

Chapter 10: Infrastructure and Design

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Section 10.1 Purpose

This chapter sets forth the design requirements for subdivisions, roads, utilities, easements, and erosion control measures.

Article I. General Subdivision Design Standards

Section 10.2 General Provisions

- A. Each subdivision shall contain the improvements specified in this Article, which shall be installed in accordance with the requirements of this Ordinance and paid for by the subdivider, unless other means of financing are specifically stated in this Ordinance.
- B. Land shall be dedicated and reserved in each subdivision as specified in this Article.
- C. Each subdivision shall be constructed in accordance with minimum county, state and federal design standards, as applicable.
- D. The name of the subdivision and the names of the roads within the subdivision shall NOT duplicate nor closely approximate the name of an existing subdivision nor any existing roads within Iredell County.
- E. Design standards set out in this Ordinance may be waived or modified for Planned Unit Developments (PUDs) provided that the intent of these regulations is NOT nullified or lessened and provided that sufficient proof is given substantiating the adequacy of the alternative design and given that the requirements of Chapter 3, R 20 of this Ordinance are met.

Section 10.2.1 Subdivision Thresholds

The following shows the various requirements that apply to new subdivisions within Iredell County based on the number of lots. This is a thumbnail view only, the remaining portions of this Chapter explain each of these requirements in detail.

Minimum of 11 Lots

- Iredell County Fire Marshal's office review in regard to ISO ratings

Minimum of 30 Lots

- Iredell County Fire Marshal's office review in regard to ISO ratings
- TIA (commercially zoned property most likely affected)
- Water connectivity if within distance specified
- Thirty (30) foot secondary access easement for Fire Department access

More than 100 Lots

- Iredell County Fire Marshal's office review in regard to ISO ratings
- TIA
- Existing Conditions Survey
- Water connectivity (if within distance specified)
- Thirty (30) foot secondary access easement for Fire Department access

Section 10.2.2 Existing Conditions & Suitability of Land

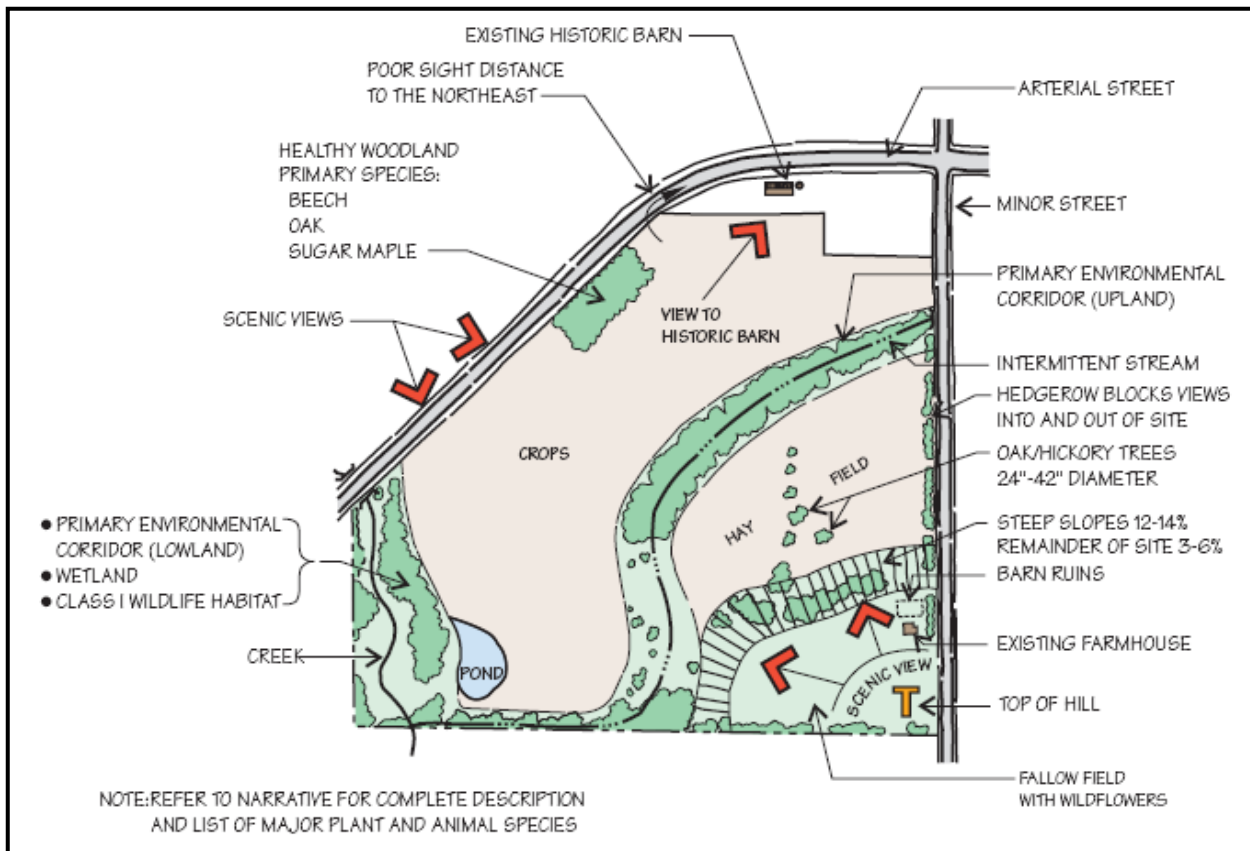
A. Preservation of Trees & Natural Features Encouraged

1. Significant forest stands, natural vegetation, specimen trees, severe natural topography, drainage features and water courses are encouraged to be preserved to the extent that is reasonable and practical while otherwise NOT reasonably prohibiting development.
2. Forested and vegetated areas whose physical site conditions render them unsuitable for development should be set aside as conservation areas or as open space. Wooded sites should be developed with careful consideration of the natural characteristics of the site. When portions of forested stands must be developed, careful consideration should be given to preserving wooded perimeters or the most desirable natural features in order to retain the aesthetic or visual character of the site. Isolated pockets of existing trees or specimen trees should be protected as a valuable asset of the property.

Section 10.2.3 Existing Conditions Survey

Existing Conditions Surveys are required at the Concept Plan stage for all Major Subdivisions with one hundred (100) or more lots. The Existing Conditions Survey must show existing conditions including topography (5ft min.), extended slopes greater than twenty-five percent (25%), large stands of trees, any known trees over thirty-six (36) inches in diameter or specimen trees, significant rock outcroppings, floodplains, floodways, wetlands, perennial streams, natural drainageways, lakes, other water bodies, dams, potential locations for community wells, and the presence of any known endangered species indicated in any surveys completed by the State of North Carolina or other governmental agency. This enables the reasonable and practical planned preservation of existing vegetation while considering unique site conditions.

FIG. 10.1 Example of an Existing Conditions Survey



Section 10.2.4 Perennial Stream Buffers

Any subdivision of land adjacent to a perennial stream as identified by the USGS shall provide a 30 foot undisturbed buffer along perennial waters.

Section 10.2.5 General Safety

- A. Land which has been determined by the Subdivision Administrator on the basis of engineering or other expert surveys to pose a risk to life or property by reason of its unsuitability for the use proposed shall NOT be platted for that purpose, unless and until the Subdivider has taken the necessary measures to correct said conditions and to eliminate said dangers.
- B. Areas that have been used for disposal of solid waste shall NOT be subdivided unless tests by the County Health Department, a structural engineer, and a soils expert determine that the land is suitable for the purpose proposed.
- C. Areas that have been used for domestic sludge application shall be required to have a soils test performed by a certified testing laboratory prior to the subdivision of land. The results of said soils test must confirm that the land is safe for the purposes proposed.

Section 10.2.6 Lots

- A. Minimum lot size requirements and setbacks are contained in and governed by the Zoning and Watershed sections of this ordinance. It is NOT permitted to average the lot areas in a subdivision to meet the minimum lot areas. However, Cluster Developments shall be allowed in accordance with Chapter 3, R5 of this Ordinance.
- B. All minimum lot dimensions may be increased in order to meet any applicable requirements of the Health Department.
- C. Residential Lot Area calculations shall NOT include any of the following:
 - Deeded road rights-of-way;
 - Road rights-of-way to be dedicated;
 - Road rights-of-way claimed by the NCDOT; and
 - Required landscaping buffers in accordance with 10.2.7.

Section 10.2.7 Lot Configuration

- A. Side lot lines shall be substantially at right angles or radial to road lines.
- B. Double-frontage lots shall be avoided wherever possible.
- C. All lots shall have a minimum road frontage of twenty-five (25) feet. Land-locked parcels that have no road frontage as shown on the Iredell County Mapping Department 1992 Parcel Boundary Line Maps (1967 Orthophotography) shall be allowed to divide a maximum of two (2) lots from that landlocked parcel. Said parcel shall be served by an easement of no less than twenty-five (25) feet in width and shall be legally described and recorded in the Register of Deeds.
- D. Panhandle lots, flag lots, and other irregular shaped lots shall NOT be approved by the Subdivision Administrator except in cases where such lots would:
 - 1. Not be contrary to the purpose of this Ordinance;
 - 2. Heighten the desirability of the subdivision; and
 - 3. Where necessary, enable a lot to be served by water and a waste disposal system.

All panhandle lots or flag lots shall have a minimum road frontage width of twenty-five (25) feet, and the panhandle shall have a maximum depth of 250 feet. At the end of the access strip, the lot shall then flare out until the minimum lot width has been met, at a minimum angle of forty-five (45) degrees (see figure 10.2). The access strip shall NOT be used to determine lot area or width or setback lines.

