# LEED- Building


N·R·D·C
Environmental Action Center
1314

THE SPINNAKER GROUP

# LEED-NC Version 2.2 Registered Project Checklist

LEED-NC

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**Project:** NCF-03
New College of Florida, New Academic/Admin Bldg., NCF-03
**Date:** April 14, 2010

Yes  Likely at Last  No

| 12 | | | 2 | Design Const. | Sustainable Sites | | 14 Points Requirements | | Action Needed | Responsibility | Review Comments | Date Due |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y | | | | C | Prereq 1 | **Construction Activity Pollution Prevention** | Required | Develop and follow an erosion and sediment control plan consistent with NPDES and SFWMD | Civil Engineer to ensure Erosion and sediment control plan meets the requirements of NPDES. CM to ensure plan is followed and documented. | Civil | Complete to date.<br>Review and re-date prior to submitting to USGBC for Construction Credit Review. | CO |
| 1 | | | | D | Credit 1 | **Site Selection** | 1 | Choose site that is already developed, not farmland, near water or wetlands or parklands | Spinnaker to document credit compliance | Project Manager | Complete | Anticipated |
| 1 | | | | D | Credit 2 | **Development Density & Community Connectivity** | 1 | Choose a previously developed site in a community with a minimum density of 60,000 SF/Acre or within 1/2 mile of 10 basic services | Spinnaker to evaluate if project site can meet the requirements of the credit. Need to find if 10 basic services are within 1/2 mile and if the dorms can count as the 10 residential units per acre | Project Manager | Complete | Anticipated |
| | | | 1 | D | Credit 3 | **Brownfield Redevelopment** | 1 | Build on a registered brownfield | N/A | | | |
| 1 | | | | D | Credit 4.1 | **Alternative Transportation**, Public Transportation Access | 1 | Select site within 1/2 mile of a light rail or subway OR within 1/4 mile of a bus stop used by 2 or more bus lines | Spinnaker to verify if credit can be met. Need information on availability of campus bus loop. May apply Campus Application Guide to include bus route at airport. Spinnaker to document. | Project Manager | Complete | Anticipated |
| 1 | | | | D | Credit 4.2 | **Alternative Transportation**, Bicycle Storage & Changing Rooms | 1 | Provide secure bicycle racks for 5% of the population & shower/changing facilities for 0.5 % of Full time employees | M&P to verify compliance and document credit compliance. Need to establish FTE and peak occupancy counts. | Architect | Complete | Anticipated |
| 1 | | | | D | Credit 4.3 | **Alternative Transportation**, Low Emitting and Fuel-Efficient Vehicles | 1 | Provide low-emitting, fuel efficient vehicles and preferred parking for 3% of FTE OR preferred parking for low-emitting, fuel efficient vehicles for 5% of parking spots | M&P and Civil to ensure signage is installed and shown on drawings. Spinnaker to document. | Project Manager | Complete | Anticipated |
| 1 | | | | D | Credit 4.4 | **Alternative Transportation**, Parking Capacity | 1 | Size parking not to exceed local zoning requirements AND provide preferred parking for carpools for 5% of spaces | Spinnaker to document that parking is being reduced | Project Manager | Complete | Anticipated |
| | | | 1 | C | Credit 5.1 | **Site Development,** Protect or Restore Habitat | 1 | Restore 50% of the site area (excluding building footprint) with native or adaptive vegetation | N/A | | | |
| 1 | | | | D | Credit 5.2 | **Site Development,** Maximize Open Space | 1 | Provide vegetated, open space on site to exceed local zoning requirements by 20% OR where there are no local requirements for open space, provide vegetated, open space equal to 20% of the project site | Civil Engineer to document credit compliance | Civil | Complete | Anticipated |
| 1 | | | | D | Credit 6.1 | **Stormwater Design,** Quantity Control | 1 | On previously developed sites, decrease the volume of stormwater runoff by 25% from the 2-year, 24-hour storm | Civil Engineer to verify if credit can be obtained and document compliance. May apply campus application guide if stormwater is not retained within the LEED boundary. | Civil | Complete | Anticipated |
| 1 | | | | D | Credit 6.2 | **Stormwater Design,** Quality Control | 1 | Remove stormwater suspended solids from 90% of runoff | Civil Engineer to verify if credit can be obtained and document compliance. May apply campus application guide if stormwater is not retained within the LEED boundary. | Civil | Complete | Anticipated |
| 1 | | | | C | Credit 7.1 | **Heat Island Effect,** Non-Roof | 1 | Use high reflectance paving materials, an open grid pavement system and/or provide shade for 50% of the site's hardscape | M&P to ensure hardscape meets the requirement and document compliance. If parking lot is part of this project look at alternatives to asphalt such as open grid and crushed shell | Architect | Re-upload new C 3.0 Dwg with generator, and bike rack pads. We have concrete pavement. Do we have pavement outside of the café French doors, for seating? Check box for New Concrete. Complete when Credit | Next deadline CO |
| 1 | | | | D | Credit 7.2 | **Heat Island Effect,** Roof | 1 | Specify a high reflectance roofing material | M&P to ensure roof meets the requirement and document compliance. Specify galvalume with appropriate SRI value. | Architect | Complete | Anticipated |
| 1 | | | | D | Credit 8 | **Light Pollution Reduction** | 1 | Minimize light trespass to neighboring sites and the night sky. Minimize exterior light levels. | Matrix Engineering to ensure compliance | MEP | Site Lumen Calculation table completed.<br>Light Fixture Schedule uploaded.<br>Narrative revised.<br>Complete. | Anticipated |

| Yes | Likely | Not Likely | No | | Water Efficiency | | 6 Points | Requirements | Action Needed | Responsibility | Application Guidance | Date Due |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | | 1 | | | | | | | | | | |
| 1 | | | | D | Credit 1.1 | **Water Efficient Landscaping** Reduce by 50% | 1 | Reduce potable water use for landscaping by using efficient irrigation techniques, drought resistant plants and/or captured rainwater | M&P and Landscape Architect to ensure compliance through use of cistern. LA to document compliance. Investigate if reclaimed water is available at the site | Architect | Deferred | CO |
| | | 1 | | D | Credit 1.2 | **Water Efficient Landscaping** No Potable Use or No Irrigation | 1 | Use no potable water for landscaping by using recaptured rainwater or plants that do not require irrigation | M&P and Landscape Architect to ensure compliance through use of cistern. LA to document compliance. Investigate if reclaimed water is available at the site Per March 6 meeting no cistern | Architect | Deferred | CO |
| 1 | | | | D | Credit 2 | **Innovative Wastewater Technologies** | 1 | Reduce potable water use for sewage conveyance by 50% through the use of water-conserving fixtures or recycled graywater | Calc. baseline & design case show % reduction in water use, report what portion of irrigation will come from non-potable water source. Document landscaping plan showing planting schedule & irrigation system | MEP | Complete | Anticipated |
| 1 | | | | D | Credit 3.1 | **Water Use Reduction**, 20% Reduction | 1 | Use high-efficiency fixtures, waterless urinals, and hand sensors to reduce potable water use by 20% | Matrix to ensure fixtures specified meet the credit compliance and document | MEP | Complete | Anticipated |
| 1 | | | | D | Credit 3.2 | **Water Use Reduction**, 30% Reduction | 1 | Use high-efficiency fixtures, waterless urinals, and hand sensors to reduce potable water use by 30% | Matrix to ensure fixtures specified meet the credit compliance and document | MEP | Complete | Anticipated |

| Yes | Likely | Not Likely | No | | Energy & Atmosphere | | 17 Points | Requirements | Action Needed | Responsibility | Review Comments | Date Due |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 3 | 11 | | | | | | | | | |
| Y | | | | C | Prereq 1 | **Fundamental Commissioning of the Building Energy Systems** | Required | Hire an independent agent to verify that all energy-related systems are installed, calibrated and perform according to the design | Spinnaker to commissioning building Owner and M&P to generate Owners Project Requirements (OPR). Matrix to generate Basis of Design (BOD) | CxA | No Template Data Saved | CO |
| Y | | | | D | Prereq 2 | **Minimum Energy Performance** | Required | Meet the Florida Energy Code | Matrix to document compliance | MEP | Template Marked Complete. This credit will reference Eac 1 Complete | Anticipated |
| Y | | | | D | Prereq 3 | **Fundamental Refrigerant Management** | Required | Do not use CFC refrigerants | Matrix to ensure central plant chiller does not contain CFC and document credit | MEP | Complete | Anticipated |
| 2 | 1 | | 7 | D | Credit 1 | **Optimize Energy Performance** | 1 to 10 | Reduce the building energy cost by 21% based on the Florida Energy Code. Use energy efficient lighting, insulated glazing, high efficiency HVAC systems, HVAC energy recovery units and high performance | Matrix to supply energy model and document credit compliance | MEP | Complete | Anticipated |
| | | | 3 | D | Credit 2.1 | **On-Site Renewable Energy** | 1 to 3 | Install systems to capture solar, wind, water or geothermal energy to produce electricity or offset heating, cooling or water heating energy consumption | NA | | | |
| | | | 1 | C | Credit 3 | **Enhanced Commissioning** | 1 | Use an independent commissioning agent to review design documents and review contractor submittals. Cx will verify training and POE | Spinnaker to commissioning building Owner and M&P to generate Owners Project Requirements (OPR). Matrix to generate Basis of Design (BOD). Ensure Spinnaker CxA receives 50% CD | | | |
| | | 1 | | D | Credit 4 | **Enhanced Refrigerant Management** | 1 | Do no use refrigerants OR select refrigerants that minimize or do not contribute to ozone depletion | Matrix to investigate if this credit can be obtained | MEP | Complete | Anticipated |
| | | 1 | | C | Credit 5 | **Measurement & Verification** | 1 | Develop a measurement and verification plan for building energy consumption. Install meters on all equipment and lighting panels. | Investigate if this makes sense for the College. Dependent on campus integrated Building Automation and centralized monitoring. Additional cost for | MEP | No Template Data Saved | CO |
| | | 1 | | C | Credit 6 | **Green Power** | 1 | Provide at least 35% of the building's electricity from renewable sources through a green power contract with a | At New College discretion, Spinnaker to work with Owner and document credit if pursued | Project Manager | No Template Data Saved | CO |

