San Diego Housing Commission

Sustainable Development Guidelines

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Acknowledgments

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SECTION 1: Introduction

Environmental sustainability is an important element of affordable housing because it ensures that residents will live in a healthy environment and enjoy the financial benefits of reduced energy and resource consumption.

A Purpose of the Guidelines

The San Diego Housing Commission serves to provide affordable housing opportunities to the people of San Diego, improving social equity and the economic viability of the entire community. Environmental sustainability is an important element of affordable housing because it ensures that residents will live in a healthy environment and enjoy the financial benefits of reduced energy and resource consumption. These guidelines establish a framework for integration of sustainable design practices in the design, construction, acquisition and improvements to the homes that the Housing Commission owns or facilitates.

True sustainability merges environmental stewardship with economy and social equity. All three factors must be in balance. Affordable housing programs inherently address economy and social equity by striving to provide everyone with a safe place to live within their means. Environmental awareness should complement and improve upon this foundation, not contradict it by driving up costs. Capital investment associated with sustainable design must be balanced against the need to maximize affordability to the most people and reduce future expenses for maintenance, energy, water and replacement of building materials and equipment. Design decisions must be fiscally responsible and should reflect the Housing Commission's fundamental purpose to provide affordable housing.

Affordable housing presents an opportunity to establish truly sustainable communities by teaching residents about how their choices may affect the environment. Education is therefore an important component of these guidelines to encourage full participation in energy conservation, recycling and use of alternative transportation.

These sustainable design guidelines are an opportunity for the San Diego Housing Commission and its development partners to lead by example, and demonstrate that safe and resource-efficient housing choices can be available to everyone in our community.

SECTION 1: Introduction

B Applicability

The Housing Commission participates in many different real estate models, often with development partners. These sustainable design guidelines apply to most projects involving the Housing Commission, including existing housing inventory owned by the Housing Commission, the acquisition and rehabilitation of properties, and new construction. Distinct approaches to these project types are described in further detail in the following sections. Developers receiving financial assistance from the Housing Commission shall comply with these guidelines.

There are certain building types that may not be appropriate for the application of sustainable design standards. It is also recognized that simple conservation of existing construction is often the most environmentally conscious approach, as it keeps demolition debris out of area landfills and avoids harvesting, production and transportation of new materials. While the features identified in these guidelines are still recommended, projects or existing sites of three dwelling units or less are not required to comply with these guidelines. Such upgrades could potentially be cost prohibitive, especially in existing facilities. The guidelines also do not apply to buildings designated as historical structures by the City of San Diego Historical Resources Board. Sustainable methods and materials may be infeasible in older buildings and may contradict preservation goals. Other buildings of potential historical significance where compliance with these guidelines would be a hardship will be considered by Housing Commission staff on a per project basis.

However, in all cases where these guidelines do not apply, awareness of environmental impacts should still be at the forefront. Improvements that promote resource conservation should be made wherever practical. If fixtures or appliances are removed, for example, they should be replaced with high-efficiency models that conserve energy and water at current standards.

Mixed-Use projects shall meet the features which are appropriate to the elements encompassed in the project.

SECTION 1: Introduction

C How to Use These Guidelines

The sustainable development guidelines are organized in sections that address appropriate strategies for different housing types. Section 2 lists basic requirements common to all facilities, both new and existing. These requirements include resident education programs, on-site recycling and landscaping. Section 3 addresses the rehabilitation of existing housing inventory and certain acquired properties. Section 4 discusses acquisition and rehabilitation and the application of either the existing facility or new construction guidelines based on the extent of demolition and reconstruction. Section 5 addresses new construction projects and significant remodels. Finally, Section 6 discusses site selection for both new construction and the acquisition of existing housing.

The guidelines recognize that different development entities may have access to various funding sources and incentives. Many programs have been established to assist affordable housing in particular to achieve higher levels of energy efficiency and environmental awareness. Such incentive programs often have requirements that will exceed these guidelines. Developers are strongly encouraged to leverage available funding sources to improve the sustainability and performance of projects beyond the basic measures described here. Since applicable programs change over time to reflect new technologies and priorities, the following resources are listed to provide information on the latest available incentive programs for improving environmental and energy efficiency in affordable housing:

- The Database of State Incentives for Renewables & Efficiency lists current federal, state and local incentive programs by state with descriptions and web links: www.dsireusa.org
- The California Center for Sustainable Energy administers several programs, including Energy Upgrade California, the California Solar Initiative and the Multifamily Affordable Solar Housing (MASH) program: http://energycenter.org/index.php/incentive-programs
- The Affordable Housing Energy Efficiency Alliance lists California resources in their AHEEA Handbook: www.h-m-g.com/multifamily/aheea.
- The Public Housing Environmental and Conservation Clearinghouse (PHECC) is a division of the U.S. Department of Housing and Urban Development: http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/programs/ph/phecc

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Code References:

Many of the conditions listed in these guidelines are requirements of state codes or reference other standards. Where such a reference is made, the document and section are listed in brackets and italicized. For example,

> [CGBS-4.303.1] refers to Chapter 4, paragraph 4.303.1 of California Green Building Standards Code, which is a mandatory measure

Abbreviations for referenced documents and organizations are as follows:

CARB	California Air Resources Board; available at www.arb.ca.gov
CGBS	California Green Building Standards Code (CALGreen); part 11 of the California Code of Regulations, Title 24; available at www.bsc.ca.gov/CALGreen Chapter 4 of CGBS addresses residential mandatory measures. Where the section number is preceded by an "A" (as in [CGBS-A4.207.4]) it references Appendix Chapter A4, which are voluntary measures (Tiers 1 and 2) unless adopted by local jurisdiction.
DWR	California Department of Water Resources; available at www.water.ca.gov
FSC	Forest Stewardship Council
IB	City of San Diego Information Bulletin, available at www.sandiego.gov/development-services/industry/infobulletins.shtml
SDHC	San Diego Housing Commission
T24	California Title 24, Part 6 - Building Energy Efficiency Standards, available at www.energy.ca.gov/title24
USGBC	United States Green Building Council
WUCOLS	Water Use Classification of Landscape Species, published by the University of California Cooperative Extension

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Definitions of terms used in these guidelines:

Climate Zone. Geographic location having distinct climate characteristics as determined by the California Energy Commission. The majority of the City of San Diego is in California Zone 7 (coastal), but portions of the city north of SR-52 may be in California Zone 10. See the California Building Climate Zone Map at www.energy.ca.gov/maps/building_climate_zones.html or determine location by zip code at www.energy.ca.gov/maps/CLIMATE_ZONES_ZIPCODE.PDF. The San Diego portion of the California Climate Zone Map is reproduced in Appendix B of these guidelines.

