Name:	Schnitzor Acme Hillsboro Mt. Hood Metals Oregon Pacific Steel	Metro Metals Calbag Other:	
Other:	yds <sup>3</sup>	self-haul ´``` or Hauler Name:	Name	Name	
Mixed Loads (i.e., trash, plastic, packaging, etc.)	yds <sup>3</sup> tons	self-haul or Hauler Name:	Metro Central Metro South Wastech	East County Recycling Hillsboro Lakeside Other:	

ADDENDUM FOR CONSTRUCTION SITE RECYCLING GUIDE

# WOOD & MIXED MATERIALS

Delete American Container Recycling

- Only taking organic yard debris.

See Large Yard Waste

Bredi Saw Service 11005 NE Marx Portland, Oregon 97220 (503) 252-2614

Fee: Call first

Delete Reidel Materials Recovery Facility

SMURFITT NEWSPRINT Foot of Wynooski Newberg, Oregon 97132

(503) 538-2151

Specifications

accepts clean, source separated wood
Fee: Free - no tipping fee

# LARGE YARD WASTE

American Container Recycling 9707 N. Columbia Boulevard Portland, Oregon 97283 (503) 286-0886

# **Specifications**

accepts nothing over 6".

- accepts shrubs, yard debris, organic materials such as grass and leaves
- Fee: \$4 yard

DELETE REIDEL MATERIALS RECOVERY FACILITY

# **ASPHALT AND CONCRETE**

East County Recycling Center 12409 NE San Rafael Portland, OR 97230 (503) 253-0867

# **Specifications**

 New Fee for clean dirt, rock or concrete/asphalt \$5/yd., with a \$12 minimum load

Hillsboro Landfill 3205 S.E. Minter Bridge Road Hillsboro, OR 97123 (503) 640-9427

Specifications

- accepts source-separated clean concrete, asphalt and bricks
- fee: free

LAKESIDE RECLAMATION (Grabhorn's) 14930 SW Vandermost Road Beaverton, Oregon 97207

(503) 628-1866 Specifications

accepts clean source separated dirt, rock, asphalt

- and concrete
- no pick-ups or trailers need to establish account
- fee: \$13.45/ton for source separated
- St.JOHNS LANDFILL

**Specifications** 

 accepts large quantities only. Call Metro #221-1646 for approval

# SCRAP METALS

# ACME TRADING AND SUPPLY CO. 4927 N.W. Front Avenue

Portland, Oregon 97210

Specifications:

accepts both ferrous and non-ferrous metals

• call for price reimbursement quotes

# CALBAG METALS CO.

2495 NW Nicolai Portland, Oregon 97210 (503)226-3441

Specifications:

• accepts non-ferrous scrap metals

call for price reimbursement quotes
# **METRO METALS**

Winkler Yard 3365 S.E. 17th (E. End Ross Isl Bridge; between Powell & Holgate) Portland, Oregon (503) 231-0799 **ZUSMAN YARD** 1525 NE Columbia Blvd. (Near Portland Airport) Portland, Oregon (503) 289-8074

Specifications

- accepts both ferrour and non-ferrous metals
- call for price reimbursement quotes

MT. HOOD METALS INC. 9645 N. COLUMBIA BV. PORTLAND, OREGON (503) 283-3300

# Specifications

accepts ferrous and non-ferrous metals

call for price reimbursement quotes

For additional listings of companies that accept and purchase scrap metal, please check your Yellow Pages under SCRAP METAL.



Appendix I

# **Construction Site Recycling**



A Guide for Builders and Developers

February 1992

# Turn Your Trash into Cash!

Landfill capacity is decreasing. Disposal fees are increasing. Policy makers and the public are concerned about environmental issues. It's no wonder that builders are looking for new, less expensive ways to dispose of construction debris.

For an increasing number of builders construction site recycling is the answer. Recycling construction waste can cut hauling and disposal costs and help builders stay competitive in the market place.

Many materials left over from construction or demolition are reusable or recyclable. Examples include clean wood, cardboard, drywall, large yard waste, asphalt, concrete and scrap metal. **Recycling can save up to half the cost of dumping at a landfill.** At the same time, recycling eases the already overburdened landfills in the Portland area.

This guide offers tips on how to set up a construction site recycling program and provides a list of local businesses that accept construction and demolition waste for reuse or reprocessing. These businesses have different specifications on the materials they accept, how they accept those materials, the cost for dumping or what the businesses will pay for materials. Some recycling companies provide dumpsters or bins and offer pick-up service.

This list of recyclers was compiled in December 1991. The recycling industry is changing rapidly, and there may be other firms offering recycling services. For additional listings, call Metro's Recycling Information Center at 224-5555. Fees are subject to change based on market conditions. Shop around until you find the right service for your business.

# What Is Construction Site Recycling?

2

In the United States, we generate about 2.5 tons of waste every time we build a single-family home. In the Portland metropolitan area, we sent an estimated 200,000 tons of construction and demolition debris to area landfills during 1990. This cost more than \$13 million.

