Guidelines For Purchasing Specific Types of Products

Recycling, energy efficiency, material conservation, pollution prevention.

These are all objectives of environmentally preferred, environmentally responsible, environmentally sound procurement or purchasing. These words capture the essence — the “key words” — of the guidelines for Environmental Purchasing.

Caution! Overload Warning
With the immense amount of information available on the Internet about other organizations’ experiences in this area, a simple search engine inquiry using the key words can result in a daunting amount of information through which to sift. Some of the information may be readily usable. However, a lot of the information in its raw form will be questionable for your particular application because most organizations’ needs grow from unique histories, available resources, and future plans.

There is good news. A lot of the legwork has been done for you. The sections in this chapter outline guidelines and specifications in ten different categories ranging from building maintenance, to janitorial products, to office supplies, to furniture and vehicle maintenance. The language in this chapter has been structured to allow you to cut through technical jargon and build your own specifications for your particular needs.

There are additional references in this guide that should be used with this chapter:
- If you want to refer to very technical specifications → go to Chapter 6 “Sample Specifications”
- If you want to refer to typical products and suppliers → go to Chapter 7 “Recycled Products Listing, GVRD”
- If you want to refer to a list of general outside references and resources → go to Chapter 8 “Reference Materials.”

All guidelines and specifications presented are intended to assist in purchasing products or services that will reduce or provide positive environmental impact. They are intended to help achieve the commitment made through the adoption of an environmental purchasing policy.

As outlined in Chapter 1 “Environmental Purchasing Matters”, environmental purchasing involves considering the costs and environmental consequences of a product in all stages of its life cycle, from product development and manufacturing through product use to the ultimate disposal of whatever remains of the product at the end of its life span. When we practice environmental purchasing we evaluate potential purchases not just by standard criteria such as price and performance but by environmental criteria such as recycled content, packaging and energy efficiency as well.

All information presented is current at the time of printing. The information may change as new technology; processes and regulations come into effect. Responsibility lies with the user to decide whether the guidelines and specifications are applicable for their unique needs. Liabilities incurred consequent to the use of these guidelines rest with the user.
Customized Guidelines and Specifications Versus Seals of Approval

When we practice environmental purchasing we can evaluate potential purchases in two ways:

- We can develop our own sets of guidelines and specifications to allow for comparisons, calling on specifications developed by others and modifying them for our own needs. The advantage to this approach is we can “up the ante,” starting with a commonly accepted base level or standard of service and then customizing it for our own purposes. The disadvantage is that it can be time consuming and fraught with challenges and questions.

- We can go a simpler route and rely on bona fide “seals of approval” that products have garnered from environmental agencies to assist us in making environmental purchasing decisions. The advantage to this approach is the time and effort saved. The disadvantage is that we may have to compromise our larger list of potential service or product providers.

Certification of products and services is based on compliance with stringent environmental criteria that are established in consultation with industry, environmental groups, and independent experts and are based on research into the life-cycle impacts of a product or service. The Program’s official symbol of certification, its seal of approval, is the EcoLogo, a registered mark of Environment Canada. It may only be used in association with products and services that are certified by Environmental Choice.

Certification programs in the United States include the U.S. Environmental Protection Agency’s Energy Star program and the Green Seal program, an initiative of the nonprofit environmental labeling organization Green Seal. For further information on environmental labeling, see Chapter 4 in this guide.

An example of a program that grants such a “seal of approval” is the Environmental Choice Program of Environment Canada. Products and services certified by Environmental Choice are proven to have less of an impact on the environment because of how they are manufactured, consumed or disposed of.
5.1 General Building Mainenance

Building Maintenance is an area of municipal operations that has seen enormous changes since the advent of “smart buildings” and the increased focus on energy conservation and workplace safety. Gone are the days of buying the least expensive paint, carpet or fixture. Purchasers should now consider a wide variety of immediate impacts on users of a facility, as well as longer-term implications on operating budgets.

By and large, products containing commonly recognized, potentially “environmentally hazardous” products (such as products containing asbestos, PCB’s or lead) are no longer offered for sale in Canada. But many older facilities still contain materials where these products can be found.

For example, asbestos was used in a wide variety of products. As recently as the 1970’s asbestos was found in ceiling tile, linoleum flooring, insulation and even in water mains. In many instances proper management to ensure that particles don’t break off and become airborne (thus becoming a danger to lungs) has minimized its hazards.

Another example concerns paint. Durable paints were traditionally oil-based and many paints commonly contained lead additives. Both of these procedures have long term environmental impacts. New paint products are water-based formulas and the more toxic additives are generally relegated to special applications.

Sections 5.1.1 through 5.1.8 deal with the most typical “day to day” building maintenance purchases. They do not deal with heating, ventilation, or air-conditioning systems that are typically engineered under larger scale contracts and require particular specifications.

You can start saving energy today. Try these three simple strategies:

- **Give your computer the night off.**
  Turning off just one computer and monitor at night and on weekends results in annual cost savings of $44. For computers that must be left on after hours, still turn off the monitor. Monitors consume over 2/3 of the total energy required to run a computer.

- **Reduce your paper trail.** Use electronic mail and fax modems to avoid the energy cost of printing messages. As an added bonus, you’ll also save paper.

- **Turn off the lights.** Just like your mother said, lights should be turned off whenever an area is unoccupied. Consider installing occupancy sensors for greater convenience.

Source: BC Hydro Business Energy Tips.

George Duncan, CAO, City of Richmond
Consider the following “Rules of Thumb” for most typical “day to day” Building Maintenance Selection:

- Reduce materials used and use materials efficiently
- Optimize space to reduce overall building size
- Specify standard dimension materials to reduce waste
- Use interior finishes that are durable or improve indoor air quality
- Specify materials with the best life-cycle environmental profile
- Look for durable and low-maintenance materials
- Match material life span to life span of the building
- Select materials that need infrequent recoating or refinishing
- Reject materials that need cleaning with high-emission cleaners
- Use materials readily recycled or reused
- Select biodegradable materials or products that can be recycled with existing technologies and collection programs
- Choose adhesives, paints, sealants, and other materials with low or no volatile organic chemical (VOC)* emissions
- Find products that emit the least amount of other chemicals harmful to human health.

* A note for cross-reference.
Some of 5.1 General Building Maintenance sections may also be applicable to Products and Services required for “Construction, Renovation, and Demolition” (Section 5.8).

* A note about VOC: What is it?
Common to many products in the Building Maintenance category (and most any refined petroleum ingredient in any number of products), is the presence of volatile organic compounds (VOC). These are commonly the ingredients that give these products their distinctive smell. Examples are paint fumes, gas fumes, the “smell” of new synthetic carpet etc. VOC’s react with nitrogen oxides in the presence of sunlight to produce ground-level ozone and photochemical smog. Reference to VOC appears throughout Chapter 5.
5.1.1 Paint

An Overview

Paints are among the most widely purchased products in the area of building maintenance. Paints are sometimes called “surface coatings” in reference material on specifications, as this is the class of product to which they belong. Surface coatings include paints, stains and varnishes.

These products range in environmental impact, but all have the potential to adversely affect the environment through improper use, waste, and end disposal.

- Latex and acrylic paints (water based) are generally considered less damaging to the environment than oil based paints.
- Oil based paints have traditionally been called “enamels”, “stains” and “varnishes”. Their application has generally been promoted because of durability in “tough wear” and adverse exposure conditions.
- Oil based paints in the past had used lead as an additive. This is no longer the case.
- In Canada, application of these coatings releases thousands of tonnes of volatile organic compounds (VOC) (see 5.1) into the atmosphere each year.

Paint is produced in a highly regulated industry governed by several associations. Paint products are produced to specific industry standards that also incorporate environmental criterion. There are many types of seals of approval or guidelines on which to rely when purchasing such product. For details refer to the “Specifications from Other Agencies and Seals of Approval” below.

Potential Environmental Impacts

- Volatile organic compounds (VOC) and fumes.
- Unused product disposal, if not performed properly, could lead to environmental problems.

Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in paint specifications to address:

- Highest recycled content
- Recyclable products with “seals of approval”
- Low or no fumes (off-gassing) and preferably no volatile organic compounds (VOCs)
- Desired absence of mercury or mercury compounds
- Desired absence of pigments of lead, cadmium, chrome VI or their oxides that have recycled content
- Longevity of application.

Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-76
(details at www.environmentalchoice.com/guidelines/pdfs/ecp-76.pdf)

Governments Incorporating Procurement Policies to Eliminate Refuse (GIPPER)
(details at www.buygreen.com/main/gipper/paint.htm)

Green Seal GS-11
(details at www.greenseal.org/pdf/paint.pdf)
### 5.1.2 Insulation

#### An Overview

There are many thermal insulation materials on the market. They may be purchased as two types: plastic foam insulation or fibrous material. More thermal insulation is used now than in the past, as the trend has been to curb the use of energy and non-renewable resources.

In addition to the energy conserved by using insulation materials, increasing the use of recycled materials will reduce the amount of materials entering the waste stream and reduce total resource consumption. In the case of use of fibrous material and cellulose filler, recycled mixed paper has become a potential ingredient.

#### Potential Environmental Impacts

Potential environmental impacts include:

- Health hazards from dust and fumes during and after insulation
- Energy and resource consumption in manufacturing the product
- Incorporation of ozone depleting substances in the manufacture of the product.

#### Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in insulation specifications to address:

- Highest recycled content
- Recyclable products with “seals of approval”
- Low or no fumes (off-gassing) and preferably no volatile organic compounds (VOCs).

#### Specifications from Other Agencies and Seals of Approval

- Environmental Choice program guideline ECP-40  
- Energy Star  
### 5.1.3 Sealants and Caulking Compounds

#### An Overview

Sealants and caulking compounds are used to fill and seal joints in buildings and other structures. They are applied to accommodate relative movement and significantly reduce unintentional air exchange. They assist in lowering heating and cooling losses and conserving energy.

The very reasons that these compounds have been developed to be soft and pliable results in their environmental impacts. The compounds dry very slowly, thereby remaining pliable. While longevity of application is sought, their slow drying results in long duration of off-gassing due to VOC (see 5.1).

#### Potential Environmental Impacts

- Many sealants and caulking compounds contain volatile organic compounds (VOC) which off-gas (release fumes) after application. Increased levels of VOC in buildings have been attributed to the use of sealants and may contribute to reduced interior air quality.
- Unused product disposal, if not performed properly, could lead to environmental problems.

#### Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in sealant and caulking specifications to address:

- Highest recycled content
- Preference for products with “seals of approval”
- Low or no fumes (off-gassing) and preferably no volatile organic compounds (VOCs)
- Longevity of application.

#### Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-45  
### 5.1.4 Adhesives

**An Overview**

Adhesives come in many forms and mixtures and are used for bonding in fabrication, maintenance and repair applications. Like sealant and caulking, many adhesives contain volatile organic compounds (VOC’s) (see 5.1) that, when released, may contribute to reduced interior air quality.

Adhesives may be specified as one component required to complete a building maintenance job (e.g. re-flooring) or as a part of a pre-assembled item (e.g. cabinetry). In both these examples VOC and fumes could be adverse or left-over adhesive could become difficult to dispose of.

**Potential Environmental Impacts**

- Volatile organic compounds (VOC) and fumes.
- Unused product disposal if not performed properly could lead to environmental problems.

**Things to Consider If You Write Your Own Specifications**

This is an opportunity to add clauses in adhesive specifications to address:

- Preference for products with “seals of approval”
- Low or no fumes (off-gassing) and preferably no volatile organic compounds (VOCs)
- Longevity of application.

**Specifications from Other Agencies and Seals of Approval**

Environmental Choice program guideline ECP-44

(details at [www.environmentalchoice.com/guidelines/pdfs/ecp-44.pdf](http://www.environmentalchoice.com/guidelines/pdfs/ecp-44.pdf))
### 5.1.5 Carpeting

#### An Overview

The vast amount of carpet manufactured and installed in North America is made of synthetic materials — nylon, polyester and polypropylene (PP) face fibres with most backings being a sandwich of polypropylene fabric and latex, or vinyl. Most commercial carpet is made by bonding a face fibre to a backing fibre, using one of a variety of strong bonding agents. Nylon accounts for nearly two-thirds of the face fibre market, with PP being the next most commonly used fibre.

Recycled content and recyclable carpet options each have their own merits and considerations, depending on specific need, location, and use. Nylon, polyester, and plastics are made from petroleum, a non-renewable resource. Since the face fibre backing can contribute up to 60% of the carpet material, purchasing a nylon face fibre with 100% recycled content backing is worth consideration.

Closed-loop systems, where used carpet fibre and backing are made into new carpet and backing (and which can be recycled into new carpet after its useful life) are important to consider. Leasing is another option for commercial applications; the manufacturer bears responsibility for replacing worn sections of carpet and recycling the used carpet.

Note that new developments have been made using recycled PET materials:

- 100 per cent of the yarn is extruded and spun from recycled polyethylene terephthalate (PET), principally derived from post consumer soft drink bottles.
- Virgin fossil fuel raw materials are not needed to produce this carpet, saving several million barrels of crude oil per year.
- The carpet is finished with materials that do not contain formaldehyde.
- The carpet is dyed in high-pressure jet dye becks, eliminating the need for biphenyl ingredients as dye carriers. This method of dyeing uses approximately 66 per cent of the water needed for conventional dyeing.
- PET recycling does not generate nitrous oxide nor emit nitrous oxide into the air, so it does not contribute to ozone depletion or global warming.
- PET carpet production uses more than 40 million pounds of PET bottles per year that would otherwise have become landfill.

#### Potential Environmental Impacts

- Indoor air quality concerns from fumes given off by new or recycled synthetic materials may favour “natural materials” such as wool, cocoa matting, hemp and similar materials.
- Conventional synthetic carpets are made from non-renewable resources.
- Disposal issues at end of product life span.

#### Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in carpeting specifications to address:

- Any extraordinary requirements for natural products or materials
- Highest recycled content
- Recyclable products with “seals of approval”
- Products that minimize volatile organic compound (VOC see 5.1) emissions
- Carpet that is not SB latex-backed (latex without 4-PC content)
- Products that contain natural or vegetable dyes and additives
- Colours that match natural soiling to hide dirt and stains
- A minimum 10-year warranty
- A minimum of 28 ounces per square yard for loop pile carpet and 34 ounces per square yard for cut pile carpet.

#### Specifications from Other Agencies and Seals of Approval

King County Environmental Purchasing Program, Environmentally Responsible Carpet Choices (details at [www.metrokc.gov/procure/green/carpet.htm](http://www.metrokc.gov/procure/green/carpet.htm))
5.1.6 Ceiling Tile

An Overview

Ceiling tiles generally fall under the product category of acoustical products. By requiring products to have at least a minimum percentage recycled content, the amount of material entering the waste stream and total resource consumption will be reduced.

Ceiling tiles are generally designed to be light, to be acoustically deadening, and to be durable and low maintenance. At one time ceiling tiles had high asbestos content. Ceiling tiles are continuing to improve with the advent of new recycling technologies. However older properties requiring maintenance may still contain some of this product. Some products now on the market have a minimum of 70 per cent recycled content (mineral fibre). They are durable and tear resistant, so they can be reused.

Potential Environmental Impacts

- Health hazards from dust and fumes during and after insulation.

Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in ceiling tile specifications to address:

- Desirability of tiles made from cellulose fibres, mineral and slag wool by-products and/or recycled fiberglass
- Tiles that do not contain asbestos fibres
- A high percentage of recycled content
- Preference for products with “seals of approval”
- Durable construction, low maintenance
- A product that meets all building and fire codes.

Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-35
(details at www.environmentalchoice.com/guidelines/pdfs/ecp-35.pdf)

Case Study: Energy Efficient Emissivity Curtains

In 1991, in order to improve energy efficiency and reduce energy costs in Richmond’s Minoru arenas, emissivity curtains (basically large reflector blankets) were installed in the arenas’ ceilings. Richmond received a $41,000 rebate from BC Hydro on the total $67,000 cost of the project. In the first year alone Richmond realised energy savings of over $16,000.

Source: Internal report.
### 5.1.7 Roofing

#### An Overview

In the last few decades roofing in institutional commercial and industrial settings has been primarily a system of membranes and tar and gravel addressing the needs of “flat roofed” structures. Because of the use of tar, off-gassing and VOCs (see 5.1) are a concern. With the advent of more diverse architectural styles and the retrofitting of existing flat roof structures to make use of urban space, more roofing material choices are available.

#### Potential Environmental Impacts

- Depending on material specified, air quality may be impacted adversely during time of installation.
- Depending on material specified, off-gassing and VOCs may have a negative impact over longer term.
- Depending on material specified, there may be use of non-renewable resources.
- Disposal issues at end of product life span.

#### Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in roofing specifications to address:

- Highest recycled content
- Preference for products with “seals of approval”
- Low or no fumes (off-gassing) and preferably no volatile organic compounds (VOCs)
- Longevity of application
- A product that meets all building and fire codes.

#### Specifications from Other Agencies and Seals of Approval

Currently, most reliable roofers adhere to strict codes of practice developed by their industry, which provides long-term warranties on materials and labour. Specifications particular to environmental purchasing and such seals of approval are not common.
### 5.1.8 Walls (Gypsum-dry wall)

#### An Overview

Gypsum-drywall is one of the most used building materials of the last 50 years. Many older facilities may still have plaster walls but a combination of plaster and drywall is more the norm. Newer facilities likely have drywall construction as the norm.

Gypsum-drywall (called drywall or rock wall or gyproc) is made from gypsum based filler sandwiched between membranes. While designed to be a particularly fast and convenient way of installing walls to a stage ready for a prime coat of paint, disposal of the walls has an environmental impact. In a landfill, drywall breaks down, emitting the readily-recognizable rotten egg smell associated with sulfur. The gases formed create problems at landfills.

Gypsum-drywall is readily recyclable for the production of new dry wall, and separate collection of gypsum-drywall during construction clean up and demolition is required by local legislation. Recycling facilities are also available.

Building maintenance purchases with regard to drywall will most likely not be influenced by specifications for a better drywall as the industry has well-accepted standards and the use of the EcoLogo is prevalent. The maintenance purchase will however be influenced by specifications for demountable (full wall) partitions as described in section 5.4.2

#### Potential Environmental Impacts
- End-of-use disposal is a potential problem at landfills.

#### Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in Gypsum-drywall specifications to address:
- A high percentage of recycled content
- Preference for products with “seals of approval”
- Signs of durable construction, low maintenance
- A product that meets all building and fire codes.

#### Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-50
5.2 Janitorial Products

Janitorial products include cleaners, disposable papers and tissues that are used on a daily basis in most workplace settings. Environmental procurement can have a large impact here because of the larger volumes of product in this material category.

Products range from general purpose cleaning agents to commercial and industrial strength cleaners to disposable papers and tissues. All of these products are commonplace and are also packaged for use in residential settings.

5.2.1 General Purpose Cleaning Agents

An Overview

The primary function of general purpose cleaners is to remove soils from hard surfaces. Statistics indicate over 54,000 tonnes of general purpose cleaners are consumed annually in Canada.

The major ingredients in general purpose cleaning products are surfactants, builder, solvents, and scouring abrasives. Surfactants lower the surface tension of the water, allowing the cleaning solution to penetrate and suspend soils.

Cleaning products on the market have been labelled "environmentally friendly" because they are phosphate free or are considered biodegradable. However, this determination has been difficult to assess in the past due to the lack of definitive standards for biodegradability and other environmental factors. The Environmental Choice Program is now developing guidelines.

Potential Environmental Impacts

- May be a burden on the environment in terms of wastewater loading and treatment, emissions of volatile organic compounds (VOCs) (see 5.1) and resource consumption.
- If surfactants are not easily biodegraded, they may persist and harm ecosystems.

Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in general purpose cleaners to address:

- Preference for natural products or materials like reusable towelling
- Preference for highest recycled content (for example in paper products)
- Preference for products with “seals of approval”
- Preference for products that are biodegradable, not toxic or chlorinated, and standardized as much as possible to reduce the number of chemicals in use
- Preference for products that minimize volatile organic compound (VOC) emissions
- Preference for products with minimal packaging in refillable or recyclable containers.

Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-33
(details at www.environmentalchoice.com/guidelines/pdfs/ecp-33.pdf)

Green Seal GS-08
(details at www.greenseal.org/standard/h-cleanr.htm)
### 5.2.2 Industrial and Commercial Cleaners

#### An Overview

Industrial and commercial cleaners are used primarily for facility and machinery cleaning. The selection of a cleaner is influenced primarily by the nature of the surface to be cleaned, the nature of the soiling, and the degree of cleanliness required.

The key active ingredients in industrial and commercial cleaners are: surfactants (to lower water tension and allow cleaning solution to work), builders (to control water hardness and improve surfactant performance), alkalis and organic solvents.

#### Potential Environmental Impacts

- If the surfactants are not easily biodegraded they may persist and harm ecosystems.
- Similarly, the products of degradation may also pose an elevated risk to the environment.
- Builders may have adverse impacts on aquatic systems and water quality if present at excessive concentrations.

#### Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in industrial and commercial cleaner specifications to address:

- Requirements for meeting existing government specifications (Canadian General Standards Board (CGSB) in order to validate manufacturer claims that products work just as well or better than other products
- Preference for products which are non-hazardous and low in phosphate
- Preference for water based cleaners over those of organic solvents with VOCs
- Where biodegradability is requested, the product’s ability to degrade at the disposal site must be evaluated based on specific criteria such as: time required to degrade, recognized test method used, degradation by-products, and overall toxicity of substances generated during the degradation process
- Products of degradation and the product in question must not contain ingredients that are known to be damaging to the environment and/or the sewage collection or treatment facility
- Preference for products that require only a small amount to clean well, over others that require a larger amount, provided that all performance criteria are met (e.g. concentrates)
- Cleaning products should be purchased in containers which are reusable (refillable), returnable or recyclable (where recycling programs accept the containers)
- Contracts for janitorial and cleaning services should specify the use of EcoLogo approved products where applicable.

#### Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-57
5.2.3 Disposable Papers and Tissues

**An Overview**

Statistics indicate that more than 500,000 tonnes of paper, including disposable paper, toilet tissue, kitchen towels, facial issues, table napkins and hand towels, are manufactured in Canada each year.

Alternatives in the choice of pulp finish, pulp and paper technology and emission control are available to manufacturers. The Environmental Choice Program has developed five separate guidelines that address: toilet tissue, paper towels, facial tissue, table napkins and hand towels.

**Potential Environmental Impacts**

- Manufacture of product may release substances that contaminate the environment and enter the solid waste stream.

**Things to Consider If You Write Your Own Specifications**

A requirement for minimum recycled content is not specified in the guidelines. That parameter has been incorporated into manufacturer resource consumption and solid waste production measurements (performance in these area increases as amount of recycled material increases).

If considering the purchase of a product outside of the ECP guidelines and EcoLogo, you may wish to consider specification of a desired level of recycled content, bleach free products, and environmentally friendly packaging, all of which are addressed in the guidelines themselves.

**Specifications from Other Agencies and Seals of Approval**

Environmental Choice program guideline ECP-59 through 63
- (details at [www.environmentalchoice.com/guidelines/pdfs/ecp-60.pdf](http://www.environmentalchoice.com/guidelines/pdfs/ecp-60.pdf))

Green Seal GS-09
- (details at [www.greenseal.org/standard/tn-paper.htm](http://www.greenseal.org/standard/tn-paper.htm))

Green Seal GS-01
- (details at [www.greenseal.org/standard/t-paper.htm](http://www.greenseal.org/standard/t-paper.htm))
Chapter 5 – Guidelines For Purchasing Specific Types of Products

5.3 Vehicles and Maintenance

“Vehicles and Maintenance” encompasses a category of environmental purchasing that addresses not only the procurement of environmentally friendly products, but also of improving performance of equipment so that it has the least impact on the environment.