Evapotranspiration (Et). The sum of water losses through evaporation from the soil and transpiration from the plant (WUCOLS)

Graywater. Untreated wastewater other than toilet and/or urinal waste and kitchen sink waste. (City of San Diego Rules and Regulations for Recycled Water Use)

Heat island effect. Absorption of solar heat by hardscapes such as pavement and buildings and radiation of that heat to surrounding areas.

Local source. Extraction, processing and manufacture of the product occur within 500 miles of the project site.

Major Remodel. Construction involving removal of sheathing/ drywall on at least one side of all exterior walls and roof/ceiling assembly and replacement of all fixtures and appliances.

Potable water. Water that is pure, wholesome and suitable for human consumption, and which conforms to the latest edition of the U.S. Public Health Service Drinking Water Standards, the California Safe Drinking Water Act, and any other applicable standards. (City of San Diego Rules and Regulations for Recycled Water Use)

Shall. Refers to a mandatory action that is required per these guidelines.

Should. Refers to a desired or preferred action that is not mandatory per these guidelines.

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D Review Process

Housing Commission staff will consider a project's level of sustainability and compliance with these guidelines as part of the overall review and selection process. Project descriptions should include specific information as to how these guidelines will be met or exceeded.

E Appeals and Deviations

The Housing Commission recognizes that not all projects are alike and that some housing opportunities may not be able to fully meet these sustainable design standards. Therefore, an appeals process has been established to review and approve deviations from the requirements herein. The process involves internal staff review and requires approval by the Board of Commissioners of the San Diego Housing Commission. Deviations cannot be arbitrary, but must result from specific conditions that make compliance infeasible or prohibitive. Deviations must be balanced by other sustainable features and will be considered in the context of overriding public benefits of the project.

SECTION 2: Basic Requirements

There are certain basic requirements that are fundamental to encouraging sustainable communities and that apply to all project types addressed in these guidelines. Among these are resident education, site landscaping and irrigation, and recycling.

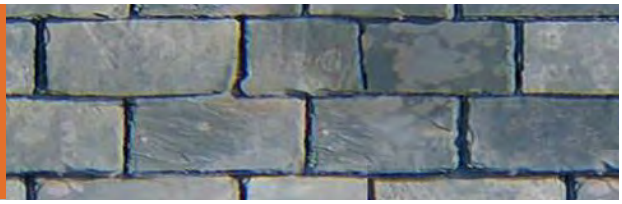
A Resident Education

An education program shall be established in all Housing Commission facilities to encourage all residents to conserve energy, water and other resources, to be aware of their impact on the environment and to reduce their utility and maintenance costs. The program should include the following information:

1. Sustainable features of the building or community (i.e. solar panels, drought tolerant landscaping, recycled construction materials)
2. Instructions on proper use and maintenance of appliances and fixtures (i.e. low-flow fixtures, compact fluorescent light bulbs or LED lamps)
3. Recommendations for improving comfort at low energy cost, such as natural ventilation, window shading, fans, thermostat setpoints, etc.
4. Information on equipment plug loads and potential reductions
5. Benchmarks for power usage
6. Recycling facilities on site
7. Approved cleaning products
8. Alternative transportation such as bus or trolley schedules, bike routes, etc. (refer to the Housing Commission's Transit-Oriented Design Guidelines)

Where families with children are likely to reside, the education program should include activities and materials oriented to children and their awareness of the environment. Interactive programs such as community gardens are encouraged. Site artwork can also be created to support the environmental education theme.

SECTION 2: Basic Requirements



B Landscaping

As a major component of all Housing Commission facilities, it is evident that significant resources can be conserved through appropriate landscape design and maintenance. The reduction in the consumption of valuable resources such as potable water, maintenance labor, materials (fuel, fertilizers and pesticides), and green waste going to landfills ensures that the facilities are utilizing sustainable principles in both their design and long term maintenance.

Sustainability is a goal for the landscape at all Housing Commission facilities. Sustainability is the ability of the landscape to survive and thrive without the need to provide an abundance of resources to keep it alive and healthy. The basic building blocks to creating a successful sustainable landscape incorporate the following steps: proper planning and design, reducing irrigation water use, using native and/or drought tolerant plants, reduction of turf areas, soil improvement, mulches, and maintenance.

Site landscaping and irrigation standards shall apply to both existing and new construction projects. For new sites, the choice of native and/or drought-tolerant plants is mandatory. Existing sites shall be evaluated by the applicant to determine if the plant materials and irrigation systems meet the Housing Commission's goals of being sustainable. The project application package to the Housing Commission shall include a report summarizing the site evaluation and its findings and describing any proposed material replacement or system improvement.

1. Proper Planning & Design:

The key to a successful sustainable landscape is proper planning and design. This is more easily achieved with a new project but can be attained in existing projects too. Key factors shall be considered when planning/designing for sustainability. A site analysis should be performed by the applicant to assess the opportunities and constraints that are unique to each project site which can include but are not limited to soils, slopes, potable/recycled water availability, views, adjacent land uses, solar orientation, prevailing winds, existing flora/fauna, and drainage. These site characteristics shall be described in the project submittal documents.

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Whether for a new project or an existing one, hardscape areas are a significant portion of each facility. These areas are generally highly visible and well used and should be designed to be sustainable and visually appealing. Hardscape areas should utilize construction materials that are locally produced, reduce erosion, promote the infiltration of groundwater and reduce the heat island effect.

a) For existing sites, special consideration should be given to hardscape elements which are in need of repair, replacement of those elements, and their life expectancy. Existing hardscape that is in good condition and serves a useful purpose need not be removed, as doing so would be an inefficient use of resources. However, in large areas of existing paving such as asphalt parking lots, insertion of bioswales to absorb and filter surface run-off should be considered where they would not necessitate significant re-grading, as should shrub and/or tree planters which would provide shade and reduce the heat island effect.

b) Acceptable paving materials that are constructed in place include concrete containing recyclable materials (i.e. fly ash, recycled concrete, local aggregates) and natural materials such as decomposed granite and stone. Permeable paving and decomposed granite are preferred as they reduce runoff and recharge the aquifer. Lighter colors should be specified to reduce the heat island effect. Asphalt is not recommended due to ongoing maintenance needs and heat island effect.