Figure 10.2 Panhandle Lot



Section 10.2.8 Buffering

Whenever a residential subdivision is located adjacent to an existing non-residential use in a nonresidential district which does NOT have a landscaping buffer in accordance with Section 5.2.1 of this Ordinance, the Subdivider shall provide such a buffer on the property of the subdivision. The buffer shall become part of the lot on which it is located, or in the case of commonly-owned property, shall be deeded to the homeowners' association. The purpose of a landscaping buffer is to create visual separation. The landscaping buffer shall be designed and installed in accordance with Section 5.2.1 of this Ordinance may NOT be counted as part of the required open space.

Section 10.2.9 School Sites on Land Use Plan

If the Board of Commissioners and Board of Education have jointly determined the specific location and size of any school sites to be reserved and if this information appears in an adopted comprehensive plan of the County, the Subdivision Administrator shall immediately notify the Board of Education whenever a sketch plan for a subdivision is submitted which includes all or part of a school site to be reserved. The Board of Education shall promptly decide whether it still wishes the site to be reserved. If the Board of Education does NOT wish to reserve the site, it shall so notify the Subdivision Administrator. If the Board does wish to reserve the site, the subdivision shall NOT be approved without such reservation. The Board of Education shall then have eighteen (18) months beginning on the date of final approval of the subdivision within which to acquire the site by purchase or by exercise of the power of eminent

domain. If the Board of Education has NOT purchased or begun proceedings to condemn the site within eighteen (18) months, the Subdivider may treat the land as freed of the reservation.

Article II. Road Design Standards

Section 10.3 Purpose

This article is intended to detail the regulations pertaining to the construction of new roads in Iredell County. This includes public and private streets in both residential and non-residential situations. The article also ties the impact of development to road design and ensures that new roads are built in correlation with the County's adopted transportation efforts and are planned in a comprehensive manner.

Section 10.4 Concurrence with Adopted Transportation Plans

If a road is identified for improvement by the North Carolina Department of Transportation (NCDOT) in an adopted plan such as the Iredell County Comprehensive Transportation Plan (CTP) or the Transportation Improvement Plan (TIP), the Iredell County Department of Planning and Development shall make every effort to accommodate the future plans through the development process.

Section 10.4.1 Applicability

The requirements of this section apply to sites that include any part of a street or thoroughfare, or include frontage on a designated street or thoroughfare as indicated on a CTP adopted by the Iredell County Commissioners, or the current state-adopted TIP.

Section 10.4.2 Relationship to Comprehensive Transportation Plan (CTP) or Transportation Improvement Program (TIP)

For newly established or expanded uses that require site plan review, and new or expanded subdivisions, right-of-way shall be reserved in the location and configuration shown on the appropriate plan or document. For the purposes of this ordinance, reservation shall mean that in no case shall structures, parking spaces or internal drives (other than driveways) be located within the future right-of-way of a road found in the TIP, or one of the roads below that are found in the CTP:

- US Highway 21;
- NC Highway 150;
- Amity Hill Road;
- Ostwalt Amity Road;
- Perth Road; and
- Cornelius Road.

In the event that an unforeseen, major development project is proposed on another road that is found in the CTP, and through a Traffic Impact Analysis it is found that the development will push traffic volumes past the practical carrying capacity of the road, the staff shall have the authority to require the reservation of future rights-of-way under the terms listed above.

Section 10.5 Concurrence with Other Plans

Iredell County should facilitate alternative modes of transportation for citizens who cannot drive and for citizens interested in biking and walking for health, environmental, or recreational purposes. Iredell County and the municipalities within have created greenway, bike and pedestrian, and transit plans detailing the best routes to traverse the county; the routes should be preserved for these purposes.

Section 10.5.1 Relationship with Other Plans

- A. Where a proposed development abuts or encompasses a public transit infrastructure project which has been designated as such upon any officially adopted transportation plan the developer will be required to reserve land for transit infrastructure in the location and configuration specified in such plan.

- B. The owners of properties containing a portion of a proposed bike, pedestrian, or blueway facility shown in a plan approved by the Iredell County Commissioners must plat and reserve right-of-way in an appropriate width which traverses their property and also connects to adjacent reserved trails. This requirement shall apply only to facilities or segments of facilities for which the trailway type and at least a portion of funding has been determined.

Section 10.6 Access Management

Access management regulations help keep traffic moving on heavily-traveled roads (referred to as thoroughfares in this Article). By restricting the number of points of ingress and egress onto the thoroughfare, access management regulations decrease points of conflict and congestion by eliminating excessive stops and starts. The marginal access and interconnectivity provisions in this article also decrease congestion on the thoroughfare by providing alternative routes.

Section 10.6.1 Applicability

The requirements of this section apply to all newly-established uses, except one and two-family residences and major subdivisions, located on any road that is designated currently by any CTP (municipal or county) as a major thoroughfare or higher classification.

A. Marginal Access

Where a tract of land to be subdivided adjoins a qualifying road, the developer may be required to provide a marginal access street parallel to the road.

- 1. Where a marginal access street is established, private driveways with access to the marginal street shall be prevented from having direct access to the thoroughfare.

2. Properties adjoining the marginal access street may have to dedicate right-of-way to lengthen the marginal access street, for the purpose of continuity and connectivity.

B. Driveway location

1. No two points of full access ingress and egress (as measured at their closest distance) shall be closer than 300 feet apart, nor closer than 300 feet to the centerline of an intersecting public street, unless driveways cannot be shared and doing so would prohibit ingress/egress to a lot. Emergency services will be exempt from this requirement for driveways that are used for emergency services only; however approval is required from NCDOT.
2. No centerline of a right-in/right-out ingress and egress shall be closer than 200 feet from the centerline of another driveway or intersecting street, unless driveways cannot be shared and doing so would prohibit ingress/egress to a lot.
3. No more than two (2) separate points of ingress and egress per lot or within a planned multi-tenant development shall be allowed per road front, except for a use located on a lot containing five (5) or more acres (Figure 10.3).
4. Notwithstanding #1 above, for any subdivision of land, a formula of, NOT more than, one (1) point of ingress and egress per every 300 feet of road frontage of the original parcel will be used, regardless of how many lots are created (Figure 10.4).

Figure 10.3 Ingress and Egress Points for a Multi-Tenant Development

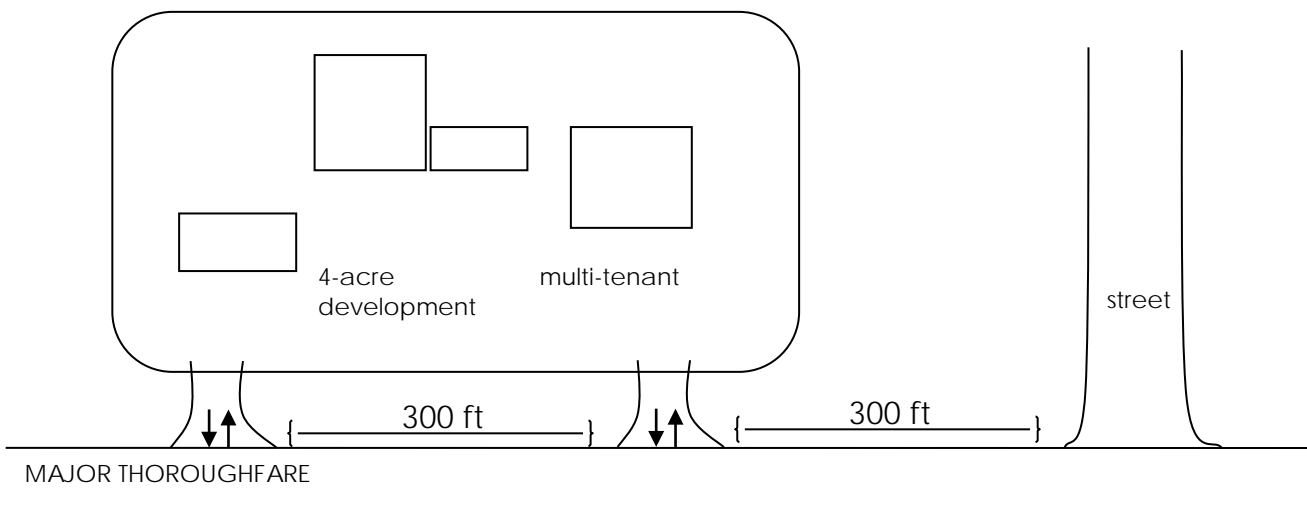
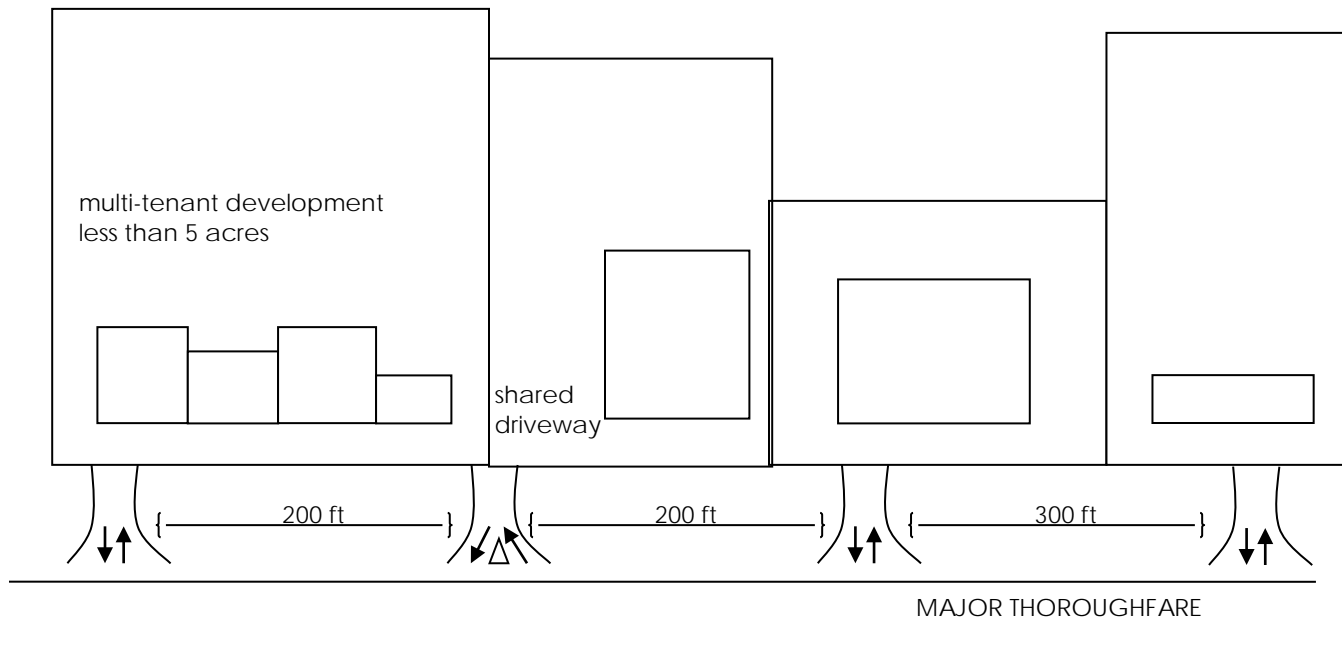


