THE COMPREHENSIVE DEVELOPMENT ORDINANCE OF THE CITY OF DAWSONVILLE, GEORGIA

ARTICLE I
AUTHORITY, TITLE, PURPOSE AND INTENT

AN ORDINANCE ESTABLISHING RULES AND REGULATIONS GOVERNING THE SUBDIVISION AND DEVELOPMENT OF LAND WITHIN THE INCORPORATED CITY OF DAWSONVILLE, GEORGIA; DEFINING STANDARDS FOR STREET, UTILITIES, AND DRAINAGE IMPROVEMENTS; PROVIDING FOR THE METHOD OF ADMINISTRATION AND AMENDMENT; PRESCRIBING PENALTIES FOR THE VIOLATION OF ITS PROVISIONS; AND FOR OTHER PURPOSES.

Section 1.1 Authority

This Ordinance is adopted under the authority of the Constitution of the State of Georgia and laws enacted pursuant thereto.

Section 1.2 Short Title

This Ordinance shall be known and may be cited as "The Comprehensive Development Ordinance of the City of Dawsonville, Georgia."

Section 1.3 Purpose

These regulations are intended to serve the following purposes:

(a) To protect and promote the health, safety and general welfare;

(b) To provide a system for the subdividing of lands and the accurate recording of land titles;

(c) To encourage economically sound and orderly land development in accordance with the Comprehensive Plan and other policies and objectives of the City;

(d) To assure the provision of needed open spaces and public facility sites in new land subdivisions through the dedication or reservation of land for public purposes; and

(e) To assure equitable review and approval of all land subdivisions by providing uniform procedures and standards for the subdivider.

Section 1.4 Intent and Application

It is the intent of this Ordinance that it will apply to and provide guidance for the subdivision of land and development of land within the incorporated limits of the City of Dawsonville, Georgia. Any land development activity must comply with this Ordinance.

ARTICLE II
DEFINITIONS

Section 2.1 Use of Words and Interpretation

(a) For the purposes of this Ordinance, the following shall apply to the use of all words:

(1) Words used in the present tense shall include the future tense,

(2) Words used in the singular number include the plural and words in the plural number include the singular,

(3) Words in masculine gender shall include the feminine and words in feminine gender shall include the masculine,

(4) The term "shall" is mandatory and not discretionary,

(5) The word "may" is permissive,

(6) Use of the word "and" is inclusive and requires that all of the component phrases so connected must be present or fulfilled for sufficiency,

(7) Use of the word "or" is not exclusive and requires that at least one of the component phrases so connected must be present or fulfilled for sufficiency. The word "or" may allow more than one component phrase to be present or fulfilled, as in the term, "and/or".

(b) In this Ordinance the following shall control the interpretation of words and phrases:

(1) Words and phrases defined in this Article shall be interpreted as defined herein without regard to other meanings in common or ordinary use, unless the context of the word indicates otherwise.

(2) Words or phrases not defined herein shall be interpreted as defined in the Zoning Ordinance of Dawsonville, Georgia, as applicable to the use of the word or phrase within the context of this Ordinance.

(3) Words or phrases not defined herein or in any other applicable code, regulations or ordinance of the City of Dawsonville, Georgia shall be construed to have the meaning customarily assigned to them.

Section 2.2 Definitions of Words and Phrases

Alley or Service Drive - A minor, permanent, public service-way which is used primarily for vehicular service to the back or the side for properties otherwise abutting a street.

Arterial - An arterial street as defined and/or designated in the Zoning Ordinance or Comprehensive Plan of the City.

Block - A piece or parcel of land entirely surrounded by public street, other than alleys, or other major physical barriers.

City Council - The legally constituted and elected governing body of the City of Dawsonville, Georgia.

Clearing - The removal of trees, other vegetation and/or above ground improvements including, but not limited to, buildings and structures, walls, fences, steps, walks, curbs, gutters, concrete slabs, pavements (including bases for pavements) and surfacing.

Concept Plan - A drawing which shows the overall concept of a proposed development, and which may include lots and streets in a subdivision or the general location of buildings and improvements for a multi-family or non-residential project, and which may be drawn to approximate dimensions in a freehand style.

Cul-de-sac - A minor local street having one end open to traffic and being permanently terminated by a vehicular turnaround.

Developer - Any person, individual, firm, partnership, association, corporation, estate, trust, or any other group or combination acting as a unit who directs the undertaking or proposes to undertake development activities as herein defined, whether the development involves the subdivision of the land for sale to individual users, the construction of buildings or other improvements on a single land ownership or both.

Development - 1. (noun) A specific subdivision or project which is a single entity or intended to be constructed as an interrelated whole, whether simultaneously or in phases. 2. (verb) All activities associated with the conversion of land or the expansion or replacement of an existing use to any new use intended for human operation, occupancy, or habitation other than for agricultural purposes. Such activities include land disturbance and the construction of improvements such as, but not limited to, streets, driveways, parking areas, sidewalks, buildings, structures, utilities, or storm drainage facilities.

Development Plans - The detailed and professional plans showing the layout and design, site work and construction activities proposed for a project (other than architectural/engineering buildings plans); including, but not limited to, Site Plans, Grading Plans, Erosion and Sediment Control Plans, Tree Protection Plans, Landscape Plans, Street Plans and Profiles, Water Supply Plans, Sanitary and Storm Sewer Plans and Profiles, Other Site Improvement Plans and Other Appropriate Sections, Details, Notes, Schedules, Legends and Diagrams.

Drainage Improvements - Those facilities and structures intended to control and direct the passage of storm waters and other surface water flows from and across property; including but not limited to, modified natural drainageways, modified creeks, modified streams, channels, swales, ditches, flumes, culverts, cross drains and other piping, catch basins, area drains, drop inlets, junction boxes, headwalls, flared end sections, detention ponds and basins, rip rap, drainageway lining systems, and energy dissipation devices.

Drainage Manual - The City of Dawsonville Drainage Manual as contained in Appendix A.

Driveway - A vehicular access way in private ownership, other than a private street, which provides access to primarily only one property, or no more than two single-family detached residences.

Easement - Recorded authorization for a specified purpose by a property owner for the use of any designated part of the real property by another entity.

Erosion Control Regulations - The City of Dawsonville, Georgia, Soil Erosion and Sediment Control Ordinance.

Expressway - A high capacity public street from which access to abutting property is prohibited and as defined and/or designated in the Zoning Ordinance or Comprehensive Plan of the City.

Final Plat - A finished drawing of a subdivision showing completely and accurately all legal and boundary information and certifications required by these Regulations and conforming to the Georgia Plat Act.

Fire Department Access - A road that provides fire apparatus access from a fire station to a facility, building, or portion thereof. This is a general term inclusive of all other terms, such as, fire lane, public streets, private streets, parking lot lane, and access roadways

Fire Department Water Supply - An approved water supply, capable of supplying the required fire flow for fire protection.

Georgia DOT - The Department of Transportation of the State of Georgia.

Grading - The movement, removal, or addition of soil, earth, sand, silt, or rock on a site by use of mechanical equipment.

Grubbing - The removal of stumps, roots, and abandoned underground facilities including, but not limited to, utilities, structures, walls, footings, foundations, wells, septic tanks, storage tanks, and pipe.

Health Department - The Health Department of Dawson County, Georgia.

Lot - A portion of a subdivision, or any other parcel of land, intended as a unit for transfer of ownership or for development or both. In determining the area and dimensions of a lot, no part of the public right-of-way may be included.

Lot, Corner - A lot abutting upon two or more streets at their intersection.

Lot, Double Frontage - A lot, other than a corner lot, abutting upon two or more streets.

Mean Sea Level - The average height of the sea for all stages of the tide. For purposes of these Regulations, the term is synonymous with National Geodetic Vertical Datum.

Owner - A person having a majority fee simple interest in real property, or a majority interest through any other form of ownership.

Pedestrian Way - A right-of-way within a block dedicated to public use, intended primarily for pedestrians and from which motor propelled vehicles are excluded.

Person - An individual, firm, partnership, corporation, joint venture, association, social club, fraternal organization, estate, trust, business trust, receiver, syndicate, or other group or combination acting singly or collectively for a common purpose, and the duly authorized agents thereof.

Planning and Zoning Commission - The City of Dawsonville Planning and Zoning Commission as established in the City of Dawsonville Zoning Ordinance.

Plat - A map or drawing indicating the subdivision, re-subdivision, or recombination of land.

Preliminary Plat - A drawing which shows the perimeter boundary, topography, lot layout arrangement, street layout, and other features of a proposed subdivision, as specified in these regulations.

Project - A principal building or structure, or a group of buildings or structures, planned as an interdependent unit together with all accessory uses of structure, utilities, drainage, access, and circulation facilities, whether built in whole or in phases. Examples include, but are not limited to, a principal building on a lot, a residential subdivision, a multi-family development, an industrial plant, an institutional building, a shopping center or an office complex.

Public Works Department - The Department of Public Works of the City of Dawsonville, Georgia.

Road - Refer to "Street, Public".

Sketch Plan - Refer to "Concept Plan".

Street, Public - A dedicated and accepted public right-of-way, which affords the principal means of access to abutting properties.

Street, Local Non-Residential - A street intended primarily to provide local access to adjacent existing or planned commercial or industrial development and not for through traffic.

Street, Local Residential - A street intended primarily to provide local access to adjacent existing or planned residential development and not for through traffic.

Street, Major Collector - A street that collects traffic from minor streets or other collector streets and channels it to arterial streets. Collector streets provide land access and traffic circulation within residential neighborhoods, commercial, and industrial areas.

Street, Minor Collector - A through street intended primarily to connect subdivisions or other areas to Major Collector Streets or other thoroughfares, or functioning as a central route within a subdivision channeling traffic from the local streets to a Major Collector, another Minor Collector, or other thoroughfares.

Street, Marginal Access - A local street which is generally parallel to and adjacent to a major thoroughfare and which provides access to adjacent properties and protection from through traffic.

Street, Substandard - A street which does not comply to at least the standards for the designated street classifications as contained in these Regulations.

Subdivider - Any person dividing or proposing to divide land so as to constitute a subdivision as herein defined.

Subdivision - 1. (verb) Any division or re-division of a lot, tract or parcel, regardless of its existing or future use, into two or more lots, tracts or parcels. The term "subdivision" shall mean the act or process of dividing property. 2. (noun) Where appropriate to the context, the term "subdivision" also may be used in reference to the aggregate of all lots held in common ownership at the time of division.

Zoning Ordinance - The City of Dawsonville, Georgia, Zoning Ordinance.

ARTICLE III
APPLICATION AND GENERAL PROVISIONS

Section 3.1 Zoning Ordinance

Whenever there is a discrepancy between minimum standards or dimensions required under this Ordinance and those contained in the Zoning Ordinance, building codes, or other ordinances or regulations, the most restrictive shall apply.

Section 3.2 Application

Any subdivision activity and land development activity must first comply with these Regulations.

Section 3.3 Dedication of Public Lands and Facilities

No land dedicated as a public street or other public purpose shall be opened or accepted as a public street or for any other purpose, and no subdivision of land shall be made, nor subdivision plat, nor part thereof, shall be recorded before obtaining final approval from the City Council. Said final approval shall be entered in writing on the Final Plat by the Mayor. As soon as practical after final approval is granted and recording fees are paid to the City by the subdivider, the Mayor shall cause the Final Plat to be recorded by the Clerk to Superior Court of Dawson County.

Section 3.4 Transfer of Land Ownership

No person shall transfer title or attempt to record title to any land in the City of Dawsonville, and no building permit may be issued on said land, unless:

(a) Said land is shown in its entirety and present boundaries on a Final Plat as approved (under these or any previous applicable regulations) and duly recorded with the Clerk to Superior Court of Dawson County; or,

(b) Said land is shown in its entirety and present boundaries on a plat recorded with the Clerk to Superior Court of Dawson County pursuant to the regulations governing Subdivision Exemptions contained herein; or,

(c) Said land is an aggregation of properties for land assembly purposes, and no building permit will be requested prior to the compliance with these regulations and the Zoning Ordinance.

No person shall transfer title to any property by reference to, exhibit of, or any other use of any map or plat illustrating the subdivision of land without a Final Plat of said land showing said property first having been duly approved under these Regulations or any previously applicable regulations and recorded with the Clerk of Superior Court of Dawson County.

Section 3.5 Subdivision Exemptions

For the purpose of these Regulations the types of activities contained in this Section shall be considered subdivisions but exempt from the procedures and required public improvements portions of these Regulations, except as noted:

(a) Combinations - The combination or recombination of two or more previously platted lots of record, where the total number of lots is not increased and the resultant lots or parcels are in compliance with the Zoning Ordinance.

(b) Minor Subdivisions - The division of land into two or fewer lots, provided;

(1) Each lot complies with all requirements of the Zoning Ordinance and is limited to single-family detached residential use.

(2) Each proposed lot fronts on an existing public street having a right-of-way not less than the City minimum for the street category given to the existing public street.

(3) Each proposed lot complies with requirements of the Health Department.

(4) Each lot thus created shall not be re-subdivided pursuant to the provisions of this subparagraph. Such re-subdivisions shall be accomplished only through the subdivision procedures contained in these Regulations.

(c) Estate Subdivisions - The division of land in any single family detached residential zoning district into lots having a minimum lot area of five acres provided:

(1) Each proposed lot fronts on an existing public street having a right-of-way not less than the City minimum for the street category given to the existing public street.

(2) Each proposed lot shall provide at least 75 feet of frontage upon the existing public street and shall meet or exceed all other minimum requirements of the applicable single family detached residential zoning district.

(3) Each proposed lot complies with requirements of the Health Department.

(4) No lot thus created may be re-subdivided to less than one acre as an exemption to these Regulations.

For the purpose of these Regulations the types of activities contained in this Section shall be considered subdivisions but exempt from the procedures and required public improvements portions of these Regulations, provided the property owner notifies the City in writing of such division and provides a copy of a plat of the land subdivision prepared and sealed by a Land Surveyor currently registered in Georgia. Such notification is to be submitted to the City Planner.

Section 3.6 Suitability of the Land

Land subject to flooding, improper drainage or erosion, and any land deemed to be unsuitable for development due to steep slopes, unsuitable soils, subsurface conditions or other undesirable characteristics shall not be subjected to development for any use that may retain such conditions or increase danger to health, safety, life, or property, unless steps are taken to eliminate or abate these conditions. Land within a proposed subdivision which is unsuitable for development shall be incorporated into the buildable lots as excess lot area.

Section 3.7 Conformance to the Comprehensive Plan

All proposed subdivisions shall conform to the City of Dawsonville Comprehensive Plan at the time of submission of the Preliminary Plat to the Planning and Zoning Commission. Where features of the Comprehensive Plan, such as parks, streets, and utility systems, are located in whole or in part in a proposed subdivision, or when these features have not been anticipated by the Comprehensive Plan, but are considered essential by the Planning and Zoning Commission and/or Mayor and Council, land for such features shall be dedicated to the City.

The Planning and Zoning Commission shall disapprove subdivisions when such planned features, as specified by the Comprehensive Plan, are not incorporated therein.

Section 3.8 Survey Monuments

All property corners shall be monumented with a steel-concrete reinforcing bar or steel pipe at least one-half inch in diameter and 18 inches long. Standard brass disk survey monuments or concrete Georgia Department of Transportation right-of-way markers are also acceptable property corner monuments. In areas to be maintained with grass mowing equipment, bar or pipe monuments are to be installed at or within two inches of ground level. In paved areas, bar or pipe monuments are to be installed flush with the pavement surface. In natural areas, bar or pipe monuments are to be installed so as to extend one to four inches above ground level.

On subdivisions containing floodplains, not less than one permanent vertical control monument per ten acres of floodplain area shall be established and identified on the Final Plat. Each permanent vertical control monument shall be referenced to mean sea level and be a standard brass disk type survey monument or concrete Georgia Department of Transportation right-of-way marker. When right-of-way markers are used, they shall be buried vertically such that three to six inches of the marker extends above ground level.

All property corner and vertical control monuments shall be installed before the Final Plat is considered for approval by the City.

Section 3.9 Access

When land is subdivided into larger parcels than ordinary building lots, such lots shall be arranged and designed so as to allow for the construction of future streets and to provide access to those areas not presently served by streets. No subdivision shall be designed so as to completely eliminate street access to adjoining parcels of land. Every development shall be designed to facilitate access to adjoining properties which are developed or anticipated to be developed in a manner substantially similar to the subject property. Inter-parcel access shall be shown on the Final Plat as required by and subject to the approval of the City.

Any lot required to provide minimum frontage by the zoning district in which the lot is located shall provide vehicular access directly from a public street along the frontage or along any other property line which abuts a public street.

Private streets as may be approved under the provisions of the Zoning Ordinance or Development Regulations shall be constructed to the roadway standards of the City.

Section 3.10 Required Public Improvements

Every developer of lands within the jurisdiction of this Ordinance shall provide the public improvements included in this Ordinance, in accordance with these Development Regulations and other pertinent ordinances, codes, and regulations of the City of Dawsonville, Georgia. These public improvements together with associated rights-of-way, easements, and other lands shall be provided at no cost to the City and shall be dedicated or otherwise transferred, as required, to the public in perpetuity and without covenant or reservation.

Section 3.11 Plan Review and Approval

Any developer of land within incorporated Dawsonville, Georgia, shall first submit to the City such plans, plats, or construction drawings as may be required by these Regulations and receive approval of those documents by the City prior to the initiation of development activities. Approval of plans, plats, or construction drawings by the City shall not imply nor transfer acceptance of responsibility for the application of the principles of engineering, surveying, architecture, landscape architecture, or any other profession, from the professional corporation or individual under whose hand or supervision the plans, plats, or construction drawings were prepared and sealed.

Section 3.12 Other Permits

Nothing in these Regulations shall impose any obligation on the City to obtain or assist in obtaining permits, approvals, and/or clearances from other local, state, or Federal agencies having jurisdiction over elements of a project. It is solely the developer's responsibility to obtain all such required permits, approvals, and/or clearances. The developer shall furnish the City with copies of all such permits, approvals, and/or clearances before authorization to proceed with development is requested.

Section 3.13 Standard Specifications

The City will maintain on file for consultation and distribution a series of standard specifications for construction of utilities and drainage facilities for the development of land in accordance with these Development Regulations.

The standard specifications describe minimum acceptable standards for utility and drainage construction of land development activities authorized under this Ordinance, but shall not supersede more restrictive, prudent design requirements or good engineering practice as applied to specific situations on a case-by-case basis. The standard specifications are included in this Ordinance as Appendix B and are subject to the modifications and appeal provisions of XII and XIII.

Section 3.14 Standard Drawings

The City will maintain on file for consultation and distribution a series of standard drawings illustrating details of construction and design of streets, utilities, drainage facilities, site improvements, and other elements related to the development of land in accordance with these Development Regulations.

The standard drawings illustrate minimum acceptable standards for land development activities authorized under this Ordinance, but shall not supersede more restrictive, prudent design requirements or good engineering practice as applied to specific situations on a case-by-case basis. The standard drawings are included in this Ordinance as Appendix C and are subject to the modification and appeal provisions of Articles XII and XIII.

ARTICLE IV
STREET STANDARDS

Section 4.1 Right-of-Way and Pavement Widths

Minimum widths for construction (new streets or widening sections) are specified in Table 4-A.

TABLE 4-A

Street Category	Minimum Right-of-way	Minimum Roadway (1)
Arterial:		
Primary	100 feet	66 feet
Secondary	90 feet	52 feet
Collector:		
Primary	90 feet	52 feet
Secondary	90 feet	42 feet
Local:		
Non-Residential	90 feet	36 feet
Non-Residential Cul-de-sac	90 foot radius	50 foot radius
Residential	90 feet	28 feet
Residential Cul-de-sac	90 foot radius	40 foot radius

(1) Roadway width dimensions are back-of-curb to back-of-curb.

