

# CHECKLIST FOR ENVIRONMENTALLY RESPONSIBLE DESIGN AND CONSTRUCTION

In April 2001 the City Council approved an Environmental Policy statement for the City of Highland Park. The policy assures that environmental concerns are considered during the planning stages of any project rather than after construction.

This checklist is for the guidance of all city departments, the Park and School Districts, architects, contractors, and others in preparing plans and constructing municipal, commercial, industrial, school, recreational, and residential buildings and ancillary facilities, such as parking lots, in Highland Park.

## GENERAL DESIGN CONSIDERATIONS

### Smaller is better:

Optimize use of interior space through careful design so that the overall building size-and resource use in constructing and operating it-are kept to a minimum.

### Design an energy efficient building:

Use high levels of insulation, high performance windows, and tight construction.

### Design buildings to use renewable energy:

Passive solar heating, daylighting, and natural cooling can be incorporated cost effectively into most buildings. Consider using solar water heating, especially for swimming pools, or design buildings for future solar installations.

### Optimize material use:

minimize waste by designing for standard ceiling heights and building dimensions. Avoid waste from structural over design. Use optimum value engineering/advanced framing. Simplify building geometry.

### Design water efficient, low maintenance landscaping:

Conventional lawns have a high environmental impact because of water use, pesticide use, and pollution generated from mowing. Landscape with drought resistant native plants and perennial ground covers, in order to reduce costs for grounds maintenance, in terms of chemical products, labor, fuel, and water.

### Make it easy for occupants to recycle waste:

Make provisions for storage and processing of recyclables, such as recycling bins near kitchens and under sink compost receptacles. Provide for convenient pickup locations for waste removal service.

### Look into the feasibility of graywater:

*Water from sinks, showers, clothes washers (graywater) can be recycled for irrigation in some areas. If current codes prevent graywater recycling, consider designing plumbing for easy future adaptation.*

*Design for durability:*

To minimize the environmental impact of buildings over a long period as possible, the structure must be durable. A building with a durable style, so called “timeless architecture” will be more likely to realize a long life.

*Design for future reuse and adaptability:*

Make the structure adaptable for other uses, and choose materials and components that can be reused or recycled.

*Insure consistent, safe, and healthy indoor air quality:*

Avoid potential health hazards such as pesticides, mold, radon, and formaldehyde. Follow recommended practices to minimize radon entry into buildings (Highland Park is in a low potential area of Illinois) and provide for future mitigation if necessary. Provide detailing that will avoid moisture problems, which could cause mold and mildew growth. Design insect resistant detailing that will require minimum use of pesticides. Tight construction and increased use of insulation materials can adversely affect indoor air quality. Choose construction materials that will not emit harmful air pollutants. Insure proper ventilation of indoor air pollutants such as tobacco smoke and carbon monoxide.

## **SITING AND LAND USE**

*Renovate older buildings:*

Conscientiously renovating existing buildings is preferable to demolition and new construction.

*Create community:*

Development patterns can either inhibit or contribute to the establishment of strong communities and neighborhoods. Creation of cohesive and diverse communities should be a high priority.

*Encourage in-fill and mixed-use development:*

In-fill development that increases density is inherently better than building on undeveloped (greenfield) sites. Mixed use development, in which residential and commercial uses are intermingled, can reduce automobile use and help to create healthy communities.

*Minimize automobile dependence:*

Locate buildings to provide access to public transportation, bicycle paths, and walking access to basic services. Consider encouraging bicycle commuting by providing bike storage, locker rooms and showers. Commuting can also be reduced by working at home; consider home office needs with layout and wiring.

Value site resources:

Early in the siting process carry out a careful site evaluation: consider solar access, soils, vegetation, water resources, important natural areas, and let this information guide the design. Site buildings to assure tree preservation and health.

Locate buildings to minimize environmental impact:

Cluster buildings or build attached units to preserve open space and wildlife habitats, avoid especially sensitive areas including wetlands, and keep roads and service lines short. Leave the most pristine areas untouched, and look for areas that have been previously damaged to build on. Seek to restore damaged ecosystems.

Provide responsible on-site water management:

Design landscapes to absorb rainwater runoff (stormwater) rather than having to carry it off site in storm sewers. Consider roof gardens and rain gardens. Water catchment systems should be considered for collecting rainwater and using it for landscape irrigation. Look into feasibility of using permeable materials for walkways, patios, driveways, and parking lots. Permeable materials such as brick pavers, flagstones or porous paving can reduce drainage costs, help with flood control, and save trees.

Situate buildings to benefit from vegetation:

Strategic placement of trees can dramatically reduce cooling loads on buildings. Hedge rows and shrubbery can block cold winter winds or help channel cool summer breezes into buildings.

## **MATERIALS**

Avoid ozone-depleting chemicals in mechanical equipment:

CFCs have been phased out but their replacements-HCFCs- also damage the ozone layer and should be avoided where possible. Avoid foam insulation made from HCFCs. Federal law requires reclaiming CFCs when servicing or disposing of equipment.

Use durable products and materials:

Because manufacturing is very energy intensive, a product that lasts longer or requires less maintenance usually saves energy. Durable products also contribute less to our solid waste problems.

Choose low maintenance building materials:

Where possible select building materials that will require little maintenance (painting, retreatment, waterproofing) or whose maintenance will have minimal environmental impact.

Buy locally produced building materials:

Transportation is costly both in energy use and pollution generation. Look for locally produced materials. Local hardwoods, for example, are preferable to tropical woods.

Use building materials made from recycled materials:

Using building products made from recycled materials reduces solid waste problems, cuts energy consumption in manufacturing, and saves on natural resource use.