Figure 10.4 Ingress and Egress Points for a Subdivision



- C. The creation of off-set full access driveways and/or street intersections is NOT permitted, unless the driveway or intersection is located on a median divided portion or where no practical alternative exists. Except where ingress and egress would be denied, no portion of a new full access driveway shall be located closer than 300 feet to a major thoroughfare's intersection (or road of higher classification's intersection).
- D. If a property of less than 300 feet of frontage along a major thoroughfare (or road of higher classification) has frontage on both the thoroughfare and a public road of lesser classification (i.e. minor thoroughfare, minor arterial, collector, etc. – as defined in the Iredell County CTP), any full access driveway must be located on the road of lesser classification unless geographically impossible. Furthermore, the driveway must be located at least 150 feet from the intersection of the road of lesser classification and the thoroughfare.
- E. Any driveway serving as a point of ingress and egress shall have a width NOT to exceed thirty-six (36) feet unless otherwise required by NCDOT.
(amended 12/5/17, TA-2017-03)

Section 10.6.2 Interconnectivity

- A. A connection to adjacent commercially-zoned property shall be established by creating a stub-out at the common property boundary, unless determined to be unnecessary or geographically impossible by the Planning Director.

- B. Once established, connections between adjacent commercially-zoned properties may NOT be blocked unless in the opinion of the Planning Director the connection no longer serves its intended purpose.
- C. Interconnectivity between uses shall be used only as intended. Parking lot connections and access roads shall NOT be used as a construction access unless agreed to by all parties. This agreement must be made in writing and submitted to the Zoning Administrator during the permitting process.

Section 10.7 Traffic Impact Analysis

Section 10.7.1 Purpose

A Traffic Impact Analysis (TIA) may be required to evaluate the effect a proposed development or project will have on the County's existing transportation system and may require specific improvements to mitigate the impact of development on public roads.

Section 10.7.2 Applicability

- A. A TIA is required for any proposed development that meets any of the following requirement thresholds:
 - 1. Residential subdivisions proposing one hundred (100) or more lots/units.
 - 2. New developments or expansions (residential or non-residential) proposed to generate an average daily traffic count of 1,000 plus vehicles per day or 100 plus trips during peak traffic hour. This traffic count must be based on the latest version of the Institute of Transportation Engineers (ITE) Trip Generation Manual.
 - 3. New schools with student enrollment over hundred (100).
 - 4. New developments that include any part of or frontage on a designated street or thoroughfare on the current state-adopted TIP and proposed to generate an average daily traffic count of 500 plus vehicles per day or 100 plus trips during peak traffic hour.
- B. A TIA shall NOT be required if the property to be developed has been the subject of a TIA within the previous three (3) years and the projected trip generation of the newly proposed development is equal to or less than the previous TIA performed and the trip distribution has NOT significantly changed.
- C. For sites of special concern, such as those found in blind curves, roads over design capacity, where driveways will be in close proximity to an existing signal, etc., the

Administrator or NCDOT may require a technical memo or signal warrant analysis, prepared by a licensed engineer or transportation planner.
(amended 12/5/17, TA-2017-03)

Section 10.7.3 TIA Preparation

- A. When required, a TIA must be submitted:
 - 1. Prior to obtaining a development permit (see Section 8.2)
 - 2. Prior to preliminary subdivision plat approval for major subdivisions (see Section 8.8.1), whichever applicable.
- B. Prior to conducting the TIA, the developer must hold a scoping meeting with the Zoning and/or Subdivision Administrator (whichever is applicable) and the NCDOT to identify the area and needs that must be addressed in the analysis.

Section 10.7.4 TIA Guidelines

- A. Any TIA, whether required or voluntarily, must be prepared by a licensed engineer.
- B. The TIA should consider the future impact of other proposed land uses in the study area NOT yet developed, but which may have a statutory or common law vested right as defined in NCGS 153A-344.1.
- C. The TIA should consider the future impact of nearby proposed/planned NCDOT roadway improvement projects as identified on the County or any Municipal Comprehensive Transportation Plan (CTP) and the Transportation Improvement Program (TIP).
- D. The TIA should consider the future impact of any officially-adopted transportation plan (including but NOT limited to county or municipal transit plans and pedestrian plans) in the study area.

Section 10.7.5 TIA Improvement Requirements

- A. The TIA shall provide the following information in an effort to identify the improvements necessary to maintain LOS-D (at build-out) for roads and intersections as defined in the Highway Capacity Manual:
 - 1. Capacity analysis,
 - 2. Detailed description of the proposed development,
 - 3. Number of access points proposed,

4. Future Level of Service (LOS) for studied intersections and road segments including the LOS at the time of build-out,
 5. Proposed AM and PM Peak Hour Trips, based on the latest edition of the ITE Trip Generation Manual,
 6. Average Daily Trips created by the development at build-out , based on the latest edition of the ITE Trip Generation Manual, and
 7. Any recommended improvements, taking into account the requirements listed in Section 10.7.5C.
- B. The Planning & Development Department may require additional mitigation standards or offsite improvements provided that improvements are acceptable by NCDOT. However, a TIA shall NOT be utilized as a means for the County to require:
1. the party developing the property to make needed transportation improvements remote from and NOT affected by the property for which the TIA is submitted,
 2. nor shall identified deficiencies in LOS automatically preclude approval of the proposed development.
- C. Required improvements may include the following:
1. Left Turn Lane, Right Turn Lane, and/or Right Turn Taper
Based on requirements of the NCDOT Policy on Street and Driveway Access to North Carolina Highways or other NCDOT standards.
 2. Additional Right-of-Way
If a subject development falls along a road projected to be widened by NCDOT or the Iredell County CTP or any Municipal CTP jointly adopted by the Municipality and the County Commissioners, additional right-of-way along the development's road frontage shall be reserved or dedicated as deemed acceptable by NCDOT.
 3. Offsite Improvements
If a road segment or intersection is currently performing at LOS-D or better and is projected to perform at LOS-E or F at the time of build-out, improvements must be made to maintain the road segment or intersection at LOS-D. If a road segment or intersection is currently performing at LOS-E or F and is projected to continue to perform at LOS-E or F at the time of build-out, the TIA shall demonstrate how an LOS-D could be achieved and also specify what improvements must be made to ensure that the road segment or intersection is NOT degraded any further than the current levels. The County may require improvements be made to preserve the existing LOS.
 4. Other Necessary Improvements

Additional improvements may be required based on the TIA recommendations related to topographic/environmental conditions, sight distance, street offsets, conflicting movements, existing traffic accident counts, circulation, and other potential traffic issues resulting from the proposed development. Additionally, the approving authority may determine that additional improvements are necessary to ensure the safety and welfare of the County's citizens and travelers.

Section 10.7.6 Installation of Improvements

Any improvements identified by the TIA which are related to the required subdivision improvements shall be installed or guaranteed in accordance with Chapter 10 prior to the approval of any Final Plat.

Section 10.8 Subdivision Road Design

Section 10.8.1 Subdivision Access

- A. At least two (2) entry points, constructed to NCDOT road standards, shall be provided in subdivisions that contain one hundred (100) or more dwelling units and to all lots within the subdivision. The Subdivision Administrator and/or the Technical Review Committee does reserve the right to allow other alternatives if the curb cuts for the two (2) accesses cannot meet the minimum distance allowed according to NCDOT regulations at any location.
- B. For subdivisions of greater than thirty (30) lots, a minimum thirty (30) foot secondary access easement may be required by the Subdivision Administrator, where applicable, for Fire Department access. The easement shall be cleared so that a fire truck may pass, but does NOT have to be improved to public road standards. If secondary access is built to NCDOT standards, it may be counted toward the two (2) entry points required in Subsection (A) above.

