

**SUGGESTED DESIGN STANDARD REVISIONS**  
**ANJEC Sustainability Grant – Hopewell Township**

January 14, 2008

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**17-77 BIKEWAYS, SIDEWALKS, TRAILS AND WALKWAYS. (Revises entire section and eliminates Section 17-)**

a. Sidewalks shall be installed in locations determined by the planning board to be in the interest of public safety and proper pedestrian circulation considering the probable volume of pedestrian traffic, the adjoining street classification where sidewalks, parallel streets, school bus stops, recreation areas, schools, shopping facilities and other populated areas, and the circulation element of the Master Plan.

b. All parking and circulation systems within each development shall accommodate the movement of vehicles, bicycles, pedestrians and transit, throughout the proposed development and to and from surrounding areas, safely and conveniently, and shall contribute to the attractiveness of the development. The on-site pedestrian system must provide adequate directness, continuity, street crossings, visible interest and security as defined by the standards in this Section. The on-site bicycle system must connect to existing bikeway, trail or walkway networks.

c. All bikeways, trails, sidewalks, trails and walkways shall meet the following design standards:

1. *Safety Considerations.* To the maximum extent feasible, pedestrians shall be separated from vehicles and bicycles.

a. Where complete separation of pedestrians and vehicles and bicycles is not possible, potential hazards shall be minimized by the use of techniques such as special paving, raised surfaces, pavement marking, signs or striping, bollards, median refuge areas, traffic calming features, landscaping, lighting or other means to clearly delineate pedestrian areas, for both day and night use.

b. Where pedestrians and bicyclists share walkways, the pedestrian/bicycle system shall be designed to be wide enough to easily accommodate the amount of pedestrian and bicycle traffic volumes that are anticipated. A minimum width of eight (8) feet shall be required and shall meet American Association of State Highway and Transportation Officials (AASHTO) guidelines, Guide for Development of Bicycle Facilities, August 1991, or any successor publication. Additional width of up to four (4) feet may be required where higher volumes of bicycle and pedestrian traffic may be experienced.

2. Curb cuts and ramps shall be located at convenient, safe locations for the physically disabled, for bicyclists and for people pushing strollers or carts. The location and design of curb cuts and ramps shall meet the requirements of the Americans With Disabilities Act ramp standards and shall avoid crossing or funneling traffic through loading areas, drive-in lanes and outdoor trash storage/collection areas.

3. *Site Amenities.* Development plans shall include site amenities that enhance safety and convenience and promote walking or bicycling as an alternative means of transportation. Site amenities may include bike racks, drinking fountains, canopies and benches.

4. *Bicycle Facilities.* Bicycle facilities to meet the following standards:

a. A minimum number of bicycle parking spaces shall be provided, equal in number to five (5) percent of the total number of automobile parking spaces provided by the development, but not less than one. For large commercial or institutional buildings parking spaces may be provided for 5% or more of all building users at peak periods and for multi-family residential buildings for 15% of building occupants.

1. To determine the number of secure bicycle spaces required for a commercial or institutional building, first identify the total number of full-time and part time occupants. Calculate the FTE occupants based on a standard 8-hour occupancy period and assign each full-time occupant a value of 1.0 and each part-time occupant a value of the number of hours worked divided by eight. Estimate the transient occupants such as students, visitors, and customers during the peak period for the facility. Calculate peak building users by combining FTE occupants and transient occupants.

2. To determine the number of secure bicycle spaces required for a residential building identify the number of total occupants. Multiply the number of occupants by 15%.

b. For convenience and security, bicycle parking facilities shall be located near building entrances, shall be visible from the land uses they serve, and shall not be in remote automobile parking areas. Such facilities shall be easily accessible by occupants during all seasons of the year and shall not be located so as to impede pedestrian or automobile traffic flow nor so as to cause damage to plant material from bicycle traffic.

c. Bicycle parking facilities shall be designed to allow the bicycle frame and both wheels to be securely locked to the parking structure. The structure shall be of permanent construction such as heavy gauge tubular steel with angle bars permanently attached to the pavement foundation. Bicycle parking facilities shall be at least two (2) feet in width and five and one-half (5½) feet in length, with additional back-out or maneuvering space of at least five (5) feet.

