Minimum Development Standards Ordinance

Adopted by the City Commission: 10/7/2014

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

Table of Contents

ARTICLE I: INTRODUCTION AND ADMINISTRATIVE

Section 101: Short Title

This ordinance shall be known as and may be cited as the ''City of Cornelia Minimum Development Standards Ordinance."

Section 102: Authority

This ordinance is adopted pursuant to powers vested in cities in Article IX, Section II, Paragraph I, II and IV of the State of Georgia Constitution, home rule powers, State administrative rules for the adoption and implementation of Comprehensive Plans, and the protection of vital areas of the State; the Georgia Planning Act, as amended; and in the Zoning Procedures Law, as amended, which includes within its definition of "zoning" ordinance any ordinance which established the uses and development standards of property. The public health, safety, morals and general welfare require the harmonious, orderly and progressive development of land within the cities and counties of the State. In furtherance of this purpose, the regulation of the development of land is authorized to carry out the orderly development of communities.

Section 103: Purpose and Intent.

Many problems can be created when new development occurs. Therefore, reasonable regulation and control of development is necessary to minimize these problems. These rules and regulations are intended to serve the following purposes, among others:

a. To protect and promote the health, safety and general welfare of the residents of the City;
b. To encourage orderly subdivision of land as well as economically sound and stable land development;
c. To assure the provision of required streets, utilities, and other facilities and services to new land developments in conformance with public improvement plans of the City;
d. To assure adequate provision of safe and convenient traffic access and circulation, both vehicular and pedestrian, in new land developments, especially for the purposes of assuring that all building lots will be accessible to firefighting equipment and other emergency and service vehicles;
e. To assure the provision of needed open spaces and building sites in new land developments through the dedication or reservation of land for recreational, educational, and other public purposes;
f. To assure the adequate provision of water supply, storm water drainage, sanitation, lighting, and other necessary improvements;
g. To assure equitable review and approval of all subdivision plans by providing uniform procedures and standards for the subdivider and land developer;
h. To assure, in general, the wise development of new land areas, in harmony with the comprehensive plan of the community and the development pattern of neighboring

properties as well as requirements of the Zoning Ordinance, State law and other regulations.

i. To assure the accurate description of property and adequate and proper identification of property in public records;

j. To help conserve and protect the natural, economic and scenic resources of the community;

k. To help eliminate the costly maintenance problems which develop when streets and lots are laid out without proper consideration given to various public purposes;

l. To protect lot purchasers who generally lack the specialized knowledge to evaluate subdivision improvements and design.

m. To assure that developed land is of such character that it can be used for building purposes without danger to health, peril from flood or fire and to improve helath, safety, convenience and general welfare.

n. To assure the protection of water and air quality within the city.

Section 104: Administration & Interpretation

No person shall subdivide land, and the Administrative Officer shall not approve any subdivision of land, unless the lots created pursuant to said subdivision meet or exceed all applicable requirements of the Zoning Ordinance of the City of Cornelia, Georgia, as may be amended from time to time.

Section 105: Jurisdiction

This ordinance shall apply to all lands within the corporate limits of the City of Cornelia, Georgia as exist at the time this ordinance is adopted, and all lands subsequently annexed into said corporate limits.

Section 106: Appeals

Any person aggrieved by an interpretation or decision in the administration or enforcement of this ordinance may file an appeal in accordance with the appeal provisions in Article 15 – Appeals and Variances of the City Zoning Ordinance.

Section 107: Variances

The Board of Adjustments is authorized and directed to receive, consider, grant, grant with conditions, or deny applications for variances to the requirements of this ordinance in accordance with the provisions of Article 15 – Appeals and Variances of the City Zoning Ordinance. **Variances are not to be freely granted and the seeking of a variance is discouraged. Evidence of greater economic cost alone is not a sufficient hardship to justify the grant of a variance. Note that variances to the water and/or sewer portion of these Minimum Development Standards will require EPD review and approval.**

Section 108: Violations, Penalties and Remedies

Any person, firm, or corporation violating any of the provisions of this ordinance shall be shall be punished as allowed under the City of Cornelia Code of Ordinances Section 1-12.

In any case where any land is, or is proposed to be, used in violation of this ordinance, the City may, in addition to other remedies provided by law, seek injunction, abatement, or any appropriate action, or proceeding to prevent, enjoin or abate such unlawful use. Any person failing to comply with any provision of this ordinance shall be subject to the revocation of his/her business license/occupation tax permit, work permit, building permit or other authorization for the conduct of business and associated work activities with the City of Cornelia and shall be subject to a stop work order. Upon receipt of notice of the stop work order, work on any project that is being performed in violation of this Ordinance shall be immediately stopped. Such notice shall be in writing and shall be given to the Owner of the property, his authorized agent or the person or persons in charge of the activity on the property, and shall state the conditions under which work is to cease and under whit it may be resumed. Where any emergency exists, no written notice shall be required.

Section 109: Amendments

Any provisions of this ordinance may be changed and amended from time to time by the Governing Body, provided, however, that such changes or amendments shall not become effective until after a recommendation by the Governing Body and until after a public hearing has been held thereon, that time and place of which shall have been published in a newspaper of general circulation, at least fifteen (15) days prior to such hearing.

Whenever the Governing Body amends this ordinance, such amendments shall have no effect on previously accepted applications in the development process, provided however, an applicant may elect to have an on-going development project comply with the newly amended standards.

Section 110: Severability

Should any section, clause, or provision of this ordinance be declared by a court of competent jurisdiction to be invalid, such adjudication shall not affect the validity of this ordinance as a whole or any part thereof other than the part so declared to be invalid, each section, clause, and provision thereof being declared severable.

Section 111: Conflicting Regulations

Whenever the provisions of this ordinance impose more restrictive standards than are required in or under any other statute, ordinance, or resolution herein contained this ordinance shall prevail, unless otherwise specified by this ordinance. Whenever the provisions of any other statute, ordinance, or resolution require more restrictive standards than are required herein contained, the requirements of such regulations shall prevail, unless otherwise specified in this ordinance.

In case of a conflict between the text of this ordinance and any caption, figure, illustration, table, or map, the text of this ordinance shall control. In case of a conflict between a chart and an illustration, the chart shall control. All illustrations included in this ordinance are for illustrative purposes only.

In those instances where development standards for a specific project have been established as a condition of zoning or conditional use permit approval, the requirements of the conditions shall control, whether more or less restrictive than the requirements of this ordinance.

In case of any conflict in limitations, restrictions, or standards applying to an individual use or structure, the more restrictive provisions shall apply.

Section 112: Repeal of Previous Ordinances

All previous ordinances and regulations adopted for the same purpose, including the Subdivision and Land Development of Regulations and Minimum Development Standards, prior to these Regulations are hereby repealed.

Section 113: Adoption and Effective Date

This ordinance shall be effective immediately upon its adoption.

MAYOR AND CITY COMMISSION OF CORNELIA, GEORGIA

_____, Mayor

ATTEST:

_____
City Clerk

POSTED: _____

ADOPTED: _____

END ARTICLE I

ARTICLE II: DEFINITIONS

Section 201: Interpretation of Certain Terms and Words

For the purposes of this ordinance, certain words or terms used herein are interpreted as follows: Additional definitions may be found in individual Articles.

A. The words "shall," "must," and "will," are mandatory in nature, implying an obligation or duty to comply with the particular provision.

B. The word "may" is permissive in nature.

C. Words used in the present tense include the future tense.

D. Words used in the singular number include the plural number and the plural number includes the singular number, unless the context of the particular usage clearly indicates otherwise.

E. Words used in the masculine gender include the feminine gender.

F. The word “person” includes a firm, association, organization, partnership, trust, company or corporation, as well as an individual.

G. The word “lot” includes the words “plot” or “parcel”.

H. The word “used” or “occupied” as applied to any land or building shall be construed to include the words “intended”, “arranged”, or “designed to be used or occupied”.

I. Any act authorized by this ordinance to be carried out by a specific official or agency of the City is impliedly authorized to be carried out by a designee of such official or agency. Any transfer of duties to a different official impliedly transfers the authority to carry out acts under this ordinance.

J. The time within which an act is to be done shall be computed by excluding the first and including the last day; if the last day is a Saturday, Sunday or a legal holiday, that day shall be excluded.

K. Any words and terms not defined herein shall have the meaning indicated by common dictionary definition.

L. Any reference to State of Georgia or Federal statutes shall be construed to be a reference to the most recent enactment of such statute, and shall include any amendments as may from time to time be adopted.

Section 202: Definitions

Except as specifically defined herein, all words used in this ordinance have their customary dictionary definition. Additional definitions may be found in individual Articles.

Access: A way or means of approach or entrance by which pedestrians, vehicles, or both shall have safe, adequate, and usable ingress/egress to a property or use. A private access is an access not in public ownership and controlled by means of deed, dedication, or easement.

Abutting: Having property boundaries or lot lines in common with no separating by a street, alley or other right-of-way.

Acre: A measure of land equating to 43,560 square feet.

Adequate channel: A natural or man-made channel or pipe that is capable of conveying the runoff from the applicable storm design without overtopping its banks or eroding, after development of the site in question.

Adjacent/adjoining: Abutting or being directly across a street, alley, other rights-of-way or waterways.

Administrative Officer: The City Manager of the City of Cornelia, or his or her duly authorized representative.

Alley: A public or private thoroughfare which affords only a secondary means of access to abutting property.

ANSI: The American National Standards Institute, Inc.

Appeal: A request for a review of an Administrative Officer's interpretation of any provision of this ordinance, or an action taken by an Administrative Officer in the application or enforcement of this ordinance.

Applicant: A person seeking any determination or approval under, or permits required by this ordinance.

Application: An application for development approval that contains the supporting documentation required by this ordinance.

Arborist: A professional in the practice of arboriculture, which is the cultivation, management, and study of individual trees, shrubs, vines, and other perennial woody plants.

Architect: A person who, by reason of his knowledge of the mathematical and physical sciences and the principles of architecture and architectural design, acquired by professional education, practical experience or both, is qualified to engage in the practice of

architecture as attested by the issuance to said person of a license as an architect by the State of Georgia.

Area: The area of a property shown to the nearest whole square foot.

Area of Special Flood Hazard: The land in the flood plain within a community subject to a one (1) percent or greater chance of flooding in any given year.

Arterial Street: A major highway with full or partial control of access.

ASCE: The American Society of Civil Engineers.

ASSHTO: The American Association of State Highway and Transportation Officials.

ASTM: The American Society of Testing and Materials.

AWWA: The American Water Works Association.

Base Flood (100-year Flood): A flood having a one (1) percent chance of being equaled or exceeded in any given year.

Base Flow: The normal flow in a stream after the impact of any specific rainfall event has dissipated.

Basement: That portion of the building having its floor sub-grade (below ground level).

Bench: The space left between the upper edge of a cut and toe of an embankment to break the continuity of an otherwise long slope.

Berm: A mound of earth or embankment, linear in dimension, which intercepts or diverts the flow of water down a slope, or visually interrupts the line of sight to provide visual interest, screen views, reduce noise or fulfill other such purposes.

Bike Lane: Paved and marked lane on the side of a roadway or other path designed and marked specifically for bicycle traffic.

Block: A piece or parcel of land or multiple parcels, entirely surrounded by public highways or streets.

BMP or Best Management Practice: An effective practicable means of reducing the amount of pollution generated by nonpoint sources, which may be structural or nonstructural practices or a combination of practices.

Board of Adjustments: The body established by the Zoning Ordinance and appointed by the Governing Body which has authority to take action on appeals and variances as established in the City's Zoning Ordinance.

Buffer: That portion of a lot or area set aside with adequate natural or planted vegetation to accomplish visual and sound screening to separate residential zoning districts from other zoning districts, or to protect and/or preserve environmentally sensitive areas and allow them to be maintained in an undisturbed and natural condition. In the event that insufficient existing vegetation or trees exist in the buffer zone, planting, fencing, or other supplemental screening shall be required, with a density or opacity to accomplish buffering as required by all approved ordinances. Roads, parking areas, above ground stormwater retention facilities, recreational facilities, or other above ground construction shall not be permitted within the required buffer area. Public rights-of-way and utility easements shall not be considered part of the buffer area. Required buffer areas are in addition to required yard areas.

Building: Any structure, either temporary or permanent, above or below ground, having a roof or other covering, and designed, built, or used as a shelter or enclosure for persons, animals or property of any kind, including tents, awnings, or vehicles used for purposes of a building.

Building Official: The person or persons designated by the City of Cornelia to be responsible for the administrative functions required in connection with the enforcement of the Minimum Development Standards Ordinance of the City of Cornelia.

Building Setback Line: A line establishing the minimum allowable distance between the buildings, including any covered porches, and the street right-of-way or property line when measured perpendicularly thereto. In the case of corner lots or double frontage lots, front yard requirements shall be observed for those areas adjacent to street right-of-ways.

Caliper: A standard of measure of tree diameter of new or replacement plantings. It is defined by the American Association of Nurserymen. Caliper is the diameter of the trunk measured six (6) inches above the ground for up to and including four (4) inches in diameter and twelve (12) inches above the ground for larger sizes.

Catchment area or basin: Watershed; drainage basin; also, the area of such a basin.

Cemetery: A place used or to be used and dedicated or designated for earth interments of human remains.

Centerline of Street: That line surveyed and monumented by the Governing Body and designated as the center of a public street. If a centerline has not been surveyed, it shall be the line running midway between the outside curbs, ditches or pavement/improvement ends of such street, or such midway line extended.

Channel: Elongated open depressions in which water may, or does, flow. An elongated depression, either naturally or artificially created and of appreciable size, which periodically or continuously contains moving water, or which forms a connecting link between two bodies of water. It must have a definite bed and bank that serve to confine the water.

Clearing: The selective removal of vegetation from a property, whether by cutting or other means.

Clear-Cutting: The clearing or removal of all trees from a site larger than one (1) acres in a manner contrary to the Best Management Practices of the Georgia Forestry Commission, except as authorized by a development permit or building permit. This definition does not include clear-cutting necessary to install required infrastructure such as roads and utilities.

City: The City of Cornelia, Georgia.

City Attorney: The City Attorney of the City of Cornelia.

City Commission: The governing body of the City of Cornelia, Georgia.

City Engineer: The Engineer of the City of Cornelia, or his authorized representative.

Comprehensive Plan: Those coordinated plans or portions thereof which have been prepared by or for the Governing Body for the physical development of the jurisdiction; or any plans that designate plans or programs to encourage the most appropriate use of the land in the interest of public health, safety and welfare.

Concept Plan: A drawing which shows the overall concept (e.g., a concept plan) of a proposed development, and which may include lots and streets in a subdivision or the general location of buildings and improvements for a residential or non-residential project.

Conduit: A general term for any channel intended for the conveyance of water, whether open or closed; any container for flowing water.

Conservation: The management of natural resources to prevent waste, destruction, or degradation.

Conservation areas, primary: Any property qualifying as conservation use property under O.C.G.A. § 48-5-7.4; and any steep slopes, floodplains, wetlands, water bodies, upland buffers around wetlands and water bodies, critical wildlife habitat, and sites of historic, cultural, or archaeological significance, located outside of building envelopes and lots established for building purposes.

Conservation areas, secondary: Prime farmland, natural meadows, mature woodlands, farm fields, localized aquifer recharge areas, and lands containing scenic views and sites, located outside of building envelopes and lots established for building purposes.

Conservation easement: A legally enforceable agreement between a property owner and the holder of the easement, with content meeting requirements of Georgia law and in a form acceptable to the City Attorney and recorded in the office of the Clerk of Superior Court of Habersham County. A conservation easement restricts the existing and future use of the defined tract or lot to conservation use, agriculture, passive recreation, or other use

approved by the Governing Body and prohibits further subdivision or development. Such agreement also provides for the maintenance of open spaces and any improvements on the tract or lot. Such agreement cannot be altered except with the express written permission of the easement holder and any other co-signers. A conservation easement may also establish other provisions and contain standards that safeguard the tract or lot's special resources from negative changes.

Conservation subdivision: A subdivision where open space is the central organizing element of the subdivision design and that identifies and permanently protects all primary conservation areas and all or some of the secondary conservation areas within the boundaries of the subdivision.

Construction, continual: Construction performed by a full complement of workers and equipment mobilized at the project site, actively engaged in incorporating materials and equipment into the building or structure each normal working day.

Construction Costs: The total value of the construction of, or reconstruction work on structures, as determined by the Administrative Officer or their designee, in issuing a building, or other type, permit for construction or reconstruction.

Construction Entrance: A temporary access for the ingress and egress of construction vehicles.

Construction, Existing: Any structure for which the "start of construction" commenced before the effective date of the initial adoption of this ordinance.

Construction, New: Structures for which the "start of construction" commenced on or after the effective date of this ordinance.

Contractor: A person, firm or corporation who the owner of a property has employed, or contracted to perform, construction activity associated with a development. For purpose of this ordinance, the term contractor shall include all subcontractors who are under separate contract or agreement with the contractor for performance of a part of the work at the site.

Corridor Map: A map adopted by the City which designates land to be reserved for the construction of future or improvement of existing transportation facilities and future parks, open spaces, and green spaces.

County: Habersham County, Georgia

Critical Root Zone: An area of root space that is within a circle circumscribed around the trunk of a healthy tree corresponding to the drip line.

Cross-section: A profile of the ground surface perpendicular to the center line of a road, stream, or other feature.

Cul-de-sac: A street having one end open to traffic and being permanently terminated at the other end by a vehicular turn-around.

Cul-de-sac, Temporary: A non-permanent vehicular turn-around located at the termination of a street.

Culvert: A closed conduit of waterway carrying water through or under a driveway, fill area, street, highway, or railroad. A culvert is distinguished from a bridge by certain characteristics: (a) a culvert is typically monolithic in cross-section, and has a regular, symmetrical shape; a bridge is typically constructed such that the span is separate from and supported by abutments and/or piers; (b) a culvert usually has a large ratio of length to width.

Curb: A boundary, usually constructed of concrete, usually marking the edge of a roadway or paved area, which is designed to channel stormwater to drainage inlets and/or prevent or deter access.

Curb Cut: A provision for vehicular ingress and/or egress between property and an abutting street.

Curb Radius: The curved edge of a street at street intersections.

Dead-End Street: A street, other than a cul-de-sac, with only one outlet. Dead-end streets are not allowed within the City.

Debris: Any material, including floating trash, suspended sediment or bed load moved by a flowing stream; detritus. This term also includes those materials that may be disposed of in a debris landfill. Also includes trash, garbage, junk, building material, or plant material left or deposited on a site or street, or disposed of improperly.

Deceleration Lane: An added roadway lane, of a specified distance and which may include a taper, as approved by the City Engineer, that permits vehicles to slow down and leave the main vehicle stream.

Deciduous: Any plant or tree which drops its leaves annually at the end of the growing season.

Dedication: The deliberate appropriation of land by an owner for any general and public use or purpose, reserving to himself no other rights than such as are compatible with the full exercise and enjoyment of the public uses to which the property has been devoted.

Dedication Plat: A plat that indicates property to be dedicated for public right-of-way or land for public use.

Demolition: The razing of any structure above or below the existing grade.

Design Professional: An individual who meets State licensure requirements applicable to the profession or practice in which he or she is engaged in.

Detention: The temporary retraining of stormwater on-site.

Detention Pond: A pond or pool used for the temporary storage of stormwater runoff and which provides for the controlled release of such stormwater.

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 as herein defined, whether the development involves the subdivision of the land for sale, the construction of buildings or other improvements on a single land ownership, or both.

Development: Any man-made change of improved or unimproved real estate, including but not limited to, buildings, structures, mining, dredging, filling, grading, paving, excavation or drilling operations.

Development Department: Administrative Officer and staff responsible for the processing and review of all plans related to new construction and redevelopment.

Development Permit: Approval by the Administrative Officer to proceed with development. For purposes of this ordinance, the development permit required by this ordinance shall be the same as (or coordinated with) the permit required for compliance with Soil Erosion and Sedimentation Control regulations of the Code of Ordinances of the City of Cornelia and the development permit required by the City of Cornelia Zoning Ordinance.

Development Plan: Any plan containing substantial information required to be filed by this ordinance, which shows how the property to be affected by the development will be changed and improved in a specific manner, including the installation of roads and utilities and the erection of buildings and structures, among other specific requirements.

Dike: An embankment to confine or control water, especially one built along the banks of a river to prevent overflow of lowlands; a levee.

Discharge: The act involved in water or other liquid passing through an opening or along a conduit or channel; and/or the water or other liquid which emerges from an opening or passes along a conduit of channel.

Disturbed Area: Disturbed area is defined as the entire limits of the site project activity, outside of the buffer area.

Ditch: An artificial channel, usually distinguished from a canal by its smaller size.

Drainage Area: The contributory area of a stream at a specified location, measured in a horizontal plane, which is enclosed by a topographic divide such that direct surface runoff from precipitation normally would drain by gravity into the river basin above the specified point.

Drainage Structure: A device composed of a virtually non-erodible material such as concrete, steel, plastic or other such material that conveys water from one place to another by intercepting the flow and carrying it to a release point for storm-water management, drainage control, or flood control purposes.

Easement: A non-possessory interest in land; a grant by a property owner for the use by the public, a corporation or persons, of a portion of land for a specified purpose or purposes. Historically, easements may have been descriptive or prescriptive, may or may not be recorded in the public land record in the Habersham County Courthouse. The lack of record of or specificity in a historic easement does not reduce its validity. Any historic easement to the interest of the City shall be construed to the maximum benefit of the City. It is the intent of this ordinance that all easements (new or historic) shall be made a part of the public record and shall be recorded in the Habersham County Courthouse.

EPD: The Environmental Protection Division (EPD) of the Georgia Department of Natural Resources is a state agency charged with protecting Georgia's air, land and water resources through the authority of state and federal statutes. EPD issues and enforces all state permits related to air, land and water pollution and control and has full delegation for federal environmental permits except Section 404 (wetland) permits.

Escrow Account: A type of subdivision improvement guarantee where the subdivider deposits cash, a note, a bond, or some other instrument readily convertible to cash for specific face value specified by the Administrative Officer to cover the costs of required improvements.

Fill: A portion of land surface to which soil or other solid materials have been added; the depth above the original ground.

Final Plan: A detailed engineering drawing(s) showing the proposed improvements required in the development of a given parcel and demonstrating compliance with the requirements of this ordinance and other law, prepared by a qualified design professional (e.g., Professional Engineer) who is licensed to prepare such in accordance with State law.

Final Plat: A scale drawing showing the boundaries, dimensions, and features of real property. Plats submitted, or recorded in compliance with this ordinance shall meet the requirements of the Georgia Plat Act.

Finished Grade: The final elevation and contour of the ground after cutting and filling and conforming to the proposed design.

Fire Flow: The flow of water required to extinguish the largest probable fire served by a water utility service or company.

Flood Hazard Area: Any normally dry area that is susceptible to being inundated by water. The flood hazard areas include, but are not limited to, land subject to the 100-year flood.

Flood Hazard Boundary Map (FHBM): An official map of a community issued by the Federal Emergency Management Agency, where the boundaries of the areas of special flood hazard have been defined as Zone A.

Flood Insurance Rate Map (FIRM): An official map of a community on which the Federal Emergency Management Agency has delineated both the areas of special flood hazard and the risk premium zones applicable to the community.

Flood Insurance Study: Official report provided by the Federal Emergency Management Agency containing flood profiles, as well as the Flood Boundary-Floodway Map and the water surface elevation of the base flood.

Flood Peak: The maximum water level at the time of maximum discharge of a particular flood at a given point along a stream.

Floodplain: Area which borders a stream channel and is covered by its water in time of flood; also consists of stream bed areas subject to recurrent overflow, or inundation.

Floodway: The channel of a river, stream or other watercourse and the adjacent land area that must be reserved to discharge the 100-year flood without cumulatively increasing the water surface elevation more than one foot (1 ft.) at any point.

Fps: Feet per second.

Frontage: Distance of lot as measured along the right-of-way.

Georgia DOT or GDOT: The (State of) Georgia Department of Transportation.

Gph: Gallons per hour.

Gpm: Gallons per minute.

Governing Body: The Mayor and City Commission of Cornelia, Georgia.

Gradient: The rate of vertical change between two distance points, determined by dividing the vertical distance by the horizontal distance (i.e., rise over run).

Grading: The movement, removal or addition of earth and the altering the shape of ground surfaces on a site by the use of mechanical equipment. This shall include stripping, cutting, filling, stockpiling and shaping or a combination thereof. Grading is a land disturbing activity.

Greenway: A linear park or open space conservation area that provides recreational opportunities, pedestrian and/or bicycle paths, and/or conservation and preservation of open spaces or natural areas.

Grubbing: The removal of stumps, roots and/or vegetation from the site by methods such as digging, raking, dragging or otherwise disturbing the roots of vegetation. Grubbing is a land disturbing activity.

Habitat for endangered or threatened species: An area verified by the Georgia Department of Natural Resources as 1) actually containing naturally occurring individuals of a species that has been listed as endangered or threatened under the Federal Endangered Species Act, as amended, and 2) being likely to support the continued existence of that species by providing for a significant portion of that species' biological requirements.

Headwater: The water upstream from a structure; or may also be the source of a stream.

Health Department: The Habersham County Health Department.

Homeowners Association: An organization formed for the maintenance and operation of the common areas of a development, where membership in the association is automatic with the purchase of a dwelling unit or lot within the development, with the ability to legally assess each owner of a dwelling unit or lot and which has authority to place a lien against all dwelling units and lots within the development. These associations are sometimes referred to as the HOA.

Hydrology: The science of dealing with the waters of the earth in their various forms, precipitation, evaporation, runoff and ground water.

Imperviousness: The quality or condition of a material that minimizes percolation.

Impervious Surface: Areas which do not permit natural infiltration of rainfall, including, but not limited to rooftops, paved parking lots, driveways, paved roads and streets, patios, paved sidewalks, swimming pools, paved tennis courts and basketball courts, and any other exposed area surfaced in concrete or asphalt, except of gravel and pervious or porous paving materials.

Invert: The floor, bottom or lowest part of the internal cross-section of conduit.

Land Disturbing Activity: Any activity including grading, scraping, clearing, dredging, excavating, and transporting or filling of land; clearing and grubbing of vegetation; any other alteration of land that may cause land and stream bank erosion, siltation or water pollution from water or wind but not including agricultural practices; and any construction, rebuilding or alteration of a structure.

Land Disturbance Permit: A permit issued to authorize clearing, grading, excavating, transporting and filling of land.

Letter of Credit: A type of subdivision improvement guarantee whereby a subdivider secures an instrument from a bank or other institution or from a person with resources sufficient to cover the cost of improvements required by the City. The instrument pledges the creditor to pay the cost of improvements in case of default by the subdivider.

Licensed Landscape Architect (LA): A person who, by reason of his special knowledge of natural, physical and mathematical sciences and the principles and methodology of landscape architectural design acquired by practical experience and formal education or both, is qualified to engage in the practice of landscape architecture, as attested by the issuance to said person of a license as a landscape architect by the State of Georgia.

Licensed Land Surveyor/Registered Land Surveyor (RLS): A person who, by reason of his knowledge of the several sciences and of the principles of land surveying acquired by practical experience and formal education, is qualified to engage in the practice of land surveying as attested by the issuance to said person of a license as a land surveyor by the State of Georgia.

Licensed Engineer/Professional Engineer (PE): A person who, by reason of his knowledge of the several sciences and of the principles of engineering acquired by practical experience and formal education, is qualified to engage in the practice of engineering as attested by the issuance to said person of a license as a professional engineer by the State of Georgia.

Lot: A portion or parcel of land intended as a unit for transfer of ownership or for development or both, intended to be devoted to a common use or occupied by a building or group of buildings devoted to a common use, and having principal frontage on a public street or an approved private street. In determining the area and dimension of a lot, no part of the right-of-way may be included.

Lot of Record: A parcel of land within the city limits which was properly platted and recorded in the Superior Court Clerk of Habersham County's Plat and Deed records as of the effective date of this ordinance, or which was lawfully subdivided prior to annexation into the City limits.

Lot of Record, Nonconforming: A historically defined parcel of land that does not meet the current standards for a lot as defined by the Zoning Ordinance. Nonconforming Lots of Record may be allowed a function consistent with adjoining lots provided that in case of division, boundary adjustment, or consolidation, no lot shall be created which does not meet the requirements of the current Zoning Ordinance. The grant of an interest, for security or other purpose, in real property for less than an entire lot, or the foreclosure or sale of such interest, shall not be deemed to create a legal lot unless properly approved by, or a variance granted by the Board of Adjustments, in accordance with this ordinance and the Zoning Ordinance. Nonconforming Lots of Record may consist of:

- A single lot of record.
- A portion of a lot of record.
- A combination of complete lots of record or complete lots of record and portions of lots of record or of portions of lots of record.

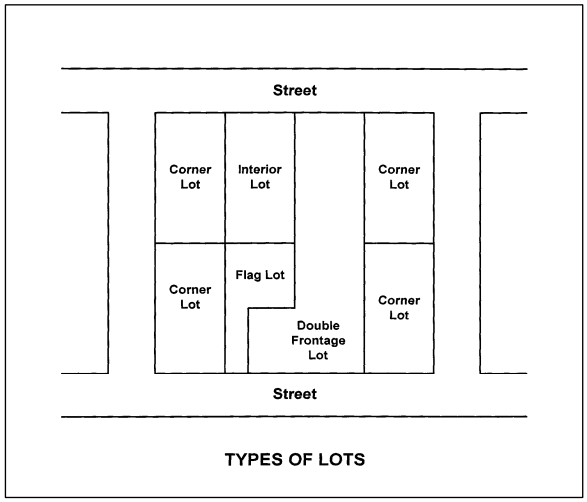
- A parcel of land described by metes and bounds.

Lot Area: The total horizontal area within the lot lines of a lot, exclusive of public street right-of-ways.

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

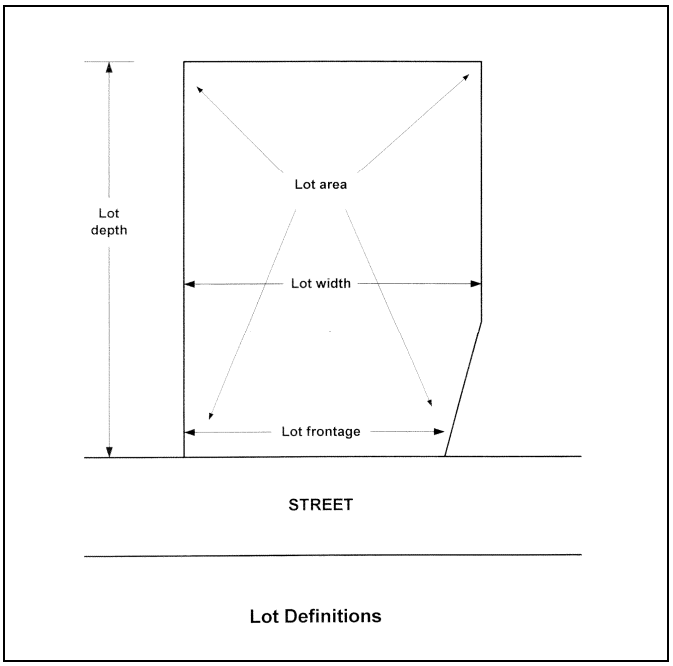
Lot, Depth: The average horizontal distance between the front and rear lot lines.

Lot, Double Frontage: A lot other than a corner lot which has frontage upon two or more streets that do not intersect at a point abutting the property.



Lot, Flag: A tract or lot of land of uneven dimensions in which the portion fronting on a public street is less than the required minimum width for construction of a building or structure on that lot.

Lot, Frontage: The width in linear feet of a lot where it abuts the right-of-way of any public street.



Lot Definitions

Lot, Interior: A lot other than a corner lot with frontage on only one lot.

Lot, Width: The distance between side lot lines measured at the regulatory/required building line.

Manufactured Home: Manufactured home is commonly referred to as a "Mobile Home" and is only allowed to be placed into existing Manufactured House Developments within the City limits through the City Zoning Ordinance. A Manufactured Home is a new or used structure or dwelling unit, meeting the definition of "manufactured home" contained in O.C.G.A. § 8-2-160, fabricated in an off-site facility, transportable in one or more sections for installation or assembly at the building site, bearing a label certifying it is constructed in compliance with the Federal Manufactured Home Construction and Safety Standards Act, 41 U.S.C. § 5401 et seq., and meeting the following development standards:

1. A minimum width in excess of twenty-eight (28) feet

2. A minimum roof pitch of 5:12, which means having a pitch equal to at least five inches of vertical height for every twelve inches of horizontal run. Any dwelling unit for which a building permit was obtained prior to the adoption of this Ordinance may be extended, enlarged or repaired as otherwise provided by this Ordinance with the same roof pitch as that allowed by the previous building permit.

3. A minimum roof overhang of 12-inches is required. All roof surfaces exposed to view shall be covered with asphalt or fiberglass shingles, wood shakes or shingles, standing seam (non-corrugated tin or steel), clay tiles, slate or similar materials.

4. Exterior siding consisting of wood, hardboard, vinyl, brick, masonry, stone, or aluminum (vinyl covered or painted, but in no case exceeding the reflectivity of gloss white paint) comparable in composition, appearance, and durability to the exterior siding commonly used in site dwellings.

5. A curtain wall, unpierced except for required ventilation and access, must be installed so that it encloses the area located under the home to the ground level. Such a wall shall have a minimum thickness of four (4) inches and shall be constructed of masonry or similar material as approved by the Zoning Administrator.

6. The dwelling must be placed on a permanent foundation, either slab or pier, which meets the requirement of the Standard Building Code. In addition, the dwelling shall be completely under pinned with masonry, stone, or other similar materials for the purpose of underpinning as approved by the Zoning Administrator.

7. Utility meters must be mounted to the structure rather than on a utility pole, and all axles, tongues, and transporting and towing apparatus must be removed before occupancy.

8. A landing must be installed at each doorway. The minimum size of the landing shall be four feet by six feet (excluding steps) at each doorway. The structure must include steps which lead to ground level, and both landing and steps must meet the requirements of the most recently adopted Building Code of the city of Cornelia Code of Ordinances.

9. The dwelling must be installed in accordance with O.C.G.A. § 8-20-160 et seq. and the rules promulgated thereunder.

Manufactured Housing Development: A development or subdivision also known as a "Mobile Home Park" intended for use as a residential area occupied by multiple manufactured homes. New Manufactured Housing Developments are not allowed within the City limits through the City Zoning Ordinances.

Mass Grading: The grading of two (2) acres or more, for residential development, or twenty-five (25) acres or more, for Non-residential development, at one time to prepare multiple lots for construction, rather than lot-by-lot grading at the time of building construction. This definition does not include grading necessary to install required infrastructure such as roads and utilities.

Master Plan: A comprehensive plan, which may consist of multiple maps, data and other descriptive matter guiding the physical development of the City or any portion thereof. This includes any amendments, extensions or additions thereof recommended by the City Manager and adopted by the City Commission indicating the general location for major roads, parks or other public open spaces, public building sites, routes for public utilities, zoning districts or other similar information.

Mean Sea Level: The average height of the sea for all states of the tide. It is used as a reference for establishing various property elevations, and for other purposes. For purposes of this ordinance, the term is synonymous with National Geodetic Vertical Datum (NGVD).

Metes and Bounds: A system of describing and identifying land by distances or measures (metes) and bearings or direction (bounds) from an identifiable point of reference, such as a monument or other marker or the corner of intersecting streets.

Municipal Planning Board: Citizens of the City of Cornelia appointed by the City Commission who have the authority to review and recommend the City Commission whether preliminary plats and final plats should be approved, conditionally approved or denied.

National Geodetic Vertical Datum (NGVD): Vertical control used as a reference for establishing varying elevations including areas within the floodplain as corrected in 1929.

Open Space: Land and water areas retained for use as passive recreation areas or for resource protection or conservation in an essentially undeveloped state. In the context of Article XI of this ordinance, open space shall mean any combination of primary conservation areas and secondary conservation areas, as defined in this Article, that together form a permanent, undivided or relatively undivided, undeveloped area.

Owner(s) of Record: The owner(s) of property as specified on the deed of the lot of record.

Parking Lot: A ground level open area that is used for the temporary parking of vehicles and does not include entry roads.

Pavement width: The width of a given lane, road, or other road pavement width, measured from back-of-curb to back-of-curb, or to the edge of pavement where no curbs are required or exist.

Pedestrian Way: Crosswalk or other areas designed and marked specifically for pedestrian traffic.

Performance bond: A type of subdivision improvement guarantee in the form of a bond, secured by the subdivider from a bonding company, in an amount specified by the City Engineer to cover the costs of required improvements, and payable to the City. The City may call in the performance bond in the event the subdivider defaults on required improvements.

Person: Any individual, partnership, firm, association, public or private corporation, trust, joint venture, estate, cooperative, political subdivision or other instrumentality of this state or other legal entity.

Plat, Final: A finished drawing of a subdivision showing completely and accurately all legal and engineering information, certification, and all other elements and requirements set

forth in this ordinance and 0.C.G.A. 15-6-7, prepared for filing for record with the Clerk of the Habersham County Superior Court.

Plat, Preliminary: A drawing which shows the proposed layout of a subdivision in sufficient detail to indicate its general design.

Pre-Application Conference: An initial and informal stage of development review at which the developer may make known concept plan proposals and the Project Review Team may respond and/or advise the developer concerning the development regulations.

Professional or Design Professional: An individual who meets state licensure requirements applicable to the profession or practice in which he/she is engaged.

Professional Engineer: See "Licensed Engineer".

Project: A principal building or structure or group of buildings or structures planned and designed as an interdependent unit together with all accessory uses or structures, utilities, drainage, access and circulation facilities, whether built in whole or phases. Examples include: a principal building on a lot, a residential subdivision, a multi-family development, a shopping center or an office park.

Project Review Team: A team of individuals, consultants, professionals, and City employees representing the City in the review and approval of proposed developments. The Project Review Team is composed of the Administrative Officer as well as others including, but not limited to, the Public Works Director, the City Engineer, City Planner/Zoning Administrator, Fire Marshall, Municipal Planning Board, Building Inspector, Economic & Community Development Manager as well as other stakeholders.

Property Owner: Any person who owns fee title to a given area of land, excluding, however, any recorded easement or right-of-way.

Protective Covenants: Contracts made between private parties as to the manner in which land may be used, with the view toward protecting and preserving the physical and economic integrity of any given area.

Protected Zone: All lands that fall outside the buildable area of a parcel; all areas of a parcel required to remain in open space, and/or all areas required as yard areas, buffers, or landscaped areas according to provisions of the City of Cornelia Zoning Ordinance or by conditions of zoning and variance approval.

Psi: Pounds per square inch.

Rational Formula: A method of calculating the total amount of stormwater runoff a given project will generate within a certain period of time, represented by the following formula:

Q = CIA, where

Q = maximum amount of runoff in cubic feet per second (Q accounts for both

quantity and rate)

C = average runoff coefficient for the entire site

I = intensity of rainfall in inches per hour

A = total area to be drained in acres

Recreation, active: Leisure activities that are facility oriented, such as swimming pools, tennis courts, and ball fields.

Recreation, passive: Leisure activities that are natural resource oriented, such as hiking trails, conservation areas, and nature preserves.

Reserve Strip: A strip of land across the end of, or along the edge of, a street, alley, or lot for the purpose of controlling access which is reserved or held until future street extension or widening.

Responsible party: In the context of enforcement procedures, a person who is alleged to have committed, causes, continued or created a violation of the terms, requirements, regulations, or provisions of this ordinance whether as a direct act, through lack of action or neglect, or at the direction of or on behalf of others. A responsible party may be the owner of a premises where a violation has occurred; an occupant whether through ownership, lease or other tenancy; a contractor, building or developer; an agent of or person otherwise acting on behalf of the aforementioned parties; or other person acting in violation of this ordinance.

Re-subdivision: The act of changing an existing lot created by a plat and recorded in the Office of the County Superior Court Clerk of Habersham County, Georgia.

Retention: The permanent maintenance of stormwater on-site.

Retention pond: A pond or pool used for the permanent storage of stormwater runoff.

Right-of-way, public: That area, distinguished from an easement or private road right-of-way, which is owned in fee-simple title by the Governing Body or other government, for the present or future use of roads, roads and highways, together with its drainage facilities and other supporting uses and structures.

Right-of-way, private: That area, distinguished from an access easement or public right-of-way, dedicated to property owners of the subdivision involved or to other individuals, and which affords permanent access to abutting property or properties. A private right-of-way is distinguishable from a public road right-of-way in that maintenance and ownership of the road and accessory improvements is by private individuals or an association rather than the Governing Body or another government.

Riprap: Rocks, rubble, or stones, irregularly shaped and at least six inches in diameter, used for erosion control and soil stabilization.

Road Classification Map: Comprehensive plan of arterial, collector and minor streets and roads for all or a portion of the City.

Roadway drainage structure: A device such as a bridge, culvert, or ditch, composed of a virtually non-erodible material such as concrete, steel, plastic, or other such material that conveys water under a roadway by intercepting the flow on one side of a traveled way consisting of one or more defined lanes, with or without shoulder areas, and carrying water to a release point on the other side.

Runoff coefficient: Ratio of the amount of rain which runs off a surface to that which falls on it; a factor from which runoff can be calculated.

Scenic views and sites: Those geographic areas containing visually significant or unique natural features, as identified in the City's Comprehensive Plan, or by other reasonable means.

Sediment: Solid material, both organic and inorganic, that is in suspension, is being transported or has been moved from its site of origin by air, water, ice or gravity as product of erosion.

Sedimentation: The process by which eroded material is transported and deposited by the action of water, wind, ice, or gravity.

Sensitive natural areas: Any area, as identified now or hereafter by the Georgia Department of Natural Resources, which contains one or more of the following: habitat, including nesting sites, occupied by rare or endangered species; rare or exemplary natural communities; significant landforms, hydroforms, or geological features; or other areas so designated by the Department of Natural Resources; and which is sensitive or vulnerable to physical or biological alteration.

Septic tank: An approved watertight tank designed or used to receive sewage from a building sewer and to affect separation and organic decomposition of sewerage solids, and discharging sewage effluent to an absorption field or other management system.

Sewer: A pipe located in a public right-of-way or easement which transports sewage, including manholes, connections, and all other appurtenances.

Sewer, storm: A sewer that carries storm, surface, and ground water drainage but excludes sewage and residential, commercial, and industrial wastes.

Shade Tree: A tree in a public place, street right-of-way, or special easement, planted to provide canopy that will obscure the sun and heat from the ground.

Sidewalk: A hard-surfaced pedestrian access area adjacent to or within the right-of-way of a public road.

Site: Any tract, lot or parcel of land where development is to be performed.

Site Work: Development activity to prepare a property for construction of buildings or finished structures, including clearing, grubbing, grading and installation of soil erosion and sedimentation control facilities.

Soil and Water Conservation Commission: The Soil and Water Conservation Commission of the State of Georgia.

Soil and Water Conservation District: The Upper Chattahoochee River Soil and Water Conservation District.

Soil Erosion and Sedimentation Control Regulations: Regulations promulgated by the State of Georgia through the Georgia Erosion and Sedimentation Act of 1975 as amended to date.

Stream Bank Buffer: Georgia law requires a 25 foot undisturbed buffer, parallel to the stream, along both banks of all "Waters of the State" as measured from the "point of wrested vegetation". The City may have Stream buffers greater than what Georgia law requires.

Street: A public or private thoroughfare which is open to the general public and which affords the principal means of access to abutting property. Private streets are not allowed in new Development.

Street, Arterial: Unless otherwise specified by the Comprehensive Plan, transportation element of the Comprehensive Plan or Major Thoroughfare Plan, arterial streets are those streets and highway facilities, including full and partial access controlled highways and major urban area entrance highways, which are designed to carry the highest traffic volumes and the longest trips through and within an urban area.

Street, Collector: Unless otherwise specified by the Comprehensive Plan, transportation element of the Comprehensive Plan or Major Thoroughfare Plan, collector streets are those streets that collect traffic from minor streets or other collector streets and channel it to the arterial system. Collector streets provide land access and traffic circulation within commercial and industrial areas.

Street, Local: Unless otherwise specified by the Comprehensive Plan, transportation element of the Comprehensive Plan or Major Thoroughfare Plan, local streets are used primarily for direct access to residential, commercial industrial or other abutting property.

Street, Private: A road or street that has not been accepted for maintenance by the City and that is not owned and maintained by a state, county, city, or another public entity. Private Streets are not allowed in new Developments.

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

Storm Drainage System: Any structure used principally to retain, detain, collect, direct, transfer, carry, convey, distribute or treat, singularly or in combination, storm water or

other surface water, including, but not limited to, aprons, basins, berms, BMP facilities, catchments, conduits, culverts, dams, dikes, ditches, drains, drops, filters, grates, infiltration devices, inlets, manholes, man-made channels, outlets, pipes, ponds, rip-rap, risers, spillways, storm sewers, swales and trenches; and also including any maintenance areas needed for such structures.

Structure: Anything constructed or erected, the use of which requires more or less permanent location on the ground, or which is attached to something having more or less permanent location on the ground, not including utility poles.

Subdivision: The division of a parcel or tract of land into two (2) or more lots for the purposes of creation of lots for development, the rearrangement of existing lot lines, or for the purpose of transfer of ownership.

Subdivision, Consolidation: The removal of common property lines between abutting lots in the same ownership. (See also boundary adjustment subdivision).

Subdivision, Consolidation Plan: A legal document, prepared by a qualified professional licensed to prepare such in the State of Georgia, for the purpose of the legal removal of common property lines between abutting lots in the same ownership.

Subdivision, major: Any subdivision which involves the construction of a new public or private street; and any subdivision, regardless of whether or not it involves a new public or private street, which contains more than three (3) lots.

Subdivision, minor: The subdivision of a tract of land into not more than three (3) lots, where each lot has minimum required frontage on an existing public street.

Time of concentration: The time it takes for runoff to travel from the hydraulically most distant part of the watershed to the point of reference. In hydrograph analysis, it is the time from the end of excessive rainfall to the point of inflection on the falling limb in the hydrograph.

Topography: The configuration of surface features of a region, including its relief, rivers, lakes, and showing relative elevations.

Tract: An area, parcel, site, piece of land or property that is subject of a development application.

Traffic Study: An analysis conducted to assess the impact of vehicular traffic generated by a new use or change in use on existing or future road network and to obtain the required information in evaluating any potential road network improvements.

Utilities: All lines and facilities related to the provision, distribution, collection, transmission, or disposal of water, storm and sanitary sewage, oil, gas, power, information, telecommunication and telephone cable, and including facilities for the generation of electricity.

Vacation: The termination of, or termination of interest in, an easement, right-of-way, or public dedication of land.

Variance: A minimal relaxation or modification of the strict terms of this ordinance as applied to specific property when, because of particular physical surroundings, shape, or topographical condition of the property, compliance would result in a particular hardship upon the owner, as distinguished from a mere inconvenience or a desire to make a profit.

Vicinity map: A map, not necessarily to scale showing the general location of the proposed subdivision or land development in relation to major roads and/or natural features.

VPD: Vehicles per day.

Waters of the State: "Any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells, and other bodies of surface or subsurface water, natural or artificial, lying within or forming a part of the boundaries of the State which are not entirely confined and retained completely upon the property of a single individual, partnership, or corporation." As defined by the Erosion and Sedimentation Act of 1975. O.C.G.A. §12-7-3

Wetlands: Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. . Wetlands generally include swamps, marshes, bogs and similar areas. (33 CFR 32.93) The ecological parameters for designating wetlands include hydric soils, hydrophytic vegetation, and hydrological conditions that involve a temporary or permanent source of water to cause soil saturation. Freshwater wetlands do not include any areas defined as "coastal marshlands" by the State Coastal Marshlands Protection Act.

Zoning Administrator: The City Planner or other city staff person designated by the City Manager responsible for administering, interpreting, and enforcing the City's Zoning Ordinance, or his or her designee.

Zoning Ordinance: The zoning ordinance adopted by the City Commission that govern all property located within the limits of the City of Cornelia.

END ARTICLE II

ARTICLE III: PROCEDURES

Section 301: Delegation of Authority to Administrative Officer.

The City Commission hereby delegates to the Administrative Officer or his or her designee the authority to approve, conditionally approve, or disapprove minor subdivisions, lot combination plats, boundary line adjustments, and dedication plats; provided, however, such delegation does not authorize the Administrative Officer to accept public improvements for the City Commission. The Administrative Officer is vested with the authority to review, approve, conditionally approve, or disapprove land development plans.

Section 302: Delegation of Authority to Municipal Planning Board.

The City Commission hereby delegates to the Municipal Planning Board the authority to review and recommend to the City Commission whether preliminary plats and final plats for major subdivisions shall be approved, conditionally approved, or denied. All recommendations of the Municipal Planning Board on preliminary and final plats for major subdivisions shall be entered onto an official form supplied by the City Planner and said form shall be submitted to the City Commission for consideration.

Section 303: Delegation of Authority to City Engineer.

The City Engineer is vested with the authority to require and approve, conditionally approve, or deny approval of subdivision and land development improvements. The City Engineer shall require improvement guarantees for public improvements as specified in this ordinance.

The City Engineer is further authorized to promulgate additional technical standards and construction specifications for land development improvements not already specified by this ordinance or the city's zoning ordinance, including but not limited to water systems, sanitary sewer systems, streets, storm drainage systems, utilities, driveways, curb cuts, and parking lots. When technical standards are prepared, the City Engineer may seek their adoption by the City Commission.

Section 304: Subdivision of Land.

No person shall subdivide land except in accordance with this ordinance. It shall hereafter be unlawful for any person, firm, corporation, owner, agent or subdivider, by deed or map, to sell, transfer, agree to sell, offer at public auction, negotiate to sell or subdivide any land until a preliminary plat, if required, has been reviewed by the Municipal Planning Board and approved by the Cornelia City Commission, and unless a final plat has been approved by the Administrative Officer in the case of a minor subdivision or reviewed by the Municipal Planning Board and approved by the Cornelia City Commission in the case of a major subdivision. Said restriction applies to lands subdivided for non-residential as well as residential uses. The description by metes and bounds in the instrument of transfer or other document used in the process of selling or transfer shall not exempt the transaction from this ordinance or from the penalties established herein. The City through its attorney

or other designated official may enjoin such transfer of, sale, or agreement by appropriate action.

Section 305: Public Streets and Lands.

No land dedicated as a public street or other public purpose shall be opened, extended or accepted as a public street or for any other purpose improvements unless such are constructed in accordance with the specifications of this ordinance and accepted by the City Commission.

Section 306: Lots Must Comply with the Zoning Ordinance

No person shall subdivide land, and the Administrative Officer shall not approve any subdivision of land, unless the lots created pursuant to said subdivision meet or exceed all applicable requirements of the Zoning Ordinance of the City of Cornelia, Georgia, as may be amended from time to time.

Section 307: Preliminary Plat, Development Permit, and Land Development Plans Required.

No person shall commence development, land-disturbing activity, or construction of any improvements on any lot or land hereafter subdivided, and no development permit shall be issued for such improvements, prior to the approval of a preliminary plat of such land if required by this ordinance and the approval of a development permit if required by the Zoning Ordinance of the City of Cornelia, Georgia, as may be amended from time to time, nor prior to approval of construction plans and engineering plans for said improvements being submitted and approved by the Administrative Officer, Building Official and the City Engineer.

Section 308: Building Permit Required Prior to Construction.

No building permit shall be issued for a building or structure located in a subdivision created subsequent to adoption of this ordinance unless a final plat if required has been approved by the Administrative Officer and recorded in accordance with this ordinance.

Section 309: Land is One Tract Until Subdivided.

Until property proposed for subdivision has received final plat approval and been properly recorded, the land involving the subdivision shall be considered as one tract, or as otherwise legally recorded.

Section 310: Recording of Subdivision Plats.

No subdivision plat, nor part thereof, shall be recorded in the Superior Court of Habersham County, unless such plat has been approved for recording by the Administrative Officer. The Clerk of the Superior Court of Habersham County shall not record a plat of a subdivision, whether evidenced as a plat or as an attachment to a deed, unless such plat is a final plat approved by the Administrative Officer or his designated representative and contains the Administrative Officer's signature thereon.

Section 311: Exemptions from Plat Approval

The following types of land subdivisions, transfers, and sales are specifically exempted from the plat approval requirements of this ordinance; provided, however, that such exemptions shall not apply to land development requirements and improvement requirements of this ordinance:

A. The creation and sale of cemetery plots.

B. The sale of lots consistent with previously approved and recorded plats or deeds.

C. The creation of leaseholds for space within a multiple-occupancy building or the division of property into leaseholds (but not for sale) for commercial, industrial, or institutional use.

D. The creation of leaseholds (but not for sale) for the agricultural use of property where the use does not involve the construction of a building to be used as a residence or for other purposes not directly related to agricultural use of the land or crops or livestock raised thereon.

E. Any division of land to heirs through a judicial estate proceeding, or any division of land pursuant to a judicial partition, or any division of land occurring from the foreclosure of a deed of trust; provided, however, that such exemption shall not require the city to issue permits if the resulting lots or parcels fail to meet any applicable zoning ordinance provisions regarding lot size, lot width, and other dimensional requirements.

Section 312: Exemption from Plan Approval.

The land development plan requirements specified in Articles I and III of this ordinance shall not apply to any individual lot which has already been platted in accordance with the requirements of this ordinance, or any lot of record, when such lawfully existing lot is to be developed for a detached, single-family, fee-simple residence or a two-family dwelling (duplex). Specifically, a development permit and the submission of land development plans shall not be required for such lots and uses.

Section 313: Reference To State and Federal Land Subdivision Laws.

The subdivision of land within the City of Cornelia shall comply, as applicable, with the Interstate Land Sales Full Disclosure Act (15 U.S.C.A. Section 1701 et seq.) and with the Georgia Land Sales Act (O.C.G.A. § 44-3-1 et seq.). All subdivision plats shall also comply with applicable state laws regarding accuracy and content of all such subdivision plats.

Section 314: Special Review of Subdivisions Along State Routes.

No subdivision plat containing land which abuts a State route or any part of the State highway system shall be approved until such plat has been submitted for review and comment to the Georgia Department of Transportation, in accordance with the provisions of O.C.G.A. § 32-6-151. It is the applicant's responsibility to submit plans to the Georgia Department of Transportation (GDOT) and obtain approval. The applicant shall furnish to the Municipal Planning Board GDOT's approval or rejection of the project. If the plat is

recommended for rejection by GDOT, the reasons for rejection and requirements for approval shall be given the Municipal Planning Board in writing.

Section 315: Plan Review Procedure

Overview: The following development plan review procedures apply to all commercial and industrial developments and to all residential subdivisions of three (3) or more lots and to all multi-family developments in the City of Cornelia. This ordinance governs the subdivision of property and the development of property. When subdivision of property is involved, the applicant is required to seek and obtain approval of the subdivision. When the subdivision involves installation of streets and other utilities, a preliminary plat is required to be approved by the City Commission after review and recommendation of the Municipal Planning Board. If no new street is involved in the subdivision, no preliminary plat is required. If the subdivision is a "minor" subdivision as defined by this ordinance, the subdivision is processed administratively as a final plat without review by the Municipal Planning Board and approval of the City Commission. All developments except “minor” subdivisions or those developments that are exempt, shall submit a Preliminary Plat or a Preliminary Development Plan. After a preliminary plat is approved, or in cases where no subdivision of land is involved, the next stage of the development process is the approval of land development plans. Once improvements are installed in accordance with an approved preliminary plat, if the development involves the subdivision of land, a final plat is required to be submitted by the applicant and approved by the City Commission (Planning Board review of final plats is not required).

Pre-application conference: Whenever the subdivision of a tract of land or a land development project is proposed to be made, the subdivider or land developer is encouraged (but not required) to consult early and informally with the Administrative Officer. The subdivider or land developer may submit sketch plans and data showing existing conditions within the site and its vicinity, and the proposed layout and development of the subdivision or land development. This pre-application conference is intended to permit an early evaluation of the subdivider's or land developer's intentions and coordination with the Comprehensive Plan of the City, and to provide the subdivider or land developer with the necessary regulations in order to properly accomplish the proposed project. No fee shall be charged for the pre-application review, and no formal application shall be required.

Section 316: Types of Plans

Preliminary Plat: This plan type is defined in Article II and is required to be submitted for review and approval by the Municipal Planning Board. Preliminary Plats are meant to show the general design of a site development or a subdivision project and its public improvements so the city can indicate its approval or disapproval of the project prior to the time the final Land Development Plans and Final Plats are designed.

Land Development Plans (Construction Drawings): Final detailed engineering plans and support documentation for a purposed project constitute the Land Development Plans. They shall include complete and detailed engineering and layout drawings for all the public

and private improvements and utilities as defined in Article II. Upon approval, the Land Development Plans form the basis for the construction of the project and inspection services of the Building Official.

Final Plat: This plan type is defined in Article II and is required to be submitted for review and approval by the Administrative Officer. Final plats are meant to show the final boundaries with meets and bounds dimensions and key features of all real property, public rights-of-way and any and all easements. The Final Plat shall show lot sizes and arrangement, and the relationship to adjoining lands. The locations of all streets, public sewers, waterline and storm drainage systems shall be shown. Surveyor's certification shall be included on the Final Plat along with the surveyor's signature and seal. A statement of dedication shall be included on the face of the Final Plat signed and dated by the property owner and acceptance of the dedication shall be demonstrated by the signature of the Administrative Officer.

Section 317: Application For Preliminary Plat Approval.

Any subdivision involving the dedication of a public street or public landshall require the submission of a preliminary plat to the Administrative Officer for review and recommendation by the Municipal Planning Board and approval of the City Commission, the Administrative Officer, and City Engineer.

Applications for preliminary plat approval shall meet the requirements of Table 3.1. In addition, it shall be the responsibility of the applicant to show to the City's satisfaction that the facilities including electric power, water, and sanitary sewer, are available to serve the proposed subdivision.

Section 318: Preliminary Plat Specifications.

When a preliminary plat is required, it shall conform to the requirements of Table 3.2. If the complete preliminary plat or set of land development plans cannot be shown on one sheet at the specified size and scale, it may be shown on more than one sheet with an index map on a separate sheet of the same size.

Section 319: Transmittal of Preliminary Plat to Review Agencies.

The Administrative Officer shall transmit for review and comment a copy of the preliminary plat to the City Engineer. When involving property abutting a state route, the applicant shall submit the Preliminary Plat, to the Georgia Department of Transportation. At his discretion, the Administrative Officer may transmit for review and comment a copy of the plat to applicable internal and external review agencies, such as but not limited to: the City Attorney, the City Fire Chief, the City Building Inspector, the County Health Department, the State Department of Natural Resources, and any other agency that may have an interest in or jurisdiction over the proposed subdivision. The Administrative Officer shall consider such comments and may recommend that conditions be placed on preliminary plat approval to be consistent with said comments. Table 3.1 presents the application requirements. Table 3.2 provides the plat and plans specifications.

TABLE 3.1
APPLICATION REQUIREMENTS

REQUIREMENT	PRELIMINARY PLAT	LAND DEVELOPMENT PLANS	FINAL PLAT
1. Pre-application review with staff	Encouraged	Encouraged	
2. Application form completed	Required	Required	Required
3. Letter requesting approval with name, address, and phone of applicant	Required		
4. Number of copies of plat/plans	8 Copies	3 Copies	10 Copies
5. Filing fee per Resolution/ schedule	Required	Required	Required
6. Description of type of water supply and sewerage system and utilities to be provided	Required	Required	Required
7. Soil test for each lot proposed for on-site septic tank an drainfield	Required	Required	Required
8. Data on existing conditions	Required		
9. Warranty deed for the dedication of streets and other public places			Required
10. Written approval from electric utility company regarding installation of service points and street lights			Required
11. As-built drawings of public improvements		Required	
12. Subdivision improvement			Required
13. Certificate of title			
14. Plat Certificates			Required

TABLE 3.2
PLAT AND PLAN SPECIFICATIONS

INFORMATION REQUIRED	PRELIMINARY PLAT	LAND DEVELOPMENT PLANS	FINAL PLAT
1. Scale (minimum)	1"=100 feet	1"=100 feet	1"=100 feet
2. Sheet size (maximum)	24" x 36"	24" x 36"	17" x 22"
3. North arrow and graphic engineering scale	Required	Required	Required
4. Reference to north point (magnetic, true north, or grid north)	Required	Required	Required
5. Proposed name of subdivision or project and phases, if any	Required	Required	Required
6. Vicinity map	Required	Required	Required
7. Total acreage of the property being subdivided or developed	Required	Required	Required
8. Name, address, and telephone of owner of record	Required	Required	Required
9. Name, address and telephone of subdivider or land developer	Required	Required	Required
10. Name, address and telephone of preparer of plat or plans	Required	Required	Required
11. Date of plat or plan drawing and revision date(s) if any	Required	Required	Required
12. Exact boundaries of the tract to be subdivided or developed by bearings and distances, tied to one or more benchmarks	Required	Required	Required
13. Names of owners of record of all abutting land	Required	Required	Required
14. Municipal, County and land lot lines inside the property or within 500 ft.	Required	Required	Required
15. Existing buildings and structures on or encroaching on the tract to be subdivided or developed	Required	Required	Not Shown
16. Existing streets, utilities and easements on and adjacent to the tract	Required	Required	Required
17. Environmental conditions (streams, wetlands, watershed protection districts, flood hazard areas, etc.)	Required	Required	Required
18. Block boundaries lettered and each lot numbered consecutively counterclockwise without repetition	Required		Required
19. Dimensions and acreage of all lots	Approximate Required	Approximate Required	Exact Required

20.	Locations of streets, alleys, lots, open spaces and any public use reservations and/or common areas.	Required	Required	Required
21.	Right-of-way widths for existing and purposed streets.			
22.	Locations, widths and purposes of easements and use restrictions, if any		Required	Required
23.	Street centerlines showing angles of deflection, angles of intersection, radii, and lengths of tangents and arcs, and degree of curvature and curve data.		Required	Required
24.	Acreage to be dedicated to the public			Required
25.	Street names		Required	Required
26.	Street mailing address for each lot			Required
27.	Topography at no less than two (2) feet contours referenced to USGS datum.	Required	Required	Not Shown
28.	Minimum front building setback lines for all lots	Required	Required	Required
29.	Location and description of all monuments			Required
30.	Certificate of ownership and dedication.			Required
31.	Plat recording and signature block			Required
32.	Land surveyor's stamp, certificate, signature, including field survey and closure statement		Required	Required
33.	Statement of and reference to private covenants, if any.			Required
34.	Schedule of construction for all proposed projects with particular attention to development planned for the first year.	Required	Required	
35.	Zoning of the project parcels and all adjacent parcels within 200 ft. of project site.	Required	Required	Required
36.	Project site's Tax Map, Block and lot number	Required	Required	Required
37.	Schedule of Construction for all proposed project with particular attention to development planned for the first year.	Required	Required	

Section 320: Action on the Preliminary Plat.

Within thirty (30) calendar days of receipt of the completed application for preliminary plat, the Administrative Officer shall submit the application to the Municipal Planning Board for its review and recommendation. The Municipal Planning Board shall recommend the preliminary plat as submitted, recommend approval of the preliminary plat with conditions, or recommend disapproval of the preliminary plat, or it may defer the application for further study provided that a recommendation must be made within sixty (60) days. The Administrative Officer shall notify the applicant and the City Commission in writing of the Municipal Planning Board's recommendations, and it shall provide reasons for disapproval if that is its recommendation.

Upon review and recommendation by the Municipal Planning Board, the Administrative Officer shall forward the application for preliminary plat to the City Commission, to be scheduled promptly (the next available meeting agenda) for its consideration and action. The City Commission shall approve the preliminary plat as submitted, approve the preliminary plat with conditions, or disapprove the preliminary plat, or it may defer the application for further study provided, or it may remand the preliminary plat back to the Municipal Planning Board for further study. The City Commission must make a decision within sixty (60) days of the date of the first meeting at which it considered the preliminary plat application. It shall be the responsibility of the applicant to show to the City's satisfaction that the facilities including electric power, water, and sanitary sewer, are available to serve the proposed subdivision, and the lack of available infrastructure may be due cause for the City Commission to deny the preliminary plat.

Approval of the preliminary plat shall not constitute approval of land development plans or the final plat; rather, it shall constitute approval of the layout submitted on the preliminary plat to be used as a guide for the preparation of land development applications and the final plat. Preliminary plat approval shall continue in effect for a period of one (1) year. If an applicant has not submitted an application for final plat approval following one (1) year of preliminary plat approval, the applicant shall be required to resubmit an application for preliminary plat approval.

Section 321: Amendments to Preliminary Plat Approval.

The City Commission is authorized to approve amendments to preliminary plats. The application requirements and procedures for amending preliminary plats shall be the same as specified for preliminary plat applications.

Section 322: Submittal of Land Development Plans.

Following approval of the preliminary plat for a land subdivision, or if subdivision is not proposed, upon proposing a land development, the subdivider or land developer shall submit an application for land development approval to the Administrative Officer per the requirements of Table 3.1 for land development plans. The land development plans shall at minimum include information specified in Table 3.2 for land development plans. Said plans shall consist of the following:

A. Utility plans providing information regarding the location, size, length and type of all water, sanitary sewer and storm drainage improvements showing their minor structures, appendages and connections with existing systems, and the approximate location of service lines from the lots to the proposed utility lines.

B. Street plans providing information as follows: street profiles and cross sections as required by the City Engineer, type of sub-base, type of paving base, type curb and gutter; type street paving, and type improvements within the street right-of-way outside of the paved area.

C. Grading plans and soil sedimentation and erosion control plans.

D. In addition to utility, street, grading and erosion control plans, the Administrative Officer and/or City Engineer may require other information as may be necessary, depending upon the scope and extent of the development project, in order to review the application for compliance with this ordinance.

Section 323: Review and Approval of Plans.

Upon receipt of the completed land development plans by the Administrative Officer, he shall review them for compliance with this ordinance, the Zoning Ordinance, and any other local regulations under his review responsibility. The Administrative Officer shall have ten (10) working days to certify compliance with planning and zoning requirements and non-engineering aspects of the land development plans. Upon such certification of compliance, the Administrative Officer shall stamp them with the date approved and forward all three (3) sets of plans to the City Engineer. The City Engineer shall have fifteen (15) working days to review and approve, conditionally approve, or disapprove the plans. If disapproved, the City Engineer shall notify the applicant in writing of the reasons for said disapproval. If approved or conditionally approved, the City Engineer shall provide his signature on said approved plans indicating said approval, retain one copy of said plans for his records, return one copy to the applicant, and submit one copy to the Administrative Officer.

Section 324: Issuance of Development Permit.

Upon approval or conditional approval of land development plans, the Administrative Officer shall issue a development permit as required by the Zoning Ordinance of the City of Cornelia. Issuance of a development permit shall constitute authorization for the applicant to begin land-disturbing activities and the construction of improvements, subject to any grading permits, soil erosion permits, or other permits and permissions as may be required by the City Engineer. A prerequisite to the issuance of a development permit shall be completion and signature of an indemnification agreement as indicated in the attached exhibit A (found at the end of this ordinance).

Section 325: Application For Final Plat Approval.

In the case of a subdivision, upon completion of required improvements, the subdivider may then submit an application for final plat approval, which at minimum shall meet the

requirements for final plat applications as specified in Table 3.1. In addition, the applicant for final plat shall submit to the Administrative Officer the following:

A. **Original and file copy.** One time-stable reproducible film copy or original of the plat, and if available, electronic file copy in a computer mapping software format accepted by the City Engineer.

B. **Approval of City Engineer and subdivision improvement guarantee.** A letter from the City Engineer certifying that all required improvements have been constructed and meet the specifications of the city, and that an acceptable subdivision improvement guarantee as required by this ordinance has been provided by the applicant. The subdivider shall upon completion of the required improvements request in writing that the City Engineer report by letter that all improvements required by this ordinance have been completed according to City specifications. The City Engineer shall upon acceptance write a letter of compliance addressed to the subdivider with a copy to the Administrative Officer stating the subdivision complies with the provisions of this ordinance. Prior to writing such letter, the City Engineer shall inspect all underground installations, sub-grades, bases or courses of asphalt, and such improvements shall not be covered or hidden before they are inspected and accepted by the City Engineer. In unusual circumstances and for good cause shown by the applicant, the City Engineer may recommend and the City Commission may approve a final plat prior to the completion of all required improvements, such as the final pavement topping. In such a case the applicant shall submit an additional performance bond for those required improvements not yet completed in an amount approved by the City Engineer. For more information on the requirements of subdivision improvement guarantees, see later sections in this article.

C. **Letter from electric utility company.** A letter from the applicable electricity service company may be required indicating that service points for individual lots and street lights, if required, have been installed.

