

ARTICLE XIII

RECREATIONAL FACILITIES AND OPEN SPACE

Section 15-196 Active Recreational Areas and Facilities Required (AMENDED 5/10/83; 4/24/84; 12/10/85; 10/22/13)

(a) Subject to subsection (d) and Sections 15-197 and 15-203, all residential developments shall provide active recreational areas and facilities to such an extent that the sum total of recreation points assigned to each recreational area and facility [under subsection (b)] equals or exceeds the number of recreation points required of that development in accordance with the remaining provisions of this section.

(b) For purposes of this section, a recreation point is a unit of measurement that allows various types of recreational areas and facilities to be compared to one another. As set forth more fully in Appendix G to this chapter, the principal criterion upon which recreation points are assigned to various facilities is the cost associated with the development of such facilities. The following table establishes the recreation points assignable to the facilities listed. Points for facilities not included in the table below shall be determined by the permit issuing authority by applying the methodology set forth in Appendix G.

| TYPE FACILITY | POINTS/SQUARE FOOT | TYPICAL POINTS | SQUARE FEET |
|-----------------------|--------------------|----------------|-------------|
| Swimming Pool | .463 | 356 | (768) |
| Swimming Pool Patio | .020 | 6 | (2820) |
| Tennis Court (1) | .034 | 245 | (7200) |
| Tennis Court (2) | .028 | 403 | (14400) |
| Tennis Court (4) | .025 | 720 | (28800) |
| Basketball Court | .058 | 139 | (2400) |
| Volleyball Court | .014 | 25 | (1800) |
| Hiking/Biking Trail | .016 | 64 | (4000) |
| Fitness Station | .022 | 9 | (400) |
| Picnic Shelter | .148 | 37 | (250) |
| Gazebo | .326 | 102 | (314) |
| Clubhouse | .508 | 609 | (1200) |
| Play Equipment | .107 | 136 | (1275) |
| Slide | .514 | 8 | (16) |
| Swing | .176 | 8 | (48) |
| Climber | .160 | 8 | (50) |
| Ladder | .108 | 5 | (48) |
| Balance Beams | .075 | 3 | (40) |
| Pullup Bars | .330 | 3 | (8) |
| Seesaw | .076 | 6 | (80) |
| Whirl | .333 | 9 | (28) |
| Sandbox | .097 | 6 | (64) |
| Baseball Field | .010 | 675 | (67500) |
| Football/Soccer Field | .011 | 396 | (36000) |
| Indoor Fitness Center | .81 | 810 | (1000) |

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(c) The minimum total of recreation points required of any development shall equal the sum of the recreation points assigned to each type of dwelling unit or lot proposed for that development in accordance with the following (The methodology for determining the assignment of recreation points to residential type is set forth in Appendix G.):

| TYPE OF RESIDENCE (By Use Classification) | POINTS PER DWELLING UNIT |
|--|---------------------------------|
| 1.100 Single Family detached | 10.39 |
| 1.120 Includes mobile home parks | 11.25 |
| 1.200 Two-family residences | 10.39 |
| 1.300 Multi-family residences | |
| One Bedroom | 5.94 |
| Two Bedroom | 9.47 |
| Three or more Bedroom | 11.81 |
| 1.34 Single-Room Occupancy | 2.97 |

With respect to residential subdivisions other than architecturally integrated subdivisions, each lot that is large enough for only a single dwelling unit or that is limited by restrictive covenants to development only with a single dwelling unit shall be deemed to house one single-family detached dwelling unit. Subject to Section 15-197, lots that are large enough to accommodate more than one dwelling unit and are not so limited by restrictive covenants shall be deemed to house the largest number of two-bedroom multi-family units that could be approved under this chapter. **(AMENDED 10/10/00)**

(d) The Board recognizes that some developments will contain such a small number of dwelling units that the active recreational areas and facilities required pursuant to this section would be of minimal practical value and that maintenance of such areas for so small a development would likely prove problematic. Therefore, the following types of residential developments shall not be required to provide active recreational areas and facilities under this section but shall be required to pay to the town's open space and recreational facilities fund a fee in lieu thereof in accordance with Section 15-203 if the town determines that it will be feasible to provide active recreational areas and facilities on land that can reasonably be expected to serve the residents of such developments:

- (1) Unsubdivided developments that are small enough so that the minimum amount of recreation points required of such developments is not more than 80. **(AMENDED 2/24/87)**
- (2) Subdivided residential developments of less than fifteen dwelling units. **(AMENDED 06/27/95)**
- (3) For purposes of this subsection, the term "development" refers to the entire project developed on a single tract or contiguous multiple tracts under common ownership or control, regardless of whether the development is constructed in phases or stages. **(AMENDED 2/24/87)**