The effects of a poorly tuned engine have been well publicized for some time. Emissions leading to smog that contributes to the greenhouse effect are not that easy to grasp.

Environmental purchasing encompasses the search for more fuel efficient, less polluting vehicles. Many fleet purchases are based on “proven track records” of a particular manufacturer. Though the track records may be proven, outdated technology might be extending the use of engines with poorer emission standards. Environmental Purchasing opens up the possibility for change.

Similarly, environmental purchasing encompasses use of high quality components during vehicle maintenance. This helps to ensure longer and cleaner service, lower maintenance costs, and less polluting waste. Examples include use of platinum tipped spark plugs, longer life coolant, (semi) synthetic transmission fluid, asbestos free brake pads, deep cycle batteries and higher quality gaskets. Use of synthetic engine oils and enhanced oil filters can double oil change intervals while prolonging engine life, decreasing fuel consumption, and providing longer catalytic converter life. Recycling of antifreeze, not common a decade ago is now becoming common practice in fleet maintenance.

Environmental purchasing opens up the possibility for alternative fuel systems. These include propane, propane-gasoline, compressed natural gas (CNG), CNG-diesel, pure ethanol, E-85 ethanol and bi-fuel combinations, sulfur free diesel. In the future bio-diesel, cellulose diesel, oxygenated diesel and synthetic or waste derived diesel fuels may join these. All hold promise for less pollution, longer engine life, and maintenance economy.

Environmental purchasing addresses the use of tires appropriate to need. While radial tires remain the proven “on road” choice, careful consideration should be given to their appropriateness for off road duties where the older bias ply has proven better for high impact uses. In all instances longer life tires are preferable, as are tire sizes that meet the manufactures’ recommendations for maximum fuel efficiency.

This line of questioning best illustrates the point:

“Have you recycled for a whole year?”
Yes.

“Did you drive your car while it needed a tune-up?”
Yes.

“Well then the effects of the later just cancelled out the effects of the former”.

Simply stated, the effects of proper vehicle maintenance with appropriate lubricants and fuel, as well as the effects of residual management of waste tires, has not been so readily publicized as other important environmental actions.
### 5.3.1 Oils

#### An Overview

Statistics show that over one billion liters of lubricating and related oils are sold in Canada annually. Fully 50% of these oils are consumed while 500 million liters are available for reclamation. Only about 35% of this 500 million liters is re-refined. Another 10% is burned as fuel in an environmentally satisfactory manner. The remaining 275 million liters represent a significant pollution burden.

Used oil can be collected, cleaned and re-refined into new oil products. Used engine oil and solvents are considered waste and must be transported accordingly under applicable regulations.

Used engine oil is recycled by one of two ways:
- Re-refined for blending with additives
- Re-used as a supplementary heating fuel.

Re-refined oils typically meet or exceed manufacturers’ specifications for virgin crude oil, and they are generally less expensive to purchase.

#### Potential Environmental Impacts

- Improper end-of-use disposal is a potential hazard.

#### Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in automotive oil specifications to address:
- Preference for products bearing the EcoLogo and developed as in ECP-01
- Assurance of product meeting SAE, API, or equipment manufacturers specifications so that vehicle/equipment warranty is not affected
- Service maintenance garages use re-refined and recycle used oil
- Assurance from collection companies of final use for used materials and verification of the same
- Assurance that collection companies are properly licensed.

#### Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-01
5.3.2 Fuels

An Overview

Canadian annual demand for gasoline reaches about 35 billion liters. Gasoline is by far the most commonly used automotive fuel.

It is reasoned that environmental benefits may accrue from either modification of existing fuels such as gasoline and diesel or through the use of alternative fuels in combination with specialized vehicles.

Only a small proportion of the country’s vehicles are designed for dedicated alternative fuel use. The most immediate benefits will be gained using alternative fuels in combination with conventional gasoline. One option is the modification of the “hydrocarbon feedstock” and the use of a variety of additives

Potential Environmental Impacts

- Increased level of air pollution
- Consumption of a non-renewable resource.

Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in fuel specifications to address:

- Preference for fuels that carry the EcoLogo
- Preference for blended fuels such as ethanol blended gasoline
- Preference for ethanol derived from biomass (material of plant origin, including agricultural waste wood and animal manure.

Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-16
(details at www.environmentalchoice.com/guidelines/pdfs/ecp-16.pdf)
### 5.3.3 Tires

#### An Overview

Tires purchased for fleets of vehicles have the potential for affecting the environment from two standpoints. Product performance of the tires affects the environment in terms of use of rubber and petroleum resources and disposal, but the immediate secondary impact on fuel economy may have far greater consequences over the longer time frame. Typically there is less pollution if the correct tire is chosen.

Tires are categorized into two types:
- Radial
- Bias Ply.

In addition tires are broken into two groups:
- Smaller diameter tires used for passenger and service vehicles
- Larger diameter tires used for transport vehicles and “off-road” heavy construction.

Both tire types have a wide range of environmental impacts. They have the potential to adversely affect the environment both through improper use, and end disposal.

- Radial tires are named such by virtue of their construction. The tire carcass is constructed in such a way that the belts, to which the actual rubber and tread are attached, are radial to the cross section of the tire. The belts have typically been made of steel. Because of their design and construction radial tires deform less than bias ply tires when rolling. This in turn causes them to heat less, wear out less quickly, and provide higher gas mileage. Typically radial tires of good quality have a wear life of between 80,000 and 100,000 KM. Radial tires are more appropriate for use on paved surfaces and for wheels less than 19 inches.

- Bias Ply tires are named such by virtue of their construction. The tire carcass is constructed in such a way that the belts are wound on a bias to the cross section of the tire. Belts traditionally have been made of rayon or nylon but can also be made of steel. Because of their design and construction bias ply tires deform more than radial tires when rolling. In turn they heat more, wear out more quickly and provide lower gas mileage. They do however provide a much greater strength sidewall and are most appropriate for off-road use or where travel is frequently “over curb”. Bias ply tires are typically better suited for high impact uses.

With regard to tire size:
- Smaller tires are easier to put into a recycling loop. Typically smaller tires (up to 19 inches) are collected. In BC they are primarily used as feedstock for cement kilns.
- Larger size transport tires and off road tires can be reconfigured into “blasting mats” used in heavy construction. Transport regulations limit the amount of times that a transport tire can be re-used. Typically a cold vulcanization process is employed. Retreads that involve gluing material onto the carcass may be preformed 3 to 6 times depending on if the tires are used for steering or not.

#### Potential Environmental Impacts

- Higher use of non-renewable resource if incorrect type of tire is used.
- Unused product disposal, if not performed properly, could lead to environmental problems.

#### Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in tire specifications to address:
- Highest recycled content
- Vehicle manufacturer’s recommendations such as size and type
- Longer life and wear performance.

#### Specifications from Other Agencies and Seals of Approval

Specifications from other agencies and seals of approval are pending. In the interim, individual tire manufacturers’ specifications are generally driven by vehicle manufacturers developing standards for “equivalent replacement for optimum performance.”
5.4 Furniture and Office Systems

5.4.1 Office Furniture and Workstation Panel Systems

An Overview

Office furniture and panel systems are made with any one or a variety of materials including gypsum board, metal, wood and wood based products, plastic and fabric. As a result of the different materials that may be used in manufacture, various environmental issues must be taken into account.

The design and manufacture of office furniture and panel systems can effect resource utilization, pollution, and worker health and safety. Waste generated as a result of manufacture and disposal of these products can be minimized through reuse, remanufacture and recycling. Office furniture has traditionally been re-usable and of long life and usefulness if use and potential future use has been taken into account. Workstation panel walls are reusable. These walls can be re-configured into new partitions or recycled. They may contain from 20 per cent to 50 per cent recycled materials. Vinyl board panels can be disassembled intact and ground up to produce gypsum board. Vinyl face and the drywall paper are either screened or burnt off to expose the gypsum for recycling.