D. **As-built drawings.** "As-built" drawings acceptable to the City Engineer of: 1) all streets showing the planned and actual location of all utility lines; 2) centerline profile of all streets with final grades; and 3) horizontal and vertical alignment including profiles and invert elevations of all storm and sanitary sewer lines; provided, however, the Administrative Officer may waive this final plat submittal requirement for a set period of time if improvements and/or "as-built" drawings are not complete, subject to subsequent denial of building permits should said drawings not be submitted.

Section 326: Final Plat Specifications and Certificates.

The final plat shall be drawn to comply with the specifications in Table 3.2 for final plats. Certificates shall be included on the final plat, as follows:

A. Final Surveyor's Certificate:

It is hereby certified that this plat is true and correct and was prepared from an actual survey of the property made by me or under my supervision; that all monuments shown hereon actually exist and their location, size, type and material are correctly shown; and that this plat meets all requirements of the City of Cornelia Minimum Development Standards Ordinance and Zoning Ordinance.

By _____ _____Registered Georgia Land Surveyor No.

Date:

B. Certificate of Ownership and Dedication:

(State of Georgia) (City of Cornelia)

The owner of record of the land shown on this plat and whose name is subscribed thereto, and in person or through a duly authorized agent, certifies that he or she owns the land shown on this plat to be subdivided and hereby dedicates to the public forever, subject to formal acceptance by the City Commission, the following:

Public Streets	_____	acres
Public drains	_____	acres
Public Easements	_____	acres
Public Parks/Open Space	_____	acres

_____

Typed Name of Subdivider

Typed Name of Owner of Record

_____ _____

Signature of Subdivider

Signature of Owner of Record

_____

Date

C. Certificate of Approval:

FINAL PLAT APPROVAL
This plat complies with the City of Cornelia Zoning Ordinance, conditions of zoning, and the City of Cornelia Minimum Development Standards Ordinance, and this plat has been approved and released for recording purposes.

City Engineer, City of Cornelia Date: _____

Administrative Officer, City of Cornelia Date: _____

_____
City Clerk
Date Approved by City Commission: _____

D. Certification of Health Department Approval:
This is to certify that this plat and proposed water and sewerage facilities are acceptable.

Public Health Officer, Habersham County Date: _____

E. Certificate of Recording:

This plat has been recorded in plat book _____ , page_____ , in the records of the Clerk of Superior Court, Habersham County, Georgia.
Clerk, Habersham County Superior Court Date:_____

Section 327: Action on the Final Plat.

Upon receipt of the completed final plat application, the Administrative Officer may transmit for review and comment a copy of the plat to applicable review agencies. He shall have ten (10) working days to approve or disapprove of the plat. If said plat is substantially in conformance with the preliminary plat, it shall be scheduled for approval by the City Commission. Final plats do not require review and recommendation by the Municipal Planning Board.

Final plat approval shall be granted by the City Commission if the following conditions, as applicable, are met:

A. A preliminary plat of the proposed subdivision, if required, has been previously approved by the City Commission.

B. Where new improvements are involved in the subdivision, development plans have been approved by the Administrative Officer, all improvements have been installed, improvements have been inspected as specified in this ordinance, and subdivision improvement guarantees as required by this Ordinance have been submitted.

C. The final plat meets all applicable requirements of this Ordinance.

D. A complete final plat application has been submitted, including all supporting materials required by this ordinance for final plats.

Any action on final plats and applications that meet the conditions set out in this ordinance shall be considered a ministerial action by the Administrative Officer. Denial of a final plat shall be supported with specific findings that one or more of the conditions required by this ordinance have not been met. Once the Administrative Officer, the City Engineer, and the City Commission have approved the final plat, the signatures of the Administrative Officer

and City Engineer, and the date of approval verified by the City Clerk shall be placed on the reproducible film copy or original of the final plat.

Section 328: Recording of Final Plats.

Upon approval and without undue delay, the Administrative Officer shall have approved final plats recorded in the records of the Clerk of the Superior Court of Habersham County, and a time-stable reproducible film copy or original filed in the Office of the Administrative Officer. Said copy of original shall not require an engineer or surveyor's stamp. Recording fees shall be included in the fee charged for final plats. The Clerk of the Superior Court shall indicate on the filed copy, as well as the time-stable reproducible film copy or original, the book and page number in the Habersham County Records where the final plat is recorded. Recordation of a final plat constitutes approval to begin the sale or transfer of subdivision lots.

Section 329: Assignment of Street Addresses.

Upon recording of a final plat, the applicant shall contact the Mapping Department of Habersham County, which shall assign each lot a street address and shall note each address in permanent ink on the time-stable, reproducible film copy or original.

Section 330: Distribution of Recorded Final Plat.

The final plat is a source of essential information to tax officials, public safety officials, and utility officials, among others. The Administrative Officer shallsend a copy of the final recorded plat with assigned addresses to:

A. Habersham County Tax Commissioner
B. Habersham County Tax Assessor
C. Habersham County Health Department
D. City Police Department
E. City Fire Department
F. City Building Inspector
G. City Engineer
H. United States Postal Service (local postmaster)

At the discretion of the Administrative Officer, additional agencies or persons may be added to the above list.

Section 331: Specifications for Subdivision Improvement Guarantees.

The subdivision improvement guarantee shall at minimum conform to the following specifications:

A. It shall be conditioned upon the faithful performance by the subdivider or developer of all work required within a specified time until formally and officially released by the City;

B. It shall be payable to, and for the indemnification of, the City;

C. It shall be in a dollar amount equal to the cost of construction of the required improvements, as calculated on the basis of construction costs by the permit applicant's engineer and approved by the City Engineer;

D. It shall include surety by a company entered and duly authorized to act in such capacity in the State of Georgia; and

E. It shall be approved as to form and content by the City Attorney.

Section 332: Use of Subdivision Improvement Guarantee.

The City will hold the subdivision improvement guarantee until twelve (12) months following final plat approval or completion of all the work by the applicant, whichever is later. During the twelve (12) month period following final plat approval or completion of all the work by the applicant, whichever is later, all maintenance, utility and all other associated costs will be the sole responsibility of the applicant for final plat approval and not the responsibility of the City.

At the twelve (12) month anniversary, the applicant for final plat approval shall request a final warranty inspection. Any deficiencies cited by the City Engineer or Administrative Officer in the final warranty inspection report as deviations from this ordinance, the approved plans, or any maintenance requirements (e.g., roads, sediment, grassing, etc.) shall be remedied by the final plat applicant within sixty (60) days, weather permitting, following said inspection.

If, upon being notified of failure of required improvements, the applicant does not correct the deficiency or commence work within sixty (60) days of notice, it shall be deemed to be a failure. If at any time prior to acceptance by the City Commission the improvements fail to meet the specifications of this ordinance, the City may after official act of the City Commission draw upon the funds pledged through the applicant's subdivision improvement guarantee, for the purposes of making the necessary repairs or corrections to improvements, either by public work or by private contract, and the subdivision improvement guarantee shall be liable for the full amount of the cost of said repairs or corrections to improvements, as determined by the City Engineer.

Section 333: Dedications of Public Streets and Acceptance of Improvements.

At any date after twelve (12) months has passed since the date of final plat approval, or the installation of requirement improvements, whichever is later, the applicant may petition in writing to the Administrative Officer for the City Commission by resolution to accept public streets and other dedications, in whole or in part, within the subdivision. The petition to accept public improvements shall be accompanied by conveyances of title to all water lines, sewer lines, lift stations, streets, and any other public utilities or other improvements for which the City has previously agreed to accept ownership. Such conveyances shall be in a form acceptable to the City Attorney.

Said improvements shall not be accepted for maintenance until approved by resolution by the City Commission. Any instrument of financial guarantee (subdivision improvement

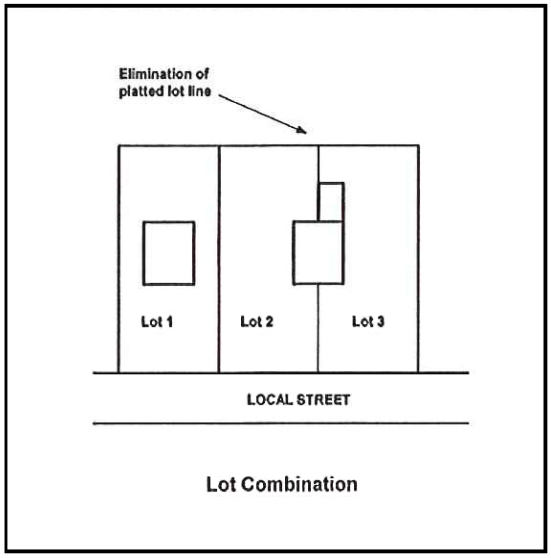
guarantee) shall be returned to the applicant upon acceptance of public streets and improvements by the City Commission.

Section 334: Minor Subdivisions.

The Administrative Officer is authorized to review and approve or deny applications for minor subdivisions as defined by this ordinance, as a final plat, provided that application is made for minor subdivision approval in accordance with all specifications for final plats as applicable and required by this ordinance. The Habersham County Health Department shall also review the plat and if approved indicate on the final plat its approval.

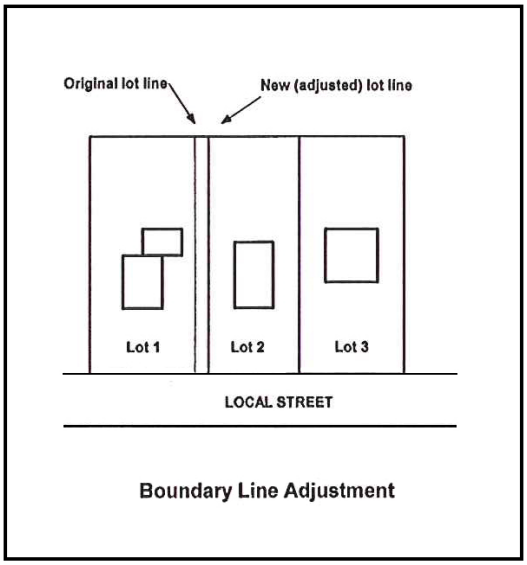
Section 335: Lot Combinations and Boundary Line Adjustments.

An existing lot line forming the boundary between two conforming platted lots located within the same subdivision or a lot line between lots or parcels that have merged to form one building lot may be removed or eliminated through a final plat revision process which conforms to the final plat requirements of this ordinance. Where separate lots of land are proposed to be combined, they shall be submitted to the Administrative Officer as a final plat for review, approval and recording. In the case no final plat applies to the subject lots or parcels, a boundary survey and plat depicting all lots involved in the lot combination shall be required to be approved by the Administrative Officer and recorded as a final plat. Such combination plat shall be titled with the same name as that of the original subdivision, if applicable, and shall indicate thereon that the re-plat is for the purpose of removing the lot lines between specific lots.



One or more existing lot lines forming boundaries between conforming platted lots located within the same subdivision, or one or more lot lines between abutting lots or parcels may be adjusted through a final plat revision process that requires the approval of the Administrative Official and recording of a plat meeting the specifications of a final plat. In the case no final plat applies to the subject lots or parcels, a boundary survey and plat of the entire lots involved in the boundary line adjustment shall be required to be approved

by the Administrative Officer and recorded. Such plat showing said boundary line adjustment shall be titled with the same name as that of the original subdivision and shall include thereon that the re-plat is for the purpose of adjusting the lot lines between specific lots.



Section 336: Performance Bonding Policy

A. Purpose

It is the purpose of this section to assure that infrastructure associated with development projects that is to be publicly dedicated is actually constructed to minimum design standards, acceptable to the City, and, once officially accepted, protected by an enforceable maintenance agreement for a period of one (1) year.

B. Performance Agreements and Guarantees**.**

1. A Performance Agreement, supported by an acceptable form of guarantee, shall be required on all projects that require public infrastructure including, but not limited to, streets, sidewalks, water, sewer, drainage facilities and improvements, parks and open space, and any other improvements that become the property of the City of Cornelia for future maintenance purposes. This agreement and guarantee shall obligate the applicant to construct all required improvements, in accordance with approved plans, in a timely manner. Public agencies seeking site development plan approval may supply a Letter of Intent to comply with this requirement, provided that a Performance Agreement is secured from the contractor performing the construction, guaranteeing the construction will be completed in accordance with the approved site development plans and requirements.

2. A separate Soil Erosion and Sedimentation Control Bond may be required on projects subject to the City's Soil Erosion and Sedimentation Control Ordinance as a condition for issuance of any land disturbing activity permits to assure the timely installation and maintenance of required erosion control measures during the construction period. Requirements for such bond may be found in the future City's Soil Erosion and Sedimentation Control Ordinance.

3. The City may also require, if applicable, an acceptable form of guarantee, to assure the timely construction and completion of required site improvements such as amenities, in accordance with approved plans including, but not limited to, recreational facilities, storm water facilities, parking, driveways, landscaping, and other improvements not intended for public dedication but which serve a common benefit to users and occupants of the development.

4. The term of the agreement shall correspond to the estimated length of the project construction period, as agreed upon between the applicant and the City Manager or his designee. Thereafter extensions may be permitted if requested in advance of the current expiration date. All agreements and any extension thereof shall be in writing.

5. The aggregate amount of all forms of guarantee posted on a project shall not exceed the total of the estimated cost of construction, as agreed upon between the applicant and the City Manager or his designee. In the event of a dispute, the amount reasonably determined by the City Manager or his designee shall be conclusive.

C. Acceptable Forms of Guarantee**.**

Cash, Irrevocable Letters of Credit, and Commercial Surety Bonds are the only forms of guarantees acceptable to the City.

1. Letters of Credit will be accepted, subject to the issuing institution meeting the City's standards:

   - Letters of Credit will only be accepted from banks with offices located in the State of Georgia. All letters must meet the requirements of the Uniform Commercial Code, as adopted in the State of Georgia. Letters of Credit shall be worded using the example provided by the City.
   - The performance agreement must expire a minimum of three (3) months prior to expiration of the Letter of Credit. The Letter of Credit shall be irrevocable during that time period.
   - A minimum 60-day notification period, of the issuer's election not to extend the validity of the Letter of Credit, is required and must be sent by certified mail to the City Manager or his designee. Failure to give notice as required shall automatically extend the Letter of Credit for successive additional six

(6) month periods. (Such provision must be expressly stated in the Letter of Credit.) Should the developer not provide a substitute Letter of Credit at least 15 days prior to the expiration, or complete all requirements to effect release, the funds shall be drawn immediately thereafter and a default action shall be initiated.

2. Cash will always be accepted by the City to guarantee a project's performance. When this option is utilized, the Administrative Officer or his designee will deposit the funds in an interest-bearing account, separate from other funds and assets of the City. In the event of default by the developer, interest that accrues on such funds shall be available to the City for application to the cost of completing required improvements. In the event of no default by the developer, such interest shall accrue for the benefit of the developer and shall be returned upon release.

3. Commercial Surety Bonds shall be issued by companies licensed in the State of Georgia and returnable to the "City of Cornelia, Georgia". The form of the bond shall be approved by the City Attorney prior to acceptance.

D. Forms

The City shall approve, and may amend from time to time, all standard forms to be used for performance agreements and bonds. No deviations shall be accepted unless approved by the City Attorney for conformity with this policy and all applicable requirements.

Section 337: Extensions and Rebonding of Agreements

A. When a developer enters into an Agreement with the City of Cornelia, it is understood that all the necessary physical improvements must be completed in the specified period of time. If all the noted improvements are not completed within this time period, and no extension has been obtained, or a replacement agreement and bond have not been submitted and approved with a new expiration date, the agreement shall be deemed in default.

B. Approximately 60 days prior to the expiration of the agreement, the City shall notify the developer in writing of the expiration date. The notification shall advise the developer that he will be in default unless the work is completed in accordance with the agreement and approved plans, or an extension of time is obtained in accordance with the requirements of this policy.

C. The developer shall make a written request to the Administrative Officer or his designee for an extension of the Performance Agreement's expiration date.

1. The first request may be for a period not to exceed one (1) year. In order to receive the maximum extension, the developer must demonstrate that the extension would be in the best interest of the City.

2. If subsequent extensions are required, they will be for maximum periods of six (6) months each. All requests shall be made at least 14 calendar days prior to the expiration date.

3. The developer must indicate the reasons and conditions that have precluded him from completing the required physical improvements. The developer must also present written consent to the request from all sureties involved, including corporate surety companies. In addition, the request shall contain a detailed cost estimate of the work remaining, together with a projected timetable for completion.

4. An additional fee to cover any necessary inspection and administrative costs shall be paid in accordance with the Fee Schedule for such inspections.

D. The Administrative Officer or his designee, upon receipt of the extension request, will review the project particulars and may either deny or condition the extension granted. The factors to be considered by the Administrative Officer or his designee shall include the following:

1. Percentage of the project that has been completed. This shall be viewed as the percentage of the bonded improvements completed. Generally, this should be at least 50% for the first extension request and 85% for the second request.

2. Number of homes/units completed, occupied, and served by public facilities, if applicable. Generally, this should be at least 10% of the project for each year (or prorated portion thereof) the project has been under construction.

3. Developer's performance history on prior projects in the City of Cornelia. This shall be based on the developer's previous number of defaults.

4. The collective number, type, and validity of complaints lodged against the developer.

5. Whether the project provides access and/or infrastructure necessary for other projects that are either under construction or approved and no site development permits have been issued.

E. In the event the developer does not respond to the letter sent by the City cautioning him of impending default, and the project is not completed by the expiration date, the matter shall be reviewed by the City Manager or his designee for appropriate action including referral to the City Attorney for action.

Section 338: Performance Bond Reductions

A. Any form of guarantee may be partially released periodically (i.e., reduced) to an amount not less than either 25% of the project's highest bond value or not less than

the actual cost of completion, whichever is higher, plus permitted allowances in accordance with the provisions of this section.

1. All reduction requests shall be submitted in writing to the Administrative Officer or his designee. No request shall be deemed officially received unless submitted in accordance with the following requirements:

   - If an extension of the performance agreement is sought, every requirement for an extension request must be met, including, but not limited to, submission of written consent by the surety to any such request

   - The request shall identify the project, performance agreement, bond, and completion date and must specify the amount of reduction sought. It shall also contain a detailed cost estimate, certified by the project design professional, of the remaining work and a projected timetable for completion.

   - A fee, covering any necessary inspection and administrative costs, shall be paid in accordance with the Fee Schedule.

2. Periodic partial bond reductions shall not occur before at least 30% of the bonded improvements have been satisfactory completed.

3. The City shall not be required to execute more than three (3) reductions in any 12 month period, except as authorized by the Administrative Officer or his designee.

4. No reduction shall be approved if the performance agreement is in default. However, reduction requests may be considered concurrently with extension requests.

B. In such instances, as deemed appropriate, the developer shall furnish the Administrative Officer or his designee a certificate of completion, from a state licensed professional engineer, stating the work described has been performed in strict conformity with either the approved final plans, or as-built plans submitted therewith, and that the work meets all applicable standards.

C. The Administrative Officer or his designee shall act upon any reduction request within 30 days of its official receipt. If the request is disapproved, the developer shall be notified in writing of the specific reasons for disapproval. If no action is taken within the time specified, the request shall be deemed approved and a partial release granted.

Section 339: Performance Bond and Agreement Final Release Procedure

A. All final performance bond release requests shall be authorized within 30 days of their official receipt, in writing, by the Administrative Officer or his designee, provided the following criteria have been met:

1. Acceptance of all public facilities by the State agency, local government department or agency, or other public authority that is responsible for maintaining or operating such facility, and the completion and approval of any other bonded site related improvements.

2. Acceptance of as-built plans by the Administrative Officer and the Project Review Team.

3. Payment by the developer of all required fees, proffers and contributions.

4. Posting of a one (1) year Maintenance bond in an amount equal to 25% of the initial bond amount posted for water, sewer and streets.

B. If a final bond release is not authorized within the 30-day period, the developer may send an additional request, by certified mail, to the Administrative Officer or his designee. Within ten (10) business days of the receipt of the request, the Administrative Officer or his designee shall either release the bond, or notify the developer of the specific agency approval not received. If no action is taken, the request shall be deemed approved and final release granted.

Section 340: Default and Evaluation Procedures

A. If the developer fails to complete the required site improvements in the period of time specified in the agreement, or any approved extension, the developer is deemed in default.

B. The Project Review Team shall forward a report on the project to the Administrative Officer, with a recommendation to formally declare the project to be in default. Such recommendation shall also enumerate a recommended course of action in response to default. Such recommendation may include the following, in any combination:

1. That the City Attorney be authorized to institute such actions as deemed appropriate to enforce the provisions of this policy, the performance agreement and bond, and applicable code provisions.

2. That demand be made of the surety on the developer's bond for payment of the funds secured thereby, for application to completion of the project, or for performance of its principal's obligations.

3. That the City contract for completion of unfinished infrastructure.

4. That all or any portion of the project be vacated.

5. That any successor in interest to the defaulted developer be required to post an adequate replacement performance agreement.

6. That no additional building permits be issued for the project subject to the bond until an adequate right of entry permit bond is posted with the City. Such a bond shall bind and hold the applicant responsible for any and all damages to any public improvements already in place caused by work covered by the resulting right of entry permit and building permit.

C. The developer and surety will be mailed copies of the Municipal Planning Board report and recommendation. They also will be advised of their opportunity to be heard on the matter at the scheduled meeting of the City Commission. Either the developer or the surety, or both, may offer proposals for completion as alternatives to that of the recommendation of the Municipal Planning Board. Any such proposal must be submitted in written form and signed by someone with the appropriate authority to issue a binding proposal.

D. All defaulted projects shall be scheduled for completion in chronological order of their declaration of default. Exceptions to a policy of first in, first out shall be made when the funds associated with a bond or letter of credit are collected by the City and cover the cost to complete the bondable items, and the project is eligible for acceptance. In such cases, the project shall be inserted into the existing project completion schedule as the next project to be handled by the City and/or its contractor.

Section 340.01 Plan Validity Periods

A. Preliminary Site Plan Validity.

1. All preliminary site plan approvals are valid for 12 months from their date of approval.

2. During that period, the following steps must be taken to maintain the validity:

   - Final plans are accepted for review, and are diligently pursued for approval;
   - Final plans are approved, or;
   - Final plans are approved and permit issuance is being diligently pursued as demonstrated by bonding the plans and recording the plans.

3. If a preliminary plan approval expires, no additional action shall be taken on the plan, or its subsequent final plans, without the submission of new preliminary plans and payment of all applicable fees.

B. Final Site Plan Validity

All final site and subdivision plans and plats are valid for two (2) years from their date of approval by the City Commission, subject to the following:

1. Requirements to be Completed Immediately Following Receipt of Final Approval by the City Commission. The applicant must complete the items listed below subsequent to the receipt of final approval:

   - For site plans, record all related plans with the Habersham County Superior Court Clerk immediately following final written approval within ten (10) days without posting a performance bond and agreement.

   - For subdivisions, record all related off-site plans immediately following receipt of written approval within ten (10) days without posting a performance bond and agreement. All remaining related plans (on-site plans) shall not be recorded until a performance bond and agreement have been posted. Note that no building permits for subdivision lots, or certificate of occupancy for other projects will be issued until infrastructure is complete.

2. Posting of a construction performance bond or other form of security as required in this Ordinance, if applicable. This is a prerequisite to the release of plans and deeds for recordation; issuance of site development permits, building permits, occupancy permits, etc.

3. Payment of any monetary and/or proffered contributions and/or obligations as established during the plan approval process, and referenced in the plan approval letter. This is a prerequisite to the release of the plans for recordation, or the issuance of site development permits, building permits, and/or occupancy permits. No building permits for subdivision lots, or certificate of occupancy for other projects will be issued until infrastructure is complete.

4. Following recordation of the plans and deeds, the applicant will return a copy of the recording receipt, a reproducible copy of the plans, electronic copy of the Plans in PDF and AutoCAD DWG format, and a copy of the deeds, to the Administrative Officer. This is a prerequisite to the issuance of site development permits, site preparation permits, building permits, and/or occupancy permits. No building permits for subdivision lots, or certificate of occupancy for other projects until infrastructure is complete.

5. Provide Development Department with evidence of possession of all applicable state and federal permits (i.e. GA DOT permit, GA EPD NPDES Notice of Intent, stream bank buffer variance, wetland permit, etc.)

6. Completion of any other special items, agreements and/or post any other escrows enumerated in the plan approval letter. This is a prerequisite to the issuance of site development permits, building permits, and/or occupancy permits.

7. Failure to complete all the items enumerated in this section during the final plan validity period shall cause the approval to expire and void the final plans. If the

final approval is voided, further consideration of the final plan will require a new plan submission, and payment of applicable fees

Section 341: As-Built Plans

As-built plans shall be required on all completed development projects except those only for minor subdivisions. The acceptance of as-built plans shall be a prerequisite to final construction acceptance, bond release, and the issuance of a final Certificate of Use and Occupancy. Copies of the as-built plans prepared and certified by a registered land surveyor or professional engineer shall be submitted to the City at the time final inspections are conducted. Final inspections will not be made unless the as-built plans are available.

The following information shall be included on the plans:

A. Horizontal locations of all sanitary sewers, storm sewers and waterlines, which include:

1. Two (2) ties to all water valves or blowoffs. In cases where a group of valves may be located at an intersection, two (2) ties may be provided to one (1) valve and the remaining valves tied to each other.

2. One (1) tie to all sanitary sewer manholes and storm sewer structure.

3. Two (2) ties to all sanitary sewer cleanouts on laterals which are located within a street right-of-way, and two ties to the first cleanout on a lateral connected to a main within a street right-of-way;

4. Location of all water meters, detector checks, fire-flow meters, fire hydrants, air release valves, grease traps and any other water or sewer system appurtenances. The size of all meters larger than three-fourths (3/4) inch is to be noted. All ties shall be affixed to easily located permanent objects (i.e., building corners).

B. Invert elevations on storm sewers and sanitary sewers.

C. Length, size, and type of material used for all storm sewer and stormwater management systems.

D. Top of structure elevations on all sanitary manholes and storm sewer structures.

E. As-built topography on storm water detention basins and verification of storage volumes.

F. Detailed as-built information for special design drainage and stormwater management structures.

G. Spot elevations showing inverts of improved channels and swales located in dedicated drainage easements.

H. All dedicated easements. The cover sheet must show, the deed book and page number(s), in which the water and sewer easements and/or subdivision plans are recorded.

I. A graphic scale.

J. Any changes from the approved construction plans must be indicated by circling the change in red.

K. A note certifying compliance of the site to approved plans and conformance of any revisions, to all applicable standards. The following certification shall be used:

1. "This physical survey has been reviewed, and in my professional opinion, based upon my knowledge, information, and belief, the design elements measured by the physical survey comply with the approved plans. This review does not imply in any way that (i) inspections were made during the construction, (ii) to the quality of the work, or (iii) to any element or structure not visible or depicted on the physical survey."

L. In addition to the as-built plans, the professional engineer/registered land surveyor shall provide the City with a measure of the impervious area of the site. This information shall be shown in a form, and provided in digital format, as detailed by the City. The as-built plans and the impervious area information will be reviewed for compliance with the requirements of this section during the final inspections. Any deficiencies with the as-built plans or the impervious area information must be corrected before final construction acceptance is granted.

Section 342: Certificate of Use and Occupancy

A. No new building or an addition to a previously constructed building, shall be occupied, nor shall a change of use of a property or any structure be permitted, until a Certificate of Use and Occupancy has been issued by the City in accordance with applicable building codes, this Ordinance and the provisions of the zoning ordinance.

B. In addition, no Certificate of Use and Occupancy shall be issued for residential uses (other than single-family detached dwellings, commercial, institutional or industrial uses) until all required site improvements are installed in accordance with the approved plans, or in accordance with a written phasing plan approved by the City.

C. A Certificate of Use and Occupancy shall state that the use and/or structures complies with all relevant provisions of this Ordinance and the Zoning Ordinance, and that it has been inspected by appropriate public officials and meets all requirements of applicable building codes, fire codes, and other laws, ordinances, rules and regulations governing the construction and use of structures on property.

D. The Administrative Officer or his designee has the authority to issue a temporary Certificate of Use and Occupancy for a period not to exceed six (6) months where

factors beyond the applicant's control have kept him from completing the required site improvements. Prior to the issuance of a temporary Certificate of Use and Occupancy, all site improvements (bondable and otherwise) required by this Ordinance and the Zoning Ordinance not yet installed, shall be bonded in accordance with this Ordinance. For developments, all nonbonded deficiencies shall be guaranteed by the submission of an irrevocable letter of credit or establishment of a cash escrow account.

E. The Administrative Officer or his designee may issue a final Certificate of Use and Occupancy for a portion of a multiphase, multiple section or multi-tenant project.

1. Such Certificate of Use and Occupancy shall only be issued, predicated on the following:

- The City's review and approval of a written, phased site development plan
- Approval of all safety related items (e.g. frontage improvements, ingress and egress, stormwater management facilities, street lights, handicap parking signs, etc.)
- Approval of adequate additional amenities as may be required to serve that portion of the project.

Section 343: Development of Regional Impact

Section 343.1. Introduction

With recent passage of Georgia's new Growth Strategies Act, planning at the local and regional levels has become a key element of growth management.

In general, **Developments of Regional Impact (DRIs)** are developments of sufficient scale that their impacts are likely to be felt outside of the local government jurisdiction in which they are located. The Georgia Planning Act of 1989 requires any local government with a proposed DRI within its jurisdiction to submit the project for possible regional review and comment before the City makes the final decision on whether a proposed development will or will not go forward. This Act also authorizes the Department of Community Affairs (DCA), which has established procedures for review of these large-scale projects.

This section is a brief overview and general guideline for determining whether or not the development qualified for a DRI review. Currently, the City of Cornelia, Habersham County, lies in a Non-Metropolitan area as indicated by the map in Exhibit 344-1. In Table 1, under the non-metropolitan column, the tiers and gross square footage thresholds are listed.

As of January 1, 2005, any development project that meets or exceeds these thresholds will be submitted for DRI review by their Regional Commission (RC) (RDC).

A complete set of rules may be obtained from the following DCA website:

http://www.dca.state.ga.us/planning/ocp_rules/dritoc.html

If you have any questions regarding the DRI rules or DRI Tier maps, please call the Department of Community Affairs – Office of Planning and Quality Growth at 404-679-5279.

Section 343.2. Population and Development Thresholds

Thresholds are used to determine whether a proposed development qualifies as a DRI. The thresholds vary by type of development and the population category of the county in which the proposed development will take place. There are various categories of development, each with separate thresholds, including (among others): office, commercial, hospitals, housing, industrial, hotels, mixed-use, airports, recreation, post-secondary schools, waste disposal, quarries and asphalt plants, wastewater treatment and petroleum storage, etc.

Because communities across the state have a wide range of population and development levels, two Tiers or "population" categories (Metropolitan Areas and Non-Metropolitan Areas) have been established. The threshold varies for each of these because a development in a region with low levels of population and development is likely to have a greater relative impact than it would have in an area with higher levels of population and development.

Section 343.3. Regional Review Process

The intergovernmental review process for each proposed DRI consists of the following:

- The regional development center distributes a summary of the proposed development to other affected local governments and public agencies, asking for their comments.

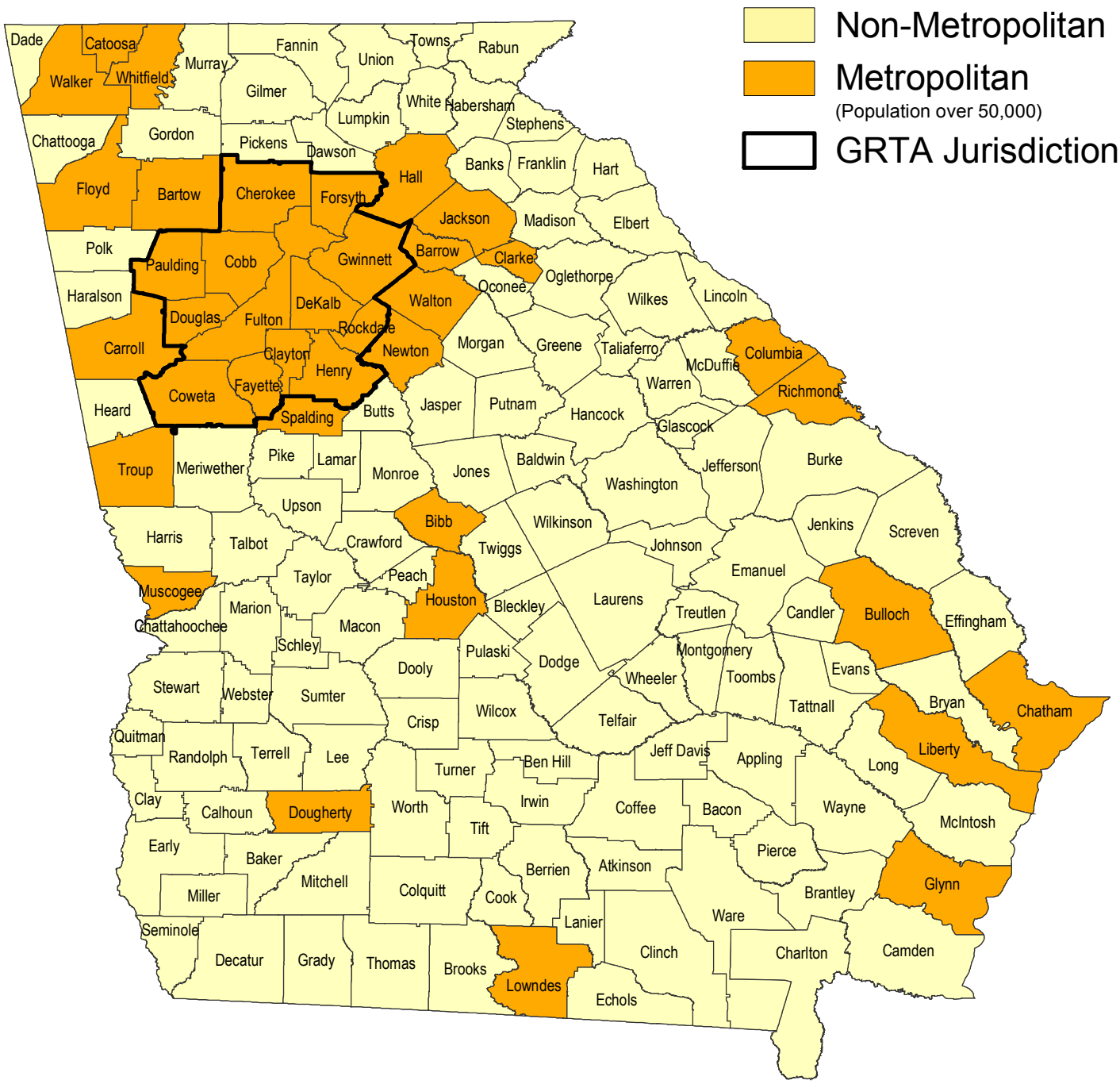
- The regional development center evaluates the likely impacts of the proposed development and determines whether the development is consistent with the regional plans and the plans of affected local governments.

- Based on the evaluation of impact and comments received from affected parties, the regional development center determines whether the proposed development is in the best interest of the region and notifies the host local government of its finding.

The regional development center's report on the results of the intergovernmental regional review process is advisory in nature, designed to help the local government anticipate possible impacts of a proposed development. The local government is encouraged to take this information into account in deciding whether to approve, deny, or require modifications to the development in order to mitigate any undesirable impacts uncovered in the DRI review.

END ARTICLE III

Developments of Regional Impact (DRI) Tier Map



Georgia Department of Community Affairs/Office of Planning and Quality Growth
06/01/10

ARTICLE IV: ROADS DESIGN STANDARDS

Section 401: Purpose

This section provides the requirements for designing, furnishing, installing, and placing in satisfactory service all public roads. The arrangement of local streets shall permit practical patterns, shapes and sizes of development parcels. Street layout must strike a balance with proposed land use so as not to unduly hinder the development of land. All public roads shall be designed and constructed in accordance with the requirements contained in this section.

1. All public roads constructed in the City shall be shown on a set of engineering plans. The Plans shall include a plan view of the road showing the road layout to scale, adjacent property owners, right-of-way width, location of ditches and streams, location and size of culverts, location of utilities, typical road cross-section including curb and gutter, and pavement profile or specification.

2. Upon successful completion of construction of the road, the developer/builder shall provide the City with a deed (including a proper legal description and/or reference to a recorded plat). The deed must be acceptable to and accepted by the City Attorney.

3. The road must be named with a name not otherwise used in Habersham County. The road name must be acceptable to the Habersham County 911 program.

4. Road sections shall generally conform to the "Typical Section" contained herein.

Section 402: Traffic Analysis

New developments that will generate a significant amount of traffic may be required to perform a traffic analysis. The City will review each proposed development on a case-by-case basis to determine if a traffic study is required. If the City deems the size of the project warrants a traffic study, then the developer's design professional who is qualified to do this type of work will be required to perform a traffic study. Three (3) copies of the Traffic analysis, if required, should accompany the applications for proposed development.

Traffic studies must describe the extent, nature, and location of traffic impacts for all property for which the application is being sought and further all contiguous property owned by the applicant. The study area shall include the entire site being developed, future phases of multi-phase development, and the surrounding roadways, which are likely to be significantly impacted. At a minimum, the surroundings roadways to be included are:

1. The expected routes of access to the site as far as the nearest major arterials serving the site from each direction nearest the site;
2. The routes and site access to major intersections expected to carry fifteen (15) percent of the project's traffic; and

3. Other roadways expected to carry 1,000 additional daily vehicles as a result of the development.

It is recommended that a preliminary traffic assignment be performed to establish the scope of the study before beginning the inventory of existing conditions.

Traffic studies must include the following elements:

1. Conceptual plan or site plan of the proposed developers.
2. Inventory of existing conditions including adjacent land users, existing travel lanes and rights-of-way, existing pavement conditions, existing peak hour volumes and turning movement data with six (6) months of applications data, levels of service for peak hour period, and existing problems of deficiencies in curvature, sight distance, drainage, etc.
3. Trip generation;
4. Trip distribution;
5. Trip assignment;
6. Planned transportation improvements;
7. Identification of traffic impacts, problems, and deficiencies; and
8. Recommended transportation improvements and other impact mitigation measures, including but not limited to, entrance requirements, number of entrances, traffic circulation with the project, etc.

A. Trip Generation

The traffic study will include trip generation data for each phase of the overall project. Trip generation data will include the total number of vehicles computed to be entering and exiting the site on an average weekday and during a.m. and p.m. peak hours. Trip generation rates will usually be based on the peak hour of adjacent roadways described in the latest edition of Trip Generation (ITE). If the planned development includes more than 250,000 square feet of retail space, include similar trip generation data for Saturdays. If the existing site is zone for a use other than single-family residential, include trip generation data for the site developed as zoned.

Trip generation rates must be taken from the latest edition of the ITE Trip Generation publication unless suitable documented local data are provided from the least three similar developments collected within the past five (5) years. Suitable documentation includes the type, location, and size of each development; the dates and hours of data collection; the availability of public transportation; and the vacancy rate for the development. Copies of actual trip data may be required.

Vehicle trip will be computed by multiplying appropriate trip generation rates by the appropriate units for which the rates were intended. There are exceptions of this procedure:

1. When mixed-use developments are designed to encourage a significant number of internal trips, the total vehicle trips may be reduced by the estimated number of internal person trips, divided by the average auto-occupancy rate. The study must provide adequate published documentation or evidence of its assumptions concerning internal trips.

2. When retail developments are located along an arterial where a significant number of passerby traffic is reasonable, an appropriate adjustment may be made if adequate published documentation or evidence is provided in the study.

B. Trip Distribution

The trip distribution process will estimate the directional distribution of travel to and from the site for the approximate year of occupancy. Note that trip distribution for residential development (home-based work trip productions) and office development (home-based work trip attractions) are different. Retail distribution process may be accomplished by one of three means:

1. Use appropriate trip distribution rates from trip tables prepared by state or regional planning agencies; or

2. Prepare a custom trip distribution based on the "area of influence" method described in the American Planning Association publication Traffic Impact Analysis by Greenberg and Hecimovich (PAS Advisory Service Report No. 387, 1984); or

3. Prepare another acceptable distribution and assignment using data approved in advance by the City of Cornelia Planning Department in the Preliminary Conference.

C. Vehicle Trip Assignment

The traffic analysis study will prepare vehicle trip assignments for the peak hour period of periods which represent the worst case in terms of the sum of existing traffic and the traffic generated by the overall proposed development. Normally this would be the p.m. peak hour. If the trip generation for the a.m. peak hour exceeds 75 percent of the traffic generated by the p.m. peak hour, then both a.m. and p.m. peak hour trip assignments should be prepared. Two trip assignments will be prepared for each peak hour period stipulated above:

1. Generated vehicle trips added to existing traffic assigned on the existing roadway system; and

2. Generated vehicle trips added to existing traffic and to traffic from other planned developments near the site, assigned on the system of existing roadways including recommended improvements; include other nearby large developments which have been rezoned or issued a development permit during the past 24 months. When information about nearby developments is not available, growth factors may be used to inflate existing traffic from other developments. Growth

factors should be computed from the forecast population and employment of the Census tract which include the site.

These trip assignments will be prepared and illustrated for the internal roadways and driveways within the overall development, along with the surrounding roadways, intersections, and interchanges in the study area. Trip assignments will describe the peak hour directional vehicle volumes and turning movements at intersections.

Section 403: Access

Access to every subdivision and land development shall be provided over a public street. Private streets are prohibited. Each lot shall have access to a public street and a minimum of thirty (30) feet of lot frontage on a public street.

When a subdivision consists of thirty (30) or more lots, it is required, that the subdivision have more than one entrance/exit to/from the subdivision. The City shall consider the amount of existing city street frontage and the configuration of the site in approving whether more than one entrance/exist is required for preliminary plat approval.

Section 404: Conformance to Adopted Major Thoroughfare and Other Plans.

All streets and other features of the adopted comprehensive plan shall be platted by the subdivider in the location and if any, to the dimensions indicated on the Major Thoroughfare Plan or transportation component or element of a comprehensive plan adopted by the City Commission.

Section 405: Continuation of Existing Streets.

Existing streets shall be continued at the same or greater width, but in no case less than the required width.

Section 406: Street Plans for Future Phases of the Tract.

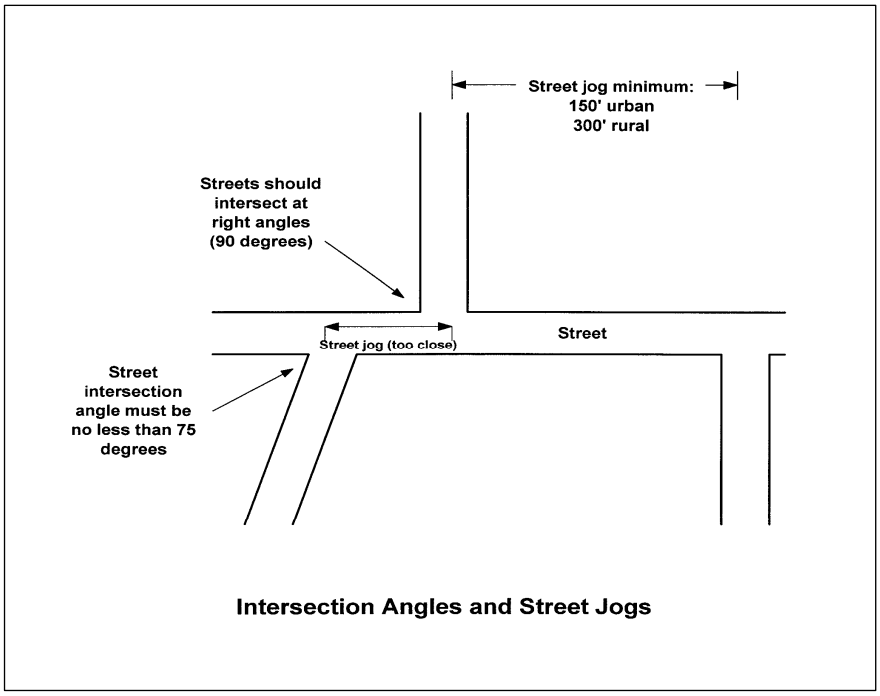
Where the plat or site plan proposed to be subdivided or developed includes only part of the tract owned or intended for subdivision or development by the subdivider or land developer, a tentative plan of a future street system for the portion not slated for immediate subdivision consideration may be required by the Administrative Officer and if required shall be prepared and submitted by the subdivider or land developer at the time of submission of an application for preliminary plat or land development plan approval, whichever occurs first.

Section 407: Street Names.

Street names shall be approved by the Administrative Officer. Streets that are in alignment with existing named streets shall be given the name of the existing street. Names of new streets shall not duplicate or closely approximate those of existing streets in the City or County.

Section 408: Street Alignment, Intersections, and Jogs.

Streets shall be aligned to join with planned or existing streets. Under normal conditions, streets shall be laid out so as to intersect as nearly as possible at right angles (90 degrees), but in no case shall such a street intersection be less than 75 degrees. Where street offsets or jogs cannot be avoided, offset "T" intersections shall be separated by a minimum centerline offset of 150 feet (i.e., the "urban" standard in the following illustration shall apply).



Intersection Angles and Street Jogs

Section 409: Development Along Arterial Street or Limited Access Highway.

Where a subdivision abuts or contains an arterial street or a limited access highway, the Administrative Officer shall require a street approximately parallel to and on each side of such right-of-way either as a marginal access street or, at a distance suitable for an appropriate use of the intervening land, with a non-access reservation suitably planted. Lots shall have no access to major streets (or limited access highways) but only to access streets.

Section 410: Alleys.

Alleys may be required at the rear of all lots used for multi-family, commercial or industrial developments, and may be provided in one or two-family residential developments.

Section 411: Reserve Strips.

Reserve strips controlling access to streets, alleys, or public grounds shall not be permitted unless their control is placed in the hands of the City Commission, under conditions approved by the City Commission.

Section 412: Cul-de-Sacs.

Streets that dead-end shall terminate in a cul-de-sac or other approved turn-around. Streets that are planned to continue at some future date shall provide a temporary cul-de-sac. Except where topographic or other conditions make a greater length unavoidable, cul-de-sacs or dead-end streets shall not be greater in length than 750 feet and shall provide at the closed end with a turn-around radius of fifty (50) feet, and approved by the City Engineer.

Section 413: Access to Property

Openings for vehicular access to lots from public streets, referred to as curb cuts or driveways, shall be in accordance with the following requirements:

A. **Size and Spacing** – In no case shall a curb cut or other access point be less than ten (10) feet or more than thirty (30) feet in width. Except in residential zoning districts no two (2) curb cuts or other access points shall be closer than 50 feet from each other.

B. **Location –** At street intersections, no curb cut or other access points shall be located closer than 35 feet from the intersecting point of the street right-of-way lines.

C. **Visibility** – At any street intersection or at the intersection of any private driveway with a street, no fence, wall, sign, planting or other structure or object shall be permitted that will form an impediment to the point of intersection of the driving surfaces.

D. **Visibility at Intersections –** On corner lots, no fence, shrubbery or other obstruction to the traffic sight vision, except utility poles or traffic lights or sign standards, shall exceed a height of three (3) feet within a triangular area formed by the intersection of the right of way lines of two (2) streets or a street intersection with a railroad right-of-way line and a diagonal line which intersects the right-of-way lines at two (2) points each a minimum of 20 feet distance from the intersection of the right-of-way lines, or in the case of a rounded corner, from the point of intersection of their tangents; provided however, signs, lights or similar objects which are totally located at least ten (10) feet above the finished grade shall be permitted.

E. **Permit Required** – No person shall be authorized to open any curb cut, grade or otherwise make any improvements upon the public right-of-way of any street, road or highway, except with approval of the City. The City reserves the right to require the applicant to indemnify and hold the City harmless for any injury or damage to public utilities and improvements existing within said right-of-way over which any driveway or other improvement is to be built. The City further reserves the right to require the property owner, at his expense, to remove any permitted improvement or to relocate or repair the same as necessary for the maintenance and future improvement of said right-of-way, including the location, relocation, repair or removal of utilities existing therein.

F. **New Subdivision or Developments Fronting Upon the State Highway System** – Whenever a new subdivision or development is proposed, which fronts the state highway system and requires access therefrom, no final approval of the site plan shall be given by the Municipal Planning Board until the developer has submitted the final plat to the Georgia Department of Transportation, received approval and submitted this approval to the Municipal Planning Board.

Section 414: AASHTO Standards

Road design shall conform to AASHTO (American Association of State Highway and Transportation Officials) requirements, unless otherwise noted.

Section 415: Minimum Design Speed and Maximum Grade

Minimum design speeds and maximum grades for proposed streets in the City of Cornelia by street classification shall be as follows:

Street Type	Maximum Allowable Grade	Minimum Required Design Speed
Arterial	7%	55 MPH
Major Collector	10%	45 MPH
Minor Collector	14%	35 MPH
Unclassified	15%	25 MPH
Alley & Dead-End Streets	14%	Varies

Minimum grade including cul-de-sacs shall be 1.5% to maintain 1% in curb lines.

Section 416: Sight Distance at Entrances to New Development

The sight distance along existing city roads at proposed entrances for both subdivisions and individual commercial/industrial sites shall be designed according to "A Policy on Geometric Design of Highways and Streets", most current edition, by AASHTO. The design professional should refer to the chapter entitled "At-Grade Intersections", and the "Sight Distance" section of this chapter.

A general guide is provided below for sight distances at entrances. This guide does not relieve the design professional from complying with all aspects of AASHTO sight distance requirements for entrance designs.

Minimum sight distances shall be as follows:

	Minimum Sight Distance
Arterials	500 ft. @ 4 ft. above ground level
Major Collectors	300 ft. @ 4ft. above ground level
Minor collecting, Alleys & Unclassified	200 ft. @ 4 ft. above ground level

Each traffic movement through the intersection should be checked for vertical and horizontal sight distance. Any object high enough above the roadway to constitute an obstruction should be shown on the plans and noted to be removed or lowered. Such obstructions include signs, ground cover (vegetation), cut slopes, hedges, buildings, etc.

Section 417: Minimum Length of Vertical Curves

Interior subdivision streets — crest vertical curves K=10, sag vertical curves K=20. Curve length equals the product of the K value and the algebraic difference in the road grades. Minimum vertical curve length shall be as follows:

	Minimum Length
Arterials	200 ft.
Major Collectors	100 ft.
Minor collecting, Alleys & Unclassified	60 ft.

Section 418: Widening for Development Entrances

A. The following widening is required for new developments in both subdivision and individual commercial/industrial site development entrances.

Street Classification	Street Width (ft.)	Required R/W (ft)
Arterial	24+	50+
Major Collector	24	40
Minor Collector	20	30
Local	12	25

B. Street width is measured from centerline to the edge of the pavement.

C. Right-of-way is measured from the existing centerline.

D. Lane length is measured 150 feet from tangent point of radius to beginning of taper. Tapers are 50 feet. Vertical curb and gutter is required through the radii, The additional lane can be stopped at the projected property line if there is inadequate right-of-way, excessive cut or fills to install the lane. In this case, the tapers would start at the projected property line unless excessive cut or fills would encroach on the right-of-way limits of the abutting property.

E. Paving section shall correspond to the street classification of the existing road the entrance connects to:

- Arterial — Industrial Paving Section
- Major Collector — Industrial Paving Section
- Minor Collector — Commercial Paving Section
- Local — Commercial Paving Section

The cost of any catch basins, which must be constructed when an existing City or County road is required to be modified, will be paid by the developer.

F. Existing storm sewers located in the area of the entrance widening shall be extended and connected to the proposed storm sewer system at the developer's expense.

G. See Standard Detail Drawings for widening at entrances.

Section 419: Residential Street Section

Residential streets shall be a minimum of 22 feet of paved width within the curb and gutter. There shall be a minimum shoulder section behind both curbs as shown in the Standard Detail Drawings and based on the City's sidewalk requirements.

Pavement width shall be no less than as follows:

Street Types	Minimum Right-of-Way	Minimum Pavement Width (Ft)
Arterial	70 ft.	50 ft. or as shown in the Major Thoroughfare Plan
Major Collector	60 ft.	12-ft lanes + curb & gutter=24 ft.
Minor Collector-Residential & Dead-End	60 ft.	22-ft + curb & gutter
Alley	20 ft.	16 ft.
Cul-de-sacs	50 ft.	50 ft. radius

Cul-de-sac radius shall be as shown in the Standard Detail Drawings.

Section 420: Industrial/Commercial Streets

A. Pavement width for industrial/commercial streets shall be no less than as follows:

Type Street	Minimum Right-of-way	Minimum Pavement Width (Ft)
Arterial	100 feet	52 ft. + w/13+foot lane
Major Collector	80 feet	52 ft. w/13 foot lane
Minor Collector	80 feet	28 ft. w/14 foot lane
Cul-de-sac	80 feet radius	55 ft. radius

B. Paving standard shall be as shown in Standard Detail Drawings for industrial/commercial streets.

C. See Typical Industrial curbing detail in Standard Detail Drawings.

D. Cul-de-sac radius shall be as shown in the Standard Detail Drawings.

Section 421: Horizontal Curvature

The minimum radii of centerline curvature shall be as follows:

Type Street	Minimum Right-of-way
Arterial Streets	≥ 800 ft.
Major Collector	≥ 300 ft.
Minor Collectors, Alleys & Dead-Ends	≥ 100 ft.

Section 422: Dam Supporting Road

No city road shall be designed to cross an existing or proposed dam.

Section 423: Dead-End Roads

No new developments shall have dead-end roads or streets.

Section 424: Curb-Line Radius.

The curb-line radius at street intersections shall be at least 20 feet. Where the angle of street intersection is less than 90 degrees, a longer radius may be required. For commercial and industrial subdivision streets, a minimum 25 foot curb-line radius shall be provided.

Section 425: Bridges.

Bridges on public rights-of-way shall meet current American Association of State Highway and Transportation Officials and the Georgia Department of Transportation standards, or as may be determined by the City Engineer.

Section 426: Right-of-Way Clearance.

All trees, brush, stumps, rocks, or other debris shall be cleared from the street right-of-way as required; provided, however, that efforts should be made and the city may accept proposals to save suitable vegetation in the right-of-way that will not pose a public safety hazard.

Section 427: Grading of Streets.

All streets shall be graded to lines, grades and cross-sections approved on the plans.

Section 428: Street Paving and Base.

Base and sub-base shall be installed in compliance with specifications of the City Engineer.

1. Residential streets shall be built to the following standards.
    A. The following types of base material may be used:
        a. Six-inch graded aggregate base meeting the requirements of Georgia State Department of Transportation specification 815.
        b. Graded aggregate base course: The base course shall consist of mineral aggregate and may be a combination of natural deposit or a blend of the materials specified. All materials are subject to approval by the City Engineer. If a blend of materials is used, it shall be blended through a base plant which meets the latest specifications of the Georgia State Department of

Transportation specification 815. Minimum depth of base course shall be six (6) inches under a minimum of 2 inches asphaltic concrete type "E."

c. Black base: The base course shall consist of asphaltic concrete as approved by the City Engineer and shall conform to applicable specifications of the Georgia Department of Transportation. Minimum base course shall be four inches under minimum two inches asphaltic concrete.

B. Prime: After the base has been placed, mixed, compacted, shaped, inspected and accepted, it shall be primed with suitable asphaltic materials as specified in Georgia Department of Transportation specification 412.

C. Roadway surfaces: After the prime has been inspected and accepted, the roadway or street shall be surfaced with a minimum 1 1/2 inches of type "E," asphaltic concrete wearing surface. No surface treatment pavement as a finished wear surface will be accepted. All asphaltic concrete will be mixed in an asphalt plant meeting the latest requirements of the Georgia Department of Transportation.

Final top course to be applied after development is approximately 95% complete.

For commercial and industrial street paving base, use 8 inches crusher run base, prime and place 3.5 inches of plant mix asphaltic binder Type “B” and surface with 1.5 inch of compact hot plant mix topping, Type “E” or “F”.

Section 429: Curb and Gutter

Curb and gutter shall be installed along both sides of all paving. All curb and gutter, valley, gutter, driveway aprons and sidewalks shall conform to City specifications. Concrete shall be Class “A” as defined by GDOT and have a minimum compressive strength of 3,000 psi at 28 days. All gutters shall drain positively with no areas of ponding.

1. Residential curbing:
   A. Concrete shall have a minimum strength of 2,500 psi at 28 days.
   B. Typical minimum section shall be 6" x 24" x 9".
2. Industrial or commercial curbing:
   A. Concrete shall have a minimum strength of 3,000 psi at 28 days.
   B. Typical section shall be 6" x 30" x 12".
   C. Vertical faced curbing only.
3. Construction methods:
   A. Line and grade shall be set by developer's engineer, landscape architect, or surveyor and approved by the City Engineer.
   B. One-half inch expansion joints or premolded bitumastic expansion joint material shall be provided at all radius points and at intervals not to exceed 50 feet in the remainder of the curb and gutter. When the development ties into existing curbing,

the curb and gutter shall match the existing width.

Section 430: Street Signs.

Street signs shall be furnished and installed at all street intersections on the rights-of-way by the developer and shall be white "scotchlite" with black legends mounted on 10 foot square posts, or as otherwise approved by the City Engineer. Exact locations shall be approved by the City Engineer prior to installation.

Section 431: Street Right-of-Way Improvements.

All street right-of-ways outside of the paved portions shall be graded to conform to approved cross section and shall be soiled with a material acceptable to the City Engineer. These areas shall be landscaped as required by this ordinance.

Section 432: Street Trees.

Street trees and other shrubbery that may be retained or planted shall be placed or retained so as not to obstruct sight distances at street intersections.

Street tree planting is required along all new local, collector, and arterial streets in the City of Cornelia and within commercial, industrial, or residential subdivisions. Street tree planting shall be required along all the property road or street frontage for each new land development in the city, except for existing lots of record developed for a detached, single-family dwelling, within the street right-of-way if sufficient room exists, or if such room does not exist, on private property within a street tree or general purpose easement.

The subdivider, owner of land to be dedicated as a public street, shall at the time of preliminary plat, development permit, or building permit approval submit a plan for the provision of street trees along all said roads or road frontages. It is the intent of this section that the subdivider or land developer carefully position street trees on the plan while taking into account future driveway and sidewalk locations if not constructed simultaneously with the construction of the public street or land development. In the cases of subdivisions, suitable arrangements must be made for either the subdivider/ developer or individual builders to install street trees according to a plan approved by the Administrative Officer as a part of preliminary plat approval, prior to dedication or opening of said street. It is the preference of the city that the subdivider shall install said street trees prior to the dedication or opening of the public street; however, the Administrative Officer may accept an agreement where the responsibility for street tree planting is shifted to the owners or individual builders of the lots to be subdivided. Any such responsibility shall be legally transferred in a form acceptable to the City Attorney.

Trees must be planted within the public right-of-way or, if right-of-way width is insufficient to accommodate said street trees, then on private property abutting the public right of way within a street tree easement dedicated to the city.

The guidelines below in Table 5.1 are intended to avoid conflicts with infrastructure; they are recommendations only and are subject to the approval of the Administrative Officer. See Article XII for additional information.

TABLE 5.1
GUIDELINES FOR THE PLANTING OF STREET TREES

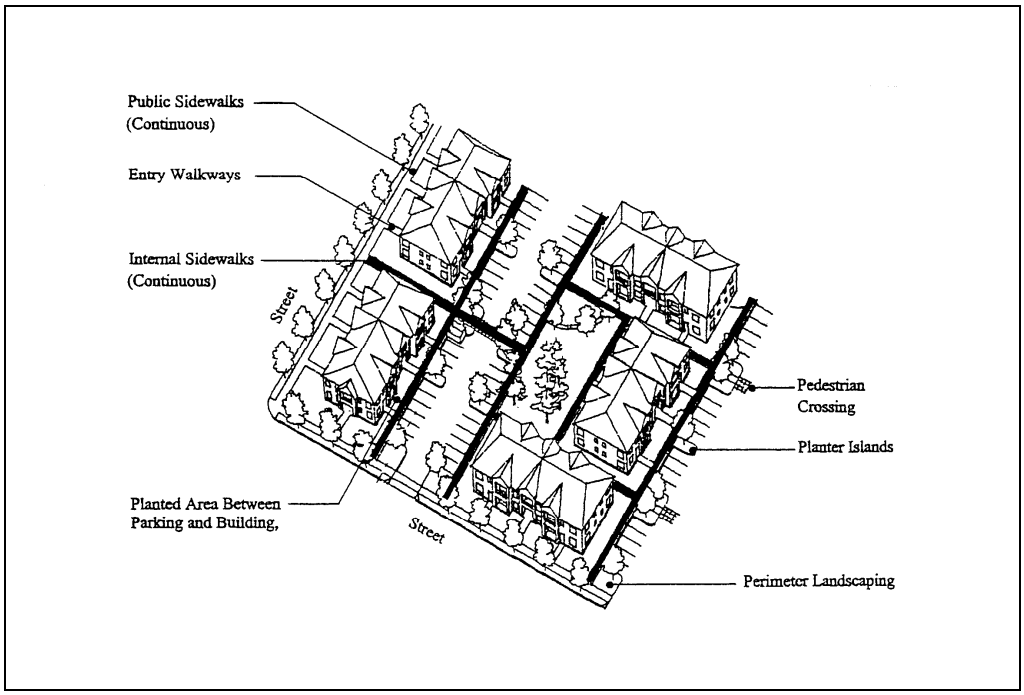
MATURE SIZE	MINIMUM WIDTH OF TREE LAWN	SPACING BETWEEN TREES	OVERHEAD UTILITIES IF PERMITTED	DISTANCE FROM SIGNS, UTILITY POLES, DRIVEWAYS, FIRE HYDRANTS	DIST-ANCE FROM INTER-SECTION	DIST-ANCE FROM UNDER-GROUND UTILITIES
Large 50-70 Feet	8 Feet	60 Feet	Do Not Plant	10 Feet	30 Feet	5 Feet
Medium 30-40 Feet	5 Feet	40 Feet	Okay	10 Feet	30 Feet	5 Feet
Small 15-20 Feet	3 Feet	20 Feet	Okay	10 Feet	30 Feet	5 Feet
Evergreen 40-50 Feet	Yards Only	30 Feet	Do Not Plant	30 Feet	30 Feet	5 Feet

Section 433: Sidewalks.

Sidewalks shall be installed in street rights-of-ways in all residential, commercial and industrial developments along one side of the proposed street. When sidewalks are required, the subdivider shall furnish and install all required paving materials without cost to the City, in accordance with City Specifications including the following

(a) Sidewalks shall have a minimum width of five (5) feet in residential areas and seven (7) feet in commercial areas.
(b) Sidewalks along streets in residential areas shall not be less than two (2) feet from street curbs or the edge of pavement.
(c) All driveway aprons over sidewalk areas shall be paved with concrete by the developer or builder.
(d) Sidewalks shall be four (4) inches thick and consist of concrete (2,500 psi at 28 days) and shall be located on the north and east sides of streets.
(e) Sidewalk systems and multi-use trails shall be constructed in accordance with requirements of Americans with Disabilities Act (ADA).

In addition to the above requirements, on private properties, individual land developments, except for detached, single-family lots, shall provide direct pedestrian access ways to all public sidewalks or multi-use trails when located on a public street abutting the property to be developed.



Source: OTAK. 1999. Model Development Code and User's Guide for Small Cities. Salem: Oregon Transportation and Growth Management Program.

Section 434: Streetlights.

Streetlights shall be provided in accordance with City specifications by the developer of a subdivision prior to the approval of a final plat. Fixtures and standards/poles installed or used shall be approved by the utility company which will be responsible for the maintenance of the facilities and by the City. The fixtures shall be mounted no more than thirty (30) feet above the ground and shall have appropriate arm length to place the light over the street. No arm shall be less than two and one-half (2-1/2) feet long unless approved by the City Engineer. Streetlights shall be serviced by underground electrical utilities. Post top luminaries may be permitted when approved by the City Engineer. Fixtures shall be located no more than five hundred (500) feet apart, unless approved by the City Engineer, and at least one light shall be located at each street intersection within the subdivision or land development.

The developer shall pay all costs for standard poles, fixtures and any other related items or materials necessary for the installation, as well as arrange an agreement with the utility company for complete maintenance of all installations. The City of Cornelia shall assume the responsibility and make the monthly payments to the power company for electrical energy for each street light only after these requirements have been accomplished and improvements accepted. The City of Cornelia shall accept responsibility for power bills for streetlights no earlier than one year after the streetlights have been installed, and the developer or Homeowners Association will be responsible until that time.

Section 435: Acceleration/Deceleration Lanes.

For subdivisions or land developments accessing state routes, the Georgia Department of

Transportation may require the installation of acceleration/deceleration lanes.

The City Engineer may require the installation of a deceleration lane for a distance of 200 feet and a 50 foot taper from all project entrances serving commercial and industrial subdivisions, and residential subdivisions serving fifty lots or more. For all commercial properties, if an acceleration/ deceleration lane is not required, the subdivider or land developer may be required to construct a wide flare entrance according to specifications of the City Engineer.

Section 436: Improvements to Abutting Streets.

For subdivisions and land developments that abut and access an abutting public street, the subdivider or land developer shall install sidewalk, street lights, street trees, other road improvements, and if required a deceleration lane, according to standards and specifications of the City Engineer along all abutting public streets. When a subdivision or land development uses an unpaved public right-of-way for access, the subdivider or land developer shall improve that right-of-way to a pavement width consistent with city street design standards. Said improvements shall be from the subdivision or land development entrance to the paved city street which the City Engineer determines will be the primary direction of travel for residents of the subdivision or occupants of the land development.

Where an impact on the safety of the motoring public may be in question as determined by the Administrative Officer, the Administrative Officer may require the developer to have a traffic impact study submitted and reviewed prior to issuance of a permit.

Section 437: Traffic Signs

The design professional shall show the location of all required traffic signs. Unless otherwise noted, design of traffic signs shall conform to the Manual on Uniform Traffic Control Devices.

Stop signs shall be located from the signs edge six (6) feet off the back of curb or edge of gravel at the beginning of the intersection radius. The sign shall be located on the right side of the intersection. The bottom of the sign shall be at least five (5) feet above the edge of pavement or back of curb. This standard applies to typical residential interior street intersections.

All other intersections shall have stop signs located according to the Manual on Uniform Traffic Control Devices.

Stop signs shall be sized so that their overall dimensions are 30" x 30".

All other signs shall be sized according to the Manual on Uniform Traffic Control Devices.

Section 438: Utility Locations

All utility locations shall correspond to the typical layout shown in the Standard Detail Drawings.

Section 439: Apartments and Condominiums

Streets shall be constructed to residential street standards as set forth in these specifications.

Section 440: Mobile Home Parks

Streets shall be constructed to residential street standards as set forth in these specifications.

Section 441: Site Design for Individual Commercial/Industrial Lots

See above sections "Sight Distance at Entrances to New Development", "Widening for Development Entrances" and Individual. Commercial/Industrial Sites-Development Entrances.

Width of entrances shall be limited to those shown in the Standard Design Drawings. Entrances with several lanes for different traffic movement with concrete or painted islands shall be reviewed on a case-by-case basis.

Spacing of entrances and distance of entrances to property lines shall be limited to distances shown in the Standard Design Drawings.

Entrances shall comply with valley gutter requirements shown in the Standard Detail Drawings (GA DOT Standard 9031U).

Section 442: Proposed Grading

1. Proposed grading shall have positive drainage.

2. Swales lined with grass or stone shall be designed with a minimum 1.0% slope. Concrete lined swales shall be designed with a minimum 0.5% slope.

Section 443: Automobile Parking

1. Automobile parking shall be designed with maneuvering aisles and parking spaces to the minimum dimensions as shown in the Standard Detail Drawings.

2. The number of parking spaces required for each development shall be as required in the City of Cornelia Zoning Ordinance.

3. All off street automobile parking, accesses and maneuvering aisles shall be paved unless approval is given for a Low Impact Development alternative. Off street automobile parking and the access and maneuvering aisles that serve this parking shall be defined as those areas that are open to the general public.

4. Parking for the handicapped shall be designed as shown in the Standard Detail Drawings.

Section 444: Retaining Walls

Retaining walls shall be designed by a registered engineer qualified to do structural design.

Section 445: Infrastructure Materials

All materials shall comply with GA DOT Standard Specifications Construction of Roads and Bridges with Supplemental Specifications and Standard Details current edition, unless noted otherwise.

Section 446: Streets

1. Graded Aggregate Base Course — The base course shall consist of mineral aggregate and may be a combination of natural deposit or a blend of the materials specified. All materials are subject to approval by the City Engineer. If a blend of materials is used, it shall be blended through a base plant, which meets the latest specifications of the Georgia State Highway Department specification 815.