Precast products may include clay bricks, concrete pavers and permeable concrete pavers.

All paving materials should be from a local source whenever possible.

c) Fence/Wall materials should include recycled content wherever possible. Wood shall be from a Forest Stewardship Council (FSC) certified source. Bricks and concrete masonry shall be from a local source.

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2. Reduce Irrigation Water Use:

For new projects, the reduction in irrigation water use directly correlates to the planting design and use of native and or drought tolerant plants. For existing projects, an evaluation of the existing irrigation system is needed to assess the viability for potential upgrades which will result in water savings. Existing water bills and/or an irrigation audit can be used to determine current water usage. The irrigation system should be designed, installed and maintained to minimize overspray and reduce runoff. Another key component to provide an efficient irrigation system is to provide proper scheduling which takes advantage of weather based data including rain, wind and the evapotranspiration (Et) of the plant material.

a) Water Demand

New projects should strive to reduce potable water usage for irrigation by 50% from a midsummer baseline case calculated per current LEED guidelines. Explore alternative water sources such as: Recycled, Well Water, and Graywater, where available.

b) Irrigation Controllers

Preference should be given to weather based controllers which have the ability to be accessed and adjusted via the internet. The Housing Commission has established a standard for weather based controllers for use on new and retrofit sites under their management. It is recommended that all new and existing projects shall be equipped with the same controller. By doing this, maintenance staff will be able to quickly access data for the irrigation system through the Internet and respond to problems that may arise. By utilizing the same controllers throughout the projects, a reduction in maintenance can occur as maintenance staff will require less training and systems can be monitored both on site and remotely.

c) Irrigation Design

Irrigation design shall be performed to maximize water efficiency and to reduce water waste. There are numerous irrigation types, but for simplicity shall be narrowed down to three (3) types:

1. Drip – high efficiency
2. Bubbler – moderate efficiency
3. Spray/Rotors – low efficiency

The goal of the irrigation design should be to achieve the highest efficiency possible in order to conserve water.

Hydrozoning based on sun exposures shall be done in order to ensure that irrigation application is efficient.

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3. Use Native and/or Drought Tolerant Plants:

Trees, shrubs, vines and groundcovers provide the most visual impact on a new or existing site. Plant material should be chosen based on the specific site conditions and characteristics desired in their placement. A list of preferred plant materials is included in Appendix A at the end of these guidelines.

a) For existing and acquired sites, analyze the existing landscape for potential changes which would reduce water usage and maintenance and would provide shade to reduce the heat island effect.

b) Use plant materials that are native, naturalized and/or sustainable low water use or drought tolerant and are not on the California Invasive Plant Council's list of prohibited plants.

c) WUCOLS (Water Use Classification of Landscape Species, published by the University of California Cooperative Extension) should be consulted to determine suitability of plant material based upon low and like crop coefficients. Plants should be grouped accordingly for efficient irrigation zoning.

d) Plant material shall be chosen according to site suitability with special attention paid to sun exposure, water needs, soil suitability and fire susceptibility.

e) Trees should be incorporated throughout the project so that 40% of paved surfaces shall be covered with a tree canopy to reduce the heat island effect. Where trees are not feasible, alternative shade elements in lieu of trees can be used to meet the shade requirements and reduce the heat island effect.

4. Reduce Turf Areas:

Turf areas require more water, fertilizer and maintenance than other planted areas and therefore are less desirable unless used for specific recreational activities. The maximum turf area allowed on any project shall be 20% of the project area (or current City of San Diego requirements, whichever is more strict) with a minimum width of 8 feet.

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On existing projects, consideration should be given to eliminating small turf areas that do not serve purposes of active or passive recreation and replacing turf with a low water use landscape palette. Initially there will be costs to implement the change, but over time the drought tolerant landscape will require less water and eliminate the need for weekly mowing of turf during the warm season, thus reducing maintenance costs.

5. Soil Improvement

Soil improvement can significantly improve the health of plant materials. Each project site shall be evaluated for the soil's ability to sustain plant life. An agronomic soils test from a certified soils test lab shall be used to determine what is needed to amend current soil conditions to allow proper plant growth and help establish new material.

6. Mulches

Mulches can be organic (wood or bark) or inorganic (rocks). The organic mulch should be applied on top of native site soil at a depth of 3 inches in order to retain soil moisture, reduce erosion and control weeds. These organic mulches will eventually decompose over time and will require replenishment to maintain their effectiveness.

Rock mulches also provide some of the same benefits as bark mulch but may contribute to the heat island effect because they absorb heat.

7. Maintenance

Maintenance is perhaps the most critical factor in conserving resources and ensuring sustainability. Regular maintenance of the irrigation system is necessary for proper growth and vitality of plant material. Internet accessible irrigation controllers allow for maintenance staff to quickly and efficiently monitor water usage and to make adjustments or send out maintenance personnel if needed. The use of native and drought tolerant plants requires that the watering schedule be monitored to ensure that plant material receives the proper amount of water.

Pruning of plant material is required to keep plants healthy. Plant material should be selectively pruned to maintain form and health and should not be heavily pruned. Shearing should only occur on plants that are part of a formal hedge.

Fertilization and pesticide application should be minimized. Excesses of either can potentially lead to contamination of downstream creeks, lakes, river and/ or ocean. A reduction of fertilization also reduces excessive growth resulting in a trickle down affect involving less mowing and pruning and less waste going to the landfill.

SECTION 2: Basic Requirements

C Recycling

Recycling programs for residents and building maintenance shall be established in all Housing Commission facilities in compliance with the City of San Diego Recycling Ordinance (SD Municipal Code Art.6 Div.7). Recycling bins for glass, paper and plastics shall be located adjacent to trash bins. Separate bins for each material type are not necessary unless required by the Recyclable Materials Collector. Information on acceptable materials for recycling shall be posted at each refuse location and distributed to residents as required in the Ordinance. Recycling should be encouraged through the resident education program described above.
Construction-period recycling shall be implemented through compliance with the City of San Diego Construction and Demolition Debris Deposit Ordinance (SD Municipal Code Ch.6 Art.6 Div.6). Smaller projects and remodels that are exempt from the Ordinance should still divert at least 50% of debris to a certified recycling facility wherever feasible, but are not required to submit forms or deposits to the City.