Section 4.2 Street Design

Access

A maximum number of 30 single family units shall be allowed per street outlet to a public street. Multi family and town homes maximum number is 100 per street outlet to public street. Reserve strips controlling access to public streets shall not be permitted.

Street Jogs

Street jogs with centerline offsets of less than 125 feet shall not be permitted.

Street Gradients

(a). The minimum street gradient shall be one percent without special approval from the Mayor. A minimum street gradient of one half percent to one percent may be approved by the Mayor, based on adequate engineering designs provided by the subdivider's engineer, where at least one percent cannot reasonably be achieved due to topographical limitations imposed by the land.

(b). The maximum street gradient for primary arterial streets shall be eight percent (8%). The maximum street gradient for secondary arterial, primary and secondary collector and non-residential local streets shall be ten percent (10%). The maximum street gradient for residential local streets shall be fourteen percent (14%). Grades between twelve percent (12%) and fourteen percent (14%) shall not exceed a length of 150 feet measured as the tangent length between points of vertical curvature.

(c). The maximum gradient on any cul-de-sac shall be six percent (6%).

Vertical Street Alignment

All changes in street profile grades having an algebraic difference greater than one percent shall be connected by a parabolic curve having a minimum length (L) equal to the product of the algebraic difference between the grades in percent (A) and the design constant (K) assigned to the street according to its category (i.e., L = A*K).

Constant (K) values are shown in the following Table 4-B for both desirable and minimum acceptable conditions. In all cases, the desirable value shall be used, unless it cannot be achieved due to topographical conditions beyond the subdivider's control. In such conditions, the Mayor may approve a lesser value to the extent required by the unique situation, but in no event less than the minimum value specified in Table 4-B.

TABLE 4-B

	Crest Curves	Sag Curves
Street Category	**Minimum Desirable**	**Minimum Desirable**
Arterial:		
Primary	110 160	90 110
Secondary	90 120	70 90
Collector:		
Primary	60 80	60 70
Secondary	60 80	60 70
Local:		
Non-Residential	30 30	40 40
Non-Residential Cul-de-sac	20 30	30 30
Residential	20 20	30 30
Residential Cul-de-sac	20 20	30 30

Horizontal Street Alignment

All new streets shall conform with the horizontal centerline curvature and super elevation criteria specified in Table 4-C.

TABLE 4-C

Street Category	**Minimum Centerline Radius (Ft)**	**Maximum Superelevation (ft/ft)**
Arterial:		
Primary	1,146	0.06
Secondary	955	0.06
Collector:		
Primary	600	0.00
Secondary	415	0.00
Local:		
Non-Residential	275	0.00
Non-Residential Cul-de-sac	50	0.00
Residential	50	0.00
Residential Cul-de-sac	50	0.00

Super elevation runoff shall be provided on each end of horizontal curves to rotate pavement section from normal crown section to full super elevation section and to rotate pavement section from full super elevation section to normal crown section in accordance with design standards of the Georgia Department of Transportation.

Tangents between reverse horizontal curves shall not be less than those specified in Table 4-D.

TABLE 4-D

Street Category	**Minimum Tangent Length**
Arterial:	
Primary	200 feet
Secondary	150 feet
Collector:	
Primary	120 feet
Secondary	120 feet
Local:	
Non-Residential	100 feet
Non-Residential Cul-de-sac	100 feet
Residential	100 feet
Residential Cul-de-sac	100 feet

Street Intersections

Intersection Angle – Intersecting streets shall meet at approximately a right angle and shall not be at an angle of less than 80 degrees unless approved by the Mayor.

Intersection Vertical Approaches

For local streets, street intersections, including approaches, shall have a maximum vertical grade of five percent (5%). The minimum approach length (distance from extended outer edge of the nearest through lane of the intersecting street to the point of vertical curvature in the approaching street) shall be provided in accordance with Table 4-E.

TABLE 4-E

Approaching Street Category	**Minimum Approach Length**
Arterial:	
Primary	100 feet
Secondary	100 feet
Collector:	
Primary	75 feet
Secondary	75 feet
Local:	
Non-Residential	50 feet
Non-Residential Cul-de-sac	50 feet
Residential	50 feet*
Residential Cul-de-sac	50 feet*

* For intersections of local residential streets, the minimum approach length is zero unless the approaching street grade is five percent or more, in which case the indicated minimums apply.

Intersection Radii

Intersection radii for streets, measured at the back-of-curb, and for rights-of-way shall be as shown in the following Table 4-F. For intersecting streets of different classifications, the larger radii shall be provided. In all cases, sufficient right-of-way shall be provided to maintain at least ten feet from the back of curb. For intersecting rights-of-way, lines may be joined by either an arc having the minimum radius shown in Table 4-F or by a chord connecting the end points of an arc having the minimum radius shown in Table 4-F. Larger radii may be required for streets intersecting at angles less than 90 degrees.

TABLE 4-F

Back-of-Curb Right-of-way: Street Category	Minimum Radius(Ft)	Minimum Radius (Ft)
Arterial:		
Primary	40	23
Secondary	40	23
Collector:		
Primary	30	23
Secondary	30	23
Local:		
Non-Residential	30	18
Non-Residential Cul-de-sac	30	18
Residential	25	14
Residential Cul-de-sac	30	18

Islands

In general use of raised traffic islands is discouraged in favor of painted islands supplemented with traffic buttons or other devices manufactured for traffic control. Where requested by the Mayor, traffic islands shall conform to the design guidance of the latest edition of *"A Policy on Geometric Design of Highways and Streets"*, published by the American Association of Highway and Transportation Officials. Improvements on islands within rights-of-way shall be limited to traffic control devices.

Turning Lanes: Turning lanes shall be required by the City to meet projected traffic demand and/or safe operations. When provided, turning lanes shall meet the following criteria:

(a) Provide not less than 150 feet of storage length for arterial roadways. Provide not less than 100 feet of storage length for collector roadways.

(b) Provide taper lengths of not less than 50 feet.

(c) Longer storage and taper lengths may be required when traffic projections indicate they are justified.

Cul-de-sac Streets: Cul-de-sac streets shall be designed to meet requirements of IFC2000, Appendix B, including circular turn around.

ARTICLE V
LOT AND BLOCK STANDARDS

Section 5.1 Lots

In general, lots should be designed such that they are no more than four times as deep as they are wide at the building set back line. For lots which include (1) particular or unusual difficulties to meet minimum setback limits, (2) unusual building sites due to easement configuration, (3) possible floodplain encroachment, (4) storm water detention facilities, (5) zoning imposed buffers, and/or (6) unusual or severe topographic features, the City shall require a final plat notation requiring an approved Site Plan prior to issuance of a building permit.

All lots shall conform to the requirements of the City of Dawsonville Zoning Ordinance. Minimum lot sizes, widths, and setbacks are specified in the City of Dawsonville Zoning Ordinance.

Section 5.2 Side Lot Lines

In so far as practical, side lot lines shall be at right angles to straight street lines or radial to curved street lines.

Each lot must front for at least seventy five (75) feet on a dedicated public street unless the lot upon which the building permit is requested is an approved lot in an approved Planned Unit Development.

Section 5.3 Corner Lots

Corner lots shall have extra width to permit prescribed set-back limits from all streets on which the lot has frontage.

Section 5.4 Double Frontage Lots

Double frontage lots other than corner lots shall be required for residential subdivisions along arterial or primary collector streets where internal access can be provided. When approved by the Planning and Zoning Commission, double frontage lots can be used to overcome specific disadvantages of topography, orientation and/or property size. Otherwise, double frontage lots other than corner lots shall be prohibited.

To properly separate residential subdivisions employing double frontage lots from traffic arteries, the Planning and Zoning Commission will require a planted buffer of ten foot minimum width along the lot line abutting the traffic artery. The easement for the buffer will be required to deny right of access to the lot on which it is located.

Section 5.5 Panhandle or Flag Lots

Panhandle or Flag lots, of required width and area, may be allowed where terrain makes standard design or frontage impossible or impractical. Where such lots are allowed, the street frontage of each panhandle access shall not be less than 30 feet wide, and the panhandle access shall not be more than 200 feet long. Not more than two (2) such panhandle access points shall abut each other, and if so combined the width of each panhandle may be reduced to not less than twenty four (24) feet. All such access points or combinations thereof shall be separated from each other by the frontage of a standard lot required under the applicable provisions of these Regulations.

Section 5.6 Blocks

The lengths, widths, and shapes of blocks shall be determined with regard to:

(a). Provision of adequate building sites suitable to the special needs of the type of use contemplated.

(b). Applicable zoning requirements as to lot size and dimensions.

(c). Needs for convenient access, circulation, control and safety of vehicular and pedestrian traffic.

(d). Limitations and opportunities of topography.

The Planning and Zoning Commission may, when existing or proposed pedestrian/bicycle circulation patterns or public gathering places so justify, require pedestrian/bicycle ways or access easements through blocks.

ARTICLE VI
PLAT SPECIFICATIONS

Section 6.1 Preliminary Plat Specifications

The Preliminary Plat for a subdivision shall be clearly and legibly drawn at a scale of not less than 100 feet to one inch. The sheet size shall not exceed 48 inches by 36 inches, provided, however, a scale of 200 feet to one inch may be used to avoid sheets in excess of 48 inches by 36 inches. The minimum sheet size shall be 8 ½ inches by 11 inches. The Mayor may approve other scales and sheet sizes as deemed appropriate.

The Preliminary Plat shall contain the following:

(a) Proposed name of the subdivision.

(b) Names, addresses and telephone numbers of the property owner of record and the developer or subdivider.

(c) Name, address and telephone number each professional firm associated with a Preliminary Plat.

(d) Date of survey, north point and graphic scale.

(e) Subdivision location including land lot(s) and land district(s), area in acres, internal and abutting zoning, proposed number of lots with minimum lot size, and proposed phasing, if any.

(f) A location sketch or vicinity map positioning the subdivision in relation to the surrounding area with regard to recognized permanent landmarks. The location sketch scale shall be not greater than 2,000 feet to the inch.

(g) Boundary lines of the overall property perimeter showing bearings in degrees, minutes and seconds and distances in feet and hundredths of a foot along all lines and the bearing and distances to an existing street intersection or other recognized permanent landmark. The source of boundary information shall be shown.

(h) Topography with mean sea level contours at intervals no greater than five feet. The source of topographic information shall be shown for ground run of aerial only.

(i) Natural features such as lakes, ponds, streams, creeks, State waters, wetlands, 100 year flood plains and other significant features. The source of flood plain information shall be shown.

(j) Cultural features such as rights-of-way, easements, pavements (including widths), bridges, culverts and storm drains, utility lines, appurtenances and structures, City and County jurisdictional limits, land lot and district lines, zoning districts and limits and other significant features.

(k) Proposed layout including lot lines with preliminary dimensions, lot numbers, block letters, street rights-of-way with names and widths, easements, public use facilities, facilities exclusively for subdivision uses, and all relevant conditions of zoning.

(l) Location of all existing or previous landfills.

(m) Proposed method of sewage disposal.

(n) Preliminary Plat Certifications as specified in Section 7.5.

Section 6.2 Preliminary Plat Supplemental Information

In addition to the Preliminary Plat, the following information shall be provided to the Planning Commission with each Preliminary Plat submittal:

(a). A written summary of the proposed subdivision giving information as to the overall development plan including, as appropriate, the types and square footage's of structures, number of housing units, types of land uses, anticipated traffic generation, and other pertinent information so that the effects of the subdivision can be fully considered by the Planning and Zoning Commission.

(b). Description of the anticipated utility systems required to serve the proposed subdivision including projected average and peak demands or flows for potable water, fire protection, sewerage, and electrical power.

(c). Description of proposed stormwater management practices for the subdivision including the ownership and proper maintenance provisions of all stormwater detention facilities within the subdivision.

(d). Such additional information as may be reasonably required to obtain an adequate understanding of the subdivision.

Section 6.3 Subdivision Development Plans

Subdivision development plans shall conform to the approved Preliminary Plat and may constitute only that portion of the Preliminary Plat which the developer or subdivider proposes to construct at one time as a single unit or phase, provided that such portion conforms to these regulations.

Subdivision Development Plans are to consist of not less than the following:

(a). Erosion/Sediment Control Plan prepared in accordance with the City's Soil Erosion and Sediment Control Ordinance.

(b). Grading and Drainage Plans prepared in accordance with the City's Development Regulations.

(c). Street Improvement Plans prepared in accordance with the City's Development Regulations.

(d). Utility Plans prepared in accordance with the City's Development Regulations.

(e). Other plans as requested by the City.

Encroachments: Where construction is proposed on adjacent property, an encroachment agreement or easement shall be submitted to the City.

Section 6.4 Final Plat Specifications

The Final Plat shall be clearly and legibly drawn in black ink on suitable permanent reproducible material. The scale of the Final Plat shall be 100 feet to one inch or larger. Sheet size shall not exceed 24 inches by 34 inches. The minimum sheet size shall be 8 ½ inches by 11 inches.

The Final Plat shall be based on a certified boundary survey delimiting the entirety of the property contained within the Final Plat, and tied to a point of reference with the same degree of accuracy as the boundary itself. The survey shall have an accuracy of no less than 1 in 10,000, and shall meet all requirements of Georgia Law regarding the recording of maps and plats.

The Final Plat shall substantially conform to the approved Preliminary Plat and it may constitute only a portion of the approved Preliminary Plat which the subdivider proposes to record at any one time, provided that such portion conforms to the requirements of these regulations, and said portion is not inconsistent with the health, safety, or welfare of the public. Any substantial deviation from the approved Preliminary Plat shall require that a revised Preliminary Plat be submitted to and approved by the Planning and Zoning Commission.

The Final Plat shall contain the following:

(a) Name of the subdivision and unit or phase number, if any.

(b) Names, addresses and telephone numbers of the property owner of record and the developer or subdivider.

(c) Name, address and telephone number each professional firm associated with the portion of the subdivision depicted on the Final Plat.

(d) Date of plat and survey, north point and graphic scale.

(e) Subdivision location including land lot(s) and land district(s), area in acres, internal and abutting zoning, and number of lots.

(f) A location sketch or vicinity map positioning the subdivision in relation to the surrounding area with regard to recognized permanent landmarks. The location sketch scale shall be not greater than 2,000 feet to the inch.

(g) Boundary lines of the subdivision property perimeter showing bearings in degrees, minutes and seconds and distances in feet and hundredths of a foot along all lines and the bearing and distances to an existing street intersection or other recognized permanent landmark. The boundary information shall be tied and related to the State Plane Coordinates System, 1983 North American Datum, Georgia, West zone.

(h) Municipal or county jurisdictional lines tied to the lines of the subdivision by distance and angles when such lines traverse or adjoin the subdivision; land lot or land district lines traversing or adjoining the subdivision shall also be indicated.

(i) Locations, widths and names of all streets within and immediately adjoining the plat and all other public or utilities easements or rights-of-way.

(k) Lot lines with complete dimensions to the nearest one-hundredth of a foot and bearings to the nearest second, and radii, arc and chord lengths, and chord bearings of rounded corners.

(l) Building setback lines with dimensions. When lots are located on a curve or when side lot lines are at angles other than ninety degrees, the lot width at the building line shall be shown.

(m) Lots numbered in numerical order and blocks lettered alphabetically.

(n) Location, material and size of all drainage pipes, location and type of all drainage system appurtenances such as catch basins, headwalls and inlets, location and extent of detention ponds with 100 year event level noted, the location, material and size of all City water mains, the location of all fire hydrants, and the location, width and purpose of any easements, including slope easements.

(o) Location of any areas to be reserved, donated, or dedicated to public use with notes stating their purpose and limitations. Location of any areas to be reserved by private deed covenant for common use of all property owners, or dedicated to a homeowner's association.

(p) A statement of private covenants, if any, and if they are brief enough to be put directly on the Final Plat; otherwise, if covenants are separately recorded, a statement as follows:

"This plat is subject to the covenants set forth in the separate document(s) attached hereto dated _____,, which hereby become a part of this plat, and which were recorded on _____."

(q) Accurate location, material and description of property corner or line monuments or markers. All monuments and markers shall be in place prior to approval of the Final Plat.

(r) Extent of the 100-year floodplain within the subdivision. When floodplain is present, a chart giving the areas within and outside of the floodplain for each lot containing any portion of the floodplain shall be on the Final Plat. The origin of the floodplain data shall be indicated.

(s) Individual lots which are deemed by the Mayor as requiring site plans shall be designated in a readily identifiable manner.

(t) Certificates and statements specified in these Regulations.

(u) The final plat shall contain any special construction requirements

Section 6.5 Plat Certifications

The Preliminary Plat shall contain the following statements;

(a). Preliminary Plat Certification to read as follows:

I hereby submit this Preliminary Plat as authorized agent/owner of all property shown thereon, and certify that all contiguous property under my ownership or control is included within the boundaries of this Preliminary Plat, as required by the Subdivision Regulations.

Signature of Authorized Agent/Owner Date:_____

(b). Preliminary Plat Approval Statement to read as follows;

This Preliminary Plat has been reviewed and approved for general compliance with the Zoning Ordinance, Development Regulations and Subdivision Regulations of the City of Dawsonville, Georgia.

Chairman, Planning and Zoning Commission Date:_____

The Final Plat shall contain the following statements;

(a). Surveyor's Certification to read as follows:

It is hereby certified that this plat is true and correct as to the property lines and all improvements shown thereon, and was prepared from an actual survey of the property made by me or under my supervision; that all monuments and markers shown thereon actually exist, and their location, size, type and material are correctly shown. The field data upon which this plat is based has a closure precision of one foot in feet and an angular error of per angle point, and was adjusted using rule. This plat has been calculated for closure and is found to be accurate within one foot in feet, and contains a total of acres. The equipment used to obtain the linear and angular measurements herein was .

Georgia Land Surveyor_____ Date:_____

(b). Owners Acknowledgement and Declaration to read as follows:

(STATE OF GEORGIA) (DAWSON COUNTY)

The owner of the land shown on this plat and whose name is subscribed thereto, and in person or through a duly authorized agent, acknowledges that this plat was made from an actual survey, and dedicates by this Declaration to the use of the public forever all streets, street rights-of-way, sanitary sewers and appurtenances, sanitary sewer easements, potable water mains and appurtenances, potable water easements, storm drains and appurtenances within street rights-of-way, and other public facilities and appurtenances thereon shown for the purposes therein expressed. Owner_____ Date:_____

(c). Health Department Approval to read as follows: (subdivisions with septic systems only);

The lots shown hereon have been reviewed by the Dawson County Health Department and with the exception of lots are approved for development. Each lot is to be reviewed by the Health Department and approved for septic system installation prior to the issuance of a building permit.

Health Department Official_____ Date:_____

(d). Final Plat Approval to read as follows:

This subdivision has been reviewed by the Planning Commission and the City and found to be in compliance with the Zoning Ordinance, Development Regulations and Subdivision Regulations. The Mayor and City Council hereby approve this Final Plat, subject to the provisions and requirements of the City's regulations.

Mayor_____ Date:_____ City Engineer_____ Date:_____

(e). The Final Plat shall contain a tabulation of the areas of street rights-of-way, sanitary sewer easements, potable water easements, and other public facilities to be dedicated to the City.

ARTICLE VII
STREET IMPROVEMENT STANDARDS

Section 7.1 Street Improvements

Streets, whether abutting or internal, existing or new, shall be constructed or improved under those circumstances and to the standards as established in these Regulations. Roadway improvements shall be in accordance with the street classification system defined in these Regulations.

Specific street classification designations shall be as shown in adopted transportation plans of the City or as established by the Planning and Zoning Commission.

Section 7.2 Minimum Right-of-Way and Pavement Widths

The minimum widths for rights-of-way and pavements shall be as specified in these Regulations and shown on standard drawings.