Potential Environmental Impacts

- Materials used in office furniture and workstation panel systems may emit VOCs when installed, immediately impacting indoor air quality.
- Building agents such as resins used in composite wood products can also affect indoor air quality, but the use of veneers and laminates can help to minimize these effects, as can low VOC content or water based liquid surface coatings.
- Materials used in the manufacture, treatment, installation, and final cleaning of fabrics can contain VOC, which in turn become secondary sources of VOC emissions.

Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in furniture and panel system specifications to address:

- Re-use of existing furniture where possible and refurbishment if desired. The environmental benefits of refurbishing are: it eliminates the need to purchase new furniture and manufacturing processes (including the use of new materials) have adverse effects on the environment.
- By promoting the re-use of existing furniture, used/surplus furniture does not go to the landfill.
- When new furniture is required, choice of a company that demonstrates environmental responsibility in its manufacturing processes (i.e. on-site recycling centres for fabric, etc.)
- Request for re-usable or returnable packaging and shipping materials.
- When alternatives exist, avoidance of the use of products containing ozone depleting substances and volatile organic compounds. Avoid PVC materials.
- Reusable demountable panel systems.
- Recycled content (the higher the better).
- Drywall that does not contain fibreglass reinforcement.

Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-66
(details at www.environmentalchoice.com/guidelines/pdfs/ecp-66.pdf)
## 5.4.2 Demountable (full wall) Partitions

### An Overview

Demountable partitions are fully or partially prefabricated gypsum board based units whose primary functions are to restrict vision, sound and passage. These walls are 100 per cent reusable. No material is sent to landfill sites as a result of office reconfigurations. The most environmentally sound products feature:

- Materials that are 100 per cent reusable
- An electrostatic powder coating system that collects and recycles over 95 per cent of paint overspray and contains no solvents, eliminating emission of dangerous air-borne particles
- Excess fabric that is recycled as automobile insulation
- Scrap gypsum that is recycled and reused
- Panels shipped unboxed eliminating additional waste.

### Potential Environmental Impacts

- End-of-use markets or deconstruction still to be proven.

### Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in demountable partition tile specifications to address desirability of:

- Recycled steel framing
- A fibre core made of recycled paper products
- Paint applied by an electrostatic powder coating process
- Longevity.

### Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-70
(details at [www.envirochoice.com/guidelines/pdfs/ecp-70.pdf](http://www.envirochoice.com/guidelines/pdfs/ecp-70.pdf))

### Case Study: Eco-Labels Appearing on Furniture

If you build it, they will buy. At least that’s what Vancouver-based Ornamentum Furniture hopes with their new line of eco-labelled tables and cabinets now available at Bonaparte Designs in Yaletown. Ornamentum buys its wood from two small-scale logging operations and a small sawmill that were recently certified by the Silva Forest Foundation. Silva certification, which recognizes sustainable logging practices, is viewed as one of the strictest certifications amongst a confusing number of certifications now underway in B.C.

Herb Hammond, founder of the Silva Forest Foundation, highlights the critical role consumers play in supporting environmental initiatives. “We are ushering in a new era of forestry, one where consumers can now have a choice in purchasing products that come from intact forests or purchasing products that come from clear-cuts and tree farms.”

Source: Vancouver Sun, March 30, 2000

Ornamentum Furniture
Environmental
Purchasing Guide

Chapter 5 – Guidelines For Purchasing Specific Types of Products

5.5 Office Equipment and Related Services

Office equipment consists of all the “hard” materials that make an office function. The items in this category focus on printing and printing services, and production of photocopies and facsimiles. In addition, as noted in the case study at the end of the section, much of this information can apply to computers.

5.5.1 Photocopiers and Facsimile Machines

An Overview

Photocopiers and facsimile (fax) machines are widely used in both traditional office and home workplaces. They are an integral part of many offices.

The variety of models on the market that perform “multifunction” tasks -- from acting as a photocopier, an answering machine, a fax machine, a computer printer or a computer scanner -- has made it possible for units to appear in the smallest of “home offices.”

With improvements to the environmental friendliness of this category of product there should be reduction in waste-to-disposal, a reduction of chemical emissions and conservation of energy.

Potential Environmental Impacts

- Consume both significant quantities of energy and paper.
- Release emissions in the form of noise and chemical substances such as ozone.

Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in photocopier specifications to address:

- Preference for units that carry the EcoLogo
- Preference for multifunction units that reduce the need for additional machines to perform office tasks
- Preference for machines that use standard paper
- Preference for photocopiers that make two sided copies.

Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-46
(details at www.environmentalchoice.com/guidelines/pdfs/ecp-46.pdf)

Environmental Choice program guideline ECP-71
(details at www.environmentalchoice.com/guidelines/pdfs/ecp-71.pdf)

Case Study: Computers for Schools

Old computers are finding new lives thanks to the Canadian Computers for Schools (CFS) Program. CFS channels eligible, surplus computer equipment and software from governments and businesses to schools and libraries. Since major sponsors Industry Canada and the Telephone Pioneers began the program in 1993, over 193,563 computers have been tested, refurbished and delivered to recipients free of cost. In British Columbia, BC Tel pioneers have logged countless volunteer hours testing and refurbishing over 16,000 of those computers for donation to BC schools.

This largely volunteer program has a lofty goal: to place a quarter of a million computers in schools and public libraries by March 31, 2001. For more information check the program’s provincial web site at www.scbc.org/cfs.
### 5.5.2 Printing Cartridges (including remanufactured printing cartridges)

#### An Overview

Printing cartridges are widely used in photocopy and facsimile equipment, as well as in laser printers. Statistics indicate that in Canada over one million cartridges are disposed of annually. Most are not reused.

Cartridges are often thrown away once the toner inside the cartridge is used up or the “toner waste sump” is filled. This typically occurs after several thousand copies have been made, depending on the make and model of the printing cartridge.

Single use cartridges contain many components that are in perfect condition at the end of the expected life of the cartridge. The practice of re-manufacturing printing cartridges involves disassembling the unit, inspecting and cleaning components, replacing or refurbishing the unit’s organic photoreceptor cell and replacing the supply of toner.

#### Potential Environmental Impacts

- End-of-use disposal problems.

#### Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in photocopier specifications to address:

- Preference for units that carry the EcoLogo
- Preference for remanufactured print cartridges.

#### Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-42  
(details at [www.environmentalchoice.com/guidelines/pdfs/ecp-42.pdf](http://www.environmentalchoice.com/guidelines/pdfs/ecp-42.pdf))

#### Case Study: Recycling Toner Cartridges

A decade ago few people thought twice about throwing a spent toner cartridge in the garbage and buying a brand-new replacement. Times have changed, and the GVRD’s approach to replacing toner cartridges is an excellent example of how. In 1998 and 1999 the GVRD sent a total of 404 spent toner cartridges for recycling and purchased 760 remanufactured cartridges. In the past 4 years the GVRD has received $10,250 in rebates from toner cartridge recycling and has applied these funds to other recycling projects.
### 5.5.3 Printing Inks

#### An Overview

Printing inks, used to produce an image on a “substrate” (usually a paper), are generally made of 3 components: pigments, “the vehicle” (the carrier and binding agent) and additives.

Pigment is the solid coloring that we see. The “vehicle” is the largest component of ink and acts as a carrier medium for the pigment as well as a binder to fix the pigment to the “substrate”. Additives modify the performance of ink and include materials such as dryers, waxes, lubricants, reducing oils and solvents, binding varnish antioxidants and resins.

#### Potential Environmental Impacts

- The manufacture, use, and disposal of printing inks which contain heavy metals, petroleum distillates and volatile organic compounds (VOCs).

#### Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in ink specifications to address.

- Preference for units that carry the EcoLogo.
- Preference for inks with lower levels of heavy metals and petroleum distillates.

#### Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-48
5.6 Office Supplies

Office supplies consists of all the “soft” materials that make an office function. The items in this category focus on the feedstock for office equipment.

5.6.1 Batteries

An Overview

In Canada, performance standards for batteries are published by the International Electrotechnical Commission.

Traditionally, batteries contained a high degree of mercury, a highly toxic metal. Mercury’s toxicity to the environment increases when converted by microorganisms under anaerobic conditions to organomercury compounds. It is known to concentrate in organisms and magnify in food chains.

Mercury previously sold in batteries is still found in municipal waste streams and has been estimated to account for 35% of the total release of mercury into the environment in Canada.

Potential Environmental Impacts

- Batteries may pose a threat to the environment during their production and disposal because of certain toxic substances. The major substance of concern has traditionally been mercury.

Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in battery specifications to address:

- Preference for batteries that carry the EcoLogo
- Preference for rechargeable batteries
- Preference for distribution and end-of-use disposal by the same contractor.

Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-04
(details at www.environmentalchoice.com/guidelines/pdfs/ecp-04.pdf)
## 5.6.2 Envelopes

### An Overview

Over 10 billion envelopes are produced in Canada each year.

The manufacturing process for envelopes involves production of the paper used as the main raw material, the printing processes and the chemical components of inks, adhesives and other materials used in the process. The manufacturing process has an impact on the recyclability of envelopes.

### Potential Environmental Impacts

Unnecessary end of use disposal of varying grades of paper.

### Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in envelope specifications to address:

- Preference for products that carry the EcoLogo
- Preference for products with stipulated levels of pre and post consumer waste recycling
- Preference for unbleached paper.

### Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-75

(details at [www.environmentalchoice.com/guidelines/pdfs/ecp-75.pdf](http://www.environmentalchoice.com/guidelines/pdfs/ecp-75.pdf))
5.6.3 Printing and Writing Papers (and uncoated mechanical printing paper)

**An Overview**

For both product categories: “Printing and writing paper” and “Uncoated Mechanical printing paper” the Environmental Choice Program has set out a guideline developed using a multi-parameter approach.

The guideline does NOT specify a minimum content of recycled material. That parameter has been incorporated into the calculation of resource consumption and waste production. (Performance in this area improves as the amount of recycled material increases.)

This method identifies the most important environmental stressors from all stages of the product life. The environmental requirements identifying pulp and paper aim to lower environmental impacts through:

- Reduction in air emissions
- Reduction in water emissions
- Reduction of waste
- Efficient use of fibre and recycled fibre
- Reduction of energy use.

**Potential Environmental Impacts**

- Production of all types of paper in pulp and paper mills consumes significant quantities of energy and resources.
- Waterborne and airborne emissions to the environment.
- Process generates significant waste.

**Things to Consider If You Write Your Own Specifications**

This is an opportunity to add clauses in paper specifications to address:

- Preference for products that carry the EcoLogo
- Preference for products with stipulated levels of pre and post consumer waste recycling.

**Specifications from Other Agencies and Seals of Approval**

Environmental Choice program guideline ECP-77  
(details at [www.environmentalchoice.com/guidelines/pdfs/ecp-77.pdf](http://www.environmentalchoice.com/guidelines/pdfs/ecp-77.pdf))

Environmental Choice program guideline ECP-78  
(details at [www.environmentalchoice.com/guidelines/pdfs/ecp-78.pdf](http://www.environmentalchoice.com/guidelines/pdfs/ecp-78.pdf))

**Case Study: Eco-Certified Paper Mill**

Fletcher Challenge Canada’s Elk Falls paper mill is the first major mill in Canada to receive an eco-certification supported by environmental groups such as Greenpeace and the Sierra Club. The mill, located on Vancouver Island, received chain-of-custody certification that meets Forest Stewardship Council standards.

John Cathro, chair of the FCS committee, says the push for certification is being driven by consumer demand. “These companies are being told by buyer groups or by their clients that consumers are demanding certified products.”

At the moment several small operations in B.C. are certified but they can not provide enough fibre to meet Fletcher’s paper demands. The onus is now on larger forest companies to make changes to their practices to ensure an adequate supply of FCS certified fibre.
## 5.6.4 Miscellaneous Recycled Paper Products

### An Overview

Waste paper such as old newspaper (ONP), printing and writing paper (OP), old corrugated containers (OCC) and other packaging (MP) contributes about 35% by weight to the municipal waste stream.

As recently as 1990, markets of an appreciable size had not been developed for recycling of paper other than ONP. Not all of the waste paper was recoverable because of limitations such as paper contamination. Now markets for and products made from recycled paper exist.

The occasion now arises to purchase products like boxes, packaging and trays and forms made from recycled paper products.

### Potential Environmental Impacts

- Unnecessary end of use disposal of varying grades of paper.

### Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in paper specifications to address:

- Preference for products that carry the EcoLogo
- Preference for products with stipulated levels of pre and post consumer waste recycling.

### Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-10

5.7 Lighting and Lighting Systems

5.7.1 Lights

An Overview

With the use of energy efficient lighting products, such as fluorescent lamps and energy efficient ballasts, electric lighting costs can be reduced by as much as 60%. Newer lamps and ballasts are more energy efficient, generate less heat than older models and last longer. Savings are also incurred in lower labour costs for maintenance as well as lower air conditioning costs for removal of lamp and ballast-generated heat.

Newer developments include these and other features:

- Electronic ballasts contain no PCBs, but disposal of old PCB ballasts is a concern
- Instant start ballasts consume less energy than rapid start ballasts. Soft start technology gives the tubes a longer lifespan
- Electronic ballasts consume substantially less energy when operating at very high frequencies, they hum less and do not flicker
- Used in combination with T8 lamps, electronic ballasts consume 36 per cent less energy than conventional ballasts with T12 lamps
- T8 lamps use 20 per cent less energy to provide the same amount of light as conventional fluorescents. They also offer better colour rendering
- Parabolic louvers control glare while maintaining a level of light efficiency that exceeds IES and ASHRAE standards.

Potential Environmental Impacts

- Higher energy costs with inefficient lighting fixtures or inefficient lighting design.
- End of use disposal problems.

Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in lighting specifications to address desirability of:

- Use energy efficient lighting systems wherever possible, i.e. low wattage, reflective fluorescent
- Ballasts not containing PCBs
- Office design to optimize natural light as well as efficient placement of lighting systems
- Task lighting to minimize need for overhead lighting. Use of T-8 lamps, compact fluorescents are preferred.

Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-19
(details at www.environmentalchoice.com/guidelines/pdfs/ecp-19.pdf)

Case Study: Energy Efficient Lighting

The lighting in Richmond’s Thompson Community Centre main gym left much to be desired. The HID (high intensity discharge) lighting system was expensive, could not be instantly switched on and off to save electricity and did not provide the desired illumination.

BC Hydro reviewed the existing lighting and made recommendations for a re-design that meets the City of Richmond’s primary objectives of reducing energy costs, increasing illumination and providing increased flexibility to switch off lights when not in use.

The new lighting system, installed in Spring 2000, uses compact fluorescent sources in high-bay luminaries. This solution combines the benefits of smaller point sources with the flexibility of switching control. This energy efficient approach is expected to provide approximately $13,000 in energy savings annually and a two year pay-back on investment from the operating cost savings.

Source: BC Hydro.
### 5.8 Construction, Renovation, Demolition

#### 5.8.1 Construction and Demolition Waste

**An Overview**

Moving, renovating, and demolishing facilities can generate significant waste. Construction and demolition waste accounts for up to 25% of the waste stream. Reorganizations in offices and facilities both add to the challenge and open new opportunities to apply sound environmental practices. These practices can lead to improved energy efficiency and workplace and public facility standards.

For the “renovation component” of any required work you may also refer to section 5.1.1 through 5.1.8 to consider replacement materials.

**Potential Environmental Impacts**

- Poor waste management practices throughout any construction, renovation or demolition project will add to disposal volumes and their impacts on the environment.