| Yes | Likely | Not Likely | No | | Materials & Resources | | 13 Points | Requirements | Action Needed | Responsibility | Review Comments | Date Due |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 1 | | 6 | | | | | | | | | |
| Y | | | | D | Prereq 1 | **Storage & Collection of Recyclables** | Required | Provide recyclable collection in common areas as well as a central collection/sorting area | M&P to design recycling area and document compliance | Architect | Complete | Anticipated |
| | | | 1 | C | Credit 1.1 | **Building Reuse**, Maintain 75% of Existing Walls, Floors & Roof | 1 | Reuse 75% of the existing building shell (excluding windows), floors and roof | N/A | | | |
| | | | 1 | C | Credit 1.2 | **Building Reuse**, Maintain 100% of Existing Walls, Floors & Roof | 1 | Reuse 100% of the existing building shell (excluding windows), floors and roof | N/A | | | |
| | | | 1 | C | Credit 1.3 | **Building Reuse**, Maintain 50% of Interior Non-Structural Elements | 1 | N/A | N/A | | | |
| 1 | | | | C | Credit 2.1 | **Construction Waste Management**, Divert 50% from Disposal | 1 | Recycle 50% of the site construction/demolition waste by weight of volume | CM to develop construction waste management plan and document compliance with credit | Contractor | No Template Data Saved | During Const. |
| 1 | | | | C | Credit 2.2 | **Construction Waste Management**, Divert 75% from Disposal | 1 | Recycle 75% of the site construction/demolition waste by weight of volume | CM to develop construction waste management plan and document compliance with credit | Contractor | No Template Data Saved | During Const. |
| | | | 1 | C | Credit 3.1 | **Materials Reuse**, 5% | 1 | Use salvaged, refurbished or reused materials for 5% of the building material costs | N/A | | | |
| | | | 1 | C | Credit 3.2 | **Materials Reuse**,10% | 1 | Use salvaged, refurbished or reused materials for 10% of the building material costs | N/A | | | |
| 1 | | | | C | Credit 4.1 | **Recycled Content**, 10% (post-consumer + ½ pre-consumer) | 1 | Use materials with recycled content for 10% of the building material costs | M&P and Spinnaker to provide specifications for recycled material and CM to track and document compliance | Contractor | No Template Data Saved | During Const. |
| 1 | | | | C | Credit 4.2 | **Recycled Content**, 20% (post-consumer + ½ pre-consumer) | 1 | Use materials with recycled content for 20% of the building material costs | M&P and Spinnaker to provide specifications for recycled material and CM to track and document compliance | Contractor | No Template Data Saved | During Const. |
| | 1 | | | C | Credit 5.1 | **Regional Materials**, 10% Extracted, Processed & Manufactured Regionally | 1 | Use building materials that have been extracted, harvested or recovered and manufacture red within 500 miles of the project site for a minimum of 10% of the building material costs | M&P and Spinnaker to provide specifications for regional material and CM to track and document compliance | Contractor | No Template Data Saved | During Const. |
| 1 | | | | C | Credit 5.2 | **Regional Materials**, 20% Extracted, Processed & Manufactured Regionally | 1 | Use building materials that have been extracted, harvested or recovered and manufacture red within 500 miles of the project site for a minimum of 20% of the building material costs | M&P and Spinnaker to provide specifications for regional material and CM to track and document compliance | Contractor | No Template Data Saved | During Const. |
| | | | 1 | C | Credit 6 | **Rapidly Renewable Materials** | 1 | Use rapidly renewable materials such as bamboo or cork for a minimum of 2.5% of the building material costs | N/A | | | |
| 1 | | | | C | Credit 7 | **Certified Wood** | 1 | Use a minimum of 50% of wood based products (by cost of wood) which are certified by the Forest Stewardship Council | M&P and Spinnaker to provide specifications for certified wood and CM to track and document compliance | Contractor | No Template Data Saved | During Const. |

| Yes | Likely | Not Likely | No | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | | 1 | 3 | | Indoor Environmental Quality | 15 Points | Requirements | Action Needed | Responsibility | Review Comments | Date Due |
| Y | | | | D | Prereq 1 | **Minimum IAQ Performance** | Required | Meet the ventilation requirements of ASHRAE 62.1 2004 | Matrix to ensure compliance and document compliance | MEP | Complete | Anticipated |
| Y | | | | D | Prereq 2 | **Environmental Tobacco Smoke** (ETS) **Control** | Required | No smoking inside the building or within 25 feet of building entrances | Owner and M&P to ensure compliance. Spinnaker to document compliance | Architect | Complete | Anticipated |
| 1 | | | | D | Credit 1 | **Outdoor Air Delivery Monitoring** | 1 | Measure outdoor airflow and provide $CO_2$ sensors in densely occupied spaces | Matrix to ensure compliance and document compliance | MEP | Complete | Anticipated |
| | | | 1 | D | Credit 2 | **Increased Ventilation** | 1 | Increase ventilation rates by at least 30% over the minimum code requirements | N/A | | | |
| 1 | | | | C | Credit 3.1 | **Construction IAQ Management Plan**, During Construction | 1 | During construction, protect ductwork and absorptive materials from water and dust AND protect air handling equipment being used during construction. Adopt SMACNA | CM to develop construction IAQ management plan, ensure compliance and document credit | Contractor | No Template Data Saved | Start of Const. |
| | | 1 | | C | Credit 3.2 | **Construction IAQ Management Plan**, Before Occupancy | 1 | Perform a building "flush-out" by using 14000 cu ft/ sq ft or have air tested | Spinnaker to evaluate credit attainability during construction phase | Project Manager | No Template Data Saved | CO |
| 1 | | | | C | Credit 4.1 | **Low-Emitting Materials**, Adhesives & Sealants | 1 | Use adhesives and sealants used in the building interior which have low VOC content | M&P to specify low VOC. CM to ensure and document compliance | Contractor | No Template Data Saved | During Const. |
| 1 | | | | C | Credit 4.2 | **Low-Emitting Materials**, Paints & Coatings | 1 | Use paints and coatings used in the building interior which have low VOC content | M&P to specify low VOC. CM to ensure and document compliance | Contractor | No Template Data Saved | During Const. |
| | | | 1 | C | Credit 4.3 | **Low-Emitting Materials**, Carpet Systems | 1 | All carpet and adhesives must be in accordance with the Green Label Plus program for low VOC content | M&P to specify low VOC. CM to ensure and document compliance | | | |
| 1 | | | | C | Credit 4.4 | **Low-Emitting Materials**, Composite Wood & Agrifiber Products | 1 | Use particle board, MDF, plywood and door cores that contain no added urea-formaldehyde | M&P to specify no added urea formaldehyde. CM to ensure and document compliance | Contractor | No Template Data Saved | During Const. |
| | | | 1 | D | Credit 5 | **Indoor Chemical & Pollutant Source Control** | 1 | Use permanent entryway systems to capture dirt, use high efficiency air filters, and provide room exhaust for spaces where hazardous chemicals are used | N/A | | | |
| 1 | | | | D | Credit 6.1 | **Controllability of Systems**, Lighting | 1 | Provide lighting controls for 90% of the building occupants AND lighting system controllability for all shared multi-occupant spaces | Matrix to ensure compliance and document compliance | MEP | Complete | Anticipated |
| 1 | | | | D | Credit 6.2 | **Controllability of Systems**, Thermal Comfort | 1 | Provide individual comfort controls for 50% of the building occupants AND provide comfort controls for all shared multi-occupant spaces | Matrix to ensure compliance and document compliance. Windows count as temperature control devices | MEP | Complete | Anticipated |
| 1 | | | | D | Credit 7.1 | **Thermal Comfort**, Design | 1 | Provide a comfortable thermal environment which meets the standards of the American Society of Heating, Ventilation and Air Conditioning Engineers | Matrix to ensure compliance and document compliance | MEP | Complete | Anticipated |
| 1 | | | | C | Credit 7.2 | **Thermal Comfort**, Verification | 1 | Implement a thermal comfort survey of building occupants between 6 to 18 months from occupancy | Owner and Spinnaker to develop survey and plan. Spinnaker to document | Project Manager | Complete | Anticipated |
| 1 | | | | D | Credit 8.1 | **Daylight & Views**, Daylight 75% of Spaces | 1 | Provide daylight in a minimum for 75% of all occupied spaces | M&P to design building to ensure credit compliance and document the credit | Architect | Complete | Anticipated |
| 1 | | | | D | Credit 8.2 | **Daylight & Views**, Views for 90% of Spaces | 1 | Provide views to the outdoors for 90% of all occupied spaces | M&P to design building to ensure credit compliance and document the credit | Architect | Complete | Anticipated |

| Yes | Likely | Not Likely | No | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | | | | | Innovation & Design Process | 5 Points | Requirements | Action Needed | Responsibility | Review Comments | Date Due |
| 1 | | | | D | Credit 1.1 | **Innovation in Design**: Provide Specific Title | 1 | Suggested - Educational Component | Spinnaker to work with M&P and owner and document credit: **Green Education.** | Architect | Deferred | CO |
| 1 | | | | D | Credit 1.2 | **Innovation in Design**: Provide Specific Title | 1 | Suggested - Green Cleaning | Spinnaker to work with M&P and owner and document credit: **Green Cleaning.** | Project Manager | Deferred | CO |
| 1 | | | | D | Credit 1.3 | **Innovation in Design**: Provide Specific Title | 1 | Suggested - Green pest control | Spinnaker to work with M&P and owner and document credit: **Green Pest.** | Project Manager | Complete | Anticipated |
| 1 | | | | D | Credit 1.4 | **Innovation in Design**: Provide Specific Title | 1 | Exceeding water credit? | Spinnaker to work with M&P and owner and document credit: **Exemplary water Use Reduction.** | Project Manager | Upload Documents then Mark as Complete | CO |
| 1 | | | | C | Credit 2 | **LEED® Accredited Professional** | 1 | Spinnaker will qualify project | Spinnaker to work with M&P and owner and document credit | Project Manager | Complete | CO |

| Yes | Likely | Not Likely | No | Project Totals (pre-certification estimates) 69 Points |
|---|---|---|---|---|
| 40 | 2 | 5 | 22 | |

Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | D | Credit 1.4 | Specific Title | | |
| 1 | | | | C | Credit 2 | **LEED® Accredited Professional** | 1 | Spinnaker will qualify p |

| Yes | Likely | Not Likely | No | |
|---|---|---|---|---|
| 40 | 2 | 5 | 22 | **Project Totals** (pre-certification estimates) **69** Points |

