Subdivision Regulations

City of Brentwood, Tennessee

As formally adopted and applied by the Brentwood Planning Commission.

December 7, 2009 (Effective: January 1, 2010)

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APPENDIX A
TO THE BRENTWOOD ZONING ORDINANCE
SUBDIVISION REGULATIONS

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Subdivision Regulations
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Subdivision Process Summary

These Subdivision Regulations are written to cover a wide range of activities related to subdivision and/or development of land within the City of Brentwood. Subdivision/development activities can range from a simple subdivision of one lot into two lots, to the development of a large tract into hundreds of lots with new streets, utilities and other related improvements. Because of this variability, it is not practical to write a step-by-step set of regulations that address every circumstance. Therefore, it is highly recommended that the Planning & Codes Department be consulted early in the process to review the requirements and identify potential opportunities or obstacles related to the proposal.

Zoning Ordinance - In addition to the Subdivision Regulations, the Zoning Ordinance serves as a companion guide to important aspects of land development. Generally, the specific zoning applicable to a tract or lot will dictate the allowable uses, setbacks and buffer requirements, and will address requirements in special overlay protection zones such as those affecting floodplain and hillside properties. The Zoning Ordinance and Subdivision Regulations are intended to work in concert to guide and regulate development in a way that reflects of the goals of the community. The proper zoning for the intended use must be in place before beginning the subdivision or development process.

Planning Commission – Though an applicant begins the subdivision process with a member of City staff, nearly all actions related to subdivision or development require formal approval by the Planning Commission. The Planning Commission is appointed by the Board of Commissioners (City Commission), and is the governmental body vested with the authority to hear and approve actions taken under these Regulations. City staff accepts applications, provides guidance, monitors construction, prepares reports, and performs many other functions that aid the Planning Commission and property owners throughout the process.

Process Overview – Subdivision/development actions governed by these Regulations generally fall into one of three categories:

1. A **minor modification** to an existing lot (commercial or residential) is proposed such as a change in the setback or shift in property line between two lots;
2. A **minor subdivision** is proposed where a larger tract is subdivided into two or more lots, and no new infrastructure is required, other than utility tap and service lines; or
3. A **major subdivision** is proposed where a larger tract is subdivided into two or more lots, and new infrastructure (streets, utilities, major drainage systems, etc.) is required.

The process for gaining approval for each of the three examples above is different. However, all three require preparation of a "final plat" or "revised final plat," and submission to the Planning Commission for review and approval. When new infrastructure such as streets, drainage systems and/or utilities is required the process involves three steps:

1. Approval of a Preliminary Plan by the Planning Commission (a master plan of the development);
2. Approval of detailed construction drawings by staff from the Engineering Department; and
3. Approval of a Final Plat for the entire project or section by the Planning Commission.

The details of each of these steps are outlined in these Regulations along with the technical and design requirements for new infrastructure and plat preparation.

The examples offered above are typical of most subdivision actions, but as stated earlier, the steps as well as the timeframe vary depending on the individual proposal. In most cases, a qualified engineer, landscape architect or surveyor licensed by the State of Tennessee must be involved in preparing the necessary documents for a subdivision application. City staff is available to assist and to answer any questions. Additional information along with key documents is available on the City's website (*www.brentwood-tn.org*).

Thank you for your interest in the City of Brentwood.

ARTICLE ONE. GENERAL PROVISIONS

1.1 Title.

These Regulations shall officially be known, cited and referred to as the Subdivision Regulations of the City of Brentwood, Tennessee.

1.2 Policy and Purpose.

The purpose of these Subdivision Regulations is to provide for the harmonious development of the City of Brentwood and its environs; to secure a coordinated layout with adequate provision for traffic, light and air, recreation, transportation, water, drainage, sewers, and other sanitary facilities and services; and to promote a distribution of population and traffic which will tend to create conditions favorable to health, safety, convenience and prosperity. Accordingly, these Subdivision Regulations set forth the procedures and minimum standards adhered to by developers of land for residential and commercial uses, and provide a guide for the Planning Commission and other City officials in exercising their duties pertaining to the review, approval and administration of land subdivision development within the jurisdiction of the City of Brentwood.

The Subdivision Regulations are further intended to:

(1) Promote the orderly development of the City in accordance with the goals and objectives of the adopted comprehensive plan and approved updates.