2. Black Base — The base course shall consist of asphaltic concrete as approved by the City Engineer and shall conform to applicable specifications of the Georgia State Highway Department.

3. Prime – After the base has been placed, mixed, compacted, shaped, inspected and accepted, it shall be primed withy suitable asphaltic materials as specified in DOT Specification 412.

4. Tack coat shall be applied on a prepared road surface according to the requirements of Georgia DOT Specification 413.

5. Roadway Surfaces — After the prime has been inspected and accepted, the roadway or street shall be surfaced with an asphaltic concrete wearing surface. No surface treatment pavement as a finished wear surface will be accepted. All asphaltic concrete will be mixed in an asphalt plant meeting the latest requirements of the Georgia State Highway Department.

Section 447: Curbs and Gutters

1. Residential — Concrete shall be Class "A" as defined by GA DOT and have a minimum compressive strength of 3,000 psi at 28 days.

2. Commercial/Industrial — Concrete shall be Class "A" as defined by GA DOT and have a minimum compressive strength of 3,000 psi at 28 days.

Section 448: Storm Sewer Pipe

1. State Highway Standard 1030D shall be used in determining class concrete or gauge of pipe under fill.

2. A certification by the supplier of the pipe specifications for each pipe shall be required before installation.

3. Concrete pipe shall be reinforced.

4. Reinforced Concrete pipe shall be used under all public streets, where pipe slopes are less than 1%, and for all live streams. Double Wall High Density Polyethylene Pipe may be used in all other instances.

Section 449: Storm Drainage Structures(Excluding storm sewer pipe)

The materials used for storm drainage structures shall comply with the standards of the GA DOT.

Section 450: Construction

All construction shall comply with GA DOT Standard Specifications Construction of Road and Bridges, with Supplemental Specifications and Standard Details, current edition, unless noted otherwise.

Section 451: Clearing and Grubbing

The entire area within the typical grading section shall be cleared and grubbed of all trees, bushes, stumps and debris and other objectionable materials. Grubbing depth shall be two (2) feet below subgrade. Rock shall be scarified to a depth of twelve (12) inches below subgrade. Prior to any grading, the entire right-of-way area shall be cleared of all bushes, stumps, debris and other questionable materials, as well as all trees not intended for preservation. All debris shall be disposed of in a lawful manner. There shall be no burial in the road right-of-way.

Section 452: Grading

Grading shall be accurately done to the lines and grades shown on the plans. Embankments shall be placed in uniform layers not to exceed six inches and compacted to a density of 95% of the maximum laboratory dry weight per cubic foot as determined by ASSHTO Method T-99. If necessary in order to obtain this compaction, the contractor shall add moisture to the material as it is placed.

Depth of Cut or Fill	Cut Slopes	Fill Slopes
2 feet or less	4 to 1	4 to 1
2 feet to 5 feet	3 to 1	3 to 1
5 feet to 10 feet	2 to 1	2 to 1
Over 10 feet	2 to 1	2 to 1

The depth of cut referred to shall be constructed to the maximum cut or fill occurring in any one section of cut or fill. The slope on cut of fill slopes shall be uniform throughout for each section of cut or fill. When a cut is made in rock that requires blasting, the slope may be changed to vertical slope upon the approval of the City's engineer. Shoulder section behind curb on typical streets shall be as shown in the Standard Detail Drawings.

Section 453: Subgrade

1. After the earthwork has been completed, all storm drainage, water, sanitary sewer and other underground utilities have been installed within the right-of-way, as appropriate, and the backfill in all such ditches has met all compaction requirements of this Ordinance and the City's representative (as appropriate), the subgrade shall be brought to the lines, grades and typical roadway sections shown on the plans.
2. A surveyor must certify grade within six (6) inches of final or submit an "as-graded" profile for review by the City Manager or his representative.

3. When the roadway is to be used for construction traffic before the paving work is completed, a layer of #3 stone can be laid as a traffic surface if the developer so desires. This material shall not be used as part of the base material. It may be worked into the subgrade; or it shall be removed before the base course is set up for paving.

4. Provision shall be made to drain low points in road construction when the final paving surface is delayed. A break in the berm section is required when the curbing has not been constructed. After installation, drainage under the curb is required

Section 454: Local and Minor Collector Streets

Any and all roadway construction shall meet the minimum specifications of the Georgia Department of Transportation, unless otherwise noted.

1. The base material for local and minor collector streets shall consist of a minimum of 8" of graded aggregate base. The base material shall be spread uniformly and with the grade of the road with a crown or super elevated depending on the cross section shown on the plans. The base shall be fine graded and compacted to 100 percent of maximum dry density. Compaction based on modified proctor in accordance with Georgia Department of Transportation (GDOT) specifications. Compaction tests will be done randomly, but not to exceed 500 feet apart. In addition, the road base shall be proof rolled in the presence of the City's authorized representative. Any areas not meeting these requirements shall be reworked until proper compaction is achieved. The cost of compaction testing shall be the responsibility of the developer.

2. After passing all compaction requirements and brought to proper section, the base shall be primed with 0.25 gallons or R.C. 70 per square yard, according to GDOT standards, the same day it is compacted. After the prime has been properly cured, two (2) inches of modified "B" binder shall be applied. Prior to applying wearing course, a tack coat shall be applied to the binder course at a rate of no less than 0.05 gallons per square yard. Type of tack shall be approved by the City's authorized representative prior to placement. After placing tack, an additional one and one-half (1 'A) inch of type "F" wearing course shall be applied.

3. After a reasonable curing time, the asphalt shall be cored for thickness a random locations, not exceeding 500 feet apart. Extraction testing shall be done on the asphalt to ensure compliance with GDOT specifications for the asphalt section

required. Areas with failing asphalt tests shall be corrected by a method approved by the City. The cost of testing shall be the responsibility of the developer.

Section 455: Construction Standards for Major Thoroughfares and Streets

Minor collectors and major thoroughfares shall be constructed in accordance with the designs prepared by GDOT of the City's Engineer, If no design has been prepared, the following standards shall be used:

Street Category	Base	Binder	Topping
Principal Arterial	10” GAB	5”**	1-1/2” F
Major Arterial	10” GAB	4” Modified B	1-1/2” F
Minor Arterial	10” GAB	3” Modified B	1-1/2” F
Major Collector	10” GAB	3” Modified B	1-1/2” F
Minor Collector	8” GAB	2” Modified B	1-1/2” F

1. All major thoroughfares and streets shall be subject to the same specifications listed under streets as far as clearing and grubbing, grading, subgrade, curbs and gutter, street cuts, underground utilities, shoulders and easements, foreign material on streets, storm sewers, contractor qualifications, construction inspection, testing of materials, etc.

2. If construction is to be located on the GDOT right-of-way, GDOT will supersede the City and have control with their specifications, construction methods, permits, etc.

Section 456: Underground Utilities

1. All utilities located within street rights-of-way within the curbs shall be installed and the trenches backfilled and thoroughly compacted before any pavement or base is installed. All utilities otherwise located within street rights-of-way, shall be installed and trenches backfilled and compacted to 95% of the maximum laboratory dry density except for the top twelve (12) inches which shall be compacted to 100%, standard proctor.

2. All utility manholes and valve boxes shall be brought to the finished grade within the roadway section.

Section 457: Shoulders and Easements

All shoulders and easements shall be clear of limbs and debris, graded smooth and established in grass.

Section 458: Foreign Material on Streets

1. The developer, builders and/or homeowners shall be responsible for keeping dirt, mud, building materials, concrete, etc., off of the pavement and curbing of existing City or County roads during construction of buildings in all developments covered by these regulations.

2. Before the streets are accepted by City of Cornelia all litter and trash shall be removed from the dedicated rights-of-way and surrounding areas,

Section 459: Testing

1. All tests shall comply with Standard Specifications Construction of Roads and Bridges by the GDOT, most current edition.
2. Compaction testing shall be done on road embankments, trench backfill and road subbase.
3. Asphalt testing including coring for pavement thickness and asphalt extraction tests shall be done for roads.

Section 460: Contractor Qualifications

1. Licensing and Safety - All contractors who work on water systems that will be owned by the City of Cornelia must be licensed in accordance with State of Georgia law and local ordinance. Compliance with applicable safety regulations is the responsibility of each company engaged in the work; the city assumes no responsibility for the actions of others on the job site. It is the responsibility of those installing water mains and related appurtenances to conform to OSHA regulations, 29 CFR Part 1926, Subpart P, Paragraph 1926.650 through 1926.653. Publications from OSHA can be obtained by contacting OSHA Publications Distribution, Washington, D.C.
2. Contractors performing road and storm sewer construction must be approved by the City and should be completely familiar with the procedures and contract requirements associated with this type project.
3. Unsatisfactory work may result in the loss of privilege to obtain a permit for future work in the City of Cornelia.

Section 461: Construction Inspection

1. The developer's contractor will be responsible for the quality, accuracy and workmanship of his completed work.
2. The City may employ the services of an Engineer or a Consulting Engineer for inspection of the project. If the City does so, the City has the option of billing the developer the same rate or amount that the City has been billed or invoiced by their Engineer.
3. City personnel and/or their authorized representative will visit the job site on a periodic basis and will make spot checks, as they deem appropriate. The City of Cornelia shall have the right to review and inspect all construction and may reject any work that does not meet quality control standards.
4. Authorized representatives of the City of Cornelia, which may include city employees, the city engineering consultant, state or federal agencies, shall have access to the site for inspection at any time.

5. All written communications regarding road and storm sewer construction will be to:

City of Cornelia
Mailing address: P.O. Box 785
Cornelia, GA 30531
Located at: 181 Larkin Street
Cornelia, GA 30531

Phone: 706-778-8585
FAX: 706-778-2234

The developer, contractor(s) and the developer's professional responsible for inspection will be required to attend a pre-construction conference with the City. At the pre-construction conference, the contractor will submit to the city, in writing, the date they propose to begin construction. The contractor will provide notification by phone any time the work is to be vacated and will provide notice by phone prior to resuming work,

6. The applicable Administrative Officer, staff or consultants may have informal verbal communications with the contractor foreman or superintendent at any time during construction. The City will not direct the actions of contractor's workmen.

7. The contractor shall notify the City and receive inspection approval prior to concealing certain work such as storm sewers and bedding, storm drainage structures, road fill, etc.

8. Minimum Inspection by Developer's Professional The following minimum compaction tests and inspections will be performed and certified by professionals employed by the developer and approved by the City to perform quality control checking on the construction of the project while it is in progress. The City's authorized representative shall have the right to choose locations for the tests and to determine the number of tests taken above the minimum requirements. The city shall be notified at least one day prior to testing in order to be present during testing if so desired.

9. Roadway Embankment Compaction Testing - Frequency of testing shall be determined by project conditions, The minimum test requirements are one per 5000 cubic yards of material placed, one per four feet of fill or at the discretion of the City's representative. All areas failing compaction test shall be reworked as necessary until compaction is achieved.

   - *Sub-base Compaction Testing and Test Rolling* Compaction tests of the sub-base should be done randomly not exceeding 500 feet apart. In addition, the road sub-base shall be test rolled with the City inspector present. Areas failing compaction testing shall be reworked until compaction is achieved.

- *Asphalt Pavement* — The asphalt shall be cored for thickness at random locations not exceeding 500 feet apart. Extraction testing shall be done on the asphalt to ensure compliance with GA DOT Specifications for the asphalt section required. Areas with failing asphalt tests shall be corrected by a method approved by the City.
- *Concrete* — Testing for concrete shall be done where concrete is used on the project for retaining walls, culverts and headwalls and bridges, Testing shall include slump tests, compressive strength tests and air entrainment tests. Testing shall comply with GA DOT testing standards for concrete.

Section 462: Final Inspection and Conditional Acceptance

The developer's design engineer shall furnish the City with as-built drawings and easements. An affidavit shall be furnished to the City stating the work on the project has been completed in accordance with the approved plans and specifications. After receipt of this affidavit, the City will schedule a final inspection. A representative of the developer's professional and the contractor will be present during this final inspection, This final inspection will generally include spot checks of storm sewers, drainage system, drainage easements, roads, water system and sanitary sewer system and a complete overview of the project,

After any discrepancies are corrected, the city will issue a letter certifying conditional acceptance of the water system. This letter shall commence the start of the 24-month warranty period, which is required of the contractor.

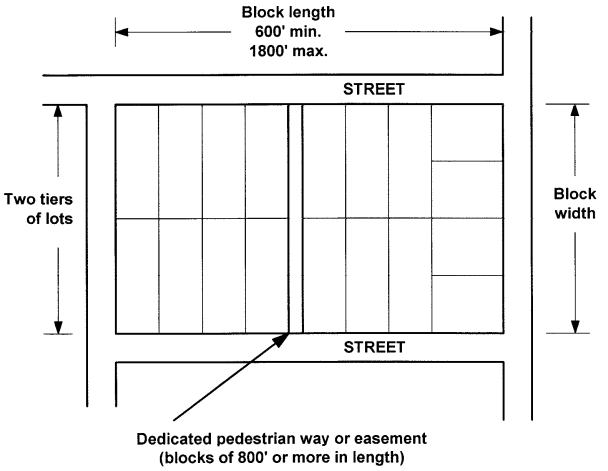
On projects having phased development, this letter will allow the developer to apply for a permit for the next phase of development.

At the end of 24 months, the City will re-inspect the entire development. When any discrepancies have been corrected, the city will issue an acceptance letter and will begin perpetual maintenance and operation of the roads and storm sewer system within the right-of-way.

Section 463: Block Lengths and Widths.

Intersecting streets shall be provided at such intervals so as to provide adequate cross traffic. Blocks in residential subdivisions should not exceed one thousand eight hundred (1800) feet nor be less than six hundred (600) feet in length, except where topography or other conditions justify a departure from these standards. In blocks longer than eight hundred (800) feet, pedestrian ways and/or easements through the block shall be required by the Administrative Officer near the center of blocks.

The width of the block shall normally be sufficient to allow two (2) tiers of lots of appropriate depth. Blocks intended for business or industrial use shall be of such width as to be considered most suitable for their respective use, including adequate space for off-street parking and deliveries.



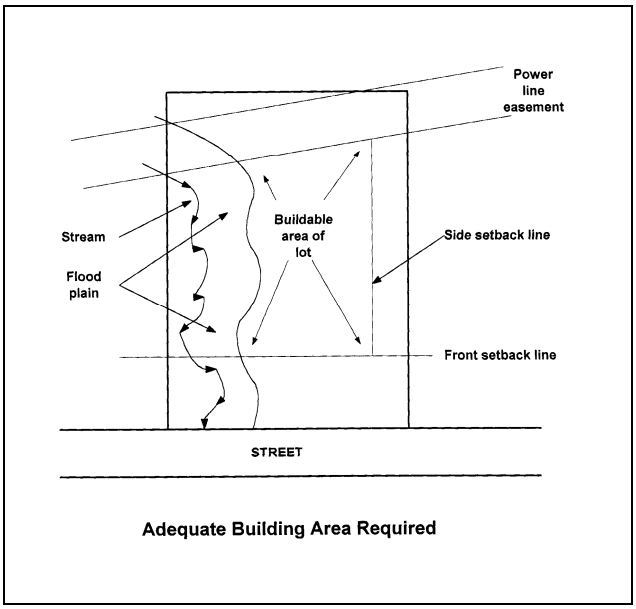
Block Length, Block Width, and Pedestrian Way

Section 464: Lot Width and Size.

1. Residential lots shall meet the lot width and lot area requirements of the Zoning Ordinance of the City of Cornelia. Residential lots should have a depth not greater than 3 times the width of the lot at the building line, unless unusual circumstances make these limitations not practicable. Residential corner lots shall have adequate width to meet building setback requirements from both abutting streets.
2. Where individual septic tanks are used, the Habersham County Health Department shall approve minimum lot sizes to conform to health standards of the Georgia Department of Public Health.

3. Commercial and industrial lots shall be adequate to provide service areas and off-street parking suitable to use intended.

4. Each lot shall contain an adequate building site not subject to flooding and outside the limits of any existing easements or required yards/ building setback lines.



Section 465: Lot Lines.

All lot lines shall be perpendicular or radial to street lines, unless not practicable because of topographic or other features.

Section 466: Building Lines.

A building line meeting the front yard/ building setback requirements of the Zoning Ordinance, as a minimum, shall be established on all lots.

Section 467: Double and Reverse Frontage Lots.

Double (or multiple) frontage and reverse frontage lots shall be avoided except where essential to provide separation of residential development from traffic arteries or overcome specific disadvantages of topography or orientation. A planting screen easement of at least ten (10) feet, across which there shall be no right of access, shall be provided along the line of lots abutting such a traffic artery or other disadvantageous use.

Section 468: Flag Lots.

Flag lots which meet minimum lot area requirements and meet the minimum lot width at the front building setback line where the building is placed may be allowed where terrain makes standard design or frontage impossible or impractical. Where such lots are allowed, the street frontage of each panhandle portion of the lot shall not be less than thirty (30) feet wide, and the panhandle portion of the lot shall be not more than two hundred (200) feet long. Not more than two (2) such panhandle access points shall about each other.

Section 469: Lot Remnants Not Permitted.

All remnants of lots below any minimum lot size which may be required, left over after subdividing of a larger tract, must be added to adjacent lots, rather than allowed to remain as unusable parcels. The Administrative Officer may permit a lot remnant for a specific purpose such as a detention pond, provided that access and design is appropriate and the lot remnant is restricted to specific non-building use.

Section 470: Monuments.

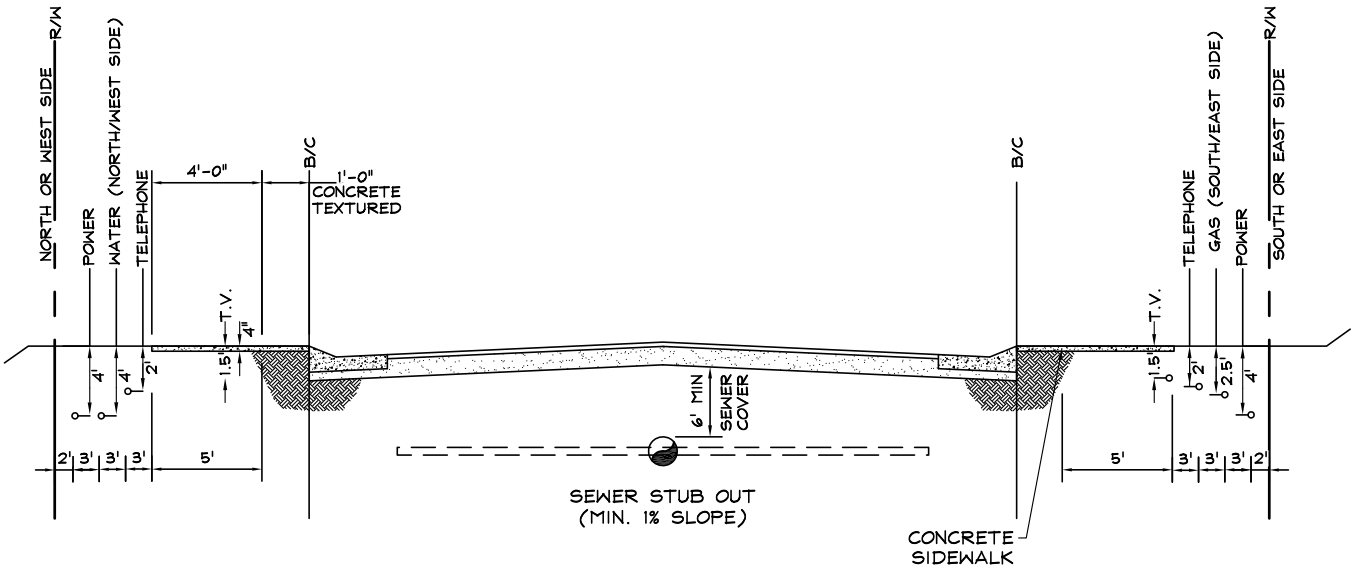
For all subdivisions, a Georgia registered land surveyor shall install permanent survey monuments at all property corners and land lot lines, prior to final plat approval. Lot corners shall be marked with metal rods not less than 1/2" in diameter and 18" in length and driven so as to be stabilized in the ground. Permanent survey monuments shall also be installed in accordance with the most recent edition of Section 180-7-.05 Monument of the Rules of State Board of Registration for Professional Engineers & Land Surveyors and the Georgia Plat Act (O.C.G.A. 15-6-67).

Section 471: Additional Technical Specifications.

As provided in Section 303 of this ordinance, the City Engineer is authorized to prepare and enforce technical specifications for various improvements, including streets. Unless otherwise indicated in such technical specifications, all of the materials, methods of construction, and workmanship for the work covered in reference to street construction shall conform to one or more of the following as appropriate and applicable:

(a) The latest standard specifications of the Georgia Department of Transportation;
(b) The latest edition of AASHTO *Policy on Geometric Design of Highways and Streets*; and/or
(c) The *Manual on Uniform Traffic Control Devices for Streets and Highways* published by the Federal Highway Administration of the U.S. Department of Transportation.

END OF ARTICLE IV



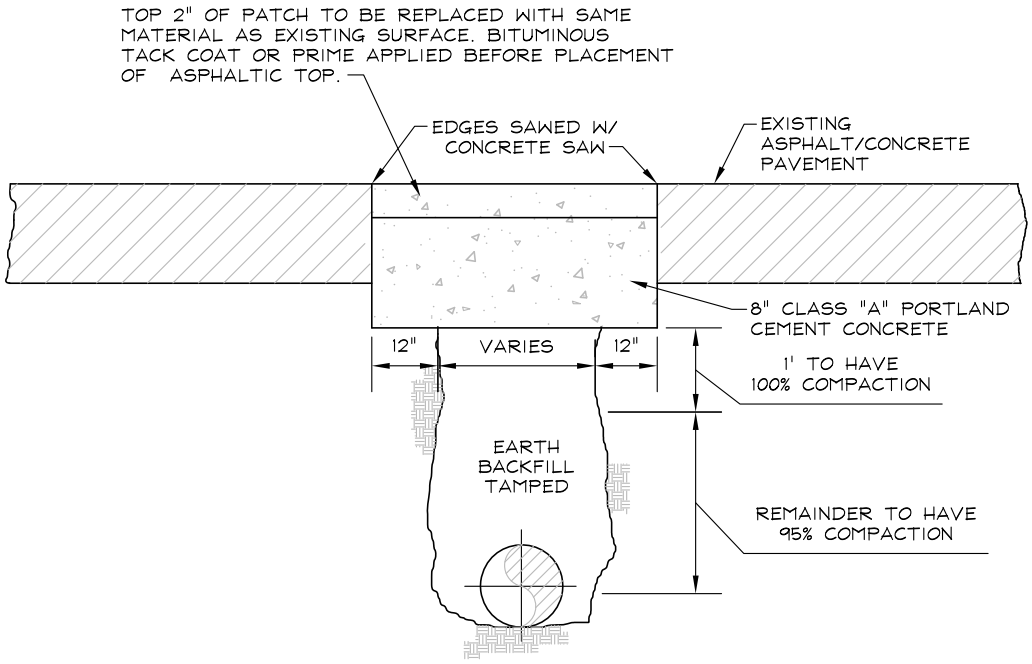
CITY OF CORNELIA
Where nature's your neighbor

TYPICAL CROSS SECTION RESIDENTIAL STREET UTILITY LOCATION

STANDARD DETAILS ROAD & SITE CONSTRUCTION

DATE: APRIL 2014
SCALE: N.T.S.

STANDARD 400 -1



NOTES:

1) PERMISSION MUST BE OBTAINED TO OPEN CUT EXISTING ROADS.

2) ROADWAYS WILL GENERALLY BE BORED OR TUNNELED FROM DITCH LINE TO DITCH LINE IF ROAD HAS BEEN RESURFACED IN THE PAST 5 YEARS.

CITY OF CORNELIA
Where nature's your neighbor

TYPICAL STREET ROAD REPAIR

STANDARD DETAILS
ROAD & SITE CONSTRUCTION

DATE: APRIL 2014
SCALE: N.T.S.

STANDARD 400 -2

ARTICLE V: STORMWATER MANAGEMENT AND DRAINAGE SYSTEMS

Section 501: Purpose

An adequate drainage system including necessary ditches, pipes, culverts, drains, inlets, bridges, detention ponds, etc. shall be provided for the proper drainage of all surface water. All persons, businesses or developers proposing development or construction in the City of Cornelia shall prepare a Stormwater Management Plan for review and approval. The plan shall detail how post-development stormwater runoff will be controlled and managed and how the proposed project will meet the requirements as set forth herein. No final subdivision plat shall be approved and no building permit shall be issued until and unless the Stormwater Management Plan, including engineering plans and specifications and hydrology report, have been reviewed and approved by the Municipal Planning Board and the necessary stormwater system infrastructure has been installed.

The following shall be exempted from these requirements:

1. Additions or modifications to existing detached single-family dwellings.
2. Construction of a detached single family dwelling which is not part of a larger development.

The Georgia Department of Transportation *Standard Specifications for Construction of Roads and Bridges and Details* shall be used for all construction of all stormwater management structures and appurtenances.

Soil erosion and sediment control practices and BMP's shall comply with the City of Cornelia ordinances, the Georgia Department of Natural Resources Environmental Protection Division regulations, The Georgia Erosion and Sedimentation Act of 1975 as amended, and the latest edition of the *Manual for Erosion and Sediment Control of Georgia* as published by the Georgia Soil and Water Conservation Commission.

Section 502: Hydrology Study

Each new development will be required to perform a hydrology study. The study shall include a discussion of existing downstream conditions and impacts of the proposed development to downstream properties, measures taken to address increased post-construction runoff, concentrated discharges, etc. Stormwater detention facilities that will provide storage and controlled release of runoff shall be required for any development activity that will increase the peak rate of discharge. Hydrologic and hydraulic calculations are required for pre- and post-construction conditions and the calculation and corresponding hydrology study shall be prepared and sealed by a professional engineer registered in the State of Georgia. The hydrology study shall include, at a minimum, the following information:

1. A narrative site description

2. A summary showing pre- and post-developed conditions and allowable release rate, including any bypass or offsite sub-basins, for 2-, 5-, 10-, 25-, 50- and 100-year storm events. Output is required for each design storm.
3. A detailed explanation of the methodology used for hydrologic and hydraulic calculations. The minimum time of concentration shall be 5 minutes.
4. Exhibits shall be included that show the following:
   A. Topographic drainage area maps for pre- and post-development conditions.
   B. Sub-basin delineations with acreage, soil types and cover.
   C. Vicinity Map
   D. Maps showing the existing and proposed stormwater management facilities on a topographic map with existing and proposed contours showing at 20-foot intervals.
   E. All perennial and intermittent streams and other surface water features.
   F. Directions of flow.

Section 503: Drainage Design Criteria

This section provides minimum and maximum values, and methodologies accepted by the City of Cornelia in the preparation of plans for stormwater management and drainage systems. The latest edition of the *Manual for Erosion and Sediment Control of Georgia* shall be consulted for the proper design procedures in meeting the standards of this section.

1. Sizing and location of all existing and proposed storm sewers shall be the responsibility of a professional engineer registered in the State of Georgia. They shall be shown on a topographic map with two foot contour intervals. Existing and proposed contours shall be shown. Profiles of the storm sewers shall be shown on plan and profile sheets labeled with structure numbers, pipe length and materials, invert elevations, and hydraulic grade line (HGL).
2. Storm drainage pipes shall be sloped so as to maintain a minimum velocity of 3 feet/second (fps) during the 2-year storm event so that sediment will not collect. The slopes shall be designed and the storm sewers constructed such that there is no standing water in any pipe or drainage structure that would promote mosquitos breeding.
3. The Rational Method can be used to estimate stormwater runoff peak flows for the design of gutter flows, drainage inlets, storm drain pipes, culverts and small ditches draining small, highly impervious areas less than or equal to 25 acres. The Rational Method cannot be used for storage design or any other application where a more detailed routing procedure is required because The Rational Method can significantly underpredict detention volumes; however, The Modified Rational Method can be used for detention design for drainage areas up to 5 acres. The Rational Method should not be used for calculating peak flows downstream of bridges, culverts or storm sewers that may act as restrictions and impact the peak rate of discharge. The SCS Method or USGS Regression Method may be used for estimating stormwater peak runoff rates and the generation of hydrographs for routing of stormwater flows in areas draining

more than 25 acres. The Simplified SCS Method can be used for drainage areas up to 2,000 acres.

4. The 25-year storm event shall be used in sizing storm drains that serve public streets and rights-of-way. Storm sewers and culverts conveying water under public streets shall be sized to carry runoff from the 100-year storm event without overtopping the road. All other storm-sewer systems shall be sized for the 50-year storm event.

5. Storm sewers and cross drain pipes shall not be less than 18 inches in diameter. No storm drain can be designed or installed under proposed acceleration/deceleration lanes. The Administrative Officer or his designee, upon recommendation by the City Engineer, may modify or waive these requirement if unusual circumstances exist such as topography.

6. Storm drainage shall be collected in storm sewers at or near the perimeter of the property on the upstream end and piped to an existing storm drainage system. This extension requirement can be waived for collection of storm water upstream of roadways where topographic conditions warrant placing the inlet at the toe of the roadway fill.

7. Maximum continuous length of pipe shall be 300 feet for pipes less than 42 inches in diameter.

8. All storm drainage pipes shall extend to the detention facility.

9. Drainage Easements shall be at least 20 ft wide along all storm drain systems and around all detention ponds.

10. Exit velocities from storm-drain pipes shall not exceed 10 fps during the 25-year storm event without the design of additional energy dissipaters (not including required rip-rap). Energy dissipation devices, such as splash pads, stilling basins, etc., shall be designed in accordance with sound engineering practices. Rip-rap shall be designed in accordance with the *Manual for Erosion and Sediment Control in Georgia.*

11. It is the developer's and/or the contractor's responsibility to ensure that all structures built on individual lots or sites have positive drainage and are built at an elevation to adequately avoid being flooded by the 100-year storm and that runoff from their project does not adversely affect downstream or upstream property. The City is not responsible for damages resulting from improper design or inadequate runoff control.

12. Maximum velocity of runoff in swales lined with vegetation shall be 5.0 feet/second during the 25-year storm event. Swales with runoff velocities in excess of 5.0 fps shall be lined with stone, concrete, or approved synthetic matting.

Section 504: Storm Sewers

1. Georgia DOT Standard 1030D shall be used in determining class concrete or gauge of pipe under fill, method of backfilling and pipe installation.

2. Only reinforced concrete pipe shall be used within street rights-of-way for arterial roads, and major and minor collectors. Concrete pipe shall not be used on grades

exceeding 10%.

3. Metal pipe may be used within the rights-of-way of local streets and for driveway culverts. Metal pipe shall either be corrugated steel (AASHTO M-36) with aluminized Type II or bituminous coating, or corrugated aluminum alloy pipe (AASHTO M-196).

4. Corrugated high density polyethylene (HDPE) pipe, smooth lined type "S", may only be used for residential driveway applications and must be manufactured and installed in strict compliance with Georgia DOT Standard 1030-P HDPE. HDPE pipes shall not exceed 36 inches in diameter.

5. Where a wet weather drainage ditch exists between the proposed road and 20 feet into the lot, the design professional shall size the driveway culvert as if the driveway was at the lowest point on that lot. The construction plans shall show the minimum driveway pipe size required. Driveway culverts may be reinforced concrete, metal or HDPE as specified herein. The inlet and outlet end of all driveway culverts shall have either flared end sections or concrete headwalls that meet the standards of Georgia Department of Transportation 1120 or 1125.

6. Pipe installation shall conform to GDOT *Standard Specifications for Construction of Roads and Bridges*. Before any traffic over a storm drain is allowed, the developer shall provide an adequate depth and width of compacted backfill to protect the structure from damage or displacement. Any debris or silt that constricts the flow through a pipe shall be removed by the developer as often as necessary to maintain drainage. All pipe structures shall be cleaned before the work is conditionally approved. Any damage or displacement that may occur due to traffic or erosion shall be repaired or corrected at the developer's expense.

7. Minimum Clearances Are:
   a. Eighteen (18) inches between the bottom of the base or sub-base, if used, and the exterior crown of the culvert. In all cases, at least 24 inches of cover shall be provided.
   b. A minimum of one (1) foot clearance between existing and proposed underground utilities and exterior crown of culverts.

8. Trench construction for storm drainage pipe shall be in accordance with GDOT Standard 1030D and current manufacturer's specifications. A typical detail shall be provided on the construction drawings.

9. The storm sewer bedding shall be designed according to the latest manufacturer's specifications and GDOT Standards and a typical detail shall be provided on the construction drawings.

10. All pipe joint connections and connections to manholes shall be made according to the latest manufacturer's specifications and GDOT Standards. At a minimum, all connections to manholes shall be grouted with cement.

11. Storm Sewer Trench Backfill Compaction Testing — Frequency of testing shall be

determined by project conditions. The minimum test requirements are once per road cut or once per one hundred fifty (150) feet if the trench line lies within the roadway as is in the case of a storm sewer running parallel to and under the pavement or at the discretion of the Administrative Officer or his authorized representative. Any areas failing the compaction tests shall be reworked as necessary to achieve compaction.

Section 505: Drainage Structures

The design professional shall check the hydraulic capacity of each drainage structure designed as an inlet point in the drainage system. The actual storm water flows shall be compared with the structures flow capacity to ensure the capacity is not exceeded. Calculations shall be included in the hydrology study.

1. Catch basins shall be designed by the design professional to GDOT Standards 1033D and/or 1034D. Alternate catch basins complying with the standards of the Georgia DOT are subject to approval by the City.

2. Catch basins shall be located outside of intersection radii unless unusual circumstances cause undue hardship, in which case the City may waive this requirement.

3. Inlet Spacing shall be limited to a maximum distance as follows:
   - 500' on grades up to 7%
   - 400' on grades from 7% to 10%
   - 250' on grades over 10%

4. Maximum gutter spread shall be one half of the travel lane, as measured from the face of curb, for the 25-year storm event. The inlets shall be spaced in order to intercept a minimum of 85% of the flow during the 25-year storm event without exceeding the above gutter spread.

5. The inlet and outlet end of all storm drain pipes including driveway pipe shall have either flared-end sections or concrete headwalls, which meet GDOT Standards 1120 or 1125.

6. Drop inlets shall be designed to GDOT Standards 1019A. Weir drop inlets shall be provided in landscape areas. Grated drop inlets shall be provided in paved areas.

7. Junction boxes or manholes having access to the pipe shall be constructed to meet the requirements of GDOT Standard 9031U or 1011A. Manholes shall be provided with eccentric cone sections.

8. Detention pond riser structures shall be designed to GDOT standards. These structures shall be checked for flotation.

9. Cul-de-sacs on downhill street grades shall require catch basins throat design and cul-de-sac grading detail.

10. Provide a minimum 0.2 feet drop between inverts across structures.

Section 506: Open Channels

1. All open channels shall be profiled at the same scale as the storm drain conduits. The stormwater management plan shall include a typical section of the channel, provided for each reach if the cross-section changes. A maximum slope of 3% along the centerline of the channel is permitted. Exit velocities from storm drain pipe for the 100-year storm shall not exceed 3 fps for vegetative channel lining, or 5 fps when rocks or cobbles are used for channel lining. No other materials may be used for channel lining.

Section 507: Storm Detention Facilities

All development plans, except those that are exempt, will require a hydrology study certified by a professional engineer registered in the State of Georgia qualified to do work in the field of hydrology. Permanent detention facilities are required for every development project that has a one (1) cfs increase in post-development discharge for the 25-year storm.

1. Detention ponds shall be designed for the 2, 5, 10, 25, 50, and 100-year storm events. The SCS Method is the only acceptable method that can be used for developing hydrographs to be used for detention pond routing.

2. An emergency overflow device for a detention pond shall be designed to pass the 100-year peak developed inflow without overtopping the dam in the event the primary outlet control structure becomes obstructed. There shall be at least 2 ft of free board between the 100-year elevation in the emergency spillway and the top of the berm.

3. Pond discharge locations shall be in defined drainage ditches or piped systems. The developer's engineer shall include in the hydrology study a discussion of existing conditions downstream of the detention pond and an explanation of how downstream property owners will not be adversely affected by the "concentrated" runoff. If there is an existing storm drainage system within 150 feet of the discharge point of the outlet pipe for the pond, then the developer shall extend the outlet pipe and tie-in to the existing system.

4. The steepest fill slopes shall be 3:1, and cut slopes shall be no steeper than 3:1. Vegetated embankments shall be less than 20 feet in height. Riprap-protected embankments shall be no steeper than 2.5:1. Geotechnical slope stability analysis is recommended for embankments greater than 10 feet in height and is mandatory for embankment slopes steeper than those given above. All embankments must be designed to State of Georgia Rules for Dam Safety (Chapter 391-3-8) and are subject to the provisions of the Georgia EPD Safe Sam Program. The maximum depth shall not exceed 10 ft. Outlet pipes shall be RCP installed with a concrete cradle.

5. A 10 feet wide access road that runs on top of the dam shall be required around the circumference of the pond except where topography prohibits this and the exception is approved by the Administrative Officer.

6. A high-quality fence made of durable materials including wood, iron or other metal shall be required around all detention facilities. Metal fences prone to rust or deterioration, such as chain link fence, are acceptable if coated with black Teflon or similar material to protect it from deterioration. The fence must also comply with the following standards:

   A. The fence shall be at least 6 feet high.

   B. Fence posts shall be set in concrete 10 feet on center.

   C. There shall be a minimum 12 feet wide gate located for access.

   D. The fence shall not be installed across the slope of the dam or berm. But installed completely around the pond and containing the dike and access road entrance.

7. The Owner of the property on which the detention facility is located shall be responsible for properly operating, maintaining and cleaning-out all storm water detention facilities.

Section 508: Erosion and Sediment Control Plans

Plans for all sites must include the following information to meet Federal, State and local requirements:

1. Graphic scale and North arrow

2. Vicinity map — Small map showing site relative to surrounding area, including designation of specific phase, if necessary.

3. Existing and planned contours shall be shown with contour lines drawn at two-foot intervals.

4. Adjacent areas — Neighboring areas, such as streams, lakes residential areas, etc., which might be affected, should be shown on plans.

5. Location of erosion and sediment practices, using uniform coding symbols from the *Manual for Erosion and Sediment Control* in Georgia, Chapter 5, with legend.

6. Delineate all State waters located on or within 200 feet of the project site.

7. Delineate contributing drainage areas, both on and off-site.

8. Delineate undisturbed stream buffers along perennial streams, lakes and water supply reservoirs and any variances that have been obtained. The minimum undisturbed buffer shall be 25-feet; however greater undisturbed buffers may be required in the City's Zoning Ordinance.

9. Include soil series and their delineation.

10. Narrative, or notes and other information should also be included and located on the site plan under general notes or under erosion and sediment control notes. Specific

notes must include the following:

- Description of existing land use at project site and description of proposed project. Include land lot and district of the site location.
- Name, address and phone number of developer/owner
- Name and phone number of 24-hour local contact who is responsible for erosion and sediment controls
- Signature/seal of qualified plan preparer
- Size of project or phase under construction, in acres

11. Activity schedule — Show anticipated starting and completion dates for project events, including vegetation and mulching. Include the statement, in bold letters that: "The escape of sediment from the site shall be prevented by the installation of erosion control measures and practices prior to, or concurrent with, land-disturbing activities."

12. Include specific design information and calculations for all structural measures on site, such as temporary sediment basins, retrofitted detention ponds and swales.

13. Show storm drain pipe and weir velocities and demonstrate how receiving area will accommodate discharges without erosion.

14. Vegetative plan — For all temporary and permanent vegetative practices. Include species, planting and seeding dates, fertilizer, lime and mulching rates. Vegetative plan shall be site specific for the appropriate time of year that seeding will take place and for the appropriate geographic region of Georgia.

15. Detailed drawings — For all structural practices, specifications must, at a minimum, meet guidelines set forth in the *Manual for Erosion and Sediment Control in Georgia*.

16. Maintenance statement — include on the plans the statement: "Erosion control measures will be maintained at all times. If full implementation of the approved plan does not provide effective erosion control, additional erosion and sediment control measures shall be implemented to control or treat the sediment source."

17. If an existing or new detention pond is to be used for sediment control or stormwater detention during construction, the developer is required to dredge clean and grass the pond upon completion of the construction project.

Section 509: Subdrainage

Subdrainage will be installed to control the surplus ground water by intercepting sidehill seepage or by lowering or regulating the ground water level where such conditions exist.

Section 510: Bridges

Bridges shall be designed for a 100-year storm event and in accordance with the GDOT *Standard Specifications for Construction of Roads and Bridges.*

Section 511: Lake(s)

If it is proposed to make a new or existing lake a part of a subdivision, the developer shall be required to submit a breach analysis for affected property within the boundaries of the development and show the dam breach zone on the plans. The developer should coordinate with Georgia EPD Safe Dams Program to determine the required design criteria and regulatory requirements.

Section 512: Field Changes

Minor changes in construction plans caused by field conditions shall be made at the direction of the Administrative Officer with costs of such changes paid for by the developer. All changes are to be documented as revisions to the approved development plans and correctly shown on the as-built plans. Discrepancies between as-built survey and approved development plans may result in delays in approving final plats.

Section 513: As-Builts

Subdivision As-builts shall include the full set of construction plans with the infrastructure shown as it was actually constructed. The plans shall show the storm sewer system in plan and profile, drainage structure invert elevations, pipe grades, lengths, size of pipes, detention pond outlet works, etc. The detention pond grading plan shall be shown with a certification that the pond configuration and outlet works were built according to the approved design. The as-builts shall be submitted before approval of the final plat. A reproducible copy of the final plan and two (2) sets of as-builts shall be submitted. A digital copy of the as-built plans shall also be submitted in a format and coordinate system compatible with City of Cornelia's Geographic Information System.

END OF ARTICLE V

ARTICLE VI - WATER SUPPLY SYSTEMS

Section 601: Purpose

A. The Developer shall be responsible for the design of an adequate water distribution system. The purpose of this section is to address the minimum requirements for design and construction of public water systems as defined by the City of Cornelia and the Georgia Environmental Protection Division. The methods of design and construction shall be in accordance with all city codes, accepted engineering practices, Georgia EPD's *Minimum Standards for Public Water Systems*, and this Article.

B. The authority for discretionary provisions for design and construction of water systems shall vest with the Administrative Officer or his/her designee.

C. This document is intended to convey the general design and construction requirements for a typical project. It also lists specific requirements relating to inspection, testing and acceptance of facilities. It is not intended as a substitute for site-specific engineering and construction techniques. Individual project conditions may require waivers from the provisions in this document.

D. This chapter is subject to periodic revision to meet changing requirements for materials, environmental regulations, etc. At the beginning of a project the user should verify that he has the latest edition.

Section 602: General Policy and Requirements

A. Water systems shall be designed in accordance with the densities and intensities reflected in the Future Land Use Plan and Map of the adopted City of Cornelia Comprehensive Plan.

B. The approximate location and character of proposed public water facilities shall correspond with the Existing and Proposed Water System Map, as amended.

C. Water systems shall be designed for the estimated future population from all contributing points under consideration. The estimated future population shall be based on the adopted Comprehensive Plan and/or the existing zoning of the land to be served, whichever is greater.

D. Except as provided below, all future buildings within the City's corporate limits that are to be utilized for human occupancy or any other use such as commercial or industrial purposes that requires water facilities shall be connected to the public water system.

E. All water service connections from the meter to the building, except when within a dedicated easement, are regulated by the Standard Plumbing Code (SBCCI) and shall be privately maintained.

F. There shall be no physical connections between a drinking water supply and a sanitary or storm sewer, or appurtenance thereof. All facilities furnished with a public drinking water supply will have no physical connection with private wells or other

private water supply systems, or any other source of contamination.

G. The City will not accept ownership of water mains installed along roadways that are not dedicated for public use (i.e., are without public right-of-way). The City will not extend water mains along private roadways that do not have a dedicated, recorded right-of-way.

Section 603: Fire Safety

A. Fire safety systems shall be designed and constructed in accordance with Article VII of this Development Ordinance.

Section 604: Plans and Submittals

Section 604.01 General

All projects which involve construction of lateral water lines, main water lines, or trunk lines shall have detailed construction plans and specifications prepared by a Registered Professional Engineer licensed in the State of Georgia or a Design Professional who meets state licensure requirements applicable to the profession or practice he is engaged in. Developments that only involve water systems for buildings may have plans and specifications prepared by the project architect.

Section 604.02 Water Flow Test

A. A water flow test shall be performed on the existing water line nearest the proposed subdivision or development prior to submitting design drawings for approval to determine the adequacy of the existing water supply line for the project. The test shall consist of a fire hydrant flow test and a 24-hour pressure test. Refer to Section 704.02 and 704.03 for additional information.

Section 604.03 Preliminary Plan Review

A. All site development plans involving water systems improvements shall be submitted to the City and GA EPD for technical review. The City shall facilitate the review and approval of all elements of the plan in accordance with Article III of these Regulations. Questions relating to availability of water and proposed location of connection should be resolved at the conceptual and preliminary planning stages before submittal of the final plans. The submittal for preliminary plan review must include all land to be developed even though the land is to be developed in several phases or units. Availability determinations will be made for the total project.

Section 604.04 Final Plan Review

All final plans for public water mains shall be prepared in accordance with the requirements described in Article III and as required in regulations promulgated by the Georgia EPD. The Developer shall be responsible for submitting all necessary plans and other data to EPD for required approvals and for obtaining other permits, such as DOT, railroad, etc. For example, a completed *Drinking Water Project Submittal Form*, including a

signed letter from the City of Cornelia approving the proposed Water System Improvements, must be submitted to Georgia EPD.

Section 604.05 Plan Elements

In addition to the information to be provided in Article III, the following information shall be provided on all site development plans:

1. All proposed water lines and the location and size of all valves, fittings, air relief valves, meters, discharge lines, blow-off chambers and other appurtenances.

2. On industrial and commercial developments the water meter and service line size and location.

Section 604.06 As-Built Drawings

At the completion of construction and preferably prior to the final field inspection, "As-Built" drawings of the project shall be submitted to the City to serve as a permanent record of the project. A reproducible copy of the final plan and two (2) sets of as-builts shall be submitted. A digital copy of the as-built plans shall also be submitted in a format and coordinate system compatible with the City's Geographic Information System (GIS). Each sheet of these drawings shall bear the words "As-Built" or "Record Drawings".

A. Guidelines for Preparation of As-Built Drawings
   1. As-Built drawings will be same format as the original construction plans.
   2. Road names and lot numbers should be on plans.
   3. "As-Builts" or "Record Drawing" is to be stamped in large clear print on plans.
   4. Sheet should be no larger than 24" x 36".
   5. Water Mains including size and type should be shown.
   6. Service and meter locations and sizes should be shown.
   7. Fire hydrants, gate valves, air release valves should be shown.
   8. Plan of fire meters or detector meters should be shown if applicable.

Section 605: Easement

A. All easements shall allow adequate room to construct the water line and appurtenances. Permanent easements shall be a minimum of 20 feet wide except that when the depth of the water line exceeds ten (10) feet the required easement width shall increase such that the easement width is at least twice the depth from the ground surface to bottom of the pipe. Easements with dual utilities are to be a minimum of 35 feet in width.

B. To provide for maximum utilization of public water systems, appropriate easements shall be provided to adjacent properties for access to, or extension of, said utilities. Such easements shall be dedicated to the City of Cornelia.

C. It shall be the responsibility of the developer to obtain any off-site easements required to connect the project to existing public water system. Easements will be conveyed to

the City of Cornelia for all facilities that are to be conveyed to the City. Final plans cannot be approved until all necessary off-site easements have been submitted, approved and recorded.

Section 606: Water Design Criteria

Section 606.01 General

The criteria listed herein is not intended to cover all aspects of design, but rather to mention the basic guidelines and those particulars that are required by the City of Cornelia. In addition to the design criteria presented herein, proposed public water systems must meet all requirements of the *Minimum Standards for Public Water Systems* (Minimum Standards) published by Georgia EPD.

Section 606.02 Water Lines in Public Rights-of-Way

1. Water lines will be allowed within the right-of-way of any roadway unless as determined by the City or GDOT there are compelling design or safety issues which would demand consideration of an alternate location.
2. GDOT should be contacted at the preliminary plan stage to determine the acceptability of locating water lines under the pavement and/or within the right-of-way of State roadways, especially if, from preliminary review, it appears their guidelines will be difficult or impossible to meet.

Section 606.03 Surface Water Crossings

1. Water lines crossing surface waters, both above and below the watercourse, present special problems and should be discussed with the Development Department before plans are prepared for submission.
2. Crossing of surface waters above the watercourse shall only be made when other methods are impractical.
3. When crossings are permitted, they shall be as close to a right angle to the stream as possible. No more area shall be disturbed than is necessary to provide for the construction of the water line at that location.

Section 606 Design Calculations

Residential water supply for domestic use shall be in accordance with Table 6-1 and at a minimum residual pressure of 20 psi. For determining the instantaneous peak demand for other types of developments, refer to Georgia EPD's *Minimum Standards*.

TABLE 6-1
INSTANTANEOUS WATER DEMANDS
FOR RESIDENTIAL AREAS

Total Number of Residences Served	Gallons per Minute
5	40
10	40
20	58
30	73
40	85
50	96
60	106
70	115
80	124
90	132
100	140
150	175
200	205
300	255
400	295
500	335
750	480
1,000	600

Note: Fire flows are not included in the instantaneous water demands above and should be added to these demands. See Article VII for more information.

Section 607 Water Mains and Appurtenances

Section 607.01 Water Mains

1. Materials - Ductile iron pipe (DIP) or polyvinyl chloride (PVC) shall be used for water mains (see later Section for material specifications). Water mains shall be DIP under pavement, at stream crossings and where mains cross under storm sewers, sanitary sewer lines or other utilities.

2. Existing Streets - On existing roads, water lines shall be located on the north or east side of the road, within five (5) feet of the right-of-way line with a minimum cover of 48 inches below the level of the roadbed or with 48 inches of cover, whichever is more restrictive. Permission must be obtained by the City to vary from this requirement. Fire hydrants on existing roads shall be located between the waterline and the street right-of-way.

3. New Streets - On new streets, water lines shall be located on the north or east side of the road, eight (8) feet from back of curb with a minimum cover of 48 inches below the level of the roadbed or with 48 inches of cover, whichever is more restrictive. All

curbing must be installed before any water lines are installed. Fire hydrants shall be located between the water main and the street right-of-way. Mains shall be located in accordance with the Utility Location Detail (see Standard Details).

Section 607.02 Service Laterals

1. Service laterals shall be located with a minimum cover of 48 inches within the right-of-way and rise to a buried depth of 18 inches at the water meter location. There shall be no splices of service lateral pipe under any pavement.

2. Service laterals crossing all roads shall be placed inside a minimum of a 2-inch diameter Sch. 40 PVC casing.

3. A "W" shall be sawed into the curb where each service tap is made to indicate its permanent location,

4. Service tubing shall be ¾" or 1" cross-linked polyethylene, SDR 9 tubing. Long and short side services shall be 1" for service to two (2) meters and ¾" for one (1) meter.

5. Services for subdivision shall be sized and located as shown on the Standard Detail Drawings.

6. Water meters shall be located at the limits of the street right-of-way.

7. Backflow preventers shall be installed in a small 5-inch diameter valve box downstream of the water meter. The backflow preventers downstream of the water meter shall be owned and maintained by the water customer.

8. Fire line meters shall be designed to meet site-specific conditions, see Standard Details for conceptual layout of meter.

9. Detector meters shall be designed to meet site-specific conditions, see Standard Details for conceptual layout.

Section 607.03 Water Valves

1. At Intersections - Valves on water mains at intersections shall be located behind the curb. Generally, the number of valves shall equal the number of streets in the intersection minus one. The City may require valves in excess of this requirement if the water system layout warrants additional valves.
2. At End of Line - A water valve and a minimum of 36 feet of pipe shall be provided at the end of all lines for phased developments, and at locations where the water main may be extended in the future for water system improvements. The end of the line shall be provided with a temporary plug and thrust collar. A 1-inch tap for chlorination/dechlorination purposes shall be provided.
3. Along Mains - Maximum spacing of water valves along water mains shall be 1,000 feet. In addition, a hydrant lead valve shall be located at every fire hydrant.

4. Concrete Pads - All valves shall have a concrete pad.
5. Valve Markers - One concrete valve marker shall be furnished and set at each line valve.
6. Air and Vacuum (A&V) Release Valves - Air and vacuum release valves shall be located where appropriate as determined by the design professional responsible for the project design. All A&V release valve locations are subject to approval of the City. In general, within subdivision A&V release valves are not necessary as long as services are located at the water main high points.
7. Polyethylene Encasement - DIP water mains shall be provided with polyethylene encasement where the water main either crosses, or is in close proximity to, a steel gas main.

Section 608: Water Line Extension Requirements

Developers shall extend all water mains along their entire property frontage if the existing main is adjacent to the proposed development. The size of the extension shall be at least the size of the existing main and may be required to be larger according to the City's Water Plan or the results of the hydraulic analysis of the water system.

Section 609: Material Specifications

Section 609.01 General

1. All materials used in the work, including equipment shall be new and unused materials of a reputable U.S. manufacturer conforming to the applicable requirements of the specifications. All materials used and that come in contact with the drinking water must meet NSF Standard 61 for potable water use.
2. Any pipe, solder or flux used in the installation or repair of the water lines must be lead free. Pipes and fittings must not contain more that 8.0% lead and solders and flux must not contain more that 0.2% lead.

Section 609.02 Ductile Iron Pipe (DIP)

Ductile iron pipe must be used on all installations 12" or larger in diameter or with working pressure above 125 psi (generally below elevation 1430 MSL) and at all other locations outlined herein in Section 607. Pipe shall be designed in accordance with ANSI A21.50 (AWWA C150), latest revision, and ANSI A21.51 (AWWA C151), latest revision. Minimum wall thickness for 6"-16" diameter pipe shall be Pressure Class 350. Minimum wall thickness for 18" — 20" diameter pipe shall be Pressure Class 300. The minimum wall thickness for pipe larger that 20" in diameter shall be Pressure Class 250.

Pipe shall have an outside asphaltic coating per AWWA C151, latest revision. Pipe shall be standard cement lined and seal coated with approved bituminous seal coat in accordance with AWWA C104, latest revision. Joints shall be push-on or mechanical joints equivalent to “Fastite”, “Bell-Tite” or “Tyton”, conforming to ANSI A21.11 (AWWA C111), latest revision. Pipe shall be in 18' to 20' nominal lengths with standard deflection pipe sockets. Where

restrained joints are shown or specified for pipe larger than 12" in diameter, the joints shall be "Lok-Fast" or "Lok-Ring" as manufactured by American Pipe or approved equal.

Where river crossing pipe is required, the pipe shall be "Flex-Lok Boltless Ball Joint Pipe" as manufactured by American Pipe or approved equal. Where specified, flanged pipe shall meet AWWA C151 specifications and be used with fittings meeting ANSI A21.10 (AWWA C110) or ANSI A21.53 (AWWA C153) having a minimum pressure class of 250psi. Flanged fittings shall be manufactured in accordance with ANSI B16.1, Class 125 flanges unless Class 250 are needed. Bolts shall conform to ANSI B18.2.1 and nuts shall conform to ANSI B18.2.2. Gaskets shall be ⅛"-inch thick full face and conform to dimensions recommended by AWWA C115, latest revision.

Section 609.03 Polyvinyl Chloride Pipe (PVC)

All PVC pressure pipe used for water service must meet the requirements of AWWA C-900, latest revision, "Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4-inch through 12-inch for Water Distribution" and shall be furnished in ductile iron pipe equivalent outside diameters with rubber gasketed joints as listed C-900 standard. All pipe shall have a minimum dimension ratio (DR) of 14, rated for Class 305 psi sustained working pressure. Certificates of conformance with the foregoing specifications shall be furnished with each lot of pipe supplied. All pipe shall conform to ASTM D-2241 and be installed in accordance with ASTM D-2321. Joints shall be in accordance with ASTM D-3036. 2-inch PVC pipe shall be SDR 13.5.

Section 609.04 Tubing for Water Services

Service pipe shall be cross-linked polyethylene (PEXa) pipe manufactured to Copper Tube Sizes (CTS) using high-pressure peroxide (Engel) method of cross-linking with an approved cell classification of 354400 in accordance with ASTM D 3350, and a minimum degree of cross-linking of 80% when tested in accordance with ASTM D2765, Method B. Pipe shall have a co-extruded UV shield made from UV-resistant, high-density polyethylene, color blue. The UV shield shall resist exposure to natural sunlight for up to one year. Pipe shall be manufactured in accordance to AWWA C904, SDR9 and be certified to meet ASTM F876, F877 and F2023 standards and be NSF 61 approved.

Pipe shall carry manufacturer's name or trademark, nominal size, ASTM F876, F877, CSAB 137.5, NSF-PW, PEXa material designation, SDR9, 160 psi markings along with footage marks, manufacturing date and hour code plum machine number.

Section 609.05 Steel Casing Pipe

Steel casing pipe shall conform to A.S.T.M. Designation A-139, Grade B, electric fusion welded steel pipe. The pipe shall have a minimum tensile strength of 35,000 psi; both the exterior and interior of the pipe shall have a coal tar varnish coating.

Section 609.06 Pipe Fittings

All fittings shall be ductile iron furnished in accordance with ANSI Specifications A21.10 (AWWA C110) or ANSI A21.53 (AWWA C153), latest revision, and have a minimum of 250

psi pressure class rating. Joints shall be mechanical joints with ductile iron retainer glands conforming to ANSI Specification A21.11 (AWWA C111), latest revision. Ductile iron retainer gland shall be equal to EBAA Mega-Lug, MJ Field Lok gasket or approved equal. All fittings shall be furnished with a cement mortar lining.

Section 609.07 Fire Hydrants

A. General – Hydrants shall be manufacturer's current model design and construction. All hydrant units are to be complete including joint assemblies. Physical characteristics and compositions of various metal used in the hydrant components shall meet the requirements as specified in AWWA C-502 latest revision. Hydrants shall meet all test requirements, be Underwriters Laboratories Listed and be Factory Mutual Inc. approved. Hydrants shall be suitable for working pressure of 250 psi. Hydrants shall be M & H Valve and Fitting Co., Traffic Model Style 129, Mueller Co., Centurion A-423 or approved equal.

B. Bonnet – Bonnet may have oil filled or dry reservoir. If oil filled, bonnet must have "O" ring packing so that all operating parts are enclosed in a sealed oil bath. Oil filter plug shall be provided in bonnet to permit checking of oil level and adding oil when required. If bonnet is the dry type, the hydrant top must have a lubricating hole or nut for ease of lubrication. All parts must be removed through top of hydrant without moving entire barrel section from safety flange.

C. Nozzles and Caps – The hydrant shall have two (2) 2-1/2 inch connections and one (1) 4-1/2" steamer connection, National standard threads. Nozzles shall be bronze and have interlocking lugs to prevent blowout. Nozzle caps shall be secured to fire hydrant with non-kinking type chain with chain loop on cap ends to permit free turning of caps.

D. Seat Ring – Seat ring shall be bronze.

E. Drain Valves and Openings – Positive operating drain valves shall be provided to assure drainage of fire hydrant when the main valve is closed. Drain openings shall have bronze bushings.

F. Main Valve – Valve shall be designed to close with the pressure and remain closed. Valve shall be made from material that will resist rocks or other foreign matter. Valve shall have a full 5-1/4-inch opening.

G. Barrel and Safety Flanges – Hydrants shall have a safety-type vertical barrel with 4-1/2 foot bury and be designed with safety flanges and/or bolts to protect the barrel and stem from damage and to eliminate flooding when hydrant is struck. Bury depth shall be cast on barrel of hydrant. Hydrant shall be installed with a locked hydrant tee equal to American A-10180 and a locked hydrant adapter equal to American A-10895.

H. Operating Stop and Nut – Hydrant shall have a positive stop feature to permit opening of hydrant without over travel of stem. Operating nut shall be bronze, 1-1/2", point to flat, pentagon.

I. Bolts and Nuts – Bolts, washers and nuts shall be corrosion resistant.

J. Inlet – Bottom inlet of hydrant shall be provided with mechanical joint connection as specified and shall be 6-inch nominal diameter.

K. Direction of Opening – Hydrant shall be designed to close "right" or clockwise and open "left" or counter-clockwise.

L. Coatings – All inside and outside portions of hydrant shall be coated in accordance with AWWA C-502. The exterior portion of hydrant above ground level shall be painted with two (2) coats of best grade zinc chromate primer paint and with two (2) coats of approved hydrant enamel. Color shall be Red unless otherwise designated by Owner.

M. Joint Assemblies – Complete joint assemblies consisting of gland, gasket, bolts, and nut shall be furnished for mechanical joint inlets.

Section 609.08 Butterfly Valves

All butterfly valves shall be bubble-tight closing at the rated pressure with flow in either direction, and shall be satisfactory for applications involving throttling service and frequent operations or operations after long periods of inactivity. Valves shall meet the full requirements of AWWA Standard C504, latest revision for 150-psi working pressure and shall be suitable for above ground or buried service.

All interior ferrous surfaces of valves larger than 12 inches shall have a special epoxy coating meeting the requirements of AWWA C550.

Valve bodies shall be equipped with integrally cast mechanical joint ends meeting ANSI Specification A21.11 (AWWA C111), latest revision. Mechanical joints shall be fitted with ductile iron retainer glands with setscrews on ductile iron pipe.

Butterfly valves installed underground shall come equipped with the following manual operator. The required manual operators shall be of the traveling nut, self-locking type, designed to hold the valve in any intermediate position between fully open and fully closed without creeping or fluttering. Operators shall be equipped with mechanical stop-limiting devices to prevent over travel of the disc in the open and closed positions. Valves shall close with a clockwise rotation. Operators shall be fully enclosed and designed for buried operation.

Section 609.09 Gate Valves

Valves 16 inches and smaller shall be gate valves. These valves shall be non-rising stem design, cast iron or Ductile iron body, bronze mounted with a compression, resilient seat manufactured in accordance with AWWA Standard C509, latest revision. Valves shall be designed for a minimum working pressure of 200 psi and be tested to 400 psi. Gate valves

shall have two (2)-inch square operating nuts, except in meter vaults where hand wheels shall be installed. Valves shall have non-rising stems, shall open when turned counter-clockwise and shall meet AWWA Specifications for Class C valves. Where flange joints are used, flanges must meet the requirements of AWWA C115, latest revision. Valves sized 6" through 16" shall be Mueller Co. A-237020 with mechanical joints or approved equal. Mechanical joints shall be fitted with retainer glands and set screws on ductile iron pipe. Retainer glands shall be EBBA Mega-Lug, MJ Field Lok gasket or approved equal.

Section 609.10 Valve Boxes

Each valve shall be provided with a valve box. Valve boxes shall be approved standard cast iron, adjustable-shaft boxes having a minimum shaft diameter of 5-1/4 inches. The casting shall be coated with two (2) coats of coal tar pitch varnish. The lids of all boxes shall bear the word "Water" or the letter "W". Boxes shall be equal to Vulcan Pattern VVB-4.

Section 609.11 Air and Vacuum Relief Valve Assemblies

Air and vacuum relief valves shall be cast iron body and covers with bronze trim, stainless steel float, Buna-N-Seal, and shall be designed for a minimum working pressure of 150 psi.

The valve shall be designed to exhaust large quantities of air during the filling period and small quantities of air that collect in the line while operating under pressure. The valves shall be equal in all respects to Empire No. 950 combination air release valves.

Gate valves between water main and air relief valve shall be bronze, solid wedge with screw connection equal to Grinnel Company's Figure 103 or Jenkins Company Figure 370. Meter box shall be equal to DFW Style D-1200 or approved equal.

Section 609.12 Service Saddles

Service saddles shall be equal to ROMAC Style 202 double strap or approved equal. Taps in pipes larger than 3-inches shall be made with a tapping machine and a corporation stop shall be installed.

Section 609.13 Pipe Couplings

Pipe connections between new pipe and existing pipe shall be made with Dresser Style 90 long steel couplings for pipe sizes 2" and below; for pipe sizes above 2", M.J. solid sleeves (long style) shall be used. Spacer rings must be used at all solid sleeve locations. A spacer ring is defined as a short section of pipe cut to fit into the gap between the two plain ends of pipe at the sleeve location.

Section 609.14 Curb Stops and Wyes

All curb stops shall have locking devices. All metal parts of curb stops shall be made of bronze. The ¾ -inch and 1-inch stops shall be FIPT x compression Ford Model B43-232W, full port, or approved equal. The cock shall be operated with a combined cap and tee and shall open when turned counter-clockwise. Wyes shall be Ford Model Wye44 or approved equal.

Section 609.15 Corporation Stops

Corporation stops shall have threaded inlet and compression outlet connection. Threaded ends of inlet shall conform to AWWA C800. All metal parts of the corporation stop assembly shall be made of bronze conforming to ASTM B61 or B62. The stop shall be operated with a tee head and shall open when turned counter-clockwise. The corporation stop shall be a Ford F1000 or approved equal.

Section 609.16 PVC Casing Pipe

PVC casing pipe used for long-side services shall be schedule 40, a minimum of 1 inch larger in diameter than the service line, but no less than 2 -inches in diameter.

Section 609.17 Tapping Sleeves and Valves

Tapping sleeves shall be equal to Mueller, H-615/715 with tapping valve attached or approved equal. The sleeve/cross shall be sized to fit the intercepted pipe without leaking.

Section 609.18 Water Meters

Water meters smaller than 2" shall be furnished and installed by the City. Meters 2" and larger shall be furnished and installed by the Developer. All meters must be capable of reading accurately at low flows and must be approved by the City prior to installation. All meters shall read in gallons. All meters shall come equipped with a touch-read or touchless sensor compatible with the City's meter reading equipment,

Water meters ¾"- 1" shall be Sensus SRII or approved equal, and meters 2"- 4" shall be a Sensus SRH compound meter or approved equal. For water meters requiring flows greater than 500 GPM, developers shall use Sensus Fireline meters or approved equal. For meters 2"-4", the bypass shall be located inside the vault. For meters larger than 4", a portion of the bypass piping may be installed outside of the vault, with the valve on the bypass located inside the vault. All water meters must be located on the right-of-way and not on private property.

Section 609.19 Meter Boxes

Meter boxes for house services shall be made of plastic, having a tensile strength rating of between 4,500 and 8,200 psi and a compressive strength rating of 4,000 to 6,500 psi. The box shall be approximately 19" long, 13" wide and 12" deep. The lid shall be made of gray cast iron, free from blow holes, warp, projections, shrinkage cracks, porosity and other defects harmful to their use. The lid shall be coated with asphaltic paint and have a hole precut for the AMR pit lid module. Meter boxes shall be DFW Style D-1200 or approved equal.

Section 609.20 Unions and Adapters

All ¾ - inch adapters shall be CTS plastic nonflare x Male IPT adapter Hays 5605 CF. All 1-inch adapters shall be Hays 5605 DF, or Mueller H-15428. All ¾ - inch and 1-inch plastic unions shall be CTS plastic x CTS plastic 3-part nonflare union, Hays 5615 DR or Mueller H-

15403. "Y" Branch connections (yokes) shall be McDonald #08yst, full port, Mueller Co. H-15347 or approved equal.

Section 609.21 Backflow Prevention

1. All water meters shall be provided with a backflow preventer downstream of the water meter in a small 5-inch diameter valve box. Backflow preventers shall be furnished and installed by the Developer and owned and maintained by the water customer.
2. Fire lines shall be provided with a detector meter or a factory mutual fire meter, in accordance with the Fire Line Requirements outlined in Article II of this ordinance. Fire line meters and detector meters shall be designed to meet site specific conditions. See the Standard Details for conceptual layouts.
3. Reduced pressure zone backflow preventers with relief vents are required for high risk situations as determined by the Development Department. All reduced pressure zone backflow preventers shall be installed in vaults set above the ground with drains.

Section 609.22 Valve Markers

Valve markers shall be made of 3,000 psi concrete and shall be four (4) feet long and four (4) inches on each side, with four No. 4 reinforcing bars. The markers shall be set with an even number of feet between the centerline of the valve and the centerline of the aluminum disc in the top of the marker and the distance in feet between the valve and marker shall be stamped in the marker at the time of setting.

Section 609.23 Polyethylene Encasement

Polyethylene encasement shall be in tube form conforming to the requirements of ANSI/AWWA C105/A21.5 latest revision. The polyethylene film shall have the following characteristics:

Tensile Strength	1,200 psi minimum
Elongation	300 percent minimum
Dielectric Strength	800 V/mil thickness minimum
Thickness	Normal thickness of .0008 in. (8 mil.)