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(e) If the proposed development contains land subject to the provisions of 15-198(e), then a bike and pedestrian path that has the potential of connecting with similar type facilities on adjoining tracts that also have lands subject to the provisions of 15-198(e) shall be provided within this area, unless the permit issuing authority concludes that such a bike and pedestrian path would be environmentally undesirable or economically unfeasible. **(AMENDED 06/27/95)**

(f) Play equipment suitable for children under 12 should comprise at least 10% of the total required recreation points of single-family units and 5% of the points required of multi-family units in a development. Residential developments consisting of solely single-room occupancy units shall be exempt from the requirement to provide play equipment suitable for children. **(AMENDED ON 10/10/00)**

(g) Active recreational facilities and areas should be located throughout the development so that they can be reached safely and easily by their anticipated users. Such facilities and areas should be on land that is suitable for the intended use, have a minimum of 1200 square feet per area, and be sufficiently screened to minimize the impacts on adjacent residences.

(h) When the cost of the land associated with recreational facilities is included in calculating the recreational points for such facilities under this section, then such land may generally not also be credited toward the fulfillment of the mandatory open space requirements set forth under Section 15-198. Exceptions to this policy are as follows:

- (1) Play fields, including without limitation baseball fields, soccer fields, and football fields;
- (2) Bike and pedestrian paths constructed pursuant to subsection (e) of this section. (Only the area that is within the width of the dedicated easement for the bike and pedestrian area is subject to the double counting provision.)
(AMENDED 06/27/95)

(i) **(AMENDED 4/8/03; REPEALED 6/12/07)**

ARTICLE XIV

STREETS AND SIDEWALKS

Section 15-216 Street Width, Sidewalk, and Drainage Requirements in Subdivisions
(AMENDED 08/27/96)

(a) Minor and local streets where the grade does not exceed 8% may be constructed without curb and gutter in accordance with the standards set forth in subsection (b). All other streets shall be constructed in accordance with the standards set forth in subsection (c).
(AMENDED 05/12/98)

(b) Subject to subsections (d), (e), and (f), streets constructed without curb and gutter shall conform to the following standards as well as the specifications referenced in Section 15-219. To the extent practicable, the side slope of the drainage swale shall not exceed 4:1 on the street side and on the back side shall not exceed 3:1. When necessary, the minimum right-of-way shall be expanded to accommodate the proper construction of the travel lane, shoulders, swales, and (if applicable) a sidewalk within the right-of-way.

| TYPE STREET with Swales | MINIMUM ROW WIDTH | MINIMUM PAVEMENT WIDTH | BIKE LANES | MINIMUM SHOULDER 1 WIDTH 2 | SIDEWALK REQUIREMENT |
|----------------------------|-------------------------|------------------------------|---------------|---|-------------------------|
| MINOR | 47' | 18' | NONE | 6' 8' | NONE |
| LOCAL | 47' | 20' | NONE | 6' 8' | ONE SIDE |

(AMENDED 11/19/96; 05/12/98)

(c) Subject to subsections (d), (e), and (f), collector streets and other streets not constructed according to the requirement of subsection (b) shall conform to the requirements of this subsection and the specifications referenced in Section 15-219. Only standard 90⁰ curb may be constructed, except that roll-type curb may be authorized by the permit issuing authority. Street pavement width shall be measured from curb face to curb face where 90⁰ curb is used, and from the back of one curb to the back of the opposite curb where roll-type curb is used.

| TYPE STREET with Curb & Gutter | MINIMUM ROW WIDTH | MINIMUM PAVE- MENT WIDTH | BIKE LANES | SIDEWALK REQUIREMENT |
|-----------------------------------|------------------------|-----------------------------|-------------------|-------------------------|
| ALLEY (One-way) | 20' | 12' | NONE | NONE |
| Minor | 37' | 18' | NONE | NONE |
| Local | 43' | 20' | NONE | ONE SIDE |
| Subcollector | 50' | 26' | NONE | BOTH SIDES |
| Collector | 60' | 34' | BOTH SIDES | BOTH SIDES |
| Arterial | NCDOT Standards | NCDOT Standards | BOTH SIDES | BOTH SIDES |

(AMENDED 11/19/96; 05/12/98)

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(d) The Board may allow a deviation from the standards set forth in subsections (b) and (c) to allow the construction of a street divided by a landscaped median with one-way traffic proceeding in opposite directions on either side of the median. The Board may allow such a street if it finds that, if completed as proposed, such a street will (i) adequately and safely serve the functions streets are designed to serve, and (ii) will not impose on the town any undue or unreasonable costs or burdens relating to repair and maintenance.

(e) The Board may allow a deviation from the right-of-way minimums set forth in subsections (b) and (c) if it finds that (i) the deviation is needed because in order for a development to be served by a public street the street must be constructed within an area that is not of sufficient width to comply with the right-of-way criteria set forth above, (ii) a street that meets the pavement width criteria and substantially complies with the other criteria set forth above can be constructed within the right-of-way that can be made available; and (iii) that the applicant show that he has made a reasonable effort and attempted to purchase the necessary right-of-way.