Section 10.8.2 Blocks

- A. The lengths, widths, and shapes of blocks shall be determined with due regard to: provision of adequate building sites suitable to the special needs of the type of use contemplated; zoning requirements; needs for vehicular and pedestrian circulation; control and safety of road traffic; limitations and opportunities of topography; and convenient access to water areas.
- B. Blocks shall NOT be less than 400 feet nor more than 1,200 feet in length. Where a longer block will reduce the number of railroad grade crossings, major stream crossings, or where longer blocks will result in less traffic through residential subdivisions from adjoining business or industrial areas, the Subdivision Administrator may authorize block lengths in excess of 1,200 feet.
- C. Blocks shall have sufficient width to allow two (2) tiers of lots of minimum depth except where single tier lots are required to separate residential development from

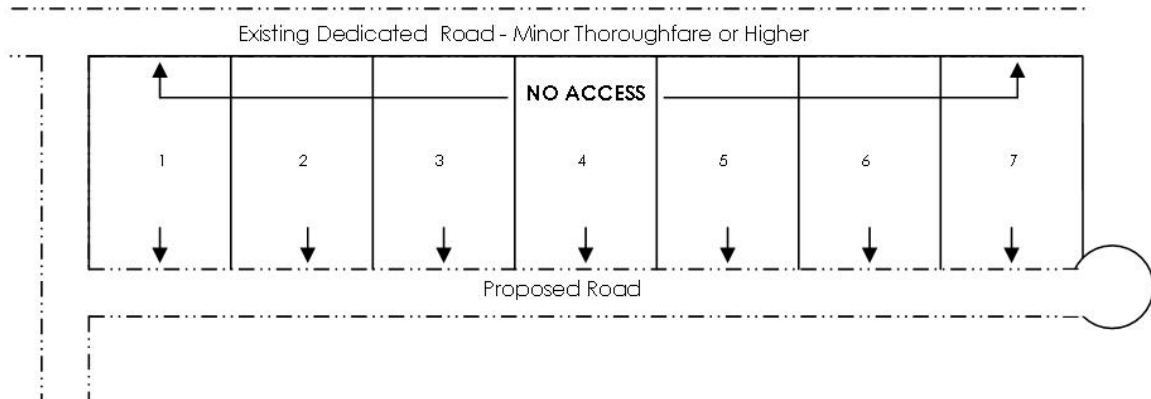
through vehicular traffic or another type of use, in nonresidential subdivisions, or where abutting a water area.

- D. Where deemed necessary by the Subdivision Administrator, a pedestrian crosswalk at least fifteen (15) feet in width may be required to provide convenient public access to a public area such as a park or school, to a water area, or to areas such as shopping centers, religious, or transportation facilities.
- E. Block and lot numbers shall conform to the County road numbering system, if applicable.

Section 10.8.3 Marginal Access Streets

Where a tract of land to be subdivided into more than two (2) lots borders a road that is designated currently by any (municipal or county) Comprehensive Transportation Plan within the confines of Iredell County as a minor thoroughfare road or higher or is projected to have greater than 5,000 vehicle trips per day within the next five years, the lots shall be prevented from having direct access to the qualifying road See Figure 10.5). The subdivider shall provide road entry and exit points to the qualifying road to facilitate connectivity. If physical barriers exist which prohibit the construction of a new road, another access design (e.g. joint driveways) may be used to achieve the intent of this regulation.

Figure 10.5 Marginal Access



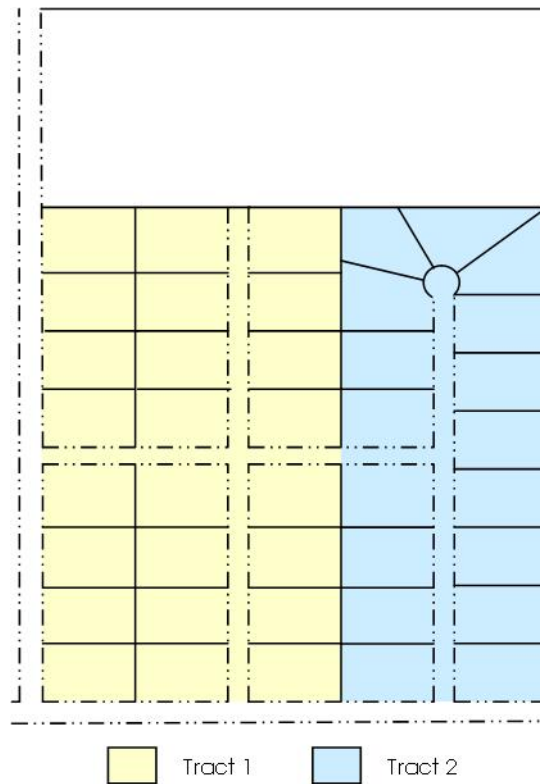
Section 10.8.4 Connectivity

Where it is deemed necessary and beneficial to the interconnectivity of local land development by the Subdivision Administrator, and to the ISO rating of the local fire district by the Iredell County Fire Marshal (ICFM), proposed roads shall be extended by dedication to the boundary of the developing property and a temporary turn around provided within the existing right of way (See Figure 10.6). The road shall be designated and constructed as a public road (to NCDOT's standards) and shall be required except when the Subdivision Administrator determined that:

- A. Physical barriers or environmentally sensitive areas are to be crossed (for example, railroad, watercourses, steep topography, or flood area).

- B. There is a large discrepancy in the size of the adjacent parcel (a smaller parcel being subdivided may NOT have to provide a stub to a much larger parcel, if other, more desirable, interconnections are available to the large parcel).
- C. The stub road would connect to property for which development rights have been sold for a public purpose and access to the property is NOT desirable for orderly development of the road network.
- D. The stub road would cause the existing roads to go over the capacity allowed on that portion of the roadway.

Figure 10.6 Connectivity



Section 10.8.5 Intersections

- A. Subdivision streets shall be laid out so as to intersect as nearly as possible at right angles, and no street shall intersect any other street at an angle less than seventy (70) degrees.
- B. Where public and private streets intersect, the design standards of the NCDOT Division of Highways, *Subdivision Roads Minimum Construction Standards* shall apply.

- C. Offset intersections are to be avoided unless exception is granted by the Subdivision Administrator upon recommendation by the Technical Review Committee. Intersections which cannot be aligned should be separated by a minimum length of 200 feet between street centerlines.
- D. Intersections with arterial, collectors, and thoroughfares (major intersections) shall be at least 1,000 feet from centerline to centerline, or more if required by the Subdivision Administrator upon recommendation by the Technical Review Committee.
- E. An approved permit is required for connection to any existing State System road. This permit is required prior to any construction on the road. The application is available at the office of the nearest district engineer of the Division of Highways.

Section 10.8.6 Cul-de-sacs

- A. Permanent dead end streets should NOT exceed 1,200 feet in length unless necessitated by topography or property accessibility.
- B. The required turn-around on a cul-de-sac street in a subdivision shall have an unobstructed roadway radius of NOT less than a thirty-five (35) feet.
- C. If the road length does NOT exceed 300 feet and if construction difficulties will NOT permit a turnaround, the use of "Y" or a "T" or other turning space of a design which will allow a vehicle with a wheel base of at least twenty-five (25) feet to complete a turning movement with a maximum of one (1) backing movement, shall be permitted.
- D. Cul-de-sacs shall NOT be used to avoid the extension of a road, unless approved by the Subdivision Administrator upon recommendation by the Technical Review Committee.

Section 10.8.7 Through Traffic

Residential collector and local roads shall be laid out in such a way that their use by through traffic will be discouraged. The intent of the street design is to provide multiple connections to existing and future developments, disperse traffic and maintain reduced speeds. Roads shall be designed or walkways dedicated to assure convenient access to parks, playgrounds, schools, or other places of public assembly.

Section 10.8.8 Road Names & Signs

- A. Proposed roads which are obviously in alignment with existing roads shall be given the same name.
- B. In assigning new names, duplication of existing names shall be avoided and in no case shall the proposed name be phonetically similar to existing names in the county irrespective of the use of a suffix such as street, road, drive, place, court, etc. Road names shall be subject to the approval of the Addressing Coordinator.
- C. The Subdivider shall be required to reimburse Iredell County for providing and placing road name signs to County standards at all intersections within the subdivision. This fee shall be paid prior to Final Plat approval.

Section 10.8.9 Sidewalks

When a proposed subdivision lies within 1,500 feet of an existing public school, library, or park, as measured from nearest property line to property line, or where an adjoining subdivision already has sidewalks in place, the Subdivision Administrator, upon recommendation of the Technical Review Committee, shall decide whether sidewalks shall be required. Said decision will specify whether sidewalks shall be located on one or both sides of the road. Other criteria that may be considered by the Committee include the potential for heavy pedestrian traffic, proximity to shopping areas, rail services or stations, etc. Such sidewalks shall be constructed to a minimum width of five (5) feet, and shall consist of a minimum thickness of four inches of concrete. All sidewalks shall be placed in the right-of-way, unless the development is platted as a planned unit or group development.

Section 10.8.10 Wheelchair Ramps, Curb Cuts for the Handicapped

All roads being constructed, reconstructed, or altered for any reason after September 1, 1973, shall conform to the requirements of North Carolina General Statutes Chapter 136, Article 2A, Section 136-44.14 as to provision of curb ramps or curb cuts for the handicapped.

Section 10.8.11 Islands or Short Medians at Subdivision Entrances

Any proposal that include islands or medians at driveway entrances shall conform to the NCDOT – Subdivision Roads, Minimum Construction Standards.

