

Project Name: \_\_\_\_\_

Case#: \_\_\_\_\_

# City of Henderson SUSTAINABILITY MATRIX WORKSHEET



**INSTRUCTIONS**

1. In the table below, enter the appropriate number of points in the corresponding column next to each option/design feature that will be included in the proposed project. Only mark in one column based on the project type.
2. Tally the number of points at the end of the checklist to determine if the project meets the minimum score required as described below.
3. On the project plans and/or related documents, clearly identify the sustainable site or building design features that are included in the proposed project.

MENU OF SITE AND BUILDING DESIGN OPTIONS FOR SUSTAINABILITY	SITE OR BUILDING DESIGN FEATURE	POINTS	DISTRICTS IN WHICH OPTION IS AVAILABLE			Description of Proposed Features
			Nonres/ Mixed Use	Multi- Family Res.	Other Res.	
<b>1. ENERGY</b>						
1.1	Renewable Energy Sources	2-30				
1.2	District Heating and Cooling	4			N/A	
1.3	Solar Orientation	3				
1.4	Shade Structures	2-4				
1.5	Heat Island Reduction	1-5				
1.6	Cool Roofs	2				
1.7	Covered Parking	1-5				
1.8	Shaded Walkways	1-5		N/A	N/A	
1.9	Solar-Ready Design	2-10				
1.10	Energy Efficiency	1-8				
1.11	Green Power	1-5				
<b>2. RECYCLING AND WASTE REDUCTION</b>						
2.1	Waste Reduction - Construction	3				
2.2	Waste Reduction – Composting	2				
2.3	Recycling Stations/Dumpsters	3				
2.4	Recycle Containers	2		N/A	N/A	
2.5	Recycled Content in Infrastructure	2				
<b>3. URBAN DESIGN</b>						
3.1	Proximity to Existing Infrastructure	3				
3.2	Floodplain Protection	1				
3.3	Use Mix	3		N/A	N/A	
3.4	Compact Development/Walkability	1-5	N/A			
3.5	Reduced Parking Footprint	2			N/A	
3.6	Workforce Housing	1-3				

**MENU OF SITE AND BUILDING DESIGN OPTIONS FOR SUSTAINABILITY**

SITE OR BUILDING DESIGN FEATURE	POINTS	DISTRICTS IN WHICH OPTION IS AVAILABLE			Description of Proposed Features
		Nonres/ Mixed Use	Multi- Family Res.	Other Res.	
<b>4. URBAN NATURE</b>					
4.1 Minimum Open Space	1-4				
4.2 Access to Parks and Open Space	1-5				
4.3 Access to Active Recreation	1-5				
4.4 Habitat Conservation - Avoidance	3				
4.5 Habitat Conservation - Setback	2				
4.6 Habitat Restoration	3				
4.7 Community Gardens	1-5				
4.8 Tree Canopy	1-5				
<b>5. TRANSPORTATION</b>					
5.1 Proximity to Transit	1-5				
5.2 Carpool, Shared-Use and Low-emitting Vehicle Parking	1-4		<b>N/A</b>	<b>N/A</b>	
5.3 Pedestrian System	5				
5.4 Interconnected Street Network	1-3				
5.5 Bicycle Circulation Systems	2				
5.6 Pedestrian/Bicycle Networks (master planned communities only)	1-3				
5.7 Facilities for Bicycle Commuters	2-4				
5.8 Developer-sponsored Transit	5				
5.9 Parking	2-10			<b>N/A</b>	
<b>6. ENVIRONMENTAL HEALTH</b>					
6.1 Green Building	1-4				
6.2 Daylighting	2				
6.3 Light Pollution Reduction	2				
<b>7. WATER</b>					
7.1 Water-Efficient Landscape	2	<b>N/A</b>	<b>N/A</b>		
7.2 Water-Efficient Plants	2				
7.3 Landscape Irrigation System	1-2				
7.4 Surface Treatments	1				
7.5 Water-Efficient Buildings	2-8				
<b>8. ADDITIONAL STRATEGIES FOR SUSTAINABILITY</b>					
8.1 Above-Code Programs	10				
8.2 Innovative Products or Strategies	1-25				
<b>TOTAL</b>					
<b>Minimum Points Required</b>		<b>28/42*</b>	<b>38</b>	<b>31</b>	

\* New buildings on partially-developed sites (such as pad sites) located in developments built before Jan 2010 = 28 points minimum; New development or substantial renovations to existing buildings = 42 points minimum.