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**5. Sidewalks and Walkways.**

a. Walkways within a site shall be located and aligned to directly and continuously connect areas or points of pedestrian origin and destination, and shall not be located and aligned solely based on the outline of a parking lot configuration that does not provide such direct pedestrian access. Walkways shall link sidewalks with building entries through parking lots. Such walkways shall be raised or enhanced with a paved surface not less than six (6) feet in width. Drive aisles leading to main entrances shall have walkways on both sides of the drive aisle.

b. Street Crossings. Where it is necessary for the primary pedestrian access to cross drive aisles or internal roadways, the pedestrian crossing shall emphasize and place priority on pedestrian access and safety. The material and layout of the pedestrian access shall be continuous as it crosses the driveway, with a break in continuity of the driveway paving and not in the pedestrian access way. The pedestrian crossings must be well-marked using pavement treatments, signs, striping, signals, lighting, traffic calming techniques, median refuge areas and landscaping. (See Figure 3.)

c. Sidewalks shall parallel streets and shall be at least four feet wide. Sidewalks not associated with a street, or the extension of a sidewalk from the end of a cul-de-sac to another street or walkway, may be required.

6. Pedestrian and Bicycle Destinations. The on-site pedestrian and bicycle circulation system shall be designed to provide, or allow for, direct connections to major pedestrian and bicycle destinations including, but not limited to, parks, schools, Neighborhood Centers, Neighborhood Commercial Districts and transit stops that are located either within the development or adjacent to the development as required, to the maximum extent feasible. The on-site pedestrian and bicycle circulation system must also provide, or allow for, on-site connections to existing or planned off-site pedestrian and bicycle facilities at points necessary to provide direct pedestrian and bicycle travel from the development to major pedestrian destinations located within the neighborhood. In order to provide direct pedestrian connections to these destinations, additional sidewalks or walkways not associated with a street, or the extension of a sidewalk from the end of a cul-de-sac to another street or walkway, may be required.

7. Bikeways, sidewalks, trails and walkways shall be constructed in accordance with NJDOT Standard Specification for Road and Bridge Construction unless otherwise required herein.

a. Bikeways, sidewalks, trails and walkways shall be constructed with a 4 inch minimum permeable stone base.

b. Surface treatment shall be constructed of porous bituminous concrete or porous Portland Cement concrete unless demonstrated to the satisfaction of the Planning Board that such surface treatments are inappropriate.

c. Bike lanes, if used for public streets, shall use porous bituminous concrete for surface treatment unless demonstrated to the satisfaction of the Planning Board that such surface treatments are inappropriate.

d. Surface treatments for sidewalks shall comply with the Americans with Disabilities Act.

1. Consideration shall be given for sidewalk surface materials being constructed of porous bituminous concrete or porous Portland Cement concrete unless demonstrated to the satisfaction of the Planning Board that such surface treatments are inappropriate.

2. Sidewalks shall be four inches thick, except at points of vehicular crossing where they shall be at least six inches thick, where Portland Cement concrete is used. Portland Cement concrete shall have a 28 day compressive strength of 4,500 p.s.i., and shall be air-entrained.

3. Where sidewalks cross curbs, curb ramps shall be provided. Preformed expansion joint material shall be installed according to NJDOT Standards for the material; type being used.

#### **17-83 DRIVEWAYS.**

Add "g." The surface treatment of driveways shall maximize, to the greatest extent practicable, the use of pavement materials for that include porous stone, porous bituminous concrete, porous Portland Cement concrete, other porous pavement treatments or any other surface such as open-jointed pavers, "soft" paving materials including wood mulch and crushed shell, and plastic geocells or lattice-like materials that hold aggregate or topsoil in their cells to prevent displacement and compaction or base construction such that the design and construction maximizes infiltration of rainfall runoff.