(f) The Board may allow a deviation from the standard right-of-way minimums set forth in subsections (b) and (c) if it finds that the developer has obtained an agreement from the utility companies whose lines will need to be located within a street right-of-way to install such lines in a single trench or in some other fashion that allows the street right-of-way to serve all of its intended purposes with a lesser width than that specified in subsections (b) and (c).

(g) The sidewalks required by this section shall be at least five feet wide and constructed with concrete according to the specification set forth in Appendix C, except that the permit issuing authority may permit the installation of walkways constructed with mortarless laid brick pavement according to specifications set forth in Appendix C when it concludes that: **(AMENDED 12/08/98)**

- (1) Such walkways shall serve the residents of the development as adequately as concrete sidewalks; and
- (2) Such walkways shall be more environmentally desirable or more in keeping with the overall design of the development.

(h) Whenever the permit issuing authority finds that a means of pedestrian access is necessary from the subdivision to schools, parks, playgrounds, or other roads or facilities and that such access is not conveniently provided by sidewalks adjacent to the streets, the developer may be required to reserve an unobstructed easement of at least ten feet in width to provide such access.

(i) In subdivision developments that abut a public street, sidewalks shall be constructed adjacent to such street if a sidewalk in that location is required by the officially adopted town sidewalk master plan. Whenever possible, such sidewalk shall be constructed within the public right-of-way.

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(j) The sidewalks required by this section along streets with curb and gutter shall be constructed with a planting strip at least three feet in width, unless the permit-issuing authority allows the strip to be omitted or constructed at a lesser width upon a finding that such deviation from the presumptive standard is warranted to avoid environmental damage or to promote public safety. For purposes of this subsection, a planting strip shall mean a strip of land located between the back of the curb and the walkway. Such planting strips shall be planted with grass or otherwise landscaped. (AMENDED 11/19/96; 12/08/98)

Section 15-216.1 Street Widths, Sidewalk and Drainage Requirements in Certain Developments (AMENDED 05/06/03)

(a) When any tract of land is developed under circumstances requiring the issuance of a special or conditional use permit, the street and road design requirements for streets other than collector streets that would otherwise be determined in accordance with the provisions of Sections 15-216 and 15-221 may be modified, by approval of the permit-issuing authority, to alternative street width and construction specifications, sidewalk and drainage requirements, as illustrated in Appendix C, for developments that

- 1) involve the extension of, or connection to, existing Town streets, the construction specifications of which do not meet the minimum standards established in Section 15-216 in association with Section 15-210 Street Classification;
- 2) meet the following low-impact development criteria:
 - a) preserves open space and minimizes land disturbance;
 - b) protects natural systems and preserves natural processes (including, but not limited to, drainage ways, vegetation, soils, and other sensitive areas);
 - c) maximizes the incorporation of natural site elements (including, but not limited to, wetlands, stream corridors, and mature forests), and;
 - d) decentralizes and micromanages stormwater at its source to the maximum extent practicable.
- 3) include a minimum of 15 percent affordable housing units (as defined in Section 15-182.4(a)).

(b) Streets constructed in accordance with this Section shall conform to the following standards as well as specifications presented in Appendix C.

| Type Street Alternative | Minimum ROW Width | Minimum Pavement Width | Bike Lanes | Minimum Shoulder Width | Shoul- | Sidewalk Requirement | Re- |
|-------------------------|-------------------|------------------------|------------|------------------------|--------|----------------------|-----|
| Local | 59' | 20' | NONE | 9 (2) | | ONE SIDE | |
| Subcollector | 73' | 26'(1) | NONE | 9 (2) | | BOTH SIDES (3) | |

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- (1) Minimum pavement width may include the concrete grade beam illustrated in Standard Drawing No. 27, or structural equivalent as approved by the Town Engineer.
 - (2) Nine feet of width may include a 3-foot planting strip, 5-foot sidewalk, and 1-foot separation between sidewalk and drainage/water quality structure.
 - (3) May be modified by the permit-issuing authority.
 - (4) Construction requirements as required in Appendix C and D of the Land Use Ordinance, unless otherwise specifically modified by these provisions or the notes included on standards in Appendix C and D.
- (c) The permit-issuing authority may reduce the sidewalk requirement for subcollector streets meeting the alternative street standard from both sides to one side of the road if
- a. The development contains a parallel system that is integrally designed and provides pedestrian access to the interior of the site;
 - b. Any new public street passing through the development and the bulk of the facilities and activities are to occur on one side of the road;
 - c. Any new public street connects to an existing street that does not meet public street standards and where the site conditions indicate that the full upgrade of the street to the town standards would not be practicable; and
 - d. The developer is participating in off-site construction of, or improvements to public sidewalks that will connect the new development with the town's sidewalk system.