What makes up all this waste? Types and quantities of construction waste vary by region. But on average, the types and percentages of left over materials follow the chart below.



## Wastes from Residential Construction

Source: Toronto Home Builders Association

# What's in Construction Waste and Demolition Debris?

The composition of different types of construction debris varies from project to project. The table below shows the contents of many types of construction waste. Some materials are more recyclable than others.

Waste Type	Contents
Rubble	Dirt, bricks, cinder blocks, concrete
Asphalt	Roads, bridges, parking lots
Tar-based materials	Shingles, tar paper
Ferrous metal	Pipes, roofing, flashing, steel
Non-ferrous metal	Aluminum, copper, brass, stainless steel
Harvested wood	Stumps, tops, limbs
Untreated wood	Framing, scraps
Treated wood	Plywood, pressure-treated,
	creosote-treated laminates, particle board
Plaster	Sheetrock, gypsum, drywall
Glass	Windows, doors
Plastic	Vinyl siding, doors, windows
White goods	Appliances
Contaminants	Lead-based paint, asbestos, fiberglass,
	fuel tanks

Source: C.T. Donovan Associates Inc., 1990

# What Is the End Use of Recycled Building Material?

Everyday, we develop new uses for recycled building materials. The table below lists some common uses.

It's up to all of us to look for and purchase products made from recycled materials. The more we stimulate the market for these products, the more valuable the raw materials become. And the more money we all save by recycling.

Waste Type	End Use
Untreated wood	Hog fuel, landscaping, compost bulking, animal bedding, manufactured building products
Treated wood –	Landscaping, compost bulking, animal bedding, manufactured building products, hog fuel. Uses vary with state regulations.
Harvested wood	Hog fuel
Asphalt	Shredded for fill or road aggregate
Concrete	Fill, road bed
Glass	Fiberglass insulation, new windows
Plastic	Chipped/shredded, used to make insulation, manufactured building products
Metals/white goods	Scrap metal buyers or appliance recyclers
Corrugated cardboard	Fuel pellets, recycled into new cardboard
Dirt	Soil, soil conditioner, landfill cover
Gypsum/sheetrock	Wallboard, agriculture supplements

# Setting Up the Recycling Site — Keep It Simple

Construction site recycling is only practical when it saves money or time.

First decide which materials you are going to recycle. Then find out the source-separation requirements for the facility taking the material.

Some recycling facilities require you to separate materials by source (wood, drywall, cardboard, trash, etc.). Others take "mixed loads." Again, it's wise to shop around for the recycling facility that best fits your needs.

Clean loads of a single material such as wood cost much less to dump than mixed loads. It's wise to commit both yourself and your subcontractors to take the time to separate materials by source.

# A Few Tips on Setting Up Your Recycling Site

6

- Clearly designate recycling bins by color coding or large identification signs. For example, use an orange bin for wood only and a green bin for trash. Some recyclers supply clearly marked bins for each material.
- Educate subcontractors on the correct method of source separation. Clearly define which bins are for which materials. Consider implementing an incentive program for subcontractors who reduce disposal costs. Or make it a contract requirement that drywallers, framers, painters, roofers and other subcontractors recycle.
- Designate one locked recycling area on site to prevent misuse or contamination of bins from the public. This works well on a multiple-builder site. Coordinate with other builders to reduce disposal costs.
- Place the recycling bins in a convenient location but out of the way of construction traffic.
- Coordinate regular or "when-called" pick ups or deliveries to eliminate overflowing bins.

When you first start construction site recycling, your major stumbling block will be keeping trash out of the recyclables. Soda cans, lunch bags, coffee cups, caulking tubes, etc. have a way of finding their way into recycling bins. But after you educate employees and subcontractors, and when you see the difference in cost between clean and dirty loads, it will become a habit to throw wood in the wood bin and trash in the trash bin.

# Wood & Mixed Materials

# **Bredl Saw Service**

11005 NE Marx Portland, Or 97220 (503) 252-2614

## Specifications

7

- clean untreated wood only
- accept particle board, pallets, plywood and crating
- Fee: Call First

#### Durham Wood & Dirt

PO Box 489 915 S 12th Avenue Cornelius, OR 97113 (503) 359-5323

#### **Fill Site:**

72nd & Bridgeport Road Durham, OR 97224

- accept clean wood
- no nails, accept paint
- fee: \$8/cu. yd.

# **East County Recycling Center**

12409 NE San Rafael Portland, OR 97230 (503) 253-0867

## Specifications

8

- accept clean or mixed loads (wood, sheetrock, metals, paper and cardboard, yard debris) at a fee of \$68/ton
- accept clean dirt, rock or concrete/asphalt at a fee of \$2/yd., with a \$12 minimum load

## Grimm's Fuel Company

18500 SW Cipole Road Tualatin, OR 97062 (503) 644-5355

#### Specifications

- untreated and clean
- paint and nails acceptable
- fee: \$4/cu. yd.