On any existing street having a right-of-way less than the minimum which abuts a property being developed, one-half of the required width of right-of-way, measured to the centerline of the existing right-of-way, shall be dedicated at no cost to the City along the entire property boundary abutting the existing street.

Additional street right-of-way width may be required to be dedicated at intersections or other locations fronting the property where turning lanes, storage lanes, medians, islands, or realignments are required for traffic safety and minimum right-of-way standards would be inadequate to accommodate these improvements.

Section 7.3 Street Widening

When property fronting on an existing City street is to be developed and when the property is to be accessed from the existing City street, roadway improvements (pavement, curb and gutter and drainage) are required along the existing road across the entire property frontage. Required improvements shall not be less than provided in these Regulations for the designated street classification. Road widening, curb, gutter, and drainage shall be provided from the centerline of the existing roadway along the side of the road upon which the property abuts. In lieu of installation of curbs and gutters and/or related improvements, the developer must have presented to and received approval by the City for a Street Improvements and Storm Water Drainage Plan for the development and its affected environs. Said plan must provide for adequate storm water drainage and will further address, as a minimum, street grading, paving, curbs and gutters, and/or other innovative provisions for said drainage. This plan must conform to the applicable standards and specification established by the City and be prepared, signed, and sealed by a Georgia registered professional civil engineer. The developer shall be responsible for the relocation and/or modifications of public and/or private utilities as necessitated by the required street improvements.

Section 7.4 New Streets

All public streets proposed to be constructed in a subdivision or other development shall be designed and constructed at least to the standards contained in these Regulations in accordance with the appropriate street classification of said streets.

Section 7.5 Substandard Streets

In the event that a development has access to a substandard street and if that substandard street provides the primary means of access to the development, the substandard street, except as indicated below, shall be fully upgraded along the entire property frontage and continuing to the nearest standard paved road along the route of primary access. In the event that a development has access to a substandard street and if that substandard street is other than the primary means of access to the development, the substandard street, except as indicated below, shall be fully upgraded only along the entire property frontage and shall be paved on the both sides of the road.
The upgrading of substandard streets used for access will not be required if any of the following conditions are met:

(a) The development consists of a single one or two family residence on an existing recorded lot within the City;

(b) Total traffic on the substandard street is less than 2000 vehicles per day including projected traffic volume from the development; or

(c) The development is a small business with ingress/egress of less than 100 vehicles per day.

Section 7.6 Acceleration/Deceleration Lanes

Except as indicated, acceleration and deceleration lanes shall be provided for new street and driveway connections to existing streets. The lanes will not be required if any of the following conditions are met:

(a) The driveway is for a one or two family residence;

(b) Total traffic on the existing roadway is less than 2000 vehicles per day (count of existing traffic must have been made within one year of the development plan submittal date);

(c) The driveway is for a small business with ingress/egress of less than 100 vehicles per day; or

Section 7.7 Improvements Along State and Federal Highways

For any development which abuts a State or Federal highway, improvements to the highway and the location and design of any street or driveway providing access from the highway shall comply with the standards and requirements of the Georgia Department of Transportation. A copy of the approved Georgia DOT permit shall be provided to the City prior to issuance of building permits.

Section 7.8 Specifications

Unless otherwise specifically set forth herein, all of the materials, methods of construction, and workmanship for street construction shall conform to the latest edition of the Georgia Department of Transportation Standard Specifications for Road and Bridge Construction including all amendments.

Section 7.9 Subgrade Preparation

(a) Clear and grub entire street right-of-way before commencing street earthwork construction. For specific technical requirements reference is made to Georgia DOT Specifications Section 201-Clearing and Grubbing Right-of-Way. Combustible material generated from clearing and grubbing operations may be burned only when authorized and permitted by the Dawson County Fire Marshal.

(b) Conduct street earthwork construction in accordance with Georgia DOT Specification Sections 205 - Roadway Excavation and 208 - Embankments. For purposes of these Regulations, the maximum density of soil material shall be determined by ASTM D 698 (Standard Proctor) test procedures.

(c) Complete utility and drainage earthwork before starting street subgrade construction.

(d) Perform subgrade construction in accordance with Georgia DOT Specification Section 209-Subgrade Construction.

(e) The developer shall provide quality control testing during earthwork and subgrade construction as necessary to assure the entire earthwork, including all fill layers and subgrades, meet the minimum requirements of these Regulations. The minimum quality control testing to be provided consists of the following:

(1) Moisture - density relationship curve for each type soil encountered.

(2) For cut areas, one in-place density test (ASTM D 1556 or other recognized method).

(3) For fill areas, one in-place density test (ASTM D1556 or other recognized method) per 1000 cubic yards or fraction thereof of fill placed.

(f) Earthwork which falls below specified minimum quality control limits shall be removed, reconstructed, and retested by the developer until compliance with specified requirements is achieved.

(g) After completing street earthwork operations and before beginning street base construction, the developer shall file a copy of the quality control test results demonstrating compliance with these requirements with the City. At any time during the construction process, representative(s) of the City may request to review and the developer shall provide quality control test results.

Section 7.10 Minimum Street Sections and Design Speeds

(a) The minimum street sections are defined in the Subdivision Regulations and in Appendix C, Standard Details, of these Regulations. Specific Details and required design speeds for the standard street classifications are as follows:

Street Classifications	Design Speed	Detail in MPH
(1) Major Thoroughfares with Medians	R010	50
(2) Collector "A" Streets (Industrial/Commercial)	R020	45
(3) Collector "B" Streets	R030	40
(4) Local (Minor) Streets	R040	30
(5) Alleys	R060	20
(6) Cul-de-Sacs	R080	NA

(b) Construct street and alley bases in accordance with Georgia DOT Specification Section 300 - Specifications Applying to All Base and Subbase Courses. The following Georgia DOT Specification Sections shall apply to base materials indicated on the Standard Detail Typical Street Sections:

(1) Graded Aggregate Base - Section 310 - Graded Aggregate Construction.

(c) Construct surface and binder asphaltic paving courses, including prime, in accordance with Georgia DOT Specification Section 400 - Hot Mix Asphaltic Concrete Construction.

(d) When street earthwork and paving are complete, the developer shall grass and stabilize all disturbed areas including roadway shoulders which are not covered by paving or other improvements. It shall be the developer's responsibility to maintain grassed areas by watering, fertilizing, weeding, mowing, trimming, regrading, and replanting as required to establish a smooth, acceptable stand of grass free of eroded or bare areas. Grassed areas will be considered acceptable when a viable stand of grass covers at least 90 percent of the total area with no bare spots exceeding one square foot and the ground surface is fully stabilized against erosion. Grassing operations shall meet the technical requirements of Georgia DOT Specification Section 700 - Grassing for Planting Zone 1A.

(e) The developer shall provide quality control testing during base and pavement construction as necessary to assure the entire pavement structure meets the minimum requirements of these Regulations. The minimum quality control testing to be provided consists of the following:

(1) Moisture-density relationship curve for each base material used on project.

(2) For soil cement base, conduct mix design to determine Portland cement content (percent of dry weight of the soil) to achieve a minimum compressive strength of 300 psi at seven days when testing in accordance with ASTM D 1632 and D 1633.

(3) One in-place density test (ASTM D 1556 or other method acceptable to the City) per 1200 square yards or fraction thereof of base. (4.9 (e) (2) and

(4) One thickness measurement normal to base surface per 1200 square yards or fraction thereof of base.

(5) For base course, one surface tolerance measurement using a 15 foot straight edge per 250 square yards or fraction thereof of base.

(6) One asphalt extraction (ASTM D 2172) and aggregate gradation analysis (ASTM C 136) per 2400 square yards or fraction thereof of surface course and per 2400 square yards or fraction thereof of binder course (if any). Obtain samples for extraction and gradation tests in accordance with ASTM D 979.

(7) One density and compacted thickness measurement per 1200 square yards or fraction thereof of each course placed. Density determined to be made in accordance with ASTM D 1188. Remove not less than 3 inch diameter nor larger than 12 inch square test specimens. Repair test specimen holes with full depth application of fresh hot asphaltic plant mix.

(8) For asphalt extraction, one surface tolerance measurement using 15 foot straight edge per 250 square yards or fraction thereof of surface course.

(f) Base and/or paving construction which falls below specified minimum quality control limits shall be removed, reconstructed, and re-tested until compliance with specified requirements is achieved.

(g) After completing base and paving construction, the developer shall file a copy of the quality control test results demonstrating compliance with these Regulations with the City. At any time during the construction process, representative(s) of the City may request to review and the developer shall provide quality control test results.

(h) In the event the developer desires to utilize base or paving materials or systems not included in these Regulations, the developer shall provide an engineering study prepared by a Georgia registered professional civil engineer comparing the proposed material or system to the appropriate system which is included in these Regulations. The engineering study will include a pavement structural design based on the AASHTO *"Guide for Design of Pavement Structures"* and suggested specifications for the materials and construction of the proposed system. The City will treat the developer's request through the appeals process described elsewhere in these Regulations.

Section 7.11 Curb and Gutter

(a) All new streets or street widening sections shall be provided with curb and gutter, except as provided herein. All gutters shall drain smoothly with no areas of ponding. In lieu of installation of curbs and gutters and/or related improvements, the developer must have presented to and received approval by the City for a Street Improvements and Storm Water Drainage Plan for the development and its affected environs. Said plan must provide for adequate storm water drainage, and will further address, as a minimum, street grading,

paving, and curbs and gutters, and or other innovative provisions for said drainage This plan must conform to the applicable standards and specification established by the City and be prepared, signed, and sealed by a Georgia registered professional civil engineer.

(b) Concrete used for curb and gutter construction shall have a minimum 3000 psi compressive strength at 28 days (ASTM C 39); a 2 inch to 4 inch slump (ASTM C 143) and, 3 to 6 percent air content (ASTM C 231 or C 173) and shall comply with ASTM C 94.

(c) In residential developments, the developer may use either a standard curb and gutter section or a roll back curb and gutter section. In other developments, the developer shall use a standard curb and gutter section. Both sections are shown in Appendix C, Standard Details.

(d) Construct curb and gutter true to line, grade and cross section on properly prepared subgrade. Apply Georgia DOT Type 2 membrane curing compound.

(e) Protect completed curb and gutter work from damage until dedication to the City. As soon as the curb and gutter will not be damaged, backfill, compact, stabilize and grass adjacent ground to achieve design line and grade. Acceptably repair or replace broken or defective curbs and gutters.

Section 7.12 Sidewalks

Sidewalks shall be provided for all residential developments within the City of Dawsonville. Sidewalks shall be provided along public streets for all multi-family, commercial, and industrial developments, and in such other locations as deemed necessary by the city for safe pedestrian movement. The sidewalks must be constructed to conform to the DOT Sidewalk Standards.

Section 7.13 Traffic Control Devices

Traffic control devices consisting of street name signs, traffic control signs, traffic markings, and traffic signals shall be provided by the developer as appropriate to serve each development. All traffic control devices and installation thereof shall conform to the Manual on Uniform Traffic Control Devices, ANSI D6.1e. For residential developments, minimum traffic control devices shall consist of street name signs on each street intersection, stop or yield signs at each intersection, one speed limit sign per block, school or pedestrian crossing signs where appropriate, no parking where applicable, and limited pavement marking such as crosswalk lines for school or pedestrian crossings. Minimum traffic control devices for non-residential developments shall include those devices for residential developments and lane and centerline markings, stop lines, including fire lane and no parking, and parking space markings. Additionally, appropriate other signs and signals shall be provided by the developer.

Section 7.14 Street Lighting

The developer shall provide a street lighting standard at each street intersection and at an interval not exceeding 400 feet.

Section 7.15 Preparation of Street Improvement Plans

Street improvement plans for all new streets, street widenings, and existing street upgrades shall be prepared by a Georgia registered professional civil engineer. At least three (3) copies of the plans shall be submitted to the City for review and comment. Within thirty (30) days of submittal of the plans, the City will either approve the plans or disapprove the plans and provide written comments on items requiring changes and/or additional information. When not approved, the cycle of plan

submittal and review will be repeated until the plans can be approved by the City. Information to be shown on the plans shall consist of not less than the following:

(a) Profiles of existing ground levels along street centerlines and each right-of-way. Field determined elevations shall be indicated at intervals not exceeding 100 feet. Where cross sections are provided at least every 100 feet, only centerline elevations need be shown on the profile.

(b) Existing facilities and features within and adjacent to rights-of-way which affect or could be affected by street improvement construction. Items include, but are not limited to, streets, rights-of-way, buildings, parking lots, driveways, fences, and tree lines.

(c) All drainage ways, lakes, streams, creeks, channels, wetlands, and drainage facilities.

(d) All existing utilities and appurtenances within and adjacent to rights-of-way which affect or could be affected by street improvement construction. The utility type, size, depth, material and location in relation to street improvements must be indicated.

(e) Existing and proposed property and easement lines, land lot, and land district lines intersecting street rights-of-way.

(f) Limits of new construction.

(g) New road improvements, including but not limited to, curbs and gutters, sidewalks, pavements, driveways, wheel chair ramps, traffic control devices, and street lights (if any).

(h) Profiles of each pavement edge or line of curb and gutter with new finished grade elevations at intervals not exceeding 100 feet.

(i) Horizontal and vertical street geometry including street centerline angles of deflection, radii, degree of curvature, design speed, tangent lengths, arc lengths, bearings street grades, and lengths of vertical curves. Stations for all points of curve, points of tangency, points of intersection, both horizontal and vertical, must be shown.

(j) Benchmarks for vertical control.

(k) Name of the development, names, addresses, and telephone numbers of developer and developer's engineer, engineer's seal, north arrow, scale, and date.

Plans shall be prepared in conformance with the following:

(a) Where specific design guidance is not given, in these regulations or other regulations, rules, ordinances, of the City, the AASHTO publication *"A Policy on Geometric Design of Highways and Streets"*, latest edition, shall be followed.

(b) All elevations shall be based on and tied to U.S. Coast and Geodetic Survey mean sea level datum.

(c) Plan drawings shall be at a scale of at least 1 inch equals 50 feet. In developed or congested areas, a scale of 1 inch equals 20 feet or less shall be utilized.

(d) For profile drawings, the horizontal scale shall be the same as that used for associated plan drawings. The vertical scale shall be at least 1 inch equals 10 feet. A 1 inch equals 10 feet vertical scale is often necessary to properly depict grade changes in flat areas.

(e) The desired drawing size is 24 inches by 36 inches. In no case shall drawings be larger than 30 inches by 42 inches nor smaller than 11 inches by 17 inches.

ARTICLE VIII
WATER AND SEWER SYSTEMS

Section 8.1 Approval Procedure

The following process applies to the approval for the installation of water mains, water systems, sewer mains, sewer systems, and appurtenances in residential and commercial developments to be operated and maintained by the City of Dawsonville.

The process includes the following steps:

(a) Application and Preliminary Approval;

(b) Construction and Inspection; and

(c) Final Acceptance.

Section 8.2 Application and Preliminary Approval

(a) The Developer must submit to the City five (5) copies of the preliminary plans showing the location and general plan for water and/or sewer systems. If the subdivision is to be constructed in phases, the Developer should also include a general layout of the entire subdivision as well as the more detailed layout of the specific phase(s) to be approved at the time.

(b) The City will evaluate the site for water service as well as the potential need for looping easements by conducting flow and pressure tests, and/or computer modeling in the area of the proposed development. All cost incurred for the evaluation, will be paid by the developer.

(c) The Developer or a representative of the Developer must bring a formal request for water and/or sewer service to the City. The City will take action to commit to serve a specific number of lots in the subdivision as presented, modify the request, or reject the request entirely. The City will also determine the City's participation in water and sewer system construction, as appropriate.

(d) If the City commits to serve the proposed development, the Developer must submit to the City a minimum of three (3) sets of plans prior to submission for design and construction approval by the Georgia Environmental Protection Division. The water and sewer system improvements being submitted to the City must be in accord with the most current Design Criteria Standards adopted by the City Council.

(e) If the plans submitted to the City for review are approved, five (5) copies of the plans will be retained by the City and the remaining copies will be returned to the Developer.

(f) If changes are required, a checklist will be returned to the Developer.

(g) After the changes have been made, the Developer must submit five (5) copies of the revised construction plans to the City for review.

(h) After review and approval by the City, five (5) copies of the plans stamped "Approved for Design Concept" will be retained by the City and the remaining copies returned to the Developer.

(i) The City shall bill the Developer for all research and engineering time on the application and approval process.

(j) The plans shall be submitted by the Developer to the Georgia Environmental Protection Division (EPD) for review and approval prior to construction. Should any changes be made to the plans resulting from the EPD review and approval process, the Developer shall provide to the City one (1) set of plans as approved by EPD for construction.

Section 8.3 Construction and Inspection

(a) A representative of the Developer, the installation contractor, the County Fire Marshall and the city building and water and sewer representatives shall attend a pre-construction conference at the city at least ten (10) working days prior to the start of any construction. Please schedule the pre-construction conference to coordinate with all county and city representatives work schedule. The purpose of this conference will be to define roles and responsibilities for the correct execution of the proposed water and/or sewer line installations.

(b) All water and/or sewer line installations shall be inspected during construction. City personnel or the City Engineer shall inspect and certify that all work was installed in accordance with the Construction Standards of the City and design provided by the Developer. The City shall receive a set of as-built drawings, as prepared by the design engineer, at the completion of all work. Payment for the inspection services provided by the City will be billed by the City to the Developer within seven (7) days of final inspection.

(c) The contractor shall notify the City 24 hours in advance of starting construction.

(d) The contractor shall perform all required water and/or sewer line tests. The City representative shall be present during testing and shall be provided detailed records for the City.

(e) The contractor shall prepare the water lines for bacteriologic testing. It is the sole responsibility of the City to secure the samples and have them tested in an EPD approved water laboratory. The Developer will be notified of the results. Successful bacteriological testing must be completed prior to the acceptance by the City.

(f) The Developer must have an executed Change Order in hand before making any field changes that do not conform to the water and/or sewer line plans approved by EPD.

Section 8.4 Final Approval

(a) The Developer shall submit to the City three (3) copies of the as-built drawings stamped by a registered civil engineer.

(b) The City Council will make final acceptance for ownership of the water and/or sewer line installations based on the City's final inspection and the City Engineer's final inspection. The Developer shall submit to the City a copy of the final subdivision plat for certification, with respect to easements dedicated to the City.

Section 8.5 Design Criteria

GENERAL

(a) A horizontal separation of at least 10 feet must be maintained between the water main and any existing or proposed parallel sewer. When water mains cross sewers, a minimum vertical separation of 12 inches must be provided between the two pipes (measured edge to edge), and the water main must cross over the sewer line. At crossings, one full length of water pipe must be located so that both joints are as far from the sewer as possible.

(b) The minimum cover over water and sewer lines shall be three (3) feet.

(c) All elevation data shall be referenced to mean sea level (MSL).

(d) A project location map shall be provided on the drawings.

(e) The drawings shall bear the following notes:

(1) The City of Dawsonville shall be notified 24 hours prior to any water or sewer line construction or repair. Call City Hall at (706) 265-3256.

(2) All water main and sanitary sewer materials and workmanship shall be in accordance with the City of Dawsonville Design Criteria.

(3) The Contractor shall be responsible for maintaining a marked-up set of design drawings showing "as-built" conditions. These "record drawings" shall be made available to the City Engineer and/or the City Inspector upon request. The mark-ups shall be at the site at all times and shall be utilized to develop final record drawings.

(f) The following note shall appear on the final plat and/or as-built drawing:

Owners Dedication Certificate
City of Dawsonville
Dawson County, Georgia
The owner of the land shown on this plat and whose name Is subscribed thereto, and in person or through a duly Authorized agent, acknowledges that this plat was made from an actual survey and Dedicated to the City of Dawsonville forever, all water mains, sanitary sewers, easements, And associated appurtenances thereon shown.