Polyethylene encasement shall be installed on ductile iron piping, fittings, and valves below grade whenever the water main crosses or is in close proximity to a steel gas main and where indicated on the drawings.

Section 609.24 Casing Spacers Steel Casing

Casing spacers shall be as manufactured by Cascade Waterworks Manufacturing Company, or approved equal. All casing spacers shall have a stainless steel shell with a PVC liner, minimum 0.09-inch thick having a hardness of 85-90 durometer. Casing Spacers shall be located within 5-feet of each end of the casing and there shall be two (2) spacers per joint

of pipe within the casing or per manufacturer's recommendations, whichever is more restrictive. The positioning of the casing spacers shall be centered for water mains.

Section 609.25 Retainer Glands

Retainer glands for mechanical joints shall utilize standard gaskets and bolts conforming to AWWA C111 and shall be EBAA Mega-Lug or approved equal.

Section 609.26 Pressure Reducing Valves

Pressure reducing valves shall be Watts Regulator 25 AUB or approved equal.

Section 609.27 Concrete for Thrust Blocks and Thrust Collars

Concrete for thrust blocks and thrust collars shall have a minimum compressive strength of 3,000 PSI at 28 days. They shall be used as a cradle or thrust blocking at all bends, fittings and at all changes in direction.

Section 609.28 Gaskets for Joint Restraint Inside Casings

Inside of casings, the D.I.P. water main joints shall be slip joint restrained by using U.S. Pipe "Field-Lok" gaskets or approved equal.

Section 609.29 Marking Tape

Marking Tape: All ductile iron and PVC water mains shall be marked by a plastic marking tape placed a minimum of 12" above the top of the pipe for its full length. The tape shall be similar to Reef Industries' Terra Tape Standard. It shall have sufficient thickness, tensile strength, elongation and resistance to alkalis, acids and other destructive agents to remain a permanent marker of the line buried below. The plastic tape shall be imprinted with a continuous message repeated every 16" to 36" "Caution: Water Line Buried Below". The message shall be in permanent blue ink. Marking tape shall be not less than 2" wide.

Section 609.30 Tracing Wire

Tracer wire shall be installed on all PVC and non-metallic pipelines and service lines in a continuous fashion. It shall be brought to the surface at each locator post. It shall be accessible from surface at all valve and meter boxes. At locations tracer wire surfaces between valves, regular valve box with plain lid and collar shall be installed between a pipeline marker pair. Tracer wire shall be 12 GA single strand or up to 7 stands, copper with insulation UL rated for direct bury underground service. Splices shall be UL rated for direct bury and shall be minimized. Wire for directionally drilled bores shall be a minimum of #8 gauge.

Section 609.31 Subgrade Stabilization

Stone Stabilizer for subgrade where needed shall be either approved crushed stone or gravel, uniformly graded from $^{3}/_{4}$" to 1 $^{1}/_{4}$" in size.

Section 610: Water System Construction

Section 610.01 General

1. It shall be expressly understood that these specifications are for installation of all underground water mains and appurtenances.
2. All work shall conform to the applicable provisions of the AWWA C600 and/or AWWA 0605 Specifications of latest revision except as otherwise specified herein.

Section 610.02 Trench Excavation

1. Trenches shall have a minimum width of 12-inches plus the diameter of the outside of the bell of the water main and the depth thereof shall be such that there shall be a minimum of 48-inches of cover measured below the roadway surface, natural ground, or proposed grade to the top of the pipe whichever is more restrictive. Maximum trench width at the top of the pipe shall not be more than the outside diameter of the bell plus two (2) feet. In cases where water lines cross above sanitary sewers, there shall be a minimum of 18 inches vertical separation between the water and sewer mains, In cases where a sanitary sewer crosses above water main, the sanitary sewer shall be DIP and encased in concrete. In cases where water mains parallel sewer mains there shall be a minimum of ten (10) feet horizontal separation maintained between the mains.
2. Trenches shall be dug so the pipe can be laid to the alignment and depth required and the trench shall be of such width and shall be braced and drained so the workmen may work therein safely and efficiently. No chocking under the pipe will be permitted. All joints shall be as specified herein. Excavation must be made under the bell of each pipe so the entire length of the pipe will lie uniformly on the bottom of the trench and the pipe weight shall not rest on the bells. Trenches shall be free of water during the work.
3. No excavation shall be made under highways, streets, alleys or private property until satisfactory arrangements have been made with the State, City, County or owners of the property to be crossed. All excavated material shall be placed so as to not interfere with public travel on the streets and highways along which the lines are laid. Not more than 100 feet of trench shall be opened on any line in advance of pipe laying.
4. All excavation shall be placed on one side of the trench, unless permission is given by the City to place it on both sides. Excavation materials shall be so placed as not to endanger the work and so that free access may be had at all times to all parts of the trench and to all fire hydrants or water valve boxes, etc. All shade trees, shrubs, etc. shall be protected.
5. The Contractor shall furnish, install and maintain such sheathing, bracing, etc. as may be required to support the sides of the excavation and to prevent any movement that might injure the pipe, or cause sloughing of the street or trench, or otherwise injure or delay the work or interfere with adjoining structures,
6. When possible, all crossings of paved highways or driveways shall be made by boring or jacking the pipe under the pavement and shall be done in such manner as not to

damage the pavement or subgrade, unless the casing or pipe is in solid rock, in which case the crossing shall be made by the open cut method or by tunneling.

7. Wherever streets, roads or driveways are cut, they shall be immediately backfilled and compacted after the pipe is laid and shall be maintained in first-class condition as passable at all times until repaved. Backfilling, compaction, dressing and clean-up shall be kept as close to the line laying crew as is practical and negligence in this feature of the work will not be tolerated.

8. In excavation and backfilling and laying pipe, care must be taken not to remove or injure any existing water, sewer, gas or other pipes, conduits or other structures. When an obstruction is encountered, the Developer shall notify the Designer, who will make necessary changes in grade and/or alignment to avoid such obstruction. Any house connection, drains or other structures damaged by the Contractor shall be repaired or replaced immediately.

9. All materials shall be considered as rock which cannot be excavated except by drilling, blasting or wedging. It shall consist of undecomposed stone in solid layers or of boulders of not less than 1/2 cubic yard. Wherever rock is encountered in the excavation, it shall be removed by suitable means. If blasting is used for removal of rock, the contractor shall take all proper safety precautions. He shall comply with all rules and regulations for the protection of life and property that may be imposed by any public body having jurisdiction relative to the handling, storing and use of explosives. He is fully responsible for paying for and acquiring any blasting permits which may be required by those agencies with such jurisdiction. Before blasting, the Contractor shall cover the excavation with heavy timbers and mats in such a manner as to prevent damage to persons or the adjacent property. Rock excavation near existing pipelines or other structures shall be conducted with the utmost care to avoid damage. The Contractor shall be wholly responsible for any damage resulting from blasting, and any injury or damage to structures or property shall be promptly repaired by the Contractor to the satisfaction of the City and property owner.

10. Drilling and blasting operations shall be conducted with due regard for the safety of persons and property in the vicinity and in strict conformity with requirements of all ordinances, laws and regulations governing blasting and the use of explosives. Rock excavation near existing pipelines or other structures shall be conducted with the utmost care to avoid damage. The contractor, to the satisfaction of the City and property owner, shall promptly repair injury or damage to other structures and properties.

11. Rock in trenches shall be excavated over the horizontal limits of excavation and to depths as shown in Table 6-2 below. The undercut space shall then be brought up to grade by backfilling with Size #57 crushed stone materials or approved equal.

TABLE 6-2
ROCK EXCAVATION DEPTHS

Size of Pipeline (inches)	Depth of Excavation Below Bottom of Pipe (inches)
4 and less	4
4 to 6	6
8 to 18	8
18 to 30	10
Over 30	12

12. In rock excavation, the backfill from the bottom of the trench to one foot above the top of the pipe shall be finely pulverized soil, free from rocks and stones. The rest of the backfill shall not contain over 75% broken stone and the maximum sized stone placed in the trench shall not weigh over 50 pounds. Excess rock and fragments of rock weighing more than 50 pounds shall be loaded and hauled to disposal. If it is necessary, in order to comply with these specifications, selected backfill shall be borrowed and hauled to the trenches in rock excavation.
13. Sides of the trench shall be trimmed of projecting rock that will interfere with backfilling operations. Rock excavation by blasting shall be at least 75 feet in advance of pipe laying.
14. Water lines shall have a minimum cover of 48 inches. All changes in grade shall be made gradually. At points of interference with storm sewers and cross drains, pipe will be run under the conflicting utility if the minimum cover cannot be maintained by going over the top of the pipe. Where the water main crosses beneath a storm sewer, there shall be a minimum of 12 inches clearance between the main and the storm sewer. The water main shall be D.I.P. at all such crossings.
15. When laying pipe across watercourses, railroad crossings, or depressions of any kind, the minimum depth specified above shall be maintained at the bottom of the depression.
16. Where necessary, the line shall be lowered at valves so the top of the valve stem is approximately one (1) foot below the finished grade. The trench shall be deepened to provide a gradual approach to all low points of the line.
17. After the pipe has been laid, backfilling shall be done in two (2) distinct operations. In general, all backfill beneath, around and to a depth of 12 inches above the top of the pipe shall be placed by hand in four (4)-inch layers for the full width of the trench and thoroughly compacted by hand with vibrating equipment. Care shall be taken so the pipe is not laterally displaced during backfilling operations. The backfill lifts shall be placed by an approved method in accordance with that hereinafter specified. Backfill materials shall be the excavated materials without bricks, stone, foreign matter or corrosive materials, where not otherwise specified or indicated on the plans.

18. Backfill under permanent concrete or bituminous pavement or floors and as elsewhere specified or indicated on the plans shall be approved bank-run sand or gravel or crushed stone, free from large stones and containing no more than 10% by weight of loam or clay. This backfill shall be compacted to 100% as determined by the Modified Proctor test for the top two (2) feet of trench and 95% by the Modified Proctor test from pipe bedding to two (2) feet below trench top. Mechanical vibrating equipment shall be used to achieve the required compaction,
19. Backfill under gravel or crushed stone surfaced roadways and low-type bituminous surfaced roadways shall be the approved suitable excavated material placed in 6-inch layers thoroughly compacted for the full depth and width of the trench, conforming to the compacting, density compaction method and materials as specified above.
20. Backfill in unpaved areas shall be compacted with mechanical vibrating equipment to 90% as determined by the Modified Proctor Test. Backfill material from pipe bedding to ground surface shall be excavated earth free from large stones and other debris.
21. The contractor shall fully restore and replace all pavement, surface structures, etc., removed or disturbed as part of the work to a condition equal to that before the work began.
22. Where sheeting is used in connection with the work, it is in no case to be withdrawn before the trench is sufficiently filled to prevent damage to banks, road surfaces, adjacent pipes, adjacent structures or adjacent property, public or private.
23. All costs associated with the compaction tests shall be the responsibility of the Developer.

Section 610.03 Laying of Pipe

1. All pipes shall be laid straight, true to line and grade. Bell and coupling holes shall be dug in the trench and the pipe shall have a continuous bearing with the trench bottom between bell or coupling holes. No shimming or blocking up of the pipe shall be allowed. When the work is not going on, all pipe openings shall be securely closed by the insertion of the proper size plug and caulking so dirt and debris will not be washed into the pipe in case of rain.
2. In making the joints with ductile iron pipe, the spigot end of the pipe and the inside of the bell shall be thoroughly cleaned and the gasket inspected to see that it is properly placed. Lubricant shall be applied to the spigot end of the pipe and it shall be inserted into the bell of the adjoining pipe to the stop mark on the pipe.

Section 610.04 Thrust Restraint for Pressure Lines

1. Underground pipe laid around curves, at all unsupported changes of direction, and all tees, wyes, crosses, plugs and other similar fittings shall be solidly and property blocked with concrete against solid earth. This blocking is designed to take the reaction of the main pressure and to prevent lateral movement of the pipe or fittings under pressure. Reaction blocking shall be installed at all locations requiring it and where tie rods and clamps are not called for in the plans. Concrete for reaction blocking shall have a minimum compressive strength of 3,000 psi at 28 days. The

blocking, unless otherwise shown, shall be placed so the pipe and fitting joints will be accessible for repair.

2. Reaction blocking shall be constructed in conformance with the Standard Detail Drawings for Thrust Blocking. Prior to blocking any joint or fitting with concrete, that joint or fitting shall be wrapped with polyethylene film in such a manner that the concrete will not stick directly to the fitting, but that the load bearing capacity of the blocking will not be affected.

3. Mechanical joint fittings on Ductile Iron Pipe shall be installed with retainer glands in compliance with the requirements of AWWA C600.

Section 610.05 Setting Valves and Fittings

1. Hydrants and Valves shall be set plumb. Valves shall have cast iron valve boxes and their operating stems shall be oriented to allow proper operation. The valve boxes shall be placed directly over the valve and set plumb and fully supported, the top of the box being brought to the surface of the ground and the operating nut set ± 1 foot below the finished grade. After the boxes are in place, earth shall be filled in the trench and thoroughly tamped around the box. After all settlement has taken place, a concrete collar shall be constructed for each valve box. Valve stem extensions shall be installed where valve operating nut is more than 3 feet below the finished grade.

2. Fittings shall be properly braced to ensure they will not be blown off or broken loose under the greatest possible working pressure. All fittings shall be mechanical joints unless specified otherwise. In situations where there is insufficient undisturbed earth to act as a bearing surface or where otherwise directed by the City, fittings shall be restrained by the use of threaded rods or other method acceptable to the City.

3. Prior to blocking any joint or fitting with concrete, the joint or fitting shall be wrapped with polyethylene film in such a manner that the concrete will not stick directly to the pipe but so the load bearing capacity of the blocking will not be affected. Polyethylene film shall be installed at other points along the water main where directed by the City.

4. Setting Hydrants, Valves, Valve Boxes and Fittings:

   a. General: Hydrants, valves and pipe fittings shall be set and jointed to new pipe in the manner heretofore specified for cleaning, laying and jointing pipe. Hydrants and valves shall be installed plumb. Valve-operating stems shall be oriented in a manner to allow proper operation.

   b. Setting Fire Hydrants: Fire hydrants shall be placed at the locations shown on the plans. Gate valves for the fire hydrants shall be connected directly to the main by means of a “Locked Hydrant Tee”. All other connections between the main and the fire hydrant shall be mechanical joint with ductile iron retainer glands. Fittings shall be restrained by a “Locked Hydrant Adapter” whenever the fire hydrant is located close enough to the main to allow its use. Care shall be

exercised that retainer glands are tightened sufficiently to secure the hydrants before pressure is put on the main. Not less than four cubic feet of No. 5 or No 57 stone shall be placed around the base of the hydrants, as shown in the Standard Detail Drawings. Before placing the hydrants, care shall be taken to see that all foreign material is removed from within the body. The stuffing boxes shall be tightened and the hydrant valve opened and closed to see that all parts are in first class working condition. All hydrant openings shall be kept capped, except when hydrant is being worked on.

When a fire hydrant has been constructed but is not yet in service, the Contractor shall provide and attaché to the fire hydrant, flags or collars indicating that the fire hydrant is not in service. Said flags or collars shall remain on the fire hydrant until it is put into service. Whenever an existing fire hydrant is taken out of service, whether temporarily or permanently, it shall be equipped with a flag or collar indicating that it is not in service. The contractor shall provide and install flags or collars as required and shall notify the Fire Department whenever the operating status of any fire hydrant changes.

FIRE HYDRANTS SHALL NOT BE OPERATED WITH ANY TOOL EXCEPT A SPECIFICALLY DESIGNED FIRE HYDRANT WRENCH. If the Contractor observes any other contractor or person operating a fire hydrant with an unapproved fire hydrant wrench, he shall report that fact to the City immediately. It is the Contractors' responsibility to insure that all new facilities are maintained in new condition until final completion of the project and acceptance by the City. Fire hydrants with damaged operating nuts shall not be accepted.

c. Valve Boxes: Cast iron valve boxes shall be firmly supported and maintained centered and plumb over the wrench nut of the gate or butterfly valve, with box cover. The top of the box shall be brought to grade. After the boxes are in place, earth shall be filled in around the valve box and thoroughly tamped. After settlement has taken place, a concrete collar shall be constructed for each valve box.

d. Valve Stem Extensions: Valve stem extensions shall be installed where valve operations nut is more than 3 feet below finished grade and shall be of sufficient length to place the operating nut between 2 feet and 3 feet below finished grade.

Section 610.06 Placing Steel Casing Pipe

1. Unless directed otherwise by the City, the installation of steel casing pipe shall be by the dry bore method. The hole is to be mechanically bored and cased through the soil by a cutting head on a continuous auger mounted inside the casing pipe. The installation of the casing and boring of the hold shall be done simultaneously by jacking. Lengths of pipe are to be full circumference and welded to the preceding section installed. Excavation material shall be removed and placed at the top of the working pit. Backfill material and methods of backfilling and tamping shall be as required as stated in this

Article. Carrier pipe shall be inserted within the casing by use of stainless steel casing spacers. Intervals shall be as recommended by the manufacturer or as stated herein. Inside of the casings, the water main joints shall be slip joint restrained by using EBAA MegaLug, US Pipe "Field-Lok" gaskets or approved equal.

Section 610.07 Marking of Valve Locations

1. Each main line water valve shall be marked by cutting a letter "V" in the curb. The "V" shall be turned to point toward the valve that may be either in the street or in the grass behind the curb. The letter height shall be four (4) to six (6) inches.
2. Concrete valve markers shall be set for main line water valves with an even number of feet between the center line of the valve and the center line of the aluminum disc in the top of the marker and the distance in feet between the valve and marker shall be stamped in the marker at the time of setting.

Section 610.08 Tape and Tracing Wire

1. Detection Tape: Marking tape shall be buried a minimum of 12” and a maximum of 18” below finish grade above all PVC and ductile iron pipes. The tape shall be placed during backfill.
2. Tracing Wire: Tracer wire will be installed on the top of all PVC pipes and looped up to surface level in all valve boxes and at all service laterals. Tracer wire shall be taped to the top of pipelines at a minimum of 5 ft intervals in a uniform, continuous manner. This tracing wire system shall be checked and tested by the Contractor, in the presence of the Engineer or OWNER, prior to acceptance of the water main installation. All equipment, meters, detectors, etc., needed for testing shall be furnished by the Contractor.

Section 610.09 Water Meter/Backflow Installation

1. The backflow preventer shall be installed by the Developer or his/her representative. The backflow preventer shall be installed in a separate 5-inch diameter box
2. Once the meter and appurtenances are installed, the box lid is closed. Often, during construction, lids are tossed to the side. This can cause the meter to freeze and break during winter months. If this happens, the Developer shall be responsible for a new meter and installation costs.
3. At the request of the Developer and after payment for the water tap, the meter and appurtenances may be installed by the City. It is the responsibility of the Developer to ensure that the boxes remain intact and undisturbed. If grade changes or material delivery results in altered or broken boxes, the Developer will be charged for the materials and labor needed for restoration.

Section 610.10 Dewatering Trenches

The contractor shall do all necessary pumping or bailing, build all drains and do all other work necessary at his own expense to keep the trenches clear of water during the progress of the work.

Section 610.11 Bracing, Sheeting and/or Shoring

Whenever the condition of the ground is such that it is necessary to protect the work, the street, the roadway or the workmen, the sides of the trench shall be supported with suitable bracing, sheeting and/or shoring to be furnished by the Contractor at his own expense.

Section 610.12 Locations and Protection of Existing Underground Utilities

It is the responsibility of the contractor to locate and protect the underground utilities. The contractor shall repair utility lines or services he damages at his own expense.

Section 610.13 Connection to Existing City Water System

1. Requirements for Fire Line Connections - All persons desiring a tap must make application at the City prior to the tap being made. The contractor shall furnish the following information when making application:
    a. Approved plans for the project.
    b. Copy of street or highway permit, if applicable.
    c. Meter size including detector meter, if applicable (City may require installation of a master meter at the point of tie-in if it is determined that a substantial water loss in the development may occur).
    d. Billing address and purchase order, if required.
    e. Plan and profile of meter installation larger than two (2) inches.
2. City Installs the Connection - The contractor will be billed for the tap plus an hourly rate, plus overhead costs, for the City's operator, his helpers, truck and any other equipment used if made by City forces. The Contractor shall furnish the following at the site:
    a. Tapping sleeve and valve installed on the line and ready for tapping.
    b. Proper traffic control devices and person(s) to direct traffic if required.
    c. Backhoe or lift capable of handling the tapping machine.
    d. Minimum of three (3) men to assist with the work.
3. Private Contractor Installs the Connection
    a. City personnel shall supervise the tap and associated work by private licensed utility contractor.
    b. All taps shall be made on wet line under pressure. Water service must be maintained at all times to commercial and industrial businesses.
    c. All taps to be made with saddles or tapping sleeves.

Section 610.14 Street Cuts

1. All paved roads will be bored and cased. A bore must be attempted before consideration will be given to cutting the street.
2. Existing roadways shall not be open cut unless written permission is granted by the governing authority or owner (e.g. City of Cornelia, Habersham County, GA DOT, etc.)
3. One lane of traffic shall be maintained open at all times. Lane closures shall be limited to time between 9 a.m. and 4 p.m.
4. The Contractor shall furnish traffic control devices and person(s) to direct traffic, if required. Traffic control per MUTCD, latest edition.
5. The above requirements may be altered with the written approval of the City in extenuating circumstances.
6. Assuming that a road bore has been attempted and failed, or that the Developer has received permission to open cut a road, pavement replacement shall adhere to the following guidelines:
    a. Removing and replacing pavement shall consist of removing the type of pavement and base encountered and replacing same to its original shape, appearance and riding quality, in accordance with the detailed plans. Where possible, all pipe under existing paved driveways will be either free bored or installed in casing. Free bores under driveways will be made with D.I.P. Casing will be required where the installation is under any roadway. Carrier pipe shall be D.I.P.
    b. Concrete pavement shall be replaced with pavement of a thickness equal to that removed, or 6" for driveways and 8" for roads, whichever is thicker. The concrete shall meet the specifications of the D.O.T. for concrete paving.
    c. Where bitumastic paving is replaced, a base course of 3,000 psi concrete shall be placed over the ditch line. The concrete shall be 6" thick for driveways and parking lots and 8" thick for public roads. The top of this base course shall be left with a rough float finish 1 1/2" below the surface of the existing paving. After the concrete has attained its strength, a tack coat of AC-15 or equal shall be applied at the rate of 0.25 gallons per square yard, and a plant mix surface course applied over this, and finished off level with existing pavement.
    d. Unless otherwise directed in writing, all pavement will be removed to a width of the trench plus 12" on each side as shown on the detailed drawings. Under normal circumstances, the maximum allowable trench width shall be the nominal diameter of the pipe plus 24 inches.

Section 610.15 Standard Drawings

Installation of fire hydrants, water valves, valve boxes, meters, long side services water lines, etc. shall be made in accordance with the applicable Standard Design Drawings in this Manual.

Section 610.16 Cleanup

1. The Contractor shall remove all unused material, excess rock and earth and all other debris from the construction site as closely behind the work as practical. If the Contractor fails to maintain clean-up responsibilities as directed by the City's designated representative, the City may choose to use their own staff to do so and then invoice the Developer for the work.
2. All trenches shall be backfilled and tamped before the end of each days work.
3. Prior to the final inspection, the Contractor shall do the following:
    a. Remove and dispose of, in an acceptable manner, all shipping timbers, shipping bands, spacers, excess materials, broken, material, crates, boxes and any other material brought to the job site.
    b. Repair or replace any work damaged by the water line construction.
    c. Regrade and smooth all shoulder areas disturbed by the construction.
    d. Pour concrete collars around all valve boxes outside paved areas.
    e. Ensure that all fire hydrants are set to grade and that all valves have been located and are fully open.
    f. All easement areas shall be cleared of trees, stumps and other debris and left in a condition such that the easement can be maintained by bush-hog equipment.
4. All shoulders, ditches, culverts and other areas impacted by the water main construction shall be at the proper grades and smooth in appearance.
5. A uniform stand of grass or mulch for erosion protection, as defined in the *Manual for Erosion and Sediment Control in Georgia*, is required over all road shoulders and water main easements prior to the City's acceptance of the water main.
6. If work is performed on a Georgia DOT or Habersham County Right of Way, a letter from the governing agency is required to be submitted after construction is complete stating that grassing, clean-up, drainage, etc, is acceptable.

Section 610.17 Interruption of Water Supply During Construction

A minimum of two (2) hours advance notice shall be given to any occupied building served by a water line that is required to be shut off. Occupants shall be informed of the date, time of cutoff and the duration of stoppage. Failure to do so will make the contractor liable for any damages reported to the City. For outages affecting several customers, notice shall be prepared and placed with local news media and to be coordinated with Development Department at least 24 hours (preferably 48 hour or more) prior to the interruption.

Section 611: Inspection and Tests

Section 611.01 Scope

This section pertains to the inspection and testing of installed water lines requiring testing to assure proper operation and service.

1. All lines designed to operate under pressure shall be successfully tested. Tests of installed piping shall consist of leakage and disinfection tests.
2. All piping to be tested must satisfactorily comply with the pressure tests before being eligible for acceptance.
3. Tests shall be conducted in accordance with AWWA Standard C-600 & C-651 except as otherwise herein specified,

Section 611.02 Leakage Testing

1. After all piping has been placed, but prior to the placement of pavement, the Contractor, in the presence of a City inspector or their representative, shall test each valved section of newly laid pipe. Tests shall be continued until all leaks have been made tight to the satisfaction of the inspector. The Contractor shall furnish all necessary meters, pumps, gauges, bulkheads and other materials and appliances necessary to conduct the required tests. Every precaution must be taken to valve-off or otherwise protect control equipment in or attached to the pipeline to prevent damage or injury thereto.
2. Before applying the specified test pressure, all air shall be expelled from the pipe. If hydrants, blow-offs or air release valves are not available at the high places, the contractor shall make the necessary taps at points of highest elevation before the test is made and insert plugs after the test has been completed.
3. Prior to the pressure test, pipe laid in trenches shall be adequately backfilled to secure the pipe during the test. Any observed leakage shall require corrective measures to pipe lines and/or joints as to the satisfaction of the Inspector.
4. The City will furnish the necessary water for testing and disinfection of the lines. However, any water lost through breakage of lines, or unnecessary or excessive flushing of lines, will be charged to the contractor at the current residential rate. All lines shall be tested to a minimum of 1.5 times the working pressure, but not less than a pressure of 200 psi (whichever is greater) for a minimum time of two (2) hours. Test pressure shall not vary by more than ± 5 psi for the duration of the test. This may require periodic pumping, in which case the added water will be counted as part of the leakage. Lines shall be tested in sections between the valves. Allowable leakage amounts are found in Table 6-3 below. Only the Administrative Officer with input from the City Engineer can allow any variances to the limits presented below.

    a. Permissible Leakage: Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, of any valved section thereof, to maintain the specified leakage test pressure after the pipe has been filled with water and the

air in the pipeline has been expelled. No installation will be accepted if leakage is greater than that determined by the formula:

For PVC Installations: $L = \frac{ND(P)^{0.5}}{7,400}$ Where:

L is the allowable leakage, in gallons per hour; N is the number of joints in the length of pipeline tested; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in pounds per square inch gauge.

For Ductile Iron Installations: $L = \frac{ND(P)^{0.5}}{133,200}$ Where:

L is the allowable leakage in gallons per hour; N is the length of pipeline tested in feet; D is the nominal diameter of the pipe in inches; and P is the average test pressure during the leakage test in pounds per square inch gauge.

Leakage values determined by the above formulas are to be found in the following Table.

Allowable Leakage for Water Main Installation (Per 1,000 ft) in Gallons per Hour

Average Test Pressure in Pipeline

TABLE 6-3
Allowable Leakage Table (gph/1,000 LF of pipeline*)

Nominal Pipe Diameter, Inches	150 PSI		200 PSI	
	PVC	DI	PVC	DI
4"	0.33	0.37	0.38	0.43
6"	0.50	0.55	0.57	0.64
8"	0.66	0.74	0.76	0.85
10"	0.83	0.92	0.96	1.06
12"	0.99	1.10	1.15	1.28
14”	1.16	1.29	1.34	1.48
16”	1.32	1.47	1.53	1.70
18”	1.49	1.66	1.72	1.91
20”	1.66	1.84	1.91	2.12
24”	1.99	2.21	2.29	2.55

**If the pipe line under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage of each size.*

Section 611.03 Correction

Any section of the line not meeting the above test shall have the leaks found and corrected at once and retested until the leakage falls within the allowable limits. Leakage testing must be witnessed and approved by the City.

Section 611.04 Disinfection

After leakage testing and all necessary repairs have been made, all new water lines shall be flushed clean and then disinfected in accordance with AWWA Standard For Disinfecting Water Mains, C651 latest edition, subject to the following special conditions:

1. The method of disinfection shall be the Continuous — Feed Method in accordance with AWWA C651, Section 5.2. The Contractor shall furnish all labor, equipment and material necessary for the complete disinfection of the new water mains. The City will furnish the necessary water for flushing and disinfecting the new water main one (1) time. Any water lost from unnecessary or excessive flushing of lines, re-chlorinating and re-testing of water lines, or from failed bacteriological testing will be charged the contractor at the current residential rates.
2. Before the main is chlorinated, it shall be filled to eliminate air pockets and flushed to remove particulates. Potable water shall be supplied through a temporary connection that shall include an appropriate cross-connection device for backflow prevention to the active distribution system. The flushing velocity in the main shall not be less than 2.5 ft/s. Table 6-4 shows the rates of flow required to produce a velocity of 2.5 ft/s in commonly used sizes of pipes. For mains 24-inches and larger, an acceptable alternate to flushing is to broom sweep the main, carefully removing all sweeps prior to chlorination.

Table 6-4

Required flow to flush pipelines

with a residual pressure of 40 psi

Flow Required to Produce ± 2.5 ft./s		Number of 2 ½-in Hydrant Outlets
Pipe Diameter	Velocity in Main	
in.	*gpm*	
4	100	1
6	200	1
8	400	1
10	600	1
12	900	2
16	1,600	2

3. The form of chlorine may be either: a one (1) percent solution made from either sodium hypochlorite or calcium hypochlorite which shall be measured and pumped into the pipeline. AWWA C651 requires the injection point be located at a point not more than 10 feet from the point of connection to the existing water supply. The

chlorine should be fed at a constant measured rate such that the water will have not less than 25 mg/L free chlorine. Table 6-5 gives the amount of chlorine required for each 100 feet of pipe of various diameters to produce a 25 mg/L, concentration. The chlorinating agent may be injected into the main through a corporation stop tapped into the newly laid main. The potable water shall be chlorinated so after a 24-hour holding period in the main, there will be a free chlorine residual of not less than 10 mg/L.

Table 6-5
Chlorine required to produce 25-mg/L
Concentration in 100 ft. of pipe by diameter

Pipe Diameter	100% Chlorine	100% Chlorine Solution
in.	lbs.	gal.
4	.013	.16
6	.030	.36
8	.054	.65
10	.085	1.02
12	.120	1.44
16	.217	2.60

4. During the 24-hour disinfection period, all valves and hydrants in the treated section shall be operated to ensure disinfection of the appurtenances. After 24-hours, the line, shall be flushed until the chlorine content is not more than 0.1 parts per million in excess of the residual in the water from the supplying main and in no event not less than 0.2 (ppm). Samples of the water shall be taken at various points along the line. The contractor should deliver the samples to an independent laboratory. The laboratory must be pre-approved by the City and hold appropriate certification from Georgia Environmental Protection Division.

5. The City must witness all flushing, disinfection, sampling and dechlorination work. The contractor shall outline his planned procedures for these tasks and obtain approval of the City before commencing this work. Documentation of the pressure tests, results, dates and method of disinfection and results of disinfection must be furnished to the City prior to any final acceptance of the new water main.

6. Dechlorination. - After the disinfection process has been completed and the contractor elects to dechlorinate, the heavily chlorinated water shall be flushed from the main until measurements show that the chlorine concentration in the water leaving the main is no higher than that generally prevailing in the distribution system or is acceptable for domestic use. The area where the chlorinated water is to be discharged shall be inspected. If there is any possibility that the chlorinated discharge will cause damage to the environment, then a neutralizing chemical shall be applied to the water to be wasted to neutralize thoroughly the chlorine residual remaining in the water.

7. The chlorine residual of water being disposed may be neutralized by treating the water with one of the chemicals listed in Table 6-6 below:

TABLE 6-6
Water Neutralizing Chemicals*

Chemical	Residual Chlorine Concentrations mg/l	Sulfur Dioxide lbs.	Sodium Bisulfite lbs.	Sodium Sulfite lbs.	Sodium Thiosulfate lbs.
Amounts	1	0.8	1,2	1.4	1.2
	2	1.7	2.5	2.9	2.4
	10	8.3	12.5	14.6	12.0
	50	41.7	62.6	73.0	60.0

❖ *Amounts of chemicals required to neutralize various residual chlorine concentrations in 100,000 gal. of water.*

Section 611.05 Contractor Qualifications

1. Licensing and Safety: All contractors who work on water systems that will be owned by the City must be licensed as a "Utility Contractor" in accordance with State of Georgia law and local ordinance. Compliance with applicable safety regulations is the responsibility of each company engaged in the work. The City shall assume no responsibility for the actions of others on the job site It is the responsibility of those installing water mains and related appurtenances to conform to OSHA regulations, 29 CFR Part 1926, Subpart P, Paragraph 1926.650 through 1926.653 (publications from OSHA can be obtained by contacting OSHA Publications Distribution, Washington, D.C.).
2. Contractors performing water system installations must be approved by the City and shall be completely familiar with the procedures and contract requirements associated with this type project.
3. Unsatisfactory work may result in the loss of privilege for future work in the City of Cornelia.

Section 611.06 Construction Observer

1. Responsibility for Inspection: The Developer's contractor will be responsible for the quality, accuracy and workmanship of his completed work
2. The City may utilize their engineer to observe the project. If so, the City has the option of billing the developer at the same rate or amount that the City has been billed by their consulting engineer,
3. City personnel will visit the job site on a periodic basis and make spot checks, as they deem appropriate. The City shall have the right to review and observe all construction and may reject any work that does not meet quality control standards.
4. Project Access: Authorized representatives of the City, which may include employees, city engineering consultant, state or federal agencies shall have access to the site for observation at all times.

5. The Developer, contractor(s) and the Developer's design professional will be required to attend a pre-construction conference with the City. At the pre-construction conference, the contractor will submit to the city, in writing, the date they proposed to begin construction. The contractor shall provide notification by phone any time the work is to be vacated and will provide notice by phone prior to resuming work.
6. The Developer's professional shall request the final inspection.
7. The City inspector may have informal verbal communications with the contractor foreman or superintendent at any time during construction. The City inspector will not direct the actions of contractor's workmen.

Section 611.07 Communications During Construction

All written communications regarding construction shall be directed to:

City of Cornelia
Mailing address: P.O. Box 785
Cornelia, GA 30531
Located at: 181 Larkin Street
Cornelia, GA 30531

Phone: 706-778-8585
FAX: 706-778-2234

Section 611.08 Concealed Work

The City inspector may direct the contractor to notify the City and receive inspection approval prior to concealing certain work such as valves, tees, fire hydrants, pipe bedding, reaction blocking, lot services, or other appurtenances.

Section 611.09 Minimum Inspection

The following minimum inspections and tests will be performed and certified by the professional employed by the Developer to perform quality control checking on the construction work:

1. Horizontal location of the mains shall be checked by measuring distance from the back-of-curb to the main. Main sizes, valve, hydrant, service location and reaction blocking shall be checked.
2. Compaction testing shall be required for mains constructed in paved areas or where pavement is planned. A minimum of two (2) tests at each road crossing shall be conducted at varying depths. If any of these tests show failing results, then the failing backfill will be removed, re-compacted and re-tested and one additional area will be tested as well.
3. Pressure and disinfection tests shall be observed until each test is passed.

Section 611.10 Final Inspections and Conditional Acceptance

1. The Developer's design engineer shall furnish the City as-built drawings and easements. An affidavit shall be furnished to the City stating that all work on the project has been substantially completed in accordance with the approved plans and specifications. After receipt of this affidavit, the City will schedule a final inspection. A representative of the Developer's design professional and the contractor will be present during this final inspection. The final inspection will generally include spot checks of hydrants, valves and other appurtenances and a complete overview of the project. All valves shall be operated to ensure all valves are in the fully open position.
2. Once all discrepancies are corrected, the City will issue a letter certifying conditional acceptance of the water system. This letter shall commence the start of the 24-month warranty period, which is required of the contractor.
3. On projects having phased development, this letter will allow the developer to apply for a permit for the next phase of development.
4. At the end of 24 months, the subdivision inspection team will re-inspect the entire development. When all discrepancies have been corrected, the City will issue an acceptance letter and will begin perpetual maintenance and operation of the water system.

Section 611.11 Maintenance and Payment Bond

The Developer shall post a maintenance bond, on the facility for a two (2)-year period after completion and conditional acceptance of the facility by the City. In addition, the Developer shall post a payment bond on the facility for all subcontractor and material supplier work.

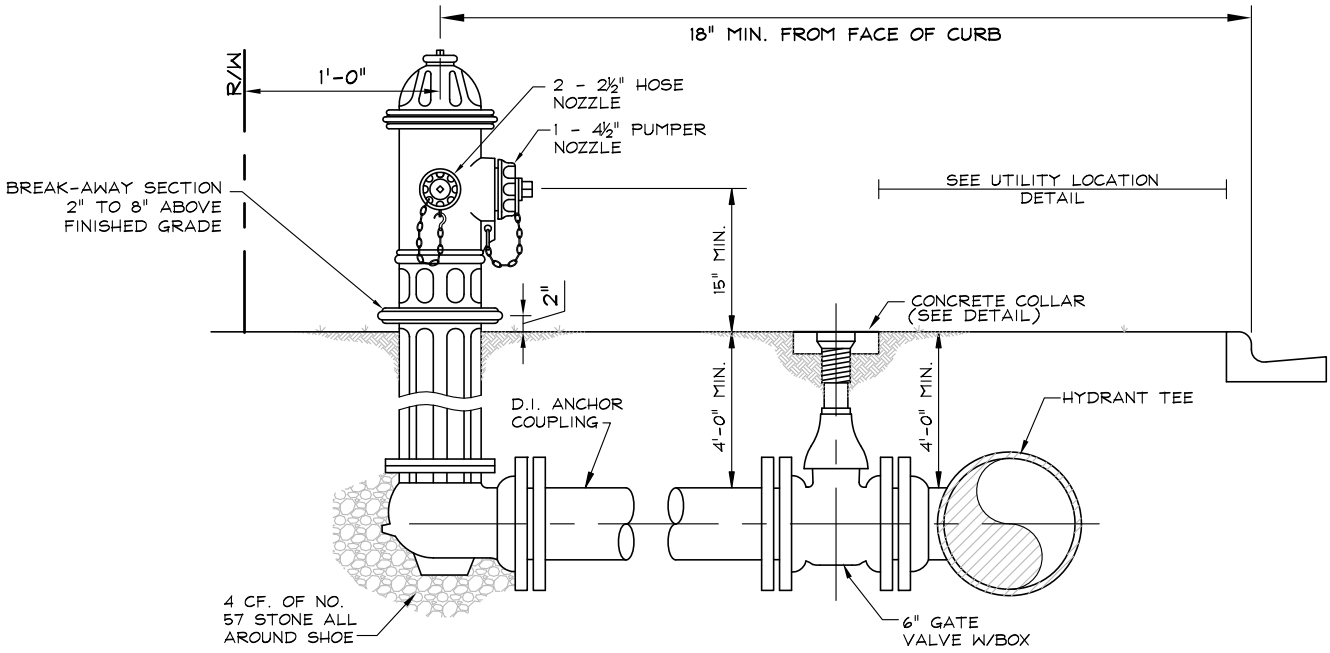
Section 611.12 Maintenance Until Final Acceptance

It shall be the Developer's obligation to provide all maintenance for a two (2)-year period after acceptance of the project by the City. The developer must notify the City three months prior to the end of the 2-year period to schedule the final inspection. The City shall then inspect the water system, and upon correction by the Developer of all deficiencies noted by the City, the City will accept the system for operation at the end of the 2-year period.

Section 611.13 Compliance with Other Agencies

No part of these specifications is intended to relieve the developer of his responsibility to comply with requirements of the Georgia DOT, the Georgia EPD or other appropriate agencies.

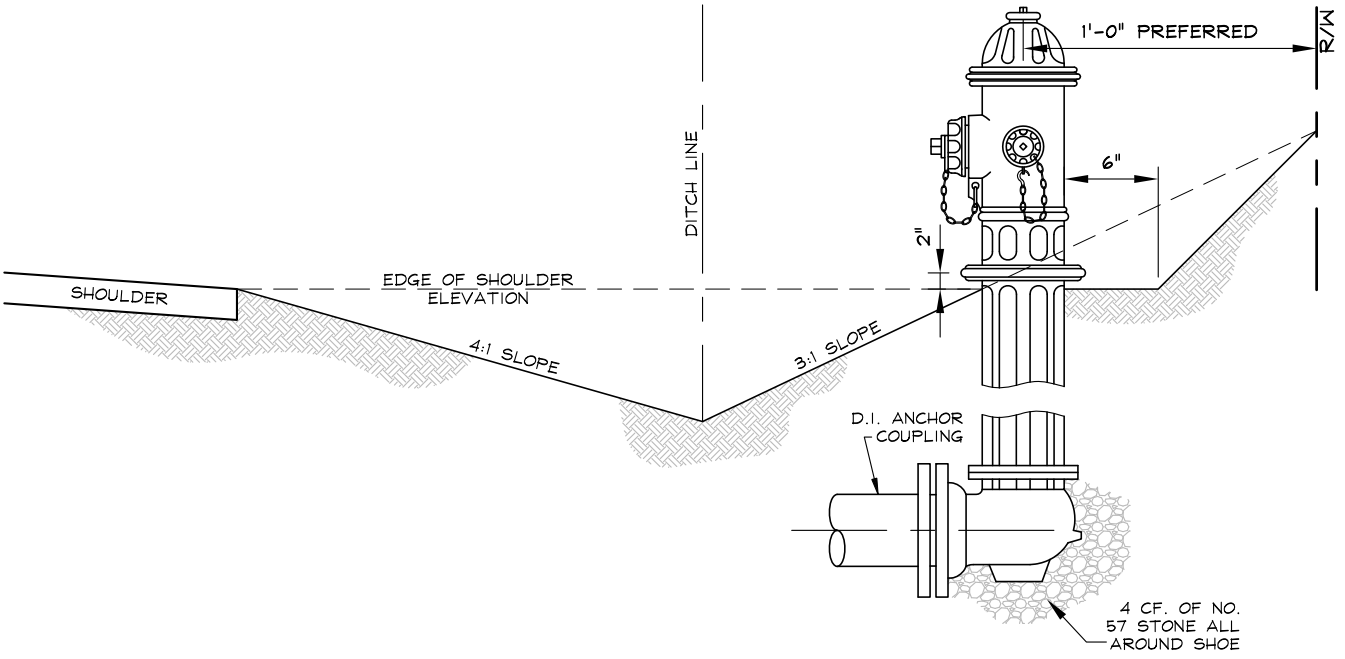
End Article VI



TYPICAL SECTION W/ CURB & GUTTER

NOTES:

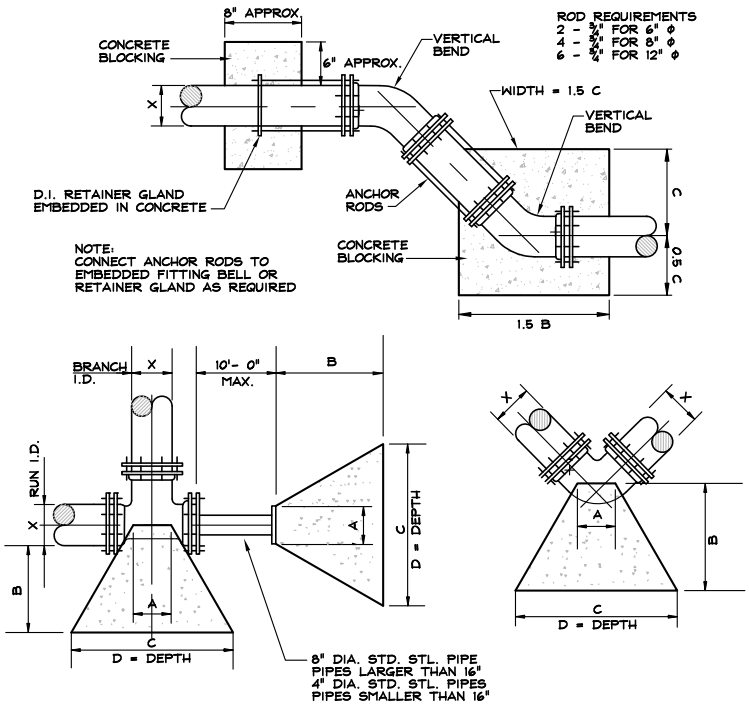
1. PUMPER NOZZLE TO FACE STREET.
2. HYDRANT SHALL NOT BE SET ON THE CURB SIDE OF WATER MAIN.
3. ADJUST VALVE BOX TO FINISHED GRADE.
4. CONCRETE COLLAR REQ'D AROUND VALVE BOX EXCEPT IN PAVED AREAS.
5. GRAVEL TO BE PLACED AROUND HYDRANT DRAIN, MINIMUM 2 FT. x 1 FT. x 2 FT.
6. NO HYDRANT SHALL BE INSTALLED SO THAT ANY PART OF THE HYDRANT IS IN CONFLICT WITH A SIDEWALK.



TYPICAL SECTION WITHOUT CURB & GUTTER

CITY OF CORNELIA
Where nature's your neighbor

TYPICAL FIRE HYDRANT SETTING	DATE: OCTOBER 2014 SCALE: N.T.S.
STANDARD DETAILS WATER SYSTEM CONSTRUCTION	STANDARD 600 - 1



BLOCKING DIMENSIONS

90° BEND

BENDS				
X	A	B	C	D
30"	2'-0"	11'-6"	15'-3"	6'-0"
24"	2'-0"	7'-9"	10'-9"	5'-6"
20"	1'-9"	6'-0"	8'-6"	5'-0"
16"	1'-3"	4'-0"	6'-0"	4'-6"
12"	10"	2'-9"	4'-0"	4'-0"
10"	10"	2'-6"	3'-9"	3'-0"
8"	8"	1'-9"	2'-6"	2'-6"
6"	6"	1'-3"	2'-0"	2'-0"
4"	4"	1'-0"	1'-6"	1'-6"

45° BEND

BENDS				
X	A	B	C	D
30"	1'-6"	7'-6"	10'-0"	5'-0"
24"	1'-3"	5'-9"	8'-0"	4'-0"
20"	1'-0"	4'-9"	6'-8"	3'-6"
16"	1'-3"	3'-3"	5'-0"	3'-3"
12"	10"	1'-9"	3'-0"	2'-9"
10"	10"	1'-9"	3'-0"	2'-0"
8"	8"	1'-6"	2'-0"	2'-0"
6"	6"	1'-3"	1'-6"	1'-6"
4"	4"	1'-0"	1'-0"	1'-0"

22-½° BEND

BENDS				
X	A	B	C	D
30"	1'-0"	4'-8"	6'-4"	4'-0"
24"	1'-0"	3'-0"	5'-0"	3'-6"
20"	1'-0"	2'-6"	4'-4"	3'-0"
16"	1'-0"	1'-9"	3'-0"	2'-6"
12"	10"	1'-3"	2'-3"	2'-0"
10"	10"	1'-0"	2'-0"	1'-6"
8"	8"	1'-0"	1'-9"	1'-9"
6"	6"	1'-0"	1'-6"	1'-6"
4"	4"	1'-0"	1'-3"	1'-3"

11-¼° BEND

BENDS				
X	A	B	C	D
30"	1'-0"	2'-10"	4'-3"	3'-0"
24"	1'-0"	2'-6"	3'-8"	2'-6"
20"	10"	2'-0"	3'-0"	2'-0"
16"	16"	1'-8"	2'-6"	1'-6"
12"	8"	1'-0"	1'-6"	1'-6"
10"	10"	1'-0"	1'-6"	1'-0"
8"	8"	1'-0"	1'-6"	1'-0"
6"	6"	1'-0"	1'-0"	1'-0"
4"	4"	1'-0"	1'-0"	9"

TEES & DEAD ENDS

X	A	B	C	D
30"	3'-0"	8'-9"	13'-0"	5'-0"
24"	2'-6"	7'-3"	10'-8"	3'-9"
20"	2'-0"	5'-3"	8'-0"	3'-6"
16"	1'-0"	4'-8"	6'-4"	3'-0"
12"	10"	2'-9"	4'-6"	2'-6"
10"	10"	2'-0"	3'-3"	2'-6"
8"	8"	1'-9"	2'-6"	2'-0"
6"	6"	1'-3"	2'-0"	1'-6"

NOTE: 200 P.S.I. TEST PRESSURE
SOIL BEARING OF 2500 P.S.F.
3000 P.S.I. CONCRETE
PIPE LESS THAN 4" IN DIAMETER
SHALL HAVE THE SAME REQUIREMENTS
AS 4" DIAMETER PIPE

CITY OF CORNELIA
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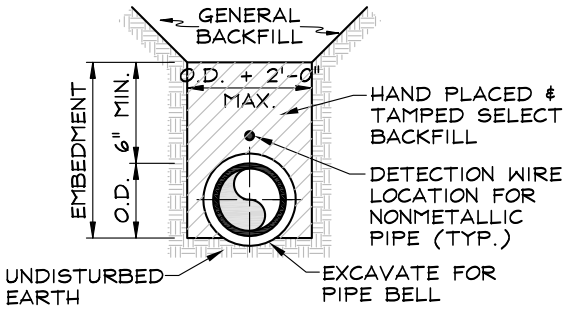
THRUST BLOCK DETAIL

DATE: APRIL 2014
SCALE: N.T.S.

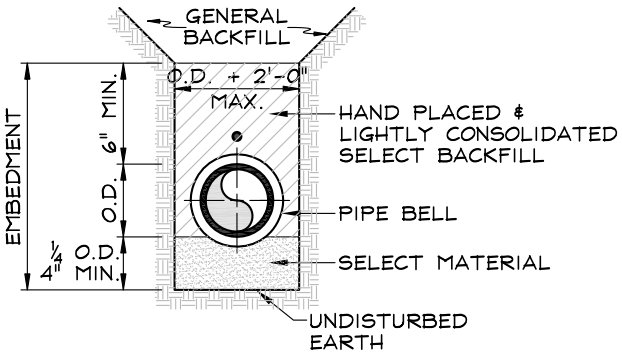
STANDARD DETAILS
WATER SYSTEM CONSTRUCTION

STANDARD 600 - 2



TYPE 2

(FLAT BOTTOM TRENCH)

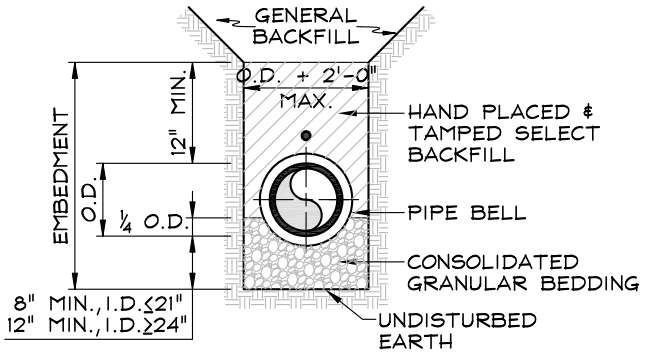


TYPE 3

(LOOSE SOIL BEDDING)

NOTES

1. TYPE 2 CAN ONLY BE USED IN DRY EARTH TRENCHES.
2. IF ROCK IS ENCOUNTERED OR OVER EXCAVATION OCCURS, TYPE 4 SHALL BE USED.
3. TYPE 1 & TYPE 5 DO NOT APPLY TO WATER MAINS AND ARE NOT SHOWN
4. SEE ARTICLE VI FOR ADDITIONAL REQUIREMENTS.



TYPE 4

(GRANULAR BEDDING)

CITY OF CORNELIA
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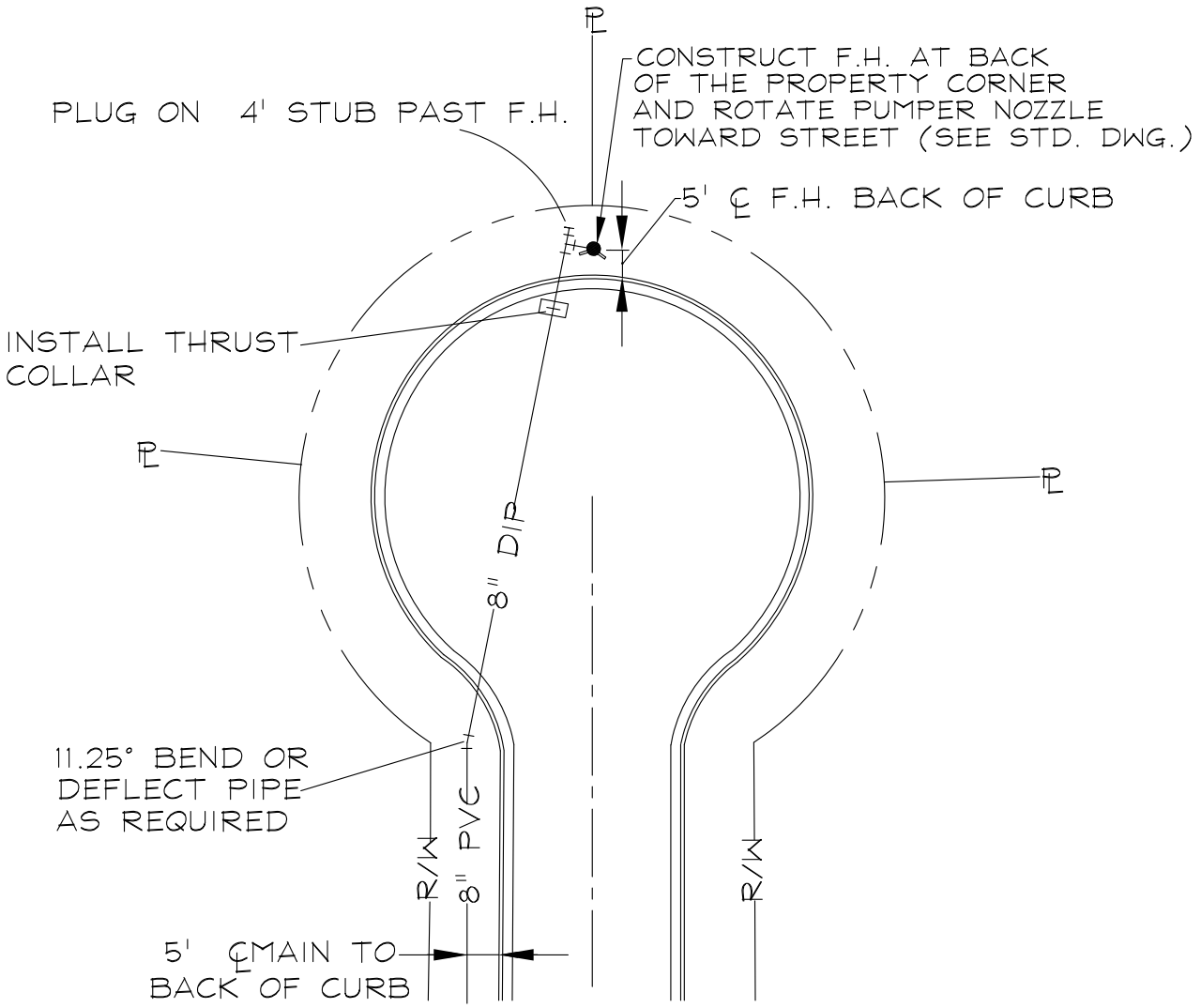
PIPE BEDDING AND HAUNCHING
GRAVITY AND PRESSURE PIPES

STANDARD DETAILS
WATER SYSTEM CONSTRUCTION

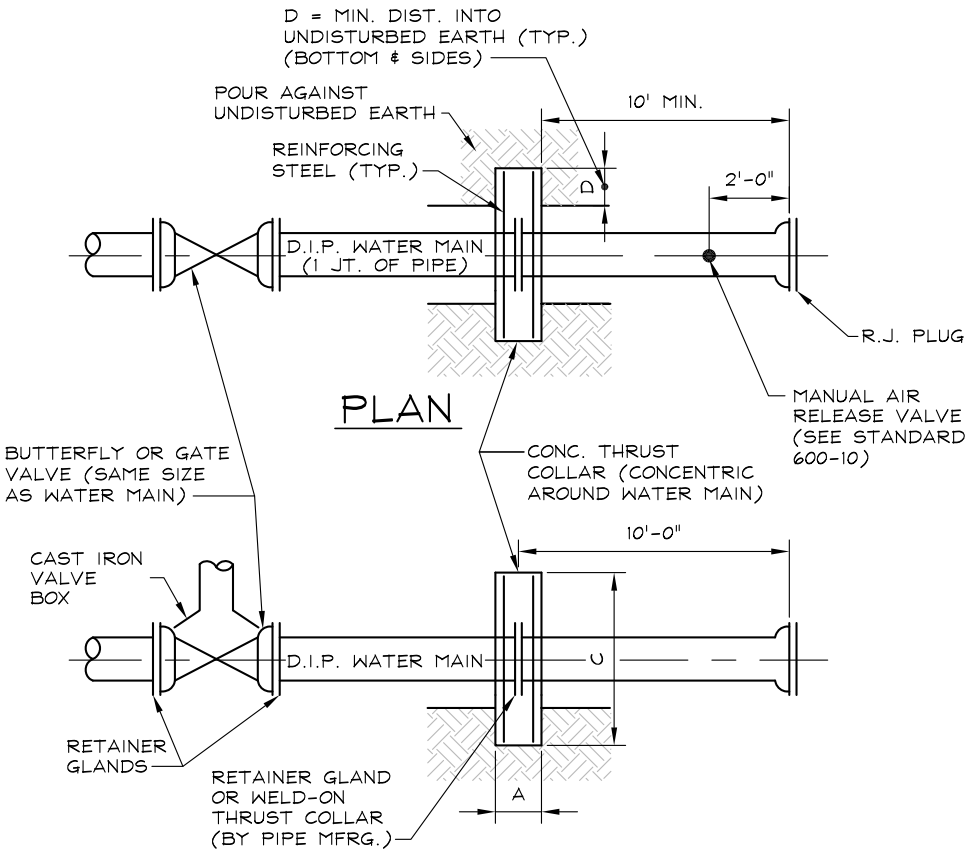
DATE: APRIL 2014
SCALE: N.T.S.

STANDARD 600 - 3



CUL-DE-SAC

CITY OF CORNELIA Where nature's your neighbor	WATER MAIN LOCATION SUBDIVISION STREET	DATE: APRIL 2014 SCALE: N.T.S.
	STANDARD DETAILS WATER SYSTEM CONSTRUCTION	STANDARD 600 - 4



SECTION

MAIN DIA	CONCRETE COLLAR DIM.				REINFORCING STEEL
	A	B	C	D	
16"	1'-3"	6'-6"	6'-6"	1'-6"	#8 @ 12" O.C. E.W.E.F.
12"	1'-2"	5'-3"	5'-3"	1'-0"	#7 @ 12" O.C. E.W.E.F.
6" or 8"	1'-0"	4'-0"	4'-0"	0'-8"	#6 @ 12" O.C. E.W.E.F.

TEST PRESSURE: 150 P.S.I.
SOIL BEARING PRESSURE: 3000 P.S.F.

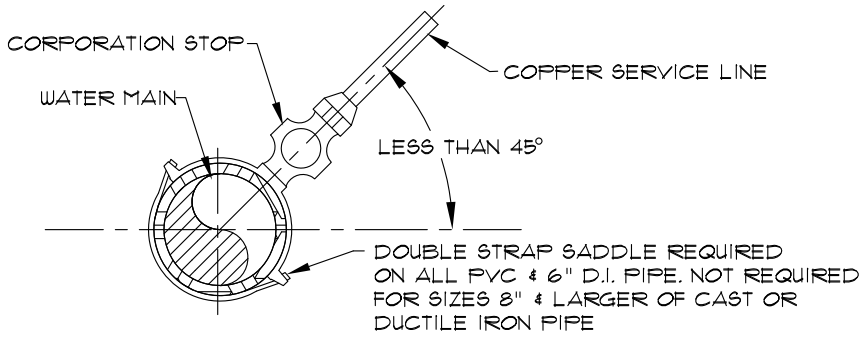
CITY OF CORNELIA
Where nature's your neighbor

WATER MAIN TERMINATION

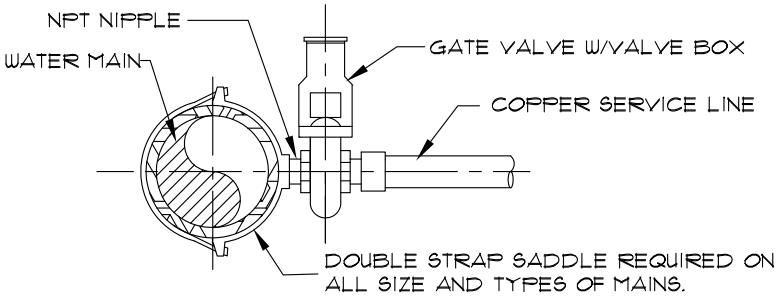
DATE: APRIL 2014
SCALE: N.T.S.

STANDARD DETAILS
WATER SYSTEM CONSTRUCTION

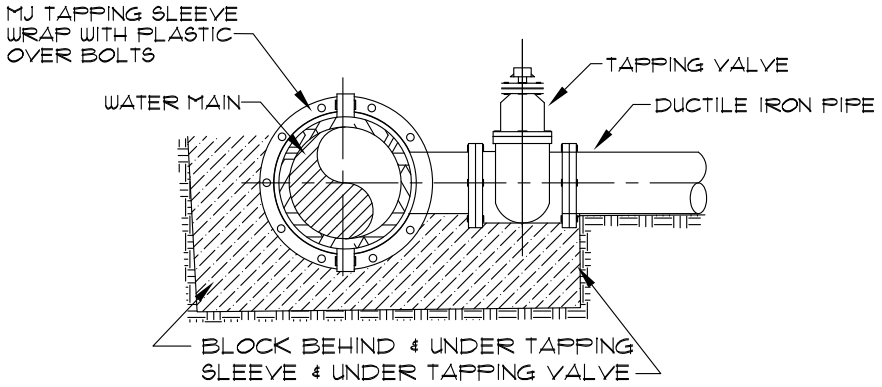
STANDARD 600 - 5



3/4" & 1" SERVICE CONNECTIONS



1 1/2" & 2" SERVICE CONNECTIONS



3" SERVICE CONNECTIONS

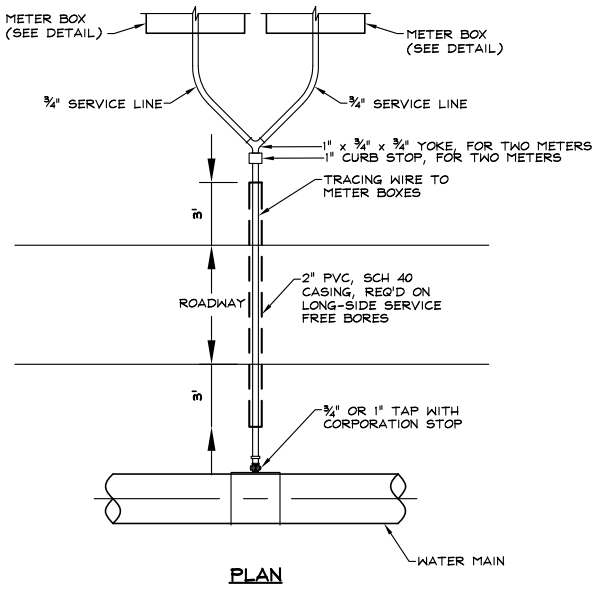
CITY OF CORNELIA
Where nature's your neighbor

CONNECTIONS TO WATER MAIN

STANDARD DETAILS
WATER SYSTEM CONSTRUCTION

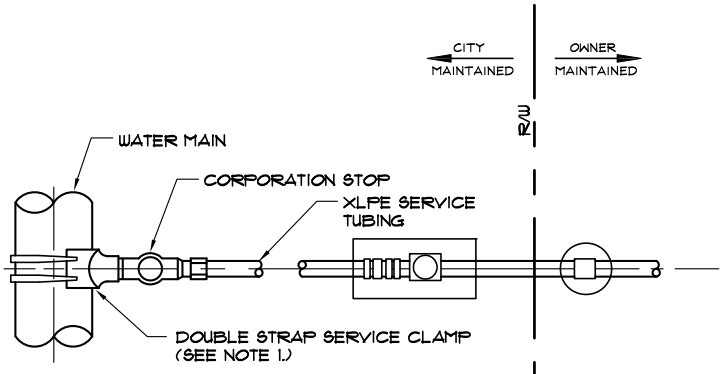
DATE: APRIL 2014
SCALE: N.T.S.

STANDARD 600 - 6

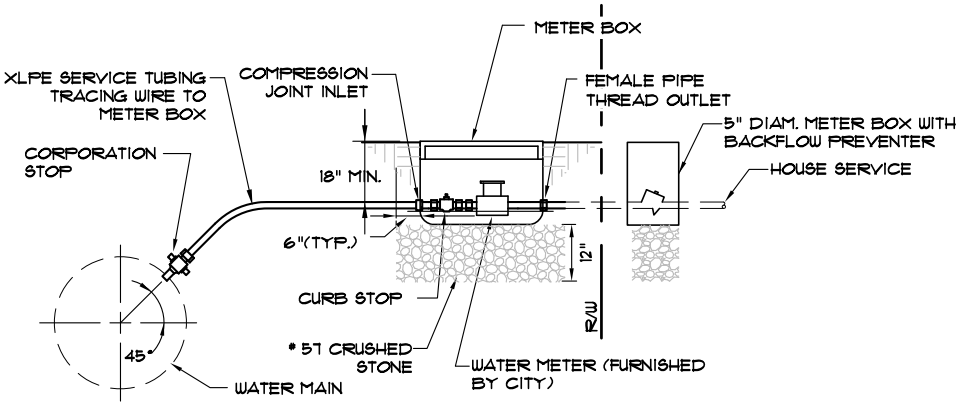


PLAN

LONG SIDE SERVICE



PLAN



ELEVATION

NOTE:
DOUBLE STRAP SADDLE REQUIRED ON ALL PVC & 6" D.I. PIPE. NOT REQUIRED FOR SIZES 8" & LARGER D.I. PIPE.

CITY OF CORNELIA
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3/4" OR 1" WATER SERVICE & METER CONNECTION

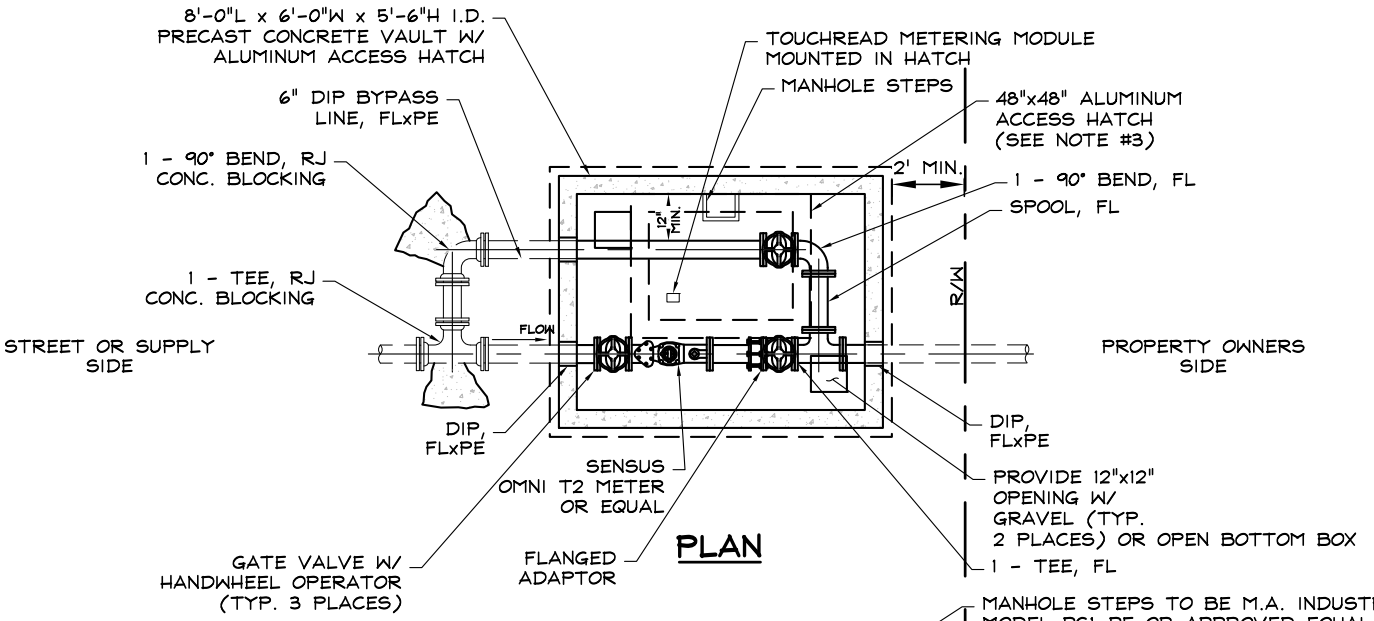
DATE: APRIL 2014
SCALE: N.T.S.