Resources: Construction Materials Recycling Association:
cdrecycling.org
CalRecycle Construction & Demolition Debris Recyclers Database:
calrecycle.ca.gov/ConDemo/Recyclers/RecyclerSearch.aspx

SECTION 2: Basic Requirements

D Entries

The design of building and dwelling unit entries has a strong relationship to indoor contaminants that affect the health of residents. Shoes can track contaminated debris and moisture into the home from outside. Durable and cleanable hard flooring (not carpet) should be installed within 3 feet of an entry door. Built-in shoe storage racks and/or benches are encouraged near unit entries. Provide walk-off mats, 4 foot minimum in length, at all exterior doors. Walk-off mats shall be easily removed and cleaned and must comply with accessibility requirements.

SECTION 3: Existing Housing Facilities

The Housing Commission has a varied inventory of existing homes, ranging from single-family houses to large multi-family complexes. These homes also differ in age and construction type and, consequently, in their performance relative to energy and water conservation. It is the intent of these guidelines to establish parameters wherein these properties may be upgraded over time to a higher performance level that will save utility and maintenance costs for residents and for the Housing Commission. These upgrades will occur according to maintenance schedules already established and will focus on easily replaced systems and/ or items with the most economic benefit.

SECTION 3: Existing Housing Facilities

A Compliance Methods

There are several paths to demonstrate compliance for sustainable upgrades to existing homes:

1. Meet the requirements of the GreenPoint Rated Existing Homes Elements rating and acquire certification. The Elements approach is appropriate for remodels involving only certain portions or systems of the home (i.e. a kitchen remodel). An energy survey is required (including blower door test).
2. Meet the requirements of the GreenPoint Rated Existing Homes Whole House rating and acquire certification. The Whole House approach requires a comprehensive energy evaluation and upgrade (including blower door test) and replacement of plumbing fixtures to meet the Federal Energy Policy Act.
3. Use the HUD/ Office of Public and Indian Housing utility benchmarking tools available at www.hud.gov/offices/pih/programs/ph/phecc/ubenchtool.cfm to prioritize homes that are in most need of energy and water performance improvements. Follow the HUD Energy Improvements Checklist and replace plumbing fixtures with water-efficient fixtures as described below until a score of 60 or above is achieved in each of the utility benchmarking tools. Implement recommendations for interior finishes and common areas as described in the following paragraphs B and C.
4. Replace building systems and components as needed following regular maintenance schedules per the recommendations listed in the following paragraphs B and C. Utilize available utility rebates and incentives to improve the efficiency of existing building systems to the greatest practical extent.

Note that the Title 24 California Building Energy Efficiency Standards (Title 24) regulates the alteration of existing residential buildings and replacement of certain components and systems. Any work performed through one of the strategies listed above must also comply with Title 24.

B Replace systems/components as needed

Most of the efficiency improvements described below are dictated by the California Title 24 - Building Energy Efficiency Standards when existing buildings are altered, as detailed in the Residential Compliance Manual (RCM). Repairs to these systems, such as replacing broken glass within a window, are not required to meet Title 24. Chapter 8 of the RCM explains the requirements for alterations to existing buildings. Alterations include the replacement of building components or systems, such as roofing, windows or water heaters, even for maintenance purposes. Alterations, renovations and additions must meet Prescriptive or Performance standards, as explained in the Residential Compliance Manual.

When replacing materials or equipment with new, consider purchasing products that are extracted, harvested and manufactured within 500 miles of San Diego.

SECTION 3: Existing Housing Facilities

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1. Building Envelope:

a) Windows and doors:

If windows and/ or doors are replaced due to frame or sash damage, maintenance or quality reasons the replacement units shall meet Title 24 performance criteria for the appropriate climate zones. Windows shall be double-paned, low-E glazing with thermal breaks at metal frames. (Current window requirements are U-Factor < 0.40 and SHGC < 0.40 for existing low-rise buildings.) [T24-152(b)1.B and Table 151C] At least two of the windows in a room should be operable to promote cross-ventilation. If a room has only one window, it shall be operable. Caulk and weatherstrip window and door perimeters.

b) Roofing:

If new roofing is needed, determine whether the existing roofing must be removed or can be covered with new roofing material. When installing a new roofing layer, City of San Diego Information Bulletin 123 - Renewal of Roof Covering requires removal of existing roof covering that is:

- water-soaked or substantially deteriorated;
- wood shake, wood shingles, slate, clay, cement or asbestos-cement tile; or
- where two or more existing roofing layers are already present.

If the existing roof covering is removed, consider installation of rigid insulation where appropriate under the new roofing material to increase the R-value of the roof assembly. If the roof sheathing or ceiling finish is removed, consider addition of thermal insulation in the attic or framing space to increase the R-value of the roof assembly. Comply with the Alterations requirements outlined in Title 24.

Roofing materials must be tested and labeled by Cool Roof Rating Council (CRRC) and meet the thermal emittance and solar reflectance criteria of Title 24 for the appropriate climate zone and roof slope [T24-152(b)1.H]. Roofing materials shall be fire retardant and meet material and class requirements of IB 123.

SECTION 3: Existing Housing Facilities

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c) Insulation:

If exterior wall or ceiling cavities or attics are exposed during renovation procedures, add or replace insulation to achieve minimum cumulative thermal values of R-13 in exterior walls, R-19 in exterior raised floors and R-30 in roof/ceiling assemblies. Insulation shall be formaldehyde-free.

Consider installation of a radiant roof barrier in Zone 10 locations.

d) Air Sealing:

Openings, joints or cracks in the building envelope should be sealed with caulk, gaskets, or weatherstripping to prevent air leakage between conditioned and unconditioned spaces or the exterior, per the requirements of Title 24 Section 117. Typical areas that must be sealed include:

- around windows and door frames; weatherstripping at doors
- joints between wall planes, floors and roof
- attic access panels
- openings for plumbing, utility lines, exhaust vents, or air intakes

2. Mechanical Systems:

If an air handler, outdoor condensing unit, cooling or heating coil or furnace heat exchanger is replaced in an existing low-rise dwelling unit, then the following must be performed in compliance with Title 24, Altered Space Conditioning Systems [T24-152(b)1.E and F]:

- in Climate Zone 10, all ducts must be sealed and verified;
- provide a setback thermostat;
- meet refrigerant charge verification requirements, including installation of temperature measurement access holes.