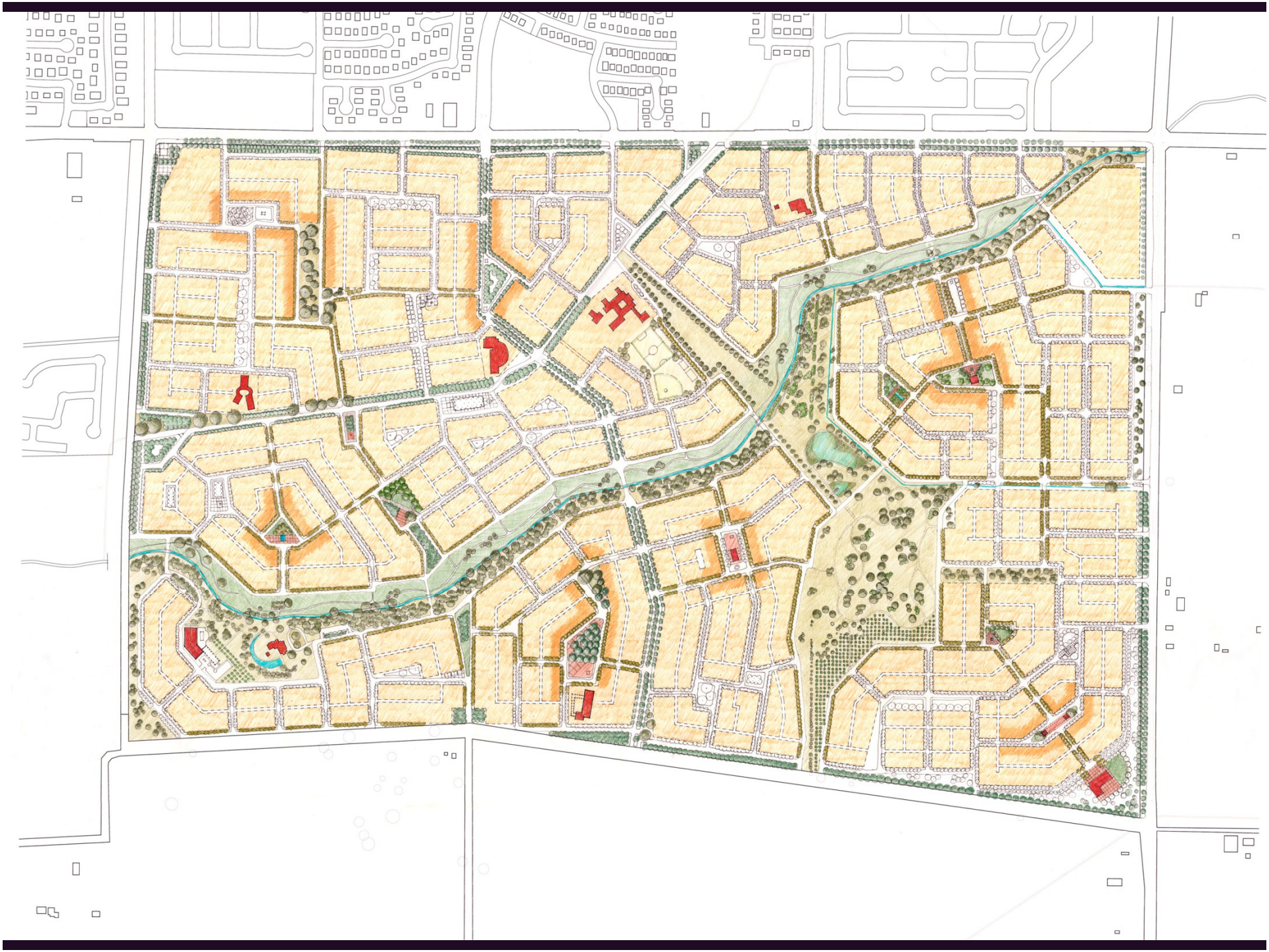
**Certified** 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

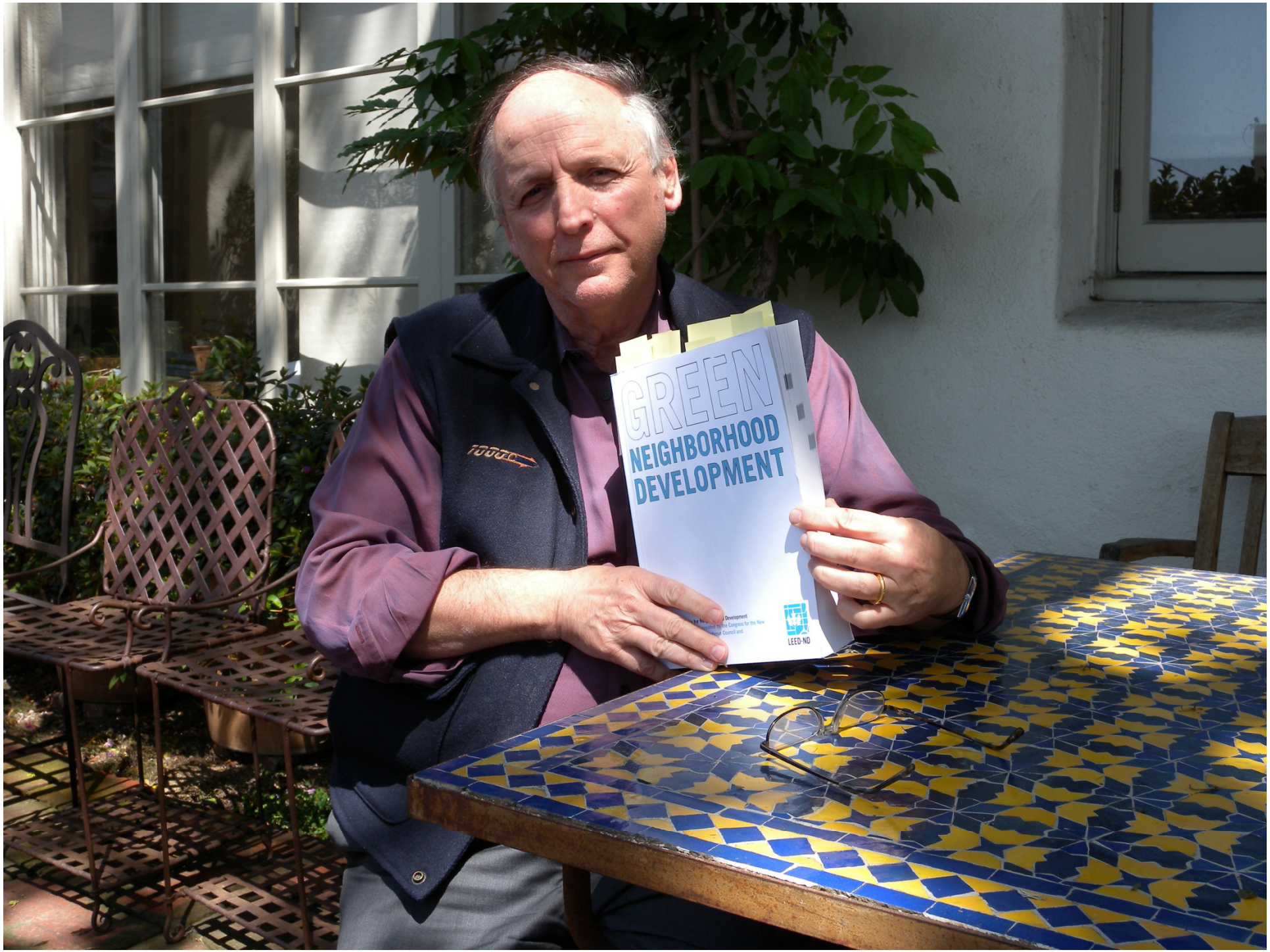

CAHILL CENTER FOR ASTRONOMY

# THE CASE AGAINST LEED - Building

1. The standards are too low- Silver is Code threshold
2. A faulty accounting system- PR vs State Energy Policy
3. Only 800 buildings certified in a decade
4. Checking boxes vs. innovative design
5. Focus on unique buildings vs. all buildings
6. No explicit reference to regional climate & culture
7. A private business vs. a public trust
8. Diverting fees from design and construction

# LEED- ND




GREEN
NEIGHBORHOOD
DEVELOPMENT
LEED-ND

## RELATED CREDITS

The project team should begin by confirming the project's compliance with all prerequisites. When selecting credits to attempt, a project team should evaluate the interconnections between them, since earning certain credits may help earn others. To illustrate these relationships, Table 2 shows credits grouped according to shared focus on eight sustainability topics. These relationships are detailed further in Table 3, where each credit's achievement is itemized by the help it may provide toward earning or supporting other credits.

**Table 2.** Sustainability focus for LEED-ND prerequisites and credits

| | Smart location | Sensitive lands protection | Site and transportation design | Public health | Social equity | Energy and climate protection | Water resource efficiency | Infrastructure efficiency |
|---|---|---|---|---|---|---|---|---|
| **Smart Location and Linkage** | | | | | | | | |
| Prerequisite 1, Smart Location | ● | | ● | ● | ● | ● | | ● |
| Prerequisite 2, Imperiled Species and Ecological Communities Conservation | | ● | | | | | | |
| Prerequisite 3, Wetland and Water Body Conservation | | ● | | | | | ● | |
| Prerequisite 4, Agricultural Land Conservation | | ● | | | | | | |
| Prerequisite 5, Floodplain Avoidance | | ● | | | | | | |
| Credit 1, Preferred Locations | ● | | | ● | ● | ● | | |
| Credit 2, Brownfields Redevelopment | ● | | | | ● | ● | | |
| Credit 3, Locations With Reduced Automobile Dependence | ● | | ● | ● | ● | ● | | |
| Credit 4, Bicycle Network and Storage | ● | | ● | ● | ● | ● | | |
| Credit 5, Housing and Jobs Proximity | ● | | | | ● | ● | | |
| Credit 6, Steep Slope Protection | | ● | | | | | | |
| Credit 7, Site Design for Habitat or Wetland and Water Body Conservation | | ● | ● | | | | ● | |
| Credit 8, Restoration of Habitat or Wetlands and Water Bodies | | ● | | | | | ● | |
| Credit 9, Long-Term Conservation Management of Habitat or Wetlands and Water Bodies | | ● | | | | | ● | |
| **Neighborhood Pattern and Design** | | | | | | | | |
| Prerequisite 1, Walkable Streets | ● | | ● | ● | ● | ● | | |
| Prerequisite 2, Compact Development | | | ● | ● | ● | ● | | ● |
| Prerequisite 3, Connected and Open Community | ● | | ● | ● | ● | ● | | |
| Credit 1, Walkable Streets | | | ● | ● | ● | ● | | |
| Credit 2, Compact Development | | | ● | ● | ● | ● | | ● |
| Credit 3, Mixed-Use Neighborhood Centers | | | ● | ● | ● | ● | | ● |
| Credit 4, Mixed-Income Diverse Communities | | | | | ● | | | |
| Credit 5, Reduced Parking Footprint | | | ● | | | ● | | |
| Credit 6, Street Network | | | ● | ● | ● | ● | | ● |