#### **17-85 FENCES AND HEDGES.**

Add "b." Fences shall be constructed of vegetation where possible. When vegetation is used, all vegetation shall be indigenous, water efficient vegetation.

#### **17-89 LANDSCAPING.**

Pending

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**17-90 LIGHTING.**

17-90.4 Outdoor Lighting Energy Conservation.

**Add “c.” Every effort shall be made to maximize the use of energy efficient fixtures and such efforts shall be demonstrated to the Planning Board.**

**17-91 LOTS.**

**Add “b.” Lots shall comply with Section 17-???, Solar Access.**

**17-93 MODIFICATION OF LOT AREAS AND OTHER RESTRICTIONS.**

**Add “c.” Lots shall comply with Section 17-???, Solar Access.**

**17-95 OFF-STREET PARKING AND LOADING.**

a. Developments shall provide for safe and efficient vehicular and pedestrian circulation, parking and loading, and shall meet the following specific standards and requirements. No required parking facilities, loading areas or passageways shall be located within the required front, side or rear setback lines of any lot located within a residential district, except as otherwise provided by this chapter.

b. Parking facilities, loading areas or passageways in industrial or commercial districts may be located within any of the required yard areas, provided that none of the same are within 25 feet of the street line nor within five feet of adjacent property lines. In the event that any subject property abuts a residential district, no such parking facilities, loading areas, or passageways shall be located within 25 feet of the district boundary and sufficient landscape screening, as described in section 17-89 shall be installed to preclude the transmission of headlight glare across such district boundary.

c. No loading area or service facility for the handling of freight may face any street frontage nor be located on the side of the subject property which abuts a residential district, without an approved landscape or topographical buffer.

d. Off-street parking spaces shall be either **nine** feet wide,\* except spaces serving retail uses shall be a minimum of ten feet wide. Parking spaces shall be a minimum of **18** feet in length\* in accordance with the following schedule. **Handicapped parking shall be provided in accordance with the Americans with Disabilities Act.**

Aisle Widths for Parking Spaces 10 Feet Wide	
Spaces 9 Feet Wide	_____
_____	_____

Angle of Parking Space	One-Way Aisle	Two-Way Aisle	One-Way Aisle	Two-Way Aisle
90 degrees	25'	25'	24'	24'
60 degrees	20'	22'	18'	20'
45 degrees	18'	20'	15'	18'
30 degrees	15'	18'	12'	18'
parallel	12'	18'	12'	18'

\*In an effort to reduce paving costs and reduce the amount of paving to assist in storm water runoff control, the planning board may approve parking plans associated with nonresidential uses where specially designated and separate parking areas may be set aside for **"alternate fuel vehicles or compact vehicles"** provided such spaces shall be limited to employee parking and each area for **"alternate fuel vehicles or compact vehicles"** shall have at least 30 spaces. The **"alternate fuel vehicles or compact vehicles"** spaces shall be eight and one-half feet by 16 feet with aisles reduced to 90 percent of the dimensions shown above. The number of parking spaces which may be approved for **"alternate fuel vehicles or compact vehicles"** shall be a determination of the planning board based upon documentation by the applicant and any data submitted by others.

e. Off-street loading spaces shall have 15 feet of vertical clearance and be designed in accordance with the following schedule:

Loading Space		Apron/Aisle Length	
Length	Width	90 degrees	60 degrees
60 feet	10 feet	72 feet	66 feet
60 feet	12 feet	63 feet	57 feet
60 feet	14 feet	60 feet	54 feet

f. All parking facilities and all loading areas which either singly, or in combination, provide for more than six parking or loading spaces shall be so located and screened that they cannot be seen from any location within a residential district other than the lot upon which such facilities are situate and all loading areas shall be considered as one unless separated by more than 100 feet.