Owner_____ Date_____

(g) Contractors and subcontractors are required to possess a business license to work within the applicable jurisdiction. Proof of said license and all other applicable permits (Erosion Control, DOT, etc.) shall be on the job site. The Contractor shall have the state utility license. The Contractor shall submit proof of insurance to the City with a minimum general liability of $1,000,000. The Contractor shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the Contractor's execution of the work, whether such execution be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts of them may be liable:

(1) Claims under workmen's compensation, disability benefit and other similar employee benefit acts.

(2) Claims for damages because of bodily injury, occupational sickness, or disease or

death of his employees.

(3) Claims for damages because of bodily injury, sickness or disease or death of any person other than his employees.

(4) Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person.

(5) Claims for damages because of injury to or destruction of tangible property including loss of use resulting therefrom.

(6) Insurance shall be written with a limit of liability of not less than $500,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident and a limit of liability of not less than $500,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than $200,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than $200,000 aggregate for any such damage sustained by two or more persons in any one accident.

WATER LINES INSTALLED WITHIN SUBDIVISIONS

(a) Water lines shall have a minimum diameter of eight (8") inches, unless approved by the City. The lines must be large enough to meet the residential demand of the proposed subdivision and fire flow requirements combined. Acceptable fire flow is a minimum of 500 gpm at 20 psi. The residential demand is determined as follows:

Total Units Served	GPM Per Unit
0-5	6
6-10	4
11-20	3
21-100	2.5
101-200	2.0
201 +	1.5

(b) Looping and Easements

(1) The overall distribution plan adhered to by the City requires looping of water lines. This looping provides adequate fire flow protection while eliminating dead ends and stagnated water.

(2) It is the City's policy to require 20 foot wide utility easements between lots in new subdivisions where a loop cannot be installed to connect to another subdivision or main line in the future. The design engineer should determine the location of possible future development around the proposed subdivision, consider the ease of construction of a loop to the future development, and discuss these with the City. All easements must be shown on the plans and on the final recorded plat as 20 foot utility easements dedicated to the City of Dawsonville.

(3) The Developer must lay the water line along the entire length of each required easement to the adjoining property with a dead-end gate valve at the end. No dead-end lines allowed over 1,000 feet unless approved by the City Engineer.

(4) Water lines are to be installed only on dedicated rights-of-way and centered within the easement. In general, easements dedicated to the City will be recorded and used by City personnel for maintenance purposes only. Non-permanent structures such as fences, shrubs, and trees shall be allowed within the water line easement. All utilities crossing roadways shall be bored, including service laterals.

(c) Subdivision water lines shall have a minimum cover of 3 feet to the top of the pipe.

(d) Pipe and Fittings

(1) All water main piping shall be a minimum of 8 inches unless approved by the City and shall be ductile iron pipe (DIP) and shall conform to AWWA C 151 with a minimum pressure class 350 or thickness class 52 unless otherwise specified or shown on the drawings. Pipe and fittings shall be cement lined in accordance with AWWA C 104.

(2) Fittings shall be mechanical joint compact ductile iron and conform to AWWA C 153 with rated working pressure of 350 PSI or AWWA C 110 with rated working pressure of 250 PSI.

(e) A 3/4 inch service tap and corporation stop for chlorination shall be indicated on the plans within 3 to 5 feet from the beginning point of the water line installation.

(f) All services crossing streets inside the subdivision shall be installed inside 1 1/2 inch or 2 inch Class 160 PVC conduit. Conduit shall extend to a minimum of 5 feet on each side of the curb/pavement.

(g) Developer shall be responsible for contacting the power company and determining where the transformers will be positioned so as to avoid conflict with meter set and fire hydrant locations.

WATER LINES INSTALLED OUTSIDE OF SUBDIVISION SITE

(a) All piping and fittings shall conform to the design criteria for water lines installed within subdivisions as a minimum. More stringent criteria may be required at the City's discretion.

(b) Water lines shall be located within 5 feet of the right-of-way limits with a minimum cover of 36 inches on county roads, state routes, and federal highways. All bores shall have steel casing with PVC carrier pipe, with the casing length equal to the width of the pavement plus 10 feet on each side.

(c) If any portion of a project is within a Georgia DOT right-of-way, then a DOT permit application will be required. The Developer must prepare a complete application package and provide it to the City for submittal to the Georgia DOT.

(d) Crossings of large streams wider than 15 feet shall require restrained joint D.I. pipe.

FIRE HYDRANTS

(a) Fire hydrants are to be spaced a maximum distance of 500 feet apart inside a proposed subdivision and a maximum of 1,000 feet outside the subdivision, measured from hydrant to hydrant along the roadway.

(b) Hydrants are to be set within a foot of the right-of-way limits on any street or road and are to be set on property lines where possible.

(c) Fire hydrants shall be required at the end of all dead-end lines such as those installed in cul-de-sacs.

(d) Each fire hydrant shall have a 6 inch gate valve bolted directly to a hydrant tee.

(e) No fire hydrants shall be placed on water mains which are smaller than 8 inches in diameter unless the main is "looped" or the Developer can show the farthest hydrant can maintain a flow of 500 gpm at 20 psi.

(f) In commercial and industrial areas, fire hydrants shall be placed such that the maximum hose lay (as a truck travels) shall be no greater than 300 feet, unless the Fire Department requires closer spacing for specific reasons.

(g) As a minimum, fire hydrants shall be placed such that the maximum hose lay (as a truck travels) shall be no greater than 500 feet in single family residential areas and 350 feet in multi-family residential housing complexes. Note: The Fire Marshall should be contacted to determine if stricter requirements are in order for specific project types.

(h) Fire hydrants shall be three way hydrants with a 4 1/2 inch valve opening and shall be as manufactured by Mueller, M & H Valve, American-Darling, or approved equal. Locking mechanisms approved by the Fire Department and the City shall be provided on hydrants located in remote locations when determined by the City.

(i) Gate valves shall be installed on all hydrant leads.

(j) Valve location markers shall be installed for all valves (except hydrant lead valves). The markers shall be four feet long concrete posts with brass discs cast into one side. The marker posts shall extend from 1/2 to 18 inches above finished grade.

VALVES

(a) Gate Valves

(1) Gate valves size 3 inches and larger shall be resilient seat wedge type and shall conform with the specifications of the American Water Works Association, Designation C509 with a wall thickness that meets or exceeds AWWA C 153, latest edition rated for 200 psi minimum working pressure. Gate valves shall be equipped with "O" ring stem seals above and below stem thrust collar. Gate valves for use on mechanical joint ductile iron pipe and slip joint ductile iron pipe shall have manufacturer's standardized mechanical joint ends. Gate valve body and bonnet shall be ductile or cast iron and shall be fusion bonded, interior and exterior, with epoxy coating which conforms to AWWA C 550, latest edition.

(2) Water mains in which the valves are installed shall be tested as specified and the valve must remain water tight under this pressure in each direction.

(3) Valves shall open counter clockwise, be designed for vertical installation, be the non-rising stem type, and shall have 2 inch square operating nut.

(4) Valves shall be equipped with valve boxes and 12" x 12" protective concrete pad unless installed in pavement. Provide extension stem where required to bring the operating nut to within 12 inches of ground surface. Extension connection shall be with wrench nut coupling; no set screw allowed.

(5) All gate valves shall be manufactured by Mueller, M & H Valve, American-Darling, or

approved equal.

(b) Butterfly Valves

(1) Butterfly valves shall be resilient seated, short body design and shall conform to AWWA C 504 latest edition. Valves shall be Class 250 (250 psi bi-directional shut-off rating, 500 psi body hydrostatic shell test, fusion bonded epoxy coated interior and exterior, and maximum line velocity of 16 feet per second). Valves shall be Mueller, M & H Valve, Clow, Dezurik, or Pratt. Certified test results shall be furnished with each valve.

(c) Every tee shall have two valves away from the source, and every cross shall have three valves away from the source.

(d) An inline valve shall be installed every 1,000 feet of water line within a subdivision, and every 1,000 feet outside of subdivision.

(e) All connections to existing water mains shall be made with tapping sleeves and tapping valves. All back-taps should be shown on the drawings and labeled as such.

(f) Tapping valves shall be as manufactured by Mueller, M & H, American-Darling, or equal. Tapping sleeves shall be fabricated steel.

(g) All stub-out valves and dead-end valves shall be shown to have a mechanical joint cap on the plans.

SERVICES

(a) Meters and backflow preventers shall be installed by the City. The City will make all service connections and collect fees for each meter set.

(b) Water service lines on the City side of the meter shall be ¾" polyethylene CTSPE-340: SDR-9 with a pressure of 200 psi.

BACKFLOW PREVENTION

(a) Backflow prevention devices shall be required on all housing and all commercial, industrial, and institutional establishments' water service lines.

(b) As a minimum, commercial, industrial, and institutional establishments and multi-family housing shall install and maintain double check valve assemblies in a separate vault immediately downstream from the City's meter.

(c) Establishments determined to present a high hazard backflow potential shall be required to install and maintain reduced pressure zone (RPZ) backflow preventers.

(d) Double detector check valves shall be installed on all fire sprinkler mains. Valves shall be housed in a vault as close to the city main as is possible. A double check valve and a detector check valve in combination may be provided in lieu of the double detector check.

SEWER LINES INSTALLED INSIDE AND OUTSIDE SUBDIVISIONS

(a) A 20'-0" permanent, recorded easement shall be required on all 8 inch diameter and larger sanitary sewers. The sewer shall be on the centerline of the easement. No permanent buildings or structures shall be built within easements.

(b) Minimum slope for 8 inch and larger gravity sanitary sewer pipe shall be 0.50% unless approved by the City, the maximum slope shall be 15.0%.

(c) Gravity sanitary sewer pipe material shall be ductile iron pipe or SDR 26 PVC unless depth of cover is 20 feet or greater, less than 4 feet, or the sewer is to be laid in fill area. In these cases, the pipe shall be ductile iron, Class 51.

(d) Bedding for sanitary sewers shall meet the following: Embedment materials shall be angular graded crushed stone, 1/4 inch to 3/4 inch in size with no more than 5 % passing a No. 8 standard sieve in accordance with Class I materials as defined in ASTM D2321 Section 5.1.1. -53-

(e) Sanitary sewer force mains shall be ductile iron pipe, Class 50 minimum.

(f) Service lateral pipe material shall be SDR 26 PVC sewer pipe six (6") inch minimum from the main to the property line.

(g) Cleanouts shall be placed on all building service laterals at the point at which City maintenance terminates. This point shall be the curb line, the property line, the right-of-way line, or the easement line as applicable. Cleanouts shall be 6 inch and have a brass cap.

(h) Manhole frames and covers shall be manufactured by Vulcan, U.S. Foundry or approved equal. The rings and cover shall have a minimum weight of 350 pounds.

(i) At the point of connection in manholes the invert of building service lines shall be placed, as a minimum, at the crown of the City sewer.

(j) The minimum diameter of gravity sanitary sewer pipe shall be 8 inches with the exception of sewer service line which may be a minimum of four (4") inches to the property line. A 4" x 6" adaptor shall be installed at the connection to the 6" service line of the City.

(k) Manholes shall be placed at all changes in direction and grade of sanitary sewers. Manholes shall be spaced such that the distance between manholes does not exceed 350 feet.

(l) Outside drop connections shall be constructed at manholes on all influent sewers where the invert elevation is greater than 2 feet over the invert elevation of the effluent sewer.

(m) Sewage pumping stations will not be permitted unless the Developer can demonstrate extreme hardship would result if the station were denied. Pumping stations will be discouraged and therefore, only permitted on a case by case basis. The pump stations shall meet the following standards:

(1) Dual submersible pump type

(2) Separate valve pit with gate valve and check valve on each discharge line.

(3) Three-phase power shall be provided. Manual transfer switch with adaptor for portable standby generator required. A permanent standby generator and automatic transfer switch shall be provided at all pump stations which serve an area with more than fifty (50) houses.

(4) Site shall be properly graded, fenced with a turnaround. Minimum fenced area shall be 30 feet x 30 feet. Access road and turnaround shall have eight (8"0 inch compacted crusher run area.

(5) Each pump shall be sized to pump peak design flow against both static and friction heads.

(6) Minimum force main velocity shall be two (2') feet per second with minimum force main size of four (4") unless otherwise approved.

(7) Pumps shall be as manufactured by Flygt Pump Company or approved equal.

(8) Each station shall be provided with a remote telemetry system compatible with the City's system.

(n) No sewer line construction will be allowed within 25 feet of a stream without obtaining a stream variance.

(o) Plans and profiles showing all utility and pipeline crossings as well as existing and proposed grades shall be provided for all sanitary sewers. Building services are excepted.

(p) Sewer maintenance access shall be maintained on all sanitary sewer easements. Maintenance access is defined as grades, soil compaction and slopes which allow a sewer jet truck (weighing approximately 50,000 pounds) to navigate easily. Maximum slope shall not exceed 20%.

WASTEWATER PRETREATMENT

(a) Sand traps and oil separators with sample station manholes shall be installed in all sanitary sewer service lines from service stations, garages, and similar operations. Domestic sewage shall not pass through sand traps or oil separators.

(b) Grease traps and sample station manholes shall be installed in process waste lines of all sanitary service sewers for commercial, industrial, and institutional establishments with food preparation areas.

(c) If dumpster pad drains are to be tied onto the sanitary sewer, a grease trap and sample station manhole shall be placed between the pad and the City sewer. Domestic wastewater shall be excluded from the trap. Food process waste streams may utilize the same trap if sized appropriately.

(d) Rainwater shall be prevented from entering the sanitary sewer at all dumpster pad locations. Method must be detailed on drawings.

(e) Grease trap and oil separator details shall appear on the project drawings and shall be approved prior to installation.

(f) Oil separators shall be sized to handle two (2) times the expected flow rate.

(g) Grease traps shall be sized as necessary with the minimum allowable size being 1,000 gallons. If a dumpster pad is tied into the grease trap the minimum size is 1,500 gallons.

(h) Sample station manholes may be required on all commercial, industrial, and institutional sanitary service sewers.

PLANS FOR PROPOSED SUBDIVISION WATER AND SEWER SYSTEM

(a) Design engineer/Developer is to submit drawings on 24" x 36" paper stamped by a professional engineer registered in Georgia. City of Dawsonville standard water and sewer line details shall be a part of the plans and specifications.

(b) Scale is to be 1" = 100'

(c) Site plans shall include:

(1) Streets and street names with lot layout and district;

(2) Location of storm drains, drainage easements, and any retention ponds;

(3) Location map and topography of subdivision;

(4) Water line layout with all gate valves, air release valves, fitting, strapping, sleeves, hydrants, chlorination taps, and sampling station including materials and size labels for each;

(5) Any rock outcroppings;

(6) All easements with labels;

(7) City road and DOT right-of-ways;

(8) Existing water lines, hydrants, and valves in surrounding are including materials and size labels for each;

(9) Service laterals;

(10) Water line legend with symbols;

(11) Details of special water line installations such as stream crossings, elevated lines on piers, bridges, etc.;

(12) All pad mounted electrical transformers; and

(13) Project name with specific phase(s) to be reviewed for approval clearly marked red on the plans.

(d) All proposed water lines and appurtenances shall have a line weight equivalent to a #3 pen. All other lines shall have a line weight equivalent to a #1 or a #2 pen.

(e) If the subdivision consists of multiple phases or units, two copies of the overall subdivision plan shall be submitted with the phase(s) or unit(s) being requested for approval. Scales of the overall plans may vary.

AS-BUILT DRAWINGS

(a) As-built drawings must be submitted before a project can receive final approval by the City.

(b) Copies must be clear, clean, and legible.

(c) Drawings shall include a site plan of the water and sewer lines and appurtenances as they were installed with any shop drawings needed for clarification or as requested by the City.

(d) As-built drawings must be on mylar, 24" x 36" in size, and stamped by a Professional Engineer registered in the State of Georgia.

ARTICLE IX
GRADING AND DRAINAGE

Section 9.1 Site Grading

Site grading shall be done in accordance with the finished grades shown on the approved development drawings. Site grades shall direct surface drainage away from buildings without causing adverse impact on adjacent properties. The maximum slopes for soil cut or fill shall be two feet of horizontal run for each foot of vertical rise or fall except for stable rock slopes. If actual soils encountered require a flatter slope for stability, the lesser slope shall be used.

Soil erosion and sediment control measures shall be provided as required in the Soil Erosion and Sediment Control Ordinance.

Section 9.2 Drainage

Provisions for storm water drainage and detention designs are given in the City of Dawsonville Drainage Manual which is incorporated in these Regulations as Appendix A.

Section 9.3 Specifications for Drainage Construction

Specifications for drainage construction are included herein as Appendix B, Specifications for Utility and Drainage Construction.

Section 9.4 Preparation of Grading and Drainage Plans

Grading and drainage plans for all developments except individual one and/or two family dwelling units, shall be prepared by a Georgia registered professional engineer or landscape architect. At least three (3) copies of the plans and detention study shall be submitted to the City for review and comment. Within thirty (30) days of submittal of the plans, the City will either approve the plans or make comment on items requiring changes and/or additional information. When not approved, the cycle of plan submittal and review will be repeated until the plans can be approved by the City. Information to be shown on the plans shall consist of not less than the following:

(a) Topographic map of the existing conditions for the development showing existing facilities and features which affect or could be affected by grading and drainage improvements. Utilize a contour interval of not greater than two feet with spot elevations as necessary to define existing ground surfaces.

(b) All drainage ways, lakes, streams, creeks, swales, ditches, channels, wetlands, and drainage facilities.

(c) All existing utilities and appurtenances which affect or could be affected by grading and drainage improvements. The utility type, size and location in relation to grading and drainage improvements should be indicated.

(d) Existing and proposed property and easement lines and land lot and land district lines intersecting or bounding grading and drainage improvements.

(e) Finished grades depicted by finished contours and/or spot elevations as necessary to define finished grade surfaces.

(f) New drainage improvements including, but not limited to, pipes, culverts, catch basins, area

drains, drop inlets, junction boxes, headwalls, berms, dikes and detention basins with outlet works. The drainage areas tributary to each drainage structure, design flow, and time of concentration shall be indicated.

(g) Profiles of storm drains showing existing and finished ground surfaces, pipes, drainage structures with top and flow line elevations, distances from centerline to centerline of drainage structures, pipe and ditch grades, crossing utilities, and limits of special construction.

(h) Benchmarks for vertical control.

(i) Name of the development, names, addresses and telephone numbers of developer and developer's design professional, design professional's seal, north arrow, scale, and date.

Plans shall be prepared in conformance with the following:

(a) All elevations shall be based on and tied to U.S. Coast and Geodetic Survey mean sea level datum.

(b) Plan drawings shall be at a scale of at least 1 inch equals 100 feet. In developed or congested areas, a scale of 1 inch equals 20 feet or less shall be utilized.

(c) For profile drawings, the horizontal scale shall be the same as that used for the associated plan drawings. The vertical scale shall be at least 1 inch equals 10 feet. A 1 inch equals 5 feet vertical scale is often necessary to properly depict drainage conditions.

(d) The desired drawing size is 24 inches by 36 inches. In no case shall drawings be larger than 30 inches by 42 inches nor smaller than 11 inches by 17 inches.

(e) Drainage construction may be shown on street or utilities improvements plans provided the resulting drawings are clear, legible and plainly show all necessary information.