**Table 2.** Sustainability focus for LEED-ND prerequisites and credits (continued)

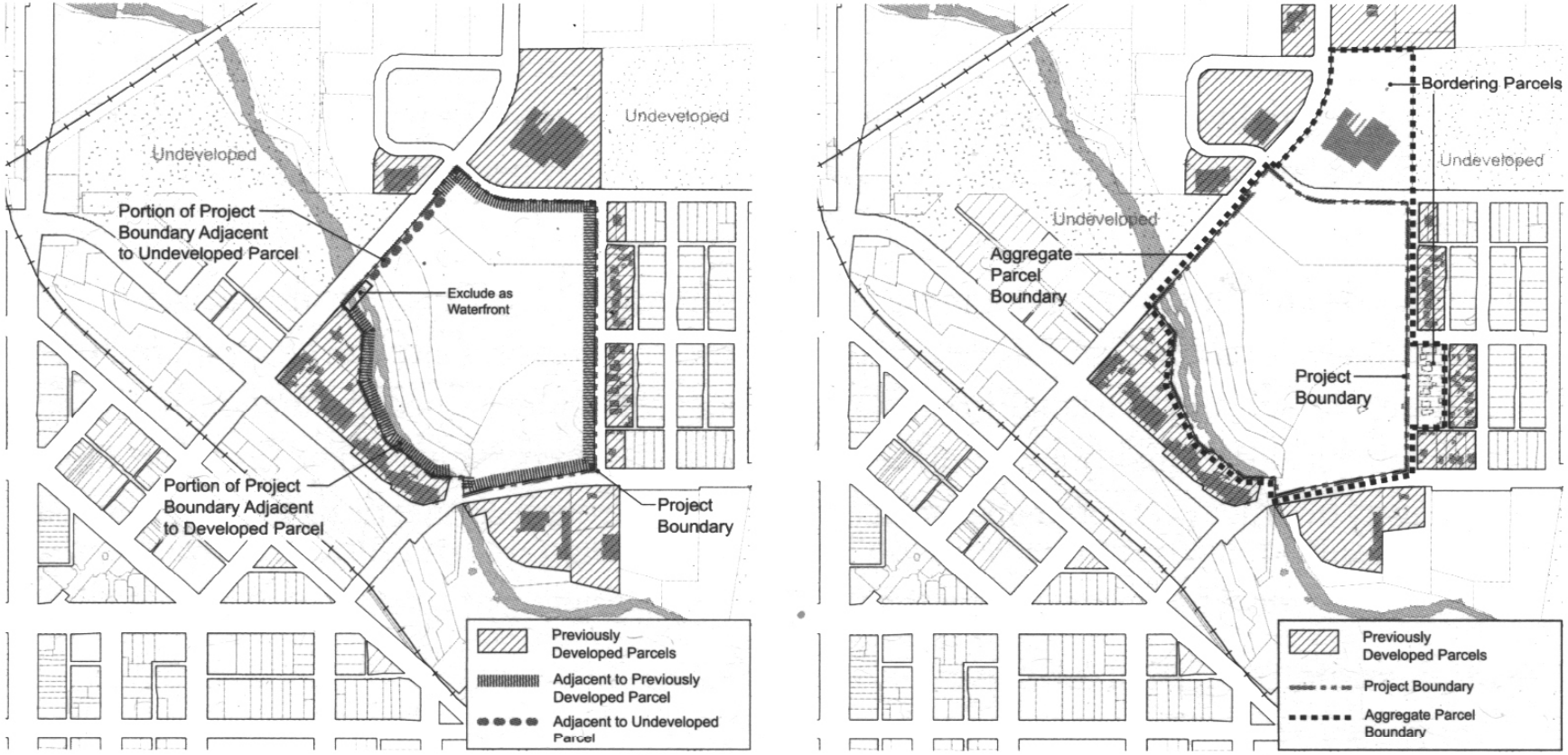
| | Smart location | Sensitive lands protection | Site and transportation design | Public health | Social equity | Energy and climate protection | Water resource efficiency | Infrastructure efficiency |
|---|---|---|---|---|---|---|---|---|
| **Neighborhood Pattern and Design (continued)** | | | | | | | | |
| Credit 7, Transit Facilities | | | ● | | ● | ● | | |
| Credit 8, Transportation Demand Management | | | ● | | | ● | | |
| Credit 9, Access to Civic and Public Space | | | ● | ● | ● | ● | | |
| Credit 10, Access to Recreation Facilities | | | ● | ● | ● | ● | | |
| Credit 11, Visitability and Universal Design | | | ● | | ● | | | |
| Credit 12, Community Outreach and Involvement | | | | ● | ● | | | |
| Credit 13, Local Food Production | | | ● | ● | ● | | | |
| Credit 14, Tree-Lined and Shaded Streets | | | ● | | | ● | | |
| Credit 15, Neighborhood Schools | | | ● | ● | ● | | | |
| **Green Infrastructure and Buildings** | | | | | | | | |
| Prerequisite 1, Certified Green Building | | | | | | ● | | |
| Prerequisite 2, Minimum Building Energy Efficiency | | | | | | ● | | |
| Prerequisite 3, Minimum Building Water Efficiency | | | | | | ● | ● | |
| Prerequisite 3, Connected and Open Community | | ● | ● | | | | | ● |
| Credit 1, Certified Green Buildings | | | | | | ● | | |
| Credit 2, Building Energy Efficiency | | | | | | ● | | |
| Credit 2, Building Water Efficiency | | | | | | ● | ● | |
| Credit 4, Water-Efficient Landscaping | | | | | | ● | ● | |
| Credit 5, Existing Building Reuse | | | ● | | | ● | | |
| Credit 6, Historic Resource Preservation and Adaptive Use | | | ● | | ● | | | |
| Credit 7, Minimized Site Disturbance in Design and Construction | | ● | | | | | | |
| Credit 8, Stormwater Management | | | | | | | ● | ● |
| Credit 9, Heat Island Reduction | | | | | | ● | | |
| Credit 10, Solar Orientation | | | | | | ● | | |
| Credit 11, On-Site Renewable Energy Sources | | | | | | ● | | ● |
| Credit 12, District Heating and Cooling | | | | | | ● | | ● |
| Credit 13, Infrastructure Energy Efficiency | | | | | | ● | | ● |
| Credit 14, Wastewater Management | | | | | | | | ● |
| Credit 15, Recycled Content in Infrastructure | | | | | | ● | | ● |
| Credit 16, Solid Waste Management Infrastructure | | | | | | ● | | ● |
| Credit 17, Light Pollution Reduction | | | ● | | | | | |

with the project; a "kitty-corner" parcel, which adjoins the project at only a single point, is not considered bordering.

**Figure 3.** Infill site based on one of these four conditions

**(a).** Infill project site based on minimum 75% of perimeter adjacent to previously developed parcels

**(b).** Infill project site based on minimum 75% adjacent to previously developed parcels using project boundary and selected bordering parcels



| CREDIT | TITLE | POINTS |
|---|---|---|
| **SLL Prerequisite 1** | Smart Location | Required |
| **SLL Prerequisite 2** | Imperiled Species and Ecological Communities Conservation | Required |
| **SLL Prerequisite 3** | Wetland and Water Body Conservation | Required |
| **SLL Prerequisite 4** | Agricultural Land Conservation | Required |
| **SLL Prerequisite 5** | Floodplain Avoidance | Required |
| **SLL Credit 1** | Preferred Locations | 10 points |
| **SLL Credit 2** | Brownfields Redevelopment | 2 points |
| **SLL Credit 3** | Reduced Automobile Dependence | 7 points |
| **SLL Credit 4** | Bicycle Network and Storage | 1 point |
| **SLL Credit 5** | Housing and Jobs Proximity | 3 points |
| **SLL Credit 6** | Steep Slope Protection | 1 point |
| **SLL Credit 7** | Site Design for Habitat or Wetland and Water Body Conservation | 1 point |
| **SLL Credit 8** | Restoration of Habitat or Wetlands and Water Bodies | 1 point |
| **SLL Credit 9** | Long-Term Conservation Management of Habitat or Wetlands and Water Bodies | 1 point |

| | SLL |
|---|---|
| ND | Prerequisite 1 |

Equation 2

$$\text{\% previously developed area of combined qualifying parcels} = \frac{\text{Total previously developed area of qualifying parcels}}{\text{Total area of qualifying parcels}} \times 100$$

Step 3. Measure the entire project perimeter, and measure the length of the portions adjacent to any waterfront and the length of the portions adjacent to parcels that are at least 50% previously developed (qualifying parcels from Step 1). After subtracting waterfront length from the total perimeter length, divide the perimeter length adjacent to qualifying parcels by the total net perimeter length, and multiply by 100 to obtain the percentage of the perimeter bordering previously developed parcels (Equation 3). The result must be 75% or more.

Equation 3

$$\text{\% of perimeter adjacent to qualifying parcels} = \frac{\text{Perimeter length adjacent to qualifying parcels}}{\text{Total perimeter length} - \text{waterfront length}} \times 100$$

OPTION 2. Adjacent Sites with Connectivity

Step 1. Measure the entire project perimeter, and measure the length of the portions adjacent to any waterfront and the length of the portions adjacent to parcels that are at least 75% previously developed. After subtracting waterfront length from the total perimeter length, divide the perimeter length adjacent to parcels that are at least 75% previously developed by the total net perimeter length, and multiply by 100 to obtain the percentage of perimeter bordering previously developed parcels (Equation 4). The result must be a continuous segment of 25% or more.

Equation 4

$$\text{\% of perimeter adjacent to previously developed parcels} = \frac{\text{Perimeter length adjacent to previously developed parcels}}{\text{Total perimeter length} - \text{waterfront length}} \times 100$$

Step 2. Map the previously developed area near the project, taking care to include a surrounding area large enough to determine qualifying intersections. This will likely require a context map larger than 1/2-mile around the project. Next, map the lands within 1/2-mile from the qualifying continuous segment of project boundary established in Step 1. To do this, offset every point of the qualifying continuous segment by 1/2- mile to define a 1/2-mile adjacent calculation area. This area may include portions of land both inside and outside the project boundary. Identify existing qualifying intersections within the 1/2-mile adjacent calculation area. Do not count any planned intersections and any intersections that were funded or built within the past ten years by the project developer to determine the net number of intersections within the 1/2-mile adjacent calculation area. Determine the gross area in square miles of the 1/2-mile adjacent calculation area, and subtract eligible exclusions to determine the net area, including undeveloped land. Divide the number of qualifying intersections by the net area. The resulting number of intersections per square mile must be 90 or more (Equation 5).

Equation 5

$$\text{Intersections per square mile of the ½-mile adjacent calculation area} = \frac{\text{Qualifying intersections}}{\text{(Square miles within ½-mile adjacent calculation area)} - \text{(Square miles eligible for exclusion)}}$$

mitigate the loss through the purchase of easements providing permanent protection from development on land with comparable soils in accordance with the ratios based on densities per acre of *buildable land* as listed in Tables 1 and 2.