# Hillsboro Landfill

3205 SE Minter Bridge Road Hillsboro, OR 97123 (503) 640-9427

- accept clean wood, plywood, pallets, wood shingles
- paint and nails acceptable
- no treated wood
- fee: \$5/cu. yd. for source-separated, \$12 minimum

# Lakeside Reclamation

14930 SW Vandermost Road Beaverton, OR 97207 (503) 628-1866

## Specifications

9

- untreated and clean
- paint and nails acceptable
- accept particle board, pallets, plywood and crating
- accept clean dirt, rock, asphalt, concrete, brush and stumps
- no pick-ups or trailers need to establish account
- fee: \$40.80/ton for mixed loads \$13.45/ton for source-separated

# McFarlane's Bark, Inc.

13345 SE Johnson Creek Road Milwaukie, OR 97222 (503) 659-4240

#### Specifications

- accept clean wood, particle board, pallets, crates, old wood waste (demolition)
- paint and nails acceptable
- no treated wood
- fee: \$35/ton

## **Metropolitan Disposal Corporation**

8443 N Kerby Portland, OR 97217 (503) 285-0571

- smaller than 6'x 6'
- untreated and clean
- paint and nails acceptable
- dump boxes and hauling services available

# 10

# Smurfit Newsprint Foot of Wynooski

Newberg, OR 97132 (503) 252-2614

## Specifications

- accepts clean, source separated wood
- Fee: Free -- no tipping fee

# Wastech

701 N Hunt Portland, OR 97217 (503) 285-5261

## Specifications

- accepts clean wood (100%) at a fee of \$35/ton
- accepts mixed loads (cardboard, metals, inert materials, yard debris) at a fee of \$68/ton

# Wood Exchange

11402 NE Marx Portland, OR 97220 (503) 255-4000

- untreated and clean
- no paint
- nails cannot exceed 3/16"
- cutting fee for lengths exceeding 6'
- accept plywood and particle board
- dump boxes and hauling services available

# 11

# **Corrugated Cardboard**

# **East County Recycling Center**

12409 NE San Rafael Portland, OR 97230 (503) 253-0867

#### Specifications

- accept clean cardboard, does not need to be bundled
- small amounts of staples and glue acceptable
- no reimbursement, no tipping fees

# **EZ** Recycling

4970 N Basin Portland, OR 97217 (503) 285-2299

#### Specifications

- clean, no staples, glue or waxes
- reimbursement: \$20/ton

# **Far West Fibers**

10750 SW Denney Road Portland, OR 97005 (503) 643-9944

- clean, small amounts of tape and staples acceptable
- reimbursement: \$20/ton

# **KB** Recycling

8277 SE Deer Creek Lane Milwaukie, OR 97013 (503) 659-7004

# Specifications

- clean, small amounts of glue and staples acceptable
- reimbursement: \$25/ton

## **Oregon Paper Fiber**

4970 N Basin Portland, OR 97217 (503) 289-6872

## Specifications

- clean, no staples, glue or waxes
- dump boxes and hauling services available
- reimbursement: \$20/ton

## Wastech

8600 N Albina Portland, OR 97217 (503) 285-5261

- clean, small amounts of staples and glue acceptable
- reimbursement: \$20/ton

# Drywall

# **Knez Building Materials**

12301 SE Highway 212 Clackamas, OR 97015 (503) 655-1991

# Specifications

- accept all wallboard scrap
- fee: call

# New West Gypsum

1321 54th Avenue E Fife, WA 98424 (206) 922-9343

# Specifications

- clean, no nails or paint
- fee: \$35/ton

# **United Pacific Recycling**

1000 SE Frontage Road North Plains, OR 97223 (503) 639-8835

- clean, no nails or paint
- fee: \$15/ton (soon to increase to \$30/ton)

# Large Yard Waste

# Durham Wood & Dirt

PO Box 489 915 S 12th Avenue Cornelius, OR 97113 (503) 359-5323

14

Fill Site: 72nd & Bridgeport Road Durham, OR 97224

#### Specifications

- wood/concrete/asphalt recycling equipment available
- hauling services available
- fee: \$8/cu. yd., \$10 minimum

## Grimm's Fuel Company

18500 SW Cipole Road Tualatin, OR 97062 (503) 644-5355

## Specifications

- tree stumps acceptable
- fee: \$6/cu. yd.

# Lakeside Reclamation

14930 SW Vandermost Road Beaverton, OR 97007 (503) 628-1866

- accepts brush and stumps
- accepts large yard debris
- fee: \$13.45/ton for source-separated \$40.80/ton for mixed loads

# McFarlane's Bark, Inc.

13345 SE Johnson Creek Road Milwaukie, OR 97222 (503) 659-4240

# Specifications

- accepts large yard waste and tree stumps
- fee: \$68/ton for stumps larger than 12" diameter by 4' long . \$35/ton for smaller loads

# **American Container Recycling**

9707 N Columbia Boulevard Portland, OR 97283 (503) 286-0886

#### Specifications

- accepts nothing over six inches
- accepts shrubs, yard debris, organic materials such as grass and leaves
- Fee: \$4/yard

# Wastech

8600 N. Albina Portland, OR 97217 (503) 285-5261

## Specifications

- accepts brush and stumps
- accepts large yard debris
- fee: \$15 for less than 900 lbs., \$35 for more than 900 lbs.