**Things to Consider If You Write Your Own Specifications**

Contractors should be required to submit a Waste Management Plan with their quotations. The plan should include:

- Procedures for educating workers and subcontractors in order to ensure adherence to the Waste Management Plan
- Methods for reducing waste such as ordering material only as required, using up excess material on site where possible, or prefabricating sections off site
- The percentage of recycled content in construction materials
- Methods and techniques for collecting, separating, and recycling waste materials and packaging, including a list of materials to be recycled and percentage expected to be recycled or sent to landfills
- Provisions for dealing with hazardous waste, including procedures for handling, clean-up and disposal
- A list of carriers and disposal destinations for each material to be disposed of or recycled. The list should be provided initially or at least before the final payment is made. This will ensure that all materials are being recycled and waste is legally disposed of
- Alternative options for recovering higher percentages of materials and related costs
- The cost associated with the recovery of the material and the anticipated revenues from the sale of such material.

**Specifications from Other Agencies and Seals of Approval**

Sample specifications from other agencies are outlined in the pages following immediately and in Appendix C - GVRD Project Waste Management Master Specification.

**Case Study: Energy Efficient City Hall**

Thanks to innovative design and attention to environmental details, the new Richmond City Hall will be 25 per cent more energy efficient than a standard office building. From energy efficient boilers to a system that automatically shuts off air conditioning when windows are opened, City Hall is a model for energy conservation. In fact, the City has been awarded federal funds in recognition of the building’s energy efficiencies.
Case Study: Construction waste management at Richmond City Hall.

When City of Richmond staff prepared the construction documents for the new City Hall, they began a process that would not only see significant volumes of waste recycled but would result in scores of contractors being introduced to value of construction waste recycling. Richmond used the GVRD Project Waste Management Master Specifications to set out standards for recycling and waste management on the construction site.

During construction, wood waste, scrap metal, drywall and cardboard were targeted for recycling. Weekly site meetings were used to educate and inform contractors about the recycling program. A site safety officer was responsible for talking to contractors, keeping recycling bins clear of contamination, and ensuring the program ran smoothly.

Urban Wood Waste Recyclers of south Vancouver accepted and sorted the co-mingled bins of materials. Wood waste was processed into hogfuel and taken to Canadian Forest Products where it was used to make value-added products such as hardboard paneling and hydro-seeding mulch. Cardboard went to Crown Packaging for recycling into new cardboard products. Scrap metal was sent to Richmond Steel, ABC Recycling and others for recycling.

Calculations suggest that 81% of total waste material was diverted to recycling. Source: GVRD Construction and Demolition Recycling Document.

An example from King County Washington highlights some typical specifications:

King County Regional Justice Center Project Overview

This project involved the development of a new regional justice center, including courthouse and detention facilities. The project manager required that materials be recycled on the project site and used in place of new material.

The project used recycled concrete aggregate from the demolition for backfill, general fill, pipe bedding and as aggregate base course for pavement construction in new construction.

The Regional Justice Center project team was able to recycle ninety-five percent of the demolition-debris generated during the demolition phase of the project and saved almost $250,000. Most of the concrete and asphalt, 31,840 tons, was crushed and used as fill-material on the project site. A local recycler accepted 1,518 tons of concrete rubble, 791 tons of steel and 918 tons of waste-wood; and 750 tons of lumber was salvaged. Only 1706 tons of the material generated was not able to be recycled.

The paragraphs below are edited from contract documents related to this project.
Summary of Work

Ownership and Disposal of Materials

- The County wants to recycle as much material as possible during demolition and the demolition schedule has been planned to maximize the amount of recycling, reuse, and salvage that can be achieved during demolition.

Base Contract Work

- Demolish building and foundations. Crush and stockpile concrete rubble and dispose of all re-bar.
- Do not mix asphalt with concrete in stockpile.
- Remove drives, parking areas, walks and pads. Segregate different material types (concrete and asphalt), load, haul, crush, consolidate and stockpile material on site.
- Backfill pits, holes and excavations with clean recycled crushed concrete. Backfill to surrounding grades.
- Recycled crushed materials of differing material types are not to be mixed. Segregate concrete and asphalt stockpiles. Concrete which has been overlaid with asphalt shall be kept separate from other stockpiles.

Requirements

- The County requires the Contractor to recycle, reuse, and salvage as much material as possible. The demolition schedule was planned to allow for selective removal and sorting of materials.

- The County requires the Contractor to submit a waste handling plan detailing how the waste streams will be separated and managed.
- The Contractor is responsible for removing and reusing, recycling, or salvaging all other materials associated with the demolition of the buildings, pavement, vegetation, utilities, and any other site improvements.

Recycled Crushed Materials

General

- Concrete including concrete and cement shall be crushed on site. Crushed concrete shall be stockpiled separately on-site. Crushed concrete shall be used as backfill as specified in Section 02200, Earthwork.
- Asphalt and Concrete Asphalt mixtures shall be crushed on site. No asphalt or combination of asphalt products shall be used as fill by the Demolition Contractor.
- Crushed asphalt shall not be mixed with crushed concrete.

Description of Work

This section pertains to work involving recycled crushed concrete, crushed asphalt, and crushed concrete/asphalt materials produced on site during demolition operations. Potential sources of recycled crushed materials on site include (but are not limited to) existing foundations, floor slabs, reinforced concrete walls, and pavements. Mixed crushed recycled concrete/asphalt may occur as a result of demolishing concrete slab areas overlain by asphalt surfacing. All reinforcing steel shall be removed from concrete elements prior to crushing, and exported from the site.
Recycled crushed concrete may be used on site as backfill in the parking garage over excavation zone identified on the project plans, or as general backfill to fill depressions produced during demolition or within low areas. Recycled crushed concrete will also be stockpiled on site for use during future site work, as backfill in future footing over excavation zones, as general fill, pipe-bedding or backfill, and as aggregate base course for pavement construction. Recycled crushed asphalt or mixed asphalt/concrete will be stockpiled on site for use during future site work, as general fill or aggregate base beneath paved areas. Brick, masonry, and CMU elements will be demolished as part of this contract. These materials will not be reused on site, but should be demolished and exported from the site.

**Description of Site Conditions**

- Reuse, recycle and salvage as much material as possible.
- Stockpile the various types of crushed recycled materials in separate, secure areas as directed by the County.
- Do not mix recycled materials with soil, and do not mix crushed recycled concrete with asphalt.

**Products**

- **Crushed Recycled Concrete**

  Crushed recycled concrete materials shall conform to the following gradation specification:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing by U.S. Standard Dry Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – ½ inch</td>
<td>100</td>
</tr>
<tr>
<td>¾ inch</td>
<td>40-75</td>
</tr>
<tr>
<td>¼ inch</td>
<td>25-50</td>
</tr>
<tr>
<td>No. 40</td>
<td>5-20</td>
</tr>
<tr>
<td>No. 200</td>
<td>10 max</td>
</tr>
</tbody>
</table>

Recycled concrete materials used or stockpiled on site shall be uniform in quality and free from wood, steel, roots, bark or other extraneous material. In addition, the recycled concrete materials shall meet the following requirements:

- **Los Angeles Abrasion, 500 rev.** — 35% max Sand Equivalent — 30 min.

- **Crushed Recycled Asphalt Pavement**

  Existing asphalt concrete pavement on site shall be pulverized by a method that limits damage or dislodging of the material below the pavement. The pulverized material shall conform to the following gradation:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing by U.S. Standard Dry Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – ½ inch</td>
<td>100</td>
</tr>
<tr>
<td>¾ inch</td>
<td>40 min.</td>
</tr>
</tbody>
</table>

Acceptance of the gradation will be based on visual inspection by the County's Representative.