**Table 1.** Mitigation ratios for projects in metropolitan or micropolitan statistical areas, pop. 250,000 or more

| Residential density (DU per acre of buildable land available for residential use) | Nonresidential density (FAR of buildable land available for nonresidential use) | Mitigation ratio (acres of easement : acres of project on prime, unique, or significant soil) |
|---|---|---|
| > 7 and ≤ 8.5 | > 0.50 and ≤ 0.67 | 2 to 1 |
| > 8.5 and ≤ 10 | > 0.67 and ≤ 0.75 | 1.5 to 1 |
| > 10 and ≤ 11.5 | > 0.75 and ≤ 0.87 | 1 to 1 |
| > 11.5 and ≤ 13 | > 0.87 and ≤ 1.0 | .5 to 1 |
| > 13 | > 1.0 | No mitigation |

**Table 2.** Mitigation ratios for projects in metropolitan or micropolitan statistical areas, pop. less than 250,000

| Residential density (DU/acre of buildable land available for residential use) | Nonresidential density (FAR of buildable land available for nonresidential use) | Mitigation ratio (acres of easement : acres of project on prime, unique, or significant soil) |
|---|---|---|
| > 7 and ≤ 8 | > 0.50 and ≤ 0.58 | 2 to 1 |
| > 8 and ≤ 9 | > 0.58 and ≤ 0.67 | 1 to 1 |
| > 9 and ≤ 10 | > 0.67 and ≤ 0.75 | 0.5 to 1 |
| > 10 | > 0.75 | No mitigation |

DU = dwelling unit; FAR = floor-area ratio.

All off-site mitigation must be located within 100 miles of the project.

Up to 15% of the impacted soils area may be exempted from the *density* requirements if it is permanently dedicated for community gardens, and may also count toward the mitigation requirement for the remainder of the site. Portions of parking structures devoted exclusively to parking must be excluded from the numerator when calculating the *floor-area ratio* (FAR).

The mitigation ratio for a mixed-use project is calculated as follows:

1. Determine the total square footage of all residential and nonresidential uses.
2. Calculate the percentage residential and percentage nonresidential of the total square footage.
3. Determine the density of the residential and nonresidential components as measured in *dwelling units* per acre and FAR, respectively.
4. Referring to Tables 1 and 2, find the appropriate mitigation ratios for the residential and nonresidential components.
5. If the mitigation ratios are different, multiply the mitigation ratio of the residential component by its percentage of the total square footage, and multiply the mitigation ratio of the nonresidential component by its percentage.
6. Add the two numbers produced by Step 5. The result is the mitigation ratio.

Print Media

*Charter of the New Urbanism*, by The Congress for the New Urbanism (McGraw-Hill, 1999).

"The Influence of Land Use on Travel Behavior: Empirical Strategies," by Reid Ewing and Robert Cervero, *Transportation Research, Policy and Practice* 35 (2001): 823-845.

"Location Efficiency: Neighborhood and Socio-Economic Characteristics Determine Auto Ownership and Use: Studies in Chicago, Los Angeles, and San Francisco," by John Holtzclaw et al., *Transportation Planning and Technology* 25 (2002).

*The New Urbanism: Toward an Architecture of Community*, by Peter Katz (McGraw Hill, 1993).

*The Next American Metropolis*, by Peter Calthorpe (Princeton Architectural Press, New York, 1993).

*Retrofitting Suburbia: Urban Design Solutions for Redesigning Suburbs*, by Ellen Dunham-Jones and June Williamson (John Wiley & Sons, 2008).

*Suburban Nation: The Rise of Sprawl and the Decline of the American Dream*, by Andres Duany et al. (North Point Press, 2000).

*Sustainable Urbanism*, by Douglas Farr (John Wiley & Sons, 2007).

| CREDIT | TITLE | POINTS |
|---|---|---|
| **NPD Prerequisite 1** | Walkable Streets | Required |
| **NPD Prerequisite 2** | Compact Development | Required |
| **NPD Prerequisite 3** | Connected and Open Community | Required |
| **NPD Credit 1** | Walkable Streets | 12 points |
| **NPD Credit 2** | Compact Development | 6 points |
| **NPD Credit 3** | Mixed-Use Neighborhood Centers | 4 points |
| **NPD Credit 4** | Mixed-Income Diverse Communities | 7 points |
| **NPD Credit 5** | Reduced Parking Footprint | 1 point |
| **NPD Credit 6** | Street Network | 2 points |
| **NPD Credit 7** | Transit Facilities | 1 point |
| **NPD Credit 8** | Transportation Demand Management | 2 points |
| **NPD Credit 9** | Access to Civic and Public Space | 1 point |
| **NPD Credit 10** | Access to Recreation Facilities | 1 point |
| **NPD Credit 11** | Visitability and Universal Design | 1 point |
| **NPD Credit 12** | Community Outreach and Involvement | 2 points |
| **NPD Credit 13** | Local Food Production | 1 point |
| **NPD Credit 14** | Tree-Lined and Shaded Streets | 2 points |
| **NPD Credit 15** | Neighborhood Schools | 1 point |

institutions.

**Figure 1**. Clarence Perry's Neighborhood Unit, 1929. Source: Regional Plan Association

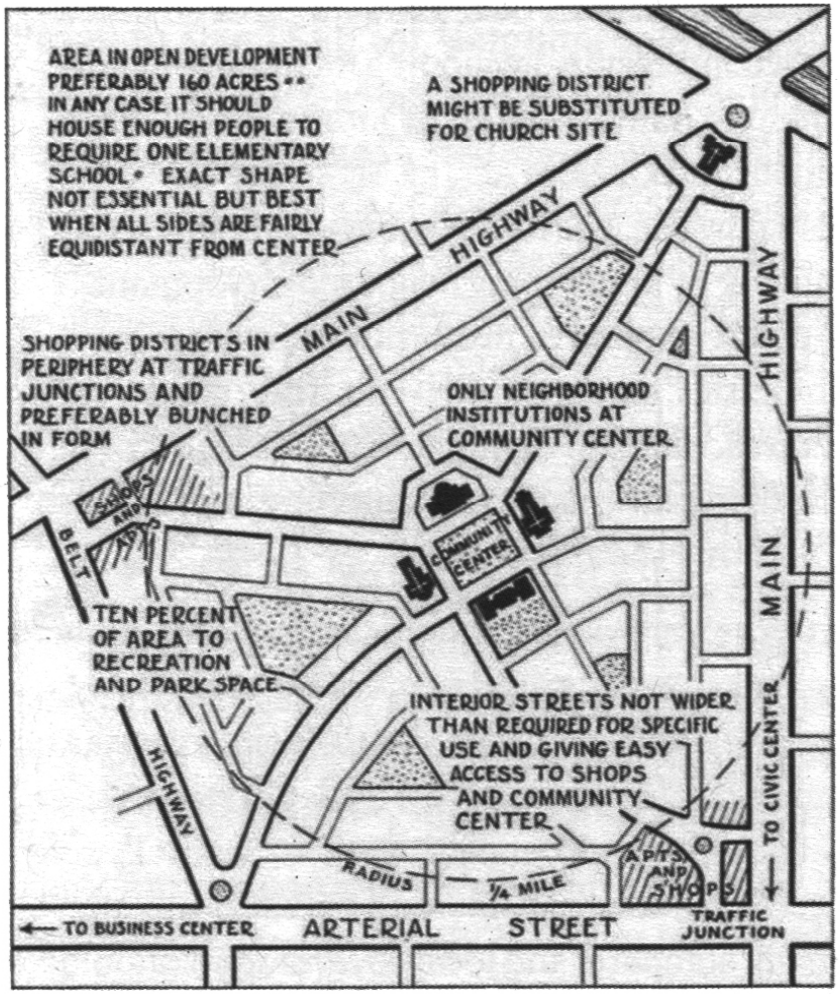
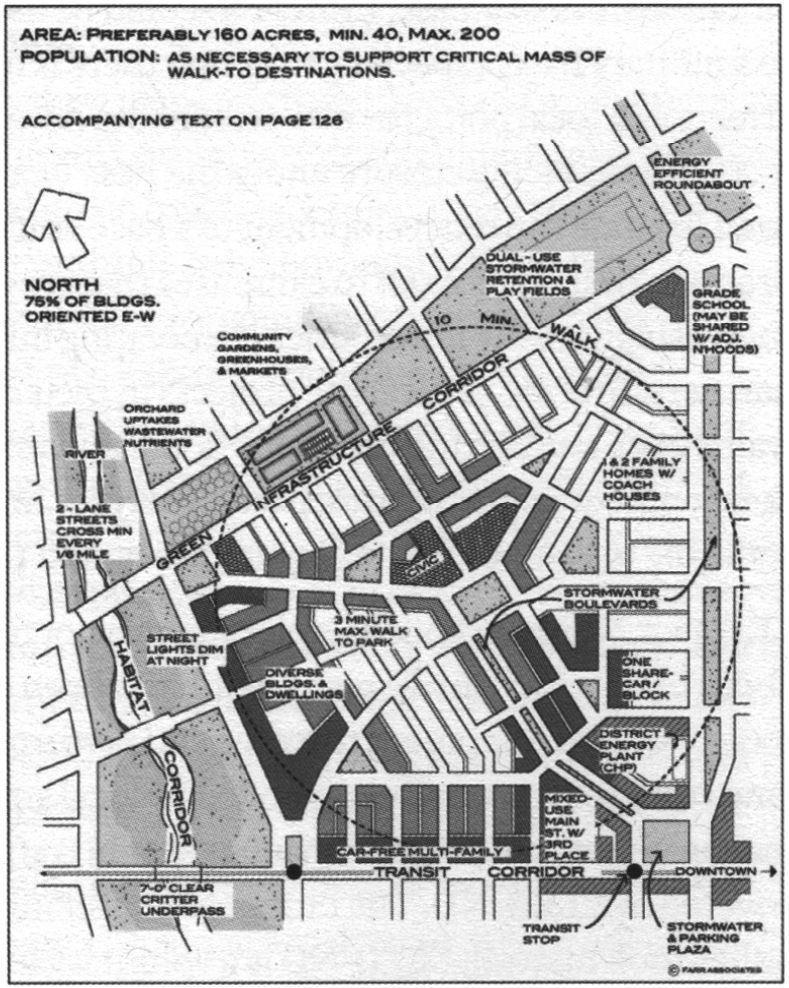



**Figure 2.** A "sustainable" update of Perry's neighborhood unit. Source: Douglas Farr, *Sustainable Urbanism*




A neighborhood can be considered the planning unit of a town. The charter of the Congress for the New Urbanism characterizes this unit as "compact, pedestrian-friendly, and mixed-use."[6] By itself the neighborhood is a village, but combined with other neighborhoods it becomes a town or a city. Similarly, several neighborhoods with their centers at transit stops can constitute a

| NPD | |
|---|---|
| ND | Prerequisite 1 |

### Continuous Sidewalks (c)

Step 1. Determine the total length of streets within and bordering the project, using centerline feet.

Step 2. Determine the length of project streets that have sidewalks (or equivalent provisions for walking) on both sides; do the same for the project side of bordering streets. Calculate their sum as a percentage of total street centerline feet, according to Equation 3. The result must be at least 90%.