Section 15-217 General Layout of Streets.

(a) To the extent practicable, all streets shall be interconnected. Cul-de-sacs shall not be used unless the topography of the land does not allow a design that would make an interconnecting street practicable. **(AMENDED 09/16/97; 09/28/99)**

(b) All permanent dead-end streets [as opposed to temporary dead-end streets, see subsection 15-214(d)] shall be developed as cul-de-sacs in accordance with the standards set forth in subsection (c), unless construction of such cul-de-sacs is not reasonably possible given such factors as steep slopes or right-of-way limitations. Under such circumstances, the town may approve alternative designs that will provide a safe and convenient means for vehicular traffic to turn around (alternatives are suggested in Appendix C, Standard Drawing No. 19). Except where no other practicable alternative is available, such streets may not extend more than 550 feet (measured to the center of the turn-around). **(AMENDED 09/27/94, 09/16/97)**

(c) The right-of-way of a cul-de-sac shall have a radius of 60 feet if constructed without curb and gutter or a radius of 52 feet if constructed with curb and gutter. The radius of the paved portion of the turn-around for streets constructed without curb and gutter shall be 42' (measured to the outer edge of pavement) and for streets constructed with curb and gutter shall be 44.5' (measured to the back of the outer curb). If a developer chooses to provide an unpaved center island in the cul-de-sac, the island shall be landscaped and shall not be dedicated to the public; it shall remain under the ownership and control of the developer (or his successor) or a homeowners

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association or similar organization that satisfies the criteria established in Section 15-201. Cul-de-sacs containing center islands shall have a minimum pavement width of 18 feet if constructed without curb and gutter or 20 feet if constructed with curb and gutter (measured from inner edge of pavement to face of curb). Mountable 45° curbing shall be installed around the island in accordance with Town of Carrboro design specifications. Minimum design and construction specifications for cul-de-sacs are set forth in Appendix C.

Asymmetrical cul-de-sacs may be allowed with the approval of the public works director, town engineer, fire chief, and the applicable permit issuing authorities. **(AMENDED 2/20/90; 08/08/95; 09/16/97)**

(d) Half streets (i.e., streets of less than the full required right-of-way and payment width) shall not be permitted except where such streets, when combined with a similar street (developed previously or simultaneously) on property adjacent to the subdivision, creates or comprises a street that meets the right-of-way and pavement requirements of this chapter. **(AMENDED 09/16/97)**

(e) Streets shall be laid out so that residential blocks do not exceed 1,000 feet, unless no other practicable alternative is available. **(AMENDED 09/16/97)**

(f) Alleys shall not intersect with any arterials and shall meet the “Entrances to Streets” standards of Section 15-213. Alley radii at street intersections shall not be less than 15 feet. Alleys may run adjacent to lot line boundaries only and not parallel and adjacent to street right-of-way or front property boundaries. In determining conformance with Section 15-184(a), Setback Requirements, the right-of-way lines associated with alleys shall be regarded as lot boundary lines and not street right-of-way lines. **(AMENDED 09/27/94; 09/16/97)**

(g) To the extent practicable, portions of subcollector and collector streets that consist of stretches of 800 feet or more uninterrupted by intersections suitable for stop signs shall contain design features intended to discourage speeding and cut-through traffic, including but not limited to one or more of the following:

- (1) Curves with radius of 800 feet or less; or
- (2) Design features described in the town’s Residential Traffic Management Plan.

(AMENDED 09/16/97)

Section 15-218 Street Intersections.

(a) Streets shall intersect as nearly as possible at right angles, and no two streets may intersect at less than 60°. Not more than two streets shall intersect at any one point, unless the public works director certifies to the permit issuing authority that such an intersection can be constructed with no extraordinary danger to public safety.

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(b) Whenever possible, proposed intersections along one side of a street shall coincide with existing or proposed intersections on the opposite side of such street. In any event, where a center line offset (jog) occurs at an intersection, the distance between centerlines of the intersecting streets shall be not less than 150 feet except as provided in subsection (d). **(AMENDED 4/26/88)**

(c) Except as otherwise provided in subsection (d) and (e): **(AMENDED 4/26/88; REWRITTEN 1/26/10)**

- (1) No two streets may intersect with any other street on the same side at a distance of less than 400 feet measured from centerline to centerline of the intersecting street.
- (2) When the intersected street is an arterial, the distance between intersecting streets shall be at least 1,000 feet.

(d) The provisions of this section shall not operate to prohibit any property from having direct access onto an adjacent public street, and when a literal application of the provisions of this section would otherwise prohibit all such access, the permit-issuing authority may allow the minimum deviation from the requirements of this section that is necessary to provide reasonable access. **(AMENDED 4/26/88)**

(e) Notwithstanding the foregoing, two streets may intersect with another street on the same side at a distance of less than 400 feet, measured from centerline to centerline of the intersecting streets, if the street with which the two streets intersect is connected to a street within a village mixed use development and a development itself is adjacent to a village mixed use development. However, in no event, may the two streets intersect at a distance of less than 125 feet. **(AMENDED 1/26/10)**.