# <u>16a</u>

# Asphalt and Concrete

# East County Recycling Center 12409 NE San Rafael

Portland, OR 97230 (503) 253-0867

#### Specifications

 New Fee for clean dirt, rock or concrete/asphalt \$5/yard, with a \$12 minimum load

## Hillsboro Landfill

3205 SE Minter Bridge Road Hillsboro, OR 97123 (503) 640-9427

#### Specifications

- accepts source-separated clean concrete, asphalt and bricks
- Fee: free

#### Lakeside Reclamation (Grabhorn)

14930 SW Vandermost Road Beaverton, OR 97007 (503) 628-1866

#### Specifications

- accepts clean source-separated dirt, rock, asphalt, and concrete
- no pick-up or trailers -- need to establish an account
- Fee: \$13.45/ton for source-separated

#### St. Johns Landfill

9363 N Columbia Boulevard Portland, OR 97203 (503) 286-6145

- accepts large quantities only
- accepts clean, source-separated dirt, rock, aspahlt
- by appointment only
- no public drop-off
- Fee: call first

# 16

# Asphalt and Concrete

# Durham Wood & Dirt

PO Box 489 915 S 12th Avenur Cornelius, OR 97113 (503) 359-5323

#### Fill Site:

72nd & Bridgeport Road Durham, OR 97224

## Specifications

- wood/concrete/asphalt recycling equipment available
- hauling services available
- fee: \$2/cu. yd., \$10 minimum

## **Porter Yet**

5949 NE Cully Portland, OR 97218 (503) 282-3251

#### Fee

- single-axle: \$5/load
- double-axle: \$8/load
- long-bed: \$15/load

# **Reidel Materials Recovery Facility**

7800 NE Killingsworth Portland, OR 97218 (503) 252-1488

## Specifications

• fee: \$1/cu. yd., \$5 minimum

# Scrap Metal

17

# Schnitzer Steel Products Company

12005 N Burgard Road Portland, OR 97210 (503) 286-5771

#### Specifications

- all metals accepted
- dump boxes and hauling services available

# Hillsboro Landfill

3205 SE Minter Bridge Road Hillsboro, OR 97123 (503) 640-9427

# Specifications

- accepts source-separated scrap metal (ductwork, piping, rebar, metal bracing)
- no fee

# **Oregon Pacific Steel**

12299 Burgard Road Portland, OR 97203 (503) 285-3089

- all metals accepted
- dump boxes and limited hauling available

# Scrap Metal

# ACME Trading and Supply Co.

4927 NW Front Avenue Portland, OR 97210 (503) 227-5501

## Specifications

- accepts both ferrous and non-ferrous metals
- call for price reimbursement quotes

# Calbag Metals Co.

2495 NW Nicolai Portland, OR 97210 (503) 226-3441

# Specifications

- Accepts non-ferrous scrap metals
- call for price reimbursement quotes

# Metro Metals

Winkler Yard 3365 SE 17th Portland, OR 97202 (503) 231-0799 Zusman Yard 1525 NE Columbia Blvd. Portland, OR 97211 (503) 289-8074

# Specifications

- accepts both ferrous and non-ferrous metals
- call for price reimbursement quotes

# Mt. Hood Metals Inc.

9645 N Columbia Boulevard Portland, OR 97203 (503) 283-3300

# Specifications

- accepts both ferrous and non-ferrous metals
- call for price reimbursement quotes



# ALPHABETICAL LIST OF FACILITIES

1. Acme Trading and Supply Co. 2. American Container Recycling 3. Bredl Saw Service 4. Calbag Metals Co. 5. Durham Wood & Dirt 6. East County Recycling 7. EZ Recycling 8. Far West Fibers 9. Forest Grove Transfer Station 10. Grimms Fuel Company 11. Hillsboro Landfill 12. KB Recycling. 13. Knez Building Materials 14. Lakeside Reclamation 15. McFarlane's Bark, Inc. 16. Metro Central Station 17. Metro Metals 18. Metro South Station 19. Mt. Hood Metals 20. Oregon Pacific Steel 21. Oregon Paper Fiber 22. Porter Yet 23. Schnitzer Steel Products Company 24. Smurfit 25. St. Johns Landfill 26. United Pacific Recycling 27. Wastech 28. Wood Exchange

1992

Construction Site Recyclers Location Map

Sponsored by Portland General Electric and Metro's 1% for Recycling Program. Produced by O'Neill & Company.

CLEAN BUILDERS is a certification trademark of O'Neill & Company.



Printed on recycled paper. Please recycle.