Section 10.9 Public Road Standards

Section 10.9.1 Road Abandonment

Roads which have NOT been used within fifteen (15) years of dedication may be deemed abandoned. The withdrawal of dedication shall be consistent with NCGS 136-96.

Section 10.9.2 Public Road Dedication & Maintenance

- A. Roads which are NOT eligible to be put on the NCDOT System because there are too few lots or residences shall, nevertheless, be dedicated to the public and shall be in accordance with the standards in this Ordinance or the standards necessary to be put on the NCDOT System, whichever is stricter in regard to each particular item, so as to be eligible to be put on the System at a later date.
- B. All roads shown on the Final Plat shall be designated in accordance with G.S. 136-102.6 and designation as a public road shall be conclusively presumed an offer of dedication to the public. Where roads are dedicated to the public but NOT accepted into a municipal or the State System, before lots are sold, a statement explaining the status of the road shall be included with the Final Plat.
- C. A written maintenance agreement with provisions for maintenance of the road until it is put on the State System shall be included with the Final Plat and recorded with the Register of Deeds office.
- D. If a request for dedication of public roads is made, inspection and approval by the NCDOT must have taken place, and roads must be inspected and approved by said organization, but acceptance is NOT required, before the Final Plat can be approved.

Section 10.9.3 Public Road Design

- A. All subdivision roads shall have access to a NCDOT or Municipal maintained road and shall be connected by a continuous dedicated right-of-way.
- B. All public roads shall be built to all applicable standards of this Ordinance and all other applicable standards of the most recent edition of NCDOT, Division of Highways, *Subdivision Roads*, *Minimum Construction Standards* or *Traditional Neighborhood Development (TND) Guidelines*.

Section 10.9.4 Private Road Standards

- A. Private roads which are NOT maintained by NCDOT or any municipality in Iredell County shall be permitted and shall be connected to a maintained public road.
- B. Roads within gated communities shall be private roads. Access information shall be provided to emergency personnel so that the community can be accessed in the event of an emergency.
- C. Private ownership and maintenance of roads within a PUD is allowed so long as such roads are suitable and adequate to carry the anticipated traffic. Information shall be submitted to the Subdivision Administrator and TRC along with the Concept Plan indicating the parties responsible for the maintenance of all private roads. Private roads shall be duly noted as such upon all plats.

D. Private roads shall meet or exceed all right-of-way and construction standards of NCDOT, except that a total of up to two (2) lots may be served by a private unpaved road. Said private road shall have no less than a forty-five (45) feet right-of-way and shall be graded to NCDOT specifications with accompanying drainage and must be stabilized to an all-weather surface. Only one such unpaved private road shall be allowed on each tax parcel of land existing as of October 16, 1990. Parcels created subsequently shall NOT be eligible for this exemption. Applicants wishing to utilize an unpaved road must demonstrate that the tax parcel in question existed at the effective date of this amendment by providing copies of the appropriate tax listing. When additional lots are proposed to be served by a private road allowed by this exception, the road must be improved to NCDOT Subdivision Roads Minimum Standards to the extent that at no time will there be in excess of two (2) lots on an unpaved road.

Article III. Utilities Standards

Section 10.10 Water Systems

- A. Any Minor or Major Subdivision with an average lot size less than two (2) acres which has community water system lines available, NOT including municipal systems, shall be required to extend the water system throughout the subdivision to each lot located therein. All required water line extensions shall include appropriate valves, hydrants, taps and service to the property line of each lot as required by the standards or specifications of the water system provider. The term "available" shall mean that:
2. There is an existing line of adequate size, flow, and pressure either crossing the subdivision property or immediately available from an adjacent public right-of-way; or
 3. There is an existing line of adequate size, flow, and pressure within the distances shown in Table 10.1 below of the outside boundary line of the subdivision; or
 4. The water authority indicates its commitment to extend such a line within the distances shown in Table 10.1 below of the property line of the subdivision at a cost negotiated by the water system provider and the subdivider; and
 5. There are no legal or topographic problems which prevent the subdivider from connecting onto and extending the existing system to the subdivision.

In the event there are phases to the subdivision or the subdivision is a part of a larger tract of land owned or under the control of the subdivider, then water service shall be deemed to be available if an existing or proposed water system line extends or will be extended within the distances shown on the Table below to the larger tract of land.

Table 10.1 Available Water System Lines

Water is available if the subdivision contains the number of lots listed in column one and public lines are within the distance shown in column two.	
LOTS	DISTANCE
2-10	200 feet
11-20	300 feet
21-50	600 feet
51-100	1000 feet
101 +	1500 feet

- B. For any Subdivision where a community or public water system is NOT available, every lot within the subdivision shall be served by a source of water supply that is adequate to accommodate the reasonable needs of the proposed use and complies with the regulations of the following agencies as applicable:

Table 10.2 Water Systems

System Type	Regulatory Agency
Any well, spring, stream or other source used to supply a single connection, or any water system which serves less than 15 service connections and less than 25 individuals for less than 60 days out of the year.	Iredell County Division of Environmental Health
A system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.	Iredell County Division of Environmental Health
Any water system owned and operated by the county, any municipality or water district.	(1) Governing body operating said system (2) Division of Environmental Health

- C. In addition to meeting all standards and regulations of their respective agencies, water systems must contain water lines a minimum of six (6) inches in diameter, unless this is detrimental to the pressure of the overall system as determined by the water provider, in order to provide for future networking with all other public water systems in Iredell County. This provision shall NOT apply, however, on cul-de-sac roads with lengths of less than 750 feet. In no instance, however, shall water lines be less than two inches in diameter.
- D. All subdivisions shall be accompanied by a written application and/or notice submitted to the appropriate state or local agency responsible for approving the particular system or systems at the time the Preliminary Plat is submitted. Written approval of such systems shall be required when the Final Plat is submitted. In the event that individual wells and/or septic systems will be used, but have NOT yet been inspected or approved by Iredell County Environmental Health, the Private Water/ Statement shall be placed on the plat.

Section 10.11 Sanitary Sewer Systems

- A. For any Subdivision where a community or public Sanitary Sewer System is NOT available, every lot within the subdivision shall be served by a source of sanitary sewage disposal that is adequate to accommodate the reasonable needs of the proposed use and complies with the regulations of the following agencies as applicable:

Table 10.3 Sanitary Sewer Systems

Definitions	Regulatory Agency
Any Public or Community Sanitary Sewage System and any sanitary sewage system which is designed to discharge effluent to the land surface or surface waters.	(1)NC Division of Water Quality (2)Governing Body or public body operating a public system.
All other sanitary sewage systems.	Iredell County Division of Environmental Health

- B. In the event that individual septic systems will be used, but have NOT yet been inspected or approved by Iredell County Environmental Health, the Private Water/Sewer Statement shall be placed on the plat.
- C. All off-site septic systems shall follow the requirements of Section 10.16.5 and the location of such systems shall be noted on the plat. It is recommended that such systems shall be located within a common open space area with each individual septic field easement designated and shown within the common open space area on the plat. A private septic system may be located off-site for cluster developments in accordance with Chapter 3, R5 of this Ordinance.

Section 10.12 Storm Water Drainage Facilities

Section 10.12.1 Storm Water Drainage Plan

The developer or his agent shall submit a Storm Water Drainage Plan with the Preliminary Subdivision Plat, as drawn by a design professional, containing topography and depicting the natural drainage of the property prior to development.

- A. The Storm Water Drainage Plan shall be designed to meet the following objectives:
 - 1. The Subdivider shall provide a storm water drainage system constructed to the standards of the NCDOT, as reflected in the most current edition of the Handbook for the Design of Highway Surface Drainage Structures subject to review by NCDOT.
 - 2. No surface water shall be channeled or directed into sanitary sewers.
 - 3. Where feasible, the Subdivider shall connect to an existing storm drainage system.
 - 4. Where an existing storm drainage system cannot feasibly be extended to the subdivision, a surface drainage system shall be designed to protect the proposed development and adjacent properties from water damage.
 - 5. Surface drainage courses shall have side slopes of at least three feet of horizontal distance for each one foot of vertical distance, and courses shall be of sufficient size to accommodate the drainage area without flooding, and designed to comply with the standards and specifications for erosion control of the North Carolina Sedimentation Pollution Control Act, NCGS 143-34.12, Chapter 113A, Article 4 and the N.C. Administrative Code Title 15, Chapter 4, and any County adopted erosion and sedimentation control ordinances.
 - 6. The minimum grade along the bottom of a surface drainage course shall be a vertical fall of at least one foot in each 200 feet of horizontal distance.

7. Streambanks and channels downstream from any land disturbing activity shall be protected from increased degradation by accelerated erosion caused by increased velocity of runoff from the land-disturbing activity in accordance with the North Carolina Sedimentation Pollution Control Act, G.S. 143-34.12, Chapter 113A, Article 4 and the North Carolina Administrative Code Title 15, Chapter 4.
 8. Anyone constructing a dam or impoundment within the subdivision must comply with the North Carolina Dam Safety Law of 1967 and the North Carolina Administrative Code Title 15, Subchapter 2K and shall submit proof of compliance prior to final plat approval.
 9. In all areas of special flood hazards, all subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage.
- B. Curb and gutter may be required by the Subdivision Administrator, upon recommendation by the Technical Review Committee, under the following conditions:
1. The proposed subdivision exceeds thirty (30) lots,
 2. There is a topographic need (such as steep slopes) and a public benefit will be realized, or
 3. An adjoining subdivision already has curb and gutter in place
- C. Curb and gutter development shall only be permitted when fifty percent (50%) or more of the stormwater run-off is discharged into an on-site perennial or annual stream as determined by the most recent version of the U.S.G.S. topographic maps. No run-off may directly discharge into Lake Norman, Lookout Shoals Lake, or the Catawba River.