Section 15-219 Construction Standards and Specifications.

Construction and design standards and specifications for streets, sidewalks, and curbs and gutters are contained in Appendix C, and all such facilities shall be completed in accordance with these standards.

Section 15-220 Public Streets and Private Roads in Subdivisions.

(a) Except as otherwise provided in this section, all lots created after the effective date of this section shall abut a public street at least to the extent necessary to comply with the access requirement set forth in Section 15-211. For purposes of this subsection, the term “public street” includes a pre-existing public street as well as a street created by the subdivider that meets the public street standards of this chapter and is dedicated for public use. Unless the recorded plat of a subdivision clearly shows a street to be private, the recording of such a plat shall constitute an offer of dedication of such street. **(AMENDED 2/14/84)**

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(b) Architecturally integrated residential subdivisions containing either twenty-five or more units, or consisting of four or more multi-family townhomes, may be developed with private roads that do not meet the public street and sidewalk standards of this chapter as long as: **(AMENDED 11/26/85; 6/25/02)**

- (1) The proposed development will have direct access onto a public street or, if the tract has access to a public street only via a private road, such private road is improved to public street standards;
- (2) No road intended to be private is planned to be extended to serve property outside that development; and
- (3) The standards applicable to unsubdivided developments set forth in Section 15-221 and 15-222 are complied with.

(c) Subdivisions containing any number of lots may be developed with private roads that do meet the public street and sidewalk standards of this chapter but that are not intended for dedication to the public so long as:

- (1) The proposed development will have direct access onto a public street or, if the tract has access to a public street only via a private road, such private road is improved to public street standards;
- (2) No road intended to be private is planned or expected to be extended to serve property outside the development; and
- (3) The subdivider demonstrates to the reasonable satisfaction of the Board that the private roads will be properly maintained.

(d) A subdivision in which the access requirement of Section 15-211 is satisfied by a private road that meets neither the public street standards nor the standards set forth in Section 15-221 may be developed so long as, since the effective date of this chapter, not more than three lots have been created out of that same tract.

- (1) The intent of this subsection is primarily to allow the creation of not more than three lots developed for single-family residential purposes. Therefore, the permit-issuing authority may not approve any subdivision served by a private road authorized under this subsection in which one or more of the lots thereby created is intended for (i) two-family or multi-family residential user or (ii) any non-residential use that would tend to generate more traffic than that customarily generated by three single-family residences.
- (2) To ensure that the intent of this subsection is not subverted, the permit-issuing authority may, among other possible options, require that the approved plans show the types and locations of buildings on each lot or that

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the lots in a residential subdivision served by a private road authorized under this subsection be smaller than the permissible size lots on which two-family or multi-family developments could be located or that restrictive covenants limiting the use of the subdivided property in accordance with this subsection be recorded before final plat approval.

(e) No final plat that shows lots served by private roads may be recorded unless the final plat contains the following notations:

- (1) “Further subdivision of any lot shown on this plat as served by a private road may be prohibited by the Carrboro Land Use Ordinance.”
- (2) “The policy of the Town of Carrboro is that, if the town improves streets (i) that were never constructed to the standards required in the Carrboro Land Use Ordinance for dedicated streets, and (ii) on which 75% of the dwelling units were constructed after July 1, 1979, 100% of the costs of such improvements shall be assessed to abutting landowners.”

(f) The recorded plat of any subdivision that includes a private road shall clearly state that such road is a private road. Further, the initial purchaser of a newly created lot served by a private road shall be furnished by the seller with a disclosure statement outlining the maintenance responsibilities for the road, in accordance with the requirements set forth in G.S. 136-102.6. The intention of this subsection is to afford the same protection to purchasers of lots on private roads within the town as is provided to purchasers of lots outside the town by G.S. 136-102.6.

(g) For purposes of this section, a private road meets the public street and sidewalk standards of this chapter if it is designed and constructed and sufficient setbacks are provided so that, if intended for dedication, it could be accepted as a public street in conformity with the requirements of this chapter. **(AMENDED 11/26/85)**

(h) Notwithstanding the other provisions of this section, the town may prohibit the creation of a private road if the creation of such a road would avoid the public street interconnection requirements set forth in Sections 15-214 and 15-217(a). **(AMENDED 6/25/02)**

Section 15-220.1 Design Standards for Village Mixed Use Developments (AMENDED 5/28/02)

- (a) Village mixed use developments may be designed in accordance with the North Carolina Department of Transportation Traditional Neighborhood Development (TND) Guidelines, August 2000. Where specific NCDOT TND design guidelines have been established, these may supercede any related street design standards contained in this Ordinance, as well as standards and guidelines for utilities, landscaping and similar considerations. In the absence of TND specific design guidelines, the existing standards, criteria, guidelines or policies shall be applied.