(2) Establish efficient standards for the subdivision of land that further the orderly layout and use of land, and that ensure proper legal description and monumentation of subdivided property.

(3) Protect and conserve the value of land throughout the City and the value of buildings and improvements upon the land, and minimize the conflicts among the uses of land and buildings.

(4) Provide suitably located streets of sufficient design to accommodate existing and anticipated traffic, affording adequate access for emergency response vehicles and equipment to buildings.

(5) Encourage street design that moderates traffic speeds and reduces primary reliance on arterial streets.

(6) Protect the residential character of the City, and minimize the environmental and visual impacts of new development.

(7) Continue to enhance and expand the network of accessible open space throughout the City, preserving unique and sensitive community resources such as groundwater, floodplains, streams, historic sites, steep slopes, woodlands and wildlife habitat.

(8) Prevent the pollution, erosion and sedimentation of waterways and drainage facilities through efficient development management practice.

(9) Promote interconnected greenways and corridors throughout the City, particularly in floodplain areas.

(10) Provide a planning horizon to ensure that public facilities and services are available concurrent with new development and will have a sufficient capacity to serve the proposed development.

(11) Ensure that new development will be required to bear its fair share of the costs of supporting the community through legally appropriate developer fees, land donations, and mitigation measures that address the public costs for new facilities and services.

1.3 Authority

By authority granted by Tennessee Code Annotated, Title 13, Chapter 4, these Subdivision Regulations are adopted. The Planning Commission has fulfilled the requirements set forth in these statutes as prerequisite to the adoption of these Regulations, having filed a certified copy of the official Major Thoroughfare Plan of the City of Brentwood in the office of the Register of Williamson County, Tennessee.

1.4 Jurisdiction

These Subdivision Regulations shall govern all subdivision of land lying within the corporate limits of the City of Brentwood, Tennessee as now or hereafter established.

ARTICLE TWO. PROCEDURE FOR SUBDIVISION APPROVAL

2.1 Preliminary Meeting Required.

Prior to the preparation of submissions for subdivision approval, the owner or agent shall meet with staff from the Planning and Codes Department to determine the scope of the proposed action, and possible issues related to the development of the property. More complex projects may be referred to the Development Review Committee (DRC) for detailed review. The initial review shall determine whether the application is a minor or major subdivision action, and shall direct the applicant on the proper procedure for official review of the proposal.

The DRC is not intended to replace the formal review process, but meant to be the first preliminary review of a project, bringing all affected review agencies, developers and applicants together. The purpose of the DRC is to increase cost efficiency, decrease processing times, improve internal project coordination during the review of development proposals and provide a more general and ongoing review of the planning process.

The DRC shall be composed of members from the various City Departments (Engineering, Fire, Planning, Public Works, Water and Sewer) charged with reviewing development proposals for complex developments. Additionally, representatives from outside agencies including utility providers (Metropolitan Nashville, Nolensville/College Grove Utility District, Mallory Valley Utility District, Harpeth Valley Utilities, Middle Tennessee Electric Members Cooperative, etc.) and other affected State agencies may be included as representatives. The City Manager shall serve as an ex-officio member of the DRC.

2.2 Application for Formal Consideration.

These Regulations outline the minimum standards for the various documents associated with any application for subdivision approval within the City of Brentwood. The necessary documents shall be accompanied by an official application form submitted prior to deadlines established annually by the Planning Commission. Most subdivision actions are subject to the approval of the Planning Commission, which considers cases according to the officially adopted meeting schedule for the calendar year. The necessary forms and a calendar of meeting dates can be found on the City's web site – *www.brentwood-tn.org*. All subdivision applications shall identify the developer and all persons having any financial interest in the proposed subdivision. If the developer or any person having any financial interest in the proposed subdivision has failed to complete required improvements or comply with conditions established by the Planning Commission for a previously approved subdivision, the City may withhold the processing of the application for the new subdivision until such deficiencies are corrected to the satisfaction of City staff.

2.3 Procedural Steps for Subdivision Actions.

Minor subdivision actions usually involve the minor modification of an existing lot (commercial or residential) such as a change in setback, a shift in a property line, or a minor division of property into two or more lots where no new infrastructure is required other than extensions of water and sewer service lines. Major subdivision actions relate to the division of land (commercial or residential) into multiple lots where new infrastructure is required.