- **Mixed Crushed Concrete/Asphalt**

  Any mixed crushed concrete/asphalt shall conform to the gradation specified above.
Execution

- The Contractor shall crush, haul and stockpile the crushed Materials to a stockpile area on site designated by King County, and crushed recycled materials shall not be placed higher than Elevation 33 within the parking garage excavation, as shown on the project plans.
- Where used as backfill in the parking garage over excavation zones, the recycled concrete shall be placed on properly prepared subgrade. Where very soft, wet subgrade conditions are encountered, use a geotextile separator between subgrade soils and the recycled concrete. Evaluation of conditions requiring use of a geotextile separator, and monitoring of geotextile placement, shall be performed in the field by County's Representative.
- Where placed as compacted fill, recycled concrete materials shall be moisture conditioned to within 3 percent of the optimum moisture content, placed in horizontal lifts less than 8 inches in loose thickness, and compacted to at least 95 percent maximum dry density, determined using ASTM D 1557. Where used as general backfill in areas to be reloaded, the recycled concrete shall be compacted to at least 90 percent maximum dry density, and using the same criteria.

Quality Control

- The Contractor is responsible for the quality of the work and for complying with the specifications. Testing will be conducted by County.
- The following laboratory tests will be performed on the recycled concrete:
  - Sand Equivalent Testing, using ASTM C 2419.
  - Sieve analysis for acceptance of aggregate gradation, using ASTM D 422.

Other tests may be performed as necessary based on field conditions, to verify the suitability of the crushed recycled materials for the intended purpose.

Measurement and Payment

- Crushing, placement, and stockpiling of crushed recycled materials shall be measured by lump sum as part of the base bid.
- Crushed recycled materials that do not meet gradation or other criteria specified herein shall be removed from the site and disposed of at the Contractor's expense.
- Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions, or beyond that level required for normal clearing and grubbing operations or removal of structural elements, without specific direction of King County. Unauthorized excavations within footing over excavation zones shall be backfilled in accordance with these specifications, at the Contractor's expense. Any unauthorized excavations in other areas of the site shall be backfilled as directed by the County representative.
- Any additional testing required due to recycled crushed materials failing laboratory or field density test specifications shall be at the Contractor’s expense. In addition, testing related to backfilling of unauthorized excavations shall be at the Contractor’s expense.

- No payment will be made for materials which have become mixed with other material or misplaced by the Contractor’s action, or lack of action. Crushed recycled material which is contaminated by the Contractor by spills or mixing with other site soils, or by any other means, shall be tested, removed, and disposed of by the Contractor at the Contractor’s expense.

Case Study: Deconstruction, not demolition.

When the University of British Columbia decided to raze the wood-framed “Pan-Hellenic House” to make way for a new building, project specifications stated that the building was to be deconstructed, not demolished. Bidders were asked to submit material reuse and recycling targets along with their pricing.

The successful bidder, Litchfield & Co. Ltd., deconstructed the building using primarily manual labour. The interior was stripped of salvageable items (e.g. cedar siding, dimensional lumber, electrical and bathroom fixtures) and recyclable materials (e.g. drywall, wood waste, scrap metal and stucco). In total 94% of demolition material was salvaged or recycled and only 6% landfilled.

Of the total recovered materials, 17% was salvaged and 77% was taken to local scrap metal, concrete, wood and drywall recycling facilities. Glulam beams and tongue-and-groove decking salvaged from the “Pan-Hellenic House” were used on site in the construction of the new Liu Centre for the Study of Global Issues.

Source: Demolition and Salvage Facts, GVRD.

See also the GVRD Project Waste Management Master Specification, Appendix C.
Chapter 5 – Guidelines For Purchasing Specific Types of Products

5.9 Parks, Recreation Amenities and Landscaping

Thus far in this chapter we have looked at the inside of facilities in terms of building maintenance, the inside of offices in terms of hard and soft equipment, vehicles and maintenance and major site works involving renovation and demolition. There is another category of purchasing that relates primarily to open spaces; that is parks and recreation amenities and landscaping.

5.9.1 Organic Turf Management

An Overview

Organic turf management is described as being a process that weans turf off of chemical management replacing traditional chemicals and compounds with natural additives. The desired result is a process that has the least impact on the environment, a managed product that is non-toxic and a waste disposal system that is not harmful to the environment.

Organic turf management can represent any number of services, from maintenance to disposal of wastes arising from the maintenance. Currently the Environmental Choice Program is in the midst of a panel review process to determine the final criterion for requirements of products to carry the Ecologo.

Potential Environmental Impacts

- Unnecessary impact on the environment in the form of additional chemicals in the turf, its cuttings, and runoff from the turf.

Things to Consider If You Write Your Own Specifications

At this time it is recommended that:

- Organic turf management systems meet or exceed all applicable governmental and industrial safety and performance standards and that all steps of the process meet all applicable laws
- The process follow the methodology outlined in “1994 Standards for certification of Organic Lawn Care Professionals in the Northeastern United States (Ecological Landscaping Association) or equivalent internal protocol
- Turf management systems include the use of (for example):
  - Synthetically compounded growth promoters
  - Synthetically compounded pesticides
  - Petroleum distillate herbicides
  - Synthetic fumigants
  - Synthetic growth regulators
  - All natural poisons such as arsenic and lead salts.

Specifications from Other Agencies and Seals of Approval

Environmental Choice program Panel Review Committee PRC-003 (guideline pending)
5.9.2 Recycled Rubber

An Overview

Used tires become raw material for the manufacture of an increasing number of products. Applications for shredded, ground, or chipped tires include rubber mats, playground surfaces, and "soaker" hoses. Tire rubber that has been sliced is fabricated into entry mats, loading-dock bumpers, and other products. Shredded tires have been used with limited success as a lightweight fill material in construction applications.

Reduction, reuse and recycling are estimated to potentially divert one third of the scrap tire stream and reduce environmental liability, as there are particular concerns regarding the difficult end-of-use disposal of tires. The recycling option has created a market for consumer products that are made from shredded tires, processed rubber crumb and rubber/plastic mixtures.

The Environmental Choice Program has developed some very specific guidelines regarding recycled rubber content of various sub categories including these that can be applied to Parks and Recreation amenities:

- Agricultural and horticultural supplies (garden hoses, soaker hoses, tubing)
- Containers (composting units, garbage containers)
- Sporting goods (sports mats, running tracks).

Potential Environmental Impacts

- Long term liability of difficult end-of-use disposal including stockpiling, fires, and vector control.

Things to Consider If You Write Your Own Specifications

This is an opportunity to add clauses in particular application specifications to address desirability of:

- Preference for products that carry the EcoLogo
- Preference for products with stipulated levels of pre and post consumer waste recycling
  For example:
  - 65% recycled rubber by weight as a portion of total rubber compound (agricultural and horticultural supplies)
  - 70% recycled rubber by weight, as a proportion of total content of rubber compound (containers)
  - 100% recycled rubber by weight, as a proportion of total content of rubber compound (sporting goods).

Specifications from Other Agencies and Seals of Approval

Environmental Choice program guideline ECP-06
(details at www.environmentalchoice.com/guidelines/pdfs/ecp-06.pdf)
5.10 Special Programs

### 5.10.1 Backyard Compost Bins

#### An Overview
Domestic composting is an effective and economical means of producing valuable soil amendments. Composting helps reduce organic wastes going to disposal.

#### Potential Environmental Impacts
- Vector control problems associated with inappropriately managed organic waste.

#### Things to Consider If You Write Your Own Specifications
This is an opportunity to add clauses in composter specifications to address desirability of:
- Preference for products that carry the EcoLogo otherwise
- Preference for products that adhere to the policies and targets as stated in the National Packaging Protocol
- Preference for products that adhere to particular specifications as outlined in Section 4.1 of ECP-15 (recommended to use exact wording).

#### Specifications from Other Agencies and Seals of Approval

#### Case Study: Plan for Sustainable Community in Vancouver
The City of Vancouver’s plan to develop a 36-hectare parcel of former industrial land in Southeast False Creek is already drawing international attention. The City intends to build a sustainable community of 2,000 - 2,500 housing units where people can shop, play, live and work without having to commute by car. Wastewater may be treated on site and Vancouver will partner with BC Hydro to explore renewable-energy technology. In March 2000 City councillors gave approval to begin work on the Official Development Plan for the area.