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- (b) For purposes of implementing the NCDOT TND Guidelines, a village mixed use development shall be deemed to be a “classic” TND.

Section 15-221 Road and Sidewalk Requirements in Unsubdivided Developments.

(a) Within unsubdivided developments, all private roads and access ways shall be designed and constructed to facilitate the safe and convenient movement of motor vehicle and pedestrian traffic. Width of roads, use of curb and gutter, and paving specifications shall be determined by the provisions of this chapter dealing with parking (Article XVIII) and drainage (Article XVI). To the extent not otherwise covered in the foregoing articles, and to the extent that the requirements set forth in this article for subdivision streets may be relevant to the roads in unsubdivided developments, the requirements of this article may be applied to satisfy the standards set forth in the first sentence of this subsection.

(b) Whenever (i) a lot is proposed to be developed residentially for more than four dwelling units or non-residentially in such a fashion as to generate more than 40 vehicle trips per day, and (ii) if the lot were to be subdivided, a street would be required running through the lot to provide a connection between existing or planned adjacent streets in accordance with the provisions of Sections 15-214 and 15-217(a), then the developer shall be required to construct and dedicate the same street that would have been required had the property been subdivided.

(AMENDED 6/25/02)

(c) In all unsubdivided residential developments, sidewalks shall be provided linking dwelling units with other dwelling units, the public street, and on-site activity centers such as parking areas, laundry facilities, and recreational areas and facilities. Notwithstanding the foregoing, sidewalks shall not be required where pedestrians have access to a road that serves not more than nine dwelling units. **(AMENDED 4/24/84)**

(d) Whenever the permit issuing authority finds that a means of pedestrian access is necessary from an unsubdivided development to schools, parks, playgrounds, or other roads or facilities and that such access is not conveniently provided by sidewalks adjacent to the roads, the developer may be required to reserve an unobstructed easement of at least ten feet to provide such access.

(e) In unsubdivided nonresidential developments that abut a public street, sidewalks shall be constructed adjacent to such street if a sidewalk in that location is required by the officially adopted town sidewalk master plan. Whenever possible, such sidewalk shall be constructed within the public right-of-way.

(f) The sidewalks required by this section shall be at least five feet wide, except that, where practicable, the sidewalks in the B-1(c), B-1(g), B-2, and C-T zoning districts shall be at least ten feet wide. Sidewalks are to be constructed according to the specifications set forth in Appendix C, except that the permit issuing authority may permit the installation of walkways constructed with other suitable materials when it concludes that: **(AMENDED 12/08/98; 4/8/03)**

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- (1) Such walkways would serve the residents of the development as adequately as concrete sidewalks; and
- (2) Such walkways could be more environmentally desirable or more in keeping with the overall design of the development.

Appendix C

SPECIFICATIONS FOR DESIGN AND CONSTRUCTION (AMENDED 04/03/90)

C-1. Design Speed, Sight Distance, Centerline Radius

| | MINOR | LOCAL | SUBCOLLECTOR | COLLECTOR | ALLEY |
|---|---------------|---------------|---------------|---------------|---------------|
| DESIGN SPEED | 25 MPH | 25 MPH | 30 MPH | 30 MPH | 15 MPH |
| MINIMUM SIGHT DISTANCE ON VERTICAL CURVE | 150' | 150' | 200' | 200' | 110' |
| MINIMUM CENTER-LINE RADIUS | 150' | 150' | 200' | 230' | 90' |

(AMENDED 09/27/94; 11/28/06; 11/27/07)

(a) The design speed, sight distance and centerline radii shall be constructed according to the table above. For stop conditions, sight distance may be designed per the criteria listed in the NCDOT Subdivision Roads Minimum Construction Standards manual (2000) or the most recent version of that document, so long as such standards will result in a street layout with a demonstrable environmental benefit. (AMENDED 11/27/07)

C-2. Cut and Fill Slopes

Cut and fill slopes on any street right-of-way may not exceed 2:1.

C-3. Sight Distances at Intersections

- (a) At non-stop intersections, the intersection shall be constructed so that a person standing at a location on the centerline of any street 90 feet from the intersection of the street centerlines has an unobstructed view to a point located on the centerline of the intersecting street 90 feet (in either direction) from the intersection of the street centerlines. See Standard Diagram No. 1.
- (b) Subject to subsection (c), at stop intersections, the intersection shall be constructed so that a person standing 10 feet back of the intersection of right-of-way lines on the stop street has an unobstructed view to a point on the right-of-way line of the intersecting through street located 70 feet from the intersection of the right-of-way lines. See Standard Diagram No. 2.
- (c) At stop intersections where a residential street intersects with a state-maintained primary road (U.S. or N.C.), the intersection shall be constructed so that a person standing 30 feet back of the intersection of right-of-way lines on the stop street has an unobstructed view to a point on the centerline of the through street located 150 feet from the intersection of the street right-of-way lines. See Standard Diagram No. 3.