Equation 3

$$\text{\% street length with sidewalks} = \frac{\text{Internal street length with sidewalks on both sides} + \text{length of streets bordering project with sidewalks on project side of street}}{\text{Total length of streets}}$$

### Garage Openings (d)

Step 1. Determine the total length of street frontages within and bordering the project.

Step 2. Determine the total length of garage doors and service bay openings on street frontages.

Step 3. Calculate the percentage of the total frontage represented by garage doors and service bays according to Equation 4. The result must be 20% or less.

Equation 4

$$\text{\% frontage with openings} = \frac{\text{Total length of garage door and service bay openings}}{\text{Total length of street frontage}}$$

## 7. Documentation Guidance

As a first step in preparing to complete the LEED-ND documentation requirements, work through the following measures. Refer to GBCI's website for the complete descriptions of all required documentation.

- Identify the principal functional entry or entries of every building in the project.
- Measure the lengths of all façades.
- Measure the length of every street within or bordering the project.
- Map the locations of all sidewalks and equivalent pedestrian provisions within and bordering the project.
- Map the locations of any garage doors or service bay openings.
- If the project is in a designated historic district, retain documents from the applicable review board if it did not grant approval for compliance with requirements (b), (c), or (d).

## 8. Examples

There are no examples for this prerequisite.

## 9. Exemplary Performance

This prerequisite is not eligible for exemplary performance under Innovation and Design Process.

| | NPD |
|---|---|
| ND | Credit 3 |

Planned transit service is defined as transit with funding commitments, as described in the credit requirements. The project must then measure both existing and planned transit according to the requirements in SLL Credit 3, Locations with Reduced Automobile Dependence, Option 1, Transit-Served Location. If the project is able to earn 1 point when counting both existing and planned transit, it can earn points under this credit, too. If it does not meet the threshold in SLL Credit 3, Option 1, it cannot earn any points under this credit. In addition, for each 50,000 square feet of retail space on the site, projects must earn an additional point on the SLL Credit 3, Option 1, scale. This means that a project with 280,000 square feet of retail must meet the 4-point threshold.

## 5. Timeline and Team

The project developer should choose a location that is near a wide range of existing and planned uses. The urban designer and architect should design a site plan that contains a diversity of uses clustered into neighborhood centers.

## 6. Calculations

### Weighted Average of Uses for Multiple Neighborhood Centers

Step 1. Identify all clusters of diverse uses that qualify as neighborhood centers. Count the uses in each such center.

Step 2. Identify the percentage of project dwelling units within a 1/4-mile walk distance of each neighborhood center. Some dwelling units may be within walking distance of more than one center, so the percentage may exceed 100%.

Step 3. Calculate a weighted average of uses in neighborhood centers by dwelling unit, according to Equation 1. The equation can include more neighborhood centers, as necessary.

Equation 1

$$\text{Weighted average} = \frac{\left[\text{\% units within walk distance of Center A} \times \text{uses in Center A}\right] + \left[\text{\% units within walk distance of Center B} \times \text{uses in Center B}\right]}{\text{Sum of percentages of units within walk distance of each center}}$$

Step 4. Round the results of Equation 1 to the nearest whole number. This is the weighted average of uses that determines the points earned, according to Table 1.

## 7. Documentation Guidance

As a first step in preparing to complete the LEED-ND documentation requirements, work through the following measures. Refer to GBCI's website for the complete descriptions of all required documentation.

- Identify the locations of all existing and planned diverse uses within and near the project.
- Identify the locations of neighborhood centers and for each, identify a single common point that represents the center of the cluster.
- If the project contains more than 150,000 square feet of retail space, identify nearby existing and planned transit, according to the requirements in SLL Credit 3, Locations with Reduced Automobile Dependence, Option 1, Transit-Served Location.

Requirements

Meet the requirements of one or more options below.

## OPTION 1. Diversity of Housing Types

Include a sufficient variety of housing sizes and types in the *project* such that the total variety of planned and *existing* housing within the project achieves a Simpson Diversity Index score greater than 0.5, using the housing categories below. Projects of less than 125 acres may calculate the Simpson Diversity Index for the area within 1/4 mile of the project's geographic center. The Simpson Diversity Index calculates the probability that any two randomly selected *dwelling units* in a project will be of a different type.

$$\text{Score} = 1 - \sum (n/N)^2$$

where n = the total number of dwelling units in a single category, and N = the total number of dwelling units in all categories.

**Table 1.** Points for housing diversity

| Simpson Diversity Index score | Points |
|---|---|
| > 0.5 to < 0.6 | 1 |
| ≥ 0.6 to < 0.7 | 2 |
| ≥ 0.7 | 3 |

Housing categories are defined according to the dwelling unit's net square footage, exclusive of any garage, as listed in Table 2.

**Table 2.** Housing categories

| Type | Square feet |
|---|---|
| Detached residential, large | > 1,250 |
| Detached residential, small | ≤ 1,250 |
| Duplex or townhouse, large | > 1,250 |
| Duplex or townhouse, small | ≤ 1,250 |
| Dwelling unit in multiunit building with no elevator, large | > 1,250 |
| Dwelling unit in multiunit building with no elevator, medium | > 750 to ≤ 1,250 |
| Dwelling unit in multiunit building with no elevator, small | ≤ 750 |
| Dwelling unit in multiunit building with elevator, 4 stories or fewer, large | > 1,250 |
| Dwelling unit in multiunit building with elevator, 4 stories or fewer, medium | > 750 to ≤ 1,250 |
| Dwelling unit in multiunit building with elevator, 4 stories or fewer, small | ≤ 750 |
| Dwelling unit in multiunit building with elevator, 5 to 8 stories, large | > 1,250 |
| Dwelling unit in multiunit building with elevator, 5 to 8 stories, medium | > 750 to ≤ 1,250 |
| Dwelling unit in multiunit building with elevator, 5 to 8 stories, small | ≤ 750 |
| Dwelling unit in multiunit building with elevator, 9 stories or more, large | > 1,250 |
| Dwelling unit in multiunit building with elevator, 9 stories or more, medium | > 750 to ≤ 1,250 |
| Dwelling unit in multiunit building with elevator, 9 stories or more, small | ≤ 750 |
| Live-work space, large | > 1,250 |
| Live-work space, small | ≤ 1,250 |
| Accessory dwelling unit, large | > 1,250 |
| Accessory dwelling unit, small | ≤ 1,250 |

For the purposes of this credit, townhouse and live-work units may have individual ground-level entrances and/or be within a multiunit or mixed-use building. Double counting is prohibited; each dwelling may be classified in only one category. The number of stories in a building is inclusive of the ground floor regardless of its use.

AND/OR

OPTION 2. Affordable Housing

Include a proportion of new rental and/or for-sale dwelling units priced for households earning below the *area median income* (AMI). Rental units must be maintained at affordable levels for a minimum of 15 years. Existing dwelling units are exempt from requirement calculations. A maximum of 3 points may be earned by meeting any combination of thresholds in Table 3.



**Table 3.** Points for affordable housing

| Rental dwelling units | | | | For-sale dwelling units | | | |
|---|---|---|---|---|---|---|---|
| Priced up to 60% AMI | | Priced up to 80% AMI | | Priced up to 100% AMI | | Priced up to 120% AMI | |
| Percentage of total rental units | Points | Percentage of total rental units | Points | Percentage of total for-sale units | Points | Percentage of total for-sale units | Points |
| 5 | 1 | 10 | 1 | 5 | 1 | 8 | 1 |
| 10 | 2 | 15 | 2 | 10 | 2 | 12 | 2 |
| 15 | 3 | 25 | 3 | 15 | 3 | -- | -- |

AMI = area median income.

AND/OR

OPTION 3. Mixed-Income Diverse Communities

A project may earn 1 additional point by earning at least 2 points in Option 1 and at least 2 points in Option 2 (at least one of which must be for providing housing at or below 100% AMI).

| | NPD |
|---|---|
| ND | Credit 10 |

## 7. Documentation Guidance

As a first step in preparing to complete the LEED-ND documentation requirements, work through the following measures. Refer to GBCI's website for the complete descriptions of all required documentation.

- Review the jurisdiction's master plan for planned parks and recreation facilities.
- Obtain information on the size and public accessibility of nearby recreation facilities.
- Identify any existing indoor or outdoor facilities on or near the site.

## 8. Examples

A 6-acre area with fields used for soccer and football lies near a 5-acre project. The team measures the walking distances from the project building entrances to the fields.

**Table 1.** Example walking distances to recreation facilities

| | Walk distance to playing fields (feet) | Less than 2,640 feet |
|---|---|---|
| Office A Main Entrance | 2,670 | N |
| Office A Retail 1 | 2,648 | N |
| Office B Main Entrance | 2,487 | Y |
| Office B Retail 1 | 2,526 | Y |
| Office B Retail 2 | 2,456 | Y |
| Residential A Main Entrance | 2,632 | Y |
| Residential A Retail 1 | 2,597 | Y |
| Residential B Main Entrance | 2,544 | Y |
| Townhouse A | 2,450 | Y |
| Townhouse B | 2,406 | Y |
| Townhouse C | 2,361 | Y |
| Townhouse D | 2,310 | Y |
| Townhouse E | 2,267 | Y |
| Townhouse F | 2,219 | Y |

In this example, two of the 14 dwellings and nonresidential uses are more than a 1/2-mile walk distance from the playing fields. The percentage of entrances that do comply is (12 / 14) x 100= 86%. This project does not meet the credit requirement that 90% of entrances be within a 1/2-mile walk distance.

## 9. Exemplary Performance

This credit is not eligible for exemplary performance under Innovation and Design Process.

## 10. Regional Variations

There are no regional variations associated with this credit.