# SUSTAINABILITY - ADDITIONAL INFORMATION

This section sets forth a range of site and building design options for sustainability to enhance other mandatory sustainability-related requirements integrated throughout this Code. For each development subject to this Chapter 19.7 (see Section 19.7.1.B, Applicability), applicants shall select a sufficient number of sustainable site and building design options from Table 19.7.12-1 below to achieve the minimum number of points outlined for that type of development. Compliance with this section shall be determined as part of the entitlement review process.

<b>REQUIRED POINTS</b>	<b>Nonresidential or Mixed-Use Development</b>
	Nonresidential or mixed-use development consisting of new buildings or substantial renovations to existing buildings shall achieve a minimum score of 42 points.
	New buildings on partially-developed sites (such as pad sites) located in developments built before the adoption of this Code shall achieve a minimum score of 28 points. Eligibility shall be determined at the discretion of the Community Development Director.
	<b>Multifamily Residential Development</b>
	Multifamily residential development consisting of new buildings or substantial renovations to existing buildings shall achieve a minimum score of 38 points.
	<b>All Other Residential Development</b>
	All other residential development consisting of new buildings or substantial renovations to existing buildings shall achieve a minimum score of 31 points.
<b>Substantial Renovation</b>	
Any "substantial renovation" project, which is defined for purposes of this chapter to include any renovation, rehabilitation, restoration, or repair work that includes an addition of floor area equal to 35 percent or more of the existing floor area; or the addition of new floors. The calculation shall include attached garages, but not include detached garages. For the purpose of calculation, the increase in floor area shall be aggregated over a three-year period.	

<b>MENU OF SITE BUILDING DESIGN OPTIONS</b>	<b>SITE OR BUILDING DESIGN FEATURES</b>
	<b>1. ENERGY</b> Intent: Encourage on-site renewable energy production; promote the design and construction of energy efficient buildings; reduce air, water, and land pollution from energy consumption; and, reduce the heat island effect.
	<b>1.1 Renewable Energy Sources</b> Design and incorporate on-site renewable energy generation technologies such as solar, wind, geothermal, or biomass. Two points granted for each 1% of the project's annual electrical energy demand generated up to a maximum of 30 points. (2-30 points)
	<b>1.2 District Heating and Cooling</b> Design and incorporate into the project a district heating and/or cooling system for space conditioning and/or water heating of new buildings in the project (at least two buildings total must be connected). (4 points.)
	<b>1.3 Solar Orientation</b> Design and orient the project such that 50% or more of the blocks have one axis within plus or minus 15 degrees of geographical east/west, and the east/west length of those blocks are at least as long, or longer, as the north/south length of the block. (3 points) OR - Design and orient the project such that 50% or more of the project total building square footage (excluding existing buildings) such that the longer axis is within 15 degrees of geographical east/west axis. (3 points)
	<b>1.4 Shade Structures</b> Where appropriate, provide shade structures over windows/doors to minimize glare and unwanted solar heat gain. Such structures shall provide shading to at least 50% of the south- and west-facing glazing on June 21 at noon with one additional point granted for each additional 25% of the glazing shaded. Structures may include awnings, screens, louvers, architectural features, or similar devices. (2-4 points)

**1.5 Heat Island Reduction**

Use any combination of the following strategies for 50% of the non-roof impervious site landscape (including roads, sidewalks, courtyards, parking lots, and driveways).