g. All parking facilities and loading areas which, either singly or in combination, contain more than 9,000 square feet shall have curbed, landscaped islands located within the perimeters of the surfaced area except as waived in lower income housing developments as permitted in section 17-92. **Landscaped islands providing for the treatment of stormwater and/or groundwater recharge shall be defined by an appropriate method that minimizes maintenance and provides for non-erosive surface water runoff entry into the island.**

h. Except as may be waived and modified in lower income housing developments under section 17-92, off-street parking areas containing ten or more spaces and all off-street loading areas shall have concrete curbing around the perimeter of the parking and loading areas and along major interior driveways, with appropriate ramps for wheelchairs and bicycles. Where other equivalent methods of controlling drainage, defining the edge of paving, protecting the edge of paving from chipping, and preventing vehicles from encroaching on nonparking/loading areas can be demonstrated to the satisfaction of the planning board with the advice of its engineer, concrete curbing may be waived in whole or in part. Concrete wheel

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blocks shall be installed where necessary to protect adjoining walls, trees, shrubs, sidewalks and other facilities.

i. Appropriate areas for pick-up of trash and garbage shall be provided, separate from and in addition to loading areas. If outside a building, suitable enclosed containers shall be provided which shall be screened at all times from view from parking areas, streets and adjacent residential areas or uses **consistent with section 17-97**.

j. Minimum Off-Street Parking and Loading Requirements. The minimum number of off-street parking spaces including required spaces for the handicapped, and the minimum number of off-street loading spaces depends on the particular use of the parcel.

The following minimum requirements shall be met: in the case of uses not listed, the amount of parking and loading spaces shall be determined by the planning board on the basis of similar uses and the anticipated actual requirements for the particular use. Sufficient off-street parking facilities shall be provided to preclude on-street parking of any vehicles of employees or customers or visitors of any nonresidential structure, and to preclude on-street parking of any vehicles of residents of residential buildings.

Where either a proposed building or the proposed use of a tract consists of more than one use, each use with different parking requirements, or where the building design is such that it could be converted to a use requiring a higher parking ratio, the site plan shall either: (a) show an off-street parking design with a sufficient number of parking spaces to accommodate the use requiring the most number of spaces; or (b) include as a deed restriction a requirement that either the owner-occupied or tenant-occupied space, together with the type uses and the proportion of uses within either a building or on the lot, shall not change from the uses and layout approved on the site plan unless a revised site plan is submitted and approved (see also section 17-15 regarding certificates of occupancy). Where the developer proposes to construct less parking than would be required for the use requiring the most parking spaces, the plan shall show where any additional spaces can be located in the event additional parking is needed. In the event the use changes and additional parking is required, or observation by the township engineer reveals additional parking is required, the township may require the owner to construct some or all of the additional parking in accordance with the approved plan. The plan and the deed to the property shall indicate that the township may require the expanded parking under either of these circumstances.

(See Schedule on next page)

k. Drainage. All parking and loading areas shall have drainage facilities installed in accordance with good engineering practice and in accordance with the "drainage" provisions of section 17-82. Where sub-base conditions are wet, springy, or of such nature that surfacing would be inadvisable without first treating the sub-base, these areas shall be excavated to a depth of at least 12 inches below the proposed sub-grade and filled with a suitable sub-base material. Where required, a system of porous concrete pipe, sub-surface drains shall be constructed beneath the surface of the paving and connected to a suitable drain. After the sub-base material has been properly placed and compacted, the parking area surfacing material shall be applied.

l. All required driveways, passageways, off-street parking facilities and loading areas shall be located on the same lot as the structure or use which they are designed to serve and shall be readily accessible thereto. Except as otherwise provided by this chapter, where more than one use exists on the same lot, the total passageways, parking facilities, loading areas and the capacity of the driveways shall be the sum of the requirements for each individual use.

m. All driveways, passageways, off-street parking facilities and loading areas shall be so designed, constructed and maintained as to permit free access and allow vehicles to enter, to leave and to turn within such places in a safe and orderly manner and without disrupting or causing hazard to the flow of traffic in any public right-of-way. No such driveway, passageways, off-street parking facilities or loading areas shall be encroached upon, reduced in any manner, or devoted to any other use.