ARTICLE X
FEES

Fees for subdivision plat review, development plan review, copies of these Regulations, appeals, waivers, re-inspections, and other items are on file with the City Clerk and may be altered or amended from time-to-time by the City Council to help defray the costs of the administration of these Regulations. Subdivision plat and development plan review fees shall be paid at the time plats and plans are submitted for review

ARTICLE XI
ADMINISTRATION, ENFORCEMENT, APPEAL, AND VIOLATIONS

Section 11.1 Administration and Enforcement

These Regulations shall be administered, interpreted, and enforced by the building Official. In any case in which activities are undertaken in violation of these Regulations, not in compliance with the provisions of a permit issued by the City, or without authorization of a permit which would otherwise be required, the Building Official is hereby authorized to order that all unauthorized or

improper work be stopped, direct correction of deficiencies, or take any other legal or administrative action appropriate to the severity of the violation and degree of threat to the public's health, safety and welfare. It shall be the duty and responsibility of the Building Official to maintain an accurate and up-to-date compilation of these Regulations, including Appendices, and all amendments, and to publish said compilation and make it available to the public for a fee set by the City Council.

Section 11.2 Appeal and Waiver of the Regulations

It is the intention of this Ordinance that all questions arising in connection with the interpretation and enforcement of these Regulations first be presented to the Building Official and that such questions shall be presented to the Planning Commission only on appeal from the decision of the Building Official. Requests of waivers of the requirements of these Regulations shall be submitted in a form as prescribed by the Building Official along with such fee as shall be established by the City Council. The Building Official shall coordinate the review of each waiver request by all other affected City departments and shall summarize such comments and/or recommendations as may be received to the Planning Commission for final action in their normal course of business.

Section 11.3 Violation and Penalty

Any person, firm or corporation violating any provision of this Ordinance shall be guilty of a misdemeanor and, upon conviction, shall be fined, as determined by the Municipal Court of the City of Dawsonville for each offense. Each day such violations continues shall constitute a separate offense. Nothing herein contained shall prevent the City from taking such other lawful action as is necessary to prevent or remedy any violation.

ARTICLE XII
APPEALS PROCEDURE

Section 12.1 Appeals, Hearings, and Notice

Appeals to the Planning Commission may be initiated by any person aggrieved or by any officer, department, board, or bureau of the City. Such appeal shall be taken within a reasonable time, as provided by the rules of the Commission by filing with the Building Official from whom the appeal is taken and with the Planning Commission's notice of said appeal specifying the grounds thereof. The City Clerk shall forthwith transmit to the Planning Commission all papers constituting the record from which the action appealed was taken.

An appeal stays all legal proceeding in furtherance of the action appealed, unless the officer from whom the appeal is taken certifies to the Planning Commission, after the notice of appeal shall have been filed with the officer, that by reason of facts stated in the certificate a stay would, in the officer's opinion, cause imminent peril to life and property. In such case, proceedings shall not be stayed otherwise than by a restraining order which may be granted by the Planning Commission or by a court of record on application, on notices to the officer from whom the appeal is taken, and on due cause shown.

The Planning Commission shall fix a reasonable time for the hearing of the appeal or other matter referred to it, and give decide the same within a reasonable time. At the hearing any party may appear in person, by agent, or by attorney.

Section 12.2 Powers and Duties

The Planning Commission shall have the following powers and duties:

To hear and decide appeals where it is alleged there is error in any order, requirement, decision, or determination made by the Mayor in the enforcement of this Ordinance. To authorize, upon appeal, in specific cases a variance from the terms of this Ordinance as will not be contrary to the public interest, where a literal enforcement of the provisions of the Ordinance will in an individual case, result in unnecessary hardship, so that the spirit of the Ordinance shall be observed, public safety and welfare secured, and substantial justice done. Such variance may be granted in such individual case of unnecessary hardship upon a finding by the Planning Commission that:

(a) there are extraordinary and exceptional conditions pertaining to the particular piece of property in question because of its size, shape, or topography;

(b) the application of the Ordinance to this particular piece of property would create an unnecessary hardship;

(c) such conditions are peculiar to the particular piece of property involved; and

(d) relief, if granted, would not cause substantial detriment to the public good or impair the purpose and intent of this Ordinance, provided, however, that no variance may be granted for a use of land or building or structure that is prohibited in a given district by the Zoning Ordinance. To decide on other matters where a decision of the Planning Commission may be specifically required by the provisions of this Ordinance. In exercising these powers, the Planning Commission may reverse or affirm, wholly or in part, or may modify the order, requirements, decision, or determination, and to that end shall have all the powers of the Building Official from whom the appeal is taken and may issue or direct the issuance of a permit. The Planning Commission, in the execution of the duties for which appointed, may subpoena witnesses and in case of contempt may certify such fact to the Superior Court.

Section 12.3 Certiorari from Decisions

Any person aggrieved by any decision of the Planning Commission shall have the right of certiorari to the Superior Court within thirty (30) days after the decision of the Planning Commission is rendered.

ARTICLE XIII
AMENDMENTS

Section 13.1 Authority

This Ordinance may be amended from time-to-time by the City Council as herein specified, but no amendment shall become effective unless it has been submitted to the Planning and Zoning Commission at a public hearing for review and recommendation The Planning and Zoning Commission shall have 30 days from the date of the hearing to submit its recommendation to the

City Council. If the Planning and Zoning Commission fails to submit a report within the 30 day period, it shall be deemed to have approved the proposed amendment.

Section 13.2 Requirements for Change

When the public necessity, general welfare, or good development practices justify such action, and after the required review and report by the Planning and Zoning Commission, the City Council may undertake the necessary steps to amend these Regulations.

Section 13.3 Procedure for Amendments

Request to amend these Regulations shall be processed in accordance with the following requirements:

(a) Initiation of amendments: A proposed amendment to these Regulations may be initiated by the City Council, the Planning and Zoning Commission, the Mayor, or by application filed with the Mayor by a developer or citizen.

(b) Application Procedure. Each request for amendment of these Regulations shall be submitted in a form as prescribed by the Mayor along with such fee as shall be established by the City Council. Applications for amendments must be submitted in proper form at least 30 days prior to a Planning and Zoning Commission hearing in order to be heard at that hearing.

ARTICLE XIV
LEGAL STATUS PROVISIONS

Section 14.1 Conflict With Other Regulations

Whenever the regulations of this Ordinance require or impose more restrictive standards than are required in or under any other statutes, the requirements of this Ordinance shall govern. Whenever the provisions of any other statute require more restrictive standards than are required by this Ordinance, the provisions of such statute shall govern.

Section 14.2 Severability

Should any section, subsection, sentence, clause, phrase, or provision of this Ordinance be declared invalid or unconstitutional by any court of competent jurisdiction, such declaration shall not affect the validity of the Ordinance as a whole or any part thereof which is not specifically declared to be invalid or unconstitutional.

Section 14.3 Effective Date

These Regulations shall be in full force and effective on June 7, 2004, following adoption by the City Council and shall apply to any subdivision or development for which the first submittal of a Preliminary Plat or development plan are received after the effective date of these Regulations.

APPENDIX A
DRAINAGE MANUAL

INTRODUCTION

As the use and character of land changes due to the growth of Dawsonville, it is important to recognize the adverse effects those changes can have on natural and man-made systems. Applying reasonable solutions project by project is much easier and more cost effective than ignoring negative impacts until they become monumental problems. Drainage affords an excellent example of this point. Up until the early 1970's, urban growth was accomplished without consideration that storm water runoff and soil erosion were dramatically increased by development. The result of this approach was often heavy siltation and flooding. Even though modern detention and erosion control regulations have eased the problems, many cities still suffer drainage woes stemming from years of poor storm water management.

The purpose of this Manual is to establish criteria for dealing with drainage for all projects within the City of Dawsonville. Set forth herein are policies, methods and techniques to be used in developing drainage improvements on a consistent basis throughout the City.

It must be recognized that this manual is not intended to be a complete reference on drainage nor is it expected to cover every situation which may arise. The manual is to serve as a guide to engineers versed in drainage analysis and design. Unique circumstances requiring special or alternative design methods should be brought to the attention of the City early in project life so that agreement on problem approach can be reached without impacting project progress. Manual users are encouraged to comment on its contents so that it may be made as useful and applicable as possible.

CHAPTER 1
DESIGN POLICY

Hydrology

For drainage areas containing 50 acres or less, designs are to be based on the Rational Method. Designs for areas containing more than 50 acres are to be based on a method approved by the City Engineer for the specific basin. Normally, the Soil Conservation Service method or the U.S.G.S. Flood Frequency Relation Method may be used.

Within the City of Dawsonville the Burkli-Zeigler formula and the Talbot formula are not considered appropriate.

Culverts and Piped Systems

1. Culverts are to be designed for a 50 year frequency flood event. The area inundated by the design event is to be contained in a drainage easement.

2. Piped storm drainage systems are to be designed for a 25 year frequency storm event in non-residential areas and for a 10 year frequency storm event in residential areas. Catch basins are to be spaced so that the maximum gutter spread is six feet or less for the design storm event.

3. The minimum pipe size to be used as a culvert or in a piped system is 15inch diameter.

4. Under City streets, all pipe used for culverts and storm drainage systems is to be reinforced concrete. Corrugated plastic pipe may also be used for culverts and storm drainage systems not under City streets. Pipe class for reinforced concrete is to be determined for actual conditions anticipated for each specific application but not less than class III. The designer may select round pipe conforming to ASTM C76, arch pipe conforming to ASTM C506 or elliptical pipe conforming to ASTM C507.

5. For concrete culvert and pipe systems, a roughness coefficient (Manning's n) of 0.012 is to be used. For corrugated plastic culvert and pipe systems a roughness coefficient (Manning's n) of 0.020 is to be used.

6. The minimum velocity in a pipe flowing full is to be 2.0 feet per second. The maximum velocity in a pipe flowing full is to be 12.0 feet per second. The exit velocity of culvert and pipe systems is to be controlled and modified to prevent channel erosion or scour.

7. The absolute minimum clearance between the bottom of the paving base or subbase and the exterior crown of the storm drain pipe or culvert is to be 1.0 foot. A clearance of 2.0 feet is considered more desirable and should be achieved if possible.

Detention Facilities

1. Detention facilities are required for any project when the runoff is increased by more than 1.0 cubic foot per second for a 10 year frequency storm event.

2. The peak release rate of storm water from a project is not to be increased from the pre-developed state for all intensities up to and including the 100- year event. Specific storm events to be examined include the 2, 5, 10, 25, 50 and 100 year return frequency.

3. Detention facilities located on paved areas used for parking or vehicular access are discouraged. The depth of water in a detention facility located on paved areas also used for vehicular purposes is limited to six inches. The depth of water in a detention facility located on paved areas also used for parking is limited to two inches.

CHAPTER 2
DATA COLLECTION

Drainage Basin Size

The size of drainage basin(s) for a project is to be determined from:

1. Field survey using conventional topographic techniques,
2. Aerial topographic maps of the project,
3. Other maps acceptable to the City.

Land Use

In drainage basins having limits beyond the boundaries of a project, land uses outside the project will be considered as either 1) the existing development or 2) natural undeveloped as appropriate.

Soil Conditions

The soil conditions for a project are to be determined from:

1. Field survey of project site soils.
2. Soil Survey of Dawson County, Georgia
   U. S. Department of Agriculture
   Soil Conservation Service

Existing Storm Drains

Careful field investigation is required to locate existing storm drains which drain into or are located within a project. Data on pipe or culvert material, size, slope, entrance and exit conditions should be recorded. Any construction record information on existing storm drains will be made available at City Hall through the Public Works Department. This data must be field verified as the City cannot assure correctness or accuracy of record information.

CHAPTER 3
RATIONAL METHOD

Rational Method Formula: Rational Method Formula used for Hydrology Determination.

CHAPTER 4
DETENTION FACILITIES

Design Methods

Small Drainage Areas (3 acres or less):

To determine detention requirements for small drainage areas of 3 acres or less, the "bowstring" method may be used. By this method, storage required is equal to the maximum difference between the total inflow (based on post development conditions) less the total outflow (based on natural undeveloped conditions). *Example No. 2* at the end of this chapter illustrates the "bowstring" method. The designer may also use the reservoir routing method.

Drainage Areas Over 3 Acres:

For drainage areas over 3 acres in size, the reservoir routing method is to be used to establish detention requirements. The basic technique of this method calls for repetitive solution to the continuity equation. The formula of the equation utilized is:

$$I1 + I2 + \frac{2S1}{t} - O1 = \frac{2Ssq}{t} + O2$$

Where:

t =	a selected time interval
I1 =	inflow at the start of the time interval
O1 =	outflow at the start of the time interval
S1 =	storage at the start of the time interval
I2 =	inflow at the end of the time interval
O2 =	outflow at the end of the time interval
S2 =	storage at the end of the time interval

The inflow hydrograph for the reservoir routing metered is to be developed from the appropriate unit hydrograph on Figure 4-1. The reservoir routing method is illustrated by *Example No. 3* at the end of this chapter.

Design Storms

In determining detention design, the engineer must evaluate the 2, 5, 10, 25, 50 and 100 year return frequency storm events. Under all events analyzed, the peak natural undeveloped runoff is not to be exceeded. In determining the peak natural undeveloped runoff, a runoff coefficient (c) not exceeding 0.3 must be used unless a higher coefficient can be demonstrated by fact. All such higher values must have the written concurrence of the Mayor or his/her designated representative.

Emergency Overflow

Detention facilities should be suitable for storing excessive post development runoff for all storm events through the 100 year frequency. Because, however, the 100 year event can be exceeded and because outlet works can become partially or totally blocked, the design engineer must provide an emergency overflow for all detention facilities. The emergency overflow should direct flows to minimize property damage and avoid risk to people.

Freeboard

Detention facilities for sites of 2 acres or less should have a freeboard of not less than six inches. For sites exceeding 2 acres, the freeboard should be not less than one foot. Freeboard is defined as the vertical distance between the maximum water surface elevation anticipated in design and the top of retaining banks or structures provided to prevent overtopping because of unforeseen conditions.

Example No.2

Design the detention facility required to serve a 12,000 square foot neighborhood shopping center located on a square 1.4-acre site. For purposes of this example consider only a 5-year frequency storm.

The existing site is a wooded lot.

Allowable Release Rate

Time of concentration (Tc)	= 11 minutes
Intensity (5)	= 6.5 in/hr. (From Figure 3-1)
C factor	= 0.20 (From Table 3-1)
Allowable Release Rate	= CIA
= 0.20 x 6.5 x 1.4	
= 1.82 cfs	
Inflow	

Determine post development "C" factor.

Use	Area	C	CXA
Roof or Paving	0.64	0.95	0.61
Grassed Lawn	0.33	0.30	0.10
Undisturbed Natural	0.43	0.20	0.09
	1.43 acres		0.08
Composite C	= CXA	= 0.80	= 0.57
A	1.40		

Inflow = CXA x It x 60t

t min	60t sec	It in/hr	CXA	Inflow C.F.
0	0	0	0.82	0
5	300	8.5	0.82	2091
10	600	6.5	0.82	3198
15	900	5.4	0.82	3985
20	1200	4.8	0.82	4723
30	1800	3.9	0.82	5756
40	2400	3.2	0.82	6298
50	3000	2.8	0.82	6888
60	3600	2.5	0.82	7380

Outflow = Allowable Release Rate x 60t

t	60t	ARR	Outflow
min	sec	C.F.S.	C.F.S.
0	0	1.82	0
50	3000	1.82	5460

Plot inflow and outflow on graph. Maximum difference between two plots represents required storage.

Assume maximum storage depth of 3.0 feet.

Required Storage Depth = Surface Area at mid depth

$$\frac{2400}{3} = 800 \text{ SF}$$

CHAPTER 5
OPEN CHANNELS

Improved open channels used as a part of a storm drainage system should be mixed to accommodate flows for the storm events given in Chapter 1 of this manual. Flow velocities and depths should be determined from the Manning equation.

A channel system consist for its (1) cross section configuration, (2) horizontal alignment, (3) slope or grade and (4) surface materials. These components must be combined so that he resulting system prevents erosion. The actual selection of system components is left to the design engineer.

The minimum channel conditions the design engineer must achieve are (1) not less than an established grass lining and (2) a lined freeboard of at least 6 inches above the 10 year frequency storm flow.

Manning "n"

For channel calculations, select the appropriate roughness coefficient from the chart at the end of this chapter. The chart was taken from the *Georgia Department of Transportation Manual on Drainage design for Highways.*

Allowable Velocities

The maximum permissible velocities in channels lined with uniform stands of various grass covers, are not to exceed the values given in Table E-2. This table is from the *Manual for Erosion and Sediment Control in Georgia*.

CHAPTER 6
CULVERTS

Design

The design of culverts in Dawsonville is to be based on Chapters 6 and 7 of the *Georgia Department of Transportation Manual on Drainage Design for Highways*.

Plan Date

Construction plans for culverts presented to the city for review should contain at least the following data for each culvert.

1. Drainage area.
2. Design Discharge and Flood Discharge.
3. Water surface elevation at the Design Discharge.
4. Culvert size and slope.

CHAPTER 7
STORM DRAINS

Inlet Spacing

Catchbasins, drop inlets, and similar structures for removing storm runoff from streets are to be spaced as necessary to keep gutter spread at or less than the maximum value identified in Chapter 1. The procedure and design aid charts contained in Chapter 10 of the *Georgia Department of Transportation Manual and Drainage design for Highways* is an acceptable method for use in the City of Dawsonville.

Piped Systems

Piped storm drain systems should be designated using the Manning equation.

APPENDIX B
STANDARD SPECIFICATIONS

SECTION 00010 – TABLE OF CONTENTS

SECTION 02112 – ROUTE CLEARING

PART 1 - GENERAL

DESCRIPTION OF WORK:

The extent of route clearing is that minimum degree of clearing necessary to install utilities and appurtenances, and such additional clearing as may be shown on the drawings or required by other documents.

Route Clearing operations include, but are not limited to, the following:

Protecting existing trees and other vegetation.

Removing trees and other vegetation.

Clearing.

Removing above-grade improvements.

Removing underground improvements.

Restoring damaged improvements.

Protecting above-grade and underground improvements.

JOB CONDITIONS:

Protection of Existing Improvements:

Provide barricades, coverings, or other types of protection necessary to prevent unnecessary damage to existing improvements.

Protect improvements on adjoining properties as well as those along the project route. Restore improvements damaged by this work to their original condition as acceptable to the owners or other parties or authorities having jurisdiction. Have property line monuments (such as iron pins) removed or disturbed by clearing operations, replaced by a Georgia registered land surveyor.

Protection of Existing Trees and Vegetation:

Protect existing trees and other vegetation against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction material within drip lines, excess foot or vehicular traffic, or parking of vehicles or equipment within drip line. Provide temporary fences, barricades or guards as required to protect trees and vegetation to be left standing

Provide protection for ornamental tree roots over 1-1/2 inch diameter that are cut during any construction operation. Coat the cut faces with an emulsified asphalt, or other acceptable coating, especially formulated for horticultural use on cut or damaged plant tissues. Temporarily cover all exposed roots of ornamental trees with wet burlap to prevent roots from drying out; provide earth cover as soon as possible.

Repair or replace unnecessarily damaged trees and vegetation, as determined by the City, resulting from any construction operation, in a manner acceptable to the property owner and the City. Tree damage repair shall be performed by a qualified tree surgeon. Replace unnecessarily damaged trees which cannot be repaired and restored to full-growth status, as determined by the tree surgeon.

Protection of Adjacent Property:

Protect improvements, trees and vegetation on adjoining property as well as those on property requiring route clearing work.

Execute work so as not to create a nuisance to persons utilizing adjacent property.

Use work methods and provide temporary facilities as necessary to prevent washing, erosion, siltation or dust damage, or hazard to persons and property, within and off the work area.

PART 2 - PRODUCTS

Not applicable to work of this section.

PART 3 – EXECUTION

Clearing:

Remove vegetation, trees, lawns, shrubbery, gardens and other plant growth to the minimum practicable extent. Limit clearing to a single lane work route without provision for construction vehicles to pass utility operation. Accurately determine limitations of construction easements or right-of-way, and keep construction activity within such limits.