Section 10.13 Watershed Storm Water Control Structures (High Density Option)

In any case where the Board of Commissioners approve the high density option for a development in the WS-IV Critical or Protected Areas, the following shall apply:

- A. All stormwater control structures shall be designed by either a North Carolina registered professional with qualifications appropriate for the type of system required; these registered professionals are defined as professional engineers, landscape architect, to the extent that the design represents are defined as professional engineers, landscape architect, to the extent that the General Statutes, Chapter 89A allow and land surveyors, to the extent that the design represents incidental drainage within a subdivision, as provided in General Statutes 89 (C)-3(7).
- B. All stormwater controls shall be designed for specific pollutant removal according to modeling techniques approved by the North Carolina Division of Water Quality,

found in the Stormwater Best Management Practices Manual, July 2007. Minimum requirements for these systems shall be in accordance with following:

1. The design criteria for approval shall be 85 percent (85%) average annual removal of Total Suspended Solids. Also, the discharge rate shall meet one of the following criteria;
 - a. The discharge rate following the 1-inch design storm shall be such that the runoff draws down to the pre-storm design stage within five days, but NOT less than two days; or
 - b. The post development peak discharge rate shall equal the predevelopment rate for the 1-year, 24-hour storm.
 - c. Vegetative filters shall be constructed for the overflow and discharge of all stormwater wet detention ponds and shall be at least thirty feet in length. The slope and width of the vegetative filter shall be determined so as to provide a non-erosive velocity of flow-through the filter for a 10-year, 24-hour storm with a 10-year, 1-hour intensity with a slope of five percent or less. Vegetation in the filter shall be natural vegetation, grasses or artificially planted wetland vegetation appropriate for the site characteristics;
 - d. In addition to the vegetative filters required in c above, all land areas outside of the pond shall be provided with a ground cover sufficient to restrain erosion within thirty (30) days after any land disturbance. Upon completion of the stormwater control structure, a permanent ground cover shall be established and maintained as part of the maintenance agreement described in Section 10.13.1.
2. A description of the area containing the stormwater control structure shall be prepared and filed in consistent with Section 8.10.2 (Step 9), as a separate deed with the Iredell County Register of Deeds along with any easements necessary for general access to the stormwater control structure. The deeded area shall include the stormwater control structure, vegetative filters, all pipes and water control structures, berms, dikes, etc., and sufficient area to perform inspections, maintenance, repairs, and reconstruction.
3. Qualifying areas of the stormwater control structure may be considered pervious when computing total built-upon area. However, if the structure is used to compute the percentage built-upon area for one site, it shall NOT be used to compute built-upon area for any other site or area.

Section 10.13.1 Maintenance and Upkeep

- A. An Operation and Maintenance Plan shall be provided by the developer for each stormwater control structure, indicating what operation and maintenance actions are needed, what specific quantitative criteria will be used for determining when those actions are to be taken and, consistent with the Operation and Maintenance Agreement (as detailed in Chapter 8), who is responsible for those actions. The plan shall clearly indicate the steps that will be taken for restoring a stormwater control structure to design specifications if a failure occurs.

- B. Landscaping and grounds management shall be the responsibility of the owning entity. However, vegetation shall NOT be established or allowed to mature to the extent that the integrity of the control structure is diminished or threatened, or to the extent of interfering with any easement or access to the stormwater control structure.
- C. Except for general landscaping and grounds management, the owning entity shall notify the Watershed Administrator prior to any repair or reconstruction of the stormwater control structure. All improvements shall be made consistent with the approval plans and specifications of the stormwater control structure and the operation and maintenance plan or manual. After notification by the owning entity, County staff shall inspect the completed improvements and shall inform the owning entity of any required additions, changes, or modifications and of the time period to complete said improvements. The Watershed Administrator may consult with an engineer or landscape architect (to the extent that the General Statutes, Chapter 89A, allow) designated by the Board of Commissioners.
- D. Amendments to the plans and specifications of the stormwater control structure and/or the Operation and Maintenance Plan or manual shall be approved by the Board of Commissioners. Proposed changes shall be prepared by a North Carolina registered professional engineer or landscape architect (to the extent that the General Statutes, Chapter 89A, allow) and submitted to and reviewed by the Watershed Administrator prior by the Board of Commissioners.
 - 1. If the Board of Commissioners approves the proposed changes, the owning entity of the stormwater control structure shall file sealed copies of the revisions with the office of the Watershed Administrator.
 - 2. If the Board of Commissioners disapproves the changes, the proposal may be revised and resubmitted to the Board of Commissioners as a new proposal. If the proposal has NOT been revised and is essentially the same that already reviewed, it shall be returned to the applicant.
- E. If the Board of Commissioners finds that the operation and maintenance plan or manual is inadequate for any reason, the Watershed Administrator shall notify the owning entity of any required changes and shall prepare and file copies of the revised agreement with the Iredell County Register of Deeds, the office of the Watershed Administrator and the owning entity.

Section 10.13.2 Detention Pond Requirements

If a detention pond is used to meet the requirements of 10.13, the following requirements shall be met:

- A. Fencing shall be provided around the perimeter of all storm water detention ponds. The required fencing shall be at least six (6) feet in height. It shall be steel or aluminum chain link fence with black or green vinyl coating. All fences should provide securable entrance to allow access for maintenance personnel and

equipment, and to provide safety of citizens. In those instances that the entire property, or portion of the property on which the pond is located, is surrounded by a fence that is at least six (6) feet in height, an additional fence around the pond shall not be required. The fence shall be located at least fifteen (15) from the top of the bank in order to allow easy access for maintenance and inspection.

- B. Except for fence entrances, shrubs shall be provided around the perimeter of the required fence so as to screen one-half (50%) of the fence at maturity. The required shrubs shall be maintained at a height of four (4) feet. Each shrub shall be from a recommended list available in the Planning Department. In those instances that the entire property, or portion of the property on which the pond is located, is surrounded by a fence, the shrubs will be required within 10 feet of the fence.
- C. Canopy trees shall be placed outside the required fencing at a rate of one (1) per fifty (50) linear feet of fencing provided around the pond. Each tree shall be from a recommended list available in the Planning Department. In those instances that the entire property, or portion of the property on which the pond is located, is surrounded by a fence, the understory trees will be required within 5 feet of the fence.

Section 10.14 Oversized Utilities

Iredell County may require installation of certain oversized utilities or the extension of utilities to adjacent property when it is in the interest of future development. If the County requires the installation of improvements in excess of the standards required in this Ordinance, including all standards adopted by reference, the County shall pay the cost differential between the improvement required and the standards in this Ordinance.

Section 10.15 Emergency Management

Section 10.15.1 Fire Hydrants

- A. Every subdivision that is served by at least a six (6) inch water line from either a community or public water system with water service that meets the minimum pounds (#) of water pressure required to maintain flow during peak demand (fire flow), according to the North Carolina Administrative Code 15a, Subchapter 18c, (Rules Governing Public Water Systems), shall include a system of fire hydrants sufficient to provide adequate fire protection for the buildings located or intended to be located within such development. The supplying water company must review and approve the proposed fire hydrant location(s) and certify water pressure compliance in writing to the Subdivision Administrator prior to fire hydrant installation.
- B. Fire hydrants shall be located at minimum intervals of 1,000 linear feet along every road serving the development.

C. Unless no practicable alternative is available, water lines shall NOT be dead-end lines.

D. These provisions shall NOT apply to subdivisions containing six (6) or fewer lots.

Section 10.15.2 Fire Suppression Requirements

As a basis for evaluating the quality of public fire protection services throughout the United States, Insurance Services Office (ISO) analyzes the relevant data in a community and assigns a Public Protection Classification (PPC) number ranging from 1 to 10. Class 1 represents exemplary fire protection and Class 10 indicates that the area's fire protection program does not meet ISO's minimum standards. In turn, this PPC number is used by insurance providers to assist in developing premiums that reflect the risk of loss in a particular location. Without provision of a water point source, major subdivision proposals located in fire districts with a PPC rating of eight (8) or less will adversely affect the PPC rating of said district. As such, a water point source shall be provided at the expense of the sub divider. Installation, inspections and certifications required to comply with NFPA 22 and 1142 (as applicable) will be the responsibility of the sub divider.

All subdivisions with more than ten (10) lots shall be reviewed according to Section 8.8.1 (c) by the ICFM to determine if a negative impact, as defined in the following table, on the ISO rating of the service district is felt. If, in the opinion of the ICFM a negative impact is created it shall be the responsibility of the developer to provide measures to mitigate said impact. The developer may be required to implement any one, or combination of, the following measures based on the negative impacts determined by the ICFM.

Table 10.4

Negative Impact	Mitigation
Water supply – There is not an adequate water source on site to provide water for fire suppression.	<ol style="list-style-type: none"> 1. Connect to a public water supply system and provide hydrants with adequate flow (per Appendix B of the Fire Code). 2. Create certified water point(s) for drafting within three (3) miles of development.
House size – The size of the houses dictate the type of apparatus that will be used to fight a fire, as well as the required water flow.	<ol style="list-style-type: none"> 1. Restrict house height to thirty (30) feet or less. 2. Restrict square footage of house size (per Appendix B of the Fire Code). 3. Increase road width upon approval from NCDOT.
Roads – Road width dictates what type of apparatus can safely and effectively access the homes within the development.	<ol style="list-style-type: none"> 1. Increase road width upon approval from NCDOT 2. Post street with no on street parking 3. Increase turnaround size 4. Provide connectivity

Failure to comply with the requirements of the ICFM shall result in the disapproval of the subdivision.