n. In any case where special conditions exist respecting the proposed use of a particular lot or contiguous lots, the immediate development of all driveways, passageways, parking facilities and loading zones will not be required if the applicant demonstrates:

1. That appropriate areas are reserved for the possible future construction of all such facilities;

2. That the required number of parking facilities or loading areas would be greatly in excess of any immediate or reasonably to be anticipated need therefor;

3. That the probable time of maximum use of such parking facilities or loading areas will be such as to make the sharing of such facilities feasible;

4. That the location and capacity of both future and proposed passageways, parking facilities and loading areas is such that the joint use of driveways will not disrupt or cause hazard to the flow of traffic at or near their entrance onto a public right-of-way; and

5. Such joint use as is proposed is protected by recorded easements.

o. In general, except for lots containing one-family houses, all driveways, parking and loading areas and other off-street traffic facilities shall be paved. Areas likely to experience relatively heavy use shall be paved with at least four inches of compacted base course of plant-mixed bituminous stabilized base course constructed in layers not more than two inches compacted thickness, or equivalent, and a minimum two-inch thick compacted wearing surface of bituminous concrete (FABC), or equivalent. **Porous Bituminous Concrete and Porous Portland Cement Concrete shall be given consideration as alternative surface treatments.** All construction shall comply with the Standard Specifications of the New Jersey Department of Transportation.

#### **17-97 PERFORMANCE STANDARDS.**

a. Electricity. Electronic equipment shall not interfere with any radio or television reception beyond the operator's property.

**b. Air, Water and Environmental Pollution. No use shall emit heat, odor, smoke, radiation, vibrations, noise, or any other pollutant into the ground, water, or air that exceeds the most stringent, applicable local County, State and Federal regulation. No building permit, zoning permit or certificate of occupancy shall be issued for any use where a any other permit is required until the approving agency has approved the level of emission, quality of emission,**



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type and quality of emission control, and level of monitoring to be conducted by the State, and such other agency regulations governing the emission of pollutants into the ground, water, or air.

c. **Hazardous Materials.** The purpose of this Section is to protect the community and neighborhood from potential harm caused directly or indirectly by hazardous materials. The proper location, construction and processing of hazardous materials facilities are important to controlling community risk. If the type and magnitude of hazardous materials emergencies can be predicted, the potential impact on adjacent land uses, emergency providers and the environment can be minimized.

1. If any use on the development site may entail the use or storage of hazardous materials (including hazardous wastes) on-site, the project shall be designed to comply with all safety, fire and building codes for the use and storage of the hazardous materials involved. Adequate precautions shall be taken to protect against negative off-site impacts of a hazardous materials release, using the best available technology.

2. In order to evaluate the impact of hazardous materials risk, all development proposals that have the potential to cause off-site impacts during the release of a hazardous material shall include a Hazardous Materials Impact Analysis (HMIA) prepared by a qualified expert. Such proposals include gas stations, manufacturing facilities and similar establishments that require the use or storage of flammable or toxic substances.

3. This analysis shall provide basic information on the project (including site layout and proposed hazardous materials use), describe likely incident scenarios, describe mitigation actions designed to limit the potential for off-site impacts on adjacent land uses or environment and describe emergency response measures in the event of a spill. Based on the information provided in the impact analysis, recommendations will be made by the Poudre Fire Authority to the relevant decision maker to protect against off-site impacts. If a HIMA is required for a development proposal, a statement indicating that such a study has been required will be included in all required written notices to property owners as defined by Section 2.2.6 of this Code, to the extent reasonably feasible.

d. **Glare or Heat.** No use shall direct or reflect a steady or flashing light beyond its lot lines. Exterior lighting and lighting resulting from any manufacturing or assembly operations shall be shielded, buffered, and directed as approved on the site plan so that any glare, direct light, flashes, or reflection will not interfere with the normal use of nearby properties, dwelling units and streets. Also see section entitled "Lighting", section 17-90.