- Provide shade from open structures such as those supporting solar panels, canopied walkways, pergolas, all with a Solar Reflectance Index (SRI) of at least 29 (SRI is a measure of the roof’s ability to reject solar heat; a higher SRI yields a cooler roofing choice. (2 points)
- Use paving materials with a Solar Reflectance Index (SRI) of at least 29. (1 point)
- Use an open grid pavement system (at least 50% pervious). (2 points)

**1.6 Cool Roofs**

Use roofing materials that have a SRI equal to or greater than 78 for low-sloped roofs (<2:12) or 29 for steep-sloped roofs (>2:12) for a minimum of 75% of the roof surface of all new buildings within the project. (2 points)  
 OR - Install a vegetated roof on a minimum of 50% of the total project roof area (exclusive of existing buildings). Any combination of SRI compliant and vegetated roof may be used, provided they collectively cover 75% of the total project roof area. (2 points)

**1.7 Covered Parking**

Locate at least 20 percent of all off-street parking spaces under cover with one additional point granted for each 20% of covered parking up to a maximum of 100%. (2 points)

Note: Cover may be provided by a combination of tree canopy, a building, a deck, or a shade structure, or parking may be underground. Tree canopy coverage to be determined by mature shade trees selected from the City of Henderson plant list. Any cover, roof, or shade used for this requirement must have a minimum Solar Reflectance Index of 78 for low-sloped roofs (<2:12) or 29 for steep-sloped roofs (>2:12).

**1.8 Shaded Walkways**

Provide shaded walkways along a minimum of 60% of all building facades adjacent to or facing streets, drive aisles, outdoor gathering spaces, or parking areas. One additional point for each additional 10% provided up to a total of 100%. (1-5 points)

Note: See base code requirements (50% shaded sidewalks) for commercial, mixed-use, and industrial buildings in Section 19.7.6.D.3.(h), *Response to the Climate*.

Note: See definition of “shaded walkway” in Chapter 19.12, *Measurement and Definitions*.

**1.9 Solar-Ready Design**

- For stand-alone buildings, design and build the project so that it will readily accommodate the installation of solar photovoltaic panels or solar thermal hot water heating devices, including all necessary conduit, chases, roof penetrations, roof pitch, and orientation. (2 points)
- For projects with multiple buildings, design and build at least 20% of the buildings to be solar-ready as described above. Two additional points granted for each additional 20% provided up to a total of 100% solar-ready buildings. (2-10 points)
- For residential development, offer solar photovoltaic panels or solar thermal hot water heating as a design option. (2 points)

**1.10 Energy Efficiency**

- Provide energy-efficient lighting such as compact fluorescent or LED lighting throughout a minimum of 75% of the project. (1 point)
- Reduce solar heat gain through the use of glazing/fenestration with a U-factor less than .50 and a solar heat gain coefficient (SHGC) less than .30. (2 points)
- Provide increased insulation to achieve a minimum R-19 in walls and R-38 in ceilings. (2 points)
- Locate HVAC ductwork within conditioned space. (1 point)
- Select high-efficiency HVAC equipment for the project. (2 points)

**1.11 Green Power**

Provide at least 10% of the project’s total energy consumption through renewable energy sources by engaging in a contract to purchase green power for at least two years. One additional point granted for each additional 10% of the project’s total energy provided through green power up to a maximum of 50%. The renewable energy sources must be certified per the Center for Resource Solution’s Green-e requirements. (1-5 points)

**2. RECYCLING AND WASTE REDUCTION**

Intent: Encourage recycling of household and commercial projects; reduce the amount of waste hauled to and disposed of in landfills; and, promote the reuse of materials.

**2.1 Waste Reduction - Construction**

Make provisions to recycle/salvage at least 50% of non-hazardous construction and demolition debris. (3 points)

**2.2 Waste Reduction – Composting**

Provide on-site composting station or location for all occupants. (2 points)

**2.3 Recycling Stations**

As part of the project, include at least one station per building dedicated to the collection, separation, and storage of materials for recycling including, at a minimum, paper, corrugated cardboard, glass, plastics, and metals. Establish a City-approved schedule and plan with the local trash hauler for retrieving the recyclable materials on a weekly basis. (3 points)

**2.4 Recycle Containers**

In mixed-use and nonresidential developments, include recycle bins adjacent to other waste-collection receptacles in areas accessible to pedestrians including streets, walkways, and common areas. (2 points)

**2.5 Recycled Content in Infrastructure**

For new roadways, parking lots, sidewalks, and curbs (above-ground structured parking and underground parking are exempt from this option), any aggregate base and aggregate sub-base shall be at least 50% by volume recycled aggregate materials such as crushed Portland cement concrete and asphalt concrete. (2 points)

**3. URBAN DESIGN**

Intent: Encourage balanced land uses, new development near existing communities or public transportation infrastructure; support alternative transportation choices; and, improve the mental and physical health of the community by reducing work commute time and increasing time devoted to leisure, community activities and family.