Replacement of entire HVAC systems must meet the applicable Title 24 requirements and are limited to natural gas, liquefied petroleum gas, or the existing fuel type unless the replacement fuel source can be shown to be more energy efficient [T24-152(b)1.C].

- Gas-fired heating equipment should have an Annual Fuel Utilization Efficiency (AFUE) of 0.90 or higher [CGBS-A4.207.4].
- If allowed, electric heat pumps should have a Heating Seasonal Performance Factor (HSPF) of 8.0 or higher [CGBS-A4.207.5].
- Cooling equipment should have a Seasonal Energy Efficiency Ratio (SEER) higher than 13.0 and an Energy Efficiency Ratio (EER) of at least 11.5 [CGBS-A4.207.6].

Consider installing ENERGY STAR ceiling fans in addition to or in lieu of air conditioning.

SECTION 3: Existing Housing Facilities

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3. Plumbing Systems:

As plumbing fixtures are removed, replace them with water efficient fixtures meeting the 20% Reduction flow rates listed in Table 4.303.2 of the latest edition of the California Green Building Standards Code [CGBS-4.303.1].

Replace aging water heaters with ENERGY STAR rated units or consider tankless water heaters where appropriate. Replacement water heaters must be either natural gas, liquefied petroleum gas, or the existing fuel type unless the replacement fuel source can be shown to be more energy efficient per Title 24 requirements [T24-152(b)1.G].

- Gas-fired storage water heaters should have an Energy Factor (EF) higher than 0.67.
- Gas-fired tankless water heaters should have an Energy Factor (EF) of 0.82 or higher. [EnergyStar]

4. Electrical Systems (energy usage):

If appliances are replaced due to damage, maintenance or quality reasons the replacement units shall be Energy Star rated appliances.

Consider replacing existing incandescent light fixtures with high-efficacy fixtures, especially in common areas and in dwelling unit kitchens.

In common areas, consider replacing lighting controls with occupancy sensors.

Consider replacing existing bathroom exhaust fans with ENERGY STAR fans equipped with an automatic humidity controller.

SECTION 3: Existing Housing Facilities

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5. Interior Finishes:

Replacement of interior finishes and cabinetry should consider the condition and expected remaining life of the existing materials. Replacement products inherently have an impact on the environment due to resource extraction, manufacturing and shipping processes. When replacing finishes or fixtures, use recycled products wherever possible. Qualified products may be found in the California Integrated Waste Management Board's Recycled Content Products Database at www.ciwmb.ca.gov/RCP .

a) Cabinetry, Counters, Shelving and Trim: Consider products with recycled content or materials certified by the Forest Stewardship Council (FSC). Composite products shall be made with no-added formaldehyde (NAF) resins or ultra-low emitting formaldehyde (ULEF) resins approved by the California Air Resources Board [CGBS-A4.504.1].

b) Flooring:

Hard floor surfaces such as tile, resilient flooring, sealed concrete or wood are preferred throughout dwelling units and interior common spaces. Consider materials that are rapidly renewable, such as natural linoleum, bamboo and cork, instead of hardwood or vinyl products.

Tile should contain recycled content where possible.

Resilient flooring includes sheet vinyl, solid vinyl or vinyl composition tile, linoleum, rubber and cork. Where resilient flooring is installed, at least 50% should be certified by the Resilient Floor Covering Institute FloorScore Program [CGBS-4.504.4], available at www.rfci.com

Carpet, if used, should contain recycled content (avoid brominated flame retardants in recycled-content cushions) and must comply with the Carpet & Rug Institute (CRI) Green Label Plus Program for carpets and Green Label cushions [CGBS-4.504.3], available at:

www.carpet-rug.org/commercial-customers/green-building-and-the-environment/green-label-plus/

If subfloor is replaced, use Forest Stewardship Council (FSC) certified and low-formaldehyde structural panels complying with emission standards set by the California Air Resources Board [CGBS-4.504.5].

c) Doors: Refinish existing doors where possible. If doors must be replaced, consider doors that are FSC certified, use no formaldehyde or urea-formaldehyde and have cores made from recycled or rapidly renewable materials such as wheat straw particleboard. Exterior doors shall have functional weatherstripping.

d) Adhesives, sealants and caulks used in repair or construction work shall comply with the South Coast Air Quality Management District (SCAQMD) Rule 1168 VOC limits and toxic compound prohibitions as listed / referenced in the California Green Building Standards [CGBS-4.504.1].

e) Paints and coatings shall comply with the VOC limits listed and/or referenced in the California Green Building Standards [CGBS-4.504.2]. Consider using paint with recycled content.

SECTION 3: Existing Housing Facilities

C Upgrade common areas to sustainable standards.

1. If common laundry facilities are provided, make the following improvements:
    a) Provide daylighting where possible, with automatic daylighting and occupancy controls for artificial lighting.
    b) Replace light fixtures with ENERGY STAR qualified fixtures using pin-based fluorescent high-efficacy lamps. Provide lighting controls with occupancy sensors requiring manual activation and an automatic off function.
    c) Replace water heater with an ENERGY STAR rated unit, preferably a gas condensing water heater, or install a solar water heating system where appropriate. Replacement water heaters must be either natural gas, liquefied petroleum gas, or the existing fuel type unless the replacement fuel source can be shown to be more energy efficient per Title 24 requirements.
    d) Replace laundry equipment with ENERGY STAR rated appliances.
    e) Replace interior finishes as described above in Section 3.B.5.
2. If community spaces are provided, make the following improvements:
    a) Provide daylighting where possible, with automatic daylighting and occupancy controls for artificial lighting.
    b) Replace light fixtures with ENERGY STAR qualified fixtures using pin-based fluorescent high-efficacy lamps. Provide lighting controls with occupancy sensors requiring manual activation and an automatic off function.
    c) Replace interior finishes as described above in Section 3.B.5.
3. Parking lot drainage: Install bio-swales where possible, and where they would not necessitate significant re-grading, to redirect surface run-off into the ground rather than into storm drains.
4. Site lighting: Replace exterior light fixture heads at parking areas and walkways with energy-efficient alternatives on timers or daylight sensor controls.
5. Establish a Resident Education Program as described in Section 2.B above.
6. Replace landscaping and irrigation systems as described in Section 2.C above.
7. Establish a Recycling Program as described in Section 2.D above.