Use salvaged building materials when possible:

Reduce landfill pressure and save natural resources by using salvaged materials: lumber, millwork, certain plumbing fixtures and/or hardware. Make sure these materials are safe(test for lead paint and asbestos); don't sacrifice energy or water efficiency by reusing old windows or toilets.

Seek responsible wood supplies:

Use lumber from independently certified, well-managed forests. Avoid lumber products produced from old growth timber. Engineered wood can be substituted for old growth Douglas fir, for example. Don't buy tropical hardwoods unless the seller can document that the wood comes from well-managed forests.

Avoid materials that will offgas(emit) pollutants:

Solvent based finishes, adhesives, carpeting, particleboard and many other building products release formaldehyde and volatile organic (VOCs) into the air. These chemicals can affect workers' and occupants' health as well as contribute to smog and ground level ozone pollution outside buildings.

Minimize use of pressure treated lumber:

Use detailing that will prevent soil contact and rot. Where possible, use alternatives such as recycled plastic lumber. Take measures to protect workers when cutting and handling pressure treated wood. Scraps should never be incinerated.

Minimize packaging waste:

Avoid excessive packaging, such as plastic wrapped plumbing fixtures or fasteners that aren't available in bulk. Tell your supplier why you are avoiding over-packaged products. Keep in mind, however, that some products must be carefully wrapped to prevent damage, and resulting waste.

## **EQUIPMENT**

Install high efficiency heating and cooling equipment:

Well designed high efficiency furnaces, boilers and air conditioners and their distribution systems (example, EnergyStar) not only save building occupants money, but also produce less pollution during operation. Install equipment with minimal risk of combustion gas spillage, such as sealed-combustion appliances.

*Install high efficiency lights and appliances:*

Fluorescent lighting has improved dramatically in recent years and is now suitable for homes. High efficiency appliances offer both economics and environmental advantages over conventional counterparts. Install automated lighting, computers, appliances, and heating and cooling fans that are programmed to shut off when not needed.

*Install water efficient equipment:*

Water conserving toilets, appliances, showerheads, and faucet aerators not only reduce water use, but also reduce demand on sewage treatment plants. Reducing hot water use saves energy.

*Install mechanical ventilation equipment:*

Mechanical ventilation is usually required to ensure safe, healthy indoor air. Heat recovery ventilators should be considered in cold climates because of energy savings, but simpler, less expensive exhaust-only ventilation systems are also adequate.

## **JOB SITE & BUSINESS**

*Protect trees and topsoil during sitework:*

Protect trees from damage during construction by fencing off the “drip line” around them. Minimize disturbance to top soil and avoid major changes to surface grade.

*Avoid use of pesticides and other chemicals that may leach into the groundwater:*

Look for less toxic treatments for termites and other insects and keep exposed frost walls free from obstructions to discourage insects. When backfilling a foundation or grading around a house, do not bury any construction debris.

*Minimize job site waste:*

Centralize cutting operations to reduce waste and simplify sorting. Set up clearly marked bins for different materials that can be taken for recycling (wood scraps for kindling, sawdust for compost).

Find out where different materials can be taken for recycling and educate construction crews about recycling procedures. Donate salvaged materials to low income housing projects, theater groups or similar places.

*Make business operations and homes more environmentally responsible:*

Make your office as energy efficient as possible, purchase energy efficient vehicles, arrange carpools to job sites, and schedule site visits and errands to minimize unnecessary driving. Purchase recycled paper and supplies, recycle office paper, use coffee mugs instead of disposable cups. Recycle beverage containers.

*Make education a part of your daily practice:*

Use the design and construction process to educate clients, employees, subcontractors, and the general public about environmental impacts of buildings and how these impacts can be minimized.

*The Environmental Commission for the City of Highland Park wishes to acknowledge the “Checklist for Environmentally Responsible Building and Design and Construction” published by Environmental Building News (<http://BuildingGreen.com>) as the basic model for our checklist. Additional Green Building Resources on the Web are listed below.*

1. Local Government Programs

City of Austin, *Green Building Program*. <http://www.ci.austin.tx.us/greenbuilder>

King County, WA *Construction/Sustainable Building Program*  
[http://dnr.metroke.gov/swd/bizprog/sus\\_build/susbuild.htm](http://dnr.metroke.gov/swd/bizprog/sus_build/susbuild.htm)

City of Seattle, *Sustainable Building Program*  
<http://www.cityofseattle.net/util/recons/susbuild/default.htm>

City of Scottsdale, *Green Building Program*,  
<http://www.ci.scottsdale.az.us/greenbuilding/>

Homebuilders Association of Denver, *Build Green Program*  
<http://www.builtgreen.org/>

2. GREEN BUILDING GUIDELINES

University of Minnesota, College of Architecture and Landscape Architecture, *Minnesota Sustainable Design Guide*, <http://www.sustainabledesignguide.umn.edu/default.htm>

Santa Barbara County, CA, *Innovative Building Design Review*,  
<http://silcom.com/~sbcplan/ibdrc.html>

City of Santa Monica, *Green Building Design and Construction Guidelines*,  
<http://greenbuildings.santa-monica.org/Main.htm>

New York City, *High Performance Building Guidelines*,  
<http://www.ci.nyc.ny.us/html/ddc/pdf/greentoc.pdf>

### 3. General Resources

California Integrated Waste Management Board, *Green Building Basics*,  
<http://www.ciwmb.ca.gov/GreenBuilding/Basics.htm>

Portland Office of Sustainability, *Green Building Links*,  
<http://www.ci/portland.or.us/energy/gblinks.htm>

### 4. Green Building Organization

U.S. Green Building Council, <http://www.usgbc.org>

Certified Forest Products Council, <http://www.certifiedwood.org>

Energy Efficient Building Association, <http://www.eeba.org>