1. If any proposed activity produces intense glare or heat, whether direct or reflected, that is perceptible from any point along the site's property lines, the operation shall be conducted within an enclosed building or with other effective screening sufficient to make such glare or heat imperceptible at the property line.

2. Manufacturing processes that create glare, such as welding, shall be conducted within an enclosed building or be effectively screened from public view. If the source of the glare is proposed to be screened with plant material, then the applicant must show that the screening will be effective year-round.

e. **Historic and Cultural Resources.** Historic sites, structures or objects shall be preserved and incorporated into any proposed development and any undertaking that may potentially alter the characteristics of the historic property is done in a way that does not adversely affect the integrity of the historic property. New construction shall be designed to respect the historic character of the site and any historic properties in the surrounding neighborhood. This Section is intended to protect designated or individually eligible historic sites, structures or objects as well as sites, structures or objects in designated historic districts, whether on or adjacent to the development site consistent with the regulations of the Hopewell Township Historic Preservation Commission from which approvals shall be sought prior to seeking planning board or zoning board approvals.

**Revised "f."** Storage and Waste Disposal. Except for agricultural operations, no materials or wastes shall be deposited upon a lot in such form or manner that they can be transferred off the lot, directly or indirectly, by natural forces such as precipitation, surface water, evaporation or wind. All materials or wastes which might create a pollutant, be a safety hazard, or be a health hazard shall be stored indoors and/or be in closed containers to eliminate such pollutant or hazard.

1. There shall be provision of areas, compatible with surrounding land uses, for the collection, separation, storage, loading and pickup of recyclable materials by requiring that adequate, convenient space is functionally located at multi-family residential, commercial and industrial land use sites.

2. All new commercial or multi-family structures and all existing commercial or multi-family structures proposed to be enlarged by more than twenty-five (25) percent, or where a change of use is proposed, shall provide adequate space for the collection and storage of refuse and recyclable materials.

3. The amount of space provided for the collection and storage of recyclable materials shall be designed to accommodate collection and storage containers that are appropriate for the recyclable materials generated. Areas for storage of trash and recyclable materials shall be adequate in capacity, number and distribution to serve the development project.

4. Recyclable materials storage areas shall be located abutting refuse collection and storage areas.

5. Each trash and recycling enclosure shall be designed to allow walk-in access without having to open the main enclosure service gates.

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6. Trash and recycling areas must be enclosed so that they are screened from public view. The enclosure shall be constructed of durable materials such as masonry and shall be compatible with the structure to which it is associated. Gates on the enclosures shall be constructed of metal or some other comparable durable material, shall be painted to match the enclosure and shall be properly maintained.
7. Enclosure areas shall be designed to provide adequate, safe and efficient accessibility for service vehicles.
8. Enclosure areas shall be constructed on a cement concrete pad.
9. The property owner shall supply and maintain adequate containers for recycling and waste disposal. Containers must be clearly marked for recycling.

**Add “g.” Construction Waste Management: Divert construction, demolition and land-clearing debris from disposal in landfills and incinerators. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites.**

1. Recycle and/or salvage at least 50% of non-hazardous construction and demolition debris. Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or co-mingled.
  - a. Excavated soil and land-clearing debris do not contribute. Calculations can be done by weight or volume, but must be consistent throughout.
  - b. Consider recycling cardboard, metal, brick, acoustical tile, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation. Designate a specific area(s) on the construction site for segregated or commingled collection of recyclable materials, and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials. Note that diversion may include donation of materials to charitable organizations and salvage of materials on-site.
2. Reuse building materials and products in order to reduce demand for virgin materials and to reduce waste, thereby reducing impacts associated with the extraction and processing of virgin resources.
3. Use salvaged, refurbished or reused materials such that the sum of these materials constitutes at least 5%, based on cost, of the total value of materials on the project. Consider salvaged materials such as beams and posts, flooring, paneling, doors and frames, cabinetry and furniture, brick and decorative items. Mechanical, electrical and plumbing components and specialty items such as elevators and equipment shall not be included in this calculation. Only include materials permanently installed in the project. Furniture may be included.
4. Increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.