APPENDIX C SPECIFICATIONS FOR DESIGN AND CONSTRUCTION**C-4. Radius at Street Intersections**

At street intersections, the intersections of the paved surfaces shall be rounded with a minimum radius as shown in Standard Diagram No. 4 and No. 5. Where streets intersect at less than right angles, a greater radius may be required.

C-5. Clearing and Grubbing

Clearing and grubbing shall be performed within the limits shown on the plans. All timber, brush, roots, stumps, trees, or other vegetation cut during the clearing operations shall become the contractor's responsibility to dispose of, and shall be either removed from the project by him, or satisfactorily disposed of on-site (See Carrboro Fire Department for burning permit).

C-6. Grading and Compaction

Streets shall be graded in accordance with the lines and grade set by the engineer. Before placing curb and gutter or base on the graded subgrade, the subgrade shall be compacted to 100% ASSHO T99 for a depth of 6 inches and then shall be proof rolled in the presence of the engineer. Places that are found to be loose, or soft, or composed of unsuitable materials, whether in the subgrade or below it, must be dug out and refilled with suitable material. All embankments or fills shall be made in one-foot horizontal lifts of suitable material. The fill shall be rolled with a sheepsfoot roller after each lift, followed by a wheel roller, each weighing not less than eight tons.

C-7. Street Base

Base course for streets shall generally be 8 inches thick, unless otherwise directed by the public works director, and shall be crushed stone conforming to N.C. DOT Type ABC stone. The stone base course shall be placed in 4 inch layers watered as necessary, and compacted to 100% AASHO T99. The contractor shall be responsible for keeping the stone base free of contamination from clay or other foreign materials. Handling and placement of stone base shall all be in accordance with N.C. DOT specifications.

C-8. Street Surfaces.

The asphalt surface course shall meet N.C. DOT specs for Type I-2 asphalt. The asphalt shall be placed in one 2-inch layer, and shall be handled and placed in accordance with N.C. DOT specifications.

C-9. Pavement Section Variations

Sections C-6, C-7, and C-8 set the standards that shall apply under normal soils conditions. However, where soils are unusually good or unusually unstable, the public works director may allow or require the developer to have soil tests run and a pavement design made by a qualified soils engineer. Under these circumstances, the public works director may allow

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pavement sections constructed to lesser standards than those set forth above (for good soils) or require pavement sections constructed to greater standards than those set forth above (for unstable soils).

C-10. Street Cross Sections

Streets shall be constructed and utilities located in accordance with Standard Drawing No. 6 or No. 7.

C-11. Curb and Gutter

(a) The concrete curb and gutter shall be constructed according to the lines and grades established by the engineer. The concrete shall meet the N.C. State Highway requirements, Section 900. The curb and gutter shall be 30 inches wide, and shall have a vertical curb face. The forms shall be of metal, free of marks or kinks, and shall be rigidly held in position. The engineer shall approve the positioning of the forms before concrete is poured. The concrete shall be placed in the forms in a manner to prevent segregation, and tamped or vibrated sufficiently to prevent honeycombs. The concrete shall be finished smooth and even by means of rollers or floats. Expansion joints shall be provided every 300 feet, and false joints every 10 feet.

(b) Curb and gutter shall be constructed in accordance with Standard Drawing No. 8.

C-12. Sidewalks (AMENDED 08/27/96)**CONCRETE**

Concrete sidewalk construction standards shall be similar to street construction standards, with subgrade compacted to 100% AASHTO T99. Concrete sidewalks shall be 4 inches thick (increasing to 6 inches thick at driveway entrances), with alternative paving surfaces constructed to withstand 3000 to 5000 psi. The minimum width of sidewalk shall be constructed to standards as addressed in Article XIV. Expansion joints shall be provided every 30 feet, either side of driveway connections and permanent structures with false joints at 5 foot intervals. **(AMENDED 12/08/98)**

BRICK

Requirements for mortarless laid brick pavement construction, when deemed necessary by the Director of Public Works, shall be modified to accommodate the anticipated usage of the facility. All driveway connections shall be a minimum of 6 inches thick - 3000 psi concrete to the required driveway dimensions from the pavement edge to the extent of the right-of-way and/or property line. A minimum 24 inch flare shall be required at the driveway intersection with the roadway pavement edge, where there is no curb.