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SECTION 4: Acquisition & Rehabilitation

As with the Housing Commission's existing residential facilities, properties that are newly acquired may range widely in age, construction type and extent of rehabilitation necessary. The level of sustainability that a project achieves will be determined both by its current efficiency level, which is often based on its age and previous upgrades, and by the extent of renovation or reconstruction that is performed. Development partners that are able to take advantage of tax credits and other incentives should leverage such opportunities toward replacement of inefficient systems and equipment.

In choosing sites to acquire, consideration should be given to the Site Selection Guidelines described in Section 6 as well as to basic program amenities already provided. The value of energy- and water-efficient construction should be accounted for in reducing long-term utility and operations costs.

SECTION 4: Existing Housing Facilities

A Major Remodels:

Reconstruction involving removal of sheathing/ drywall on at least one side of all exterior walls and the roof/ceiling assembly and replacement of all fixtures and appliances is considered a Major Remodel and should follow the guidelines established for New Construction in Section 5, below.

B Minor or Selective Rehabilitation:

Rehabilitation projects that are not as extensive as a major remodel should follow the guidelines in Section 3, above, for Existing Housing Facilities. Regardless of the scope of rehabilitation, all projects should fulfill the Basic Requirements described in Section 2 for resident education, landscaping and irrigation, recycling and entryway finishes.

SECTION 5: New Construction

This section addresses both new construction and major remodels, defined as reconstruction involving removal of sheathing/ drywall on at least one side of all exterior walls and the roof/ceiling assembly and replacement of all fixtures and appliances. These guidelines recognize that state and local building codes will enforce a high level of resource efficiency in new construction, as well as certain sustainable methods such as waste management and limits on formaldehyde and VOCs in construction materials. However, development partners are encouraged to utilize tax credits, grants, rebates and other financial incentives to exceed code requirements wherever possible. Compliance with funding programs such as Enterprise Green Communities can provide needed financing and result in a better long term facility.

Projects using Low Income Housing Tax Credits through CTCAC should maximize both the project ranking score and available increases in the threshold basis by providing supplemental site and service amenities, achieving sustainable building methods and certification, and exceeding Title 24 energy standards as described in the CTCAC regulations (California Code of Regulations, Title 4, Division 17, Chapter 1). Application information related to these achievements should also be submitted to the Housing Commission for project evaluation.

Development in the Centre City Planned District of downtown San Diego should take advantage of deviations and FAR bonuses available through the City's Develop Green Incentive Program in order to increase the amount of affordable housing that can be built on these sites.

SECTION 5: New Construction

A Alternative Compliance Methods

Compliance with these guidelines can be demonstrated through the designated project certification in any of the following rating programs for sustainable design and construction. No further documentation showing satisfaction of the minimum requirements is necessary if any of these certifications are obtained:

1. LEED-NC (New Construction & Major Renovation) for buildings 4 stories and higher, as administered by the U.S. Green Building Council (USGBC): Silver level certification
2. LEED for Homes for 1-3 story buildings: Gold level certification
3. LEED for Homes Mid-rise (when available) for multifamily buildings 4-6 stories in height: Gold level certification
4. GreenPoint Rated Multifamily, as administered by Build It Green

B Minimum Requirements

All new or substantially remodeled projects must meet the following minimum requirements, regardless of supplemental certification:

1. Basic Requirements described in Section 2 for resident education, landscaping and irrigation, recycling and entryway finishes.
2. Exceed Title 24 energy performance requirements by 15%.
3. All fixtures and appliances, including water heaters, shall be ENERGY STAR rated.
4. Water conservation:
   a) Indoor: Comply with Section A4.303.1of the California Green Building Standards Code for Tier 1 buildings (kitchen sink faucet flow rate < 1.5 gal/min at 60 psi).
   b) Outdoor: Calculate water budget (MAWA-maximum applied water allowance) and estimated total water use (ETWU) per the latest City of San Diego Landscape Standards. Reduce potable water use for irrigation to not exceed 80% of water allowance.
5. Water sub-metering: For new construction and for remodels that replace entire indoor plumbing systems, provide water submeters at each dwelling unit in conformance with San Diego Municipal Code sections 67.06 and 147.0410, without exemptions for affordable housing.

SECTION 5: New Construction

B

6. Use Forest Stewardship Council (FSC) certified and low-formaldehyde structural panels complying with emission standards set by the California Air Resources Board [CGBS-4.504.5].

   Interior Finishes: use recycled products wherever possible. Qualified products may be found in the California Integrated Waste Management Board's Recycled Content Products Database at www.ciwmb.ca.gov/RCP.

   a) Cabinetry, Counters, Shelving and Trim: Install products with recycled content or materials certified by the Forest Stewardship Council (FSC). Composite products shall be made with no-added formaldehyde (NAF) resins or ultra-low emitting formaldehyde (ULEF) resins approved by the California Air Resources Board [CGBS-A4.504.1].

   b) Flooring: Hard floor surfaces such as tile, resilient flooring, sealed concrete or wood are preferred throughout dwelling units and interior common spaces. Consider materials that are rapidly renewable, such as natural linoleum, bamboo and cork, instead of hardwood or vinyl products. Tile should contain recycled content where possible.

   Resilient flooring includes sheet vinyl, solid vinyl or vinyl composition tile, linoleum, rubber and cork. Where resilient flooring is installed, at least 50% should be certified by the Resilient Floor Covering Institute FloorScore Program [CGBS-4.504.4], available at www.rfci.com.

   Carpet, if used, should contain recycled content (avoid brominated flame retardants in recycled-content cushions) and must comply with the Carpet & Rug Institute (CRI) Green Label Plus Program for carpets and Green Label cushions [CGBS-4.504.3], available at www.carpet-rug.org.

   c) Doors: Install interior doors that are FSC certified, use no formaldehyde or urea-formaldehyde and have cores made from recycled or rapidly renewable materials such as wheat straw particleboard.

   d) Adhesives, sealants and caulks shall comply with the South Coast Air Quality Management District (SCAQMD) Rule 1168 VOC limits and toxic compound prohibitions as listed / referenced in the California Green Building Standards [CGBS-4.504.1].

   e) Paints and coatings shall comply with the VOC limits listed and/or referenced in the California GreenBuilding Standards [CGBS-4.504.2]. Consider using recycled content paint.