METRO

PRINTED ON RECYCLED PAPER. PLEASE RECYCLE.

# A GUIDE FOR ARCHITECTS, BUILDERS AND DEVELOPERS

JUNE 1992

# Contents

What is construction site recycling?	
What makes up all this waste?	
Tips for setting up a recycling site	
Definition of terms	
Salvage and used building materials	
Wood	8
Map of facilities	10
Drywall	14
Glass	14
Land-clearing debris	15
Corrugated cardboard	17
Metal	18
Rubble	20
Carpet padding	22

# **Acknowledgements**

Debbi Palermini Palermini & Associates

# **Endorsed by**



THE AMERICAN INSTITUTE OF ARCHITECTS TE

P 5 P

.

P (

1





OF METROPOLITAN PORTLAND



# **Prepared by**

Metro 2000 SW First Ave. Portland, OR 97201

Solid Waste Department 221-1646

# What is construction site recycling?

For many builders, construction site recycling is the answer to rising waste disposal costs. By recycling construction waste, builders can control hauling and disposal costs and help stay competitive in the market place. Recycling also conserves landfill space and other resources.

The chart below shows an example of disposal and recycling costs for an actual 108-unit apartment construction project.

#### Disposal

Estimated cost to dispose: 96 tons of wood @ \$68/ton <u>\$6,528</u> (Metro Central Transfer Station) **Recycling** Actual recycling costs Labor: 40 hours @ \$6.77/hr. \$ 271 Hauling to processor \$1,200 (containers included) Disposal <u>\$ 0</u> -\$1,471 Total savings <u>\$5,057</u> Many materials left over from construction or demolition are reusable or recyclable. Examples include clean wood, cardboard, drywall, land-clearing debris, bricks, asphalt, concrete and scrap metal.

This guide offers tips on how to set up a construction site recycling program and provides a list of businesses that accept construction and demolition waste for reuse or re-processing in the Portland area. Fees for dumping or price paid for the materials vary. Some recycling companies also provide dumpsters or bins and offer pickup service.

**Please note:** This list of recyclers was compiled in June 1992. The recycling industry is changing rapidly and there may now be other firms offering recycling services. Fees may change based on market conditions; shop around to find the right fit for your business.

For more information, call:

Metro Recycling Information 224-5555.

# What makes up all this waste?

In the United States, we generate about 2.5 tons of waste material every time we build a single-family home. In the Portland metropolitan area, an estimated 200,000 tons of construction and demolition debris were sent to area landfills during 1990.

Types and quantities of construction waste vary. But on average, the types and percentages of disposed materials follow the chart below.



Typical waste from construction Percentages based on volume

# Tips for setting up a recycling site

**Options:** Investigate recycling and disposal options before the job begins. Work with the recycler and hauler to determine what materials should be separated for recycling. Determine where and how recyclable materials will be collected and stored on site. Some recycling facilities require separation of materials by type (wood, drywall, cardboard, trash, etc.). Others take "mixed loads." Recyclers generally charge less to accept source-separated materials than mixed loads.

**Bin coding:** Clearly designate recycling bins by color coding and/or large identification signs. Example: orange bin for wood only, green bin for trash. Some recyclers supply clearly marked bins for each material.

**Source separation:** Educate subcontractors about the acceptable methods of source separation. Clearly define which bins are for which materials (see "bin coding" above). Consider offering an incentive program for subcontractors if disposal costs are reduced. Make it a contract requirement that drywallers,

framers, painters, roofers and other subcontractors must recycle. Contractors may be held liable for illegal dumping by their subcontractors.

**Locked area:** Designate one locked recycling area on site to prevent misuse or contamination of bins by the public. This works well on multiple builder sites. Coordinate with other builders to reduce disposal costs.

**Location:** Place the recycling bins in a convenient location that is out of the way of construction traffic.

**Pickup:** Coordinate regular or "whencalled" pickup or delivery to eliminate overflowing bins.

**Contamination:** When a recycling program is first started, workers may need to be reminded to keep trash out of the recyclables. Soda cans, lunch bags, coffee cups, caulking tubes, etc., have a way of finding their way into recycling bins. This effort will pay off later when employees see the difference in cost between source-separated and contaminated loads. It will soon become a habit to throw wood in a recycling bin and trash in the trash bin.

# **Definition of terms**

The facilities listed in this guide will accept materials as defined below.

**Source-separated:** similar materials that are separated from other waste or incompatible materials according to categories such as those described below.

**Mixed loads:** several types of materials that are combined into one container; food waste is not acceptable.

5

(

.

7

C

C

Concrete: see "rubble."

**Land-clearing debris**: includes grass, leaves, sod, woody debris, limbs and brush. **Does not include** concrete, rock, stumps or treated landscaping timbers.

Lumber: see "wood."

Rocks: see "rubble."

**Rubble:** includes dirt, bricks, block, rock, asphalt and concrete.

Sod: see "land-clearing debris."