The sidewalk sub-grade shall be shaped to conform to the lines, grades and typical sections shown on approved plans. All existing vegetation shall be stripped from the ground surface wherever shaping of the sidewalk sub-grade is required. All unsuitable materials,

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boulders, and all vegetative matter shall be removed and replaced with suitable materials. "Soft spots", such as utility trenches or other detected unsuitable load supporting soils shall be removed and refilled with suitable compacted material. The entire sub-grade shall be compacted to a density equal to at least 100 percent of that obtained by compacting a sample of the material in accordance with AASHTO - T99 as modified by the North Carolina Department of Transportation.

Wherever sub-surface drainage problems are anticipated or discovered during construction, the developer/contractor shall provide adequate sub-surface drainage. The trench shall be excavated to the dimensions, depth, line and grade established by the engineer or as directed by the Director of Public Works. Perforated piping shall be laid, coupled securely and backfilled cover and around the pipe with #67 stone or other approved fine aggregate.

Where drainage is to be piped away from the sub-surface drainage system, then a solid pipe without perforations shall be used to the outlet. At locations shown on the plans or as directed by the engineer or the Director of Public Works, the sub-drain system shall be connected to the existing drainage structures or the concrete pads at the outlet end of the sub-drain. Where corrugated plastic pipe is to be used and the outlet is to be through the curb face or to a concrete pad, a minimum 3 feet length of equal diameter PVC piping shall be connected to the corrugated plastic pipe with a suitable fitting. Care shall be taken when backfilling so as to not disturb the installing piping. All earthen backfill shall be firmly tamped.

A minimum 4 inches thick aggregate base course (ABC) shall be applied to all sidewalk paver sub-grade placement areas. The aggregate material shall be placed carefully to minimize segregation of stone and fines. The aggregate base course shall be either watered or dried to obtain optimum moisture content and compacted to at least 100 percent of that obtained by compacting a sample of material in accordance with AASHTO - T180 as modified by the North Carolina Department of Transportation. The aggregate base course surface shall be shaped with a minimum ¼ inch to ½ inch per foot cross slope from the back edge of the sidewalk to the curb edge or if a shoulder/swale constructed roadway, the slope would then be directed to the drainage swale.

The use of edge restraints are necessary with mortarless brick pavements as they hold the pavers together, prevent spreading and movement of pavers due to horizontal surface loading. Only brick or stone embedded in concrete or cast-in-place concrete shall be used for edge restraints conforming to the finished sidewalk surface elevation. All edge restraints shall be installed perpendicular to the brick paver surface. Intermediate restraints shall be used at all interruptions of the brick paver surface and where there are sloped or curved locations. Where mortared brick pavers are required, expansion joints shall be provided every 20 linear feet and along fixed objects such as walls or where directed.

Brick pavers are to be set in a 1 to 1.5 inch compacted sand setting bed over the compacted aggregate base course. The finished brick surface shall have a minimum ¼ inch to ½ inch per foot cross slope from the back edge of the sidewalk to the curb edge. If it is a

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shoulder/swale constructed roadway, the slope shall then be directed to the drainage swale. The brick paver surface pattern shall be of the running bond type and perpendicular to the edge restraints. After brick pavers have been laid between the edge restraints, sand shall be broadcast over the paver surface. The loose sand and brick pavers shall be compacted with a vibratory plate tamp to lock-in paver joints with sand and to set the brick pavers in the underlying sand sitting bed. The remaining sand on the paver surface should be broomed into any other remaining open joints or voids and excess removed.

All brick pavers shall be solid red common wire cut units with a dimension of 2.25 inches x 3.75 inches x 7.5. Reference: Brick Sidewalk Standard Drawings No. 24 and No. 25.

C-13. Wheel Chair Ramps

Where required, wheel chair ramps shall be constructed in accordance with Standard Drawing No. 9.

C-14. Storm Water Runoff Control

(a) All stormwater drainage facilities other than building foundation and roof drain pipes shall be constructed of materials that meet minimum standards contained in the current version of the N.C. Department of Transportation's Standard Specifications for Roads and Structures, except that culverts described in subsections 1032-1(A) (Plain Concrete Culvert Pipe) and 1033-7 (Vitrified Clay Culvert Pipe) shall not be permitted. **(AMENDED 04/03/90)**

(b) All stormwater drainage facilities shall be designed and installed in accordance with the N.C. Department of Transportation's specifications and the standard specifications and drawings contained herein. In case of conflict, the more stringent specifications shall prevail. **(AMENDED 04/03/90)**

(c) With the exception of building foundation and roof drain pipes, all stormwater drainage culverts, when installed, shall have a minimum cover of 12 inches, unless the town engineer and public works director allow less extensive cover. **(AMENDED 04/03/90)**

C-15 Sedimentation Control

Road shoulders, swales, back-of-curbs, and cut and fill banks shall be completely dressed up by the contractor and seeded as soon as possible. The seeding mixture and application rate shall be approved by the Orange County Erosion Control Officer.