Remove lawn sod by cutting into maximum size which can be handled without tearing, stripping sod and underlying topsoil, and stockpiling for use in restoring the surface area. Water sod and otherwise maintain sod in viable, growing condition.

Remove above-grade structures only where specifically authorized.

Remove conflicting fences and provide effective temporary measures to prevent stock, cattle or other domestic animals from wandering to other lands. Reconstruct fences promptly.

Remove abandoned underground facilities such as utilities and structures, walls, footings, basements, wells, septic tanks, tanks, underground pipe, and other items which conflict with construction.

HOLES AND DEPRESSIONS:

Fill holes, depressions and voids created or exposed by clearing operations with non-organic soil material, unless further excavation or earthwork is indicated.

Place fill material in horizontal layers not exceeding six inches loose depth, and thoroughly compact to a density at least equal to adjacent original ground.

DISPOSAL OF WASTE MATERIALS:

Disposal General Requirements:

Accomplish disposal of cleared matter daily so as to maintain site in a safe and neat condition throughout the construction period.

Burning of cleared materials on the work site is only allowed when authorized and permitted by the Fire Chief.

On-Site Disposal:

Unless property owner requests complete removal, cut tree trunks and limbs, over two inches in diameter, into 24 inch lengths and neatly stack within work limits having the same property ownership as that on which the tree originally grew.

On undeveloped property, distribute brush, trees and limbs less than two inches in diameter, within the work area from which cut, in such a way as not to be objectionable to the property owner. On developed property, remove all such clearing waste and legally dispose of it.

END OF SECTION - SECTION 02112 – ROUTE CLEARING

SECTION 02204 – TRENCHING AND BACKFILLING

PART 1 - GENERAL

DESCRIPTION OF WORK:

Trenching and backfilling operations include, but are not limited to, all earthwork associated with installation, modification, or abandonment of underground utilities and appurtenances, and restoration of damaged improvements and disturbed surfaces.

Related work specified elsewhere includes, but is not limited to, the following:

Route Clearing, Section 02112

Sampling and Testing:

Provide quality control testing during construction as necessary to assure the entire earthwork including all fill layers, sub grades, and bases meets specified requirements. Remove and reconstruct, or otherwise correct work which falls below specified density or is outside other specified limits.

Employ, at Contractor's expense, an independent testing laboratory to perform quality control testing during trenching and backfilling operations.

The City may perform sampling, surveying, inspection or testing activity during construction for its use, but such activity does not relieve the Contractor from responsibility to achieve specified results.

SUBMITTALS:

Quality Control Testing Reports: After completing utility earthwork construction and prior to acceptance by the City, the Contractor must file a copy of the quality control test results demonstrating compliance with these specifications with the City. At any time during the construction process, representatives of the City may request to review and the Contractor shall provide quality control test results.

SITE INFORMATION:

Verify existing site grades to be substantially consistent with grades shown on the drawings before commencing work. Report any significant conflict in grades to the design engineer before proceeding.

Subsurface conditions presented, if any, are not intended as representations or warrants of continuity of such conditions between soil borings or pits. It is expressly understood that the Contractor is solely responsible for interpretations or conclusions drawn there from.

Data are made available for the convenience of the Contractor who may, without cost to the City, perform additional test borings and other exploratory operations, provided such operations are acceptable to the City.

Existing Utilities: Locate all existing underground utilities in the areas of work including verification of nature and exact location of any utility indicated on drawings. If utilities are to remain in place, provide adequate means of protection during earthwork operations.

Should unexpected piping or other utilities be encountered during excavation, consult the utility owner immediately for directions. Cooperate with City and other utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

Do not interrupt utilities serving existing facilities except when permitted in writing by City and then only within time periods acceptable to the City.

Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.

Traffic Control: Schedule and conduct Work in a manner which will minimize inconvenience to vehicular and pedestrian traffic. Provide flaggers, barricades, warning signs, warning lights, and other warning means as appropriate. Flaggers, when utilized, must hold a valid Georgia D.O.T. Flagging certificate. Maintain traffic on all roads and streets which must be crossed by trenching and making two separate cuts so that at least one traffic lane is open at all times. All traffic controls during construction must conform to Part VI of the *Manual on Uniform Traffic Control Devices,* ANSI D6.le.

PART 2 - PRODUCTS

RIP-RAP STABILIZATION:

Soil Cement Bag Rip-Rap:

Cement: ASTM C 150 Portland Cement, Type I or II.

Soil: Select site excavation material of finely selected earth, stone dust, sand or similar material.

Bags: Cotton or burlap, capable of containing the soil-cement mixture without leakage during handling and placing. Do not use bags which have previously been used for sugar, or other material which will adversely affect the soil-cement mixture. Provide bags with a capacity between one cubic foot minimum and two cubic feet maximum.

Stone Rip-Rap: Individual stones not less than 6 inches thick nor 12 inches wide, not more than 2 cubic feet in volume and of proper shape to bring structures to accurate lines, shapes and elevations. Provide stone free of rounded or worn surfaces and also free of segregation, seams, cracks, pyrite intrusions and other defects tending to reduce weather resistance.

PART 3- EXECUTION

PROTECTION OF PERSONS AND PROPERTY:

Prior to commencing other work, accurately locate above and below ground utilities and structures which may be affected by the Work, using whatever means be appropriate. Mark the location of existing utilities and structures, not otherwise readily visible, with flagging, stakes, barricades, or other suitable means.

Barricade open excavations and post warning lights for safety of persons. Operate warning lights during hours from dusk to dawn each day.

Protect structures, utilities, sidewalks, pavements, and other facilities immediately adjacent to excavations, from damage caused by settlement, lateral movement, undermining, washout and other hazards.

Take precautions and provide necessary bracing and shoring to guard against movement or settlement of existing improvements or new construction. Contractor is entirely responsible for strength and adequacy of bracing and shoring, and for safety and support of construction from damage or injury caused by the lack thereof or by movement or settlement.

Use work methods and provide temporary facilities as necessary to prevent washing, erosion, siltation or dust damage, or hazard to persons and property, within and outside the work area.

Place excavated material compactly alongside of the trench, and keep such material trimmed up so as to present the least practicable inconvenience to the public. Where necessitated by traffic conditions, remove from the roadway the first material excavated from a working length of trench so that further excavation is immediately used for backfilling, and thereby avoid stockpiling of material upon the roadway. Afterward, return first excavated material if needed for final backfilling.

Maintain all streets, alleys, sidewalks, pipe crossings, fire hydrants, water and gas valves, and other utilities accessible for their intended use except while the work is steadily advancing in the immediate vicinity of each such facility.

Keep every drain, gutter, culvert, sewer, and surface drainage route encountered, open for both temporary and permanent flow unless other effective provision for drainage is made.

Do not permit any hazardous condition to result from trenching and backfilling operations.

USE OF EXPLOSIVES:

Do not bring explosives onto site or use in work without prior written permission from authorities having jurisdiction.

Use explosives only as legally permitted and when other work methods are impractical.

Do not permit explosives on the project site other than during the least practicable use period.

Assume sole responsibility for handling, storage, and use of any explosive materials.

TRENCHING:

Trenching consists of removal and disposal of material encountered to obtain required sub-grade elevations, usually, but not necessarily limited to that incidental to installation or modification of underground pipelines and appurtenances.

Unauthorized trenching consists of removal of materials beyond indicated sub-grade elevations or dimensions without specific authorization of the City.

Rock excavation consists of removal and disposal of natural material encountered that cannot be excavated without continuous and systematic drilling and blasting or continuous use of a ripper or other special equipment. Intermittent drilling or blasting performed to increase production and unnecessary for excavation of material encountered will not be classified as rock excavation.

Stability of Excavation: Slope sides of excavations to comply with Subpart P of Part 1926 of the Occupational Safety and Health Act as amended. Shore and brace or use trench box where sloping is not possible either because of space restrictions or stability of material excavated.

Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

Shoring and Bracing: Provide portable trench boxes and materials for shoring and bracing, such as sheet piling, uprights, stringers and cross-braces, in good serviceable condition.

Maintain shoring and bracing and/or portable trench boxes in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.

Provide trench boxes and/or shoring and bracing to comply with Subpart P of Part 1926 of the Occupational Safety and Health Act as amended.

Dewatering: Perform earthwork in a manner to prevent surface water and minimize subsurface or ground water from flowing into excavations, and to prevent water from flooding project work and surrounding area.

Do not allow water to accumulate in excavations. Remove water using dewatering methods which will prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of sub-grades and foundations. Provide and maintain pumps, sumps, suction and discharge lines, and other de-watering system components necessary to convey water away from excavations.

Limit opening of additional trench length to that which can be de-watered with available equipment or methods.

Do not use trench as temporary drainage ditch.

Material Storage: Locate and retain materials away from edge of trench.

Dispose of excess soil material and waste materials, such as unsatisfactory excavated soil material, trash and debris, as specified hereinafter.

STANDARD SPECIFICATIONS (cont.)

Excavating: Do not extend excavation below or wider than that which is necessary to construct work except as otherwise provided herein. Repair any unauthorized trenching as necessary to obtain an adequate subgrade.

Limit open trench excavation to a maximum of 300 feet ahead of completed backfill.

Where specific utility system elevations or depths are indicated on the Drawings or elsewhere herein, accurately conform with such requirements. Otherwise, achieve a minimum earth and/or pavement cover of 30 inches above top of underground utilities being constructed unless a greater cover is made necessary by easement or permit requirement, by maintaining a minimum clearance of 18 inches below any existing or proposed structure or channel, or by achieving proper alignment with existing or proposed facilities.

Maintain a horizontal separation of at least 12 inches between sanitary sewers and any existing or proposed water main. A sewer may be laid closer than 12 inches to a water main if it is laid in a separate trench.

Maintain a vertical separation of at least 18 inches between the crown of sanitary sewers and the invert of existing or proposed water mains with the sewer located below the water main. Where a vertical separation of 18 inches cannot be provided and the water main cannot be relocated to provide adequate clearance, center one full length of water main over the sewer so that both joints of the water main will be as far from the sewer as possible.

Confine trench width from an elevation of one foot above top of underground pipe to the trench bottom, to that minimum which is necessary to pipe laying operations, but do not exceed maximum trench width determined by pipe foundation requirements.

Remove rock, masonry and concrete material to a distance of at least six inches from all parts of pipe and appurtenances being installed. Backfill and thoroughly compact to proper trench bottom elevation with select excavated material.

Do not mix excavated rock, masonry or concrete with backfill material placed within two feet of installed pipe, or within one foot of finished grade.

Pavement Removal: Remove all pavement, including curb and gutter, sidewalk and the like, which must be disturbed by trenching operations.

Saw cut edges of bituminous pavement. For concrete pavement, saw cut edges or remove and replace to nearest joint.

At sidewalks, curbs and gutters, and the like, remove entire width of damaged sections.

Extend pavement removal to the width required to accomplish trenching operations without damage to edge of remaining pavement. Correct any edge damage which occurs as requested by the City.

Removal of Unsatisfactory Soil Materials: To the extent necessary, over-excavate those soil materials which are unsatisfactory in the opinion of the City and backfill with approved materials.

STANDARD SPECIFICATIONS (cont.)

COMPACTION:

General: Control soil compaction during construction providing minimum percentage of density specified for each area classification.

Percentage of Maximum Density Requirements: Achieve not less than the following percentages of maximum density of soil material compacted at optimum moisture content, for each layer of soil material-in-place as determined by ASTM D 698 (Standard Proctor) test procedures:

Rights-of-Way: Conform with the more stringent requirements of the permit issuing authority and the requirements herein. Roadways: Under and within five feet horizontal distance of traffic using surfaces, compact each layer of backfill and fill material to 95 percent of maximum dry density. Walkways: Under and within two feet horizontal distance of paved walks, compact top six inches of subgrade and each layer of backfill and fill material to 95 percent of maximum dry density.

Driveways and Parking Lots: Under and within two feet horizontal distance of traffic using surfaces, compact each layer of backfill and fill material to 95 percent of maximum dry density.

Lawn or Unpaved Areas: Compact each layer of backfill or fill material to 85 percent of maximum dry density.

Spoil Areas: Compact each layer of backfill or fill material to 85 percent of maximum dry density.

Moisture Control: Where a layer of soil material is too dry to achieve required compaction, uniformly apply water to layer as necessary to bring moisture within limits which permit compaction to at least the specified densities.

Remove, dry and replace, or scarify and air dry in place, soil material that is too wet to achieve required compaction.

BACKFILL AND FILL:

General: Place acceptable soil material in uniform layers, to required elevations. Backfill excavations as promptly as work permits.

Backfill and Fill Materials: Use acceptable trench excavated soil material, free of stumps, trees, roots, muck, trash and other objectionable matter.

Placement and Compaction: Place backfill and fill materials in layers not more than eight inches in loose depth. Before compaction, moisten or aerate each layer as necessary to provide the proper moisture content. Compact each layer to not less than the required percentage of maximum density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

Commence backfill and fill operations close behind utility laying operations. Take care to prevent wedging action of backfill or fill against structures by carrying the material uniformly around structure to approximately same elevation in each lift.

STANDARD SPECIFICATIONS (cont.)

GRADING:

General: Uniformly grade areas within limits of earthwork, including adjacent transition areas. Smooth and compact finished surface within specified tolerances, with uniform levels or slopes between points where elevations are shown, or between such points and existing grades, or between existing grades.

Grading Outside Structures: Grade finished areas adjacent to structures to drain away from structures (except drainage inlets), and to prevent ponding. Finish surfaces free from irregular surface changes, and as follows:

Grassed or Landscaped Areas: Finish areas to within not more than 0.10 feet above or below the required elevations.

Walks and Pavements: Shape surface of areas under walks and pavements to line, grade and cross-section, with finish surface not more than 112 inch above or below the required subgrade elevation.

Compaction: After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

RIP RAP SURFACE STABILIZATION:

General: Prior to placing rip rap, bring ground surface to correct line and grades. At Contractor's option, provide either soil cement bag rip rap or stone rip rap at all stream crossings, and/or at locations indicated on Drawings or requested by the City.

Soil Cement Bag Rip Rap: Proportion select pipe line excavation material and cement in the ratio of 5:1 by volume. Uniformly fill bags to maximum capacity which will permit satisfactory tying, and which produces an in-place thickness of 6 inches. Place bagged rip rap by hand with the tied joint ends facing the same direction with close staggered joints.

When rip rap is placed above water level, do not add water to mix until bags have been finally placed. Then lightly sprinkle bags with water using methods which moisten soil-cement through its entire depth without causing washes or permitting bagged material to become fluid. Use minimum water necessary to moisten mix.

When rip rap is placed below water, temporarily place bagged mix above water level and moisten as outlined above. Use care in uniformly shaping bagged mixture to approximately rectangular cross section before adding water. After moistened bagged mixture has set up sufficiently to be handled without cracking, but not less than 7 days, the rip rap may be placed in its final position. Where bagged mix can be placed below water without danger of contents being washed out of bags, bags may be placed under water in the same manner as specified for placing above water.

When placing rip rap above water level, ram and pack bags against one another to produce the required thickness and form a consolidated mass. When placing rip rap below water, carefully handle bags so as not to crack the soil-cement. Place bags neatly and so that finished rip rap units are free of tendency to slip out of position. Place all rip rap so that no more than 3 inches variation exists above or below the required plane.

Stone Rip Rap: Hand place stone rip rap into final position to form a compact layer not less than 6 inches in-place thickness. Use well graded stone sizes to eliminate void spaces between stones.

Place stones neatly and anchor units to be free of tendency to slip out of position. Place rip rap so that no more than 3 inches variation exists above or below the required plane.

MAINTENANCE:

Protection of Graded Areas: Protect newly graded areas from traffic and erosion, and keep free of trash and debris.

Repair and re-establish grades in settled, eroded, and rutted areas to specified compaction and tolerances.

Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction, adverse weather, traffic, or other cause, scarify surface, re-shape, and compact to required density prior to further construction.

Maintain temporary erosion and sediment control measures until permanent measures become effective.

DISPOSAL OF EXCESS AND WASTE MATERIALS:

Disposal of Excess Excavation: Transport excess excavated material, including unsatisfactory soil material, to any designated spoil areas, and spread as specified; otherwise remove from the project work area and legally dispose of such material which cannot be acceptably distributed within project work area.

Disposal of Waste Material: Remove trash, debris, and waste materials from the project work area and legally dispose of such material.

RESTORATION:

Plan and execute total work so as to minimize damage to property. Restore all surface materials, shrubbery, fences, lawns, walls, structures and other improvements to a condition no less desirable than that which existed before construction operations began.

Conduct all construction operations such that upon completion of any part of the work, the contour and topography of the construction area has not been substantially altered. No alteration of previously established storm drainage patterns will be permitted unless such alteration can be proven to the City's satisfaction to improve the drainage pattern without adverse impact on affected property owners.

Where necessary to temporarily remove or damage improvements of any significance, take professional quality photographs of such improvements before disturbing them. Make copies of such photographs available to the City on request.

Restore work area and accomplish site cleanup immediately after backfilling and fill operations.

Replace property line monuments which were damaged, removed or disturbed by trenching and backfilling operations. Employ, at Contractor's expense, a Georgia registered land surveyor for all property line monument replacement.

END SECTION - 02204 - TRENCHING AND BACKFILLING

SECTION 02408 - TUNNELING

PART 1 - GENERAL

DESCRIPTION OF WORK:

Tunneling pertains to the installation of carrier pipe or tunnel liner below ground by means other than open cut excavation.

Tunnel liner sizes indicated on the Drawings are minimum nominal diameters. Use appropriate size and type of tunnel liner and construction methods as necessary to provide a complete tunnel liner installation.

Related Work Specified Elsewhere:

Route Clearing, Section 02112

Trenching and Backfilling, Section 02204

Storm Sewer System, Section 02770

PART 2- PRODUCTS

CARRIER PIPE:

Where carrier pipe is installed without tunnel liner by tunneling methods, conform with carrier pipe material specifications unless otherwise indicated.

PIPE TUNNEL LINER:

Where tunnel liner is installed using jacking or boring construction methods, comply with the following material specifications for tunnel liner:

Steel Pipe Tunnel Liner:

Steel Pipe Tunnel Liner - 4 Inches and Smaller: Conform to ASTM A120 material specifications. Use galvanized steel, Schedule 40 minimum, with threaded couplings.

Steel Pipe Tunnel Liner - Larger Than 4 Inches: Conform to ASTM A53 or A139 material specifications, except hydrostatic testing is not required. Join pipe sections with full strength, continuous welds in accordance with procedures approved by the American Welding Society to obtain a watertight seal.

Use pipe having not less than the following wall thicknesses:

Nominal Diameter - Inches	Minimum Wall Thickness - Inches
12 or Smaller	0.188
14-16	0.282
18	0.313
20	0.344
22	0.375
24	0.407
26	0.438
28-30	0.469
32	0.501
34-36	0.532
38-42	0.563

Reinforced Concrete Pipe Tunnel Liner:

Conform to ASTM C76, Class V material specifications for withstanding in-place vertical loads. Provide additional reinforcement or strength required to withstand jacking pressure. Except for end closures, provide pipe in eight foot minimum lengths. Use self centering tongue and groove joints such that outside of tunnel liner is uniform in diameter at all locations. Seal pipe joints with butyl based sealant manufactured for that purpose.

SECTIONAL PLATE TUNNEL LINER:

Where carrier pipe is installed in tunnel liner and mining methods are utilized, **comply with the following specifications**:

Materials:

Fabricate tunnel liner sections of corrugated steel plate especially manufactured for tunnel liner service. Design liner sections and fasteners in consideration of actual tunnel location. For liner plate design purposes, use soil, wheel, and surcharge loads of sufficient magnitude to insure a safe liner plate system in actual use conditions.