SECTION 5: New Construction

B

7. Provide Operations and Maintenance Manuals to building maintenance staff. Manuals shall be in 3-ring binder(s) for ease of updating information as needed and shall include the following information:

   a) A description of the project's sustainable design features

   b) An explanation of all operations and maintenance procedures necessary to retain the environmental benefits and performance efficiencies of the design

   c) Warranty, operations and maintenance instructions for all equipment, appliances and fixtures.

   d) Information for obtaining spare or replacement parts, accessories, filters, finish materials, fixtures or special tools including part numbers and manufacturer or supplier contact information.

   e) Lamp schedule and ordering information for all light fixtures

   f) Information regarding management of resident recycling program

   g) Information regarding management of resident education and TOD programs

   h) Listing of all paint and coating systems used; including color formula

   i) Information on organic pest control, fertilizers and environmental cleaning products

   j) Procedures for landscape maintenance, including watering schedule, plant names and replacement source(s), soil cultivation, mulch replacement and pruning.

   k) Procedures for irrigation system operation and maintenance, including water usage budget.

   l) Information regarding indoor air quality relative to ventilation systems, filters, finishes, combustion appliances, indoor pollutants, walk-off mat cleaning and remodeling procedures.

   m) Maintenance of all site drainage including roof and deck drains and gutters, area drains, swales and filtration systems

   n) HVAC system commissioning checklist

   o) Other information unique to project and as required by the California Green Building Standards Code [CGBS 4.410.1].

8. Provide a minimum of four hours of special training on site for building maintenance staff to become familiar with location, operation and maintenance of all equipment and sustainable features of the project.

9. Provide HVAC Systems commissioning plan and independent third-party verification as described in Section A4.207.2 of the California Green Building Standards Code.

SECTION 5: New Construction

C Program Requirements

Multifamily housing program requirements for amenities and dwelling unit standards are established by affordable housing financial assistance programs such as CalHFA, the California Department of Housing and Community Development, and tax credits administered through CTCAC. Project designs should follow the applicable requirements for laundry facilities, community spaces, open space, parking and technology.

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SECTION 6: Site Selection Guidelines

A General Plan Concurrence

The San Diego Housing Commission supports the City of San Diego General Plan and its goals for attaining balanced communities, equitable development and environmental justice. These goals are outlined in the Land Use and Community Plan Element and the Housing Element and include

- distribution of affordable housing throughout the City without disproportionate concentration in any areas;
- encouraging better links from homes to jobs and services;
- a variety of housing types and affordability within communities;
- a balance of land uses within communities and an emphasis on transit-oriented development.

In selecting sites for new construction and acquisition, the Housing Commission will strive to implement these General Plan goals by giving priority to locations near employment, amenities and public transit and in areas that are underserved by affordable housing. Mixed-use neighborhoods will be given strong consideration.

SECTION 6: Site Selection Guidelines

B Transportation Choices

Residents of affordable housing are often limited to public transportation to reach their destination. Sites that offer easy access to public transit (bus, trolley or train) provide the most benefit. Locations that are within ¼-mile of at least one bus stop or within ½-mile of several different transit routes and/or modes and do not require multiple transfers or lengthy travel times are considered a positive.

C Neighborhood Linkages

Pedestrian access to goods and services that are needed on a frequent basis saves time and transportation costs, as well as reducing the environmental impact of vehicle trips. Sites for new construction or acquisition of affordable housing should be within ½-mile of at least five basic shopping, services or public facilities. Such facilities include the following:

Grocery Store	Bank or Credit Union	Library
Pharmacy	Doctor or Dentist	Recreation Center
Laundry	Day Care or Senior Center	School (K-12)
Hardware Store	Social Services	Public Park

D Local Employment

Access to jobs is crucial to residents' ability to afford adequate housing. A balance between employment and housing within a community not only benefits resident employees, but provides a local workforce to support business and industry, thus improving the local economy. The Housing Commission will give priority to sites near major employment centers.

SECTION 6: Site Selection Guidelines

E Infill Development

The City's General Plan encourages infill development to counteract the suburban sprawl that leads to inefficient infrastructure and circulation systems. Sprawl is expensive to maintain and affects the City's ability to provide services, including affordable housing. Infill development benefits the entire region by conserving resources and preserving open space and undeveloped land. Infill sites also provide the neighborhood linkages, transportation and employment choices discussed above. The Housing Commission considers sites on or next to previously developed land to be of special benefit. This includes sites adjacent to previously developed land on at least 75% of the perimeter of the proposed site (ignore intervening streets or public right of way). To qualify as previously developed, a site must have been covered by building or hardscape over at least 50% of the site area for the past 5 years or more.

F Walkability and Cycling

Walking and bicycling are healthy activities that promote community interaction, whether they are used to commute or simply for recreation. All Housing Commission sites should promote walking through safe and accessible pathways that connect to other pedestrian routes in the surrounding community. Safety is ensured through proper lighting, public visibility and protection from automobile traffic. Provide secure bicycle storage facilities outside of the dwelling units, preferably in a covered and gated area.

G Safe Environment

The principle of environmental justice requires that affordable housing be safe and healthy. Sites that pose significant health risks due to proximity to sources of pollution, excess noise and other hazards will not be considered.

Crime Prevention Through Environmental Design (CPTED) is an approach to crime prevention through better design of the shaped environment. Its four basic concepts are surveillance, access control, territoriality and maintenance. All new and substantially remodeled facilities should comply with the principles explained on the San Diego Police Department's Prevention Tips website at:

www.sandiego.gov/police/prevention/deter.shtml

and as described in more detail in the Department's publication "Crime Prevention Through Environmental Design (CPTED) for Urban Village Centers", dated May 2005 and available at:

www.sandiego.gov/police/pdf/CPTEDvillagesmay2005.pdf

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APPENDICES


A Preferred Plant Materials List

Trees

Botanical Name	Common Name
Agonis flexuosa	Peppermint Tree
Albizia julibrissin	Silk Tree
Arbutus 'Marina'	Marina Strawberry Tree
Arbutus unedo	Strawberry Tree
Archontophoenix cunninghamiana	King Palm
Callistemon citrinus	Lemon Bottlebrush
Chamaerops humilis	Mediterranean Fan Palm
Chorisia speciosa	Floss Silk Tree
Citrus spp.	Citrus Trees
Jacaranda mimosifolia	Jacaranda
Koelreuteria bipinnata	Chinese Flame Tree
Koelreuteria paniculata	Goldenrain Tree
Lagerstroemia india	Crape Myrtle
Laurus nobilis	Laurel Tree
Magnolia grandiflora	Southern Magnolia
Melaleuca quinquenervia	Paperbark Tree
Metrosideros excelsus	New Zealand Christmas Tree
Olea europaea - fruitless	Fruitless Olive
Parkinsonia spp. + cvs.	Palo Verde Tree
Phoenix dactylifera cvs.	Date Palm
Pinus eldarica	Afghan Pine
Pinus halepensis	Aleppo Pine