## 11. Resources

Websites

**Trust for Public Land**
www.tpl.org/tier2_pa.cfm?folder_id=3208

*Costing Green: A Comprehensive Cost Database and Budgeting Methodology*, by Lisa Matthiessen and Peter Morris (Davis Langdon, 2004).

| CREDIT | TITLE | POINTS |
|---|---|---|
| **GIB Prerequisite 1** | Certified Green Building | Required |
| **GIB Prerequisite 2** | Minimum Building Energy Efficiency | Required |
| **GIB Prerequisite 3** | Minimum Building Water Efficiency | Required |
| **GIB Prerequisite 4** | Construction Activity Pollution Prevention | Required |
| **GIB Credit 1** | Certified Green Buildings | 5 points |
| **GIB Credit 2** | Building Energy Efficiency | 2 points |
| **GIB Credit 3** | Building Water Efficiency | 1 point |
| **GIB Credit 4** | Water-Efficient Landscaping | 1 point |
| **GIB Credit 5** | Existing Building Reuse | 1 point |
| **GIB Credit 6** | Historic Resource Preservation and Adaptive Use | 1 point |
| **GIB Credit 7** | Minimized Site Disturbance in Design and Construction | 1 point |
| **GIB Credit 8** | Stormwater Management | 4 points |
| **GIB Credit 9** | Heat Island Reduction | 1 point |
| **GIB Credit 10** | Solar Orientation | 1 point |
| **GIB Credit 11** | On-Site Renewable Energy Sources | 3 points |
| **GIB Credit 12** | District Heating and Cooling | 2 points |
| **GIB Credit 13** | Infrastructure Energy Efficiency | 1 point |
| **GIB Credit 14** | Wastewater Management | 2 points |
| **GIB Credit 15** | Recycled Content in Infrastructure | 1 point |
| **GIB Credit 16** | Solid Waste Management Infrastructure | 1 point |
| **GIB Credit 17** | Light Pollution Reduction | 1 point |

| | GIB |
|---|---|
| ND | Credit 4 |

- The density factor ($k_d$) accounts for the number of plants and the total leaf area of a landscape. Sparsely planted areas will have less evapotranspiration than densely planted areas. An average $k_d$ is applied to areas where shading from trees is 60% to 100%. This is equivalent to shrubs and groundcovers that shade 90% to 100% of the landscape area. Low $k_d$ values are found where shading from trees is less than 60%, or where shrub and groundcover shading is less than 90%. For instance, a 25% ground shading from trees results in a $k_d$ value of 0.5. In mixed plantings, where the tree canopy shades understory shrubs and groundcovers, evapotranspiration increases. This represents the highest level of landscape density; the $k_d$ value is 1.0 to 1.3.
- The microclimate factor ($k_{mc}$) accounts for environmental conditions specific to the landscape, including temperature, wind, and humidity. For instance, parking lots increase wind and temperature effects on adjacent landscapes. The average $k_{mc}$ is 1.0; this refers to conditions where evapotranspiration is unaffected by buildings, pavements, reflective surfaces, and slopes. High-$k_{mc}$ conditions occur where evaporative potential is increased by heat-absorbing and reflective surfaces or exposure to high winds; examples include parking lots, west sides of buildings, west- and south-facing slopes, medians, and areas experiencing wind tunnel effects. Low-$k_{mc}$ landscapes include shaded areas and areas protected from wind, such as north sides of buildings, courtyards, areas under wide building overhangs, and north-facing slopes.

## Step 1. Create the design case.

Determine the landscape area for the project. This number must represent the as-designed landscape area and must use the same project boundary used throughout the submission. Sort the total landscape area into the major vegetation types (trees, shrubs, groundcover, mixed, and turf grass), listing the area for each.

Determine the following characteristics for each landscape area: species factor ($k_s$), density factor ($k_d$), and microclimate factor ($k_{mc}$). Recommended values for each are provided in Table 1. Select the low, average, or high value for each parameter as appropriate for the site. Project teams must be prepared to justify any variance from the recommended values..

**Table 1.** Landscape factors

| Vegetation | Species factor ($k_s$) | | | Density factor ($k_d$) | | | Microclimate factor ($k_{mc}$) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Low | Average | High | Low | Average | High | Low | Average | High |
| Trees | 0.2 | 0.5 | 0.9 | 0.5 | 1.0 | 1.3 | 0.5 | 1.0 | 1.4 |
| Shrubs | 0.2 | 0.5 | 0.7 | 0.5 | 1.0 | 1.1 | 0.5 | 1.0 | 1.3 |
| Groundcovers | 0.2 | 0.5 | 0.7 | 0.5 | 1.0 | 1.1 | 0.5 | 1.0 | 1.2 |
| Mixed trees, shrubs, groundcovers | 0.2 | 0.5 | 0.9 | 0.6 | 1.1 | 1.3 | 0.5 | 1.0 | 1.4 |
| Turf grass | 0.6 | 0.7 | 0.8 | 0.6 | 1.0 | 1.0 | 0.8 | 1.0 | 1.2 |

Calculate the landscape coefficient ($K_L$) by multiplying the three area characteristics, as shown in Equation 1.

Equation 1

$$K_L = k_s \times k_d \times k_{mc}$$

| GIB | |
|---|---|
| ND | Credit 4 |

Determine the reference evapotranspiration rate ($ET_o$) for the region. This rate is a measurement of the total amount of water needed to grow a reference plant (such as grass or alfalfa), expressed in millimeters or inches. The values for $ET_o$ in various regions throughout the United States can be found in regional agricultural data (see Resources). The $ET_o$ for July is used in the calculation because this is typically the month with the greatest evapotranspiration effects and, therefore, the greatest irrigation demands.

Calculate the project-specific evapotranspiration rate ($ET_L$) for each landscape area by multiplying the $ET_o$ by the $K_L$, as shown in Equation 2.

Equation 2

$$ET_L\,[in] = ET_0 \times K_L$$

Determine the irrigation efficiency (IE) by listing the type of irrigation used for each landscape area and the corresponding efficiency. Table 2 lists irrigation efficiencies for two irrigation systems.

**Table 2.** Irrigation types and efficiencies

| Type | Efficiency |
|---|---|
| Sprinkler | 0.625 |
| Drip | 0.90 |

Determine, if applicable, the controller efficiency (CE), the percentage reduction in water use from any weather-based controllers or moisture sensor-based systems. This number must be supported by either manufacturer's documentation or detailed calculations by the landscape designer.

Determine, if applicable, the volume of reuse water (harvested rainwater, recycled graywater, or treated wastewater) available in July. Reuse water volumes may depend on rainfall volume and frequency, building-generated graywater and wastewater, and on-site storage capacity. On-site reuse systems must be modeled to predict volumes generated on a monthly basis as well as optimal storage capacity. For harvested stormwater calculations, the project team may use either the collected stormwater total for July based on historical average precipitation, or historical data for each month to model collection and reuse throughout the year. The latter method allows the team to determine what volume of water can be expected in the storage cistern at the beginning of July and add it to the expected stormwater volume collected during the month; it also allows the team to determine the optimal size of the stormwater cistern.

To calculate total water applied (TWA) and total potable water applied (TPWA) for each landscape area and the installed case, use Equations 3 and 4.

Equation 3

$$\text{Design case TWA (gal)} = \frac{\text{Area [sf]} \times ET_L\,[in]}{IE} \times CE \times 0.6233\ \text{gal/sf/in}$$

Equation 4

$$\text{Design case TPWA (gal)} = \text{TWA (gal)} - \text{Reuse water (gal)}$$

Step 2. Create the baseline case.

In the baseline case, the $k_s$, $k_d$, and IE are set to average values representative of equipment and design practices. The same $k_{MC}$ and the reference ETo are used i design and the baseline cases. If the project substitutes low-water-using plants for high-water-using types (such as turf grass), the landscape areas can be reall baseline case, but the total landscape area must remain the same. The baseline turf grass if typical landscaping practices in the region include trees, shrubs, an

Calculate the TWA for the baseline case using Equation 5.

Equation 5

$$\text{Baseline case TWA (gal)} = \frac{\text{Area [sf]} \times ET_L\,[in]}{IE} \times 0.6233\ \text{gal/sf/in}$$

Step 3. Calculate the percentage reduction in total irrigation water use reuse) and the percentage reduction of potable water use for irrigation.

Calculate the percentage reduction of potable water use according to Equation

Equation 6

$$\text{\% reduction of potable water} = \frac{1 - \text{design TPWA}}{\text{baseline TWA}} \times 100$$

If the percentage reduction of potable water use for irrigation achieved is 50% requirement for the credit is met.

## 7. Documentation Guidance

As a first step in preparing to complete the LEED-ND documentation requirement the following measures. Refer to GBCI's website for the complete descriptions of documentation.

- Perform calculations of the baseline and design case to show the percentag in water demand, and report what portion of irrigation will come from each source (if any).
- Prepare a landscape plan showing a planting schedule and irrigation systen

## 8. Examples

A 2-acre mixed-use project in Austin, Texas, has 6,000 square feet of planted areas landscape types: shrubs, mixed vegetation, and turf grass. All are irrigated with a c potable water and graywater harvested from the building. The reference $ET_o$ for A obtained from the local agricultural service, is 8.12. The high-efficiency irrigation irrigation with an efficiency of 90% and consumes an estimated 4,200 gallons of g July. Table 3 shows the calculations to determine total potable water use for this d

The baseline case uses the same reference $ET_o$ and total planted area but assumes irrigation (IE = 0.625), does not take advantage of graywater harvesting, and irriga and turf grass. Calculations to determine total water use for the baseline case are Table 4.