Provide tunnel liner plate having a minimum thickness of 0.179 inches and liner plate fasteners having a minimum diameter of 0.625 inches.

Fabrication:

General: Tunnel diameters shown on the Drawings are in terms of the required minimum clear inside diameter of the erected liner plate tunnel. Fabricate liner plate sections to allow complete installation from within the tunnel, and with alternate liner, plate rings in the erected tunnel containing two threaded grout holes in the vicinity of the tunnel invert and two grout bleed holes in the vicinity of the tunnel crown.

Galvanized Coating: After tunnel liner plate sections have been formed and punched, hot dip galvanize plate sections with at least a two ounce coating of spelter per square foot total for both sides. Galvanized liner plates must not be warped, and the spelter coating must be free from defects such as blisters, flux, abrasion, poor adhesion, and uncoated spots.

Bituminous Coating: After galvanizing, fully coat both sides of liner plate sections with an asphaltic bituminous coating not less than 0.05 inch thick and conforming to AASHTO N 190 for bituminous protected corrugated metal pipe.

PART 3- EXECUTION

INSPECTION:

Examine areas and conditions under which tunneling is to be done, and notify design engineer in writing, of conditions detrimental to proper and timely completion of Work.

GENERAL:

Carry out Work in a safe manner, taking all necessary precautions and measures necessary to maintain a stable construction system which does not weaken existing earth or structures nor cause settlement of the overpassing roadway or railway section.

When tunneling operations are carried out under railroad tracks, highways, streets, or any other existing thoroughfare, perform operations in such manner as not to interfere with nor in any way endanger the normal operation of such thoroughfares.

Complete all tunneling work at one particular location before starting work at another location.

EXCAVATION:

The following requirements are supplemental to Section 02204, Trenching and Backfilling, of these specifications.

When required, excavate suitable pits or trenches for tunneling operations. Provide all necessary bracing, sheeting, and/or other temporary means to insure safety of persons and property. Comply with Subpart P of Part 1926 of the Occupational Safety and Health Act as amended.

Maintain excavation free from water, mud, and debris which will interfere with an efficient tunneling operation. Neatly dry-excavate material of whatever nature encountered within the tunnel. Do not use sluicing or jetting excavation techniques.

Limit excavation to the minimum diameter required for tunnel liner installation.

Pressure grout all excessive voids which may develop about the tunnel liner exterior.

Promptly backfill all pits and trenches.

JACKING:

When installing tunnel liner by jacking method, use guide rails or other jacking frame structure to effectively maintain tunnel liner at proper line and grade. Force tunnel liner into place with suitable jacks which apply uniform pressure around the tunnel liner end section. Excavate at the lead end of the tunnel as the jacking operation progresses, but do not excavate more than six inches in front of tunnel liner. Reduce the two feet distance where material character results in excess loss of soil. Remove excavated material through the tunnel liner. Once jacking is begun, continue operation without interruption to prevent the pipe from becoming firmly set in the embankment.

Perform tunneling such that the final tunnel liner position is within the following limits:

Lateral Alignment: Within two percent of tunnel liner length.
Vertical Elevation: Within one percent of tunnel liner vertical grade, provided that the final grade of flow line is in the direction indicated on the Drawings.

BORING:

Mechanically bore by use of a cutting head on a continuous auger. Install tunnel liner in hole by jacking or other suitable methods. Accomplish boring of hole and tunnel liner installation simultaneously. Do not permit boring to proceed more than one foot in front of tunnel liner.

At contractor's option and to minimize abandoned tunnel liner, conduct initial boring using a pilot hole approximately 2 inches in diameter for the entire installation length. Verify required line and grade and use pilot hole as the centerline of the larger hole to be bored. If rock is encountered in pilot hole, withdraw equipment and relocate tunnel location. Conduct pilot hole installation in revised location and repeat procedure. No extra payment will be considered for installations that encounter rock and must be abandoned.

Perform tunneling such that the final tunnel liner position is within the following limits:

Lateral Alignment: Within two percent of tunnel liner length.
Vertical Elevation: Within one percent of tunnel liner vertical grade, provided that the final grade of flow line is in the direction indicated on the Drawings.

MINING:

When installing tunnel liner by mining methods, handle, maintain, and install liner plate sections in such manner as to avoid damage to plates and surface coating thereon. Install liner plates immediately after excavated material is removed from the tunnel. Do not permit liner plate installation to fall more than 24 inches behind the tunnel working face. Do not leave more than 12 inches of unlined tunnel at the end of the day's operation.

Provide all necessary bracing bulkheads and/or shields required to insure safety of persons and property. Provide well-braced, temporary bulkhead against excavation face during each cessation of work while the heading is within 20 feet of railroad tracks or roadway pavement.

Pressure grout voids between excavated tunnel bore and liner plate at least daily as tunnel excavation and liner plate installation proceeds. In addition, do not extend liner plate installation

more than 10 feet without placing grout. Introduce grout through all grout holes in tunnel liner plate at or near tunnel invert, continue grouting until grout mixture bleeds through grout holes located at tunnel crown. Use grouting pressure sufficient to fill all voids.

Perform tunneling such that the final tunnel liner position is within 0.2 feet of specified position, both laterally and vertically.

ABANDONMENT:

Should it become necessary to abandon a tunnel for any reason, pressure grout the abandoned hole to prevent damage to surrounding earth and structures. When the tunnel liner is retained, fill entire tunnel with grout and pressure grout any voids about the tunnel liner exterior.

TUNNEL LOCATIONS:

Locate tunnels as indicated on the drawings or by City.

To facilitate construction, changes in tunnel location may be permitted. Proposed changes must be submitted by the Contractor. Changes in location must be acceptable to the City, and any utility company or public agency having jurisdiction over the location.

END SEALS:

Seal ends of tunnel liner to prevent debris and moisture from entering the annular space between the carrier pipe and tunnel liner. For pipe tunnel liner, provide end seal consisting of flexible synthetic rubber boot conforming to ASTM C-923 or Link Seal penetration seal with insulating plastic plate, galvanized bolts and nuts, and EPDM rubber element manufactured by Thunderline Corporation.

END SECTION - 02408 - TUNNELING

SECTION 02504 - GRADED AGGREGATE BASE AND SUBBASE

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division- 1 Specification Sections, apply to this section.

DESCRIPTION OF WORK:

The extent of graded aggregate base and subbase is shown on the Drawings.

Graded aggregate base and subbase construction includes, but is not limited to, the furnishing and placing of graded aggregate base or subbase on prepared subgrade or subbase.

Related work specified elsewhere includes Earthwork and Site Grading, Section 02200.

QUALITY ASSURANCE:

Submittals:

For information, and as necessary to show compliance with these specifications, submit producer's technical data for graded aggregate including laboratory test reports or notarized certificates and other data.

Sampling and Testing:

Provide quality control testing during construction as necessary to assure the entire base or subbase including all courses meets contract requirements. Remove and reconstruct, or otherwise correct work which falls below specified density or is outside other specified limits.

Provide quality control testing by an approved testing laboratory during construction as necessary to assure the entire base or subbase including all courses meets contract requirements.

Remove and reconstruct, or otherwise correct work which falls below specified density or is outside other specified limits.

Minimum quality control testing to be provided by the Contractor consists of the following:

Moisture-density relationship curve for graded aggregate to be used on project.

One-in-place density test (ASTM D 1556 or other method approved by the Engineer) per 1200 square yards of base or subbase.

One thickness measurement normal to base or subbase surface per 1200 square yards of base or subbase.

One surface tolerance measurement using a 15 foot straight edge per 250 square yards of base or subbase.

Report test results in writing to the Engineer promptly (normally same day tests are made).

The Engineer may perform sampling, surveying, inspection or testing activity during construction for his use, but such activity does not relieve the Contractor from his responsibility to achieve specified results.

The Owner may perform compaction, surface tolerance and thickness check tests on graded aggregate work when the Contractor indicates such work meets contract requirements. If these tests demonstrate work fails to meet contract requirements, it is the Contractor's responsibility to determine the extent to which the deficiency is present, to correct the deficiency, and to demonstrate by tests made by an approved testing laboratory, compliance with contract provisions in the deficient area. Check testing activity by the Owner does not relieve the Contractor from his responsibility to achieve specified results. All costs of determining the extent to which a deficiency is present and of retesting to demonstrate compliance with specified results are to be assumed by the Contractor. The Owner will pay all other check testing costs.

PART 2- PRODUCTS

GRADED AGGREGATE:

Hard, strong, durable particles or fragments of crushed stone of uniform quality, free from dirt and other detrimental matter.

Not more than a 50 percent wear as determined by ASTM C131.

Not more than a 15 percent weight loss when subjected to 5 alterations of the magnesium sulfate soundness test (ASTM C88).

Gradation:

Sieve	Percent by Weight Passing
1 ½ inch	100
¾ inch	60-97
No. 10	25-45
No. 60	5-30
No. 200	0-15

Material passing No. 10 sieve to have a sand equivalent not less than 20 as determined by ASTM D2419

GRADED AGGREGATE:

Hard, strong, durable particles or fragments of crushed stone of uniform quality, free from dirt and other detrimental matter.

Not more than a 65 percent wear as determined by ASTM C131.

Not more than a 15 percent weight loss when subjected to 5 alterations of the magnesium sulfate soundness test (ASTM C88).

Gradation:

Sieve	Percent by Weight Passing
1 ½ inch	100
¾ inch	65-100
½ inch	50-90
3/8 inch	45-70
No. 4	35-55
No. 30	17-38
No. 200	6-15

Material to have a liquid limit not exceeding 25 and a plasticity index not exceeding 6.

PART 3 - EXECUTION

GENERAL:

Assure that subgrade or subbase conforms to specified compaction, line and grade and thickness requirements before commencing graded aggregate construction.

Responsibility for placing the specified graded material lies with the Contractor. Approval by the engineer of material, source of supply, etc. in no way relieves the Contractor of his responsibility of providing the specified graded aggregate material.

PLACING AND SPREADING:

Place homogeneously and uniformly mixed graded aggregate on prepared subgrade or subbase.

Spread material to a uniform depth not exceeding the thickness indicated on the Drawings nor 6 inches after compaction. Where graded aggregate base or subbase is indicated more than 6 inches in thickness, construct base or subbase in two or more courses of approximately equal thickness.

COMPACTION:

General:

Control graded aggregate compaction during construction providing no less than minimum percentage of density specified.

Percentage of Maximum Density Requirement:

Achieve not less than 100 percent of maximum dry density as determined by ASTM D 698 (Standard Proctor) for each course of material-in-place.

FINISHING:

After compaction, shape surface to required line, grade, and cross section. Compact loosened material until the surface is smooth, closely knit, free from cracks, conforming to required line, grade and cross section.

Obtain a finished surface with no variation from design requirements in excess of 1/4 inch when measured with a 15 foot straight edge.

Maintain graded aggregate base or subbase in a smooth, true to grade, compacted condition until it is covered by other construction.

THICKNESS TOLERANCE:

Achieve compacted thickness which is no more than 112 inch less than the required thickness at any point.

Correct any area deficient by more than 1/2 inch by adding additional graded aggregate and rebuilding the base or subbase to the required thickness in accordance with this section.

END OF SECTION - 02504 - GRADED AGGREGATED BASE AND SUBASE

SECTION 02482 - GRASSING

PART 1 - GENERAL

RELATED DOCUMENTS:

The Drawings and general provisions of the contract, including General and Supplementary Conditions and General Requirements (if any), apply to the work of this section.

DESCRIPTION OF WORK:

The extent of grassing consists of those areas which are disturbed by operations of the Contractor and are not covered over by improvements, except where specifically noted otherwise, together with any additional areas shown on the drawings or designated by the City.

Grassing operations include, but are not limited to, the following:

Ground preparation

Seeding

Liming

Fertilizing

Mulching

Watering

Maintenance of grassed areas

QUALITY ASSURANCE:

Source Quality Control: Use grassing materials with certificates of inspection as required by governmental authorities. Comply with regulations governing grassing materials.

Specified work is minimum required, and any and all necessary materials and operations including reworking, must be performed to obtain specified results.

PART 2- PRODUCTS

GRASS MATERIALS:

Grass Seed: Provide fresh, clean, new-crop seed complying with the tolerance for purity and germination established by the Official Seed Analysts of North America. Provide seed of the grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified below:

Common Name:	Sowing Rate lbs.per acre	% by WT.	Min %. Germ.	Min.% Purity	Max % Weed Seed
Bermuda Grass, Common	8		70	90	2

SOIL AMENDMENTS:

Lime: Natural limestone containing not less than 85 percent of total carbonates, ground so that not less than 90 percent passes a 10-mesh sieve and not less than 25 percent passes a 100-mesh sieve.

Fertilizer: Standard commercial grade fertilizer conforming to the standards of the Association of Official Agricultural Chemists. Provide either grade 4-12-12, 6-12-12 or 5-10-15 at Contractor's option.

Nitrogen: Standard commercial grade nitrogen conforming to state fertilizer laws. Provide in either granular or liquid form at Contractor's option.

WATER: Water used to produce grass is to be free of excess and harmful chemicals, acids, alkalies and all other substances which are harmful to plant growth.

MULCH:

Wood Cellulose Fiber Mulch: Green colored wood cellulose fiber containing no germination or growth inhibiting ingredients, and suitable for uniform application by hydraulic mulching equipment. Mulch material to have the following packaged properties:

Property	Nominal Value
Percent Moisture Content	9.0% ± 3.0%
Percent Organic Matter (Oven Dried Basis)	99.2%±8.8%
Percent Ash Content	08%±02%
pH	4.8% ±0.5%
Water Holding Capacity (g/l000g)	1150 Minimum

Natural Mulch: At Contractor's option, either threshed rye, oat or wheat straw or Bermuda grass hay free of noxious weed seeds.

Asphalt: Homogeneous emulsified asphalt meeting ASTM D 977 which contains no agents harmful or toxic to plant growth.

PART 3- EXECUTION

GENERAL:

Minimum Operations: These Specifications set forth minimum operations and material applications which are acceptable. However, a satisfactory stand of grass must be obtained by using supplemental methods and/or materials as may be required.

Grassing By Private Property: Where grassing is required between curbs and sidewalks or behind sidewalks in areas adjacent to private residential or commercial property, the City may change the type of grassing required to match any type of grass which may be planted and growing on the adjacent lawn.

STANDARD SPECIFICATIONS (cont.)

Ground Preparation: Plow area to be grassed to a depth of not less than 4 inches. After plowing disk and harrow area until soil is well pulverized to a depth of at least 4 inches. Completed surface must be smooth, uniform, loose and free of large clods, boulders, stumps, large roots, debris and other similar undesirable matter.

Lime and Fertilizer Application:

Spread lime uniformly over the ground surface at the following rate: 1000 pounds per acre

Spread fertilizer uniformly over the ground surface at the following rate: 1000 pounds per acre

Once lime and fertilizer are placed, blend into top 4 inches of soil with suitable harrows, rotary tillers or other appropriate equipment. Restore surface areas to line and grade.

SEEDING:

Sowing: Sow seed within 24 hours following completion of placing lime and fertilizer using mechanical equipment that produces uniform application of seed. Once seed is sown, roll seeded areas before placing mulch. Sow seed only when weather conditions permit uniform distribution of seed and ground is not frozen, wet or otherwise non-tillable.

MULCHING:

Mulch all grassed areas using either wood cellulose fiber mulch or natural mulch with bituminous treatment at the following rates:

> **Wood Cellulose Fiber Mulch:** 1500 pounds per acre.
>
> **Natural Mulch-Bituminous Treated**: ¾ inch to 1 ½ inch deep over entire area with sufficient asphalt material to hold mulch in place.

Apply mulch only when weather conditions will permit uniform distribution of mulch.

Exercise care at all times to protect the public, adjacent property, bridges, pavements, curbs, sidewalks and all other structures.

Remove any mulch placed on facilities or areas other than areas authorized for grassing.

APPLICATION OF NITROGEN:

Make two applications of nitrogen to all grassed areas using mechanical spreading equipment. Apply at a uniform rate of not less than 70 pounds per acre per application. Make both applications only when weather conditions will permit uniform and even distribution and when moisture conditions will not cause harm to grass.

Place first application of nitrogen when young grass reaches a height of at least one inch. Make the second application of nitrogen between 30 and 45 days after the first application.

WATER:

Water grassed areas as required to obtain specified grass coverage.

REQUIRED COVERAGE:

Grassed areas will be considered acceptable when a viable stand of grass covers at least 98 percent of the total area with no bare spots exceeding one square foot and the ground surface is fully stabilized against erosion.

MAINTENANCE:

Maintain grassed areas until the later of (1) final project acceptance, or (2) the required grass coverage is achieved.

Maintain grassed areas by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading and replanting as required to establish a smooth, acceptable stand of grass free of eroded or bare areas. Mow areas as required to keep grass not more than 8 inches above ground surface until grassing work is accepted.

Final Inspection and Acceptance:

When the grassing work is completed, including maintenance, the City will, upon request, make an inspection to determine acceptability.

Where inspected work does not comply with the requirements, replace rejected work and continue specified maintenance until re-inspected by the City and found to be acceptable.

END SECTION - 02482 - GRASSING

SECTION 02528 - PAVEMENT PATCHING

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-l Specification Sections, apply to the Work specified in this section.

DESCRIPTION OF WORK:

The extent of pavement patching consists of the repair of all pavement removed or damaged in the course of constructing the Project.

Pavement patching includes repair of paved roads, streets, highways, walkways, driveways, patios, slabs on grade, and parking lots together with walls, curbing, gutters and headers, and other pavements and appurtenances. Pavement referred to under this Section, refers to asphaltic, cementious, brick, cobble or other large stone pavement materials together with underlying construction, irrespective of its composition.

JOB CONDITIONS:

Traffic Control: Schedule and conduct Work in a manner which will minimize inconvenience to vehicular and pedestrian traffic. Provide flaggers, barricades, waming signs, warning lights, and other warning means as appropriate.

Weather Limitations: Conduct all operations during weather conditions appropriate to the Work being performed

Grade Control: Establish and maintain lines and elevations which will assure finished Pavement patch having desirable appearance, function and strength.

SUBMITTALS:

Submit detailed material descriptions when requested by the Engineer.

PART 2- PRODUCTS

General: For products not described below, use materials and gradations which have locally exhibited a satisfactory record of previous usage, and which for finished visible surfaces will permit obtaining appearance, color and texture reasonably matching remaining adjacent pavement of the same type.

Asphalt Concrete: Bituminous plant mixture of asphalt cement and aggregates complying with Type E or F hot plant mix of Section 828 of the *Georgia Department of Transportation "Standard Specifications for Road and Bridge Constructions".*

Graded A~reaate Base: Uniform graded aggregate material complying with Section 815 of the *Georgia Department of Transportation "Standard Specifications for Road and Bridge*

Construction".

Bituminous Prime: Cutback asphalt complying with Section 821 of the *Georgia Department of Transportation "Standard Specifications for Road and Bridge Construction".*

Bituminous Tack Coat: Asphalt material complying with Section 413, topics 413.01 through 413.04 of the *Georgia Department of Transportation "Standard Specifications for Road and Bridge Construction".*

Portland Cement Concrete: Concrete mix of Portland cement, aggregates, water, and air entraining admixture to produce the following properties: 3500 psi minimum compressive strength at 28 days per ASTM C39, 4 inches maximum slump per ASTM C143, and air content between 3% and 6%.

Cold Mix: Uniform bituminous mixture of aggregate, asphaltic material and, if it is required, mineral filler complying with Type E or F cold mix of Section 401 of the *Georgia Department of Transportation "Standard Specifications for Road and Bridge Construction".*

PART 3- EXECUTION

Pavement Cuts: Saw cut trench edges in paved areas to neat, straight lines before starting to break the pavement slab. Completely backfill the open half before opening the other half of pavement.