**3.1 Proximity to Existing Infrastructure**

Site new development so that at least 25% of the perimeter is contiguous with existing development that is already served by public infrastructure, including water, wastewater, roads, and electric. Replacement of or other on-location improvements to existing infrastructure may be considered existing for the purpose of this option. (3 points)

**3.2 Floodplain Protection**

For sites with portions located within a 100-year floodplain as defined and mapped by FEMA or the CCRFCD, develop only on portions of the site that are not in a 100-year flood zone or on portions that have been previously developed. Previously developed portions must be developed according to National Flood Insurance Program (NFIP) requirements. (1 point)

**3.3 Use Mix**

Include a minimum of three of the following use types: residential, office, commercial (besides office), or public/institutional. (3 points)

- No use type shall amount to less than 10% or more than 80% of the total development gross floor area.
- Individual phases of multiphase projects may have a lesser mix of uses if the applicant provides assurances acceptable to the city that later phases will produce the required mix of uses overall.

**3.4 Compact Development/Walkability**

Locate at least 20% of dwelling units within ½ mile of a mixed-use development, commercial development, religious assembly use, park or school. One additional point granted for each additional 20% of dwelling units within a ½ half-mile distance up to a total of 100%. (1-5 points)

**3.5 Reduced Parking Footprint**

Devote less than 25 percent of the impervious surface area, up to a maximum of five acres, to surface parking. (2 points)

**3.6 Workforce Housing**

For developments with a residential component, include a proportionate amount of dwelling units priced for households earning between 80% and 120% of area medium income (AMI.) (1 point for 5% of units, 2 points for 10% of units, 3 points for 15% of units.)

**4. URBAN NATURE**

Intent: Provide a variety of appealing and comfortable open spaces close to work and home; encourage physical activity and time spent outdoors; support natural resource and habitat conservation; and, promote social networking, civic engagement, personal recreation, and other activities.

**4.1 Minimum Open Space**

Provide common open space that exceeds the base requirements of Section 19.7.2 by 10% One additional point granted for each additional 10% up to a total of 40% above code. (1-4 points)

**4.2 Access to Parks and Open Space**

Locate or design the project so that a park, publicly-accessible open space, multi-use path, trail or plaza lies within ½ mile of 20% of planned and existing dwelling units and business entrances. One additional point granted for each additional 20% of dwelling units within a ½ half-mile distance up to a total of 100%. (1-5 points)

**4.3 Access to Active Recreation**

Locate or design the project so that active public facilities (e.g., playfields, soccer, baseball, basketball, or other sports fields) totaling at least one acre, or a public indoor recreational facility, lies within ½ mile of 20% of dwelling units and/or business entrances. One additional point granted for each additional 20% of dwelling units within a ½ half-mile distance up to a total of 100%. (1-5 points)

**4.4 Habitat Conservation - Avoidance**

Locate the project on a site that does not have significant habitat. For the purposes of this and the following item, “significant habitat” includes:

- Habitat for species that are listed or are candidates for listing under state or federal endangered species acts;
- Locally or regionally significant habitat, or patches of natural vegetation at least 150 acres in size; and
- Habitat flagged for conservation under the Multiple Species Habitat Conservation Plan. (3 points)

**4.5 Habitat Conservation - Setback**

For projects on a site that has significant habitat, design the site such that all development is a minimum of 100 feet away from such habitat. For the purposes of this item, “significant habitat” is defined in item 4.4 above. (2 points)

**4.6 Habitat Restoration**

Using only native plants, restore pre-development native habitat on the project site in an area equal to or greater than 10% of the development footprint. Work with a qualified ecologist to ensure that restored areas will have habitat, including native species assemblages and hydrology that likely occurred in pre-development conditions. (3 points)