APPENDICES

A Preferred Plant Materials List

Trees (continued)

Botanical Name	Common Name
Pinus torreyana	Torrey Pine
Pistacia chinensis	Chinese Pistache
Platanus acerifolia	London Plane Tree
Platanus racemosa	California Sycamore
Podocarpus gracilior	Fern Pine
Podocarpus macrophyllus	Yew Pine
Prunus cerasifera	Purple Leaf Plum
Pyrus calleryana	Callery Pear
Pyrus kawakamii	Evergreen Pear
Quercus agrifolia	Coast Live Oak
Quercus ilex	Holly Oak
Rhaphiolepis x ‘Majestic Beauty’	Majestic Beauty Indian Hawthorn
Rhus lancea	African Sumac
Syagrus romanzoffianum	Queen Palm
Tipuana tipu	Tipu Tree
Washingtonia filifera	California Fan Palm

Shrubs

Abelia grandiflora	Abelia
Acanthus mollis	Bear’s Breech
Alyogyne huegelii	Blue Hibiscus
Anigozanthos spp. + cvs.	Kangaroo Paw
Arctostaphylos spp. + cvs.	Manzanita
Artemisia californica	California Sagebrush
Asparagus densiflorus + cvs.	Asparagus
Aspidistra elatior	Cast Iron Plant
Baccharis spp.	Coyote Brush
Bougainvillea spp. + cvs.	Bougainvillea
Buddleja davidii	Butterfly Bush
Calliandra spp.	Powder Puff
Carex spp.	Sedge
Carissa macrocarpa	Natal Plum
Ceanothus spp. + cvs.	Ceanothus
Cistus spp.	Rockrose

APPENDICES

A Preferred Plant Materials List

Shrubs (continued)

Botanical Name	Common Name
Cotoneaster spp.	Cotoneaster
Echium candicans	Pride of Madeira
Elaeagnus pungens	Silverberry
Eriogonum fasciculatum	California Buckwheat
Festuca ovina 'Glauca'	Blue Fescue
Heteromeles arbutifolia	Toyon
Lantana spp.	Lantana
Lavandula spp.	Lavender
Leonotis leonurus	Lion's Tail
Leptospermum spp. + cvs.	Tea Tree
Liriope muscari	Lily Turf
Malosma laurina	Laurel Sumac
Melaleuca nesophylla	Pink Melaleuca
Muhlenbergia spp.	Deer Grass
Myrtus communis	True Myrtle
Nassella tenuissima	Mexican Feather Grass
Osmanthus fragrans	Sweet Olive
Phormium spp. + cvs.	New Zealand Flax
Photinia fraseri	Fraser's Photinia
Pittosporum tobira + cvs.	Mock Orange
Prunus caroliniana	Caolina Laurel Cherry
Rhaphiolepis spp. + cvs.	Indian Hawthorn
Rhus spp. + cvs.	Sumac
Ribes speciosum	Fuchsia-Flowering Gooseberry
Rosa spp.	Rose
Rosmarinus officinalis + cvs.	Rosemary
Salvia spp. + cvs.	Sage
Trichostema lanatum	Wooly Blue Curls
Viburnum spp. + cvs.	Viburnum
Westringia fruticosa	Coast Rosemary

APPENDICES

A Preferred Plant Materials List

Cacti, Succulents, etc.

Botanical Name	Common Name
Aeonium spp.	NCN
Agave spp.	Agave
Aloe spp.	Aloe
Dasylirion wheeleri	Desert Spoon
Dracaena draco	Dragon Tree
Echeveria spp. + cvs.	Hens and Chicks
Echinocactus grusonii	Golden Barrel Cactus
Euphorbia tirucalli	Pencilbush
Hesperaloe parviflora	Red Yucca
Kalanchoe spp. + cvs.	NCN
Sedum spp. + cvs.	Stonecrop
Senecio mandraliscae	Blue Chalk Sticks
Yucca spp.	Yucca

Groundcover

Acacia spp.	Acacia
Achillea millefolium	Common Yarrow
Aptenia cordifolia	Red Apple
Arctostaphylos spp.	Manzanita
Baccharis pilularis + cvs.	Dwarf Coyote Brush
Ceanothus spp.	Ceanothus
Cotoneaster spp.	Cotoneaster
Delosperma spp.	Ice Plant
Fragaria chiloensis	Wild Strawberry
Lantana spp.	Lantana
Liriope muscari	Lily Turf
Myoporum spp.	NCN
Pyracantha spp.	Firethorn
Rosa ‘Floral Carpet’	Carpet Rose
Rosmarinus officinalis + cvs.	Rosemary
Salvia spp.	Sage
Sedum spp. + cvs.	Stonecrop
Senecio mandraliscae	Blue Chalk Sticks
Trachelospermum jasminoides	Star Jasmine
Vinca minor	Dwarf Periwinkle

APPENDICES

A Preferred Plant Materials List

Vines

Botanical Name	Common Name
Bougainvillea spp. + cvs.	Bougainvillea
Distictis spp. + cvs.	Trumpet Vine
Ficus pumila	Creeping Fig
Gelsemium sempervirens	Carolina Jessamine
Macfadyena unguis-cati	Cat's Claw Vine
Mandevilla spp. + cvs.	NCN
Parthenocissus tricuspidata	Boston Ivy
Pyrostegia venusta	Flame Vine
Solandra maxima	Cup-of-Gold Vine
Trachelospermum jasminoides	Star Jasmine

APPENDICES

B California Climate Zone Map (partial reproduction for City of San Diego)