**Uncoated corrugated cardboard:** cardboard with a wavy layer in the middle with no wax or plastic coating. Small amounts of glue, tape and staples acceptable.

**Untreated wood:** includes lumber, particle board, pallets, plywood and crating. May include nails and be painted or stained. **Does not include** pressure-treated or creosote-treated wood.

# Salvage and Used Building Materials

Architectural Salvage (503) 248-0611 4118 SW Macadam PO Box 69581 Portland, OR 97201

antique hardware, plumbing, houseparts, selected furnishings

pickup services available

· by appointment only

• retail outlet

· fees: call for information

## Hippo Hardware & Trading Co. (503) 231-1444 1040 E. Burnside Portland, OR 97214

 contemporary and antique hardware, lighting, plumbing and houseparts

- salvage drop-off
- will purchase rights to salvage
- · pickup services available
- retail outlet

•reimbursement: payment based on material value

#### Rejuvenation Houseparts (503) 238-1900 1100 SE Grand Ave. Portland, OR 97214

· pre-1940 doors, fixtures and plumbing

restoration of light fixtures

salvage services available

· retail outlet

•reimbursement: payment based on material value

The Wherehouse Project, Inc. (503) 285-0116 PO Box 31099 2808 NE Martin Luther King Jr. Blvd. Portland, OR 97283 01 01

F

- reusable new and used materials
- fixtures
- non-profit organization
- retail outlet

·fee: donations are tax deductible

# Wood

Architectural Salvage (503) 248-0611 4118 SW Macadam PO Box 69581 Portland, OR 97201 • reusable large-dimensional lumber

· fee: call for information

#### Bredl Saw Service (503) 252-2614 11005 NE Marx Portland, OR 97220

· source-separated untreated wood

· fee: call for information

#### Durham Wood & Dirt (503) 359-5323 72nd and Bridgeport Road Durham, OR 97224

source-separated untreated wood
 nails not acceptable

• fee: \$8/cubic yard \$10 minimum

#### East County Recycling Center (503) 253-0867 12409 NE San Rafael (at 122nd) Portland, OR 97230

· source-separated untreated wood

- · mixed loads accepted
- fee: \$75/ton, source-separated
   \$75/ton, mixed loads

#### Grimm's Fuel Co. (503) 692-3756 18850 SW Cipole Rd. (Highway 99 and Cipole Road) Tualatin, OR 97062

source-separated untreated wood

fee: \$4/cubic yard
 \$3.50/cubic yard commercial

#### Hillsboro Landfill (503) 640-9427 3205 SE Minter Bridge Rd. Hillsboro, OR 97123

source-separated untreated wood

- mixed loads accepted
- fee: \$6/cubic yard, source-separated,
  \$13 minimum
  \$58.56/ton, mixed loads

#### Lakeside Reclamation (503) 628-1866 14930 SW Vandermost Rd. Beaverton, OR 97007

- · source-separated untreated wood
- no pickups or trailers
- mixed loads accepted
- fee: \$13.55/ton, source-separated
   \$47.65/ton, mixed loads
# Facilities Map



- Ac Acme Trading and Supply Co.
- Am American Container Recycling
- Ar Architectural Salvage
- **BB** Best Buy in Town, Co.
- BS Bredl Saw Service
- **CM** Calbag Metals Co.
- DW Durham Wood & Dirt
- **E** East County Recycling
- EZ EZ Recycling
- FW Far West Fibers
- Gr Grimm's Fuel Company
- Gy Gypsum Wallboard Recycling
- H Hickory Springs Manufacturing Co.
- Hi Hillsboro Landfill
- Ho Hippo Hardware
- KB KB Recycling
- Kz Knez Building Materials
- L Lakeside Reclamation
- Mc McFarlane's Bark, Inc.
- Me Metro Metals

- Mt Mt. Hood Metals
- **OS** Oregon Pacific Steel
- OF Oregon Paper Fiber
- PY Porter Yett
- PR Portland Road & Driveway
- PI Potters Industries
- Pu Pumlite Building Products
- **Re** Rejuvenation Houseparts
- Sc Schnitzer Steel Products Company
- Sm Smurfit
- SS Storie Steel and Wood Products
- Su Sunflower Recycling
- St St. Johns Landfill
- Ty Taylormade Products Inc.
- TW The Wall
- **TP** The Wherehouse Project, Inc.
- U United Pacific Recycling
- W Wastech
- WE Wood Exchange

#### McFarlane's Bark, Inc. (503) 659-4240 13345 SE Johnson Rd. Milwaukie, OR 97222

· source-separated untreated wood

• no paint/few nails acceptable

•fee: \$35/ton

#### Metropolitan Disposal Corporation (MDC) (503) 285-0571 8443 N. Kerby Portland, OR 97217

 $\cdot$  source-separated untreated wood smaller than 6' x 6'