Backfill Placement: Place trench backfill materials in layers not more than six inches compacted thickness. Commence backfill immediately after utility is installed. Complete new replacement base construction immediately after trench backfill.

Inspection: Examine areas and conditions under which pavement patching will be conducted, giving special attention to stability of subbase. Do not proceed with pavement patching work until unsatisfactory conditions have been corrected.

Preparation: Saw cut any ragged edges of existing pavement, or in the case of concrete work, remove existing pavement to nearest joint. Remove all loose material from underlying and adjacent surfaces.

Strength and Stability: Use materials and construction techniques as necessary to obtain strength, stability and durability of pavement patch at least equal to that of remaining adjacent pavement of the same type. As a minimum, conform with pavement patch details, if any, required elsewhere by the Contract Documents; and where such details are not provided, accomplish pavement patching utilizing strengths, thickness, etc. not less than that of remaining adjacent pavement of the same type.

Placing: Construct pavement using methods and equipment in general use for the type of work being performed.

Immediately after new base construction, cover pavement cut with steel plates or similar devices of sufficient thickness to span the cut without noticeable deflection. Maintain plates in place for not less than 24 hours and not more than 7 days and until the concrete base (if used) has gained

sufficient strength to withstand traffic loads. Traffic may resume after installation of metal plates.

Upon removal of the metal plates or similar devices, provide new pavement surface in accordance with one of the following options:

Immediately apply new permanent pavement surface materials indicated or

Immediately apply bituminous cold mixture over bond breaker paper over new base. Monitor performance and repair or replace materials regularly to maintain smooth traffic surface until placement of permanent pavement surface materials. At Contractor's time selection prior to substantial completion, remove cold mix and bond breaker paper and provide new permanent pavement surface materials. If performance or maintenance of cold mix patch is unsatisfactory in the opinion of the Owner or Engineer, remove materials and provide new permanent pavement surface materials within 72 hours of notice by the Owner or Engineer.

Traffic control devices in lieu of cover plates are permitted for pavement patching longitudinal to the street centerline in excess of 20 feet. Use traffic barricades, warning signs and lights, flagmen, and other means as appropriate to continuously control traffic 24 hours per day. Use devices such that at least 12 feet wide, one-way through traffic access is provided at all times.

Upon removal of traffic control devices, install permanent pavement surface.

Contractor assumes all responsibility for maintaining repairing and or replacing concrete base that may be damaged during curing period.

For existing surface of Portland cement concrete, furnish new Portland cement concrete structure thickness, including base and pavement surface, of not less than eight inches; except for driveways and sidewalks which shall be not less than four inches thick.

Provide not less than eight inches thickness of new graded aggregate base for replacement of asphalt concrete pavement at driveways, sidewalks and parking lots.

For repair of asphalt concrete pavement, clean base and adjacent surfaces and apply bituminous tack coat or bituminous prime (as appropriate) to such surfaces before placing new asphalt concrete surface.

Finish: Accomplish pavement patching using materials and techniques which result in visible, finished surfaces having appearance, color, and texture reasonably matching remaining adjacent pavement of the same type. Do not permit the finished surface to have dips, objectionable roughness or discontinuity or non-draining areas. Do not create any unsafe pavement condition.

Repairs: If pavement patch or adjacent pavement settles or shows evidence of other distress resulting from the Work, cut pavement out, repair subgrade, and reconstruct patch. Do not place additional pavement material on top of unsatisfactory previously repaired surfaces. At expense of Contractor, repair any pavement which he damages beyond that minimum amount necessary to construct the Work.

END SECTION - 02528 - PAVEMENT PATCHING

SECTION 02770 - STORM SEWER SYSTEM

PART 1 - GENERAL

DESCRIPTION OF WORK:

The extent of storm sewer system is shown on the drawings.

Storm sewer system work includes, but is not limited to, the following:

Foundation preparation.

Furnishing and laying gravity sewer pipe.

Furnishing and/or constructing drainage structures and appurtenances.

Cleaning constructed work

Related Work Specified Elsewhere:

Route Clearing, Section 02112

Trenching and Backfilling, Section 02204

Pavement Patching, Section 02528

JOB CONDITIONS:

Traffic Control: Schedule and conduct Work in a manner which will minimize inconvenience to vehicular and pedestrian traffic. Provide flaggers, barricades, warning signs, warning lights, and other warning means as appropriate. Flaggers, when utilized, must hold a valid Georgia D.O.T. flagging certificate. Maintain traffic on all roads and streets which must be crossed by sewer lines. All traffic controls during construction must conform to Part VI of the *Manual on Uniform Traffic Control Devices, ANSI D6.le.*

Weather Limitations: Conduct all operations during weather conditions appropriate to the Work being performed.

QUALITY ASSURANCE:

Manufacturer Experience: Furnish manufactured products produced by firms having regularly produced such items as specified herein which have proven satisfactory in actual service over at least a two year period, as determined by the City.

Imperfections: Regardless of tolerances permitted by industry standards specified herein, the City may reject pipe or precast structures at the manufacturing plant or project site, which have cracks, chips, blisters, lack of smooth interior or exterior surface, evidence of structural weakness, porosity, joint defect, significant variation from theoretical shape, or other imperfection which might, in the

opinion of the City, contribute to a reduced functional capability, accelerated deterioration, or reduced structural strength.

Repairs: Do not use patched or repaired pipe or precast structures unless each individual length or element has been approved and marked for repair by the City at the manufacturing plant. Repairs, other than at the manufacturing plant, are not permitted.

PART 2- PRODUCTS

Concrete Pipe (CPDV):

Basic specification, nominal 15 inch size and over: ASTM C 76, reinforced sewer pipe furnished in not less than 8 foot lengths.

Identification: Stamp each length or joint of concrete pipe at the plant of manufacture, showing strength or reinforcement class, wall thickness designation, date of manufacture, and manufacturer symbol.

Joints: At Contractor option use one of the following jointing systems. Once a system is selected, utilize system for entire project unless specified or authorized otherwise.

Cement grout type which results in entire joint annular space being filled with grout and inside of each joint being wiped smooth. Use grout mixture consisting of not more than five gallons of water per sack of cement. Utilize cement conforming to AASHTO M85 or M150.

AWWA C 302 0-ring rubber gasket style in which the completed joint confines the 0-ring on four sides with nominal clearance not to exceed 1/16 inch between smooth, accurately formed, bell and spigot surfaces.

Elliptical Concrete Pipe (ECPD):

Basic Specification: ASTM C 507, reinforced elliptical sewer pipe furnished in not less than 8 foot lengths.

Additional Specification Requirements: Maximum absorption by standard ASTM test may not exceed 7.0 percent, and pipe must be aged at manufacturing plant for not less than five days.

Identification: Stamp each length or joint of concrete elliptical pipe at the plant of manufacture, showing strength or reinforcement class, wall thickness designation, date of manufacture, manufacturer's symbol and quadrant reinforcing symbol.

Joints: At Contractor option use one of the following jointing systems. Once a system is selected, utilized system for entire project unless specified or authorized otherwise.

Cement grout type which results in entire joint annular space being filled with grout and inside of each joint being wiped smooth. Use grout mixture consisting of not more than five gallons of water per sack of cement. Utilize cement conforming to AASHTO M85 or MISO.

Preformed flexible pipe joint compound to be confined in the tongue and groove joint, meet Federal Specification SS-S-002 10.

Corrugated Plastic Pipe (CPPD'):

Corrugated flexible conduit with slip-on joints made of polyethylene conforming with ASTM F 405 and F 449.

Subject to compliance with requirements, firms offering products which may be incorporated in the work include, but are not limited to, the following:

ADS Inc.

Hancor Inc.

Bituminous Coated Corrugated Aluminum Pipe (BCCAP'):

Basic specification: AASI-ITO M 196 with full uniform bituminous coating having minimum thickness of 0.05 inch and conforming with AASHTO M 190.

Joints: Fully bituminous coated coupling bands manufactured from base metal as pipe. Utilize bands of same manufacturer as pipe.

Pipe Fittings: Use standard, factory fabricated adapters, wyes, tees, and other necessary fittings comparable to pipe with which connected.

Coarse Granular Material For Pipe Bedding: Crushed stone, crushed gravel, natural gravel, or crushed shell meeting ASTM C 33, and having No. 67 gradation (3/4 inch to No.4 sieve).

Fine Granular Material For Pipe Bedding: Uniformly graded natural or manufactured sand composed of hard, durable particles with 100 percent passing a No.4 sieve, not more than 25 percent passing a No. 100 sieve, and containing no more than 25 percent total of silt and clay.

Sewer System Structures: Conform with applicable provisions contained in Article V of the *City's Development Regulations.*

PART 3- EXECUTION

PIPE FOUNDATION:

Concrete Pipe Foundation: Unless otherwise indicated, lay pipe in trenches and on foundations prepared as selected by the Contractor in conformance with the bedding class, trench width and depth, and pipe size tabulated below:

Pipe Size Inches	Maximum Trench Width Ft-in.	Maximum Trench Depth in Feet: Class C Bedding: Conc. Cl. 3	Conc. Cl. 4	Conc. Cl. 5	Class B Bedding: Conc. Cl. 3	Conc. Cl. 4	Conc. Cl. 5
15	3-0	8	13	30	11	21	30
18	3-3	9	15	30	12	24	30
21	3-6	9	16	30	13	26	30
24	4-0	10	16	30	13	23	30
27	4-0	11	19	30	15	29	30
30	4-6	11	18	30	14	25	30
36	5-6	11	17	29	14	23	30
42	6-0	12	16	26	15	21	30
48	7-0	12	18	28	15	23	30
54	7-6	13	18	29	16	24	30
60	8-6	13	19	28	16	23	30

Corrugated Plastic Pipe Foundation: Unless otherwise approved, lay corrugated plastic pipe in trenches, or fills using not less than Class C Modified Bedding and in conformance with the maximum fill depth and pipe size tabulated below:

Pipe Size Inches	Maximum Fill Depth for Corrugated Plastic Pipe in Feet
18	11
24	7

Bituminous Coated Corrugated Aluminum Pipe Foundation: Unless otherwise approved, lay bituminous coated corrugated aluminum pipe in trenches, or fills using not less than Class C Modified Bedding, and in conformance with the maximum fill depth, and pipe size tabulated below:

Pipe Size Inches	Maximum Fill Depth In Feet For Bituminous Coated Corrugated Aluminum Pipe With Wall Thickness: 0.060 In. (16 Ga.)	0.075 In. (14 Ga.)	0.105 In. (12 Ga.)	0.135 In. (10 Ga.)	0.164 In. (8 Ga.)
18	30	30	52	54	56
24	22	22	39	41	42
30	18	18	31	32	34
36	15	15	26	27	28
42		26	43	43	44
48			40	41	43

Definition of Pipe Foundation Terms:

Trench depth: the vertical distance from pipe invert or flow line to finished ground surface.

Trench width: the horizontal distance between trench walls at any point from one foot above top of pipe to trench bottom.

Class B Bedding may be achieved by either of the following two construction methods:

(1) Shaped Bottom with Tamped Backfill: Shape bottom of trench excavation to conform to a cylindrical surface with a radius at least 2 inches greater than the radius to the outside of the pipe and with a width sufficient to allow six-tenths of the width of the pipe barrel to be bedded in fine granular material fill placed in the shaped excavation. Carefully place and compact backfill at sides of pipe to a thickness of at least 12 inches above top of pipe. Limit use of this bedding method to trenches with firm bottom and sides.

(2) Compacted Coarse Granular Bedding With Tamped Backfill: Bed pipe in compacted coarse granular material placed on a flat trench bottom. Thickness of granular bedding must be at least one-fourth the outside pipe diameter, but not less than 4 inches thick under pipe barrel, and extend at least halfway up the pipe barrel at the sides. Carefully place compacted backfill above the granular material up a minimum depth of 12 inches over the top of pipe.

Class C Bedding may be achieved by either of the following two construction methods:

(1) Shaped Bottom: Bed pipe with ordinary care in an earth foundation formed in the trench bottom by a shaped excavation which fits the pipe barrel with reasonable closeness for a width of at least 50 percent of the outside pipe diameter. Place compacted fill to a minimum depth of six inches above top of pipe.

(2) Compacted Coarse Granular Bedding with a Tamped Backfill: Bed pipe in compacted granular material placed on a flat trench bottom. Thickness of granular material must be at least 4 inches under the barrel and must extend one-tenth to one-sixth of the outside diameter up the pipe barrel at the sides. Place compacted backfill above the granular material to a minimum depth of six inches over top of pipe.

Class C Modified Bedding is defined as bedding pipe on a bedding blanket of sandy material roughly shaped to fit bottom of pipe. Thickness of bedding blanket must be not less than 0.1 of the nominal pipe diameter. Place compacted backfill above bedding blanket to a minimum depth of 12 inches over the top of pipe.

PIPE LAYING:

When either bituminous coated corrugated aluminum or corrugated plastic pipe is used, pipe installation must be observed by a Georgia registered professional engineer engaged by the contractor or developer. Upon completion of the pipe installation and prior to acceptance by the City, the observing engineer is to furnish to the City a certification that the storm drainage pipe has been installed in accordance with the approved plans and these specifications. Acceptance by the City will not be considered without the engineer's certification.

Clean interior of pipe and all joints before laying. When pipe laying activity is not in actual progress, tightly cover open ends of sewer. Avoid permitting mud or other material from entering sever at all times.

Avoid damage or shock in handling pipe and accessories. Inspect each length of pipe, and reject any defective piece. Carefully protect pipe in place from damage or displacement until backfilling operations are complete.

Lay and joint pipe in strict conformance with manufacturer's written recommendations as submitted to and accepted by the City.

Where cement joints are used, provide wet burlap or earth protective cover for joints immediately after initial grout set. Maintain protective cover until joint is covered by backfilling.

Lay all pipe upgrade with spigots pointing downgrade.

Control geometric position of pipe as necessary to ensure that pipe and fittings accurately conform with required grade and alignment after sewer is completed.

Prevent water from accumulating or running in trench during pipe laying operations, and until the trench or excavation has been backfilled..

Remove and re-lay any length of pipe which does not accurately conform with required line or grade, is crushed, or is excessively deflected.

PIPE CONNECTIONS:

Make all pipe connections with standard fittings, manholes, structures, or special construction detailed on Drawings.

At manholes and structures, neatly cut all connecting pipe flush with inside surface, and provide flexible pipe joint within 18 inches of outer surface. Make pipe connections to manholes and structures by laying pipe in mortar bed or concrete. Use supplemental materials and techniques as required to obtain watertightness.

Do not connect any flow to new work until authorized by the City.

SEWER STRUCTURES:

Conform with applicable provisions contained in Article V of the *City's Development Regulations.*

LINE CLEANING:

Avoid permitting dirt, rubbish, surplus construction material, and other foreign matter to enter structures or pipe during construction. Use whatever means may be necessary to obtain a clean and internally smooth sewer system prior to final acceptance.

SEWER LEAKAGE:

General Leakage Requirements:

Make entire sewer line system as near watertight as practicable. Eliminate all visible points of ground water infiltration, and any other significant points of leakage which can be located.

END SECTION - 02770 - STORM SEWER SYSTEM

DEVELOPMENT REGULATIONS
CITY OF DAWSONVILLE

AN ORDINANCE AMENDING IN THEIR ENTIRETY THE CITY OF DAWSONVILLE DEVELOPMENT REGULATIONS FOR THE PURPOSE OF ESTABLISHING RULES AND REGULATIONS GOVERNING THE DEVELOPMENT OF LAND WITHIN THE INCORPORATED CITY OF DAWSONVILE, GEORGIA; DEFINING STANDARDS FOR STREET, UTILITIES AND DRAINAGE IMPROVEMENTS; PROVINDING FOR THE METHOD OF ADMINISTRATION AND AMENDMENT; PRESCRIBING PENALITIES FOR THE VIOLATION OF ITS PROVISION; AND FOR OTHER PURPOSES.

WHEREAS, the City of Dawsonville is desirous of enacting new Development Regulations to incorporate changes and amendments enacted since the adoption of the May 20, 2002 Development regulations and to yield a new document in its entirety to reflect said changes; and

WHEREAS, the City of Dawsonville Planning Commission duly advertised the public hearing for the first reading of the amended Development Standards on May 5, 2004 and the public hearing for the second reading of the proposed Development Standards and May 26, 2004, reviewed and recommended to the City Council, the adoption of the text of the new Development Regulations.

WHEREAS, the Mayor and City Council of the City of Dawsonville on May 17, 2004 and June 7, 2004, held duly advertised public hearings on those proposed amendments; and

WHEREAS, the Mayor and City Council of the City of Dawsonville find that the above-specified amendments further the purpose of promoting the health, safety, morals, convenience, order, prosperity, and general welfare of the present and future residents of the City of Dawsonville;

NOW THEREFORE BE IT RESOLVED by the Mayor and City Council of Dawsonville, that it hereby approves and adopts the new document entitled "The Development Regulations of the City of Dawsonville, Georgia".

BE IT FURTHER RESOLVED that, effective the 7th day of June, 2004, the May 20, 2002 City of Dawsonville Development Regulations is hereby superceded to the extent conflicting with "The Development Regulations of the City of Dawsonville".

ADOPTED this 7th day of June, 2004

_____
Joe Lane Cox, Mayor

_____
Mike Sosebee, Council Member

_____
Mike Wilson, Council Member

_____
Tim Wimpey, Council Member

_____
Jonathan Cox, Council Member

Attest:_____
City Clerk

CITY OF DAWSONVILLE, GEORGIA
COMPREHENSIVE DEVELOPMENT REGULATIONS

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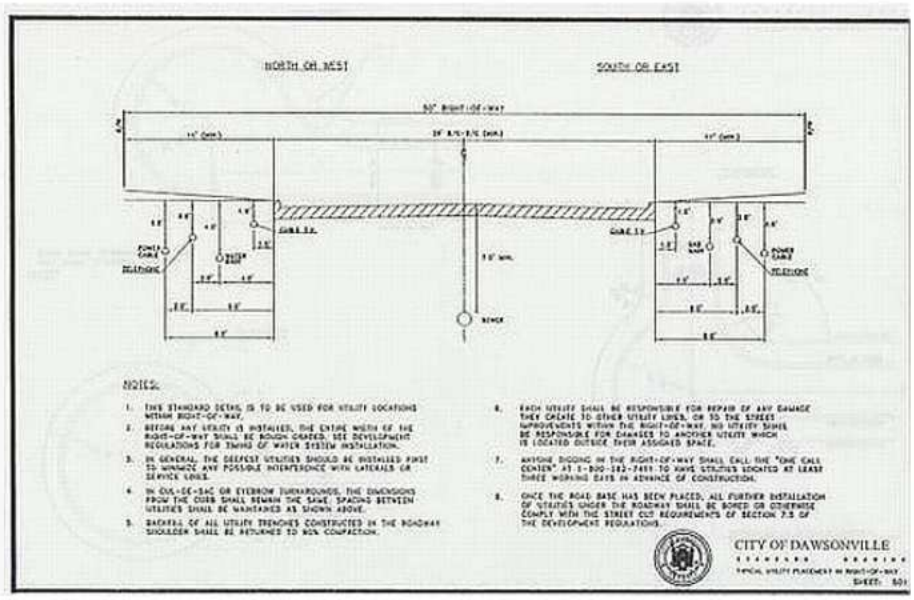
NORTH OR WEST
SOUTH OR EAST
NOTES:
CITY OF DAWSONVILLE

ORDINANCE NO.: _____

THE DEVELOPMENT REGULATIONS

of the

CITY OF DAWSONVILLE, GEORGIA

The Mayor and City Council of Dawsonville, hereby approves and adopts this new document entitled "The Development Regulations of the City of Dawsonville, Georgia".

June 21, 2004