Section 10.16 Monuments

Unless otherwise specified by this Ordinance, the Standards of Practice for Land Surveying as adopted by the State Board of Examiners, under the provisions of Title 21 of the North Carolina Administrative Code, Chapter 56 (21 NCAC 56), shall apply when conducting surveys for subdivisions; to determine the accuracy for surveys and placement of monuments, control corners, markers, and property corner ties; to determine the location, design, and material of markers, control corners, and property corner ties; and to determine other standards and procedures governing the practice of land surveying for subdivisions.

Section 10.16.1 Construction Procedures

- A. No construction or installation or improvements shall commence in a proposed subdivision until the preliminary plat has been approved, and all plans and specifications have been approved by the appropriate authorities.
- B. No building, development or other permits shall be issued for erection of a structure on any lot NOT of record at the time of adoption of this Ordinance until all the requirements of this Ordinance have been met. The Subdivider, prior to commencing any work within the subdivision, shall make arrangements with the Subdivision Administrator to provide for adequate inspection. The approving authorities having jurisdiction or their representatives shall inspect and approve all completed work prior to release of the sureties.

Article IV. Easements

Section 10.17 Easements

Section 10.17.1 Utility Easements

A utility easement of no less than ten (10) feet in width shall be provided along the front, side and rear lot lines if necessary for utility purposes. These easements may be shown by typical lot section or through certificates on the Final Plat.

Section 10.17.2 Landscape Buffer Easement

Whenever a residential subdivision is located adjacent to an existing non-residential use in a nonresidential district which does NOT have a landscaping buffer in accordance with Section 5.2.1 of the Zoning Ordinance, the Subdivider shall provide such a buffer on the property of the subdivision. The buffer shall become part of the lot on which it is located, or in the case of commonly-owned property, shall be deeded to the homeowners' association. The purpose of a landscaping buffer is to create visual separation. The landscaping buffer shall be designed and installed in accordance with Section 5.2.1 of the Zoning Ordinance of the may NOT be counted as part of the required open space.

Section 10.17.3 Driveway Easements

All lots shall have a minimum road frontage of twenty-five (25) feet. Land-locked parcels that have no road frontage as shown on the Iredell County Mapping Department 1992 Parcel Boundary Line Maps (1967 Orthophotography), shall be allowed to divide a maximum of two (2) lots from that landlocked parcel. Said parcel shall be served by a driveway easement of no less than twenty-five 25 feet in width and shall be legally described and recorded in the Register of Deeds.

Section 10.17.4 Water Course and Drainage Easements

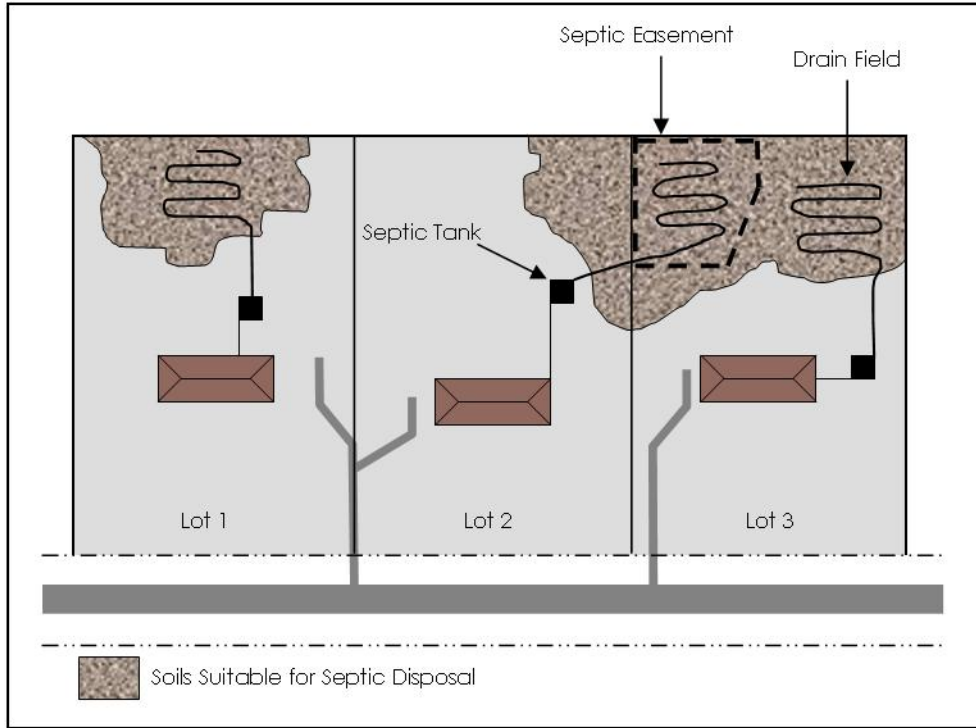
- A. Where a subdivision is traversed by a water course, drainage way, channel, or stream, there shall be provided a storm water easement or drainage right-of-way conforming substantially to the lines of such water course.
- B. If an easement is required for physical improvements to control drainage it must be shown on the Preliminary Plat, including access to the easement for repairs.
- C. Said drainage way shall be of sufficient width to carry storm water runoff from a 10 year storm.

Section 10.17.5 Septic Field Easements

Any subdivision which utilizes an off-site septic system shall provide to the Subdivision Administrator and the Iredell County Department of Environmental Health an "Off-Site Septic System Management and Maintenance Plan" which shall provide for the design, installation, maintenance and use of off-site systems. This plan shall be approved by the

Environmental Health Department before the final subdivision plat is recorded. Upon approval the plan shall be recorded with the Register of Deeds at the same time as the subdivision plat.

Figure 10.7: Septic Field Easement Example



Article V. Erosion Control

Section 10.18 Mandatory Requirements for Land-Disturbing Activity

Persons conducting land-disturbing activity shall take all reasonable measures to protect all public and private property from damage caused by such activities. No land-disturbing activity subject to the control of this ordinance shall be undertaken except in accordance with the following mandatory standards:

Section 10.18.1 Design and Performance Standards

A. Maximum Peak Rate of Runoff

Except as provided in Section 205(b)(2) of this ordinance, erosion and sedimentation control measures, structures, and devices shall be planned, designed, and constructed to provide protection from the calculated maximum peak rate of runoff from the ten-year storm. Runoff rates shall be calculated using the procedures included in but NOT limited to the "North Carolina Erosion and Sediment Control Planning and Design Manual".

B. HQW Zones

In High Quality Water (HQW) zones the following design standards shall apply:

1. Uncovered areas in HQW zones shall be limited at any time to a maximum total area of twenty acres within the boundaries of the tract. Only the portion of the land-disturbing activity within a HQW zone shall be governed by this section. Larger areas may be uncovered within the boundaries of the tract with the written approval of the Administrator.
2. Erosion and sedimentation control measures, structures, and devices within HQW zones shall be planned, designed and constructed to provide protection from the runoff of the twenty-five year storm which produces the maximum peak rate of runoff as calculated according to procedures in the "North Carolina Erosion and Sediment Control Planning and Design Manual" or according to procedures adopted by any other agency of this state or the United States or any generally recognized organization or association.
3. Sediment basins within HQW zones shall be designed and constructed such that the basin will have a settling efficiency of at least seventy percent (70%) for the forty (40) micron (0.04 millimeter) size soil particle transported into the basin by the runoff of that two year storm which produces the maximum peak rate of runoff as calculated according to procedures in the "North Carolina Erosion and Sediment Control Planning and Design Manual" or according to procedures adopted by any other agency of this state or the United States or any generally recognized organization or association.

4. Newly constructed open channels in HQW zones shall be designed and constructed with side slopes no steeper than two horizontal to one vertical if a vegetative cover is used for stabilization unless soil conditions permit a steeper slope or where the slopes are stabilized by using mechanical devices, structural devices or other acceptable ditch liners. In any event, the angle for side slopes shall be sufficient to restrain accelerated erosion.
5. Ground cover sufficient to restrain erosion must be provided for any portion of a land-disturbing activity in a HQW zone within seven (7) days.

Table 10.5 Stabilization Timeframes

Site Area Description	Stabilization	Timeframe Exceptions
 Perimeter dikes, swales, ditches, and slopes	7 days	None
 High Quality Water (HQW) Zones	7 days	None
 Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
 Slopes 3:1 or flatter	14 days	7 days for slopes greater than 50' in length.
 All other areas with slopes flatter than 4:1	14 days	None, except for perimeters and HQW Zones.

(amended 7/17/12, TA-2012-01)

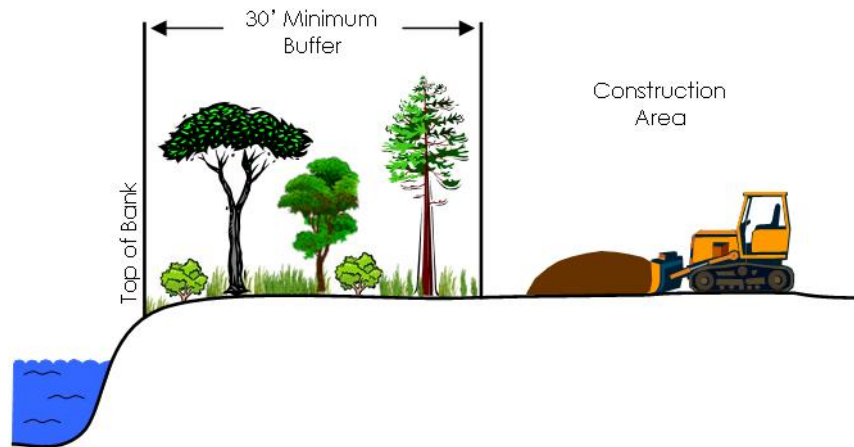
Section 10.18.2 Buffer zone

- A. No land-disturbing activity during periods of construction or improvement to land shall be permitted in proximity to a lake or natural watercourse unless a buffer zone is provided along the margin of the watercourse thirty (30) feet minimum inside the Water Supply Watershed area or twenty-five (25) feet minimum in all areas outside of the Water Supply Watershed from edge of Lake or Natural Watercourse.