· drop box and pickup service available

· fee: call for information

#### Smurfit Newsprint (503) 538-2151 Foot of Wynooski Newberg, OR 97132

· source-separated untreated wood

· fee: free - suppliers must be prequalified, call Caye Poe or Barbara Buie

Storie Steel & Wood Products Portland office (503) 287-1775 Yard office (503) 667-0607 I-84E at exit 16B PO Box 12490 Portland, OR 97212

 source-separated commercial structural components

· treated wood accepted

· hauling and pickup services available

wholesale and retail outlet

· fee: call for information

#### Sunflower Recycling (503) 238-1640 2345 SE Gladstone St. Portland, OR 97202

source-separated untreated wood

• fee: landscapers \$6/yard public \$8/yard commercial haulers \$30/ton

#### Taylormade Products Inc. (503) 223-7041 PO Box 548 34202 Johnsons Landing Rd. Scappoose, OR 97056

· source-separated untreated wood

· pickup service available

· call before delivery

· fee: free delivered

· free pickup of full loads

#### Wastech (503) 285-5261 701 N. Hunt Portland, OR 97217

· source-separated untreated wood

· fee: call for information mixed loads accepted

#### Wood Exchange (503) 255-4000 11402 NE Marx St. Portland, OR 97220

source-separated untreated wood

· dump boxes and pickup service available

· fee: call for information

## Drywall

Gypsum Wallboard Recycling (503) 691-9765 Tri-County Industrial Park 11120 SW Industrial Way, Bldg. 9 Tualatin, OR 97062

all waste gypsum wallboard
new, old, painted, textured, vinyl covered, wet
all drywall-related waste

p

(

.

.

R

•fee: \$45/ton

#### Knez Building Materials (503) 655-1991 12301 SE Highway 212 Clackamas, OR 97015

source-separated new construction scrap
 source-separated used, installed after 1979

· call before delivering used drywall

Call before delivering used dryw

· fee: call for information

United Pacific Recycling Portland office (503) 639-8835 North Plains office (503) 647-9052 1000 SE Frontage Rd. North Plains, OR 97223

source-separated new construction scrap

• fee: \$30/ton

## Glass

Potters Industries (503) 266-7814 350 NW Baker Drive Canby, OR 97013

source-separated window glass

hauler must unload glass

· call to make an appointment

fee: free, call first

## Land-Clearing Debris

#### American Container Recycling (503) 286-0886 9707 N. Columbia Blvd. Portland, OR 97283

source-separated land-clearing debris less than
 8 inches in diameter

• fee: \$4/yard \$10 minimum

#### Best Buy in Town Co. (503) 645-6665 21600 NW Cornell Rd. (1½ mile west of 185th) Hillsboro, OR 97124

source-separated land-clearing debris
limbs less than 10 inches in diameter
stumps up to 4 inches in diameter

fee: \$5/yard \$5 minimum

#### Durham Wood & Dirt (503) 359-5323 72nd and Bridgeport Road Durham, OR 97224

source-separated land-clearing debris
 grass, leaves and sod not accepted

• stumps

· fee: call for information

#### Grimm's Fuel Co. (503) 692-3756 18850 SW Cipole Rd. (Highway 99 and Cipole Road) Tualatin, OR 97062

source-separated land-clearing debris
 stumps

·fee: \$6/yard

#### Hillsboro Landfill (503) 640-9427 3205 SE Minter Bridge Rd. Hillsboro, OR 97123

source-separated land-clearing debris
 mixed loads accepted

fee: \$6/cubic yard, source-separated,
\$13 minimum
\$58.56/ton, mixed loads

#### Lakeside Reclamation (503) 628-1866 14930 SW Vandermost Rd. Beaverton, OR 97007

·source-separated land-clearing debris

- no pickups or trailers
- ·mixed loads accepted

 fee: \$13.55/ton, source-separated \$47.65/ton, mixed loads

#### McFarlane's Bark, Inc. (503) 659-4240 13345 SE Johnson Rd. Milwaukie OR 97222

· source-separated land-clearing debris

stumps

fee: \$35/ton
\$55/ton for stumps larger than
12" diameter by 4' long
\$16/ton grass - \$2 minimum
\$20/ton sod - \$2 minimum

#### Wastech (503) 285-5261 701 N. Hunt Portland, OR 97217

·source-separated land-clearing debris

stumps

fee: \$35/ton
\$15 for less than 840 pounds

## **Corrugated Cardboard**

#### East County Recycling Center (503) 253-0867 12409 NE San Rafael (at 122nd) Portland, OR 97230

- source-separated uncoated corrugated cardboard
- bundling not required
- mixed loads accepted

 fees: free, source-separated \$68/ton, mixed loads

#### EZ Recycling (503) 285-2299 4970 N. Basin Portland, OR 97217

- source-separated uncoated corrugated cardboard
- tape, glue and staples not accepted
- reimbursement: \$20/ton