**17-106 SIGNS. (Revisions in red)**

Revised “10.” Illuminated Signs. Signs shall be illuminated in accordance with section 17-90. Illuminated signs shall be arranged to reflect the light and glare away from adjoining or nearby lots and streets. All illuminated signs shall have the light source shielded from adjoining or nearby lots, streets, and interior drives. All lights shall be either shielded or have translucent fixtures to reduce off-site effects. **LED fixtures and/or light fixtures of equivalent energy efficiency shall be used where possible consistent with section 17-90.**

**17-??? SOLAR ACCESS (New Section)**

**The use of both active and passive solar energy systems for heating air and water in homes and businesses is encouraged, as long as natural topography, soil or other subsurface conditions or other natural conditions peculiar to the site are preserved. While the use of solar energy systems is optional, the right to solar access is protected. Solar collectors generally require access to available sunshine during the entire year, including between the hours of 9:00 am and 3:00 pm, EST, on December 21, when the longest shadows occur.**

**a. Solar-Oriented Lots. The elements of the development plan (e.g., buildings, circulation, open space and landscaping) shall be located and designed, to the maximum extent feasible, to protect access to sunshine for planned solar energy systems or for solar-oriented rooftop surfaces that can support a solar collector or collectors capable of providing for the anticipated hot water needs of the buildings in the project between the hours of 9:00 am and 3:00 pm EST, on December 21.**

**b. Shading. A goal of this Section is to ensure that site plan elements do not excessively shade adjacent properties, creating a significant adverse impact upon adjacent property owners.**

**1. The physical elements of the development plan shall be, to the maximum extent feasible, located and designed so as not to cast a shadow onto structures on adjacent property greater than the shadow which would be cast by a twenty-five-foot hypothetical wall located along the property lines of the project between the hours of 9:00 am and 3:00 pm, MST, on December 21. This provision shall not apply to structures within the following high-density zone districts: Downtown, Community Commercial.**

**2. The impact of trees shall be evaluated on an individual basis considering the potential impacts of the shading and the potential adverse impacts that the shading could create for the adjacent properties in terms of blocking sunlight in indoor living areas, outdoor activity areas, gardens and similar spaces benefiting from access to sunlight. Shading caused by deciduous trees can be beneficial and is not prohibited.**

**c. Alternative Compliance. Upon request by an applicant, an alternative site layout that may be substituted in whole or in part for a plan meeting the standards of this Section. An alternative design enhances neighborhood continuity and connectivity, fosters nonvehicular access, and preserves existing natural or topographic conditions on the site.**

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**17-??? SUSTAINABILITY (New Section)**

**a. Building Materials.** When possible, Building materials should meet or exceed at least two of the following:

**1. Regional Materials: 10% Extracted, Processed & Manufactured Regionally.** Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and local economies, and reducing the environmental impacts resulting from transportation. If only a fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.

Use building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site for a minimum of 10% (based on cost) of the total materials value. During construction, ensure that the specified local materials are installed and quantify the total percentage of local materials installed. Consider a range of environmental, economic and performance attributes when selecting products and material.

**2. Reduce the use and depletion of finite raw materials and long-cycle renewable materials by replacing them with rapidly renewable materials.** Use rapidly renewable building materials and products (made from plants that are typically harvested within a ten-year cycle or shorter) for 2.5% of the total value of all building materials and products used in the project, based on cost. Identify products and suppliers that can support achievement of this goal. Consider materials such as bamboo, wool, cotton insulation, agrifiber, linoleum, wheatboard, strawboard and cork. During construction, ensure that the specified renewable materials are installed.