**4.7 Community Gardens**

For residential or mixed-use projects, dedicate permanent and viable growing space and related facilities (such as greenhouses) within the project at a minimum of ten sq. ft. per dwelling unit for 20% of the project. Provide fencing, watering systems, soil, and/or garden bed enhancements (such as raised beds), secure storage space for garden tools, solar access, and pedestrian access for these spaces. One additional point granted for community garden space provided for each additional 20% of the project up to 100%. (1-5 points)

**4.8 Tree Canopy**

Provide trees in an amount that exceeds the base requirements of Section 19.7.5, *Landscaping and Screening*, by 10%. One additional point granted for each additional 10% up to 50% above Code. (1-5 points)

**5. TRANSPORTATION**

Intent: Promote public health by encouraging daily physical activity associated with alternative modes of transportation such as walking and bicycling; encourage the use of public transit; promote safe and efficient transportation; and, design parking facilities to minimize adverse environmental impacts to pedestrians.

**5.1 Proximity to Transit**

Locate the project near existing or planned transit service so that at least 20% of dwelling units and business entrances within the project area are within ½ mile of transit stops. One additional point granted for each additional 20% of dwelling units and business entrances within a ½ half-mile distance up to a total of 100% (1-5 points)

<p><b>5.2 Carpool, Shared-Use and Low-emitting Vehicle Parking</b>            For new nonresidential and mixed-use buildings, provide preferred parking spaces for carpool, shared-use, or low-emitting vehicles. Signage indicating carpool, shared-use, or low-emitting vehicle parking spaces must be provided, and the parking spaces must be located closest to the building entrance (exclusive of accessible parking spaces.)</p> <ul style="list-style-type: none"> <li>•Provide parking spaces for carpool and/or shared-use vehicles equal to 5% of the total parking capacity for each nonresidential and mixed-use building on the site. One additional point granted for 10% of the total parking capacity. (1-2 points)</li> <li>•Provide parking spaces for low-emitting vehicles (zero-emission vehicles, partial-zero emission vehicles, ultra-low emission vehicles, etc.) equal to 5% of the total parking capacity for each nonresidential and mixed-use building on the site. One additional point granted for 10% of the total parking capacity. (1-2 points)</li> </ul>
<p><b>5.3 Pedestrian System</b>            Design and build a project such that no block length exceeds 600 feet. (5 points)</p> <ul style="list-style-type: none"> <li>•If longer blocks are necessary, mid-block crossings shall be provided every 600 feet.</li> <li>•Exceptions are permitted to avoid incursion into or damage to sensitive natural areas or to accommodate major institutional buildings or uses, such as hospitals, parks, or schools, or for infill developments where the street pattern is already established.</li> </ul>
<p><b>5.4 Interconnected Street Network</b>            The development achieves a connectivity index score of 0.1 above the applicable base requirements of this Code. Two points granted for a score of 0.15 above the base requirements, and three points granted for a score of 0.2 above the base requirements. (1-3 points)</p>
<p><b>5.5 Bicycle Circulation Systems</b>            Build a network of on-site bicycle pathways that provide safe, continuous bicycle access to all land uses within the development site and to land uses on adjacent properties. (2 points)</p>
<p><b>5.6 Pedestrian/Bicycle Networks (master planned communities only)</b>            Provide safe pedestrian and bicycle routes between major residential centers in a development and schools, churches, and other major community facilities and gathering places.</p> <ul style="list-style-type: none"> <li>•Safety features shall include raised/marked pedestrian crossings, narrow streets, or streets with pedestrian medians, and similar features (1 point).</li> <li>•Avoid erecting obstructions such as signage and utility poles in sidewalks (1 point).</li> <li>•Provide separated grade crossings (1 point).</li> </ul>
<p><b>5.7 Facilities for Bicycle Commuters</b>            In addition to the bicycle parking requirements in Section 19.74.K.13, provide the following:</p> <ul style="list-style-type: none"> <li>•Indoor or self-contained bicycle storage lockers equal to a minimum of 5% of the vehicle parking spaces provided. (2 points)</li> <li>•Shower and dressing areas for employees. (2 points)</li> </ul>
<p><b>5.8 Developer-sponsored Transit</b>            For a minimum of three years, provide year-round, developer-sponsored transit service (vans, shuttles, or buses) from at least one central point in the project to major transit facilities and/or other major destinations such as a retail or employment center. (5 points)</p>
<p><b>5.9 Parking</b>            Locate all new off-street surface parking lots at the side or rear of buildings, leaving building frontages and streetscapes free of surface parking lots. Building entrances must be easily accessible from the public way. (2 points) OR            Provide structured parking to meet 20% of the total parking requirement for nonresidential and multifamily residential projects. Two additional points will be granted for each additional 20% up to a total of 100%. In addition, as applicable, locate all new off-street surface parking lots at the side or rear of buildings, leaving building frontages and streetscapes free of surface parking lots. (2-10 points)</p>