#### Far West Fibers (503) 643-9944 10750 SW Denney Rd. Beaverton, OR 97005

 source-separated uncoated corrugated cardboard

• reimbursement: \$20/ton

#### KB Recycling (503) 659-7004 8277 SE Deer Creek Lane Milwaukie, OR 97222

- source-separated uncoated corrugated cardboard
- reimbursement: \$25/ton

#### Oregon Paper Fiber (503) 289-6872 4970 N. Basin Portland, OR 97217

- source-separated uncoated corrugated cardboard
- · drop boxes and pickup service available
- reimbursement: \$20/ton

#### Wastech (503) 285-5261 701 N. Hunt Portland, OR 97217

- source-separated uncoated corrugated cardboard
- reimbursement: \$20/ton

# Metal

ACME Trading and Supply Co. (503) 227-5501 4927 NW Front Ave. Portland, OR 97210 • source-separated metals

· reimbursement: call for information

#### Calbag Metals Co. (503) 226-3441 2495 NW Nicolai Portland, OR 97210 • source-separated metals

· reimbursement: call for information

Hillsboro Landfill (503) 640-9427 3205 SE Minter Bridge Rd. Hillsboro, OR 97123 • source-separated metals

· fee: free

Metro Metals: Winkler yard (503) 231-0799 3365 SE 17th Portland, OR 97202

#### Zusman yard (503) 289-8074 1525 NE Columbia Blvd. Portland, OR 97211

source-separated metals

· reimbursement: call for information

#### Mt. Hood Metals Inc. (503) 283-3300 9645 N. Columbia Blvd. Portland, OR 97203

source-separated metals

· drop boxes available for large quantities

· reimbursement: call for information

#### Oregon Pacific Steel (503) 285-3089 12299 Burgard Rd. Portland, OR 97203

source-separated metals

· drop boxes and pickup service available

· reimbursement: call for information

#### Schnitzer Steel Products Co. (503) 286-5771 12005 N. Burgard Rd. Portland, OR 97210

source-separated metals

· drop boxes and pickup service available

· reimbursement: call for information

**Storie Steel & Wood Products** Portland office (503) 287-1775 Yard office (503) 667-0607 I-84E at exit 16B PO Box 12490 Portland, OR 97212

- · source-separated commercial structural components
- · hauling and pickup services available ·wholesale and retail outlet
- fee: call for information

# Rubble

I

1

Best Buy in Town Co. (503) 645-6665 21600 NW Cornell Rd. (1½ mile west of 185th) Hillsboro, OR 97124 • source-separated rubble • 4-inch or less concrete slab • no wire or bar • pickup service available
• fee: call for information
Durham Wood & Dirt (503) 359-5323 72nd and Bridgeport Road Durham, OR 97224 • source-separated rubble • pickup service available
• fee: \$1/cubic yard \$10 minimum
East County Recycling Center (503) 253-0867 12409 NE San Rafael (at 122nd) Portland, OR 97230 • source-separated rubble • mixed loads accepted
<ul> <li>fee: \$5/yard, source-separated</li> <li>\$12 minimum</li> </ul>

\$75/ton, mixed loads

#### Hillsboro Landfill (503) 640-9427 3205 SE Minter Bridge Rd. Hillsboro, OR 97123

- · source-separated rubble
- · concrete or asphalt slabs 6 inches or less
- · bar and wire not accepted
- · mixed loads accepted
- fee: free, source-separated
   \$58.56/ton, mixed loads

#### Lakeside Reclamation (503) 628-1866 14930 SW Vandermost Rd. Beaverton, OR 97007

- source-separated rubble
- no pickups or trailers
- · mixed loads accepted

 fee: \$13.55/ton
 4 inches and less concrete slabs - free \$47.65/ton, mixed loads

#### Porter Yett (503) 282-3251 5949 NE Cully Portland, OR 97218

source-separated rubble

 fee: single axle: \$6/load double axle: \$12/load long bed: \$18/load

#### Portland Road and Driveway (503) 650-5006 10500 SE Jennifer St. Clackamas, OR 97015 • source-separated rubble

fee: \$20 for first 10 yards
 \$2/yard over 10 yards
 minimum 10 yards

#### Pumlite Building Products (503) 692-1050 19477 SW 89th Tualatin, OR 97062

- · source-separated red brick
- 5,000 or more
- · must be on pallets
- · retail outlet

·reimbursement: call for information

#### St. Johns Landfill (503) 286-9614 9363 N. Columbia Blvd. Portland, OR 97203

· source-separated rubble

- · large quantities only by appointment
- ·no pickups or trailers
- •fee: call for information

#### The Wall (503) 288-7881 5204 N. Albina Ave. Portland, OR 97217

 4-inch or less thick concrete slabs 2 feet or larger

- no wire or bar
- · tear-out and pickup services
- · fee: call for information

## **Carpet Padding**

Hickory Springs Manufacturing Co. (503) 255-5850 3900 NE 158th Portland, OR 97230

- source-separated polyurethane padding
- · staples and tacks not accepted
- wholesale outlet for remanufactured carpet padding
- rubber padding not accepted
- reimbursement: 5 cents\pound