**b. Encourage environmentally responsible forest management.** During construction, ensure that the FSC-certified wood products are installed.

**c. Framing.** Without compromising structural integrity, use advanced framing techniques that reduce the amount of building material while maintaining the structural integrity of the home.

**d. Roofing Alternatives.** Reduce the urban heat island effect by use of the following:

**1. Materials that are no darker than a light gray or demonstrate how alternate roofing materials reduce the urban heat island effect.**

2. Roofing materials have a Solar Reflectance Index (SRI) equal to or greater than 78 for a low-sloped roof (less than or equal to 2:12) or 29 for a steep-sloped roof (greater than 2:12) covering 75% of the roof surface. When calculating the surface area of a roof, deduct areas with equipment, solar energy panels, and appurtenances.

3. Install a vegetated roof for at least 50% of the roof area.

**e. Non-Residential Construction**

1. Commission the building's energy systems. Verify that the building's energy related systems are installed, calibrated and perform according to the owner's project requirements, basis of design, and construction documents.

a. Designate an individual as the Commissioning Authority (CA) to lead, review and oversee the completion of the commissioning process activities. The Owner shall document the Owner's Project Requirements (OPR). The design team shall develop the Basis of Design (BOD). The CA shall review these documents for clarity and completeness. The Owner and design team shall be responsible for updates to their respective documents.

b. In order to complete the commissioning process the following steps must be completed:

1. Develop and incorporate commissioning requirements into the construction documents.
2. Develop and implement a commissioning plan.
3. Verify the installation and performance of the systems to be commissioned.
4. Complete a summary commissioning report.
5. Commissioning process activities shall be completed for the following energy-related systems, at a minimum: HVAC & R systems and associated controls, lighting and daylighting controls, domestic hot water systems, and renewable energy systems.

2. Re-commission the building's energy systems on an ongoing basis to provide for the ongoing accountability of building of energy consumption over time.

3. Eliminate use of CFC-based refrigerants in new base building HVAC&R systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phase-out conversion prior to project completion. Phase-out plans extending beyond the project completion date will be considered on their merits. Zero use of CFC-based refrigerants in new base building HVAC&R systems. When reusing existing base building HVAC equipment, complete a comprehensive CFC phase-out conversion prior to project completion. Phase-out plans extending beyond the project completion date will be considered on their merits.

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**f. Residential Construction**

**1. Energy Star Home Certification: Comply with ENERGY STAR Labeled home guidelines, for all new single-family dwelling and multiple-family dwellings including apartments and townhouses**

**a. Complete all the verification requirements for an ENERGY STAR HOME including: performing and HERS rating on the house, thermal bypass (insulation) inspection, envelope air leakage testing with blower door, duct leakage testing with duct pressurization fan. ENERGY STAR for HOMES; home must be third-party inspected.**

**2. Provide homeowner with information and enrollment materials about options to purchase green power from the local electric utility.**

**17-114 WATER. (Revision in red)**

a. An adequate water supply for the residents and occupants of the site shall be provided. If a public water supply is available, water mains shall be connected to the existing mains, **if Hopewell Township approves**, and the developer shall contribute the entire cost of any necessary new wells, additional storage facilities, extension of water mains and increased size of water mains, except as provided in section 17-96 with respect to off-tract improvements.

b. If a public water supply is not available, or if in the judgment of the planning board it is not economically feasible to extend public water lines to the site, the planning board shall determine whether individual wells are appropriate, or whether a central water system should be installed, subject to the approval **by Hopewell Township of** the arrangements for transferring ownership of the system to the municipal utilities authority. In addition, compliance with section 16-6 of the Revised General Ordinances shall be required.

c. Whenever a public water supply or central water system is installed or expanded, the developer shall include fire hydrants, with approved coupling devices, sufficient for firefighting purposes.

**New "d." Use water-conserving fixtures and minimize water consumption. When possible, specify high-efficiency fixtures and dry fixtures such as dual flush toilets, and non-water using urinals to reduce water consumption.**