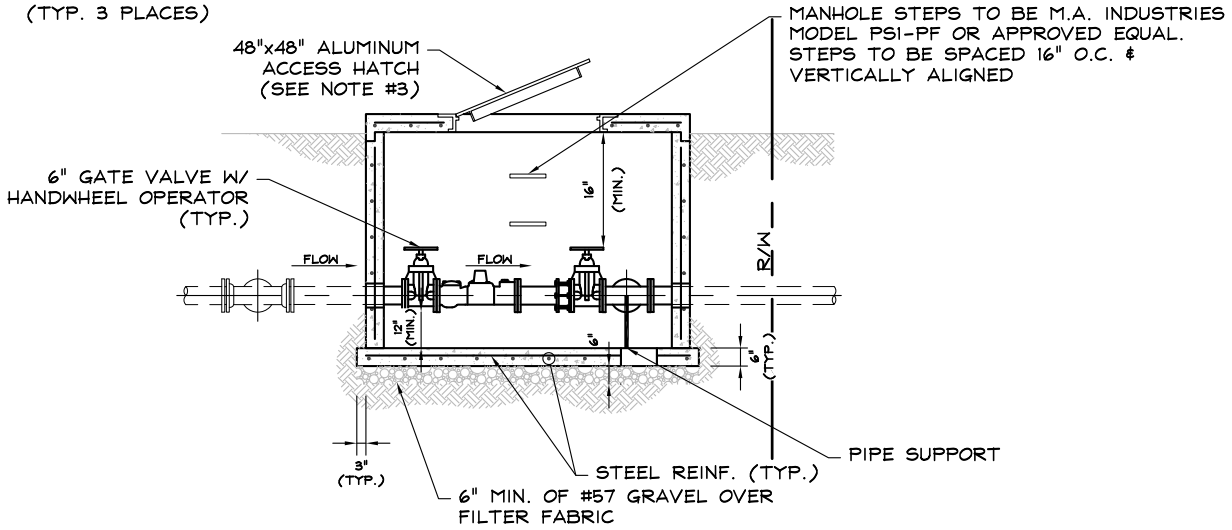
STANDARD DETAILS
WATER SYSTEM CONSTRUCTION

STANDARD 600 - 7

NOTES:

1. VAULT - 4,000 PSI REINFORCED PRECAST CONCRETE OR CAST-IN-PLACE, CONTRACTOR'S OPTION.
2. TOP OF VAULT ELEVATION TO BE AT LEAST 3" - 6" ABOVE FINISHED GRADE.
3. ALUMINUM HATCH EQUAL TO BILCO, 300 PSF, STAINLESS STEEL HARDWARE WITH RECESSED PADLOCK HASP.
4. VAULT MFR. SHALL CAST HATCH FLUSH IN TOP SLAB.
5. PROVIDE MIN. 4'-0" COVER OVER LINES OR PER APPROVED SITE DRAWINGS.
6. CLASS 350 DIP REQ'D; RESTRAIN MJ WITH MEGA-LUGS FOR BURIED SERVICE, FIELD-LOK OR TR-FLEX RJ FOR PUSH-ON JOINTS.
7. CLASS 125 FLANGE JOINTS INSIDE VAULT: FLANGE DIP = THICKNESS CLASS 53.
8. JOINTS IMMEDIATELY UPSTREAM OR DOWNSTREAM OF VAULT SHALL BE RESTRAINED JOINT
9. PRESSURE TEST AND DISINFECT IN ACCORDANCE W/ AWWA.
10. TESTABLE PER AWWA STANDARDS.
11. DOUBLE CHECK VALVE BACK FLOW PREVENTION IS REQUIRED ON PROPERTY OWNER'S SIDE OF METER.





CITY OF CORNELIA
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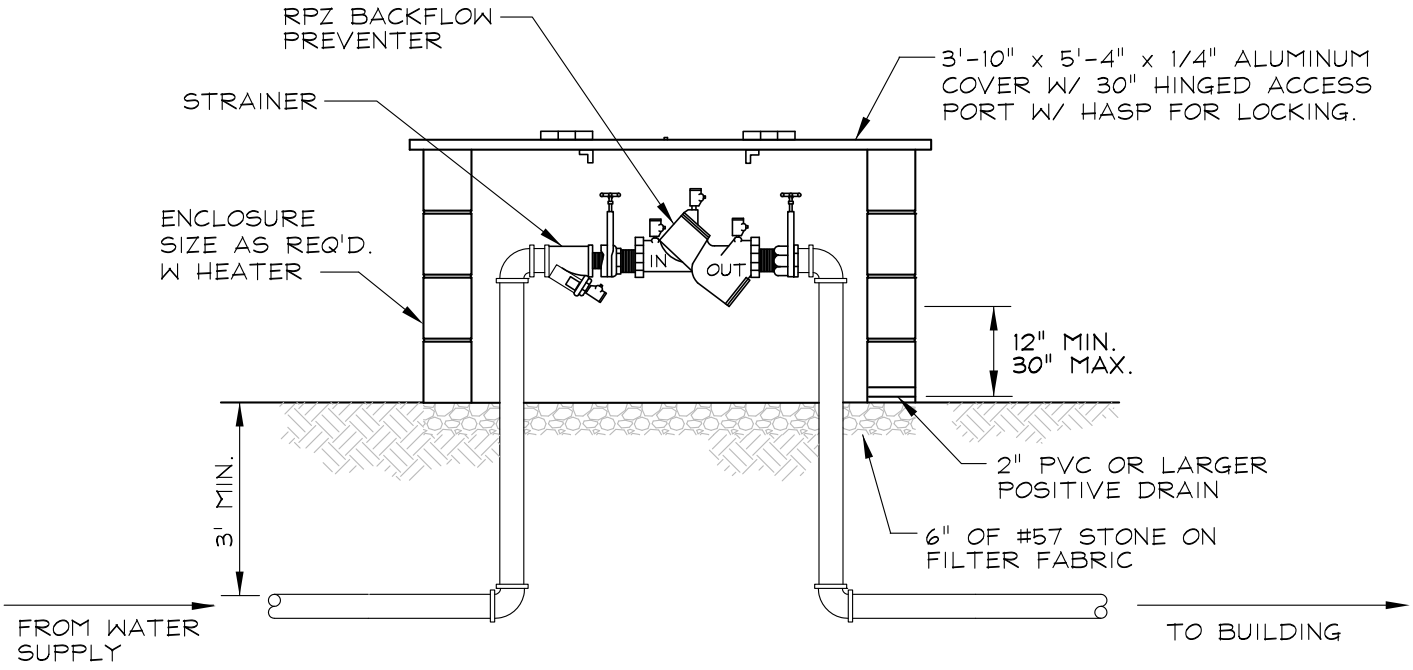
METERS 3" & LARGER

STANDARD DETAILS
WATER SYSTEM CONSTRUCTION

DATE: APRIL 2014
SCALE: 3/6"=1'-0"

STANDARD 600 - 8



NOTE:

1) RPZ TO BE OWNER MAINTAINED

2) ENCLOSURE SHOULD BE HEATED OR INSULATED TO PROTECT FROM FREEZING

3) ENCLOSURE SHALL HAVE GROUND ANCHOR CAPABILITIES AND BE KEPT LOCKED AT ALL TIMES

4) AT OWNER'S OPTION, A BYPASS LINE MAY BE INSTALLED FOR SERVICING THE RPZ. BYPASS SHALL HAVE A VALVE THAT IS LOCKABLE BY THE CITY.

CITY OF CORNELIA
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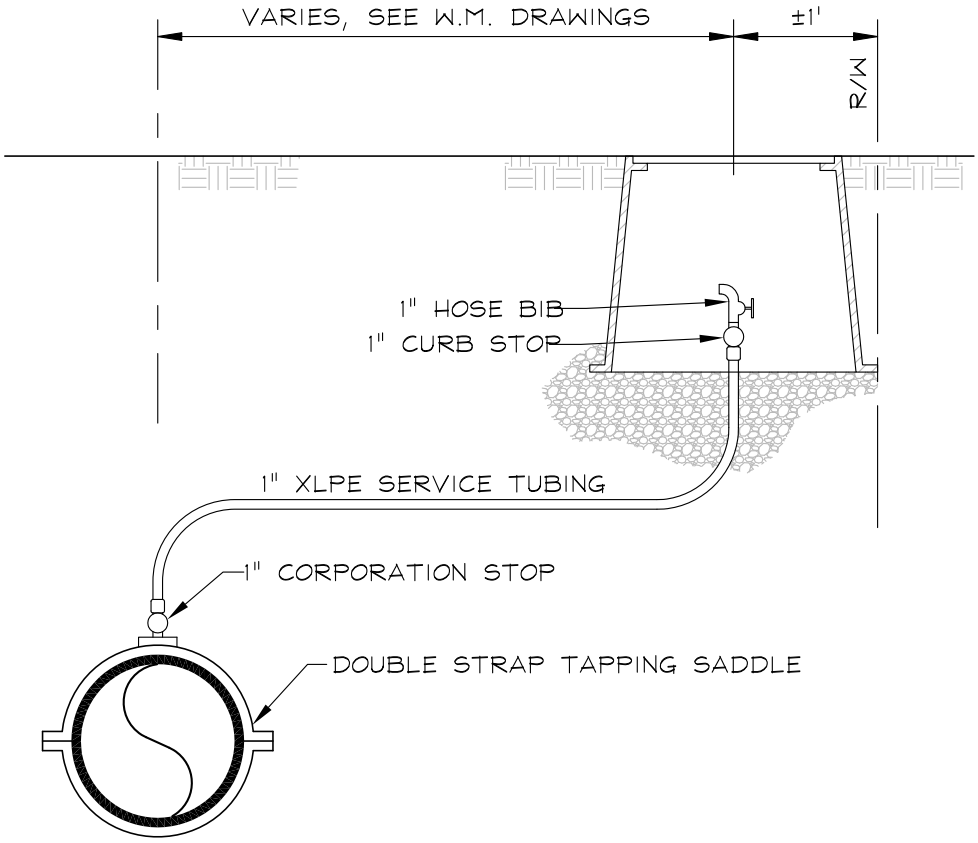
RPZ BACKFLOW PREVENTER FOR 1 1/2" & GREATER SERVICES

STANDARD DETAILS
WATER SYSTEM CONSTRUCTION

DATE: OCTOBER 2014
SCALE: N.T.S.

STANDARD 600 - 9



CITY OF CORNELIA
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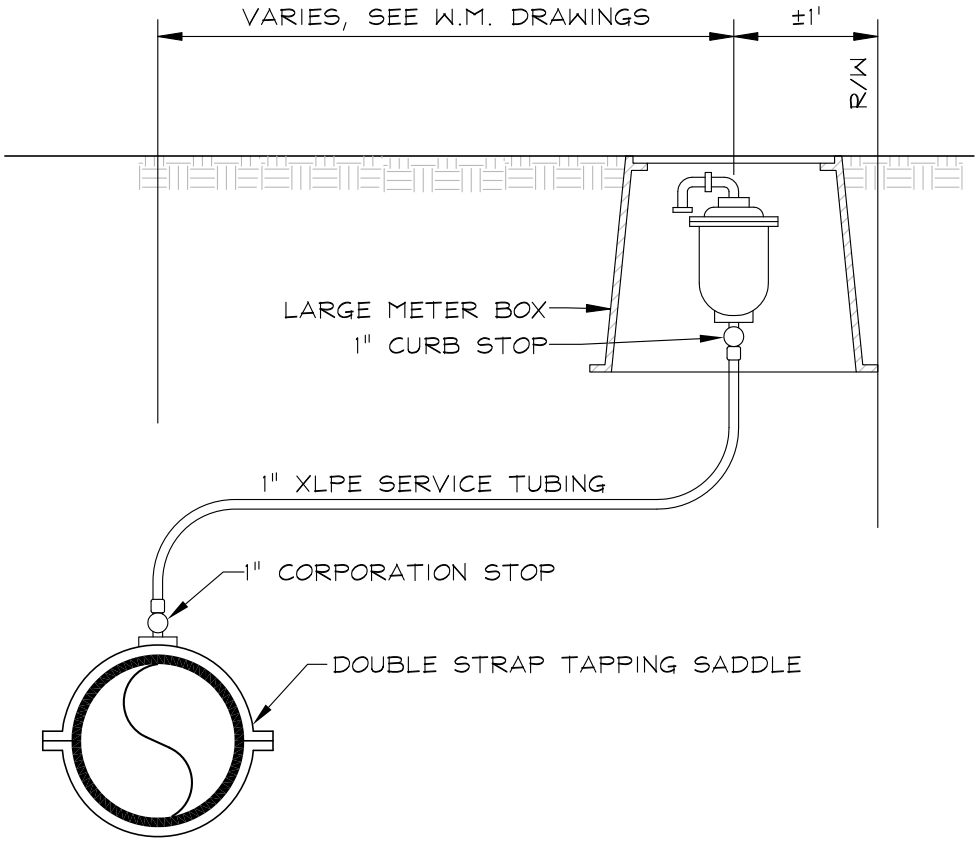
MANUAL AIR RELEASE / SAMPLE TAP

STANDARD DETAILS
WATER SYSTEM CONSTRUCTION

DATE: APRIL 2014
SCALE: N.T.S.

STANDARD 600 - 10



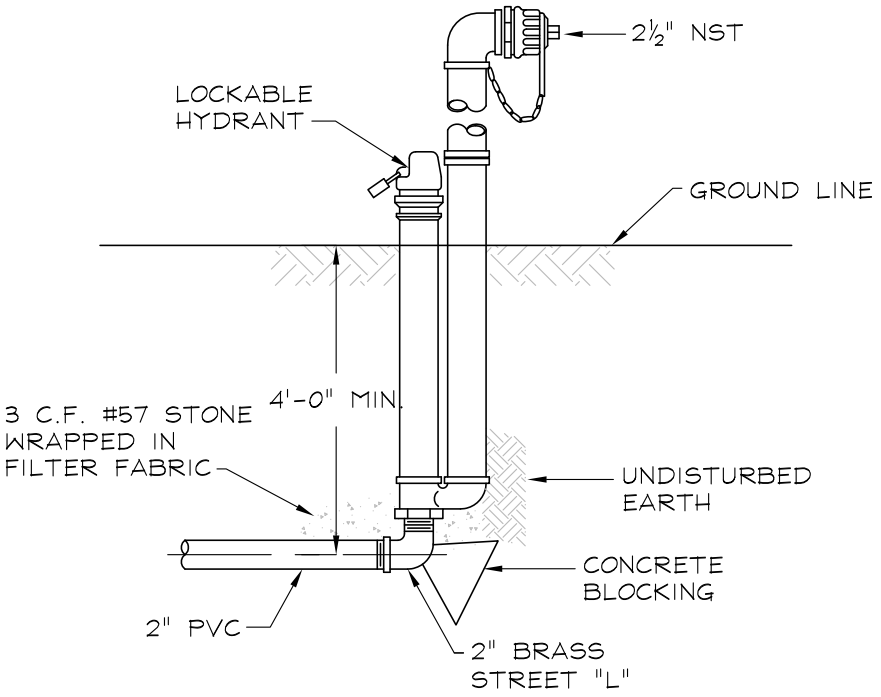
CITY OF CORNELIA
Where nature's your neighbor

AIR RELEASE VALVE

STANDARD DETAILS
WATER SYSTEM CONSTRUCTION

DATE: APRIL 2014
SCALE: N.T.S.

STANDARD 600 - 11



POST HYDRANTS SHALL BE NON-FREEZING, SELF DRAINING TYPE WITH 4' BURY. THESE HYDRANTS WILL BE FURNISHED WITH A 2" FIP INLET, A NON-TURNING OPERATING ROD, AND SHALL OPEN TO THE LEFT. ALL OF THE WORKING PARTS SHALL BE OF BRONZE-TO-BRONZE DESIGN, AND BE SERVICABLE FROM ABOVE GRADE WITH NO DIGGING. THE OUTLET SHALL ALSO BE BRONZE AND BE 2-1/2" NST. HYDRANTS SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED USE AS MANUFACTURED BY KUPFERLE FOUNDRY CO., ST. LOUIS, MO, MAINGUARD NO. 77 OR APPROVED EQUAL.

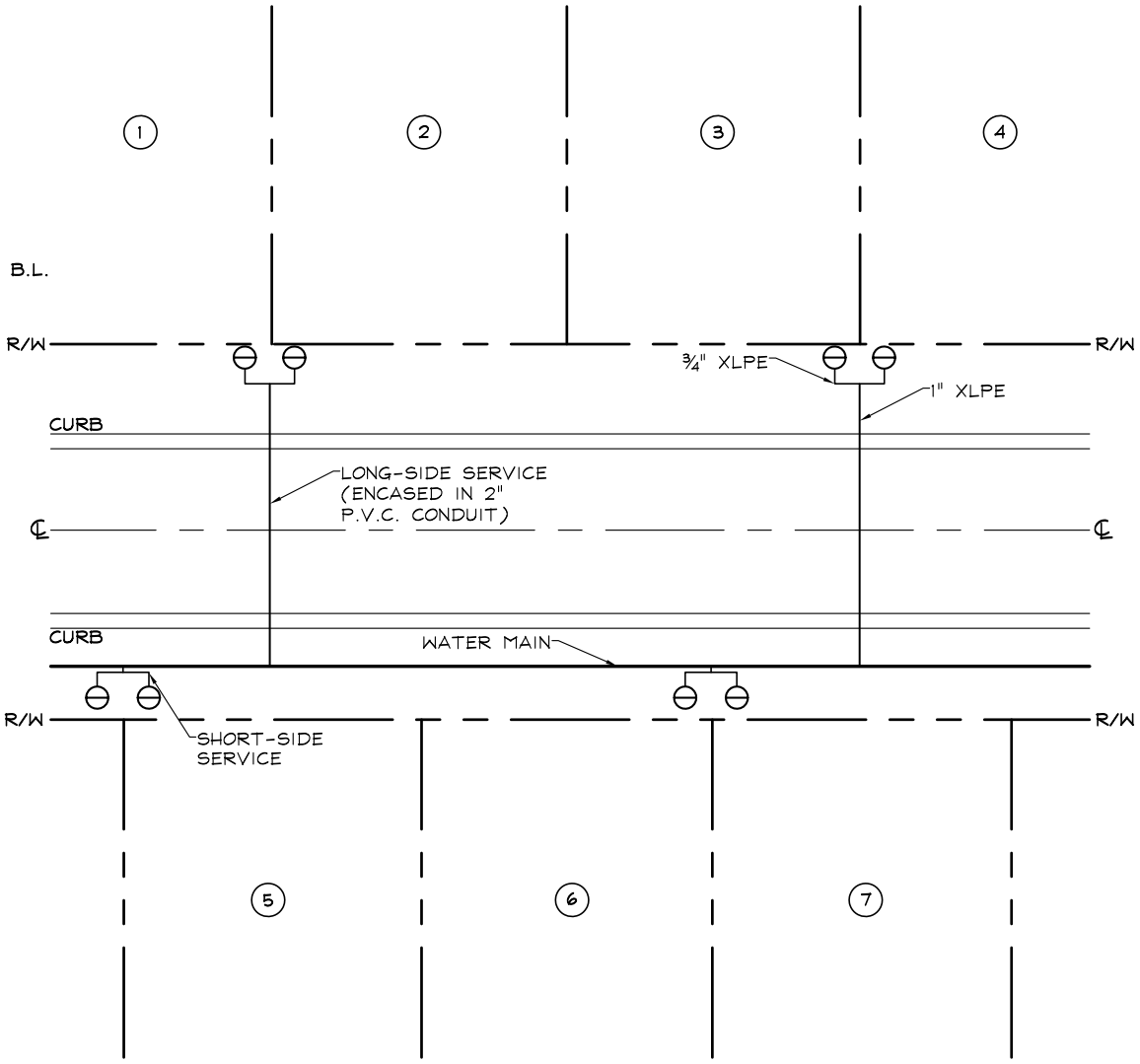
CITY OF CORNELIA
Where nature's your neighbor

FLUSHING HYDRANT

STANDARD DETAILS
WATER SYSTEM CONSTRUCTION

DATE: APRIL 2014
SCALE: N.T.S.

STANDARD 600 - 12



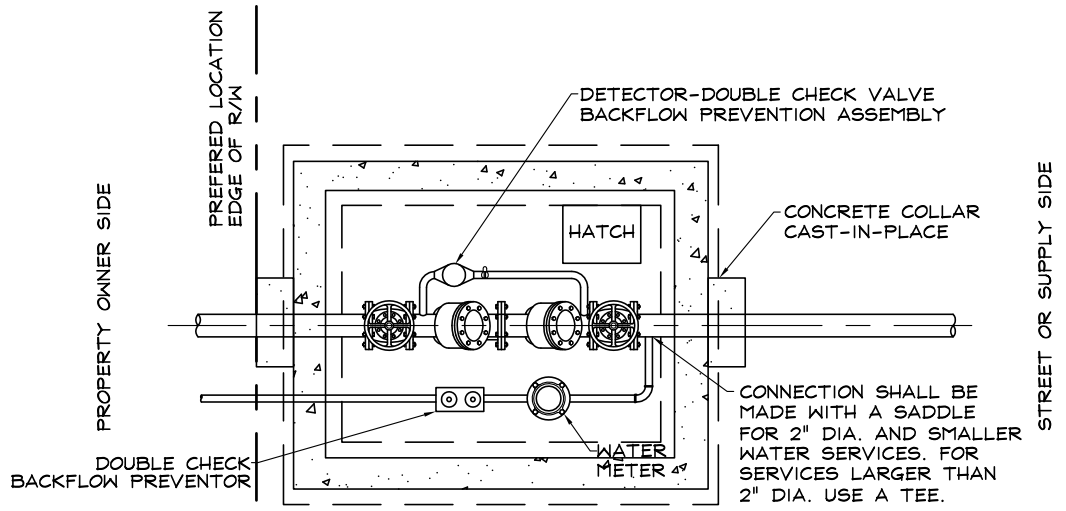
CITY OF CORNELIA
Where nature's your neighbor

3/4" WATER METER LOCATION FOR SUBDIVISIONS

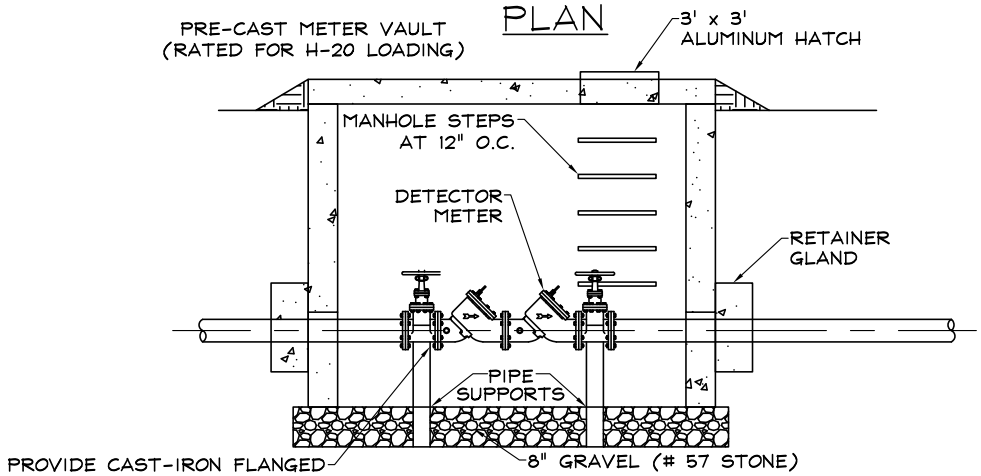
DATE: APRIL 2014
SCALE: N.T.S.

STANDARD DETAILS
WATER SYSTEM CONSTRUCTION

STANDARD 600 - 13



PLAN



SECTION

NOTES:

1. BOXES EXCEEDING 7' IN DEPTH MUST BE APPROVED BY THE CITY.
2. WHEN METER BOX CANNOT BE LOCATED ENTIRELY ON R/W, A PERMANENT EASEMENT SHALL BE OBTAINED TO PREVENT FENCES OR OTHER OBSTRUCTION FROM BEING ERECTED AROUND THE METER BOX.
3. COVER OPENING & STEPS TO BE PLACED NEAREST THE METER REGISTER.
4. THESE BOXES ARE NOT TO BE INSTALLED IN TRAFFIC AREAS WITHOUT PRIOR PERMISSION FROM THE CITY.
5. ALL VALVES AND FITTINGS INSIDE THE VAULT SHALL BE FLANGED.

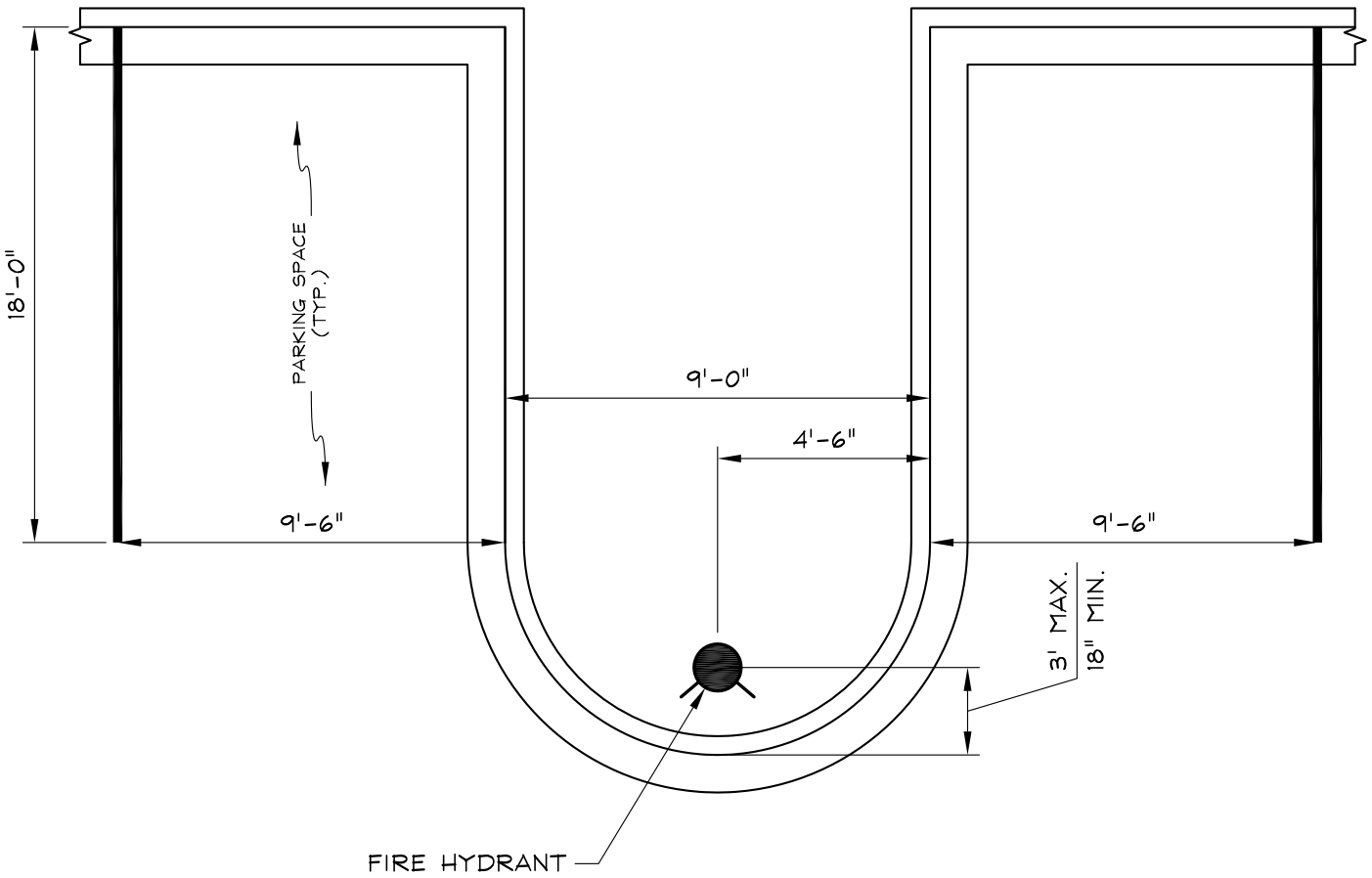
CITY OF CORNELIA
Where nature's your neighbor

DETECTOR/WATER METER AND VAULT

STANDARD DETAILS
WATER SYSTEM CONSTRUCTION

DATE: APRIL 2014
SCALE: N.T.S.

STANDARD 600 - 14



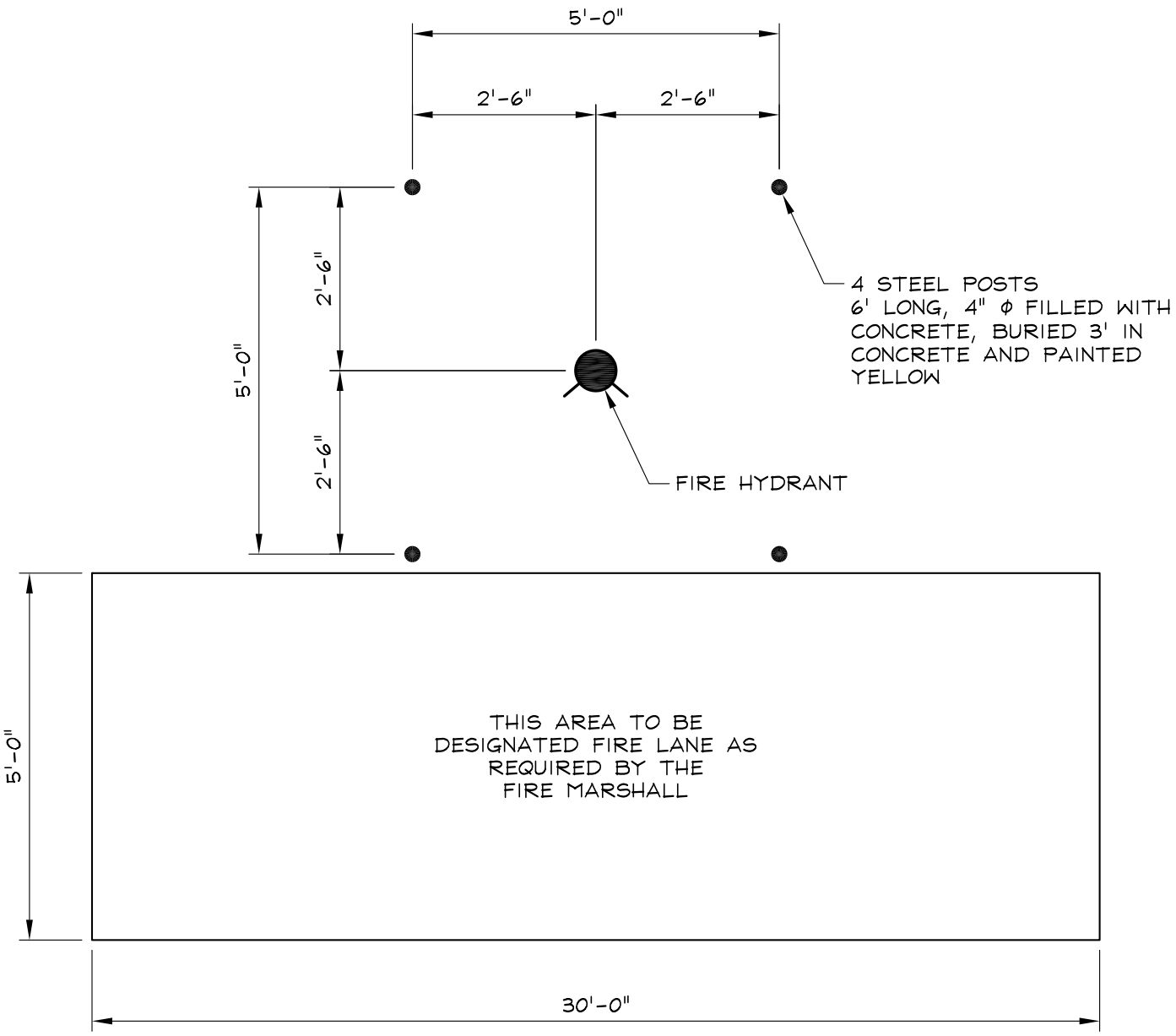
CITY OF CORNELIA
Where nature's your neighbor

TYPICAL FIRE HYDRANT ISLAND - PARKING AREA

STANDARD DETAILS
WATER SYSTEM CONSTRUCTION

DATE: OCTOBER 2014
SCALE: N.T.S.

STANDARD 600 - 15



CITY OF CORNELIA
Where nature's your neighbor

TYPICAL FIRE HYDRANT - POST PROTECTION

STANDARD DETAILS
WATER SYSTEM CONSTRUCTION

DATE: OCTOBER 2014
SCALE: N.T.S.

STANDARD 600 - 16

ARTICLE VII – FIRE SAFETY SYSTEMS

Section 701: Purpose

The purpose of this section is to address the minimum requirements for design and construction of public fire safety systems and to require the installation and testing of an underwriter approved detector meter or a factory mutual fire meter on all unmetered fire service systems having private fire hydrant(s), hand hose connection(s), or sprinkler head(s) on private property. This document is intended to convey the general design and construction requirements for a typical project and therefore is not intended as a substitute for site-specific engineering and construction techniques nor as a substitute for the requirements of the local and State Fire Marshall or the Rules and Regulations of the State Minimum Fire Safety Standards of the State of Georgia, under authority of O.C.G.A. 25-2-14, 25-2-12 AND 50-13-21. If any Sections of the Georgia Minimum Fire Safety Standards conflict with the requirements listed within this Ordinance herein, the stricter policy shall apply. Individual project conditions may require waivers from the provisions in this document.

Section 702: General Policy and Requirements

A. Water Supply System: Water supply systems complete with fire hydrants shall be designed and in accordance provided for all new developments in accordance with Article VI of this *Minimum Development Standards Ordinance*.
B. Fire Hydrants: Fire hydrants shall be furnished and installed in accordance with these standards on all new water mains that are 6-inches in diameter or larger.
C. Fire Lanes: The City shall designate fire lanes on public streets and private property used for townhouse, multi-family, commercial, institutional and industrial developments. The purpose of the fire lanes shall be to prevent parking adjacent to fire hydrants and also to provide clear access to buildings and fire protection equipment.
D. Fire Lines: Fire protection lines shall be designed and installed to serve private fire hydrants, hand hose connections and fire sprinkler systems. All fire lines shall be installed with an underwriter approved detector check valve located in a concrete vault and the fire lines shall be privately owned and maintained downstream of the detector check valve assembly.
E. It is unlawful for anyone other than City personnel to use a public fire hydrant for any reason without first obtaining a permit from the City.

Section 703: Planning and Design

Section 703.01: Fire Lanes

1. Fire lanes in residential, commercial, institutional and industrial developments shall be designated by the City and shall be a minimum of 18 feet in width. This dimension shall be measured perpendicularly from the painted curb or perimeter line.

2. A minimum of two (2) signs shall designate fire lanes, one at each end of the lane. Additional signs shall be provided at minimum intervals of 200 feet. Fire lanes may be painted in parking areas where no curb and gutter exists and where posting of a metal sign is not feasible.

Section 703.02: Emergency Access in General

1. Emergency access shall have an all-weather surface capable of supporting heavy equipment.
2. Emergency access driveways, excluding parking, shall be a minimum of twenty (20) feet wide. The minimum turning radii shall be thirty-two (32) feet.
3. Reasonable accessibility shall be provided to and around all buildings for firefighting equipment, including ladder trucks on multiple-story buildings. A minimum of twenty (20) feet on all sides of buildings and a radius of fifty (50) feet at all building corners shall be maintained.
4. Where the number of dwelling units in a project exceeds 30, there shall be two (2) entrances/exits to the project where road frontage is adequate for two (2) entrances.
5. Accessibility for firefighting equipment shall be maintained throughout all stages of construction and occupancy.

Section 703.03: Emergency Access to Front of Building

An unobstructed emergency space of at least nine (9) feet in width shall be provided in front of the main entrance of buildings where vehicle parking is adjacent to the building and not separated by a fire lane.

A series of nine (9) foot wide unobstructed emergency spaces shall be provided in front of a strip shopping center where parking is adjacent to the building and not separated from it by a fire lane. The spaces shall be provided at 100-foot intervals along the front of the building.

Section 703.04: Emergency Access to Rear and Side of Building

Each building with a rear dimension exceeding 100 feet in length shall have an access capable of handling emergency equipment if the building is not accessible from a street, driveway, service area, or parking area. The access used exclusively for emergency purposes shall be a minimum of 20 feet wide.

Section 703.05: Emergency Access Limits

1. Emergency access limits are defined as the maximum distance between a building and the closest point of emergency vehicle access. These limits shall be measured from the main building entrance to the edge of pavement, curb line or emergency access point. An emergency access point is defined as the closest point to the main entrance of a building that an emergency vehicle can reach on all weather surface capable of supporting such a vehicle.

2. In townhouse developments, the maximum distance from the curb line (or the emergency access point) to the building entrance may not exceed 75 feet.

3. In multi-family developments, the maximum distance from the curb line (or the emergency access point) to the building entrance shall be 50 feet.

4. In buildings over three (3) stories in height, the maximum distance from the curb (or the emergency access point) shall conform to the guidelines listed in Table 7-1. For purposes of this section, the building height measured in feet is the distance between the lowest level of fire department access to the finish floor level of the topmost habitable floor.

Table 7-1
Building Height Distance From The
Curb or Emergency Access Point

Building Height (feet)	Distance (feet)
30 to 45	50
40 to 60	40
61 to 75	30
Greater than 75	20

Section 703.06: Fire Main Size

1. Single family: Single-family residential developments shall use a minimum of eight (8) inch mains. Larger mains may be required depending on the water demand, fire flow requirements and the City's overall distribution system master plan.
2. Multi-family: Multi-family residential developments shall use a minimum of eight (8) inch mains.
3. Commercial areas with less than 200,000 square feet shall use fire mains a minimum of eight (8) inches in size.
4. Large shopping centers, strip-malls, etc. shall use fire mains a minimum of eight (8) inches in size.
5. Motels, light industrial & schools shall use fire mains a minimum of eight (8) inches in size.
6. Heavy industry, warehouses and office buildings greater than 200,000 square feet shall use fire mains a minimum of ten (10) inches in size.
7. The City or its designated representative shall have the authority to waive the above minimum fire main sizes provided the following conditions have been met:
   - Note on Plans: "I have designed the water service installation for this facility in accordance with all applicable City water specifications in regards to fire flows and these conditions have been met". This note is to be signed and stamped by the engineer providing the calculations.
   - Provide the City with the calculations stamped and certified as required in Section 704 of this ordinance.

Section 704: Fire Flow Requirements

Section 704.01: Flow Requirements

1. An adequate supply of water to meet the instantaneous flow and peak domestic water demand requirements of the proposed project must be available prior to approval of any plans. Water systems shall be designed to provide fire flows in accordance with Insurance Services Office (ISO) requirements, plus the domestic demand required by the City. A residual pressure of not less than 20 pounds per square inch (psi) to at least one point within 500 feet hose lay of each building proposed to be served shall be provided.
2. The minimum fire flows in Table7-2 apply to new development. Where the size and the scope of the development exceed these requirements, additional flow shall be provided in accordance with Insurance Services office (ISO) requirements.
3. Fire flow requirements may be met in single-family residential and two-family developments with a single hydrant within 300 or 500 feet hose lay of a structure in accordance with Table 7-2. In special circumstances, a written waiver from these requirements may be obtained from the Administrative Officer and Fire Chief.
4. In areas of multi-use development, the higher flow rates listed in Table 7-2 shall be provided for each hydrant,

Other residential (i.e., multi-family, condominium, townhouse), commercial, institutional, and industrial developments shall provide a fire flow in accordance with Insurance Services office (ISO) requirements.

TABLE 7-2
FIRE FLOW REQUIREMENTS FOR SINGLE-FAMILY DETACHED AND TWO-FAMILY DWELLINGS

Unit to Unit Exposure Distance (Feet)	Flow Requirements per Hydrant (gpm)	Flow Requirements for a Hydrant within 500 feet of a Structure (gpm)
0 to 10	1,500	2,000
10 to 30	1,000	1,500
Greater than 30	1,000	1,000

Section 704.02: Fire Flow Test

A. A fire flow test must be conducted on the existing water system in the vicinity of the proposed subdivision or development prior to submitting design drawings for approval to determine the adequacy of water supply for the project. The City will perform the pre-development test at the Developer's expense. The Applicant or Developer shall request, coordinate, and pay all necessary fees to the City for required pre-development fire flow tests on existing water mains prior to the performance of the test at the rate established by the City. Flow test are valid for one

(1) year and use of a fire flow test for more than one project is prohibited. The City will also perform a post-development fire flow test to confirm fire flows available on newly installed water mains before the new water system will be accepted by the City. The Developer must also request, coordinate and pay all necessary fees to the City for required post-development fire flow tests.

B. The test shall consist of a fire hydrant(s) flow test and a 24-hour flow and pressure test. Test information provided to the Developer shall consist of:

a. Static pressure and approximate elevation of the Static gauge;
b. Residual pressure and recorded flow rate in gallons per minute (GPM);
c. Projected flow at the test hydrant in GPM at 20 psi;
d. 24-hour pressure chart;
e. Site map including fire hydrant locations tested.

Section 704.03: Fire Flow Calculations

1. The Developer's engineer shall furnish fire flow calculations when submitting plans for water system extensions to serve a development. All projects which have flow test results with static pressure less than 35 psi will require a special design study of the water distribution system that is to be submitted by the Developer's engineer with the development plans for the City to review and approve to ensure no problems are encountered during peak demands. This study must be completed prior to construction plan approval. Water model results (pump, tank, valve, junction, pipe reports, etc.) shall include simulations at ultimate build-out of the proposed development including:

- Average day demand
- Peak day demand
- Peak day demand plus fire flow

A written summary shall be provided explaining the water model and its assumptions, deficiencies identified and impact of proposed improvements.

2. The fire flow calculations shall include assumptions about the existing water system plus the fire flow test results and the 24-hour pressure chart recording furnished by the City. The calculations shall indicate available flows at the proposed hydrants and the pressure throughout the proposed water system. Fire flow calculations for projects to be developed in sections or phases shall indicate the available fire flows during each section or phase of the project. The water system shall meet the instantaneous fire flow demand plus peak domestic demand requirements for the existing water service area plus the proposed development.

3. For small sites that propose no major waterline extensions, an evaluation of the existing fire flow available may be substituted for existing fire flow calculations.

4. In the event that minimum fire flows cannot be achieved, the Developer of a property shall design additional fire protection measures into every building not covered by adequate flows. Any deviation from the minimum fire flow requirements shall require variance application for conditional fire flow requirements. See Article I in this Ordinance for more information.

5. Flow calculations shall be prepared using a program that is acceptable to the City, such as the "K Pipe" program developed by the University of Kentucky, WaterCAD by Bentley or InfoWater by Innovyze. Flow calculations shall utilize a pipe roughness factor, c=120 for pipes that are 12 inches in diameter and greater. For pipes smaller than 12 inches a roughness factor of c=100 shall be utilized. Since a conservative "c" factor is utilized in the calculations, no allowance is required for the losses in valves and other fittings.

Section 705: Fire Hydrants

1. All fire hydrants shall be designed and manufactured to comply with the latest specifications of the American Water Works Association (AWWA) M-17 Manual. They shall be designed for 150 pounds working pressure. The hydrants shall be of simple design, easy to operate, effectively and positively drained and protected from damage by freezing and convenient for repairing and replacing parts.
2. Hydrants shall be equipped with one 4 ½-inch diameter pumper nozzle and two 2 ½ - inch diameter hose connections. The hydrants shall have threads meeting the latest requirements of the State Fire Insurance Commission, Hydrants shall also have a safety flange on the barrel and a safety coupling on the valve stem, to prevent damage to barrel and stem in case of traffic accident. Hydrants shall be either U. S. Pipe or M & H Valve and Fitting Co. Style 129 Traffic Model.

Section 705.01: Fire Hydrant Locations

1. The 4 1/2-inch pumper connection on the hydrant shall face the street, travel lane or service drive.
2. The bottom of the 4 1/2-inch nozzle shall be 18 inches minimum to 24 inches maximum above the finished elevation of the edge of the shoulder on streets without curb and gutter and 24 inches above the elevation of the curb on streets with curb and gutter.
3. The 2 1/2-inch hose connections shall have a minimum of four (4) feet of clearance on all sides.
4. No fire hydrant shall be obscured from view by plantings, fences, etc.
5. Fire hydrants shall be placed at high points along the water line so as to bleed air from the water lines. Locations to be field verified and approved by the City.

Section 705.02: Spacing of Fire Hydrants

1. Single Family — Fire hydrants shall be spaced not more than 300 feet apart. Fire hydrants shall be located at all intersections and shall be located at the end of all dead-end lines, such as those installed in cul-de-sacs.
2. Multi-Family, Condominiums & Townhouses — Fire hydrants shall be spaced not

more than 500 feet or at the Fire Department's discretion.

3. Shopping Centers, Malls, etc. — Fire hydrants shall be spaced not more than 300 feet or at the Fire Department's discretion.
4. Motels, Light Industry and Schools — Fire hydrants shall be spaced not more than 300 feet or at the Fire Department's discretion.
5. Heavy Industry/Tall Buildings — Fire hydrants shall be spaced not more than 300 feet or at the Fire Department's discretion.

No installation requiring fire hydrants shall have spacing greater than 1,000 feet apart, as measured along the main supply line, except in large tract developments, where spacing may either be 1,000 feet or the distance from the center of a lot, whichever is greater.

Section 705.03: Fire Hydrants in Relation to Streets and Parking Lots

1. Fire hydrants shall be located along the right-of-way at street intersections and at intermediate locations where necessary, as determined by the City Fire Chief or his designee in cooperation with the Public Works Director. All distance measurements are to be made along with the centerline of streets, travel ways or other unobstructed path that may be used by the Fire Department.
2. In areas with curb and gutter, the center of the fire hydrant shall be located no less than 18 inches nor more than 36 inches from the face of the curb. No part of a fire hydrant shall conflict with or overhand a sidewalk, trail or vehicular travel way.
3. On streets without curb and gutter, fire hydrants shall be located behind the ditch.
4. Traffic bollards or other protective measures shall be provided in areas, such as parking lots where the proposed site improvements will not provide adequate protection of the fire hydrant from vehicles,
5. When installed in parking areas, clear access shall be provided to the front of the hydrant (that portion with the large pumper connection at the center) and 15 feet to each side. This clear access area shall be marked as fire lane,
6. Plantings and other obstructions shall be kept clear of fire hydrants for a minimum of 4 feet around the hydrant.

Section 705.04: Fire Hydrants in Relation to Buildings

1. Fire hydrants shall be located to serve remote areas of buildings. Those hydrants used to meet fire flow requirements shall be located within 500 feet hose lay of the building to be protected,
2. Fire hydrants shall be required along the perimeter of the building for use groups in accordance with Table 7-3. The remote distance shall be measured to the most remote distance the hydrant will serve.

TABLE 7-3
USE GROUP AND FIRE HYDRANT REMOTE DISTANCE

Use Group	Remote Distance
Heavy industrial & Warehouse Buildings	250 Feet
School & institutional buildings	300 Feet
Commercial, church & office buildings	300 Feet
Motels, multi-family, condominium & townhouse buildings	250 Feet
Single-family detached dwellings	400 Feet

3. Fire hydrants shall be a minimum of 50 feet away from all buildings, except single-family dwellings.

Section 705.05: Fire Hydrants in Relation to Sprinklers/Standpipes

Fire hydrants shall be located within 50 feet of any Fire Department sprinkler connection or standpipes where those systems are required or provided in buildings.

Section 706: Fire Lines & Sprinkler/Standpipe Fire Department Connections

Section 706.01: Purpose

The purpose of this section is to require the installation of an underwriter approved detector meter or a factory mutual fire meter on all unmetered fire service systems having fire hydrant(s), hand hose connection(s), or sprinkler head(s) on private property.

Section 706.02: Effective Date

1. Upon adoption of this Ordinance, all persons making applications for new fire service connections with private fire hydrant(s), hand hose connection(s), or sprinkler head(s) attached thereto shall be required to have an underwriter approved detector meter or factory mutual fire line meter. However, if consumption of unmetered water from an existing fire service systems is discovered, the City will require immediate installation of an approved detector meter or factor mutual fire line meter on the existing unmetered fire service system.
2. When unauthorized water is used through a detector meter in three (3) or more billing periods in one (1) calendar year, it shall be replaced with a factory mutual fire line meter. Unauthorized use of water is defined as non-firefighting water and/or water use without prior notification and approval of the City.
3. All domestic water supply must be metered with a proper meter.

Section 706.03: General Requirements

1. Installation of detector meters or factory mutual billing periods in one calendar year shall be handled by the developer under the supervision of the City's inspectors. The cost of installation will be at a rate established for each individual site.
2. The City shall have the authority to cut off water service to buildings whose owners refuse to comply with the provisions of this ordinance upon proper notification of 60 days.
3. The regular monthly fire service standby charge shall be continued for fire service

installation having a detector or mutual fire line meter. The water that is measured by the detector meter will be billed at five (5) times normal water charge. If the services of an attorney are required to collect bills, the attorney's fees and any associated costs of court shall be added to the billing.

4. Fire Department connections shall be located to be visible from a street. If a visible location from a street is not possible, the Fire Chief or his designee shall approve alternate locations. Such connections shall be located to provide immediate access to the Fire Department. Generally, walls, fences, trees, shrubs and other obstructions shall not be placed to prevent access.
5. Fire Department connections shall be arranged to allow the use of any one water sprinkler connection to serve all the sprinklers within the building and to allow the use of any one standpipe connection to serve all the standpipes within the building.
6. Fire Department connections shall not be less than 18 inches or more than 42 inches in elevation measured from ground level to the centerline of the inlets.
7. In buildings classified as high-rise by the building code, the Fire Department connections shall be located a minimum of 50 feet from the building. The Fire Chief or his designee and the Public Works Director shall approve the location of this yard connection.

Section 707: Private Fire Hydrants

Section 707.01: Purpose

The purpose of this section is to require the maintenance and inspection of private fire hydrants located on private property or public right-of-way in the City of Cornelia which are not owned, controlled or maintained by the City to ensure that every private fire hydrant will function as designed to produce the water necessary to respond appropriately to the fire or other emergency.

Section 707.02: Definitions

The following words, terms and phrases, when used in this Article, shall have the meanings ascribed to them herein, except where the context clearly indicates a different meaning and are in addition to those definitions found in Article II:

1. *Certified private hydrant contractor* means a person who has demonstrated to the Cornelia Fire Department the degree of competency required to perform necessary inspection of private hydrants and to certify to the City the private fire hydrant meets the NFPA Standard. The Cornelia Fire Department shall maintain a list of certified private hydrant contractors for reference by an owner or owner's designee desiring such information.
2. *Emergency impairment* means a condition where a private hydrant is out-of-service due to an unexpected occurrence, whereby the hydrant fails, or may fail, to provide an adequate water supply.
3. *Fire Department* means the Fire Department of the City of Cornelia.

4. *Impaired hydrant* means a private hydrant which is not operational due to an emergency impairment or a pre-planned impairment which renders the hydrant non-operational and therefore out-of-service.
5. *Impairment* means a shutdown of a private hydrant which renders they hydrant non-operational and therefore out of service.
6. *Inspection* means a visual examination of a private hydrant to verify that it appears to be in operating condition and is free from physical damage.
7. *Maintenance* means work performed to keep a private hydrant operable or to make repairs.
8. *NFPA Standard* means Publication 25 of the National Fire Protection Association (NFPA) titled Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems 2012, and any subsequent amendments or revisions thereto.
9. *Owner* means the person that holds record title to the property upon which a private fire hydrant is located. For fire hydrants located in the public right-of-way of a public road in the City of Cornelia that are not owned by the City of Cornelia, the Owner is the person that owns the fire hydrant itself.
10. *Owner's designee* means the occupant, management firm, or managing individual designated by the owner who, through specific provisions in the lease, written use agreement or covenants, has assumed responsibility to inspect, test, maintain and repair a private hydrant located on the Owner's property.
11. *Person* means any individual, partnership, institution, public or private corporation, or other entity.
12. *Pre-planned impairment* means a condition where a private fire hydrant is out-of-service due to work that has been planned in advance.
13. *Private fire hydrant* means a valved connection to a water main or water supply system for the purpose of supplying water to a fire hose or other fire protection apparatus that is owned by any person other than the City of Cornelia. A private fire hydrant also includes any fire hydrant located in a public right-of-way that is not owned by the City of Cornelia.
14. *Record* means written documentation of the inspection, testing, maintenance, correction, or repair of a private hydrant.
15. *Testing* means a procedure of periodic physical and operational checks used to determine whether a private fire hydrant is capable of being operated as intended and will perform as intended, e.g. water flow tests. These test shall be performed at intervals specified in this Ordinance.

Section 707.03: General Requirements

1. All Private fire hydrants shall comply with the requirements in this Article.
2. *Responsibility:* Responsibility for properly inspecting and maintaining a private hydrant shall be that of the owner or the owner's designee. Where the owner has designated and owner's designee to be responsible for maintaining the private property of the owner on which a private hydrant is located, the owner's designee

shall comply with the requirements of this ordinance and shall be subject to enforcement of this ordinance in the event of a failure to so comply.

3. *Time of Inspection:* All private hydrants shall be field tested annually and shall meet, or exceed, the NFPA Standard, which the certified private hydrant contractor shall certify to the Fire Department. Private hydrants shall also be inspected and tested after completion of any repairs to ensure that they hydrant is operational and according to the NFPA Standard and they hydrant manufacture's specifications and recommendations.
4. *Testing:* All testing of a private fire hydrant shall be conducted in accordance with the NFDA standard. The owner or owner's designee shall notify the Fire Department and/or the Public Utilities Department before testing and shutting down a private fire hydrant or its water supply and also when returning it to service.
5. *Repair:* The Owner or the owner's designee shall repair as soon as possible a private hydrant which does not pass inspection, is impaired or otherwise does not function as required by the NFPA Standard or the manufacturer's specifications. After completing any repairs, the owner or the owner's designee shall have the hydrant inspected to certify it meets the NFPA Standard.
6. *Impairment Device:* An approved impairment device shall be place on any hydrant with has been turned off for repairs or is out-of-service for any reason. The Fire Department shall be notified of: (i) the hydrant being taken out-of-service; (ii) the completion of repairs; and (iii) the hydrant being placed back in service.

Section 707.04: Inspections, Testing, Maintenance and Repair of Private Fire Hydrants

1. Each private fire hydrant must be inspected by August 1st annually to determine if it is in proper working condition. Owners or Owner's designee may contract with the City Fire Department to perform the testing or they may hire a qualified contractor to do so. Regardless of whether the Fire Department or a third party performs the testing, the property owner is ultimately responsible for the cost and performance of any necessary maintenance and repair.
2. If the Fire Department performs the testing and if the hydrant needs repair, the City will notify the property owner in writing by both regular first class and certified mail requesting that the hydrant be repaired within 30 days of the receipt of the letter. If the hydrant is not repaired within 30 days, the city will repair the hydrant and bill the property owner for the cost of the labor and materials necessary to put the hydrant back in proper working condition.
3. If a qualified contractor performs the testing, it must submit to the City the testing results on a form provided by the Fire Department no later than seven days from the testing date. If maintenance or repairs are necessary, the property owner may contract for those repairs with a qualified contractor. If the repairs are not made within 30 days of the results submittal date, the City will repair the hydrant and bill the property owner for the cost of the labor and materials necessary to put the hydrant back in proper working condition.
4. Private fire hydrants shall be lubricated annually to ensure that all stems, caps, plugs, and threads are in proper operating conditions.

5. Private fire hydrants shall be kept free of snow, ice, or other materials or obstructions including plantings and landscaping and protected against mechanical damage so that free access ensured. A minimum area of 4 ft. around the hydrant shall be kept clear of any obstructions.
6. The owner or the owner's designee shall repair as soon as possible a private fire hydrant which is impaired or otherwise does not function as required by this Ordinance, the NFPA Standard, or the manufacturer's specifications.
7. After completing all necessary repairs to a private fire hydrant, the owner or the owner's designee shall inspect and test the hydrant as necessary consistent with the standards of this Ordinance to ensure that the hydrant is operational.
8. The owner or owner's designee shall notify the Fire Department in advance of a preplanned impairment and testing of a private fire hydrant.
9. The owner or the owner's designee shall notify the Fire Department immediately of an emergency impairment of a private fire hydrant.
10. The owner or owner's designee shall affix an impairment tag to an impaired hydrant at the commencement of a preplanned impairment and at the time of discovery of an emergency impairment.
11. Once the necessary inspection and testing confirm that the repirs have restored a private fire hydrant to operational status, the owner or the owner's designee shall remove the impairment tag and shall notify the Fire Department that the hydrant is operational.

Section 707.05: Records

1. *Contents:* A permanent record shall be maintained by the owner or owner's designee that shall indicate the procedure performed to inspect, test, maintain, correct, and repair a private hydrant. Such records shall include the entity that performed the work, the results, the date work was performed, and other pertinent information as the Fire Department may reasonable require to make this ordinance effective.
2. *Report to Fire Chief:* Within thirty (30) days after completion of an inspection by a certified private hydrant contractor, the owner or owner's designee shall submit to the Fire Chief of the City a report documenting the inspection of each private hydrant and advising of any repairs made to any hydrant.
3. *Records Retention:* Records shall be maintained by the owner or the owner's designee for a period of four (4) years after the inspection required by this ordinance.

Section 707.06: Enforcement of Violations and Penalties

Failure to comply with this ordinance shall be a violation and the Owner and/or the Owner's designee is subject to a civil penalty. Each week that the violation continues shall constitute a separate violation of this ordinance.

Section 707.07: No City Liability

The City is not liable for loss or damage of any nature whatsoever caused by the City's inspection of private fire hydrants. The City does not assume the duty of maintaining a private

fire hydrant and is not responsible for any plumbing or equipment necessary for the proper function and maintenance of a private fire hydrant.

Section 708: Fire Safety Systems-Plan Submission Requirements

Section 708.01 Plan Elements in General

The site development and subdivision plans shall include the following:

1. Fire lanes.
2. Emergency access.
3. Existing and proposed fire hydrants.
4. Fire protection lines.
5. Water storage supplies, where applicable.

Section 708.02 Fire Flow Calculations

1. Fire flow calculations including the results of the 24-hour fire flow test shall be included with the site and subdivision development plans.
2. Deviations from the minimum fire flow requirements in Section 704 of this manual shall require a conditional fire flow waiver with the site and subdivision development plan application. The waiver shall address current fire flow available and provide a system analysis to determine measures for bringing deficiencies up to minimum standards.
3. The Development Department, after coordinating with the Fire Chief and Fire Marshall, shall approve additional fire protection measures proposed for every building not covered by adequate fire flows, prior to the approval of the site and subdivision development plans.

Section 709: Fire Safety Systems-Construction Standards

Section 709:01 Fire Lane Signs and Painting

1. Fire lane signs shall be constructed of metal with a dimension of approximately 12 inches by 15 inches.
2. The sign shall be painted with red letters on a white background with a 3/8 inch red trim strip around the entire outer edge of the sign. The lettering on the sign shall read, "NO PARKING OR STANDING FIRE LANE", which shall be spaced on the sign face uniformly. Solid arrows shall be painted on the signs to point to and indicate the designated fire lane. The lettering and arrow on the sign shall be in accordance with Table 7-4.
3. Signs for fire lanes shall be posted at intervals of 100 feet with the bottom of the sign no less than six (6) feet from the ground, and the top no more than eight (8) feet from the ground, unless otherwise directed by the Fire Chief or his designee.
4. Letters at least two (2) feet in height may be painted on the pavement where a fire lane runs through a parking area without curbing adjacent to the fire lane, and

where the posting of a metal sign(s) is impractical. The lettering shall read "NO PARKING OR STANDING FIRE LANE."

TABLE 7-4
FIRE LANE SIGN LETTERING SIGN

Lettering (words)	Letter Height (inches)
No Parking	2
Or	1
Standing	2
Fire Land	2-1/2
Arrows	1

5. When curbing is provided adjacent to the fire lane, it shall be painted red within the limits of the fire lane.
6. When curbing is not provided adjacent to the fire lane, a yellow line shall be painted on the pavement along the perimeter and within the limits of the fire lane with two (2)-foot long intersecting lines and painted at three (3)-foot intervals on the fire lane side of the perimeter.

Section 709:02 Fire Hydrants

1. The construction to the main line shall be with mechanical joint locked hydrant tee equal to American Cast Iron Pipe Company A-10180. Wherever possible the fire hydrant shall be connected to the gate valve by using a locked hydrant adapter equal to American A-10895. The connection at the base of the hydrant shall be mechanical joint with ductile iron retainer gland, for Class 150, centrifugally case, six (6)-inch ductile iron pipe. The valve opening shall meet the requirements of the AWWA Specifications for 5 1/4-inch hydrants. The valve, valve seat and inner working parts shall be easily accessible. The distance from the ground to the hose nozzle shall not be less than 24 inches. Each hydrant shall be neatly painted with a red reflecting paint.

2. Each hydrant shall be tested to 200 psi. The first test shall he made with the valve closed. The second test shall be made with the main valve open but all nozzles closed. While this test is being carried on, the hydrant shall be subjected to a hammer test. Any hydrant showing defects by leakage, sweating or otherwise shall be rejected. The barrel and all parts shall withstand these tests. These tests shall be made in the field after the hydrants are installed.

Section 709:03 Setting Fire Hydrants

1. Fire hydrants shall be placed at the locations shown on the plans or as directed by the design professional. Gate valves for fire hydrants shall be connected directly to the main by means of a Locked Hydrant Tee. All other connections between the main and the fire hydrant shall be mechanical joint with ductile iron retainer glands with setscrews. Fittings shall be restrained by a locked hydrant adapter whenever the fire hydrant is located close enough to the main to allow their use. Care shall be exercised

that setscrews and retainer glands are tightened sufficiently to secure the hydrants before pressure is put on the main. Not less than four (4) cubic feet of coarse, broken stone shall be placed around the base of the hydrants, as shown in the Standard Detail Drawings in Article VI. Before placing the hydrants, care shall be taken to see that all foreign material is removed from within the body. The stuffing boxes shall be tightened and the hydrant valve opened and closed to see that all parts are in first class working condition. All hydrant openings shall be kept capped, except when hydrant is being worked on.

2. When a fire hydrant has been constructed but is not yet placed in service, the contractor shall provide and attach to the fire hydrant an approved impairment device such as flags or collars indicating that the fire hydrant is not in service. Said flags or collars shall remain on the fire hydrant until it is put into service.

3. Whenever an existing fire hydrant is taken out of service, whether temporarily or permanently, it shall be equipped with a flag or collar impairment device indicating that it is not in service. The contractor shall provide and install flags or collars as required and shall notify the City Fire Department whenever the operating status of any fire hydrant changes.

4. FIRE HYDRANTS SHALL NOT BE OPERATED WITH ANY TOOL EXCEPT A SPECIFICALLY DESIGNED FIRE HYDRANT WRENCH. If the contractor observes any other contractor or person operating a fire hydrant with an unapproved fire hydrant wrench, he shall report that fact to the City Fire Department Public Works Director immediately. It is the contractor's responsibility to insure that all new facilities are maintained in a new condition until final completion of the project and acceptance by the City. Fire hydrants with damaged operating nuts shall not be accepted.

Section 709:04 Fire Detection Check Valves

1. Approved detection check valves shall be required on all fire service mains in buildings served by a "wet pipe" type sprinkler system.

2. The detection check valve shall be equipped with a bypass meter assembly. An appropriately sized gate valve shall be installed on either side of the check valve.

3. The vault housing for the detector check valve should be sized in accordance with the Standard Detail Drawings in this manual.

Section 709:05 Sprinkler Standpipe Connections

1. All Fire Department connections shall be fitted with National Standard threads or threads meeting the latest requirements of the State Fire Insurance Commission.

End Article VII

ARTICLE VIII - SANITARY SEWER SYSTEMS

Section 800: Purpose & Scope

Section 801.01 Minimum Requirements & Standards

The purpose of this Article is to address the minimum requirements for design and construction and describe the products to be incorporated into public sanitary sewerage systems with gravity sewer mains, pump stations and sewer force mains. All products shall be supplied and all work performed in accordance with applicable American Society for Testing and Material (ASTM), American Water Works Association (AWWA), American National Standards Institute (ANSI) or other reorganized standards. Latest revisions of all standards are applicable. When the standards set forth in these Articles are more restrictive than those required by any statute, ordinance or regulation applicable within the City of Cornelia, the requirements of this Article shall govern. When the provisions of any other statute, ordinances, or regulation require more restrictive standards than required by this Article, the more restrictive standards shall apply.

Section 801.02 Authority

The authority for discretionary provisions for design and construction of public sewer systems shall vest with the Administrative Officer or his/her designee.

Section 801.03 On-site Sewage Disposal Systems

On-site sewage disposal systems for more than one individual residence or one stand-alone business will not be allowed.

Section 801.04 Periodic Revisions

This Article is subject to periodic revision to meet changing requirements for materials, environmental regulations, etc. At the beginning of a project the Developer should verify that he has the latest edition.

Section 801.05 General Design and Construction Requirements

This document is intended to convey the general design and construction requirements for a typical project. It also lists specific requirements relating to inspection, testing and acceptance of facilities. It is not intended as a substitute for site-specific engineering and construction techniques. Individual project conditions may require waivers from the provisions in this document.

Section 801.06. Sewer Extensions into Unincorporated Habersham Co.

Sanitary Sewer extensions into unincorporated Habersham County require approval by the Board of City Commissioners. Prior to requesting approval, the developer or his representative will work with the City of Cornelia and Habersham County to ensure that the proposed sewer extension is consistent with the Service Delivery Strategy for the area. If approved, these extensions must meet all regulations and specifications set forth in the City of Cornelia Minimum Development Standards Ordinance.

Section 802: General Policy and Requirements

Section 802.01. Sewer System Design

Sewerage systems shall be designed in accordance with the densities and intensities reflected in the Long Range Future Land Use Map of the Adopted City of Cornelia Comprehensive Plan and the City's Wastewater Management Plan.

Section 802.02. Coordination of Location of Existing and Proposed Sewers

The approximate location and character of proposed public sewer facilities shall correspond with the Existing and Proposed Sewer System Map, as amended.

Section 802.03. Designed for Future Population

Sewer systems shall be designed for the estimated future population from all contributing points under consideration. The estimated future population shall be based on the adopted Comprehensive Plan and/or the existing zoning of the land for the watershed to be served, whichever is greater.

Section 802.04. Buildings for Human Occupancy

Except as provided below, all future buildings within the City's corporate limits that are to be utilized for human occupancy or any other use such as commercial or industrial purposes that requires sanitary sewerage facilities shall be connected to the public sanitary sewer system.

Waiver of the requirement to connect to public sanitary sewers will be considered on a case-by-case basis for non-subdivided, single-lot buildings when the nearest connection point to a public sanitary sewer is more than 200 feet from the property line, when such buildings are to be used for single-family dwelling or some other use where the wastewater loading is no more than that of a single-family dwelling. Requests for waiver must be accompanied by appropriate documentation as may be required by local public health officials.

Section 802.05. Sewer Connections

Sewer Connections - All sewers and service laterals located outside of dedicated rights-of-way or public easements are regulated by the International Plumbing Code (IPC), and shall be privately owned and maintained.

Section 802.06. Water Supply Interconnections

There shall be no physical connections between a drinking water supply and a sewer, or appurtenance thereof.

Section 802.07. Pre-treatment Requirements for Industrial Wastewater

Some industrial and other developments may be required to pre-treat sewage prior to discharge into the City's collection system. Requirements for pretreatment will be determined in accordance with the City's Industrial Pretreatment Permit requirements.