The processes outlined as follows are intended to provide an overview of the necessary steps for the most common subdivision actions. Given the complexity of some subdivision proposals, there may be other actions, approval requirements and fees that are not detailed here. These include, but are not limited to, off-site improvements, sales offices, impact fees, utility approvals and fees, entrance features, and amenity

areas. Because each subdivision is unique, the implications and requirements for each case will be discussed in meetings with City staff, the DRC or the Planning Commission.

(1) **Minor Subdivision/Plat Revision:**

a. Complete required preliminary meeting with City staff.

b. Prepare paper copy of the draft final plat.

c. Submit a completed application, required fees and five copies of the draft final plat to the Planning and Codes Department for review.

d. Review and address comments provided by the Planning and Codes Department.

e. If Planning Commission review and approval are required the Commission may defer consideration of the item if a representative acting on behalf of the property owner is not in attendance at the meeting.

f. Make any necessary revisions to the plat, prepare mylar copy, and circulate to required agencies for signatures.

g. Deliver signed mylar copy to the Planning and Codes Department for final approval signatures.

h. Retrieve signed mylar copy and deliver to the County Register's office for recordation.

i. Provide staff from the Planning and Codes Department a mylar copy of the recorded plat showing the "Recorders Information" seal on the face of the plat. The mylar copy must be received before building permits will be issued for the project.

j. Provide planning staff with a digital copy of the proposed subdivision section and the entire project. The file shall be in AutoCAD .DWG or .DXF or other compatible file format as specified by staff, and submitted on a CD-ROM or DVD, or other format specified by staff from the Planning Department. All data shall be based upon the Tennessee State Plane coordinate system, Zone 5301, FIPS Zone 4100, NAD 83 datum. Digital copies of the plat must be received by staff before it may be recorded.

(2) **Major Subdivision:**

a. Attend the required preliminary meeting with City staff.

b. Submit the concept development plan or preliminary plan, where applicable to the Planning and Codes Department for initial review and comment by the Planning Commission (optional). Refer to Article Three of these Regulations.

c. Submit a completed application, required fees and five copies of the preliminary plan to the Planning and Codes Department for review.

d. Review and address comments provided by the Planning and Codes Department.

k. If Planning Commission review is required, a representative acting on behalf of the property owner must attend the meeting to conduct a presentation and answer questions regarding the proposal.

e. Make any necessary revisions to the preliminary plan and submit updated plan to the Planning and Codes Department. The revised submittal shall include a traffic impact study, based upon the requirements of Section 78-21 of the Brentwood Zoning Ordinance.

f. Prepare a full set of construction drawings as specified in these Regulations, and submit three copies to the Engineering Department and all applicable utility providers. Refer to Article Four of these Regulations.

g. Receive and address staff comments, resubmit revised construction plans (multiple submissions may be necessary).

h. Schedule Pre-Construction Conference with the Engineering Department.

i. Install erosion and siltation control, and tree protection measures and request inspection by staff from the Engineering Department.

j. Pay the applicable fee and receive the approved grading permit.

k. Begin construction, following approved construction drawings.

l. Prepare final plat for submission to the Planning Commission, following specifications outlined in these Regulations. A final plat may not be submitted until all streets have been constructed to the sub-grade elevation, and minimum required improvements have been inspected for compliance. The final plat will not be signed by City staff for recordation until it meets all the requirements of these Regulations. Refer to Article Five of these Regulations.

m. Obtain all required certifications, post the required security, and record the final plat with the County Register's office.

l. Provide staff from the Planning and Codes Department a mylar copy of the recorded plat showing the "Recorders Information" seal on the face of the plat. The mylar copy must be received before building permits will be issued for the project.

m. Provide planning staff with a digital copy of the proposed subdivision section and the entire project. The file shall be in AutoCAD .DWG or .DXF or other compatible file format as specified by staff, and submitted on a CD-ROM or DVD, or other format specified by staff from the Planning Department. All data shall be based upon the Tennessee State Plane coordinate system, Zone 5301, FIPS Zone 4100, NAD 83 datum. Digital copies of the plat must be received by staff before it may be recorded.

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ARTICLE THREE. PRELIMINARY PLAN.