This subdivision shall NOT apply to a land-disturbing activity in connection with the construction of facilities to be located on, over, or under a lake or natural watercourse.

- B. Unless otherwise provided, the width of a buffer zone (See Figure 10.8) is measured horizontally from the edge of the water to the nearest edge of the disturbed area, with a minimum thirty (30) feet from Lake or Natural Watercourse in all areas inside the Water Supply Watershed or minimum twenty-five (25) feet from Lake or Natural Watercourse in all areas outside the Water Supply Watershed. For rivers, measurement starts "at the most landward limit of the top of the bank. For lakes, measurement starts at the "most landward limit of the full-pond level."

Figure 10.8 Buffer Zone



Section 10.18.3 Graded Slopes and Fills

The angle for graded slopes and fills shall be no greater than the angle that can be retained by vegetative cover or other adequate erosion control devices or structures. In any event, slopes left exposed will, within seven (7) days on slopes greater than 3:1 and fourteen (14) days on other areas (see Table 10.5) of completion of any phase of grading, be planted or otherwise provided with temporary or permanent ground cover, devices, or structures sufficient to restrain erosion. The angle for graded slopes and fills must be demonstrated to be stable. Stable is the condition where the soil remains in its original configuration, with or without mechanical constraints.

(amended 7/17/12, TA-2012-01)

Section 10.18.4 Fill Material

Unless a permit from the Department's Division of Waste Management to operate a landfill is on file for the official site, acceptable fill material shall be free of organic or other degradable materials, masonry, concrete and brick in sizes exceeding twelve (12) inches, and any materials which would cause the site to be regulated as a landfill by the State of North Carolina.

Section 10.18.5 Ground Cover

Whenever land-disturbing activity is undertaken on a tract, the person conducting the land-disturbing activity shall install erosion and sedimentation control devices and practices that are sufficient to retain the sediment generated by the land-disturbing activity within the boundaries of the tract during construction upon and development of said tract, and shall plant or otherwise provide a viable permanent ground cover sufficient to restrain erosion after completion of construction or development. The viable permanent ground cover must be established prior to the removal of existing erosion control measures. Except as provided in Section 10.17.1 B(5) of this ordinance, provisions for a ground cover sufficient to restrain erosion must be accomplished within seven (7) days on perimeter areas and slopes greater than 3:1 and fourteen (14) days on other areas (See Table 10.5).

(amended 7/17/12, TA-2012-01)

Section 10.18.6 Storm Water Outlet Protection

- A. Stream banks and channels downstream from any land-disturbing activity shall be protected from increased degradation by accelerated erosion caused by increased velocity of runoff from the land-disturbing activity.
- B. Persons shall conduct land-disturbing activity so that the post construction velocity of the 10-year storm runoff in the receiving watercourse to the discharge point does NOT exceed the greater of:
 - 1. The velocity established by the Maximum Permissible Velocities Table set out within this subsection; or
 - 2. The velocity of the 10-year storm runoff in the receiving watercourse prior to development.
 - 3. If condition (1) or (2) cannot be met, then the receiving watercourse to and including the discharge point shall be designed and constructed to withstand the expected velocity anywhere the velocity exceeds the "prior to development" velocity by ten percent (10%).

Table 10.6 Maximum Permissible Velocities for storm water discharges in feet per second (F.P.S.) and meters per second (M.P.S.)

Material	F.P.S.	M.P.S.
Fine sand (noncolloidal)	2.5	0.8
Sandy loam (noncolloidal)	2.5	0.8
Silt loam (noncolloidal)	3.0	0.9
Ordinary firm loam	3.5	1.1
Fine gravel	5.0	1.5
Stiff clay (very colloidal)	5.0	1.5
Graded, loam to cobbles (noncolloidal)	5.0	1.5
Graded, silt to cobbles (colloidal)	5.5	1.7
Alluvial silts (noncolloidal)	3.5	1.1
Alluvial silts (colloidal)	5.0	1.5
Coarse gravel (noncolloidal)	6.0	1.8
Cobbles and shingles	5.5	1.7
Shales and hard pans	6.0	1.8

Source: Adapted from recommendations by Special Committee on Irrigation Research, American Society of Civil Engineers, 1926, for channels with straight alignment. For sinuous channels, multiply allowable velocity by 0.95 for slightly sinuous, by 0.9 for moderately sinuous channels, and by 0.8 for highly sinuous channels.

(amended 7/17/12, TA-2012-01)

- A. Measures applied alone or in combination to satisfy the intent of this section are acceptable if there are no objectionable secondary consequences. The County recognizes that the management of storm water runoff to minimize or control

downstream channel and bank erosion is a developing technology. Innovative techniques and ideas will be considered and may be used when shown to have the potential to produce successful results.

Some alternatives, while NOT exhaustive, are to:

1. Avoid increases in surface runoff volume and velocity by including measures to promote infiltration to compensate for increased runoff from areas rendered impervious;
 2. Avoid increases in storm water discharge velocities by using vegetated or roughened swales and waterways in place of closed drains and high velocity paved sections;
 3. Provide energy dissipaters at outlets of storm drainage facilities to reduce flow velocities to the point of discharge;
 4. Protect watercourses subject to accelerated erosion by improving cross sections and/or providing erosion-resistant lining; and
 5. Upgrade or replace the receiving device structure or watercourse such that it will receive and conduct the flow to a point where it is no longer subject to degradation from the increased rate of flow or increased velocity.
- B. This rule shall NOT apply where it can be demonstrated to the County that storm water discharge velocities will NOT create an erosion problem in the receiving watercourse.

Section 10.18.7 Borrow and Waste Areas

When the person conducting the land-disturbing activity is also the person conducting the borrow or waste disposal activity, areas from which borrow is obtained and which are NOT regulated by the provisions of the Mining Act of 1971, and waste areas for surplus materials other than landfills regulated by the Department's Division of Waste Management shall be considered as part of the land-disturbing activity where the borrow material is being used or from which the waste material originated. When the person conducting the land-disturbing activity is NOT also the person obtaining borrow and/or disposing of the waste, the areas shall be considered a separate land-disturbing activity.

Section 10.18.8 Access and Haul Roads

Temporary access and haul roads, other than public roads, constructed or used in connection with any land-disturbing activity shall be considered a part of such activity.

Section 10.18.9 Operations in Lakes or Natural Watercourses

Land-disturbing activity in connection with construction in, on, over, or under a lake or natural watercourse shall minimize the extent and duration of disruption of the stream channel. Where relocation of a stream forms an essential part of the proposed activity, the relocation shall minimize unnecessary changes in the stream flow characteristics.

Section 10.18.10 Responsibility for Maintenance

During the development of a site, the person conducting the land-disturbing activity shall install and maintain all temporary and permanent erosion and sedimentation

control measures as required by the approved plan or any provision of this Ordinance, the Act, or any order adopted pursuant to this ordinance or the Act. After site development, the landowner or person in possession or control of the land shall install and/or maintain all necessary permanent erosion and sediment control measures, except those measures installed within a road or street right-of-way or easement accepted for maintenance by a governmental agency.

Section 10.18.11 Additional Measures

- A. Whenever the County determines that significant erosion and sedimentation is occurring as a result of land-disturbing activity, despite application and maintenance of protective practices, the person conducting the land-disturbing activity will be required to and shall take additional protective action.
- B. On any project where there is more than 1 acre of drainage going to an erosion control measure, a surface dewatering device will need to be installed to this measure. Refer to Section II.B.4 of the NPDES Construction Stormwater General Permit NCG010000 for further information.

(amended 7/17/12, TA-2012-01)

Section 10.18.12 Existing Uncovered Areas

- A. All uncovered areas existing on the effective date of this ordinance which resulted from land-disturbing activity, exceed one (1) acre (one half (1/2) acre or greater in a water supply watershed area), are subject to continued accelerated erosion, and are causing off-site damage from sedimentation, shall be provided with a ground cover or other protective measures, structures, or devices sufficient to restrain accelerated erosion and control off-site sedimentation.
- B. The County shall serve upon the landowner or other person in possession or control of the land a written notice to comply with the Act, this ordinance, a rule or order adopted or issued pursuant to the Act by the North Carolina Sedimentation Control Commission or by Iredell County. The notice to comply shall be sent by registered or certified mail, return receipt requested, or other means provided in GS 1A-1, Rule 4. The notice will set forth the measures needed to comply and will state the time within which such measures must be completed. In determining the measures required and the time allowed for compliance, the authority serving notice should take into consideration the economic feasibility, technology, and quantity of work required, and shall set reasonable and attainable time limits of compliance.
- C. The County reserves the right to require preparation and approval of an Erosion Control Plan in any instance where extensive control measures are required.
- D. This rule shall NOT require ground cover on cleared land forming the future basin of a planned reservoir.