Section 802.08. Erosion and Sediment Control

All installation and maintenance activities for sewerage systems must comply with all Federal, State and local erosion and sediment control regulations. A detailed erosion and sediment control plan is required to be submitted and approved prior to initiating any construction activities.

Section 802.09. Other Requirements

A. Bypassing of raw wastewater onto the ground or a receiving stream is prohibited at all times.

B. No part of these specifications is intended to relieve the Developer of his responsibility to comply with requirements of the Georgia DOT, the Georgia EPD or other appropriate regulatory agency.

C. Photographs of the area should be taken and submitted to the City prior to initiation of any land disturbance or construction activities to show that final site conditions will be the same or better than original conditions as a result of restoration activities.

D. All unsuitable excavated material must be properly disposed of in a manner acceptable to the City and in a manner that will not adversely impact the environment.

Section 803: Plans and Submittals

Section 803.01. General

All projects which involve construction of lateral sewers, main sewers, trunk sewers, interceptor sewers or pumping facilities shall have detailed construction plans and specifications prepared by a Registered Professional Engineer licensed in the State of Georgia. Developments that only involve gravity sanitary sewers and small connecting sewers less than 1,000 linear feet may have plans and specifications prepared and stamped by a Registered Land Surveyor licensed in the State of Georgia.

Section 803.02. Plan Submission

All development plans proposing a sewer system shall be submitted to the City of Cornelia's Development Department. The Development Department shall coordinate the review and approval of all elements of the plan in accordance with these Minimum Development Standards.

Section 803.03. Preliminary Plan Review

Preliminary plans will be prepared and submitted for review as described in Article III of these Development Standards. Questions relating to availability of sanitary sewers and proposed location of connection should be resolved at this stage before proceeding with final planning. A submittal for preliminary plan review must include all land to be developed even though the land is to be developed in several phases or units. Availability determinations will be made for the total project.

Section 803.04. Final Plan Review

All final plans for public sanitary sewer facilities shall be prepared in accordance with the requirements described in Article III and as required in regulations promulgated by the Georgia Environmental Protection Division (EPD). The Developer (not the City) shall be responsible for submitting all necessary plans and other data to EPD for required approvals and for obtaining other permits, such as DOT, railroad, wetlands, etc.

Sanitary sewer design calculations shall be submitted for all proposed mains as part of the development plans along with a sewer-shed map. Deviations from the flow rates of Table 8-1 shall be included in the submission of the development plan, with a description of the procedure used for the calculations and must be approved by the Public Works Director.

Section 803.05. Design of Cross-Country Sewers

The design of cross-country (undeveloped property) sanitary sewer lines and force mains shall be based on field-run surveys. The site plan for cross-country sanitary sewer lines and force mains need not show contour intervals, but the profiles shall be based on mean sea level elevation. Site plans for lift stations shall show existing and proposed contours.

Section 803.06. Phased Subdivision Development

In the event the subdivision is developed in phases, the final construction plans for sanitary sewers may be submitted in phases.

Section 803.07. Plan and Profiles

Profiles should have a horizontal scale of not more than 1"=100' for cross-country lines and 1"=50' for (existing and proposed) developed areas, and a vertical scale of not more than 1"=10'. The plan view should be drawn to the corresponding horizontal scale. The plan view should normally be shown on the same sheet as the profile. In any case, both the plan and profile view should have line designations, station numbers, manhole numbers and any other indexing necessary to easily correlate the plan and profile view. The vertical datum used should be the elevation above mean sea level with benchmarks shown on the plans and the horizontal datum should be tied to State Plane coordinates. Plans and profile shall show location of streets, storm sewer, water lines and their easements.

Section 803.08. Manual for Erosion and Sediment Control in Georgia

Final plans and specifications shall include appropriate soil erosion and sediment control practices and BMP's which shall comply with the City of Cornelia ordinances, the Georgia Department of Natural Resources Environmental Protection Division regulations, the Georgia Erosion and Sedimentation Act of 1975 as amended, and the latest edition of the manual for Erosion and Sediment Control in Georgia as published by the Georgia Soil and Water Conservation Commission.

Section 803.09. Sanitary Sewer Details

Detailed engineering design drawings shall be furnished that are drawn to scale clearly show the nature of the design, and shall include the following:

1. All stream crossings and storm drain outlets with elevations of the stream bed and of

normal and extreme high and low water levels.

2. Details of special sanitary sewer joints and cross sections.

3. Details of special sanitary sewer appurtenances such as manholes, service connections, elevated sanitary sewers, piers, pipe bedding, special highway crossings, railroad crossings, drop manhole connections, etc.

4. The developer's design professional shall furnish appropriate drawings for submittal by the owner to any state or federal highways, railroads, power lines, water lines, gas lines, petroleum lines or any other utility lines on which the sanitary sewer construction will encroach.

   a. The encroachment drawings shall be 8 ½ " x 11" and shall show a plan view and profile view. The drawing shall show the same information required for easement drawings.

   b. The encroachment drawing shall also show the right-of-way of the existing street or utility, the owner's designation of the line, the name or number of the nearest intersection or milepost or tower number and the distance to that appurtenance; clearance distance between the street surface, or the bottom of the rail, or the utility and the sanitary sewer; the type of material to be used for the sanitary sewer and the method of construction to be used; any other special information required by the owner of the facility on which the sanitary sewer is encroaching.

   c. Two (2) copies of the utility encroachment drawing will be furnished with the plans when they are submitted for approval.

   d. The developer's design professional shall prepare and handle the submittal. Construction permits shall not be issued until the utility encroachment permit has been obtained and until any special conditions such as insurance requirements have been complied with.

Section 803.010. As-Built Drawings

At the completion of construction (and preferably prior to the final field inspection) "As-Built" drawings of the project shall be submitted to the City to serve as a permanent record of the project. A reproducible copy of the final plan and two (2) sets of as-builts shall be submitted. A digital copy of the as-built plans shall also be submitted in a format and coordinate system compatible with the City of Cornelia's Geographic Information System (GIS). Each sheet of these drawings shall bear the words "As-Built" or "Record Drawings".

1. Guidelines for Preparation of As-Builts

   a. As-Built drawings will be same format as the original construction plans.

   b. Existing contour lines are not required, however the final contour lines should be shown.

   c. Road names and lot numbers should be on plan.

   d. "As-Built" or "Record Drawing" is to be stamped in large clear print on plans.

   e. Sheet should be no larger than 24" x 36".

f. Lateral wye locations must show distance from the downstream manhole.

g. Ends of lateral lines must show distance from downstream manhole and offset distance from the main line. Approximate depth of end of lateral should be shown.

h. Show elevations of manhole inverts and tops.

i. Show field-measured distance between manholes.

j. For all sanitary sewers, show the field-measured azimuth or bearing of the line from manhole to manhole.

k. Show actual slope of pipe.

l. When a phase of a subdivision is completed, a location sketch of entire subdivision with said phase outlines shall appear on plans.

m. Maximum error of as-built measurements shall be:

- Manhole inverts measure to 0.01' with maximum vertical error of 0.05' per 1,000 feet of horizontal traverse.
- Manhole tops measure to 0.10' with maximum vertical error of 0.05' per 1,000 feet of horizontal traverse.
- Horizontal Locations: Measure to nearest 1.0' with allowable error of 0.10' per 1,000' of traverse.

Section 804: Easements

Section 804.01. General

All easements shall allow adequate room to construct and maintain the sanitary sewer and appurtenances. Permanent easements shall be provided for all sanitary sewers not located within the right-of-way or within 10 feet inside of the right-of-way shall be a minimum of 20 feet wide, ten (10) feet on each side of the line; except that when the depth of the sanitary sewer exceeds ten (10) feet the required sanitary sewer easement width shall increase such that the easement width is at least twice the depth from the ground surface to bottom of the pipe. Easements with dual utilities shall be a minimum of 35 feet in width.

Section 804.02. Easement Drawings

Easement drawings shall be furnished for work outside the development prior to approval of the sanitary sewer plans. The drawings shall be of a size suitable for legal recording and shall be prepared by a Registered Land Surveyor. The drawings shall be drawn in accordance with these Development Standards.

Sewer easements off the street right-of-way shall be clearly defined on the plat of the individual property owner and said property owner will be required to keep the easement free of all obstacles.

All easements shall be cleared of debris, excess dirt and other materials. The ground shall be smoothed down and grassed within 10 days of completing construction work. The use of sediment control measures will be required to protect the area until a vegetative cover is

obtained.

Where the developer does not contemplate installation of sewers to the most upstream property line of drainage basins running through the development, a 20 foot wide permanent easement and 60 foot wide construction easement will be required for future use of the City. These easements must be shown and recorded on the final development plat.

The title block for these easement plats shall read as follows:

CITY OF CORNELIA
NAME OF OUTFALL OR SUBDIVISION
EASEMENT FOR PROPOSED SANITARY SEWER
CROSSING PROPERTY OF
John Doe
Tax Map, Block & Lot No,/Zoning District//Date and/or Revised Date:

Section 804.03. Adjacent Property Access

To provide for maximum utilization of public sewer systems, appropriate easements shall be provided to adjacent properties for access to, or extension of, said utilities. Such easements shall be dedicated to the City of Cornelia.

Section 804.04. Offsite Easements

It shall be the responsibility of the Developer to obtain any off-site easements required to connect the project to existing public sanitary sewers. Easements will be conveyed to the City of Cornelia for all facilities that are to be conveyed to the City. Final plans cannot be approved until all necessary on-site and off-site sanitary sewer easements have been submitted, approved and recorded (see Appendix B for a sample easement form).

Section 805: Sewers in Relation to Streams, Lakes and Other Water Bodies

Section 805.01. Crossing Streams and Standing Bodies of Water

Sewer lines crossing streams or standing bodies of water, both above and under water, present special problems, and should be discussed with the City's Development Department before final plans are prepared.

Section 805.02. Sanitary Sewers Adjacent to State Waters

Cross-country sanitary sewers adjacent to state waters shall be designed and constructed to comply with the buffer requirements, including Georgia DNR Rules 391-3-7, the Georgia Erosion and Sediment Control Act OCGA 12-7-1, and any other ordinances the City of Cornelia may have enacted. In cases where these regulations differ, the most protective (greatest distance from the edge of the stream) will serve as the standard. Sanitary sewers crossing streams shall be kept to a practicable minimum. Where sewers parallel state waters, the sewers and their respective easements shall be located outside the buffer area. Reasons for requesting sewer lines to be located within stream buffers shall be provided in

the preliminary plan application and a Stream Buffer Variance application must be made by the Developer to Georgia EPD.

Section 805.03. Sewers on Piers

Sewers laid on piers across ravines or streams shall be allowed only when it can be demonstrated that no other practical alternative exists.

Section 806: Sewer Systems in Relation to Waterworks Structures

Section 806.01. EPD and Local Health Department Requirements

Sewer systems shall meet the requirements of the EPD and the local health department with respect to minimum distances from water supply wells or water supply sources and structures.

Section 806.02. Water Supply Structure or Source

No sewer line shall pass within fifty (50) feet of a water supply source or structure unless special construction and / or pipe materials are used to obtain adequate protection.

Section 806.03. Protection of Water Structures

The proposed design shall identify and adequately address the protection of all water supply structures within 100 feet of the proposed project.

Section 807: Design Calculations

Section 807.01. Peak Flows Based on Future Flows

Sewer systems shall be designed to carry the peak flows generated by the estimated future population from all contributing points under consideration. The estimated average daily flow will be computed using the unit flows from Table 8-1. In the absence of actual data, sewer peak flows should be determined by consulting the latest edition of the Recommended Standards for Sewage Works (Ten State Standards) .

Section 807.02. Determining Peak Flows

Peak flows will be determined using Table 8-2.

Section 807.03. Determining Sewer Capacity

Considerations will be given to domestic, commercial, institutional and industrial wastes plus groundwater infiltration in determining the necessary capacity of the sewer system.

TABLE 8-1
AVERAGE DAILY WASTEWATER FLOWS
BY FUTURE LAND USE CATEGORY

Land Use Category	Density SU/Ac.	Unit*	Flow/Unit (gpd/unit)
Residential: Low Density	2	DU	400
Residential: Medium Density	5	DU	375
Residential: High Density	9	DU	350
Neighborhood: Commercial	--	ACRE	2,000
Office/Professional	--	Acre	2,000
Commercial	--	Acre	2,000
Light Industrial	--	Acre	1,500
Office/Distribution/Technology	--	Acre	1,750
Heavy Industrial	--	Acre	2,000
Quasi-Public/Institutional/Churches	--	Acre	2,000
Public Land	--	Acre	**

* *Acres refer to gross acreage minus the floodplain area as established.*
** *Design of sewer facilities to serve these land uses shall be on a case-by-case basis depending on specific uses.*

Section 808: Sanitary Sewer Design Criteria

Section 808.01. General

The criteria listed herein is not intended to cover all aspects of design, but rather to mention the basic guidelines and those particulars that are required by the City of Cornelia. For more detailed criteria, the design should refer to standard references such as "Ten States Standards", Georgia EPD Rules and Regulations, Water Pollution Control Federation Manual of Practice No. FD-5, and other available literature.

All sanitary sewers for the conveyance of wastewater shall be designed as separate sanitary sewers in which groundwater, stormwater or other runoff from roofs, streets, parking lots, foundation drains and any source other than wastewater are excluded. Overflows from sanitary sewers shall not be permitted.

Section 808.02. Design Period

Gravity sanitary sewer pipelines should be designed in accordance with the City's wastewater management plan and should, as a minimum, be designed with capacity sufficient to handle the estimated tributary population twenty to forty years into the future. Tributary population is considered to be all areas upstream of the discharge point of the system being designed as well as any anticipated pumped flow from other basins, sanitary sewers shall be designed and installed to the uppermost property line of the development

being served. Consideration should be given to the maximum anticipated capacity of institutions, industrial parks, etc.

Section 808.03. Capacity and Size Determinations

In determining the required capacities of sanitary sewers, the following factors should be considered:

1. Maximum hourly sewage flow;
2. Additional maximum sewage or waste flow from industrial plants;
3. Groundwater infiltration;
4. Topography of the area;
5. Depth of excavation.

Section 808.04. Design Features

1. No sewer main shall be less than 8"; No service lateral shall be less than 6".
2. Wet Well Volume - The wet well volume shall be sized to limit pump cycles to no more than six (6) cycles per hour under worst conditions.
3. Ventilation - The minimum requirement for wet wells shall be one (1) gravity vent pipes designed for natural ventilation. Vents shall be elevated to a minimum of two (2) feet above the 100-year flood elevation. Where conditions are conducive to formation of hazardous conditions (in the design engineer's opinion), mechanical ventilation shall be provided. Mechanical ventilation shall be required for dry wells.
4. Structures - Submersible lift stations shall have a wet well structure and a separate valve pit. Both structures shall be pre-cast concrete with a monolithic base, however, cast-in-place will be considered on a case-by-case basis. The valve pit shall be a minimum of 4' x 4' x 5' deep with manhole steps, floor drain pipe with a “p” trap and backflow preventer, and a minimum 3' x 3' lockable aluminum access hatch. Wet wells may be either round or rectangular and shall have a diameter or width of at least five feet (5'). Wet wells shall be sized to meet cycle time requirements with a draw down (i.e. the distance between high water level and low water level) of not more than three (3) feet. The wet well shall have a lockable aluminum hatch large enough for easy removal of pumps.
    a. Riser sections in pre-cast units shall be sealed watertight using butyl rubber sealant or other approved sealant. Mastic shall not be used. Structures shall be adequately reinforced for all loading conditions normally encountered during shipping, construction and service. All openings (for pipes, hatch, conduits, etc.) shall be either cast-in-place or cored. Sanitary sewer pipe connections shall utilize rubber boot connectors and be watertight. The wet well will be equipped with either manhole steps or an aluminum ladder, whichever is the City's preference.
5. Accessories - All materials inside the wet well and valve pit shall be corrosion resistant. Mechanical equipment requiring ferrous metals shall have a coal tar epoxy coating. Guide rails for pumps shall be stainless steel. Miscellaneous metals including

fasteners shall be aluminum or stainless steel; hatches shall be aluminum; anchor bolts shall be stainless steel. All stainless steel must be Grade 316.

6. Pressure Gauge - Pressure gauges shall be installed on the force main inside the valve pit and visible from ground level as follows: between each pump and its check valve and one (1) downstream of the plug valves. A corporation stop shall be installed on each tap to allow removal of the gauge.

7. Valves - The discharge pipe of each pump shall have a check valve followed by a plug valve before the two pipes join into a common force main.

8. Surge Control Valves - The pumping system shall be checked to determine if a surge control valve is required. If a valve is required, it shall be located within the valve pit on the common force main and a drain line installed to drain to the wet well.

9. By-pass Pump Connection – Each pump station shall be equipped with a bypass pump connection constructed of flanged and/or restrained joint ductile iron pipe, plug valve and a camlock fitting. The bypass pump connection shall be installed downstream of the valve vault and allow for the connection of a temporary pump.

Section 808.05. Pump Features

1. Pumps shall have the following features:
   a. Non-clog impeller
   b. Be capable of passing a three (3) inch sphere (except grinder pumps)
   c. Be capable of dry operation without overheating
   d. Have dual mechanical seals with seal leak indicator light in the control panel
   e. Pump and motor casing shall be cast iron and all fasteners shall be stainless steel (Grade 316)
   f. Motor shall be selected to be non-overloading under all operating conditions.
   g. Motor winding shall have a heat sensor with auto reset to prevent overheating; three-phase motors shall have two sensors
   h. The operating speed of the pump shall not exceed 1800 rpm without special approval. The motor shall have upper and lower roller bearings. The pump shall be automatically connected to the discharge connection elbow when lowered into place and shall be easily removed for inspection or service. There shall be no need for personnel to enter pump well. A simple linear downward motion of the pump shall accomplish sealing of the pumping unit to the discharge connection elbow. Each pump shall be equipped with a stainless steel chain or cable for easy removal and a hoist shall be provided for easy removal.

Section 808.06. Depth Requirements

Any sewers installed in the street shall be sufficiently deep to provide 5 feet of cover at the inlet end of all service laterals at the street right-of-way and over any part of the main or service within the street right-of-way. Any sewers on off-street easements shall have a minimum of four feet of cover. In extraordinary circumstances where there is no other

alternative, ductile iron pipe shall be used where there is less than four feet of cover and it shall have a protective coating on the pipe interior as required herein. Filling over the pipe to obtain minimum cover is not allowed if the fill will impede the natural flow of surface water or will cause an erosion problem.

Section 808.07. Design on Average Daily Flow (ADF)

New sanitary sewer systems shall be designed on the basis of an average daily flow of sewage of not less than 400 gallons per household per day. Normally, all sanitary sewers shall be designed for a peak flow of not less than 2.5 times the average flow; this peak factor will be higher for smaller basins. Sanitary sewers should be designed to carry the peak flow when flowing at a depth of 2/3 the pipe diameter.

Section 808.08. Flow Velocities

All sanitary sewers shall be so designed and constructed to give mean velocities, when flowing full of not less than two (2) feet per second based on Manning's formula using an "n" value of 0.013. Table 8-2 below indicates the minimum slopes that should be provided; however, slopes greater than these are desirable: Where velocities greater than 15 feet per second are attained, special provision should be made to protect against displacement by erosion and impact.

TABLE 8-2
MINIMUM REQUIRED SEWER PIPE SLOPES

Minimum Sewer Size (inches)	Minimum Slope (ft/100ft.)
8	0.40
10	0.29
12	0.22
14	0.17
15	0.15
16	0.14
18	0.12
21	0.10
24	0.08
27	0.07
30	0.06
36	0.05

These minimum slopes shall be used only when sufficient flows are expected to maintain a velocity of two (2) feet per second and maintain a cleaning action in the line. Sanitary sewers shall be laid with uniform slope between manholes. Sanitary sewers on 20% slopes or greater shall be ductile iron pipe and shall be anchored securely with concrete anchors (See Standard Details) to prevent displacement by erosion or shock. The maximum slopes of sanitary sewers shall be 30% and sanitary sewers shall be designed at less than 20% whenever possible.

Section 808.09. Increasing Size

When a small sanitary sewer is connected to a larger sewer, the connection shall not be

lower than matching the top of both sewers to the same elevation.

Section 808.010. Gravity Sewer Pipe

The City reserves the right to disallow any manufacturer that does not have a consistent, long-term record of quality control and successful product performance. Gravity sewer pipe up through 15-inch diameter will normally be polyvinyl chloride (PVC). Ductile iron pipe (DIP) shall be used where certain conditions exist (see Section 809). For 18-inch diameter pipe and larger, the contractor may have the option of using either PVC, or DIP. The City may approve the other types of pipe on a case-by-case basis and may limit the options of type of pipe depending on site conditions. All pipe shall be marked continuously with metalized locator wire. This should be addressed at the preliminary plan review stage.

Section 808.011. Wyes and Bends

Wyes ad bends shall be equal in quality to the materials of the pipeline being installed.

Section 808.012. Pre-Cast Concrete Manholes

1. Manholes - Sanitary sewer manholes shall consist of Portland Cement concrete with a compressive strength of not less than 4,000 pounds per square inch at an age of 28 days. The minimum inside diameter of the manhole shall be as required by the Standard Details. The wall thickness shall be not less than 5 inches. Manholes over 12' deep shall be placed on a reinforced slab as shown on the detail. Joints in the wall shall be tongue and groove type. Sections shall be joined using O-ring rubber gaskets, flexible plastic gaskets conforming to the applicable provisions of ASTM Standard Specification, Serial Designation C43, or an approved bitumastic joint material. Precast concrete manholes shall consist of precast reinforced concrete sections with eccentric, (or flat slab for shallow manholes) top section and a base section conforming with the typical manhole details as shown on the Standard Detail. Flat top manholes will be approved only if a need for such can be demonstrated by the design professional.

2. Manhole Sections - Each section of the pre-cast manhole shall have not more than two holes for the purpose of handling and laying. These holes shall be sealed with cement mortar using on part Portland Cement to two parts clean sand, meeting ASTM Standard Specification, Serial Designation C144.

3. Lift Holes - Holes in precast bases to receive sewer pipe shall be precast at the factory at the required locations and heights. Knocking out of holes in the field will not be permitted; however, holes can be cored in the field with a coring machine. The design, the materials used in, the manufacturing process and the transportation of precast manhole shall be subject to inspection at any time by the City. Materials found defective by the City will not be delivered to the jobsite. Material on the jobsite that is found defective shall be removed immediately after being notified that such materials are unacceptable. Precast manhole shall conform to ASTM C478.

4. Pipe Holes - Holes in pre-cast bases to receive sanitary sewer pipe shall be pre-cast at the factory at the required locations and heights. Knocking out of holes in the field shall not be permitted on new construction. However, holes can be cored in the field with a coring machine. All manholes shall have Kor-N-Seal (or equal) rubber boots for all pipe entries/exits.

5. Rubber Boots - Pre-molded rubber boots with stainless steel bands shall be used for connecting sewer pipe to manholes. These may be either the lock-in "Kor-N-Seal" type as manufactured by National Pollution Control Systems, Inc. or the cast-in type as manufactured by Interpace Division of Ball Rubber, Inc. or approved equal. In all cases, the boot shall be sized to suit the outside diameter of the type pipe being used.

6. Manhole Steps - Manhole steps shall be of #4 steel reinforcing bars covered with Polypropylene Plastic or rubber and shall be supplied with depth rings and other necessary appurtenances. The manhole steps shall conform to the applicable provisions of ASTM Specification C478 and shall be similar to and of equal quality to the "Sure Foot" by Oliver Tire and Rubber Company of Oakland, California or "PSI-PF" by M.A. Industries, Inc. of Peachtree City, Georgia. The step shall be factory built into the precast sections.

7. Inverts - The invert of manholes shall be constructed of concrete or brick in accordance with the Standard Details and shall have a cross-section of the exact shape of the invert of the sewer which it connects, changes in size and grade being made gradually and evenly. Changes in direction of the sewer and entering branch or branches shall have a true curve of as large a radius as the size of the manhole will permit. Inverts shall have a "smooth trowel" finish. The manhole bench shall be sloped 30 degrees from the manhole wall toward the invert. Manholes shall be provided with steps built into the wall as shown on the detailed drawings. Drop manholes will be required where the invert of any incoming line will be higher than two (2) feet from the invert of the outlet pipe. All manholes shall be watertight when completely built.

8. Manhole Foundation - The manhole base shall be set on a compacted mat of #57 size crushed stone. The mat shall be a minimum of 6-inch thick and graded level. In wet areas the crushed stone mat shall be thickened as needed to provide a non-yielding foundation.

9. Brickwork - Any brickwork required to complete the pre-cast concrete manhole shall be constructed using one (1) part Portland cement to two (2) parts clean sand, meeting ASTM C144 Specifications as amended, thoroughly mixed to a workable plastic mixture. All brickwork shall be constructed in a neat and workmanlike manner. Cement mortar shall be used to grout interior exposed brick joints and faces. No more than three (3) courses of brick with nine (9)-inch maximum total depth of bricks may be used to adjust manhole covers. In cross country areas, the elevation of the top shall be 18 inches above the finished grade. Manholes in other areas shall be at the elevation shown on the approved plans.

10. Frame and Cover - Manhole covers shall be cast iron with a coat of asphaltic paint applied at the foundry. The frame and cover shall be as shown on the detail drawings. All covers shall have "Sewer" printed on them. Manhole frame and covers shall be as manufactured by Neenah R-1765 (365 lbs.) in paved roads, parking lots and driveways; and Neenah R-1779 (300 lbs.) for non-traffic areas, or approved equal. Manhole frames shall be cast in the cone if located in non-traffic areas. Waterproof manhole covers shall be cast iron with a coat of asphaltic paint applied at the foundry as shown on the drawings with a "bolted-down" lid. All covers shall have "Sewer" printed on them. Manhole frame and covers shall be as manufactured by Neenah Foundry Company R-1915-F2 (435 lbs.) or approved equal. Manhole frames shall be cast in the cone if located in non-traffic areas.

11. Masonry Work - Masonry work shall be allowed to set for a period of not less than 24 hours before being placed under traffic or in operation. All loose or waste material shall be removed from the interior of the manhole.

12. Location - Manholes shall be installed at the end of each line; all changes in grade, size or alignment; at all intersections; and at horizontal distances normally not greater than 400 feet. Cleanouts may only be used for special conditions and shall not be substituted for manholes nor installed at the ends of laterals greater than 150 feet in length. Manholes in cross-country areas shall be elevated so that the top is 18 inches above ground and/or two (2) feet above the 100-year flood plain.

13. Drop in Manholes - Drop across manholes shall be minimum 0.1 feet unless approved by the City.

14. Both wet wells and manholes receiving force main effluent must be coated with a factory applied coal tar epoxy to prevent corrosion. The coating shall be 300 M as manufactured by Kopper Company, Inc. or acceptable equivalent. The coating shall be applied in two coats to achieve a dry film-thickness of at least 10 mils per coat in accordance with the manufacture's recommendations. Surfaces shall be cleaned of dust, form oil, curing compounds or other foreign material prior to coating. If the City believes that coatings will not provide adequate protection, more stringent requirements like PVC liners may be required on a case-by-case basis. If the City believes that coatings will not provide adequate protection, more stringent requirements, like PVC liners, may be required on a case-by-case basis.

Section 808.013. Concrete and Mortar

1. Concrete shall consist of Portland Cement, a fine aggregate, a coarse aggregate and water. Portland Cement shall conform to Fed. Spec. SS-C-19 lb. Fine aggregate shall be clean, sharp, well-graded sand conforming to Fed. Spec. SS-S-51. Coarse aggregate shall be uniformly graded broken stone or gravel, which will pass a 1 ½" screen and be retained on 9¼" screen. Aggregate shall be free of clay, loam silt or organic matter. Water used for concrete shall be clean and free from vegetable, sewage or organic matter and the total amount used shall not exceed six (6) gallons per sack of cement. Forms may be of wood or metal properly braced to prevent bulging. Concrete shall be thoroughly mixed and well vibrated into forms and around fittings. Exposed

surfaces of concrete shall be protected from premature drying by being kept covered and moist for a period of seven days. After the forms have been removed, the voids in the interior surface, if any, shall be properly filled with cement mortar and the whole surfaced rubbed uniformly with neat cement.

2. All mortar shall be composed of one part Portland Cement to three parts sand, conforming to these specifications.
3. All concrete shall have a compressive strength of not less than 3,000 psi at an age of 28 days.

Section 808.014. Reinforcing Steel

Bars for concrete reinforcement shall be of the sizes, lengths and bent as shown on plans. Bars shall be ASTM Specifications A-615 Grade 60. All Steel shall be free from rust, scale or any foreign coating.

Section 808.015. Brick

All brick shall be best grade, hard-burned, common, giving a ringing sound when struck and acceptable to the City. Only bricks presenting a regular and smooth face shall be used. When submerged in water for 24 hours, they shall not absorb more than 10% of their weight in water. Brick shall be culled when delivered on the ground, and all imperfect brick are to be immediately removed from the work. All salmon, soft or arch brick or brick made of alluvial soil will be rejected. All brick used in the work shall be of uniform size.

Section 808.016. Subgrade Stabilizer Stone

Stabilizer for subgrade shall be either approved crushed stone or gravel, uniformly graded from ¼" to ½" in size.

Section 808.017. Casing Spacers

Approved casing spacers shall be used to secure the sewer line on grade throughout the length of the casing. The spacers shall be sufficient to secure the pipe on grade during the grouting operation.

Section 808.018. Concrete for Thrust Blocks and Thrust Collars

Concrete for thrust blocks and thrust collars shall have a minimum compressive strength of 3,000 psi at 28 days.

Section 808.019. Steel Casing Pipe

Steel casing pipe shall be used where boring and jacking of more than 20 feet in length is required for installation.

Steel casing pipe shall be schedule 40 thickness with minimum yield strength of 35,000 psi and shall conform to the requirements of ASTM A139. It shall be fully coated on the exterior and interior with a coal tar coating. The casing pipe diameter shall be 6 to 8 inches greater than the "bell" diameter of the carrier pipe.

Wherever steel casing is required, the carrier pipe shall be ductile iron pipe with push-on joints. Approved spacers made of stainless steel straps with nylon skids shall be used to center the carrier pipe; two spacers per section of pipe shall be used. A manhole shall be placed at each end of the cased section at a distance of five to 10 feet beyond the end of the casing. Ductile iron pipe shall be continuous from manhole to manhole.

Section 808.020. Protection of Water Supply

There shall be no physical connection between a public or private potable water supply system and a sanitary sewer which would permit the passage of any sewage or polluted water into the potable supply.

1. A horizontal separation of at least 10 feet is required between sanitary sewer lines and existing or proposed water mains (measured edge to edge). Should conditions prevent a separation of 10 feet, the lines shall be laid in separate trenches and sanitary sewers shall be ductile iron, Where sewer mains cross existing or proposed water lines, 18" vertical separation is required between the two mains (measured edge to edge).
2. Whenever possible, the elevation of the crown of the sewer shall be at least 18 inches below the invert of the water main. The two pipes shall be installed such that a full length of pipe will be centered over the crossing so that all joints will be separated as much as possible. Ductile iron pipe shall be installed for both mains at points where the two lines cross.
3. When sewers are laid within public streets, the manholes and lines shall normally be laid along the center of the street at a depth of not less than 7 feet below the road surface to the top of the pipe so that service laterals will have 6 feet of cover at the edge of the right-of-way. In curves and other areas where this is not possible, the lines and manholes are to be installed within the confines of the curb to avoid conflict with the curb and other utilities. Ductile Iron Pipe shall be used for sewer lines crossing storm sewers and at other locations specified by the City.

Section 808.021. Service Laterals

1. A sewer service shall be provided for every existing or proposed lot or building. All services shall be shown on the construction drawings. All service laterals shall be a minimum of 6" in diameter. A common service shall not be allowed for multiple buildings. The service shall extend to 5 feet inside the property line of the lot being served and normally be within 10 feet of the lower corner of the lot.
2. The developer shall be responsible for serving all lots developed. Also, unless noted on the final plat, the service shall be low enough to serve the first floor elevation at the building line.
3. Cleanouts shall be provided with a cast iron ferrule with a brass screw plug to enable the cleanout to be located with a metal detector. Plastic plugs are not allowed.

Section 808.022. Sanitary Sewer Line Extension Requirements

1. If an existing trunk line must be extended to serve the property, the developer may

be required to pay all of the initial costs. If the line extension would serve other developments within a one-year period, the City may negotiate with the initial developer for a pro-rata share participation from future developers who wish to connect to the extension during the one-year period. This one-year period would begin upon final acceptance of the line by the City at the end of the two-year developer maintenance period.

2. Sewer line extensions shall be sized in accordance with the requirements of this Section. If the size of the trunk main extension required is larger than the minimum size required to serve the development, the Developer may be able to recapture some of the initial costs through negotiations with the City for the cost of the betterment in accordance with the Section above.

Section 808.023. Polyethylene Encasement

Ductile iron pipe shall be provided with polyethylene encasement whenever the sewer line either crosses or is in close proximity to a steel gas main. Polyethylene wrap shall be manufactured of virgin polyethylene material conforming to ASTM Standard Specification D-1248, latest revision, Type I**,** Class A or C, Grade E-1. The polyethylene film shall have a minimum thickness of 8 mm.

Section 808.024. Wastewater Lift Stations

A registered professional engineer licensed in the State of Georgia shall do lift station design. The following minimum requirements apply to wastewater lift stations:

1. Lift stations having less than 500 gpm capacity (per pump) shall utilize two submersible centrifugal pumps each having a capacity equal to the design flow. Lift stations having a capacity of 500 gpm or more shall be reviewed on an individual basis and may have requirements differing from those outlined herein,
2. Grinder type centrifugal pumps shall be used for pumps having a capacity of less than 100 gpm. Force mains shall be sized to provide a velocity of at least two (2) feet per second.
3. The design shall allow for each removal of any pump or equipment item without the need to shutdown the entire lift station. Lift assembly shall be provided for pump or equipment removal.
4. The design engineer shall consult with the Administrative Officer or his/her designee after preliminary design data has been developed for information on approved pump manufacturers. The City reserves the right to review each application on an individual basis and to reject the use of non-approved manufacturers.

Section 808.025. Plan & Design Submission

1. In addition to the information requested in Article 300, construction plans shall also include the following lift station information:

    a. System head calculations; tabulated and plotted on the pump curve, along with a plot of force main velocity.

b. Standard drawings, details and specifications sufficient to ascertain compliance with these regulations.

c. Calculations showing determination of wet well volume and cycle time at design conditions. Wet well volume should be sufficient to provide a cycle time of no less than five (5) minutes from a pump "on" to the next pump "on" time. In addition to short cycles, the design engineer should ensure that cycles times will not be too long and create a nuisance condition.

d. Backup power must be provided for pump stations in the event of a power outage.

e. Construction drawings and specifications in sufficient detail to ascertain compliance with these regulations.

f. Buoyancy computations showing that structures are protected against flotation.

g. All pump stations must have separate valve boxes with drains. The drains shall be tied back to the wet well and include a p-trap, flap valve or similar device to prevent sewer gases from entering the valve pit and water from backing up into the valve pit.

2. Shop Drawings - After construction plan approval, but before purchasing any lift station equipment, shop drawings shall be submitted to the City including the following information:

   a. Manufacturer's catalog sheets, performance curves, installation drawings, specifications and list of options for the specific pump that is offered for approval.

   b. Similar catalog data for controls, valves, hatches, yard hydrants, pre-cast wet well and other manufactured items.

3. Certification - After installation and before placing the system into full operation, the work must be inspected by the Developer's Engineer who must then issue a certification to the City verifying that all work has been complete in accordance with approved plans. This certification shall include all construction of the lift stations and force mains. After acceptance of the work by the engineer, a factory representative shall inspect and start up the system certifying rotation, capacity, amperage draw, lack of vibration and other standard checks. This certification shall state the beginning date of the warranty and include a copy of the warranty. The pump shall have a minimum manufacturer's warranty of five (5) years with no prorating.

4. Operation & Maintenance Manuals - On or before the date of start-up, five (5) sets of factory O & M Manuals shall be delivered to the Public Work Director. These manuals shall include the name of the purchaser, the serial numbers of pumps, detailed wiring schematics, telephone number and address for purchase of parts.

5. After construction is complete, as-built drawings shall be furnished including three (3) hard copies plus a copy in Adobe PDF formats.

a. Spare Parts shall be provided per Manufacturer's Recommendations for all pumps. Lift stations with pumps of five (5) HP or smaller shall be supplied with a spare complete pump. Lift stations with pumps above five (5) HP shall be supplied with an extra impeller and set of bearings.

b. Each lift station shall be provided with a permanent in-place emergency generator for standby power. The only exception to this requirement is if the power supply in the project area of the City has a dual feed. Generators shall not be required where there is a dual feed. Where generators are required, the generator shall be diesel powers with an automatic transfer switch and provisions for an automatic exercise cycle. Specifications for the generator shall be submitted to the City for review and approval.

Section 808.026. Site Requirements

1. Flooding - Lift stations shall be designed to remain fully operational and accessible during the 25-year flood event. All electrical controls shall be designed to be above the 100-year flood elevation. All motors and mechanical equipment shall be protected against physical damage from the 100-year flood.
2. Access Road - Access roads shall be paved with a 12-foot wide surface of either concrete (4-inch thick with wire mesh) or asphalt (6-inch graded aggregated base plus 2-inch Type E asphalt),
3. Ownership - Lift station sites and the access roads shall be dedicated to the City. The land dedicated for lift stations shall include sufficient space for parking of two trucks, plus turn-around and slope maintenance. The dedicated width for access roads shall be a minimum of 30 feet.
4. Fencing - Lift station sites shall be fenced with a minimum of 6-foot high chain link fencing topped with three (3) strands of barbed wire. Access gates shall be a minimum of 15 feet in width. The fence shall be coated with black vinyl with a sign that provides the City's Contact information. The area inside the fencing shall be large enough to facilitate service vehicle access to the pumping station, wet well, and other facilities. A paved turn-around area shall be provided whenever the access road length exceeds 200 feet or when the access road grade exceeds 10%.
5. Water Supply - A metered water supply line (1" minimum size) shall be installed to the site with a freeze-proof yard hydrant located near the wet well. The hydrant shall be equipped with a suitable backflow preventer (Watts No. NF8 or approved equal). If City potable water is unavailable to the location of the lift station, a well may be supplied.
6. Lighting – One (1) pole-mounted, 150-watt mercury vapor security light shall be installed. It shall be photocell controlled and equipped with a manual on/off switch located in the main control panel to override the photocell control.
7. Submersible pumping stations shall include a hoist capable of lifting the pump from the wet-well and placing it on the bed of a truck.

Section 808.027. Force Main

1. The force main shall be sized for a minimum velocity of two (2) feet per second with one pump operation.
2. Force mains shall be PVC pipe confirming to AWWA C900 DR 25 (Class 165) or DR 18 (Class 235) based on the design pressure. Color shall be green. PVC pipe shall not be exposed to sunlight or freezing temperatures. Buried PVC pipe shall be marked continuously with metallized locator wire. Ductile iron pipe shall be used in force main for stream crossing, highway and railroad crossings, and at other applications required by the City. All ductile iron pipe shall be furnished in nominal lengths of 18 to 20 feet and coated with an approved coating to prevent corrosion.
3. The force main profile shall slope continuously upward where practical. If high points occur where air could be trapped in the pipe, an air release valve of the type made for sewage applications shall be installed in a manhole at the high points.
4. The minimum depth of cover over force mains shall be four (4) feet.

Section 808.028. Electrical

1. Lift station controls and electrical components shall be factory-wired in weatherproof NEMA 4X stainless steel metal cabinets. The cabinet shall be provided with condensate heaters. Spare fuses of each type used in the electrical/control system shall be furnished.
2. A main circuit breaker shall be installed that is designed to disconnect power to the entire station.
3. Three-phase power shall be provided for all motors exceeding five (5) horsepower. Phase converters will not be allowed, however, the City may consider variable frequency drives (VFD).
4. Protection against voltage surge and loss of a phase shall be provided.
5. The panel shall be equipped with a ground bus and neutral bus. The terminal shall be suitable for either aluminum or copper wire. All internal panel wiring shall be copper.
6. Motors shall be suitable for either 230 or 460-volt operation, The design engineer shall consult with the local power company to verify specifics pertaining to electrical power availability.
7. Four sealed float switches shall control the wet well level. All floats shall be provided with 25-feet of Type KO flexible cord and shall be attached to a bracket mounted at the top of the wet well. Float functions shall be as follows:
    a. Float no. 1 Low level (Pumps Off)
    b. Float no. 2 High Level (Lead Pump On)
    c. Float no. 3 Extra High Level (Lag Pump On)
    d. Float no. 4 Surcharge level (Alarm Activated)
8. The pump control system shall include the following features:

a. Level transducer or ultrasonic level indicator;
b. Lead pump/lag pump alternator;
c. Alarm light and horn to indicate high water level;
d. Seal failure indicating light;
e. Pump failure indicating light;
f. Condensate heater;
g. Lead pump selector switch;
h. H-O-A switch and run light for each pump;
i. Control voltage shall be 120V;
j. The wiring shall be neatly tied and number coded to facilitate maintenance and a schematic diagram furnished with the panel;
k. A 120V GFCI type electrical receptacle shall be located at the control panel;
l. Pump stations shall be equipped with a remote transmitting unit and telemeter circuitry connected to the City's SCADA system; and
m. Manufacturer's warranties to be supplied with a minimum of 100% coverage for five (5) years with no pro-rating,

9. All conduit entering the pump station should be sealed air tight at the wet well and at the control panel or the motor control center.
10. Warranty - Regardless of the manufacturer's warranty terms, the developer will be responsible for all repairs necessary within two (2) years from the date the station is completed and approved by the City. The Developer will be required to furnish such assurances to the City as deemed appropriate by the City to ensure prompt action.

Section 809: Sanitary Sewer Pipe Design Criteria

Section 809.01. Ductile Iron Pipe (DIP)

1. Ductile iron pipe shall be required for all sanitary sewer mains:
   a. Over or under all storm sewers
   b. Crossing water mains
   c. At all stream crossings
   d. At all utility crossings with less than two (2) feet of clearance (above or below)
   e. At locations where cover is less than four (4) feet
   f. Where slopes exceed 20%
   g. Under road and railroad crossings and inside casings
   h. Where PVC sanitary sewer pipe has more than 14 feet of cover
   i. At all other locations specified by the City
2. Ductile iron pipe shall be designed and manufactured in accordance with AWWA

C150. Minimum wall thickness for 4" — 12" diameter pipe shall be Pressure Class 350; Minimum wall thickness for 14" — 20" diameter pipe shall be Pressure Class 250; Minimum wall thickness for 24" diameter pipe shall be pressure Class 200; Minimum wall thickness for pipe larger than 24" in diameter shall be Pressure Class 150. Pipe shall be manufactured in accordance with AWWA C151. Wall thicknesses greater than the minimums called for above may be required due to greater depths or varying bedding requirements.

3. All D.I.P shall be subject to inspection and approval by the City after delivery. No broken, cracked, imperfectly coated or otherwise damaged or unsatisfactory pipe or fittings shall be used. The pipe interior shall be Polybond, Polyline, polyurethane or Protecto 401 ceramic epoxy lined with a minimum thickness of 40 mils. The exterior shall be seal coated with an approved bituminous seal coat in accordance with AWWA C151.
4. Pipe joints shall be push-on joints conforming to AWWA C111, latest revision, unless specified otherwise on plans. Where called for, mechanical joints shall conform to AWWA C111.

Section 809.02. Polyvinyl Chloride Pipe (PVC)

1. The contractor shall provide unplasticized PVC gravity sanitary sewer pipe meeting the requirements of ASTM D3034, or latest revision, in the sizes shown unless otherwise indicated in the contract documents.
2. All PVC pipe and fittings through 15" shall meet the requirements as specified under ASTM D3034. PVC pipe 18" in diameter shall meet the requirements of ASTM F679. All pipe and fittings shall be suitable for use as a sanitary sewer conduit. Bell joints shall consist of an integral wall section with elastomeric gasket joint which provides a watertight seal. Standard laying lengths shall be 13-18 feet (± 1 inch). The pipe shall be capable of passing all tests which are detailed in this specification. Minimum wall thickness for pipe through 15" in diameter shall be as specified under SDR 35 in ASTM D3034. Minimum wall thickness for 18" diameter pipe shall be as specified under T-1 in ASTM F679. PVC sewers with more than 12 feet of cover may require wall thicknesses greater than SDR 35 or T-1. PVC is not allowed for sewers greater than 18" in diameter or more than 14 feet of cover.
3. Each length of pipe shall be marked with the manufacturer's name, trade name, nominal size, class, hydrostatic test pressure, manufacturer's standard symbol to signify it was tested and the date of manufacture. Each rubber ring shall be marked with the manufacturer's identification, the size, the year of manufacture and the classes of pipe with which it can be used.
4. All PVC fitting and accessories shall meet the requirements specified under ASTM D3034 or F679 and shall be manufactured and furnished by the pipe supplier. They shall have bell and/or spigot configurations compatible with that of the pipe and shall have an equivalent wall thickness. Gaskets shall meet the requirements of ASTM F477.

Section 809.03. Pipe and Fittings Tests

All shipments of pipe and/or fittings shall be certified by the manufacturer that the pipe and fittings were manufactured and tested in accordance with the applicable standards.

Section 809.04. Deflection

Minimum "pipe stiffness" (F/Y) at 5% deflection shall be 46 psi for all sizes, when tested in accordance with ASTM Standard Method of Test D2412 (latest edition), to determine the "External Loading Properties of Plastic Pipe by Parallel-Plate Loading". There shall be no evidence of splitting, cracking or breaking at a deflection of up to 30% of the original diameter.

Section 809.05. Extrusion Quality

There shall be no evidence of flaking, swelling, or disintegration when the pipe material is tested in accordance with ASTM D2152, "Quality of Extruded Poly (vinyl chloride) pipe by Acetone Immersion".

Section 809.06. Joint Tightness

Pipe and fitting joints shall comply with ASTM D32I2, latest edition, for "Joints for Drain and Sanitary Sewer Plastic Pipes Using Flexible Elastomeric Seals". Joint assemblies shall not leak when subjected to both an internal and external hydrostatic test at equivalent pressures of 10.8-psi gauge for a period of one hour. Pipes shall be tested in straight alignment, axially deflected position, and by shear load test as otherwise defined in Paragraphs 7.2, 7.3 and 7.4 of ASTM D3212.

Section 809.07. Impact Resistance

PVC pipe shall comply with impact resistance test conducted in accordance with ASTM D2444, "Test for Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)."

Section 809.08. Sanitary Sewer Pipe Bedding

PVC gravity sewer pipe shall be installed in accordance with ASTM D2321 (latest revision). Type 5 bedding is the minimum bedding requirement for PVC pipe. In any area where the pipe is below existing ground water level, the contractor will embed PVC pipe in sand or graded gravel must extend from six (6) inches below the pipe to twelve (12) inches above the pipe, and the material must be firmly placed under the pipe haunches. Initial backfill shall be compacted to the densities outlined in ASTM D2321.

The minimum bedding for ductile iron gravity sewer pipes shall be Type 4. In certain areas, the minimum bedding requirements for all types of pipes will be increased as needed to ensure a stable support under and on the sides of the pipe.

Section 809.09. Compaction Testing

The City may require up to ten (10) random compaction tests to insure compliance with ASTM D2321. If any material tested is less than the required density, the contractor shall re-compact said material and the city shall then have the right to additional compaction

tests at the expense of the developer or his contractor to insure compliance with ASTM D2321.

Section 809.010. Deflection Limit

Vertical deflection of installed pipe shall not exceed 5% of the undeflected diameter as defined in Table X1.1 of ASTM D3034. Upon completion of the pipe laying, and at least 30 days after installation (to allow for settling), the pipe will be tested for final acceptance. The contractor, pulling a mandrel of specified dimensions through the pipeline, shall perform the test.

Section 809.011. Deflection Tape/Locator Wire

All buried pipe, not just PVC, shall be marked continuously with metalized detection tape.

Section 809.012. Polyethylene Pipe (HDPE)

HDPE shall be considered by the Administrative Officer in consultation with the City Engineer on a case-by-case basis.

Section 809.013. Other Design Requirements

1. Distance Between Manholes **-** Maximum distance between manholes shall be 400 feet.
2. Depth **-** Any sanitary sewers installed in the street shall be sufficiently deep to provide five (5) feet of cover at the inlet end of all service laterals at the street right-of-way, and over any part of the main or service within the street right-of-way. Any sanitary sewers in off-street easements shall have a minimum of four (4) feet of cover unless ductile iron pipe is used. Filling over the pipe to obtain minimum cover is not allowed.
3. Drop Across Manhole **-** For manholes where the change in pipe horizontal direction (deflection) is less than 45 degrees, the normal pipe slope can be maintained across the manhole. Where the deflection is 45 degrees or more, a vertical drop across the manhole (between in and out pipes) of 0.1 feet is required.

Section 810: Construction Methods

Section 810.01: Licensing and Safety

1. All contractors who work on sanitary sewer systems that will be owned by the City of Cornelia must be licensed as an Underground Utility Contractor in accordance with State of Georgia law and local ordinance. Compliance with applicable safety regulations is the responsibility of each company engaged in the work. The City assumes no responsibility for the actions of others on the job site. It is the responsibility of those installing sanitary sewers, lift stations and related appurtenances to conform to OSHA regulations, 29 CFR Part 1926, Subpart P, Paragraph 1926.650 through 1926.653. Publications from OSHA can be obtained by contacting OSHA Publications Distribution, Washington, D.C.
2. Contractors performing sanitary sewer system installations must be approved by

the City and shall be required to be completely familiar with the procedures and contract requirements associated with this type project.

3. Unsatisfactory work may result in the loss of privilege to obtain a permit for future work in the City of Cornelia.

Section 810.02: Construction Permits

1. No construction shall begin until the City of Cornelia and the Georgia Department of Natural Resources, Environmental Protection Division has issued all applicable permits. A pre-construction conference will be required prior to the commencement of construction.
2. The contractor shall submit one copy of the approved construction plans. The contractor shall furnish his name and address, telephone number, proof of his Georgia Utility Contractor License to do this type of work, name of the person in charge of the project, list of any subcontractors and the name and telephone number of a responsible person who can be contacted in case of emergencies during nonworking hours.
3. The contractor, whose name shall appear on the approved contractor's list, shall furnish his construction schedule and shall notify the City 24-hours prior to beginning any work. Once the contractor begins work, he shall proceed in a workmanlike manner and shall complete the work in a reasonable time without undue off days and period of inactivity which makes it hard for the City to keep up with his activity.

Section 810.03: Revisions to Approved Plans

1. Any revisions to approved final plans that affect the approved site or subdivision plan, shall require formal City review and approval prior acceptance of the project by the City and issuance of any Certificates of Completion or Occupancy. Revisions shall be submitted and process in accordance with these Regulations.
2. Any major changes to the approved system plans, not affecting the approved site or subdivision plans shall require the design engineer to submit revised drawings to the Development Department prior to construction of the change. Such request shall include an explanation of the reason for the change. Any deviation from City's standards will be considered a major change, as will any change that will affect capacity, longevity, operation or maintenance of the facility. Any deviation from approved materials will be considered a major change.
3. Minor field changes may be made by the design engineer only with prior approval of the City and the changes documented in writing. The written documents must be submitted to the Public Works Director for review and approval.

Section 810.04: Trench Excavation

1. Sanitary sewer lines shall normally be installed by open-cut trench excavation. Trenches shall be cut true to the lines and grades shown on the approved plans. The bottom of the trench shall be cut carefully to the required grade of the pipe except where bedding materials or cradles are shown. In such cases the excavation shall

extend to the bottom of the bedding or cradles as shown on the approved plans. Minimum pipe cover shall be as shown on the approved plans.

2. Trenches shall have a minimum width of 12-inches plus the diameter of the outside of the bell of the sewer main and the maximum trench width at the centerline of the pipe shall not be more than the nominal diameter of the pipe plus two (2) feet. In unpaved areas, the trenches may have a greater width than this, beginning at one foot above the top of the pipe and extending to the ground surface, if such width is necessary or desirable; however, in paved areas, the width of the trench from top to bottom shall not exceed the nominal diameter of the pipe plus two feet.

3. No excavation shall be made under highways, streets, alleys or private property until satisfactory arrangements have been made with the State, City, County or owners of the property to be crossed. All excavated material shall be placed so as to not interfere with public travel on the streets and highways along which the lines are laid. Not more than 100 feet of trench shall be opened on any line in advance of pipe laying.

4. When possible, all crossings of paved highways or driveways by pipeline shall be made by boring or jacking the pipe under the pavement and shall be done in such manner as not to damage the pavement or foundation, unless the casing or pipe is in solid rock, in which case the crossing shall be made by the open cut method or by tunneling.

5. Wherever streets, roads or driveways are cut, they shall be immediately backfilled and compacted after the pipe is laid and shall be maintained in first-class condition as passable at all times until repaved.

6. Backfilling, compaction, dressing and clean-up shall be kept as close to the line laying crew as is practical and negligence in this feature of the work will not be tolerated.

7. In excavation and backfilling and laying pipe, care must be taken not to remove or damage any water, sewer, gas or other pipes, conduits or other structures without an order from the Designer. When an obstruction is encountered, the Contractor shall notify the Designer, who will have the Owners of the obstruction adjust same or make necessary changes in grade and/or alignment to avoid such obstruction. Any house connection, drains or other structures damaged by the Contractor shall be repaired or replaced immediately.

8. All excavation shall be placed on one side of the trench, unless permission is given by the City to place it on both sides. Excavation materials shall be so placed as not to endanger the work and so that free access may be had at all times to all parts of the trench and to all fire hydrants or water valve boxes, etc. All shade trees, shrubs, etc. shall be protected.

9. The excavation for manholes shall extend to a firm, acceptable foundation and leave not less than 24 inches in the clear between their exterior surface and the embankment or timber that may be used to protect it,

10. The Contractor shall furnish, install and maintain such sheathing, bracing, etc., as may be required to support the sides of the excavation and to prevent any movement that might injure the pipe, or cause sloughing of the street or trench, or otherwise injure or delay the work or interfere with adjoining structures,

11. All materials shall be considered as rock which cannot be excavated except by drilling, blasting or wedging. It shall consist of undecomposed stone in solid layers or of boulders of not less than 1/2 cubic yard. Wherever rock is encountered in the excavation, it shall be removed by suitable means. If blasting is used for removal of rock, the contractor shall take all proper safety precautions. He shall comply with all rules and regulations for the protection of life and property that may be imposed by any public body having jurisdiction relative to the handling, storing and use of explosives. He is fully responsible for applying for and acquiring any blasting permits which may be required by those agencies with such jurisdiction. Before blasting, the Contractor shall cover the excavation with heavy timbers and mats in such a manner as to prevent damage to persons or the adjacent property. Rock excavation near existing pipelines or other structures shall be conducted with the utmost care to avoid damage. The Contractor shall be wholly responsible for any damage resulting from blasting, and any injury or damage to structures or property shall be promptly repaired by the Contractor to the satisfaction of the City and property owner.

12. Rock in trenches shall be excavated over the horizontal limits of excavation and to depths as follows:

TABLE 8-3
ROCK EXCAVATION DEPTHS

Size of Pipe (inches)	Depth of Excavation Below Bottom of Pipe (inches)
4 and Less	4
4 to 6	6
8 to 18	8
18 to 30	10
Over 30	12

The undercut space shall then be brought up to grade by backfilling with subgrade stabilizer stone.

13. In rock excavation, the backfill from the bottom of the trench to one foot above the top of the pipe shall be finely pulverized soil, free from rocks and stones. The rest of the backfill shall not contain over 75% broken stone and the maximum sized stone placed in the trench shall not weigh over 50 pounds. Excess rock and fragments of rock weighing more than 50 pounds shall be loaded and hauled to disposal. If it is necessary, in order to comply with these specifications, selected backfill shall be borrowed and hauled to the trenches in rock excavation. Sides of the trench shall be trimmed of projecting rock that will interfere with backfilling operations. Rock excavation by blasting shall be at least 75 feet in advance of pipe laying.

14. Construction occurring around active sanitary sewerage systems shall be done in

such a way so as to prevent the spillage of sewage.

Section 810.05: Installation of Sanitary Sewer Pipe

1. Construction stakeout shall be required prior to construction of sanitary sewer lines. As a minimum, the horizontal alignment will be staked at 100-foot intervals and each manhole will be located with a centerline stake and two offset hubs, "Cuts" to invert elevations will be shown for each manhole entry and exit pipe. A copy of the stakeout notes will be provided to the Public Works Director.

2. Pipe and accessories shall be handled with care at all times to avoid damage. Whether moved by hand, skidways or hoists, material shall not be dropped or bumped. The interior of all pipes shall be kept free from dirt and foreign matter at all times. Each joint of pipe shall be unloaded opposite or near the place where it is to be laid in the trench.

3. All pipe and specials shall be of the dimensions and laid to the line and grade as shown on the plans and as established by the design professional and as approved by the City. Wyes and/or service connections and stubs from manholes shall be placed where shown on plans and as approved by the City. All such connections shall be blanked off with suitable stopper and made watertight with jute and cement mortar.

4. The preferred order of construction is to connect to existing sanitary sewers after all other construction is complete and conditionally accepted by the City. Connection to existing sanitary sewers can be done at the beginning of construction, however, the new main shall be plugged where it entered either the existing manhole or the new doghouse manhole over an existing sanitary sewer and the plug shall remain in-place until the project is conditionally accepted.

5. Sanitary sewer pipes shall be joined by "push-on" joints using elastomeric gaskets to affect the pressure seal. The ends of pipe to be joined and the gaskets shall be cleaned immediately before assembly and the assembly shall be made as recommended by the pipe manufacturer. Lubricant used must be non-toxic and supplied or approved for use by the pipe manufacturer. Sanitary sewer pipes shall be laid in the uphill direction with the bells pointing upgrade. Any variation from this procedure shall require approval from the City.

6. Bell holes shall be provided of sufficient size to allow ample room for making the pipe joints without putting any load on the bell of the pipe. The bottom of the trench between bell holes shall be carefully graded so the pipe barrel will rest on a solid foundation for its entire length as shown on the plans. Each joint shall be laid so it will form a close concentric joint with adjoining pipe and in order to avoid sudden offsets or inequalities in the flow line.

7. When pipe is not actively being laid, the open ends of installed pipe shall be plugged with a watertight plug to prevent entrance of trench water into the line.

8. All D.I.P. pipe shall have a minimum of Type 4 bedding and all PVC pipe shall have

minimum Type 5 bedding as and shown in the Standard Details. Wherever water or wet soil is encountered, Type 5 bedding shall be provided for D.I.P. A description of Type 1, 2, 3, 4 and 5 bedding is as follows:

a. Type 1 - Flat Bottom Trench. Flat bottom trench on undisturbed earth with excavation for Bells.

b. Type 2 - Flat Bottom Trench. Flat Bottom Trench on undisturbed earth with excavation for Bells. Select backfill shall be placed and lightly tamped to the top of the pipe.

c. Type 3 - Loose Soil Bedding. Pipe bedded in Select Material to a depth of ¼ outside pipe diameter or 4-inch minimum, whichever is greater, on a flat bottom trench. Select backfill shall be placed and lightly consolidated to a level of 6-inches minimum over the top of the pipe.

d. Type 4 - Granular Bedding. Pipe bedded in granular material to a depth of 8-inches of granular material for pipes with an inside diameter of 21-inches or less or 12-inches of granular material for pipes with an inside diameter of 24-inches or greater on a flat trench bottom. The bedding material shall be placed under the haunches of the pipe with a shovel or other suitable tool to a height of 1/4 outside pipe diameter of the pipe. The initial select backfill shall be hand placed to a level of 12-inches minimum over the top of the pipe and shall consist of finely divided select materials free from debris, organic material and large rocks and stones. It shall be placed and tamped in layers not over 6-inches thick to at least 90% Standard Proctor, AASHTO T-99 (95% under road crossings).

e. Type 5 - Granular Bedding. Pipe bedded in to a depth of 8-inches of granular material for pipes with an inside diameter of 21-inches or less or 12-inches of granular material for pipes with an inside diameter of 24-inches or greater on a flat trench bottom. The bedding material shall be placed under the haunches of the pipe with a shovel or other suitable tool to a height of 1/2 outside pipe diameter of the pipe. The initial select backfill shall be hand placed to a level of 12-inches minimum over the top of the pipe and shall consist of finely divided select materials free from debris, organic material and large rocks and stones. It shall be placed and tamped in layers not over 6-inches thick to at least 95% Standard Proctor, AASHTO T-99.

9. Pipe grades shall be obtained by use of a laser and double checked with a surveying level and rod. Completed sewers shall be tested between manholes with lanterns or reflected light and shall show at least 80% of the full circle of the pipe from manhole to manhole without obstruction.

10. Sewers shall be laid tight and the rate of infiltration in any section of line between adjacent manholes shall not exceed 25 gpd per inch diameter of pipe per mile of line when the trenches are saturated with water.

11. No length of pipe shall be laid until the one preceding it has a sufficient quantity of fine earth tamped around to hold it firmly in place.

12. The Contractor shall do all necessary pumping or bailing, build all drains and do all other work necessary at his own expense to keep the trenches clear of water during the progress of the work. If pumps are used, the Contractor shall have back-up pumps available in case the primary pumps fail. No structure shall be built or pipe shall be laid in water and water shall not be allowed to flow over or rise upon any concrete, masonry or pipe until the same has been inspected and the concrete or joint material has thoroughly set. The installed pipe shall not be used for draining water from the ditch. All water pumped, bailed or otherwise removed from the trench or other excavation shall be conveyed in a proper manner to a suitable place of discharge where it will not cause injury to the public health, or the public or private property, or to work completed or in progress, or to the surface of the streets, or cause any interference with the use of same by the public.

13. Trench Backfilling

    a. After the pipe has been laid, backfilling shall be done in two (2) distinct operations. In general, all backfill beneath, around and to a depth of 12 inches (12") above the top of the pipe shall be placed by hand in four-inch (4") layers for the full width of the trench and thoroughly compacted by hand with vibrating equipment. The remainder of the backfill shall be placed in 6" layers and compacted to the top of the trench, either by pneumatic hand tamps, hydro-tamps or other approved methods. Care shall be taken so the pipe is not laterally displaced during backfilling operations. The backfill lifts shall be placed by an approved method in accordance with that hereinafter specified. Backfill materials shall be the excavated materials without bricks, stone, foreign matter or corrosive materials, where not otherwise specified or indicated on the plans.

    b. Backfill under permanent concrete or bituminous pavement or floors and as elsewhere specified or indicated on the plans shall be approved bank-run sand or gravel or crushed stone, free from large stones and containing no more than 10% by weight of loam or clay. This backfill shall be compacted to 100% as determined by the Modified Proctor test for the top 12” of trench and 95% by the Modified Proctor test from pipe bedding to 12” below trench top. Mechanical vibrating equipment shall be used to achieve the required compaction.

    c. Backfill under gravel or crushed stone surfaced roadways and low-type bituminous surfaced roadways shall be the approved suitable excavated material placed in 6-inch (6") layers thoroughly compacted for the full depth and width of the trench, conforming to the compacting, density compaction method and materials as specified above.

    d. Backfill in unpaved areas shall be compacted with mechanical vibrating

equipment to 90% as determined by the Modified Proctor Test. Backfill material from pipe bedding to ground surface shall be excavated earth free from large stones and other debris.

e. The contractor shall fully restore and replace all pavement, sidewalks, landscapes, surface structures, etc. removed or disturbed as part of the work to a condition equal to that before the work began to the satisfaction of the City.

f. Where sheeting is used in connection with the work, it is in no case to be withdrawn before the trench is sufficiently filled to prevent damage to banks, road surfaces, adjacent pipes, adjacent structures or adjacent property, public or private.

g. All costs associated with the compaction tests shall be the responsibility of the developer.

14. Backfill Compaction - All backfill beneath proposed lots, roads, sidewalks or other critical areas shall be compacted to 95% Standard Proctor, except for the top 12" in roadways where the compaction requirement is 100% of standard Proctor, The compaction shall be done using mechanical tamping equipment in six-inch (6") lifts. Moisture control of the backfill material and/or hauling in of select material may be required to achieve this compaction percentage. Compaction testing and certification by an independent soil testing company will be required in these areas. The test results shall be submitted for review to the Administrative Officer or his/her designee,

15. Railroad Crossings - All railroad crossings shall conform to the requirements of the American Railway Engineering Association Manual for Railway Engineering, Part 5. The Developer shall secure permission from the railroad to schedule the work so as not to interfere with the operation of the railroads. The Developer shall be held responsible for any delays or damages occurring to the railroads. The Developer shall furnish the railroad with such additional insurance as may be required, cost of the insurance shall be borne by the Developer , together with the costs for flagmen, watchmen, temporary work of any nature, safety devices and any other items that may be required by the railroad.

16. Highway Crossings - All construction work in a State highway right-of-way shall be approved by the Georgia DOT.

17. Stream Crossings

a. The preferred method for crossing rivers, streams, creeks, impoundments or wet weather ditches is with a minimum of six-inches (6") of cover between the lowest point in the stream and the top outside diameter of the pipe. Ductile iron pipe is required for all stream crossings and shall extend a minimum of ten (10) feet beyond the top of bank on each side. Concrete collars or encasement must be provided at all joints for ductile iron pipe with less than three (3) feet of

cover.

b. The stream bed and sides at the crossing point shall be protected from erosion with the use of rip-rap, as defined and sized in the *Manual for Erosion and Sediment Control in Georgia,* Appendix C — Construction Materials, latest revision.

c. Aerial Crossings will require detailed plans and will be allowed only when, in the City's opinion, there is no reasonable alternative.

d. Erosion control measures shall be installed prior to installing pipe across any stream. All work should be performed when stream flows are at their lowest, and as quickly and safely as possible. As soon as conditions permit, the stream bed shall be cleared of all false-work, debris, and other obstructions placed therein or caused by the construction operations.

Section 810.06: Casing for Sanitary Sewers

1. Where pipe is required to be installed under railroads, highways, streets or other facilities by jacking or boring methods, construction shall be done in a manner that will not interfere with the operation of the facility, and shall not weaken the roadbed or structure.

2. Casing pipe shall be installed at the locations shown on the plans. Unless directed otherwise, the installation procedure shall be the dry bore method. The hole is to be mechanically bored and cased through the soil by cutting head on a continuous auger mounted inside the casing pipe. The installation of the casing and boring of the hole shall be done simultaneously by jacking. The diameter of the bore shall conform to the outside diameter and circumference of the casing pipe as closely as practicable. Any voids that develop during the installation operation shall be pressure grouted. Each segment of the casing pipe shall be welded with a full circumference butt weld to the adjoining segment. The completed casing shall have no sags or crowns that cause the grade for any segment to be less than the minimum slope for the size pipe being installed.

3. Excavation material will be removed and placed at the top of the working pit. Backfill material and methods of backfilling and tamping shall be as required herein. Carrier pipe shall be D.I.P. and shall be inserted within the casing by use of approved casing spacers. Inside of casings, the sewer main joints shall be slip joint restrained by using U.S. Pipe "Field-Lok" gaskets or approved equal.

4. The annular space between the carrier pipe and the casing shall be pressure grouted after the carrier pipe is sufficiently secured on grade to prevent floating during grouting. The carrier pipe should be filled with water prior to grouting to aid in the prevention of floating. At each end of the casing pipe, the void between the carrier pipe and casing shall be sealed with brick and mortar.

Section 810.07: Replacement of Pavement

The Developer shall fully restore and replace all pavement, curbs, gutters, sidewalks and other surface structures removed or disturbed by the construction, to a condition that is equal to or better than the original condition in a manner satisfactory to the City (see Standard Details).

Section 810.08: Location/Protection of Existing Underground Utilities

It shall be the responsibility of the contractor to locate and protect all underground utilities. The contractor , at his own expense, shall repair utility lines or services damaged by the contractor .

Section 810.09: Protection of Water Supply and Other Utilities

1. The City has an established Cross-Connection Program to prevent the entry of contaminants of pollutants into any area of the potable water supply. Therefore, it is illegal to introduce any substance into, or to have any cross connections with, the potable water supply. There shall be no physical connection between a public or private potable water supply system and a sanitary sewer that permits the passage of any sewage or polluted water into the potable water supply.

2. Whenever possible, sanitary sewers shall be laid at least ten (10) feet distance horizontally from any existing or proposed water main. Should conditions prevent this separation, the lines shall be laid in separate trenches and the sanitary sewers shall be ductile iron. In either case, the elevation of the crown of the sanitary sewer shall be at least 18 inches below the invert of the water main.