3.1 Concept Development Plan.

Prior to formal submission of a detailed preliminary plan, the applicant may submit a concept development plan to the Planning Commission for initial review and comment. The purpose for review of a concept development plan is to provide guidance regarding the design of the proposed project before the applicant makes a significant financial investment in detailed professional design work. Submittal of the plan shall be for informational purposes only and shall be non-binding, except in the case where the subject property is zoned OSRD. In no event shall positive guidance from the Planning Commission be construed as official endorsement or approval of the plan.

A concept development plan is not as detailed as a preliminary plan, but it must provide enough information to determine if a proposed project meets the technical requirements of all applicable ordinances for a given tract. City staff will determine the information required based upon the location of the proposed project.

3.2 Filing and Review of Preliminary Plan.

Any person proposing to subdivide land shall submit five (5) prints of the preliminary plan to the Planning and Codes Department. Electronic copy of the submission shall also be provided in the format specified by the Planning and Codes Department. Should the subject property be zoned Open Space Residential Development (OSRD) the submitted preliminary plan shall be based upon the OSRD or OSRD-IP Development plan as approved by the Board of Commissioners.

Review of the proposed preliminary plan shall be scheduled for the first available meeting agenda of the Planning Commission in accordance with the adopted schedule of meetings and submittal deadlines. In accordance with T.C.A. section 13-4-304, submittal deadlines will be established so that a plan filed as required by this section shall be placed on the Planning Commission's agenda within thirty (30) days of the filing or the next regularly scheduled Planning Commission meeting after the thirty-day period. The applicant may waive this time frame requirement for the appearance of the plat on the agenda. City staff shall verify that any preliminary plan meets the minimum standards of these Regulations prior to its submission for formal Planning Commission consideration. For purposes of this section and T.C.A. section 13-4-304, a preliminary plan shall not be considered to have been "filed" unless it meets the minimum standards of these Regulations.

Review of the proposed preliminary plan shall be scheduled for the first available meeting agenda of the Planning Commission in accordance with the adopted schedule of meetings and submittal deadlines, provided that City staff shall verify that any preliminary plan meets the minimum standards of these Regulations prior to its submission for formal Planning Commission consideration.

3.3 Preliminary Plan, Scale and Size.

Preliminary plans shall be drawn to a scale of one (1) inch equals one hundred (100) feet (1"=100'), on sheets at least twenty-four (24) inches by thirty-six (36) inches (24" x 36"). The use of an appropriate smaller scale for an overall plan sheet is permitted for projects larger than one acre. When more than one sheet is required, an index sheet of the same size shall also be filed showing the entire subdivision with the sheets lettered in alphabetical order as a key.

3.4 Dedication of Additional Right-of-Way for Existing Streets.

The developer of a proposed subdivision may be required to dedicate additional right-of-way for that portion of the street frontage necessary to comply with the minimum requirements of the Major Thoroughfare Plan. If a shift of the right-of-way is required to improve the alignment, a greater portion of the right-of-way shall be dedicated. The exact width and configuration of the dedication shall be determined by staff from the Engineering Director or his designee.

3.5 Preliminary Plan Contents.

Refer to Article Six of these Regulations for detailed construction design standards. The preliminary plan shall show:

(1) The proposed name of the subdivision, as approved by the City, the address(es) of the owner or owners; and the name of the designer of the plan, who shall be a qualified engineer, landscape architect or surveyor licensed by the State of Tennessee.

(2) The proposed names of all internal streets. Two (2) prints of the proposed preliminary plan showing the street names shall be submitted for review and approval by the Williamson County Department of Emergency Communications before submission of the preliminary plan for Planning Commission review (also see Article 3.6 of these Regulations regarding street names).

(3) A location map of the subdivision shall be shown on the preliminary plan indicating the area within a 1,000-foot radius of the proposed subdivision boundaries. The location map shall show the relation of the subdivision to well-known streets, railroads and watercourses in all directions. The suggested scale of the location map is one inch equals 1,000 feet (1"=1,000').

(4) Date, graphic scale and approximate north arrow, with north to be at top of the sheet.

(5) The location of existing and platted property lines, existing streets, buildings, watercourses, railroads, cemeteries, sewer lines, bridges, culverts, drain pipes, water mains, fire hydrants, street lights, tree masses, public utility easements.