# THE CASE AGAINST LEED - ND

1. Prerequisites a  poor stand in for a regional growth policy

2. Beaurocratization and pseudo scientification of new urbanist terms of art

3. Same as LEED- Building – Bells and Whistles as Ideal

# CHARTER

## OF THE NEW URBANISM

REGION | NEIGHBORHOOD, DISTRICT, AND CORRIDOR | BLOCK, STREET, AND BUILDING

CONGRESS FOR THE NEW URBANISM

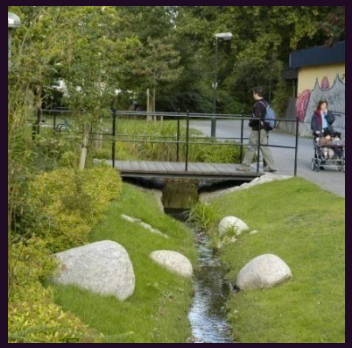
# SUSTAINABLE DESIGN PRINCIPLES

Multi-Modality

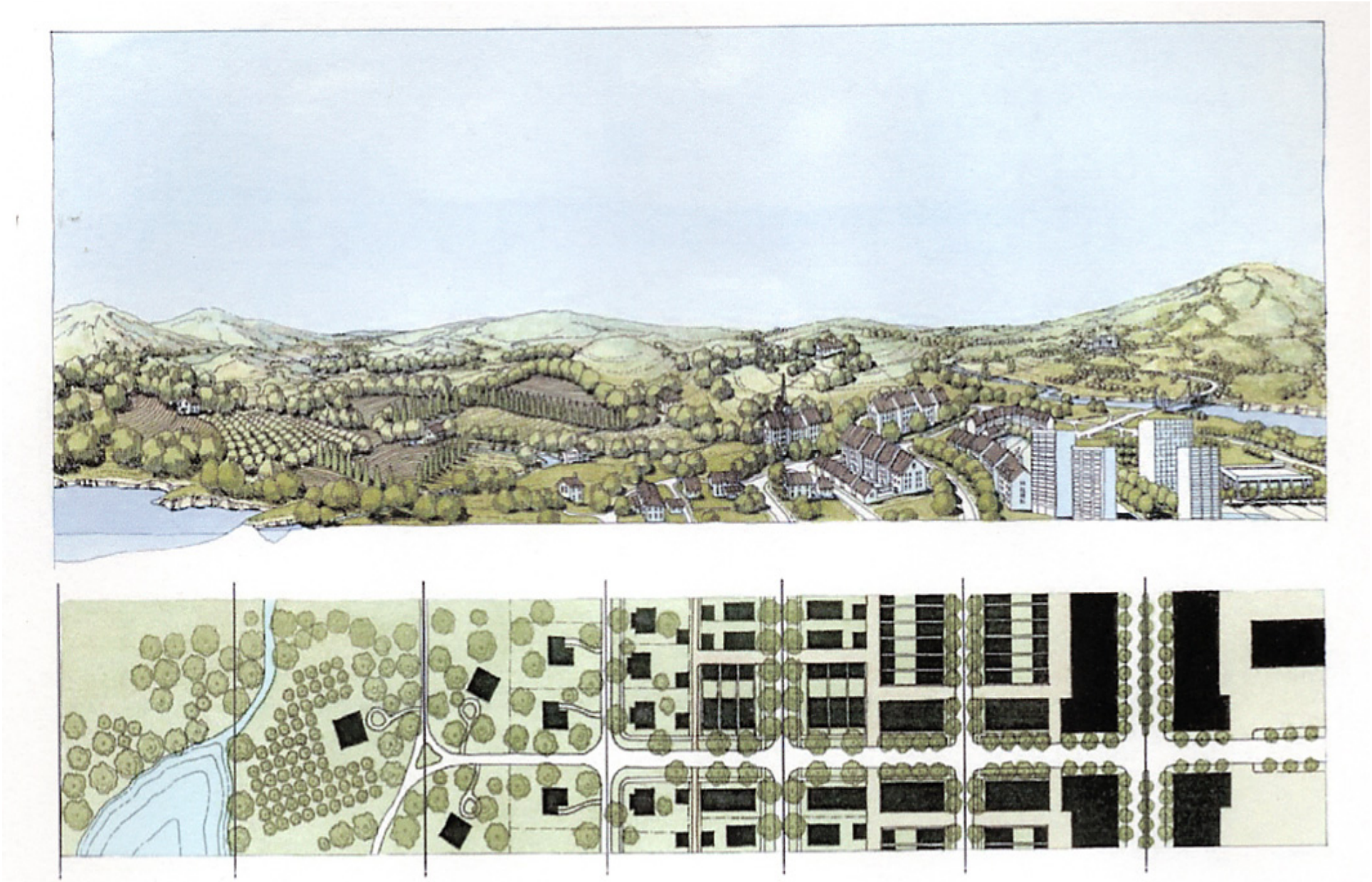
Placeness

Compactness


Diversity



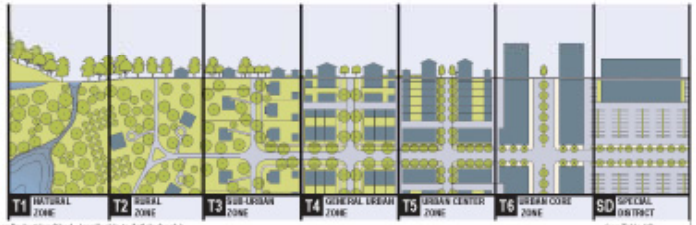
Frugality



Courtesy: Smart Code V8.0 2006, Duany Plater-Zyberk

# TABLE 14. SMARTCODE SUMMARY

Note: All requirements in this Table are subject to calibration for local context.




| | T1 NATURAL ZONE | T2 RURAL ZONE | T3 SUB-URBAN ZONE | T4 GENERAL URBAN ZONE | T5 URBAN CENTER ZONE | T6 URBAN CORE ZONE | SD SPECIAL DISTRICT |
|---|---|---|---|---|---|---|---|
| a. ALLOCATION OF ZONES per Pedestrian Shed (applicable to Article 3 only) | | | | | | | (see Table 16) |
| CLD requires | no minimum | 50% min | 10 - 30% | 20 - 40% | not permitted | not permitted | |
| TND requires | no minimum | no minimum | 10 - 30% | 30 - 60 % | 10 - 30% | not permitted | |
| RCD requires | no minimum | no minimum | not permitted | 10 - 30% | 10 - 30% | 40 - 80% | |
| b. BASE RESIDENTIAL DENSITY (see Section 3.4) | | | | | | | |
| By Right | not applicable | 1 unit / 20 ac avg. | 2 units / ac. gross | 4 units / ac. gross | 6 units / ac. gross | 12 units / ac. gross | |
| By TDR | by Variance | by Variance | 6 units / ac. gross | 12 units / ac. gross | 24 units / ac. gross | 96 units / ac. gross | |
| Other Funetions | by Variance | by Variance | 10 - 20% | 20 - 30% | 30 - 50% | 50 - 70% | |
| c. BLOCK SIZE | | | | | | | |
| Block Perimeter | no maximum | no maximum | 3000 ft. max | 2400 ft. max | 2000 ft. max | 2000 ft. max * | |
| | | | | | | * 3000 ft. max with parking structures | |
| d. THOROUGHFARES (see Table 3 and Table 4) | | | | | | | |
| HW | permitted | permitted | permitted | not permitted | not permitted | not permitted | |
| BV | not permitted | not permitted | permitted | permitted | permitted | permitted | |
| AV | not permitted | not permitted | permitted | permitted | permitted | permitted | |
| CS | not permitted | not permitted | not permitted | not permitted | permitted | permitted | |
| DR | not permitted | not permitted | permitted | permitted | permitted | permitted | |
| ST | not permitted | not permitted | permitted | permitted | permitted | not permitted | |
| RD | permitted | permitted | permitted | not permitted | not permitted | not permitted | |
| Rear Lane | permitted | permitted | permitted | permitted | not permitted | not permitted | |
| Rear Alley | not permitted | not permitted | permitted | required | required | required | |
| Path | permitted | permitted | permitted | permitted | not permitted | not permitted | |
| Passage | not permitted | not permitted | permitted | permitted | permitted | permitted | |
| Bicycle Trail | permitted | permitted | permitted | not permitted * | not permitted | not permitted | |
| Bicycle Lane | permitted | permitted | permitted | permitted | not permitted | not permitted | |
| Bicycle Route | permitted | permitted | permitted | permitted | permitted | permitted | |
| e. CIVIC SPACES (see Table 13) | | | | | | * permitted within Open Spaces | |
| Park | permitted | permitted | permitted | by Warrant | by Warrant | by Warrant | |
| Green | not permitted | not permitted | permitted | permitted | permitted | not permitted | |
| Square | not permitted | not permitted | not permitted | permitted | permitted | permitted | |
| Plaza | not permitted | not permitted | not permitted | not permitted | permitted | permitted | |
| Playground | permitted | permitted | permitted | permitted | permitted | permitted | |
| f. LOT OCCUPATION | | | | | | | DISPOSITION |
| Lot Width | not applicable | By Warrant | 72 ft. min 120 ft. max | 18 ft. min 96 ft. max | 18 ft. min 180 ft. max | 18 ft. min 780 ft. max | |
| Lot Coverage | not applicable | By Warrant | 60% max | 70% max | 80% max | 90% max | |
| g. SETBACKS - PRINCIPAL BUILDING (see Table 15) | | | | | | | |
| (g.1) Front Setback (Principal) | not applicable | 50 ft. min | 24 ft. min | 8 ft. min 16 ft. max | 2 ft. min 12 ft. max | 2 ft. min 12 ft. max | |
| (g.2) Front Setback (Secondary) | not applicable | 50 ft. min | 12 ft. min | 8 ft. min 16 ft. max | 2 ft. min 12 ft. max | 2 ft. min 12 ft. max | |
| (g.3) Side Setback | not applicable | 50 ft. min | 12 ft. min | 0 ft. min | 0 ft. min 24 ft. max | 0 ft. min 24 ft. max | |
| (g.4) Rear Setback | not applicable | 50 ft. min | 12 ft. min | 3 ft. min * | 3 ft. min * | 0 ft. min | |
| Frontage Buildout | not applicable | not applicable | 40% min | 60% min | 80% min | 80% min | |
| h. SETBACKS - OUTBUILDING (see Table 15) | | | | | | | |
| (h.1) Front Setback | not applicable | 20 ft. min +bldg setback | 20 ft. min +bldg setback | 20 ft. min +bldg setback | 40 ft. max from rear prop'l | not applicable | |
| (h.2) Side Setback | not applicable | 3 ft. or 6 ft. | 3 ft. or 6 ft. | 0 ft. min or 3 ft. | 0 ft min | not applicable | |
| (h.3) Rear Setback | not applicable | 3 ft. min | 3 ft. min | 3 ft. | 3 ft. max | not applicable | |
| i. BUILDING DISPOSITION (see Table 9) | | | | | | | |
| Edgeyard | permitted | permitted | permitted | permitted | not permitted | not permitted | |
| Sideyard | not permitted | not permitted | not permitted | permitted | permitted | not permitted | |
| Rearyard | not permitted | not permitted | not permitted | permitted | permitted | permitted | |
| Courtyard | not permitted | not permitted | not permitted | not permitted | permitted | permitted | |
| j. PRIVATE FRONTAGES (see Table 7) | | | | | | | CONFIGURATION |
| Common Yard | not applicable | permitted | permitted | not permitted | not permitted | not permitted | |
| Porch & Fence | not applicable | not permitted | permitted | permitted | not permitted | not permitted | |
| Terrace or Dooryard | not applicable | not permitted | not permitted | permitted | permitted | not permitted | |
| Forecourt | not applicable | not permitted | not permitted | permitted | permitted | permitted | |
| Stoop | not applicable | not permitted | not permitted | permitted | permitted | permitted | |
| Shopfront & Awning | not applicable | not permitted | not permitted | permitted | permitted | permitted | |
| Gallery | not applicable | not permitted | not permitted | permitted | permitted | permitted | |
| Arcade | not applicable | not permitted | not permitted | not permitted | permitted | permitted | |
| k. BUILDING CONFIGURATION (see Table 8) | | | | | | | |
| Principal Building | not applicable | 2 Stories max | 2 Stories max | 3 Stories max, 2 min | 5 Stories max, 2 min | 8 Stories max, 2 min | |
| Outbuilding | not applicable | 2 Stories max | 2 Stories max | 2 Stories max | 2 Stories max | not applicable | |
| l. BUILDING FUNCTION (see Table 10 &Table 12) | | | | | | | FUNCTION |
| Residential | not applicable | restricted use | restricted use | limited use | open use | open use | |
| Lodging | not applicable | restricted use | restricted use | limited use | open use | open use | |
| Office | not applicable | restricted use | restricted use | limited use | open use | open use | |
| Retail | not applicable | restricted use | restricted use | limited use | open use | open use | |
| ARTICLE 5 | | | | | | | |
| ARTICLE 2, 3, 4 | | | | | | | |

The End