3. When sanitary sewers cross under water mains, the sanitary sewer shall be laid so the top of the sanitary sewer is at least 18 inches below the bottom of the water main. If conditions prevent this minimum vertical separation, the sanitary sewer shall be ductile iron and shall be encased in concrete.

Section 810.010: Sewer Service Laterals

1. A sewer service shall be provided for every existing or proposed lot or building. All services shall be shown on the construction drawings. All service laterals shall be a minimum of 6" in diameter, A common service shall not be allowed for two or more buildings. The service shall extend to 5' inside the property line of the lot being served and normally be within 10 feet of the lower corner of the lot. The Contractor shall install a clean out at the right-of-way and extend the PVC cleanout to a height of 3' above the finished grade. The Contractor shall also place a 4"x4" pre-treated wood post painted green above the end of the service lateral to enable the builder to locate the service. All service laterals shall have minimum of 5 feet of cover at the right-of-way. Where 5 feet of cover cannot be achieved, services shall be ductile iron.

2. Six inch (6") services shall be laid at a minimum grade of 1%. Service laterals tied directly to manholes shall enter the manholes through cored holes and shall be provided with a pre-molded rubber boot as described herein. Laterals shall enter the manhole no higher than 6" above the table and shall be provided with a concrete

flume to slope the flow into the manhole invert

3. The developer shall be responsible for serving all lots developed. On any lot where the service cannot be found, the developer shall be responsible for payment of the cost of installation of a new service. Also, unless noted on the final plat, the service shall be located low enough to serve the first floor elevation at the building line.

4. The builder shall be responsible for the location of the service prior to the pouring of the foundation, driveway or other appurtenance. The City will not be responsible for any house built too low to be served, nor for any service made inaccessible.

5. No plumber or contractor will be allowed to connect to the sewerage system except to the end of the service provided for this connection, when proper permit is issued. After the service is run from the end of the lateral provided by the sewer line contractor to the house plumbing, the cleanout at the right-of-way may be cut down to a level six inches below the finished grade. The cleanout shall be provided with a cast iron ferrule with a brass screw plug to enable the cleanout to be located with a metal detector. Plastic plugs are not allowed.

Section 810.011: Fittings on Force Mains

1. Fittings shall be placed where shown on the plans. Fittings shall be properly braced to insure they will not be blown off or broken loose under the greatest possible working pressure. All fittings shall be mechanical joints unless specified otherwise. In situations where there is insufficient undisturbed earth to act as a bearing surface or where otherwise directed by the City, fittings shall be restrained by the use of threaded rods or other method acceptable to the City.

2. Prior to blocking any joint or fitting with concrete, the joint or fitting shall be wrapped with polyethylene film in such a manner that the concrete will not stick directly to the pipe but so the load bearing capacity of the blocking will not be affected.

Section 810.012: Bracing, Sheeting and/or Shoring

Whenever the condition of the ground is such that it is necessary to protect the work, the street, the roadway or the workmen, the sides of the trench shall be supported with suitable bracing, sheeting and/or shoring to be furnished by the contractor at his own expense.

Section 810.013: Connection to Existing City Sanitary Sewer System

1. The developer's private contractor shall make all required connections to the City's sewer system. The City's Inspector will supervise the connection and all associated work. The contractor shall give the City a minimum of 48 hours notice prior to any sewerage system work.

2. The Contractor will provide proper traffic control devises and certified personnel to direct traffic if required.

3. All connections to existing manholes shall be properly cored with a coring machine; "Knocking-out" of a hole in the manhole for a connection is not permitted.

4. The timing of the Developer's connection to the City's system shall be pre-arranged

with the City.

Section 810.014: Street Cuts

1. All paved roads will be bored and cased. A bore must be attempted before consideration will be given to cutting the street.
2. Existing roadways shall not be open cut unless written permission is granted by the governing authority or owner (e.g. City of Cornelia, Habersham County, GA DOT, etc.)
3. Submittal of an authorization letter from the D.O.T. or Habersham County is required.
4. One lane of traffic shall be maintained open at all times. Lane and road closure shall be limited to time between 9 a.m. and 2 p.m., if practical
5. The Contractor shall furnish traffic control devices and person(s) to direct traffic, if required.
6. The above requirements may be altered with the written approval of the City in extenuating circumstances.
7. Assuming that a road bore has been attempted and failed, or that the Developer has received permission to open cut a road, pavement replacement shall adhere to the following guidelines:

    a. Removing and replacing pavement shall consist of removing the type of pavement and base encountered and replacing same to its original shape, appearance and riding quality, in accordance with the detailed plans. Where possible, all pipe under existing paved driveways will be either free bored or installed in casing. Free bores under driveways will be made with D.I.P. Casing will be required where the installation is under any roadway. Carrier pipe shall be D.I.P.

    b. Concrete pavement shall be replaced with pavement of a thickness equal to that removed, or 6" for driveways and 8" for roads, whichever is thicker. The concrete shall meet the specifications of the D.O.T. for concrete paving.

    c. Where bitumastic paving is replaced, a base course of 3000 psi concrete shall be placed over the ditch line. The concrete shall be 6" thick for driveways and parking lots and 8" thick for public roads. The top of this base course shall be left with a rough float finish 1 1/2" below the surface of the existing paving. After the concrete has attained its strength, a tack coat of AC-15 or equal shall be applied at the rate of 0.25 gallons per square yard, and a plant mix surface course applied over this, and finished off level with existing pavement.

    d. Unless otherwise directed in writing, all pavement will be removed to a width of the trench plus 12" on each side as shown on the detailed drawings. Under normal circumstances, the maximum allowable trench width shall be the nominal diameter of the pipe plus 24 inches.

Section 810.015: Standard Drawings

Installation of sewer mains, service laterals, manholes, casings, cleanouts, etc. shall be made in accordance with the applicable Standard Design Drawings in this Manual.

Section 810.016: Clean-up

1. Prior to requesting the "completion of sanitary sewer construction" inspection, the contractor shall remove and dispose of in an acceptable manner all shipping timbers, shipping bands, spacers, excess materials, broken material, crates, boxes and any other material brought to the job site.
2. Any work areas, within the public right-of-way or on private property outside of the development, that were damaged by the sanitary sewer construction shall be repaired or replaced with the same kind of material as existed prior to the damage occurring. All easement areas shall be completely cleared of trees, stumps and other debris and left in a condition such that the easement can be maintained by bush-hog equipment.
3. All shoulders, ditches, culverts and other areas disturbed by the sanitary sewer construction shall be brought to the proper grades and left smooth in appearance.
4. All manhole covers shall be brought to grade.
5. A uniform stand of grass or mulch for erosion protection, as defined in the *Manual for Erosion and Sediment Control in Georgia*, is required over all construction easements and sanitary sewer easements prior to the City's acceptance of the sanitary sewer.
6. Streets, sidewalks, landscaping and other public and private property disturbed in the course of the work shall be restored as near to original condition as possible or better in a manner satisfactory to the City.
7. Trenches shall be kept free of water by pumping or well pointing, as determined by the contractor. No structure shall be built or pipe shall be laid in water. Water shall not be allowed to flow over or rise upon any concrete, masonry or pipe until the same has been inspected and the concrete or joint material has thoroughly set. All water pumped, bailed, or otherwise removed from the trench or other excavation shall be conveyed in a proper manner to a suitable place of discharge. Such discharge shall not cause injury to public health, property, work completed, work in progress or to any street surface, or cause any interference with the use of it by the public.

Section 810.017: Barricades

The Contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient red lights, danger signals and necessary precautions for the protection of the work and the safety of the public. Streets closed to traffic shall be protected by effective barricades on which shall be placed acceptable warning signs. Barricades shall extend completely across the street which is to be closed, and shall be illuminated at night by lights not farther than five feet apart and lights shall be kept burning from sunset to sunrise.

Section 810.018: Grassing

1. All areas outside structures and along pipelines where earth is disturbed shall be grassed. After the soil has been properly prepared, the seed shall be planted. After the

seeds have been planted, mulching using wheat or oat straw shall be applied and the moisture content of the soil shall be maintained at the optimum amount to ensure germination of the seed and growth of the grass.

2. Immediately after the initial watering of seeded areas, the Contractor shall apply a mat of hay or rye, wheat or oat straw over the area at a uniform rate of not less than 1 ½ ton of mat to the acre. The minimum depth of the straw shall be two inches (2") and the maximum depth of 3 inches (3"). After the grass has shown a satisfactory growth (approximately 30 days after planting), fertilizer shall be applied at a uniform rate of 100 pounds per acre, followed by sufficient water to dissolve the fertilizer.
3. The Contractor shall do all maintenance work necessary to keep all planted areas in satisfactory condition until the work is finally accepted. This shall include mowing, repairing washes that occur, reseeding and watering as required to produce a healthy and growing stand of grass. Mowing will be required to remove tall and obnoxious weeds before they go to seed.
4. It is the intent of these specifications to produce a stand of grass that is alive and growing, without any bare spots larger than one square foot. The Contractor shall repeat all work, including plowing, fertilizing, watering and seeding as is necessary to produce a satisfactory stand of grass.

Section 811: Inspection of Sanitary Sewers

Section 811.01: Construction Inspection

1. The developer's contractor is responsible for the quality, accuracy and workmanship of his completed work.

2. The City may employ the services of an engineer for the inspection of the project. If a consulting engineer is used, the City has the option of billing the Developer the same rate or amount that the City has been billed or invoiced by their consulting engineer.

3. City personnel or their authorized representative will visit the job site on a periodic basis and will make spot checks, as they deem appropriate. The City shall have the right to review and inspect all construction and may reject any work that does not meet quality control standards.

Section 811.02: Access to Project

Authorized representatives of the City that may include, but is not limited to, City employees, City consultants, state or Federal agencies shall have access to the site for inspection at any time.

Section 811.03: Communications During Construction

1. All written communications regarding sanitary sewer construction shall be directed to:

    Administrative Officer (or his/her designee)
    City of Cornelia

P. O. Box 785
Cornelia, GA 30531
Phone: (706) 778-8585
Fax: (706) 778-2234

2. The Developer, contractor(s) and the Developer's professional responsible for inspection will be required to attend a pre-construction conference with the City. At the pre-construction conference, the contractor will submit to the City, in writing, the date they propose to begin construction. The contractor shall provide notification by phone any time the work is to be vacated and will provide notice by phone prior to resuming work.

3. The City inspector may have informal verbal communications with the contractor, foreman or superintendent at any time during construction. The City inspector will not direct the actions of the contractor's workmen.

Section 811.04: Concealed Work

The City inspector may direct that the contractor notify the City and receive inspection approval prior to concealing certain work such as manhole foundations, pipe bedding, wyes, bends, service laterals or other appurtenances.

Section 811.05: Minimum Required Inspections

The following inspections shall be the minimum to be performed and certified in writing by the professional engineer employed by the developer for quality control checking of the construction work:

1. Distances - Horizontal location measuring "as-built" distances between manholes and bearings from manhole to manhole to check horizontal location of the line.

2. Elevation and Slope - Elevation of each invert and top of manhole shall be measured and recorded. Actual pipe slope shall be computed and any segment having less than minimum allowable slope shall be rejected and re-done.

3. Manhole Construction - Every manhole shall be visually inspected to check for plugging of lift holes, use of connection boots, use of joint material, leakage, proper invert construction, and the proper setting of frame and cover. In addition, vacuum testing of every manhole will be required.

4. Pipe Straightness - Every section of sanitary sewer line shall be visually checked for straightness. For a section to pass must show at least 80% of a full circle when observed from one end. Any section that fails this visual test shall have water run through it sufficient to fill any sag that may exist. It shall also have a television camera pulled through it to check for sags. Any sag holding more than 1 ½ -inches of water shall require the pipe be removed and replaced to proper grade. Following the replacement, the section shall be televised again to verify correction at which time the section is evaluated by the City or their designated representative.

5. Video - The video of the televised lines shall be furnished to the City prior to issuance of the Certificate of Occupancy. Sections of lines in the video shall be identified by

manhole numbers corresponding to those on the plans. In addition, all service wyes shall be identified by station number on the video.

6. Infiltration - The allowable limit of infiltration, for any section from manhole to manhole, shall be 25 gallons per day per inch of pipe diameter per mile of pipe. If any infiltration is present at the most downstream point, then it will be measured using a specially made weir and measurements also made at each upstream manhole that has any visible flow of water. Any individual segment that exceeds the allowable infiltration shall be corrected to within allowance limits.

7. Compaction of Backfill - Compaction testing shall be required for construction in paved areas or where pavement is planned. A minimum of five (5) tests per 1,000 feet of sanitary sewer shall be conducted at varying depths. If any of these tests show failing results, the failing backfill shall be removed, re-compacted and re-tested, and one additional area shall also be tested.

Section 811.06: Additional Testing Requirements

The contractor shall also perform the tests listed below during the presence of the developer's professional. The City must be notified at least two (2) days prior to these tests being conducted to afford the City the opportunity to be present.

1. Mandrel Test for Gravity Sanitary Sewer PVC Pipe **-** The procedure for testing PVC sanitary sewer pipe for maximum allowable deflection shall be generally as follows (see ASTM specs for mandrel dimensions and more detail):

   Completely flush the line making sure the pipe is clean of any mud or trash that would hinder the passage of the mandrel. During the final flushing of the line, attach a floating block or ball to the end of the mandrel pull rope and float the rope through the line (a nylon ski rope is recommended). After the rope is threaded through the line, connect the pull rope to the mandrel and place the mandrel in the entrance of the pipe. Connect a second rope to the back of the mandrel. This will enable the mandrel to be retrieved if excessive deflection is encountered. Draw the mandrel through the sanitary sewer line. An increasing resistance to pull is an indication of excessive deflection. If this occurs mark the rope to note the location. Televise the sanitary sewer section to identify the extent of the problem and develop a plan, subject to City approval, for correcting the problem. A retest shall then be undertaken.

2. Air Pressure Test

   a. The contractor, to check for leaks, shall conduct a low-pressure test of each gravity sanitary sewer line section. The following general procedures will apply:

      Temporarily plug the line segment between two (2) manholes using plugs with airtight fittings through which low-pressure air can be introduced into the pipe segment being tested. Introduce low-pressure air into the test pipe segment until the internal air pressure reaches 4.5 psig above ground water pressure, if any. Wait at least five (5) minutes for air temperature in the test segment to stabilize while internal air pressure remains at least 3.5 psig above ground water pressure. Bleed internal air pressure to exactly 3.5 psig above ground water pressure. Accurately determine the elapsed time for the internal pressure to drop to 2.5 psig

above ground water pressure. The air test is acceptable is elapsed time is no less than shown on Table 8-4 below.

b. Excessive leakage shall be permanently corrected and the test repeated until the developer's professional witnesses a successful test on each line segment.

c. Air leakage time is based on the pipe being damp. If pipe and joints are dry, dampen line if helpful in meeting air test time requirement.

d. All visible leaks will be corrected regardless of test results.

e. Upon request, the City may allow substitution of an exfiltration test in lieu of the air pressure test. If used, the exfiltration test shall be conducted with a minimum water head of two (2) feet above the groundwater table and the allowable exfiltration shall be limited to 50 gallons per day per inch diameter of pipe per mile of pipe.

3. Force Main Pressure Testing - Before applying the specified test pressure, all air shall be expelled from the pipe. All pipe laid in trenches shall be backfilled adequately to secure the pipe during the test.

Any observed leakage shall require corrective measures to pipe lines and/or joints as otherwise provided for in these specifications and to the satisfaction of the City. The City will furnish the necessary water for testing the force main. However, any water lost through breakage of lines or unnecessary or excessive flushing of the line shall be charged to the developer. The force main must be flushed and tested at a pressure of 200 PSI for two (2) hours. When testing at the specified pressures, the rate of leakage shall not exceed 25 gallons per 24 hours per inch diameter per mile of line (see Table 8-4 below). If the force main does not meet this test, the leaks shall be found and corrected at once and re-tested until the leakage falls within the limits specified.

TABLE 8-4
MAXIMUM ACCEPTABLE WATER LEAKAGE

Size of Pipe (inches)	Gallons per Hour per 100 Feet	Gallons per Day per 100 Feet
14	0.276	6.624
12	0.237	5.688
10	0.197	4.728
8	0.158	3.792
6	0.118	2.832
4	0.079	1.896

Section 811.07: Final Inspection and Conditional Acceptance

1. No buildings or plumbing fixtures shall be connected to the sanitary sewers until inspected and approved by the City.

2. The professional responsible for inspection of the construction shall provide the City with an engineering statement after he completes his inspection, testing and submittal of as-built

drawings and easements. This statement must certify that all specified inspections and tests have been made and successfully passed, and that the work has been completed in substantial accordance with the approved plans and specifications. After receipt of this statement, the City will schedule a final inspection. A representative of the developer's professional and the contractor shall be present during this final inspection.

3. After any discrepancies are corrected, the City will issue a letter certifying conditional acceptance of the system. This letter shall commence the start of the twelve (12) month warranty period that is required of the contractor.

4. At the end of the warranty period, the subdivision inspection team will again inspect the entire development. When all discrepancies have been corrected, the City will issue an acceptance letter and will begin perpetual maintenance and operation of the system.

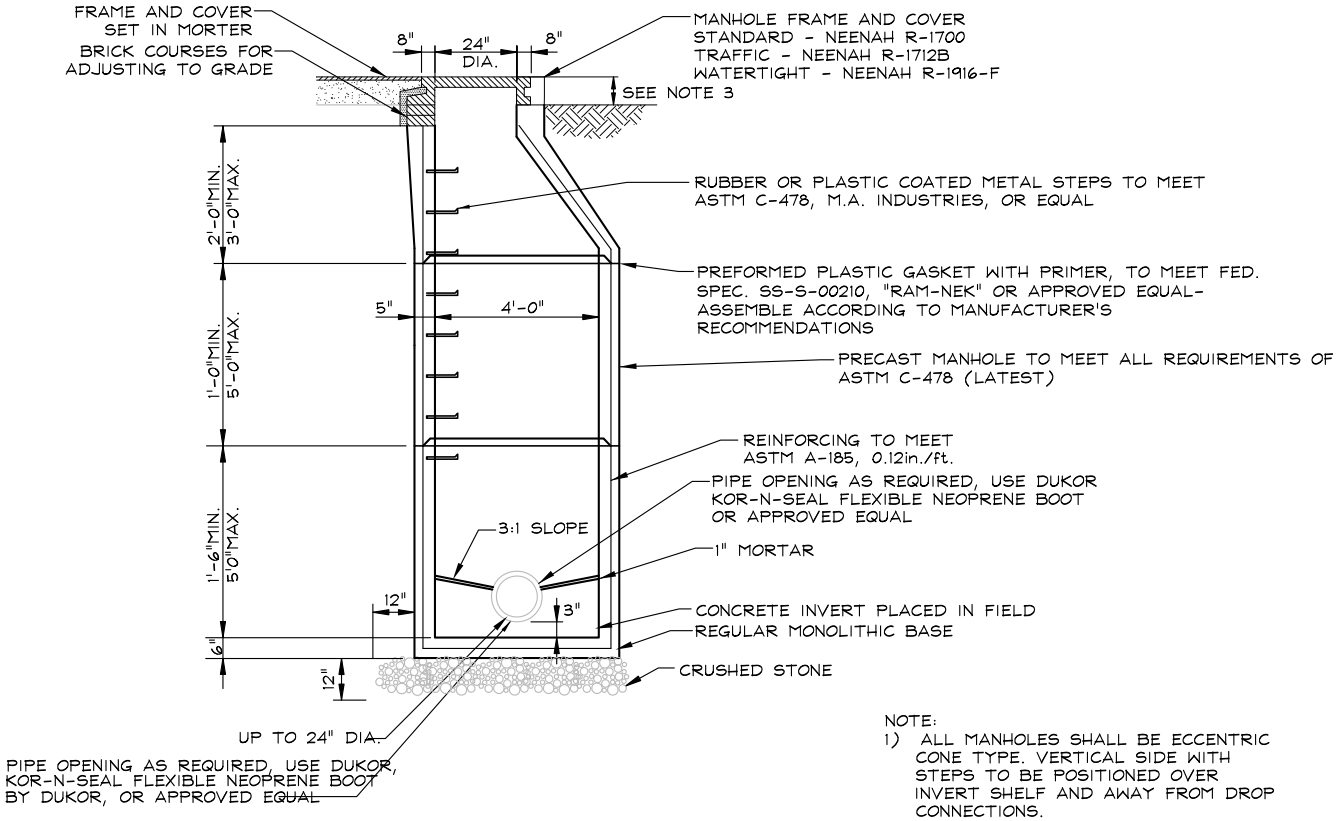
Section 811.08: Maintenance and Payment Bond

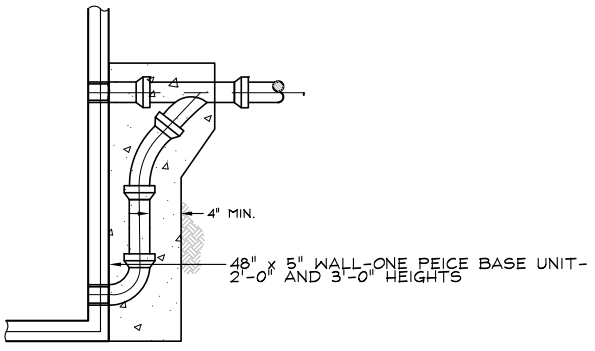
The Developer shall post a maintenance bond on the facility, in accordance with Article III of this Ordinance, for a twelve (12) month period after completion and conditional acceptance of the facility by the City. In addition, the developer shall post a payment bond on the facility for all subcontractor and material supplier work.

Section 811.09: Maintenance Until Final Acceptance

It shall be the Developer's obligation to provide all maintenance for a twelve (12) month period after conditional acceptance of the project by the City. The developer must notify the City three months prior to the end of the twelve (12) month period to schedule the final inspection. The City shall inspect the sewer system, and upon correction by the Developer of all deficiencies noted by the City, the City will accept the system for operation.

END OF ARTICLE VIII





DROP CONNECTION

NOTE:

1) ALL MANHOLES SHALL BE ECCENTRIC CONE TYPE. VERTICAL SIDE WITH STEPS TO BE POSITIONED OVER INVERT SHELF AND AWAY FROM DROP CONNECTIONS.

2) 8" FOOTING REQUIRED ON DEPTHS OVER 12' WITH ADEQUATE REBAR ON A 12" GRANULAR FOUNDATION.

3) 12" IN ROAD SHOULDERS/MAINTAINED RIGHT-OF-WAY 24" MIN. IN CROSS COUNTY EASEMENTS.

4) OUTSIDE DROP CONNECTION REQUIRED FOR DROPS OVER 2'-0".

5) WATER-TIGHT MANHOLE FRAME SHALL BE DESIGNATED ON PLAN AND PROFILE, AND SHALL BE REQUIRED IN FLOOD PLAINS ON AREAS SUBJECT TO FLOODING (SUBMERGED DURING RAINFALL). VENT REQUIRED FOR WATERTIGHT MANHOLES. SEE STANDARD 700-9

6) SEE STANDARD 700-9 FOR SEWERS 18" AND LARGER

CITY OF CORNELIA
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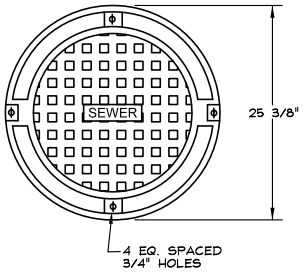
PRECAST DROP MANHOLE DETAIL

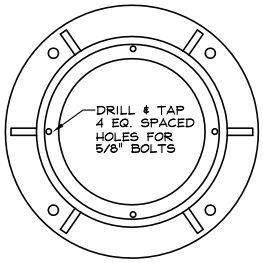
DATE: OCTOBER 2014
SCALE: N.T.S.

STANDARD DETAILS
SEWERAGE SYSTEM CONSTRUCTION

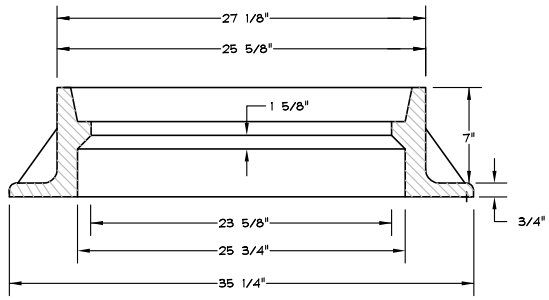
STANDARD 800-1



COVER FACE
N.T.S.

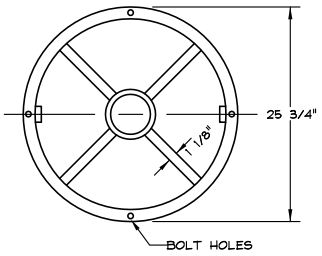


FRAME PLAN
N.T.S.

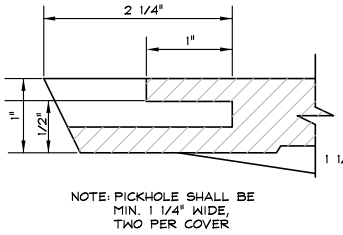


NOTE: PICKHOLES SHALL BE NON-PENETRATING AND WATER TIGHT. CORRUGATION AND TWO PICKHOLES IN COVER, NO PERFORATION. SEATING SURFACE OF FRAMES AND COVERS TO BE MACHINED TO FIT.
FRAME AND COVER SHALL WEIGH 300 POUNDS MINIMUM.

FRAME SECTION
N.T.S.



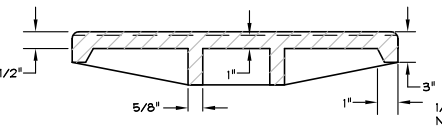
COVER BACK
N.T.S.



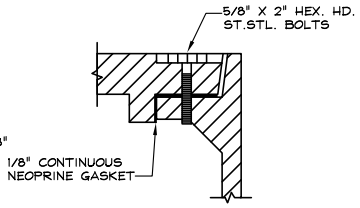
NOTE: PICKHOLE SHALL BE MIN. 1 1/4" WIDE, TWO PER COVER

PICKHOLE DETAIL
N.T.S.

APPROX. WEIGHTS
FRAME 135 LBS.
COVER 295 LBS.
TOTAL 430 LBS.



COVER SECTION
N.T.S.



WATERTIGHT DETAIL
N.T.S.

NOTE:
1) ONLY BOLT DOWN MANHOLE REQUIRES "O" RING GASKET & BOLTS.

2) BOLT-DOWN MANHOLE COVERS REQUIRED IN FLOOD PLAINS OR AREAS SUBJECT TO FLOODING.

CITY OF CORNELIA
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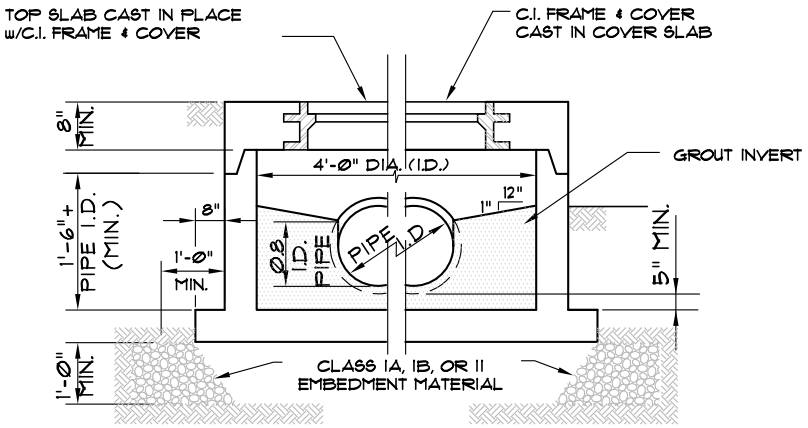
FRAME AND COVER DETAIL

STANDARD DETAILS
SEWERAGE SYSTEM CONSTRUCTION

DATE: APRIL 2014
SCALE: N.T.S.

STANDARD 800-2



TOP AT GRADE TOP ABOVE GRADE

NOTE: MANHOLE SHALL BE LINED & COATED

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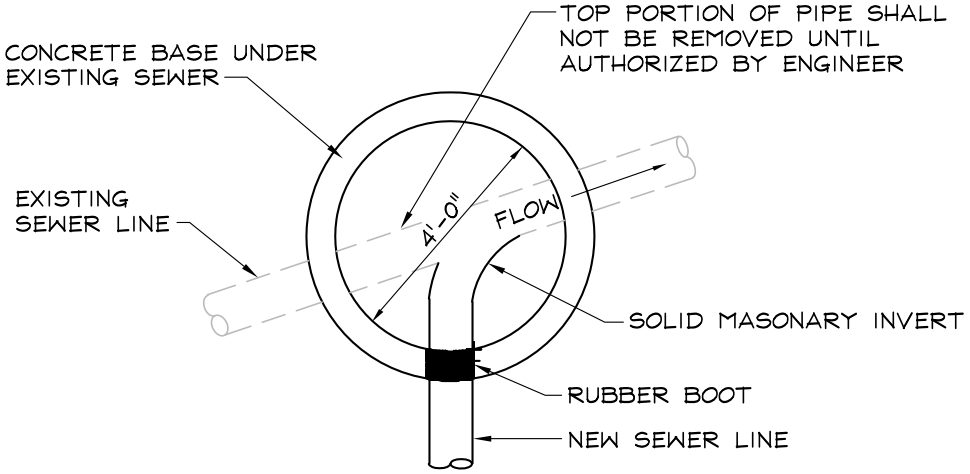
PRECAST CONCRETE SHALLOW MANHOLE

STANDARD DETAILS SEWERAGE SYSTEM CONSTRUCTION

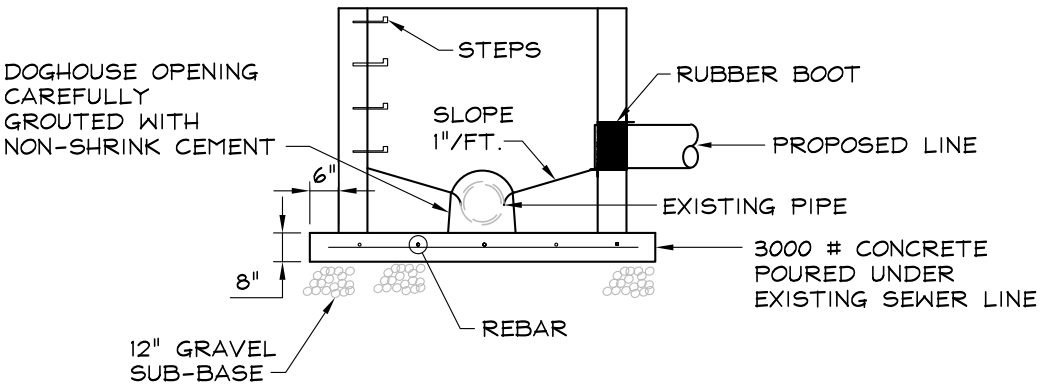
DATE: APRIL 2014
SCALE: N.T.S.

STANDARD 800-3



NOTES

1. PROVIDE PRECAST MANHOLE RISER COMPLETE WITH UP-SIDE DOWN U-SHAPED OPENING TO SUIT EXISTING LINES.
2. CORED AND BOOTED OPENINGS TO SUIT PROPOSED PIPELINES.
3. TABLES ARE TO BE GENTLY SLOPED AND TROWELED SMOOTH FROM MANHOLE WALL TO INVERT WALL HEIGHT AND CONSTRUCTED OF SOLID MASONRY.



CITY OF CORNELIA
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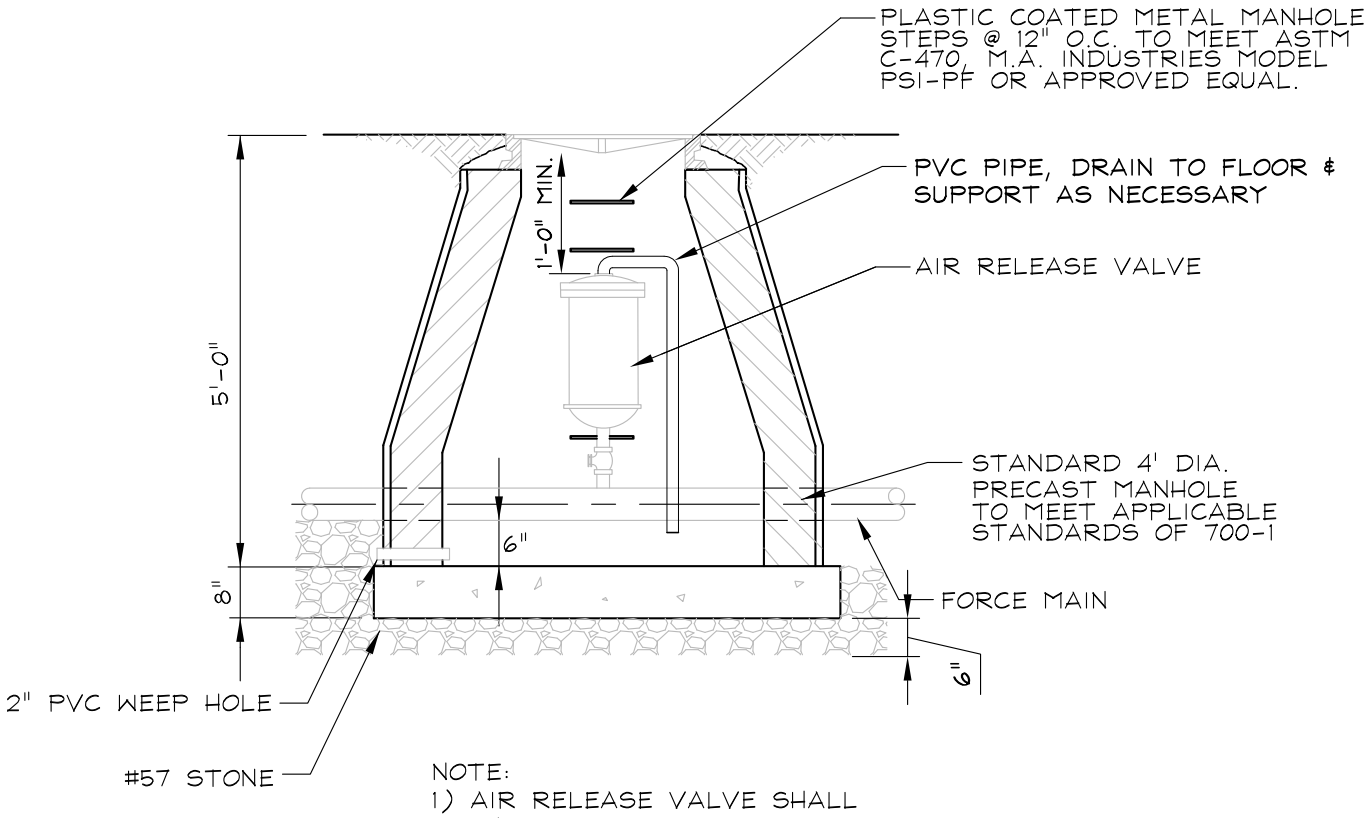
DOGHOUSE MANHOLE	DATE: OCTOBOER 2014 SCALE: N.T.S.
STANDARD DETAILS SEWERAGE SYSTEM CONSTRUCTION	STANDARD 800-4



NOTE:

1) AIR RELEASE VALVE SHALL INCLUDE VALVE ACCESSORIES, TAPPING, AND STANDARD MANHOLE.

2) NO PIPE JOINTS ALLOWED WITHIN MANHOLE

CITY OF CORNELIA
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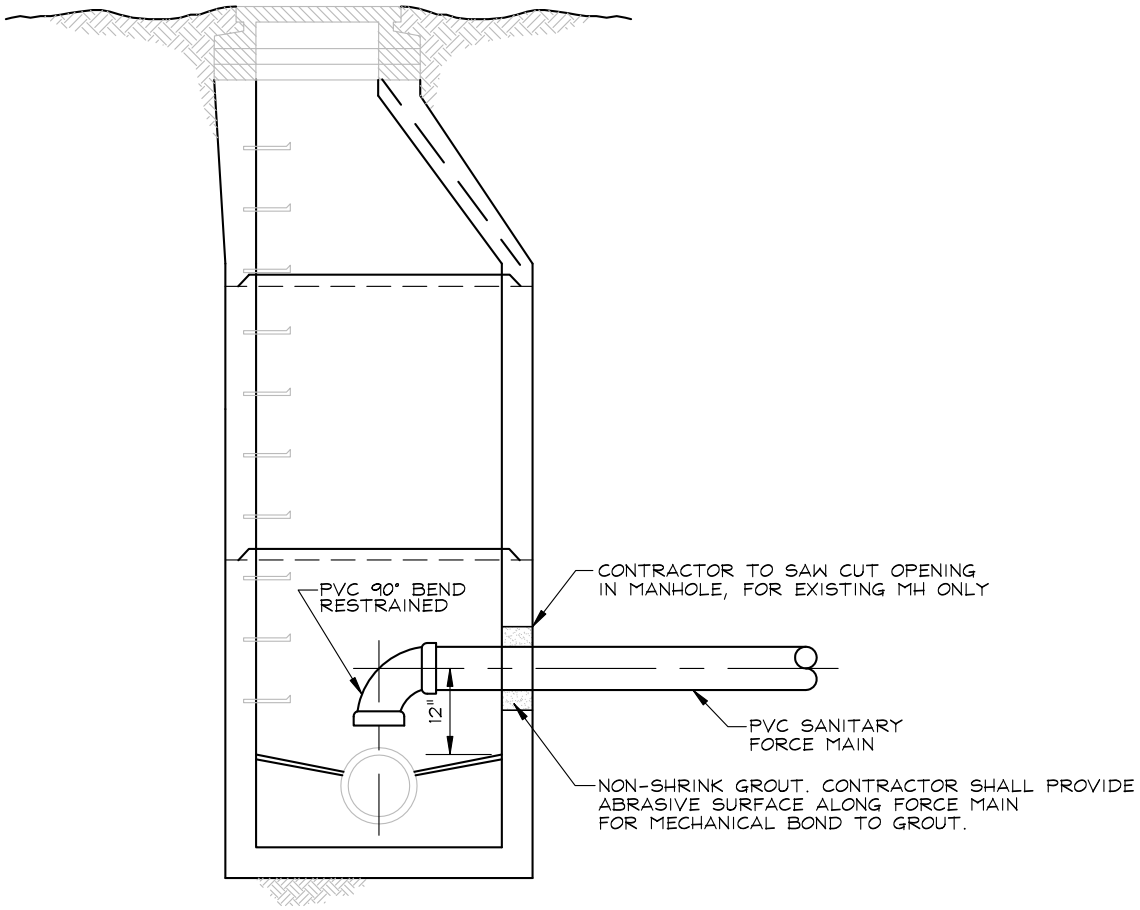
AIR RELEASE VALVE DETAIL

STANDARD DETAILS SEWERAGE SYSTEM CONSTRUCTION

DATE: OCTOBER 2014
SCALE: N.T.S.

STANDARD 800-5



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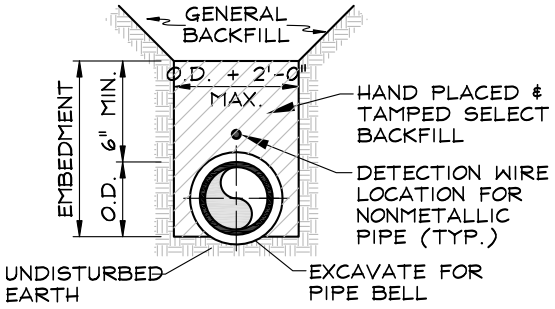
FORCE MAIN CONNECTION

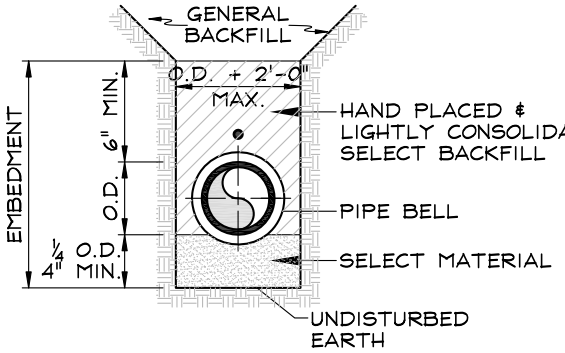
STANDARD DETAILS
SEWERAGE SYSTEM CONSTRUCTION

DATE: APRIL 2014
SCALE: N.T.S.

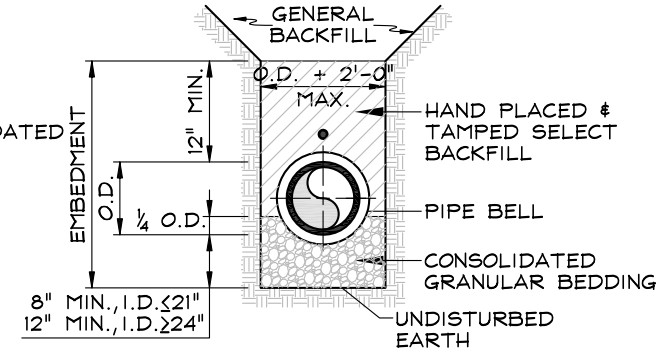
STANDARD 800-6



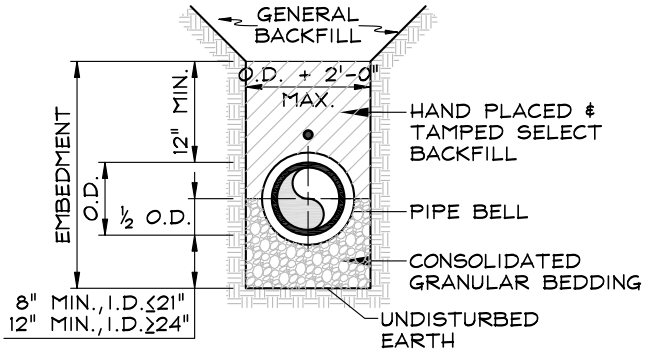
TYPE 2
(FLAT BOTTOM TRENCH)



TYPE 3
(LOOSE SOIL BEDDING)



TYPE 4
(GRANULAR BEDDING)



TYPE 5
(GRANULAR BEDDING)

NOTES

1. TYPE 2 CAN ONLY BE USED IN DRY EARTH TRENCHES.
2. TYPE 2 SHALL BE USED FOR PVC & D.I. FORCE MAINS UNLESS ROCK IS ENCOUNTERED OR OVER EXCAVATION OCCURS, IN WHICH CASE 6" MIN. OF GRANULAR CRUSHED STONE SHALL BE USED AS BEDDING.
3. TYPE 1 DOES NOT APPLY TO FORCE MAINS & SANITARY SEWER MAINS AND IS NOT SHOWN.
4. SEE ARTICLE VII FOR ADDITIONAL REQUIREMENTS.

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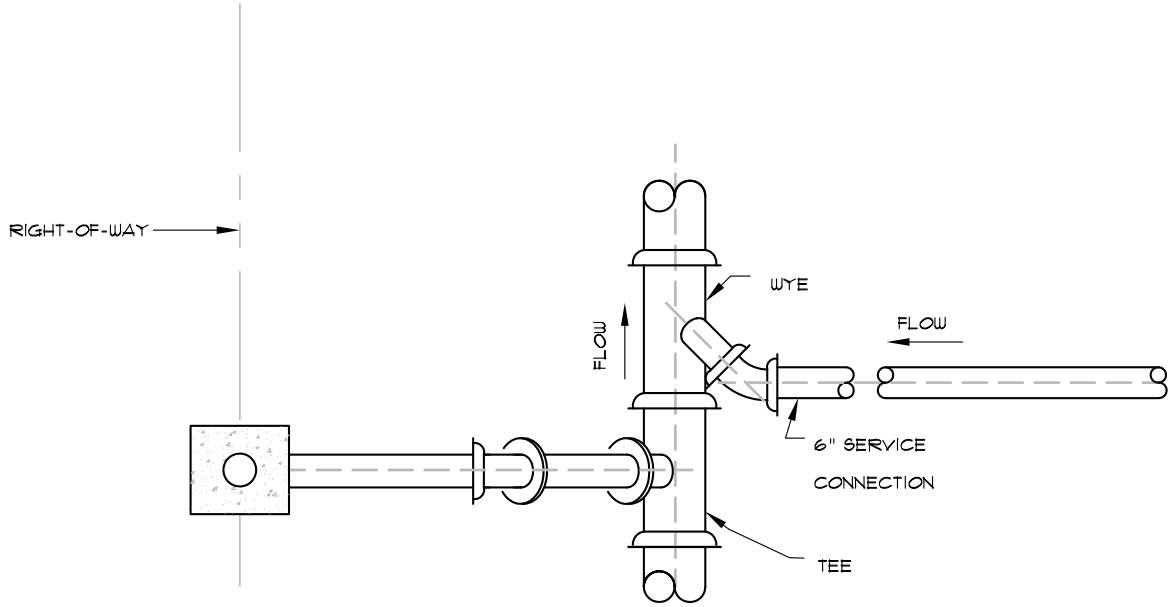
PIPE BEDDING AND HAUNCHING

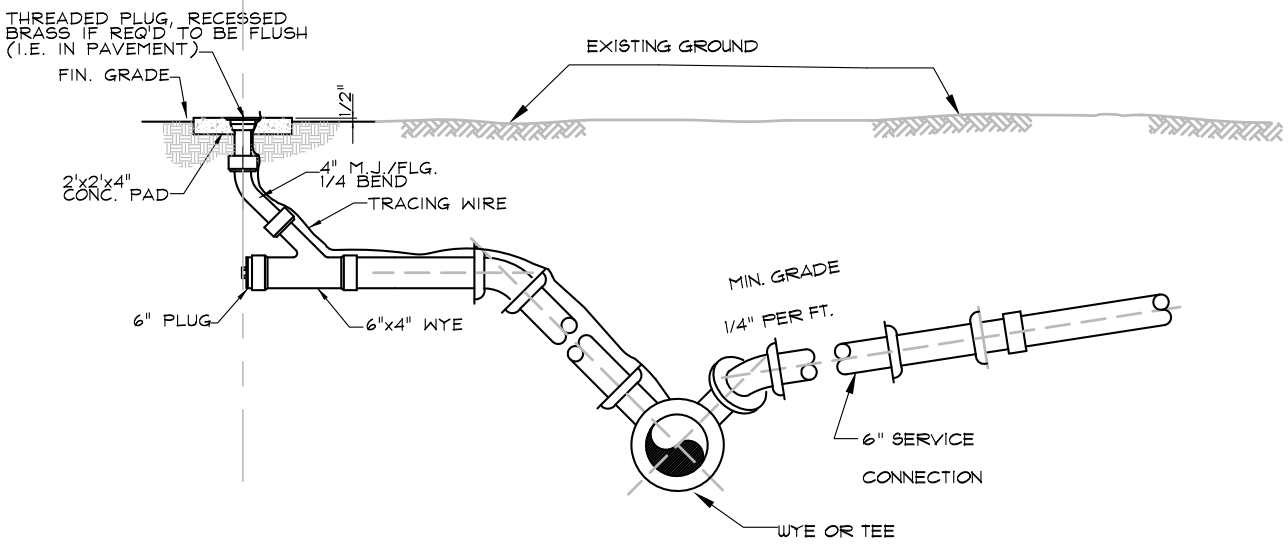
STANDARD DETAILS
SEWERAGE SYSTEM CONSTRUCTION

DATE: APRIL 2014
SCALE: N.T.S.

STANDARD 800-7



PLAN



ELEVATION

CITY OF CORNELIA
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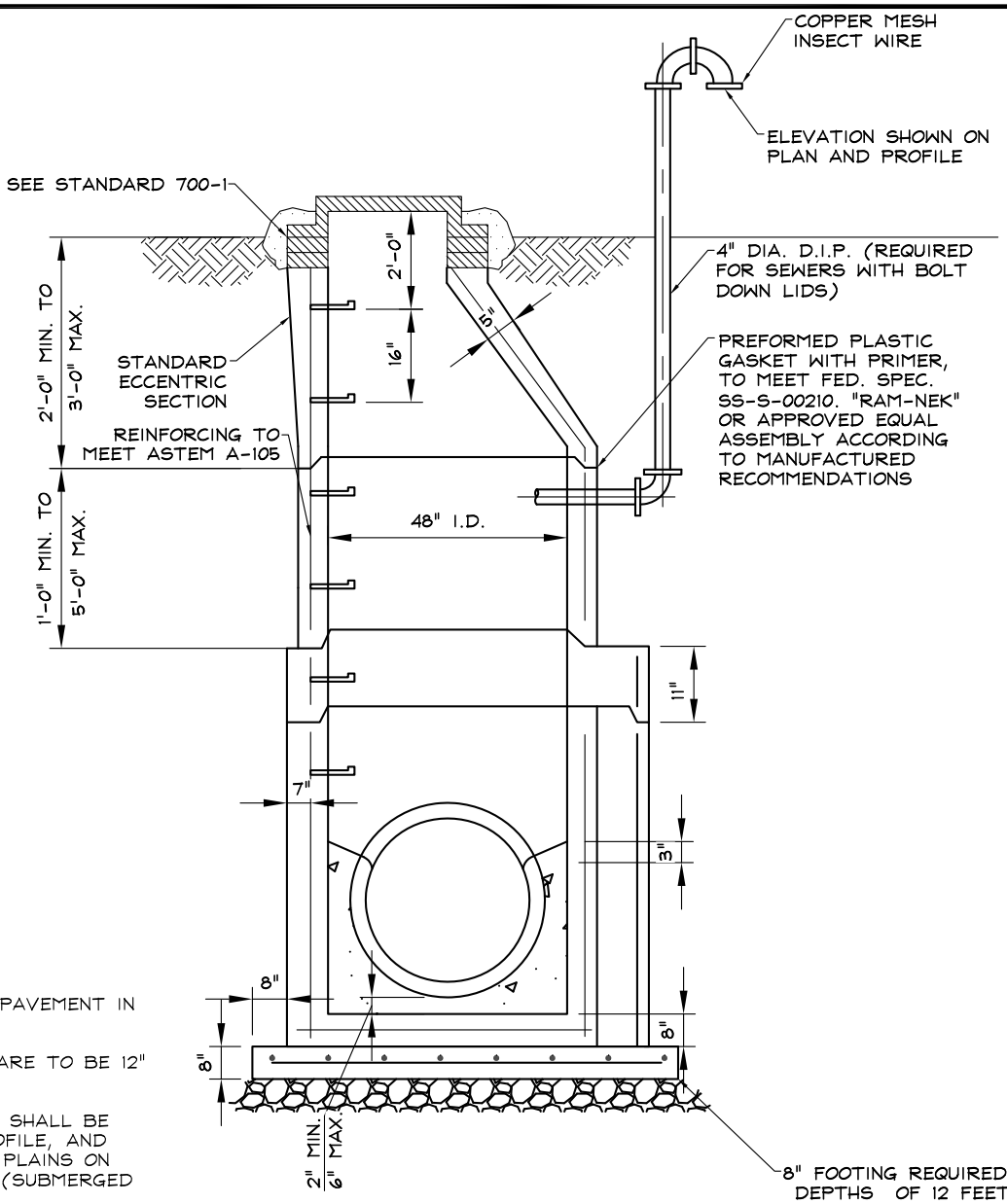
SERVICE CONNECTIONS

STANDARD DETAILS
SEWERAGE SYSTEM CONSTRUCTION

DATE: APRIL 2014
SCALE: N.T.S.

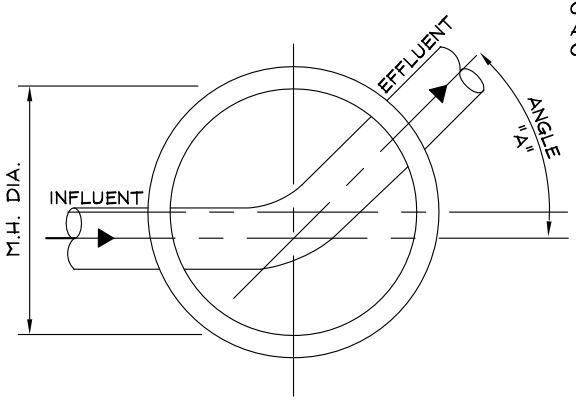
STANDARD 800-8



NOTES:

1. MANHOLES TO BE FLUSH WITH PAVEMENT IN PAVED AREAS.
2. MANHOLES ON OUTFALL LINES ARE TO BE 12" ABOVE GROUND.
3. WATER-TIGHT MANHOLE FRAME SHALL BE DESIGNATED ON PLAN AND PROFILE, AND SHALL BE REQUIRED IN FLOOD PLAINS ON AREAS SUBJECT TO FLOODING (SUBMERGED DURING RAINFALL)

STANDARD MANHOLE SCHEDULE OF GOVERNING DIMENSIONS		
PIPE SIZE	ANGLE "A"	MH. DIA.
8" TO 15"	0° TO 90°	4'-0"
18" TO 24"	0° TO 60°	4'-0"
18" TO 24"	60° TO 90°	5'-0"
27" TO 30"	0° TO 30°	5'-0"
27" TO 30"	30° TO 60°	5'-0"
27" TO 30"	60° TO 90°	6'-0"
36"	0° TO 90°	6'-0"
42"	0° TO 60°	7'-0"
42"	60° TO 90°	8'-0"
48"	0° TO 45°	8'-0"



NOTE:

MINIMUM ℄ RADIUS OF M.H. INVERT = 1.5 x PIPE DIAMETER

CITY OF CORNELIA
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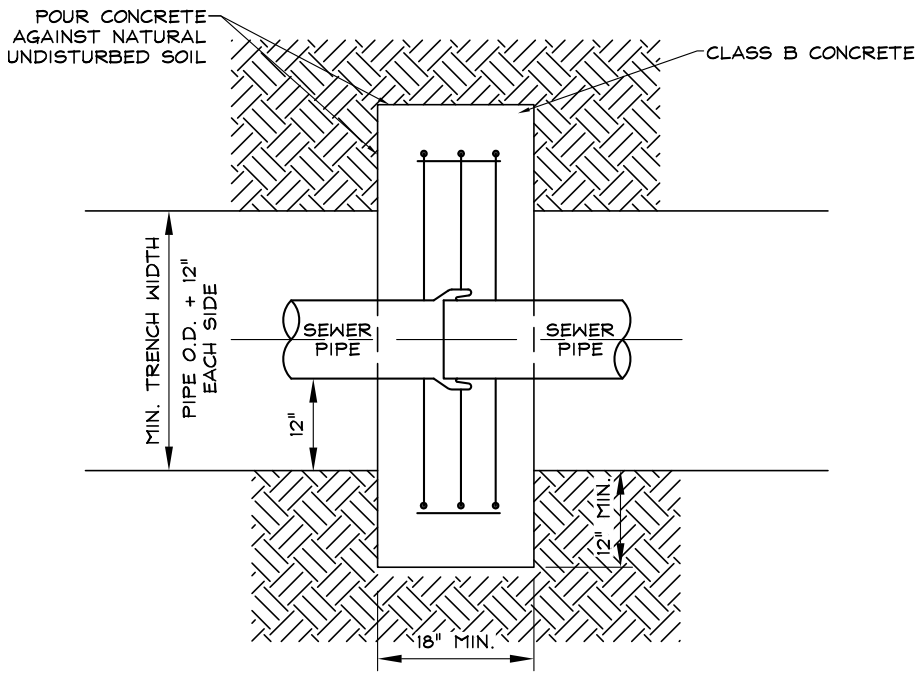
STANDARD VENTED MANHOLE (FOR PIPE LARGER THAN 18")

STANDARD DETAILS SEWERAGE SYSTEM CONSTRUCTION

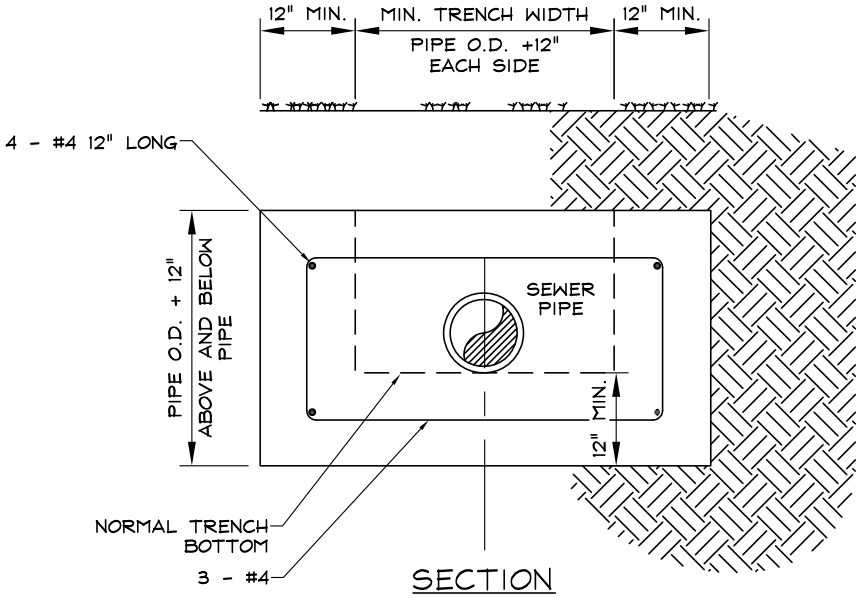
DATE: APRIL 2014
SCALE: N.T.S.

STANDARD 800 - 9



PLAN

NOTE:
COLLAR REQUIRED AT EVERY PIPE JOINT



SECTION

CITY OF CORNELIA
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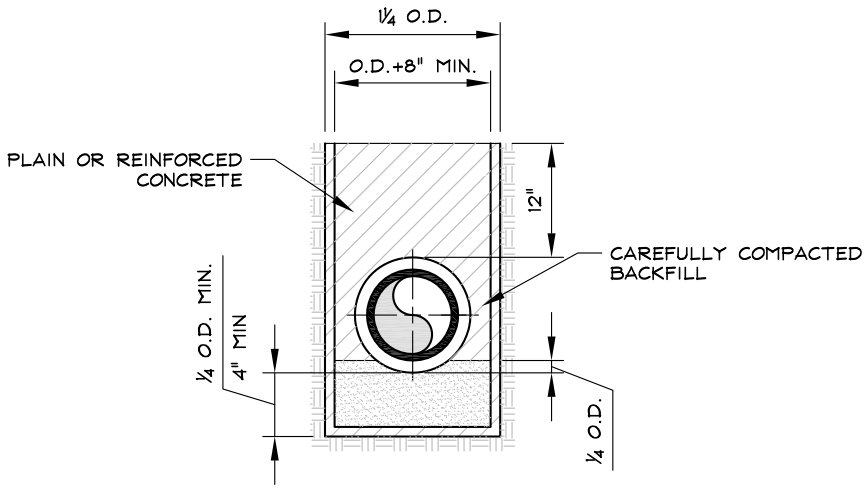
SEWER PIPE ANCHOR
(SLOPES 20% OR MORE)

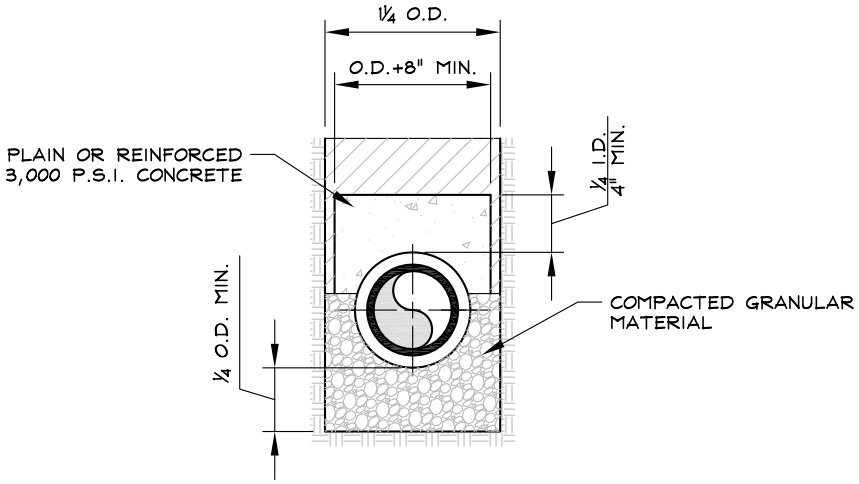
DATE: APRIL 2014
SCALE: N.T.S.

STANDARD DETAILS
SEWERAGE SYSTEM CONSTRUCTION

STANDARD 800 - 10



CONCRETE CRADLE



CONCRETE ARCH

CITY OF CORNELIA
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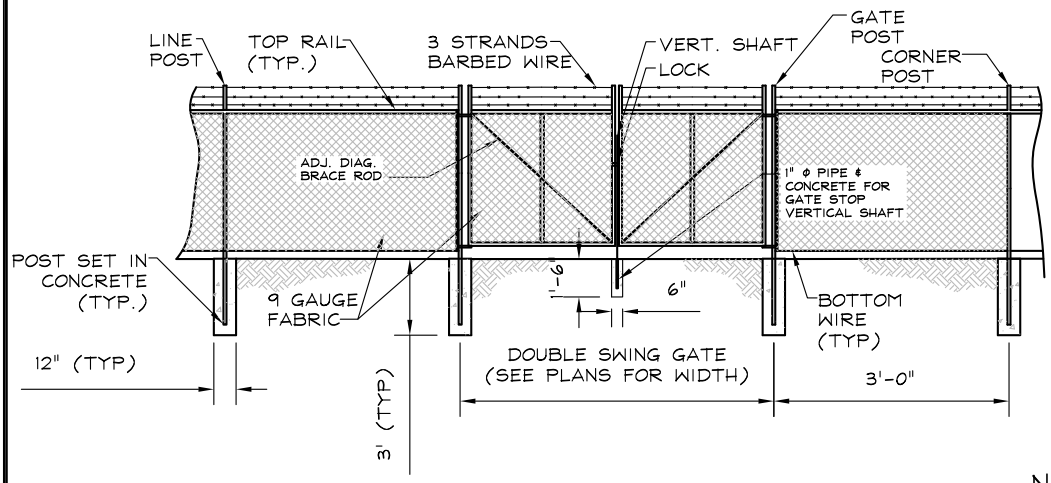
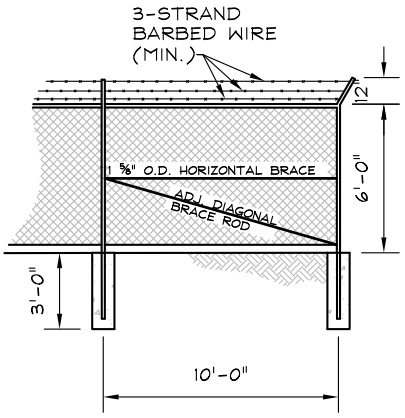
PIPE CLASS
"A" BEDDING

STANDARD DETAILS
SEWERAGE SYSTEM CONSTRUCTION

DATE: APRIL 2014
SCALE: N.T.S.

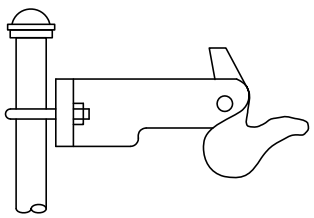
STANDARD 800 - 11





NOTE

PROVIDE GATE KEEPERS FOR ALL GATES.



GATE KEEPER

N.T.S.

CITY OF CORNELIA
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FENCE & GATE DETAIL

STANDARD DETAILS
SEWERAGE SYSTEM CONSTRUCTION

DATE: OCTOBER 2014
SCALE: N.T.S.

STANDARD 800 - 12

Article IX - Solid Waste Requirements and Specifications

Section 901: General Policy and Requirements

The City of Cornelia has the responsibility to protect the public health, safety and well being of its citizens and to protect and enhance the quality of its environment by enforcing policies governing the collection, storage, handling and disposal of solid waste and construction and/or demolition debris as part of all new development within the City of Cornelia including residential, commercial and industrial.

Therefore, the City has adopted procedures in accordance with laws enforced by the Georgia Environmental Protection Agency to regulate solid waste handling, storage, collection and disposal by the Solid Waste Department, who is licensed to collect, store, handle and dispose of solid waste, commercial and/or demolition debris generated from residential, commercial and industrial developments within the city.

Section 902: General Policy and Requirements

1. Prior to issuance of building permits for all construction including new or remodeling of residential , commercial or industrial sites, the applicant must provide documentation of the manner in which collection, storage and disposal of all building materials will be handled during construction. The director of solid waste or designee shall approve the proper location for the container. All residential and commercial contractors and/or property owners are required to keep the project site free of waste, debris and litter generated during new construction or remodeling.
2. All commercial, industrial, and multi-family generators of solid waste within the city are responsible for assuring the safe handling, storage and collection of solid waste from their premises. Commercial, industrial and multi-family customers are expected to enter into written service contracts with the City and abide by the regulations for such service.
3. It shall be the responsibility of each commercial, industrial and multi-family customer to provide adequate containers for storage of its own solid waste. It shall be the responsibility of each commercial, industrial and multi-family customer to provide a location easily accessible for the customer and the collection equipment utilized for disposal. The City of Cornelia will not be responsible for deterioration of parking lots, driveways, streets or roads. The location of the permanent refuse container shall be detailed on the site plan in a location approved by the solid waste director or designee.

Section 903: Single Unit Design

1. Concrete pad shall be a minimum of eight feet in length by 12 feet in width, inside dimension, sloped for positive drainage capable of withstanding the front weight of a 60,000 pound front-end loading truck.
2. Concrete approach pad shall be a minimum of 15 feet in length and 12 feet in width, inside dimension, and constructed to hold a 60,000 pound front-end loading truck.

3. Dumpster pad shall be enclosed on three sides with walls a minimum of six feet in height constructed of wood fence, masonry wall or non-transparent material compatible with the design, material and color selections used on the principal building(s).
4. The front side of the dumpster shall have gates a minimum of six feet in height, constructed of wood, chain link fence with privacy inserts or metal. Gates and gateposts shall be constructed to prevent leaning or sagging. Foot rollers may be used in design to accomplish these criteria and to ensure gates are easy to open. Gates shall have gate keepers and stops and locks installed.
5. Details of pad and enclosure are to be noted on site plans, with "no vertical interference" statement on site plans.
6. A minimum of two steel bollards set in concrete 48 inches on center (the distance from the center of one bollard to the center of the next bollard) shall be placed at the rear of the pad to prevent damage to the rear wall of the dumpster enclosure.
7. Pad must be constructed for accessibility of front-end loading trucks, with no vertical interference entering or exiting proposed site.

Section 904: Double Unit Design

1. Concrete pad shall be a minimum of eight feet in length by 24 feet in width, inside dimension, sloped for positive drainage capable of withstanding a 60,000 pound front-end loading truck.
2. Concrete approach pad shall be a minimum of 15 feet in length by 24 feet in width, inside dimension, and constructed to withstand a 60,000 pound front-end loading truck.
3. Container area shall be enclosed on three sides with walls at least six feet in height constructed of wood fence, masonry wall or non-transparent material compatible with the design, material and color selections used on the principal building(s).
4. The front side of the dumpster pad shall have gates with gate keepers and with stops and locks at least six feet in height. Gates are to be constructed of wood, chain link fence with privacy inserts or metal. Gates and gateposts shall be constructed to prevent sagging and leaning and to be easily opened and closed,
5. Details of the container pad an enclosure are to be noted on the site plan with "no vertical interference" statement on the plan.
6. A minimum of four bollards spaced 47 inches on center (the distance from the center of one bollard to the center of the next bollard) for each pair. Bollards are to be set in concrete at rear of pad to prevent damage to the rear wall of the container enclosure.
7. Pad must be constructed for accessibility of front-end loading trucks with no vertical interference entering or exiting the proposed site.
8. Double unit may be designed with or without partition wall between containers.
    a. Double unit may have one or two pair of gates. If designed with one pair of gates then the foot rollers shall be installed.

Section 905: Compactor Design

1. Concrete pad 36 feet in length by 12 feet in width, inside dimension, capable of holding a 60,000 pound roll-off truck.
2. Concrete approach pad shall be 20 feet in length by 12 feet in width, inside dimension, capable of withstanding a 60,000 pound roll-off truck. Approach shall be straight to allow tandem truck to back into compactor pad.
3. Compactor pad shall be enclosed on three sides with a wall height of a minimum of eight feet, constructed or a wood fence, masonry wall or non-transparent material compatible with the design, material and color selections used on the principal building(s),
4. Compactor pad shall have gates with stops and locks. Gates shall be a minimum of eight feet in height. Gates and gateposts shall be constructed to prevent sagging and leaning and to be easily opened and closed. Foot rollers may be installed to accomplish these criteria.
5. On commercial sites, walls may be omitted if unit design is self—contained with access to hopper form the interior of the building.
6. For residential units, the enclosure walls at the hopper access shall be designed to prevent access by children and to prevent accidental injury. The area adjacent to the unit shall be no more than 42 inches to the access of the hopper.
7. Electrical service shall be installed according to the manufacturer's specifications.
8. Compactor pads shall allow for positive drainage to prevent the accumulation of standing water or sediment. A floor drain may be installed to permit stormwater drainage.
9. Details of the compactor pad are to be noted on the site plan with "no vertical interference" statement on the plan.
10. Hopper size shall be large enough to accommodate the volume of waste for which the container is designed to handle. Hoppers may require sides or tops depending on the application.
11. The power unit, electric connection and hydraulic tank shall have easy access and be elevated to prevent water accumulation, which would interfere with safe operation of the compactor.
12. The control unit shall be keyed and placed in an area of easy access for operation of the compactor. A sign with instructions and safety information shall be posted next to the control unit. A lock over the control unit shall be required for all residential complexes.
13. Installation of a self-contained or stationary compactor shall be completed in accordance with the manufacturer's specifications.
14. Any request for a variance from these requirements shall be made in writing to the attention of the City of Cornelia.