**6. ENVIRONMENTAL HEALTH**

Intent: Encourage the use of green building practices in the design, construction, or retrofit of buildings; promote the reuse of land by developing sites where development is complicated by environmental contamination; prevent pollution and erosion from stormwater runoff; and, improve nighttime visibility and reduce glare.

**6.1 Green Building**

- Use green building materials (recycled materials, locally-produced materials, sustainably-harvested wood, etc.) in the construction of the project. (2 points)
- Use furniture made from recycled materials, locally-produced materials, sustainably-harvested wood, etc. in the project. (1 point)
- Use flooring made from recycled or rapidly renewable materials such as PET carpeting, bamboo, cork flooring, etc. in the project. (1 point)

**6.2 Daylighting**

Incorporate daylighting strategies into the design of the project to minimize the use of artificial lighting.

**6.3 Light Pollution Reduction**

Reduce light pollution by using full cutoff exterior lighting and using downlighting only.

**7. WATER**

Intent: Minimize water use in buildings to reduce impacts to natural water resources; and, minimize outdoor water use for landscape irrigation.

**7.1 Water-Efficient Landscape**

- Limit turf grass beyond base code requirements. (2 points)
- Single-family residential: Turf limited to 25% of landscaped area
  - Base code turf requirements are in Section 19.7.5.F6(e).

**7.2 Water-Efficient Plants**

All landscaping plants, including those on green roofs, shall be selected from a list of water-efficient vegetation maintained by the City of Henderson. The use of native plants is strongly encouraged. (2 points)

**7.3 Landscape Irrigation System**

Drip or subsurface irrigation systems shall be utilized for all landscape irrigation systems when irrigation is necessary. Drip irrigation systems must be equipped with pressure regulators, filters, and emitters. Each drip emitter must be rated at less than 20 gallons per hour (gph). (1 pt for drip, 2 pts for subsurface)

**7.4 Surface Treatments**

Non-turf landscaped areas must be completely covered by a two-inch-minimum layer of air- and water-permeable mulch to reduce evaporation. Living groundcovers qualify as mulch provided the individual plants are installed at sufficient density to assure 100 percent ground coverage at maturity. If a weed barrier is used beneath the mulch, it must be manufactured to be air- and water-permeable to reduce evaporation and run-off. (1 point)

**7.5 Water-Efficient Buildings**

- Minimize indoor water use in new buildings and buildings undergoing major renovations as part of the project through any combination of the following:
- Use low-flow plumbing fixtures such as toilets, urinals, faucets, and showerheads. (2 points)
  - Use of hot water recirculation system. (Can not be used in conjunction with tankless water heater) (2 points)
  - Use of a tankless water heater. (2 points)
  - Use of a solar water heater. (2 points)

**8. ADDITIONAL STRATEGIES FOR SUSTAINABILITY**

Intent: Implement strategies of existing above-code programs or explore and implement new, unique or innovative ways to increase the sustainability of the project and community.

**8.1 Above-Code Programs**

Design and build the project to meet the standards of an above-code program such as LEED, Green Globes, Energy Star, Green Building Partnership, etc. (10 points)

**8.2 Innovative Products or Strategies**

Provide documentation of an innovative product or strategy that increases the sustainability of the project or community but is not provided in this Section. Up to five Innovative Products or Strategies may be submitted for review. Points awarded at the discretion of the Director of Community Development based on the capacity of the proposed product or strategy to increase the sustainability of the project in any of the above categories. (1-5 points for each Innovative Strategy)