End Article IX

ARTICLE X - CORRIDOR MAP

Section 1001: Corridor Map Adoption.

A "Trail Parks" map is hereby adopted and made a part of this Ordinance. Prior to adoption of the corridor map, the following actions have been taken to ensure procedural due process:

1. At least fifteen (15) days before the public hearing, the City Commission notified the public of the date, time, place, and nature of a public hearing on this ordinance by publication in a newspaper of general circulation in the territory of the local government.

2. The City Commission held the public hearing at the date, time, and place advertised, and afforded all interested individuals with the opportunity to be heard concerning the proposed corridor map.

Section 1002: General Provisions.

The City shall not issue a development permit, building permit, or any other permit for development except pursuant to the procedure and in compliance with this Article. This Article does not forbid or restrict the use of any reserved land that does not constitute the development of that land, nor does this Article forbid or restrict development on the unreserved portion of any reserved land.

Section 1003: Authorization Required to Develop Reserved Land.

An owner of land shown on the corridor map for future public use who proposes to develop such reserved land shall apply to the Administrative Officer for the appropriate permit. It shall be unlawful to carry out development upon land shown as reserved or for public use on the corridor map, without securing the appropriate approval as required by this Ordinance.

Section 1004: Public Hearing and Notice.

Upon receiving an application for a permit involving shown on the corridor map, the Administrative Officer shall arrange for the application to be scheduled for public hearing before the City Commission. The applicant shall be notified in writing of the date, time, and place of the hearing within five business days of receipt of the application, by written mail, personal service, or facsimile, at least fifteen (15) days prior to the public hearing. The public shall be given notice by publication in a newspaper of general circulation in the territory of the local government at least fifteen (15) days prior to the public hearing of the date, time, place, and nature of the hearing. The applicant shall, at the hearing, have an opportunity, personally or through counsel, to present evidence and argument in support of his or her application, as shall others with an interest in the application.

Section 1005: Action.

Following the public hearing, the City Commission may take one of the following actions:

1. Approve the request as proposed, with or without conditions.

2. Modify the mapped corridor to remove all or part of the reserved land from the mapped corridor, and issue with or without conditions the permit authorizing development on the land removed from the mapped corridor.

3. Modify the proposed application and issue it for development as modified, with or without conditions, if the development can reasonably be accomplished on the subject parcel without encroaching on the reserved land.

4. Delay action on the permit for a defined period of time not to exceed six (6) months for the purpose of any of the following:

    a. Negotiating with the property owner for the purchase of all or a part of the reserved land by the governmental agency responsible for the transportation facilities.
    b. Acquiring the reserved land voluntarily.
    c. Acquiring a negative easement over the reserved land that prevents the property owner from building on the reserved land.
    d. Taking the reserved land through eminent domain.

Section 1006: Authority to Acquire for Reserved Land for Public Use.

After delaying action on the permit by the city, the City Commission may, but shall not be obligated to, negotiate for the voluntary dedication of the land, enter into option, or it may initiate condemnation proceedings subject to applicable state law and use its powers of eminent domain.

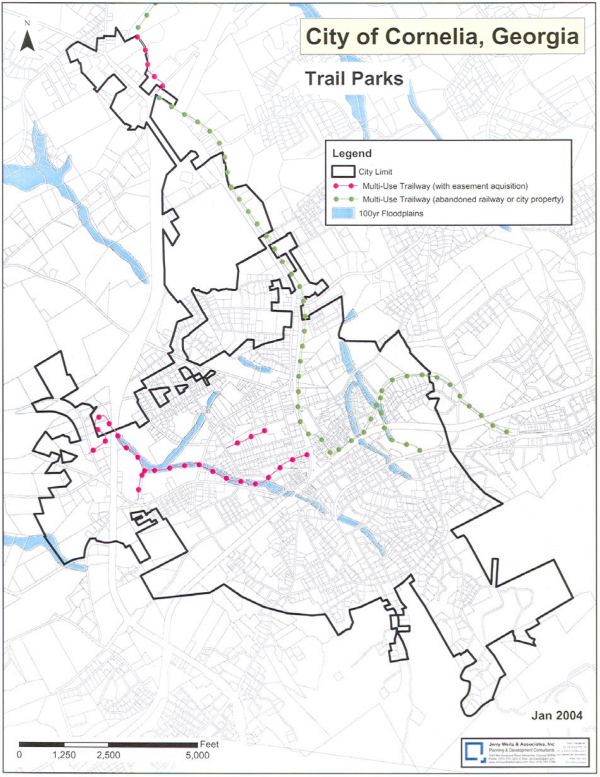
Section 1007: Final Action on Permit.

If the City Commission fails to arrange for the legal acquisition of all or a part of the land shown for public use on the corridor map within the specified time period which shall not exceed six (6) months, then the city shall approve the permit, with or without conditions, or in the absence of such approval the permit shall be deemed approved as submitted.

Section 1008: Corridor Map

See attached map.

End Article X


City of Cornelia, Georgia
Trail Parks
Legend
City Limit
Multi-Use Trailway (with easement aquisition)
Multi-Use Trailway (abandoned railway or city property)
100yr Floodplains
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1,250
2,500
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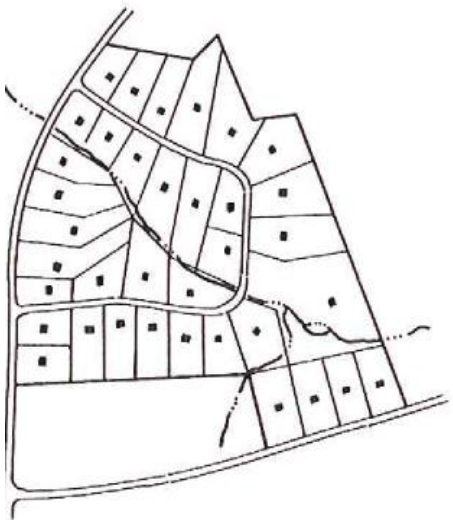
Jerry Weitz & Associates, Inc
Planning & Development Consultants

ARTICLE XI - CONSERVATION SUBDIVISIONS

Section 1101: Purpose and Intent.

This Article is intended to provide for residential subdivisions that are designed based first and foremost on the preservation of open space, but that accommodate the full extent of development that would otherwise be legally possible under conventional subdivision designs, and that:

1. Minimize the environmental and visual impacts of new development on critical resources and historically and culturally significant sites and structures.
2. Contribute to an interconnected network of permanent open space in the community and provide for undivided or relatively undivided open spaces within new developments.
3. Create a greater diversity of living environments than is possible with conventional residential subdivision developments.
4. Foster informal social interaction among neighborhood residents in common open spaces.
5. Reduce the demand on public expenditures for open space, parkland, play fields, and other areas for active and passive recreation.
6. Encourage compact patterns that reduce capital costs by requiring less linear footage distances of roads and utilities than conventional subdivision development.
7. Offer greater opportunities to implement environmentally sensitive sewage treatment and disposal systems.



Conventional Subdivision

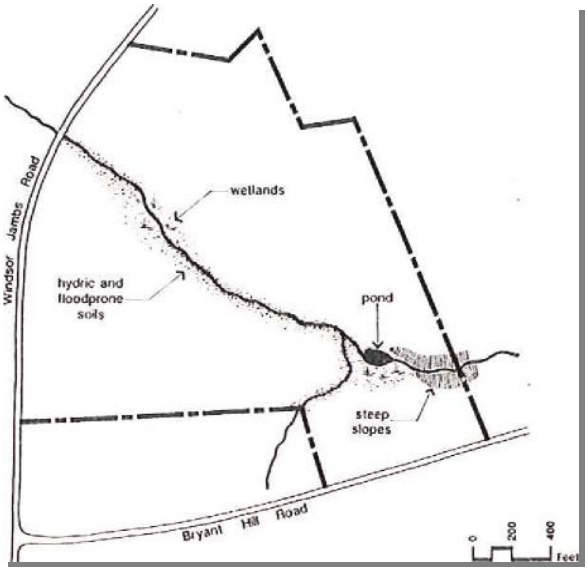
Conservation Subdivision

Section 1102: Relationship to Subdivision Regulations.

Conservation subdivisions shall be considered and processed in accordance with preliminary and final plat requirements as specified in this ordinance, except that in addition the criteria for approval and grounds for disapproval as provided in this Article shall also apply to decisions on preliminary plats. Conservation subdivisions shall meet the improvement requirements of this ordinance. Where design considerations for lots and blocks are more specifically recommended in this Article, they shall be considered applicable recommendations in lieu of those found in other Articles of this ordinance which would otherwise be applied.

Section 1103: Primary Conservation Areas.

Primary conservation areas on lands in conventional subdivisions are permitted to be platted and included in adjacent residential lots. In contrast, a conservation subdivision incorporates, and shall include, all primary conservation areas into undivided or relatively undivided, permanent, open spaces. Primary conservation areas, as defined by this Article, include the following: habitats for endangered or threatened species, wetlands, groundwater recharge areas, flood plains, water bodies, shorelines, and adjacent riparian zones or upland buffers, historic, cultural, and archaeological sites, and steep slopes.



Primary Conservation Areas

Section 1104: Secondary Conservation Areas.

Secondary conservation areas on lands in conventional subdivisions are rarely identified and conserved. In contrast, a conservation subdivision identifies, and shall identify secondary conservation areas and shall integrate all or a portion of them into undivided or relatively undivided, permanent, open spaces.

Secondary Conservation Areas

Section 1105: Required Open Space Specifications.

1. Minimum Percent of Site Area. Each conservation subdivision shall provide a minimum of twenty percent (20%) of its total land area as open space, as defined by this ordinance. Areas of above-ground utility right-of-way must be excluded from the minimum.

2. Minimum Size. The minimum amount of open space required to qualify for an open space conservation subdivision shall be one and one-half (1.5) contiguous acres. The purpose of this minimum open space acreage is to avoid development proposals that provide only small, scattered open spaces that would not functionally contribute to the overall open space network of the surrounding area.

3. Permitted Uses. In the case of farmland conversion, part of the open space within a conservation subdivision may be permitted to be retained in the hands of the original farmer/landowner or leased to a farmer for agricultural, pasture, or horticulture uses, so long as the activity is undertaken using best management practices to reduce environmental impacts to the extent possible. Open space may not be used for golf courses, roadways, or water impoundments. No more than 25% of the open space may by used for active recreation spaces. Uses not expressly authorized via the preliminary plat review and approval process are prohibited.

4. Open Spaces Shall Be Named. Each open space shall be given a name appropriate to its purpose and design. Acceptable identifying types of names for open spaces include but are not limited to "Common," "Park," "Green," "Meadow," "Woods," "Farm," and "Historic Site."

Section 1106: Conservation Easement Required.

All primary conservation areas, and all secondary conservation areas shown on the preliminary plat and required or proposed to be retained as open space, shall be permanently protected from further subdivision, development, and unauthorized use by a conservation easement. A conservation easement, as defined, shall be approved by the City and 1) co-signed by the City and donated to a conservation organization or land trust; or 2) co-signed by the City, donated to a

homeowners association and co-signed by a conservation organization or land trust; or 3) donated to the City if accepted by the City and co-signed by a conservation organization or land trust. In the case of farmland conversion, part of the open space within a conservation subdivision may be permitted to be retained in the hands of the original farmer/landowner if subject to a conservation easement meeting the requirements of this Article.

Section 1107: Guidelines for Drafting Conservation Easements.

The following guidelines are offered for drafting conservation easements and may be required by the City of Cornelia:

1. The easement recognizes and describes in a statement of purpose the special qualities of the property subject to the easement. The easement must include a map of the tract noting all significant features within the area. The easement clearly identifies the owner of the property subject to the easement, the holder of the easement, and co-signer, and the responsibilities of the property owner, easement holder, and co-signer.
2. The easement specifically and clearly identifies the boundaries of the property subject to the easement, preferably by metes and bounds legal description and survey plat.
3. The easement contains restrictions as to what the owner may do with the property and specifically delineates what may not be done with the property. Limitations may include but may not be confined to prohibitions against subdivision, earthmoving, dumping, signs, utility lines, construction, changes to existing structures, and uses made of the property.
4. The easement provides for the right of the easement holder and co-signer to inspect the property to assure observance of restrictions. It also provides for enforcement procedures.
5. The easement provides for the maintenance of property.
6. The easement contains provisions governing its amendment, including provisions that the easement shall not be altered except with the express written permission of the easement holder, property owner, and any co-signers.

Section 1108: Homeowners Association.

Open spaces may be owned and managed in common by a homeowners association, subject to compliance with the provisions of this Article and the following requirements:

1. The developer of the conservation subdivision shall provide to the Administrative Officer for approval, prior to the approval of a preliminary plat, a description of the homeowners association, including bylaws and methods for maintaining open space. The developer of the conservation subdivision shall provide a property management plan or an estimate of the costs and staff requirements for the maintenance, operation, and insurance of the open space and any facilities it includes in the description of methods for maintaining the subdivision's open space.
2. The homeowners association shall be established by the conservation subdivision developer and endowed with a financial subsidy from the developer prior to the approval of a final plat on the property involving a conservation subdivision.

3. Homeowners' association membership of each non-open space lot owner in the conservation subdivision shall be mandatory (required) and automatic.
4. Unless maintenance is assigned to a conservation organization or land trust, the homeowners association shall be responsible for maintenance, insurance, and taxes on the open space within the conservation subdivision. In such cases, the association shall be required to assess dues for the maintenance of open space, purchase of insurance, and payment of taxes, unless another income source is proven to be available. Members of the association shall share equitably the costs of open space maintenance as indicated in bylaws. The association shall be empowered with the legal ability to place liens on non-open space lot owners for failure to pay association dues.
5. Said homeowners association shall not be dissolved without the consent of the Governing Body. If common ownership of open spaces by a homeowners association is proposed and approved, then open spaces shall be subject to permanent deed and final plat restrictions or covenants on the future use, development, and subdivision of open spaces, in addition to the requirement of a conservation easement.
6. The Governing Body may, upon recommendation of the City Attorney and the City Engineer, require that the homeowners association establish a minimum amount of funds to be initially deposited and maintained in a maintenance account.

Section 1109: Fee Simple Dedication to the City.

Dedication in fee-simple ownership to the public for recreational and/or open space use is a possible mechanism for the permanent retention and maintenance of open spaces within the conservation subdivision, at the sole discretion of the Governing Body, and subject to the following in addition to other applicable provisions of this ordinance:

1. Dedication to the City shall only be approved if the Governing Body finds that the size, shape, location, type of open space, or cost of development or maintenance of such open space or the availability of open space would make public ownership desirable or necessary.
2. The decision to accept open spaces for fee simple public ownership shall be at the sole discretion of the Governing Body but guided by recommendations of the Administrative Officer, Municipal Planning Board, and the comprehensive plan as it pertains to open space acquisition.

The Governing Body may require a maintenance bond or other financial security with duration of twelve (12) months following public acceptance in an amount sufficient to ensure that such lands do not cause unwarranted public expenditures because of faulty conditions or construction. The Governing Body shall have authority to cash said bond in the event substandard conditions are evident. Otherwise, following the one-year period following public dedication, with satisfactory performance, the Governing Body shall upon request return the performance bond to the subdivider.

In addition to the required conservation easement, a deed for open space lands in a form acceptable to the City Attorney in favor of the City shall be signed and recorded prior to the approval of any final plat pertaining to land within the conservation subdivision.

Section 1110: Application.

As a part of the preliminary plat application, the applicant for a conservation subdivision shall in addition to the requirements for preliminary plats specified in this ordinance, submit an analysis of existing features on the site, which shall at minimum include the following:

1. Significant wildlife habitats, if any. If information on habitats is not available, the wildlife potential of various soil types on the site shall be identified and examined.
2. Soils, including analysis of suitability for septic tanks, erosion potential, prime farmland, and identification of hydric soils.
3. Wetlands.
4. Floodplains. Areas of 100-year flood plains as identified on flood hazard boundary maps or flood insurance rate maps developed by the Federal Emergency Management Agency.
5. Steep slopes and protection mountain and hillside areas.
6. Historic, archaeological, and cultural features.
7. Tree cover/woodlands.
8. Views into and out from the site, and any scenic qualities.
9. Groundwater recharge areas.
10. Protected river corridors.
11. Water supply watersheds.
12. Property boundaries.
13. Existing roads and structures.
14. Greenspaces and trails traversing or adjacent to the site.
15. Planned boundaries of open space.

Section 1111: Consideration.

Approval or denial of a preliminary plat for a conservation subdivision shall, be based on the extent to which the plat meets the following criteria:

1. All primary conservation areas are protected as permanent open space.
2. A sufficient amount of secondary conservation areas are protected as permanent open space, as opposed to being devoted to lots and other uses.
3. The configuration of the open space tract is contiguous and undivided, or open space is provided in relatively undivided tracts that cannot reasonably be reconfigured into one contiguous, undivided tract.
4. The conservation subdivision meets the regulations specified in this Article.

Section 1112: Justifiable Grounds for Denial.

Reasons for the denial of a preliminary plat of a conservation subdivision include but are not limited to the following:

1. The application fails to fully identify primary and secondary conservation areas.
2. The proposed method of sewage treatment is inappropriate for the site or found to be potentially dangerous to public health.
3. One or more of the lots within the conservation subdivision are too small to be in character with residences on adjoining or nearby properties.
4. One or more of the lots are significantly large or wide, such that their design contributes to an unnecessary decrease in the amount of open space retained on site.
5. The street configuration does not provide for connectivity, or preserve natural features, or it is found to be inconsistent with the open space character of the subject property and its surroundings.
6. The proposed open space network is divided, not functional, inconsistent with open space plans of the City, or does not provide for the protection of the most valuable secondary conservation areas on the site given the natural and scenic properties `inherent on the site.
7. The proposed open space network fails to maximize the length of the common boundary between conservation areas on site and conservation areas or parkland abutting the conservation subdivision.

End Article XI

ARTICLE XII - TREE AND LANDSCAPING REQUIREMENTS

Section 1201: Purpose

It is the purpose of this article to promote a healthy, natural environment whenever possible by conserving existing vegetation and providing environmentally sound landscape amenities and buffers that promote a positive community image. The purpose is also to provide standards for the conservation of trees as part of the land development process, to protect trees during construction whenever possible, and ensure replacement of trees that must be removed during development. Considering the dependence of the public on the automobile, parking lots are necessary for all commercial establishments. Large areas of continuous pavement are not visually appealing and result in problems related to storm water run-off and heat production.

Providing trees and other landscaping provides many benefits including:

1. Conserves the aesthetic qualities of the area.
2. Improves property values.
3. Provides a more pleasing and comfortable environment for customers.
4. Reduces noise and glare.
5. Decreases water, soil, and air pollutants
6. Moderates storm water run-off and decreases stream and river silting.
7. Improves the overall quality of life for residents.

Section 1202: Applicability

This ordinance will apply to all activity requiring a land disturbance permit including new local government projects, commercial development, commercial redevelopment, multi-family dwellings and residential subdivisions. Any redevelopment or renovation of a building over 3,000 square feet or change in use that will require an increase in parking by 25% will require adherence to the provisions of this ordinance. Normal maintenance is excluded.

Section 1203: Definitions

The following definitions are specific to this Article and are in addition to those definitions found in Article II. For words found in both Articles, the definition in this Article shall govern herein if the definition is in conflict with the one in Article II.

1. Buffer:
   a. An area along some natural feature designated to protect and/or preserve the essential character of such feature and allow it to be maintained in an undisturbed and natural condition.
   b. A natural undisturbed portion of a lot, except for approved access and

utility crossings, which is set aside to achieve a visual barrier between the use on the lot and adjacent lots and/or uses.

2. *Clear Cutting*: A forestry management technique employed to prepare a site for replanting trees. Clear cutting is a non-land disturbing activity not associated with development activity and does not including grading or stump removal.
3. *Clearing / grading / grubbing / scraping*: A land disturbing activity involving the removal of trees, shrubs, or undergrowth from real property for non-agricultural development purpose.
4. *Critical Root Zone*: The minimum area beneath a tree that must be left undisturbed in order to preserve a sufficient root mass to give a tree a reasonable chance of survival. The critical root zone is approximately 1.3 feet of radial distance for every inch of a tree's DBH, with a minimum of eight feet.
5. *Cut:*
   a. A portion of land surface or area from which soil, earth, rock or other materials has been removed or will be removed by excavation.
   b. The height below original ground surface after the material has been or will be removed.
6. *Deciduous*: A plant with foliage that is shed annually.
7. *Diameter Breast Height (DBH)*: The standard measure of tree size for those trees existing on a site that are at least four (4) inch caliper at a height of four and one-half (4.5) feet above the ground. If a tree splits into multiple trunks below four and one-half (4.5) feet, then the trunk is measured at its most narrow point beneath the split.
8. *Drip Line*: A vertical line extending from the outer surface of a tree's branch tips to the ground. The drip line generally bears little relationship to the extent of a tree's critical root zone.
9. *Evergreen*: A plant with foliage that persists and remains green year-round.
10. *Existing Density Factor (EDF)*: The tree density units awarded for the preservation of existing trees that will remain on site to be protected during construction.
11. *Grade, existing*: The vertical location of the existing ground surface prior to cutting or filling.
12. *Grade, finished*: The final grade or elevation of the ground surface after cutting or filling and conforming to a proposed and approved design.
13. *Ground Cover*: Living material planted in such a way as to form a sixty (60) percent or more ground cover at the time of planting and a continuous cover over the ground that can be maintained at a height of not more than eighteen (18) inches.
14. *Hedge*: An evenly spaced planting of shrubs that forms a compact, dense, visually opaque living barrier. Hedges inhibit passage or obscure views.

15. *Landscape Strip*: Land area located within the boundary of a lot and required to be set aside and used for landscaping upon which only limited encroachments are allowed.
16. *Landscaping*: Any combination of living plants, such as trees, shrubs, vines, ground covers, flowers, or grass, and which may include natural features such as rock, stone, bark chips or shavings, and structure features, including but not limited to fountains, pools, outdoor artwork, screen walls, fences, or benches.
17. *Landscape Plan*: A graphic and written document containing criteria, specifications and detailed plans to arrange and modify the effects of natural features. A landscape plan consists of a site plan showing the boundaries of the property and the location of proposed plant materials, in relation to surroundings and improvements, along with a planting schedule and any additional specifications required by the city arborist.
18. *Natural Area*: An area containing natural vegetation that will remain undisturbed when the property is fully developed.
19. *Replacement Density Factor (RDF)*: The minimum number of tree density units which must be achieved on a property after calculating tree density units for existing trees (EDF) which will remain on site to be protected during construction.
20. *Revegetation*: The replacement of trees and landscape plant materials.
21. *Screen:* A method of reducing the impact of noise and unsightly visual intrusions with plants, berms, fences, walls, or any appropriate combination thereof, to provide a less offensive or more harmonious environment in relation to abutting properties.
22. *Shrub*: A woody plant, smaller than a tree, consisting of several small stems from the ground or small branches near the ground, and generally obtaining a height less than eight (8) feet; a shrub may be deciduous or evergreen.
23. *Site Density Factor (SDF)*: The minimum number of tree density units per acre that must be achieved on a property after development.
24. *Specimen Tree*: Any tree that qualifies for special consideration for preservation as determined by the Zoning Administrator due to its size, species or historic relevance.
    a. Size Criteria:
        i. Large Hardwoods (oak, poplar, sweetgum, etc.): 24 inch diameter or greater.
        ii. Large softwoods (pine, cedar, etc.): 30 inch diameter or greater.
        iii. Small trees (dogwood, redbud, sourwood, etc.): 8 inch diameter or larger.
    b. Condition Criteria:
        i. Life expectancy of more than 15 years.
        ii. Relatively sound and solid trunk with no extensive decay

iii. No more than one major and several minor dead limbs (hardwoods).
iv. No major insect or pathological problems.

25. *Stripping*: Any activity that removes the vegetative surface cover including tree removal, grubbing and storage or removal of topsoil.
26. *Timber:* Harvestable trees.
27. *Topping:* Severely cutting back tree limbs to stubs larger than three inches in diameter within the tree's crown to such a degree so as to remove the normal canopy and disfigure the tree.
28. *Tree:* Any self-supporting, woody perennial plant usually having a single trunk diameter of three (3) inches or more that normally attains a mature height of a minimum of fifteen (15) feet.
    a. Overstory: Trees that compose the top layer of canopy of vegetation and will generally reach a mature height of greater than 40 feet.
    b. Understory: Trees that grow beneath the overstory and will generally reach a mature height of less than 40 feet.
29. *Tree Density Unit*: A credit assigned to a tree based on the diameter of the tree, in accordance with table contained in this article.
30. *Tree Protection Area*: The tree protection area shall include no less than the total area beneath the tree canopy as defined by the dripline of the tree plus any additional area encompassing the critical root zone of a tree or group of trees collectively that are proposed to be retained in order to comply with the requirements of this article.
31. *Tree Protection Plan*: A plan that identifies tree protection areas, existing trees to be retained, specimen trees and proposed trees to be planted on a property to meet minimum requirements, as well as methods of tree preservation to be undertaken on the site and other pertinent information.
32. *Tree Removal*: The actual removal of a tree or any act that causes a tree to die within two years after commission of the act, including but not limited to damage inflicted upon the root system, crown or trunk as a result of:
    a. The storage of materials in or around the trees
    b. Soil compaction within the critical root zone
    c. Altering the natural grade to expose the roots or to cover the root system within the critical root zone with more than four inches of soil
    d. Pruning not in accordance with the standards set forth by the International Society of Arboriculture (ISA)
    e. Paving with concrete, asphalt or other impervious surface within such proximity as to be harmful to the tree or its root system within the critical root zone
    f. Application of herbicides or defoliates within the critical root zone
33. *Tree Save Area*: An area designated for the purpose of meeting tree density requirements, saving natural trees and/or preserving natural buffer.

34. *Tree Thinning*: Selective cutting or thinning of trees for the clear purpose of good forestry management in order to protect said forest from disease or infestation and in no was shall be construed as clear cutting.
35. *Woodland*: A tract of land or part thereof dominated by trees but usually also containing woody shrubs, grasses, and other vegetation.

Section 1204: Tree Preservation and Replacement

Section 1204.01 Exemptions

1. Plant and tree nurseries.
2. All orchards of trees in active commercial operation shall be exempt for bona fide agricultural purposes only.
3. Clear cutting activities for clearly agricultural purposes in agriculturally zoned areas. The property will not be eligible for a change in zoning for a period of five (5) years after it has been cleared.
4. Timber harvesting. This exemption shall not be interpreted to include tree harvesting incidental to the development of land or tree harvesting on land that is anticipated to be developed for non - horticultural uses. All legitimate timber harvesting shall be required to provide a 50 foot undisturbed buffer along the entire perimeter of the property except that trees with a diameter of at least 16 inches may be harvested from the buffer. Once tree harvesting takes place, no development of the property shall be permitted for a period of five (5) years following the timber harvesting.

Section 1204.02 Planning Considerations

1. The use of tree save islands and stands is encouraged rather than the protection of individual (non-specimen) trees scattered throughout a site. This will facilitate ease in overall organization as related to tree protection.
2. The protective zone of specimen trees or stands of trees or otherwise designated tree save areas shall include no less than the total area beneath the tree(s) canopy as defined by the furthest canopy drip line of the tree(s).
3. Tree preservation and grading requirements are two design constraints, which are most often in conflict. A grade change of a few inches can be detrimental to a tree, yet most sites require extensive cut and fill in order to manage drainage. The use of berms or retaining walls, instead of cutting, to provide detention can be used to preserve significant trees. Detention ponds can be designed around significant trees by adding depth to minimize width where possible. Detention areas can also be designed as green space and to accommodate new trees. Retaining walls can also be used to mitigate cuts and fills. Tree wells and or aeration systems can also be provided for trees in areas of fill, but are generally ineffective and their use should be very limited and employed only with the approval of the city arborist.
4. Underground water and wastewater lines, storm sewers, irrigation lines and both underground and overhead electric and telephone lines can have a

considerable impact on trees. The layout of the project site utility plans should accommodate the required tree protective zones. Utilities should be placed along corridors between tree protective zones. Developers shall coordinate the location of utility lines, including irrigation and electric lighting, with the utility companies in order to prevent root damage within the critical root zones of protected trees and to minimize damage to trees located in protected zones.

5. Construction activities such as parking, material storage, concrete washout, burnhole placement, etc. shall be arranged so as to prevent disturbances within tree protective zones. No disturbance shall occur within the protective zone of specimen trees or stands of trees without prior approval of the city arborist.
6. Sidewalks often appear innocuous on plans, but can be very detrimental to trees due to grading requirements. Considerations should be given to move sidewalks as far from tree trunks as possible and provide a finished grade above the existing grade for sidewalks required in close proximity to a tree trunk. Drainage can be routed under sidewalks where an elevated grade is required.

Section 1204.03 Tree Protection and Replacement Plan

A tree protection and replacement plan shall be submitted and approved prior to issuance of a land disturbance permit. No clearing, grubbing, grading or other removal of the existing vegetation shall be done prior to plan approval. All tree protection measures shall be installed and inspected prior to the start of any land disturbance and maintained until final landscaping is installed. The plan shall include the following:

1. Names and addresses of the owner of record and the applicant.
2. Boundary lines of the tract by lengths and bearings, streets adjoining the property, total area of the tract, graphic scale and date.
3. Location, name and diameter of all existing specimen trees and their critical root zone.
4. The location, botanical names, diameters (dbh), and critical root zones of all trees proposed to be protected. In heavily wooded areas that will not be disturbed, the site plan may show only the boundaries of each stand of trees and a list of the number, size and species of all trees in the stand 10 inches dbh or larger.
5. Calculations showing compliance with the required site density factor using existing trees and/or replacement trees.
6. The location of all trees to be planted on the site to meet density requirements.
7. The location of proposed buildings, structures and paved areas.
8. The locations of all existing and proposed utility lines. Utility lines must be placed along corridors between critical root zones of trees that will remain on the site.

9. Limits of land disturbance, clearing, grading and trenching.
10. Grade changes or other work adjacent to a tree that would affect it adversely, with drawings or descriptions as to how the grade, drainage and aeration will be maintained around the tree.
11. Methods of tree protection shall be indicated for all tree protection zones, including tree fencing, erosion control, retaining walls, tunneling for utilities, aeration systems, transplanting, staking, signage, etc.
12. The plan should indicate staging areas for parking, materials storage, concrete washout and debris burn where these areas might affect tree protection.

Section 1204.04 Tree Protection Methods

No construction activities are to occur within the tree protection areas.

1. Damage prohibited: Within tree preservation zones, no person shall:
    a. Cut, carve, transplant or otherwise damage a tree.
    b. Attach any rope, wire, nails, or posters to any tree.
    c. Allow any substance (such as concrete, fuel, lubricants, herbicides and paint) to come in contact with a tree.
    d. Set a fire or permit any fire to burn when such fire or the heat of the fire will injure any portion of a tree.
2. Active protective barriers: Barriers shall be installed along the outer edge of and completely around the critical root zones of all specimen trees or stands of trees or otherwise designated tree protective zones, prior to any land disturbance. Barriers will be a minimum four (4) feet high, constructed in a post and rail configuration. A two-inch by four-inch post and a one-inch by four-inch rail, with the posts no further than six (6) feet apart is recommended. Chain link fence may also be used. "Tree Save Area" signs shall be posted on all sides of the fenced in area.
3. Passive protective barriers: Tree save areas and their critical root zones not within 60 feet of any grading, storage, construction or traffic areas may be protected by four-foot orange plastic safety fencing or continuous plastic flagging. Tree protective materials shall consist of heavy mil, plastic flagging, a minimum four inches in width with dark letters reading "Tree Protection Area. Do Not Enter" or equivalent signage on a continuous durable restraint.
4. Boring: No open trenching will be allowed within the save areas. All underground utilities to be installed within this protection zone shall be installed by boring underneath the root zone. Utilities may be tunneled in the root zone using soft dig methods such as an air spade, air knife, or vacuum truck at a twenty-four-inch minimum depth providing that the plans are approved showing the location and method. Soil shall be replaced at approximately 70% compaction in these areas.
5. Grade changes: There shall be no raising or lowering of the ground level within the critical root zone. Stripping of topsoil shall not be permitted. Where necessary, moderate fill may be permitted after installation of an

approved aeration system. Deposition of sediment in tree protection areas shall be prevented by placement of sediment barriers.

6. Clearing activities: When trees adjacent to tree protection areas are removed, it is best to cut them down and grind the stump. If this is not possible, the roots should be cut at the edge of the tree protection area. This helps to prevent damage to the roots extending out from tree protection areas that may be entangled with roots from the removed tree.
7. Soil Compaction: All buildings, materials, vehicles, construction equipment, dirt, debris or other objects likely to cause soil compaction shall be kept outside the critical root zone. Where a limited amount of encroachment is unavoidable and is approved, the critical root zone shall first be mulched with a four-inch layer of processed pine bark, shredded hardwood or wood chips or a six-inch layer of pine straw.

Section 1204.06 Site Density Factor

All non-exempted projects must maintain or exceed a minimum site density factor of 15 units per acre. **The site density requirement must be met whether or not a site had trees prior to development**. The term "unit" is not synonymous with "tree". The site density factor (sdf) equals the existing density factor (edf) plus the replacement density factor (rdf).

The existing density factor is calculated using Table 12-1. Existing trees are measured at dbh. Trees less than 10 inches dbh can be counted only if they have grown in uncrowded conditions and developed a normal spread.

The replacement density factor is then calculated by subtracting the existing density factor from the site density factor. The number of replacement trees required is calculated using Table 12-2. Caliber is measured at 6 inches above ground for trees 4 inches in diameter or less and at 12 inches for trees over 4 inches in diameter.

Table 12-1: Existing Density Factor

dbh	Units	dbh	Units	dbh	Units	dbh	Units
3	.05	15	1.2	27	4.0	39	8.3
4	.1	16	1.4	28	4.3	40	8.7
5	.15	17	1.6	29	4.6	41	9.2
6	.2	18	1.8	30	4.	42	9.6
7	.3	19	2.0	31	95.2	43	10.1
8	.4	20	2.2	32	5.6	44	10.6
9	.5	21	2.4	33	5.9	45	11.0
10	.6	22	2.6	34	6.3	46	11.5
11	.7	23	2.9	35	6.7	47	12.0
12	.8	24	3.1	36	7.1	48	12.6
13	.9	25	3.4	37	7.5	49	13.1
14	1.1	26	3.7	38	7.9	50	13.6

Table 12-2: Replacement Density Factor

Caliper	Units
1	0
2	.5
3	.6
4	.7
5	.9
6	1.0
7	1.2
8	1.3

When trees must be added to achieve the total site density factor (sdf), such additions shall be made between the street and the front of the building until such additions comprise at least half the total site density factor.

Where the proposed development area is so dense that the minimum site density factor cannot reasonably be achieved, the development area shall be reduced by removing parking spaces n excess of the minimum number of spaces required by zoning, placing additional planting islands within the development, or reducing the area to be occupied by buildings.

No tree shall be planted closer to a building foundation or underground water, sewer or electrical or natural gas line than as follows:

a. Mature small tree – 5 feet.
b. Mature medium tree – 10 feet.
c. Mature large tree – 15 feet.

Trees that will grow to a height of more than 15 feet should be planted far enough away from power lines so that there will be a 10 to 15 foot clearance between the crown and the power line when the tree reaches maturity.

Section 1205.06 Specimen Trees

Specimen trees preserved on the site will be given a unit value twice that shown in Table 1. If a specimen tree must be removed, it shall be replaced by a species with potential for comparable size and quality. Replacement trees must be at least 4-inch caliper. Specimen trees removed shall be replaced with trees with a unit density equal to 2 times the unit value of the tree removed. Size and type will determine whether a tree was of specimen quality if the tree is removed without approval and there is not sufficient evidence of its condition.

Section 1205: Landscaping Requirements

Section 1205.01 Landscape Plan

A landscaping plan approved by the city shall be required prior to the issuance of a land disturbance, development, or building permit to demonstrate compliance with the provisions of this Article. The landscape plan shall be based on an accurate boundary survey of the site or reasonable property description and shall include the following:

a. Location and general type of existing vegetation;
b. Existing vegetation to be saved;
c. Methods and details for protecting existing vegetation during construction;
d. Locations and labels for all proposed plants and a plant list or schedule showing the proposed and minimum required quantities;
e. Location and description of other landscape improvements, such as earth berms, walls, fences, screens, sculptures, fountains, street furniture, lights, and courts or paved areas;

Approval of all landscaping and other materials by the city shall be required. The following general guidance is provided. The use of native plants as landscaping materials is encouraged wherever possible. Invasive or potentially invasive plants are not permitted. However, well-mannered non-native plants are acceptable if they are not considered invasive. Existing tree cover and natural vegetation shall be preserved, whenever possible, or replaced with suitable vegetation. Ground cover(s) should be used to supplement landscaping in appropriate areas to reduce the need for extensive grass lawns, which would require regular watering in drought conditions. Grass areas shall be sodded. However, if grass seed must be used, it shall be a variety suitable to the area that produces complete coverage. No artificial plants, trees, or other vegetation shall be installed.

Section 1205.02 Parking Lot Design

Owners are encouraged to incorporate innovative designs such as curved rows, compact car spaces, long planting rows, water retention swales or planting islands and lower lights that will not compete with tree crowns. Strong consideration should be given to landscaping between the building and pavement. In lots with more than 20 spaces, 30% of spaces must be designed with permeable pavement or pavers. Compaction of the soil of planned planting islands shall be prevented during development. If compacting has occurred, the soil must be excavated to a depth of 4 feet and replaced prior to planting. No permanent structures other than lighting and utilities are allowed within landscape strips or islands. Curbs or bumpers are required to prevent overhang of cars into landscaped areas by more than 1 foot.

Section 1205.03 Street Yards

A minimum 10 foot planting strip is required along any street and is measured from the edge of the right of way to the nearest impervious surface. The landscape strip requirement shall not apply to vehicle access areas, pedestrian sidewalks or trails, but shall include any other paved surfaces. This planting strip shall have a continuous canopy cover within 10 years. If a sidewalk is placed within the buffer, the width of the buffer will be increased by the width of the sidewalk.

1. One understory tree per 20 linear feet or one overstory tree per 35 linear feet spaced so that each tree may reach its normal canopy size without interfering with adjacent trees.
2. 10 evergreen shrubs per 35 linear feet. Shrubs should grow to 4 feet in height and be fairly evenly spaced but not necessarily in a straight line. Clustering of shrubs is allowed as long as there is no gap of more than 20 feet.
3. The remainder should be covered with sod, ground cover or mulch.

Section 1205.04 Side Yards

A minimum 5 foot planting strip is required along all property lines not abutting a street right-of-way and is measured from the property line to the nearest impervious surface. The landscape strip requirement shall not apply to vehicle access areas, pedestrian sidewalks or trails, but shall include any other paved surfaces.

1. One overstory tree per 35 linear feet spaced so that each tree may reach its normal canopy size without interfering with adjacent trees.
2. 6 evergreen shrubs per planted tree. Clustering of shrubs is allowed as long as there is no gap of more than 20 feet.
3. The remainder is to be covered with sod, ground cover or mulch.

Existing woodlands or other vegetation may be used to meet the requirements of this section if approved by the city arborist.

Section 1205.05 Interior Landscaping

Interior lot landscaping shall be required for any parking lot with 12 or more spaces. 160 square feet of landscaping is required for each 6 parking spaces. Landscape islands shall be placed at the end of each row of parking spaces. Islands at the end of single rows must be at least 150 square feet and be planted with one overstory tree and at least 6 evergreen shrubs with the remainder covered with ground cover or mulch. Islands at the end of double rows must be at least 300 square feet and be planted with 1 overstory tree and at least 12 evergreen shrubs with the remainder covered with grass, ground cover or mulch.

The remaining required landscaping may be placed in one of the following manners:

1. Islands placed uniformly amongst the parking spaces so that there are no more than 6 spaces between islands. Each island must be at least 160 square feet and contain one overstory tree and 6 evergreen shrubs per 160 square feet with the remainder covered with ground cover or mulch.
2. Long islands may be placed along the middle of a double parking row. These islands must be at least 10 feet wide if cars are allowed to overhang the island or 6 feet wide if cars are prevented from overhanging the island. One overstory tree and 6 evergreen shrubs are to be planted for every 30 – 40 feet in length depending on the type of tree so that each tree may reach its normal canopy size without interfering with adjacent trees. The remainder shall be covered with ground cover or mulch.

Planting islands may be raised and surrounded with curbing or depressed to act as water detainment areas. Depressed areas should be planted with plants and trees tolerant of flooding.

Section 1205.06 Screening and Buffer Specifications

Objectionable views or nuisances, such as service areas, loading docks, refuse containers, air conditioning units, transformers, etc. must be surrounded by screening. All required screening shall consist of shrubs and/or trees but may be supplemented with walls, fences, or earth berms. Screening shall be of such nature and density to screen activities on the lot from view from the normal level of a first story window on an abutting lot and shall provide year-round maximum opacity from the ground to a height of at least six (6) feet. Trees and shrubs shall be installed to not only provide maximum opacity, but to allow for proper plant growth and maintenance.

To achieve maximum opacity within buffers, the following alternatives, or combination thereof, shall be considered by the applicant and applied, subject to the approval of the city arborist:

(a) Six-foot-high evergreen screening shrubs planted four (4) feet on center.
(b) Tall evergreen trees stagger planted with branches touching ground.
(c) Combination of small shrubs planted thirty inches (30") on center, small trees planted thirty (30) feet on center, and large trees planted forty (40) feet on center.
(D) Six-foot (6') high masonry wall as an adjunct to vegetation.

In selecting materials and the size of plantings to be installed, the applicant and the Zoning Administrator shall consider the purpose of the landscape and the required materials shown in Table 12-3:

Table 12-3: Landscaping Purposes and Materials

Purpose	Materials
Very dense sight barrier	Evergreen trees, sight-obscuring fence
Visual separation between uses	Evergreen and deciduous trees, shrubs
Visual separation of uses	Evergreen and deciduous trees, shrubs, berms
Provide visual relief	Ground covers and shrubs lower than 36 inches
Visual relief/shade in parking areas	Trees, ground cover, decorative mulch, pavers

Section 1205.07 Plant Material

All canopy trees shall be at least 8 feet tall planted and have a trunk of not less than 2 caliper inches. No more than 35% of trees planted should be of the same species. At least 50% of trees and shrubs must be native to the area as indicated on the plant list. At least 50% of plant material must be evergreen. Shrubs shall be 3-gallon size. All plant material should comply with the quality specifications in the American Association of Nurserymen publication American Standard of Nursery Stock.

Section 1205.08 Irrigation

An automatically controlled irrigation system is recommended, but not required, for all landscaped areas. If provided, irrigation controllers shall be capable of irrigating grass and tree-shrub zones on different schedules and they shall incorporate the use of a rain sensor shut-off switch as required by City Ordinance No. 12-08-01. No significant overthrow shall be allowed onto non-pervious areas. Drip irrigation is encouraged.

Section 1205.09 Maintenance

It shall be the duty of any person or persons owning or occupying property subject to this article to maintain said property in good condition so as to present a healthy, neat, and orderly appearance. Property shall be kept free from refuse and debris. Planting beds shall be mulched to prevent weed growth and maintain soil moisture. Plant materials shall be pruned as required to maintain good health and character. Turf areas shall be mowed periodically. All roadways, curbs, and sidewalks shall be edged when necessary in order to prevent encroachment from adjacent grassed areas.

Any trees, shrubs or ground cover that die must be replaced within 60 days with a like specimen.

Canopy trees should be pruned in accordance with International Society of Arboriculture publication Pruning Standard (ANSI A300). Topping of trees is not allowed unless approved by the city arborist. The canopy of canopy trees may be

raised no more than 8 feet. Canopy trees are to be allowed to reach their normal shape and canopy size unless that will result in interference with the building or utilities. Shrubs in street and side yards should be maintained at a height of no less than 4 feet. Shrubs in interior landscape islands should be maintained at a height of 2 to 3 feet. All plant material should be planted and maintained so as to not obstruct vision clearance zones as defined by AASHTO.

Section 1205.10 Enforcement

The Administrative Officer will have authority to approve compliance with the landscape and tree plans prior to issuance of an occupancy permit. The owner, occupant, tenant, and respective agent of each, if any, shall be jointly and severally responsible for the maintenance and protection of all landscaping required to be installed pursuant to this Article. Prior to issuance of a certificate of occupancy, the developer or owner may be required to post a performance bond or cash escrow guaranteeing all landscaping materials and work for a period of two (2) years after approval or acceptance thereof. The bond, if required, will be in the amount of 100 percent of the estimated cost of replacing all of the landscaping required by these specifications, unless otherwise specified by the Administrative Officer. The city arborist will inspect the property one year after issuance of an occupancy permit, but will also have the authority to require replacement of dead or diseased plant material at any time after installation. The current owners must plant any plant material that is required to be replaced within 60 days of receipt of notification. An extension may be allowed based on planting conditions. At the end of two years, the city arborist shall make an inspection and notify the owner or developer and the bond company of any corrections to be made. If no maintenance is required, or if said responsible party provides maintenance, the city arborist shall release the bond.

Permission from the city arborist will be required before canopy trees are pruned. Any finding of the arborist may be appealed to the Administrative Office or Governing Body.

Section 1205.11 Violations, Penalties, and Appeals

Any person, firm or corporation violating, neglecting or refusing to comply with any of the provisions of these regulations shall be guilty of a misdemeanor and, upon conviction, shall be fined not less than fifty ($50) dollars nor more than two hundred ($200) dollars for each offense. Each day such violation continues shall constitute a separate offense. Pruning of canopy trees without permission will result in a fine of $500 per tree.

Table 12-4: PLANT LISTS

Allowed Trees and Shrubs *** Native**

OVERSTORY TREES

Botanical Name	Common Name
Acer barbatum	Florida Maple
Acer rubrum *	Red Maple
Acer sacchanum *	Sugar Maple
Betula nigra *	River Birch
Carya species *	Hickory
Celtis laevigata *	Sugar Hackberry
Cercidphyllum japonicum	Katsura Tree
Fagus grandiflora *	American Beech
Fraxinus pennsylvanica *	Red Ash
Ginkgo biloba	Gingko
Liriodendron tulipeifera *	Tulip Poplar
Magnolia grandiflora	Southern Magnolia
Metasequoia glyptostroboides	Dawn Redwood
Nyssa sylvatica *	Black Gum
Ostrya virginiana *	Ironwood
Pinus strobes *	White Pine
Pinus taeda *	Loblolly Pine
Pinus virginiana *	Virginia Pine
Platanus occidentalis *	Sycamore
Quercus alba *	White Oak
Quercus accutissima	Sawtooth Oak
Quercus coccinea *	Scarlet Oak
Quercus falcate *	Southern Red Oak
Quercus laurifolia	Laurel Oak
Quercus nigra *	Water Oak
Quercus palustris	Pin Oak
Quercus rubra *	Northern Red Oak
Quercus shumardii *	Shumard Oak
Quercus stellata *	Post Oak
Quercus phellos *	Willow Oak
Tilia cordata	Littleleaf Linden
Ulmus parvifolia	Lacebark Elm
Zelkova japonica	Japanese Zelkova

UNDERSTORY TREES

Botanical Name	Common Name
Acer buergerianum	Trident Maple
Acer campestre	Hedge Maple
Acer ginnata	Amur Maple
Acer griseum	Paperbark Maple
Acer palmatum	Japanese Maple
Amelanchier arborea *	Serviceberry
Carpinus caroliniana *	American Hornbeam
Cedrus deodara	Deodar Cedar
Cercis Canadensis *	Eastern Red Bud
Chlonanthus verginicus *	Fringe Tree
Comus florida *	Flowering Dogwood
Comus kousa	Kousa Dogwood
Crataegus phaenopyrum *	Washington Hawthorne
Cryptomeria japonica	Cryptomeria
Cupressocyparis leylandii	Leyland Cypress
Halesia Carolina *	Carolina Silverbell
Hamamelis virginiana *	Witch Hazel
Illicium floridanum	Flroida Anise Tree
Ilex aquafolium x 'Nellie R. Stevens'	Nellie R. Stevens Holly
Ilex attenuate x 'fosteri'	Foster's Holly
Ilex attenuate x 'Savannah'	Savannah Holly
Ilex opaca *	American Holly
Ilex vomitoria (treeform) *	Treeform yaupon Holly
Juniperus virginiana *	Red Cedar
Koelreuteria pnaiculata	Golden Rain Tree
Lagerstroemia indica	Crape Myrtle
Magnolia soulangiana	Saucer Magnolia
Magnolia stellata	Star Magnolia
Magnolia virginiana	Sweetbay Magnolia
Malus species *	Flowering Crabapple
Myrica cerifera (tree form)	Tree Form Wax Myrtle
Ostrya virginiana *	Eastern Hophornbeam
Oxydendrum arboretum *	Sourwood
Pistacia chinensis	Chinese Pistache
Prunus caroliniana	Cherry Laurel
Prunus species	Flowering Cherry
Prus calleryana x Chanticleer	Chanticleer Pear
Sassafras albidum *	Sassafras
Sophora japonica	Japanese Pagodatree
Taxodium distichum	Bald Cypress
Vitex agnus-castus	Chaste Tree

LARGE SHRUBS

Botanical Name	**Common Name**
Abelia grandiflora	Glossy Abelia
Aesculus pavia *	Red Buckeye
Aesculus parviflora *	Bottlebrush Buckeye
Aucuba japonica	Aucuba
Buxus sempervirens	Common Boxwood
Camellia japonica	Camellia
Camellia sasanqua	Sasanqua Camellia
Cleyera japonica	Japanese cleyera
Forsythia suspensa	Border Forsythia
Hibiscus syriacus	Shrubalthea
Hydrangea quercifolia	Oakleaf Hydrangea
Ilex aquafolium x 'Nellie r. Stevens'	Nellie R. Stevens Holly
Ilex attenuate x 'fosteri'	Foster's Holly
Ilex attenuate x 'Savannah'	Savannah Holly
Ilex latifolia	Lusterleaf Holly
Ilex cornuta 'Burfordii"	Buford Holly
Ilex opaca *	American Holly
Ilex verticillata	Deciduous Holly
Ilex vomitoria *	Yaupon Holly
Kerria japonica	Kerria
Loropetalum chinense	Loropetualum
Miscanthus varieties	Miscanthus
Myrica cerifera	Wax Myrtle
Osmanthus fragrans	Fragrant Tea Olive
Pieris japonica	Japanese Pieris
Prunus caroliniana *	Cherry Laurel
Rhodendron indica	Indica Azaleas
Rhododendron species *	Rhododendron
Viburnum opuluus	Snowball Viburnum
Viburnum sieboldi	Siebold Viburnum
Vibernum plicaturn x tomentosum	Doublefile Viburnum

SMALL/MEDUIM SHRUBS

Azalea obtusum	Kurume Azalea
Azalea hybrids	Glenn Dale Azalea
Berberis thunbergi	Japanese Barberry
Buxus microphylla	Dwarf Boxwood
Callicarpa Americana *	Beautyberry
Calycanthus floridus	Sweet Shrub
Chaenomeles speciosa	Common Flowering Quince
Clethra alnifolia *	Summersweet Clethra
Cotoneaster horizontalis	Rock Cotoneaster
Duetzia gracilis	Slender Deutzia
Euonymus alatus compactus	Dwarf Winged Euomymus
Forsythia x intermedia	Forsythia
Fothergilla gardenia *	Dwarf Fothergilla
Gardenia jasminoides	Gardenia
Hydrangea arborescens	Snowhill Hydrangea
Hydrangea macrophylia	Bigleaf Hydrangea
Hydrangea paniculata	Panicle Hydrangea
Hydrangea quercifolia	Oakleaf Hydrangea
Ilex cornuta 'Burfordii nana'	Dwarf Burford Holly
Ilex cornuta 'Carissa'	Carissa Holly
Ilex vomitoria 'Nana'	Dwarf yaupon Holly
Itea virginica *	Virginia Sweetspire
Jasminum floridanum	Flowering Jasmine
Jasminum nudiflorum	Winter Jasmine
Juniper species	Spreading Junipers
Juniper species	Upright Junipers
Leucothoe populifolia	Florida Leucothoe
Kalmia latifolia *	Mountain Laurel
Mahonia aquifolium	Origon Grape Holly
Mahonia bealei	Leatherleaf Mahonia
Nandina domestica	Nandina
Prunus laurocerasus 'Otto Lukyen'	Otto Lukyen Laurel
Prunus laurocerasus 'Schipkaensis'	Skip Laurel
Prunus laurocerasus 'Zabeliana'	Zabel laurel
Rhaphiolipsis indica	Indian Hawthorn
Rosa species	Shrub Roses/Old Roses
Spirea species * some sp.	Spirea
Weiglea florida	Old Fashioned Weiglea

GROUND COVERS

Hemerocallis species	Day Lilies
Hosta species	Hosta
Ibris sempervirens	Evergreen Candytuft
Iris species	Iris
Juniperus horizontalis	Creeping Junipers
Lantana sellowiana	Trailing Lantana
Liriope muscari	Bigblue Liriope
Liriope spicata	Creeping Liriope
Narcissus species	Daffodils
Ophiopogon jaonicus	Mondo Grass
Pachysandra terminalis	Pachysandra
Phlox subulata	Thrift
Vinca minor	Common Periwinkle
Vinca major	Large Periwinkle
Clematis species	Clematis
Euonymus fortunei	Wintercreeper
Gelsemium sempervirens *	Carolina Yellow Jessamine
Lonicera sempervirens	Trumpet Honeysuckle
Parthenocissus quinquefolia *	Virginia Creeper
Rosa banksiae	Lady Banks Rose
Rosa hybrida	Climbing Roses

FERNS

Adiantum Capilus-Veneris *	Maidenhair Fern
Asplenium Filix-foemina *	Southern Lady Fern
Asplenium platyneuron *	Ebony Spleenwort
Osmunda cinnamomea *	Cinnamon Fern
Osmunda regalis *	Royal Fern
Polystichum acrostichoides *	Christmas Fern

Prohibited Trees and Shrubs

Scientific Name	Common Name
Ailanthhus altissima	Tree of Heaven
Albizia julibrissin Durazz	Mimosa
Alternanthera philoxeroides	Alligatorweed
Eichhornia crassipes	Common water hyacinth
Elaeagnus umbellate	Autumn olive
Hedera helix	English Ivy
Hydrilla verticillata	Hydrilla
Lespedeza bicolor	Shrubby lespedeza
Lespedeza cuneata	Sericea lespedeza
Ligustrum sinense	Chinese privet
Lonicera japonica	Japanese honeysuckle
Lygodium japonicum	Japanese climbing fern
Melia azedarach	Chinaberry tree
Microstegium vimineum	Nepalese browntop
Murdannia keisak	Marsh dewflower
Paulownia tomentaosa	Princesstree
Pueraria Montana	Kudzu
Rosa multiflora	Multiflora rose
Triadica sevifera	Chinese tallow
Wisteria sinensis	Chinese wisteria
Achyranthes japonica	Japanese chaff flower
Alliaria petiolata	Garlic mustard
Arthraxon hispidus	Small carpgrass
Celastrus orbiculatus	Oriental bittersweet
Imperata cylindrical	Cogon grass
Paederia foetida	Skunk vine
Polygonum cuspidatum	Japanese knotweed
Alvinia molesta	
Ardisia crenata	Coral ardisia
Cinnamonum camphora	Camphortree
Dioscorea oppositifolia	Chinese yam
Egeria densa	Brazilian waterweed
Elaeagnus pungens	Thorny olive
Leucanthemum vulgare	Oxeye daisy
Ligustrum japonicum	Japanese privet
Lonicera maackii	Amur honeysuckle
Myriophyllum aquaticum	Parrot feather watermilfoil
Nasturtium officinale	Watercress
Paspalum notatum	Bahia grass
Phyllostachys aurea	Golden bamboo
Sesbania hervacea	Bigpod sesbnia
Sesbania punicea	Rattlebox
Tamarix gallica	French tamarisk

Scientific Name	Common Name
Alternanthera sessilis	Sessile joyweed
Ampelopsis brevipedunculata	Amur peppervine
Anthoxanthum odoratum	Sweet vernal grass
Arundo donax	Giant reed
Broussonetia papyrifera	Paper mulberry
Carduus nutans	Musk thistle
Centaurea cyanus	Garden cornflower
Clematis terniflora	Sweet autumn virginsbower
Colocasia esculenta	Coco yam
Coronilla varia	Purple crownvetch
Daucus carota	Queen Anne's lace
Dioscorea alata	Water yam
Dioscorea bulbifera	Air yam
Eragrostis curvula	Weeping love grass
Euonymus fortunei	Winter creeper
Hibiscus syriacus	Rose of Sharon
Lantana camara	Lantana
Lespedeza thunbergii	Thunberg's lespedeza
Limnophila sessiliflora	Asian marshweed
Lolium arundinaceum	Tall fescue
Lonicera fragrantissima	Sweet breath of Spring
Marsilea minuta	Dwarf waterclover
Melilotus alba	White sweetclover
Melinis repens	Rose Natal grass
Menthe x piperita	Peppermint
Morus alba	White mulberry
Mosla dianthera	Miniature beefsteak plant
Myriophyllum spicuatum	Eurasian Watermilfoil
Panicum repens	Torpedo grass
Paspalum urvillei	Vasey's grass
Phragmites australis	Common reed
Poa annua	Annual bluegrass
Polygonum persicaria	Spotted ladysthumb
Poncirus trifoliate	Trifoliate orange
Potamogeton crispus	Curly pondweed
Pyrus calleryana	Callery pear (Bradford pear)
Rottboellia cochinchinensis	Itchgrass
Rubus discolor	Himalayan blackberry
Sesbania vesicaria	Bagpod
Solanum viarum	Tropical soda apple
Sorghum halepense	Johnson grass
Stachys floridana	Florida hedgenettle
Vernicia fordii	Tungoil tree

End Article XII

EXHIBIT A

INDEMNIFICATION AGREEMENT
REQUIRED FOR GRADING PERMIT

EXHIBIT A

INDEMNIFICATION AGREEMENT
REQUIRED FOR GRADING PERMIT

INDEMNIFICATION AGREEMENT

THIS AGREEMENT, made this ___ day of _____, _____, between_____ _____ (Developer), hereinafter referred to as "Indemnitor", and the City of Cornelia, a political subdivision of the State of Georgia, hereinafter referred to as "City of Cornelia".

For good and valuable consideration, receipt of which is acknowledged, it is hereby agreed:

Section 1. Liability, Loss or Damage. Indemnitor hereby agrees to indemnify the City of Cornelia and hold the City of Cornelia harmless from any and all damage which the City of Cornelia may suffer and from any and all liability, claims, demands, attorney's fees and costs of defense, or judgment against it, arising from the increase of flow and diversion of flow of water resulting from the development of the _____Subdivision being more particularly described as indicated on the attached plat or metes and bounds legal description.

Section 2. Duration. Indemnity under this agreement shall commence on the date of execution hereof and shall continue in full force for a period of two (2) years after the development has been completed and the final plat dated.

Section 3. Requirement of Notice to Indemnitor. City of Cornelia agrees to notify Indemnitor in writing of any claim of the City of Cornelia for loss or damage or of any claim made against the City of Cornelia on the obligation indemnified against.

IN WITNESS WHEREOF, the parties have executed this agreement at Cornelia, Georgia, the day and year first above written.

By:_____
Developer

By:_____
City of Cornelia

END OF EXHIBIT A

EXHIBIT B

EXAMPLE OF EASEMENT DEED
SANITARY SEWER

EXHIBIT B

EXAMPLE OF EASEMENT DEED
SANITARY SEWER

_____("Grantor") of _____(address), for consideration paid grants to the **CITY OF CORNELIA**, a Georgia municipal corporation ("Grantee"), for One and No/100 ($1.00) Dollars and other good and valuable considerations, the receipt of which is acknowledged, the perpetual right and easement to enter upon and to lay, construct, reconstruct, operate, and to reenter as necessity may require, to repair, replace, or maintain a sanitary sewer line and appurtenances in, on, or through a portion of the Grantor's property, described as follows:

(Insert description):

The Grantor, her successors, and assigns, agrees that she will not, without the consent of the Grantee, alter, erect, or maintain any building or other improvement, including landscaping, upon the above-described easement area that may unreasonably interfere with or endanger the above-granted rights and easement or the operation and maintenance thereof. Grantee shall make all repairs to property of Grantor damaged by Grantee, or persons acting under contract with Grantee, in constructing, operating and maintaining the sanitary sewer line or otherwise exercising the rights held hereunder. Following any repairs thereto or other work thereon, as the case may be, Grantee agrees to restore the lands of Grantor subject to this Easement as nearly as practicable to their condition immediately prior to such construction, repair or other work done on the line.

This easement is granted only for the purposes herein stated and for such period of time as Grantee shall use the Easement for purposes provided, and, should Grantee at any time hereafter abandon the sewer line or discontinue its use, then, and in such event, this Easement shall terminate.

IN WITNESS WHEREOF, the Grantor has here unto set his/her hand and affixed his/her seal this _____ day of _____, 20_____.

Signed, sealed and delivered
in the presence of:

_____ _____(SEAL)
Witness Grantor

_____
Notary Public

END OF EXHIBIT B

EXHIBIT C

APPLICATION AND PERMIT

FOR

UTILITY FACILITY ENCROACHMENT

CITY OF CORNELIA
Where nature's your neighbor

181 Larkin Street, Cornelia, GA 30531
(706) 778-8585 Fax: (706) 778-2234
CORNELIAGEORGIA.ORG

Application and Permit for Utility Facility Encroachment

PLEASE BE ADVISED, THIS FORM IS SUBJECT TO OPEN RECORDS

Application is hereby made to the City of Cornelia by (Utility Owner):_____

_____

24 Hour Emergency Phone Number:_____

Mailing Address: _____

For permission to construct, operate and maintain the following described Utility Facility within the public right of way of City Road (Name & Number):_____

_____

Description (including starting location & ending location):_____

_____

_____

_____

_____

Length installed in R/W:_____
Number of Bores Under Roadway:_____
Plans Attached: Yes or No
Area Disturbed _____ AC (Note: The City Is the Local Issuing Authority & Erosion Control Plans must be submitted for disturbance greater than 1 acre.)

The Utility facilities covered hereby shall be installed in accordance with the plans attached hereto and made a part hereof. Applicant agrees to comply with and be bound by **City of Cornelia's Development Standards Ordinance** on file in the office of Planning and Development or GDOT Utility Accommodation Policy and Standards, for utilities not covered in the standards, made a part hereof by reference, and all general provisions and special provisions shown on the reverse hereto, during the installation, operation, and maintenance of said Utility.

Permit requested this_____ day of _____ 20___

Typed Name: _____ Title: _____

Signature: _____ Date: _____

Permission is granted for the above described Utility Facility Encroachment in accordance with the plans and provisions thereof. This permit is to be strictly constructed and no work other than that specifically described above is hereby authorized.

Permit is granted this _____ day of _____ 20___

Typed Name: _____ Title: _____

Signature: _____ Date: _____

CITY OF CORNELIA
Where nature's your neighbor

181 Larkin Street, Cornelia, GA 30531
(706) 778-8585 Fax: (706) 778-2234
CORNELIAGEORGIA.ORG

Application and Permit for Utility Facility Encroachment

GENERAL PROVISIONS

1. It is expressly stipulated that this permit is a license for permissive use only and the placing of facilities upon public property pursuant to this permit shall not operate to create or vest any property rights in the holder of the permit.
2. Prior to the initiation of any work under this permit, the applicant shall determine the location of any and all other installations for utilities upon, over or across the right-of-way and shall install, operate and maintain the facilities in such a manner as not to damage or interfere with the operation of its existing facilities.
3. Whenever necessary for the construction, repair, improvement, maintenance, safe and effective operation, alteration or relocation of all or any portion of the roadway or other city facilities as determined by the City of Cornelia, and at the sole expense of the permittee unless reimbursement is authorized by separate agreement. Should the permittee fail to remove or relocate facilities, upon-due notice from the city, permittee shall be liable for any extraordinary cost or damages incurred by the City of Cornelia as a result thereof.
4. Applicant agrees to indemnify and hold harmless the City of Cornelia and all officers, employees or agents of the City of Cornelia or any political subdivision thereof, against any and all claims, damages, demands, actions, causes of action, cost and expenses of whatsoever nature, which may result from any injury to, or the death of any persons, or from the loss of or damage to, property of any kind or nature, when such injury, death, loss or damage arises out of the construction operation, maintenance, repair, removal or relocation of the facilities covered by this permit.
5. The City of Cornelia, its engineers, officers or employees shall not be held responsible or liable for injury or damage that may occur to facilities covered by this permit, or to any connection or connections thereto, by reason of city maintenance and construction activities or city contractor or permittee operations. The City of Cornelia 's contractor shall not be held liable for any damage that may occur to utility facilities if the permittee has been notified of a construction conflict and given reasonable time to mark or relocate its facilities but has failed to do so, the Facility owner shall be responsible for interfacing with Utilities Protection Center (UPC) to determine notification.
6. If the City of Cornelia undertakes to improve this roadway or other city owned facilities it shall be the responsibility of the permittee to plan with the City of Cornelia and its contractor a schedule which will clearly set forth at which state of operations the permittee will be required to perform any adjustment to its facilities necessary to accommodate the city improvements.
7. During the initial installation or construction of facilities authorized by this permit, or during any future repair, removal or relocation thereof or any miscellaneous operations, the permittee shall at all times maintain flagman, signs, lights, flares, barricades, and other safety devices in accordance with the latest edition of the Manual on Uniform Traffic Control Devices, and as may be necessary to properly protect traffic upon the roadway and to warn and safeguard the public against injury or damage.
8. It is expressly provided that with respect to any limited access highway, the permittee shall not have or gain direct access, either ingress or egress, from the main traveled way of said highway or its on or off ramps to any facilities authorized by the permit except upon specific approval by the City of Cornelia.
9. It is the applicant's responsibility to verify the limits of public right-of-way and perform land surveying if necessary for location of the utility facilities authorized hereby.

10. No inherent or retained right or privilege of any abutting property owner is affected by this permit nor is the City of Cornelia responsible for any claim which may develop between the permittee and any Property owner concerning the use of the right-of-way. Permittee is responsible for maintaining reasonable access to private driveways during installation of its facilities and for restoration of driveways to the owner's satisfaction. The permittee will be required to replace any disturbed area with "in kind" materials throughout entire permit area unless a satisfactory replacement is approved by the city and abutting property owners.
11. Approval of this permit does not constitute approval of design (or construction details) for the proposed facilities. Applicant is responsible for compliance with all applicable governmental codes and regulations.
12. Use of explosives within the city right-of-way is prohibited unless approved by a separate permit.
13. Applicant shall be responsible for obtaining approvals for the proposed installation which may be required by any local government of agency on roads or streets under their jurisdiction.
14. Permittee shall give the City of Cornelia a minimum of 24 hours notices prior to beginning any work under this permit.
15. This permit shall be void unless work hereunder is begun within one (1) year of the date of its approval.
16. The provisions of this permit are regulatory and not contractual, no interest or right of an applicant granted by this permit may be transferred to another except by written consent of the City of Cornelia.
17. This permit may be revoked at the discretion of the City of Cornelia upon thirty (30) days written notice to the permittee.
18. Roads resurfaced in the past five (5) years will not be allowed to be cut.
19. Any utility cut made within the roadbed of any city road shall be replaced as required by the GDOT standard drawing 1401. In addition, said cut shall be plated until such time as the concrete has cured to design compressive stress and promptly asphalted.
20. Permittee shall be responsible for obtaining any other state and Federal permits necessary for work performed under this permit.
21. The permittee's attention is drawn to the requirements of the Georgia Sedimentation and Erosion Control Act. If strict adherence to those requirements are not met, the city has the authority to revoke this permit.