(6) The location of all significant historic and archeological features and structures located on the affected property or within 500 feet of the boundary of the affected property. Any proposed development plan for the affected tract shall also be guided by the principles and standards contained within the publication, "Saving the Farmstead" (a publication of the Heritage Foundation of Franklin and Williamson County dated December 1996.) Refer to Section 78-15 of the zoning ordinance.

(7) The present zoning classification and zoning overlay district (if any) for the land to be subdivided and on the adjoining land, and the names of the adjoining property owners or subdivisions.

(8) The bearing and distance of one of the corners of the boundary of the subdivision to the nearest intersection of existing streets and to a corner of the original survey of which it is a part.

(9) Plans of proposed utility layouts (sewer lines and manholes, water lines and fire hydrants).

(10) The locations and dimensions of proposed streets, right-of-way dedications, alleys, easements, parks and other open spaces, waterway natural areas, reservations, lot lines, building setback lines, utilities, and all required public utility and drainage easements.

(11) As determined by staff from the Engineering Department, an applicant may be required to provide a traffic impact study to determine the potential impact of any proposed development on the existing traffic network and/or the effects of traffic system improvements and alterations proposed by the applicant on the existing network. All traffic impact studies shall comply with applicable policies and standards established by the City. Refer to Sections 78-21 and 78-484 of the zoning ordinance.

(12) Topographic contours at vertical intervals of not more than two (2) feet and identification of all natural steep grades, differentiated between those grades from fifteen percent to twenty-five percent (15%-25%) and those grades in excess of twenty-five percent (25%+).

(13) The acreage of the land to be subdivided.

(14) A lot size table and the appropriate open space calculations.

(15) The proposed location and layout of any planned amenities/and or entrance features for the project (clubhouse, pool tennis courts, walking trails, etc). In subdivisions where amenity improvements including entrance features have been proposed by the developer/subdivider or approved as a part of an Open Space Residential Development (OSRD) project, they shall be shown schematically as part of the preliminary plans using a separate plan sheet. The plan shall include itemized cost estimates for the improvements provided. The amenity/entrance feature improvements and related site plans shall be considered by the Planning Commission in conjunction with approval and recording of the final plat for the first section of the subdivision. In addition, the developer/subdivider shall also provide adequate security, in a form acceptable to the City, to cover the cost of the amenity improvements before the first section of the subdivision is recorded. All amenity/entrance feature improvements shall be initiated and completed before building construction is completed on fifty percent (50%) of the total building lots in the subdivision.

(16) The proposed location and layout of any planned amenities for the project (clubhouse, pool, tennis courts, walking trails, etc.)

(17) Plans setting out the grades or profiles of the streets, the proposed type and character of all improvements, and proposed development phasing.

(18) Subsurface conditions on the tract if required by City staff. The report shall be produced by a qualified geotechnical engineer licensed to practice in the State of Tennessee.

(19) If any portion of the land proposed for subdivision lies within a floodable area (i.e. floodplain or floodway) as determined by an official Flood Study Map or special flood study as required by the Director of Engineering or his designee, that portion shall be so indicated with its elevation annotated on the preliminary plan. If not within a floodable area, the following note certifying such must be added to the preliminary plan: "The property described on this plan does not lie within an area of Special Flood Hazard as delineated on the current Flood Insurance Rate Map, prepared by the Federal Emergency Management Agency (FEMA), Community Panel Number: _____ , revised: _____ ."

(20) Provide a copy of the Certificate of Availability from the appropriate utility companies (electric, gas, water, sewer etc.) acknowledging that service will be provided to the proposed project.

(21) The approximate size and location of all proposed detention ponds and water quality features.

(22) The proposed construction phase boundaries and lot numbering scheme.

(23) Any sinkholes on the subject property as identified by a qualified geo-technical Engineer shall be located and appropriately labeled on the preliminary plan. The plan shall be configured to locate all sinkholes in permanent open space only and not within any buildable lots. Sinkholes in the permanent open space shall be protected from natural and/or man-made debris.

(24) The preliminary plan for a proposed subdivision shall identify all areas affected by the Hillside Protection Overlay as detailed within Division 14 of the Zoning Ordinance.

(25) Special designations, encumbrances and/or restrictions for all lots, including but not limited to the Lowest Floor Elevation (LFE), grinder pump requirement (GP), Hillside Protection Overlay(HP), transitional lot designation (*), and floodway/floodway fringe areas.

3.6 Street Names.

The naming of the streets within a proposed subdivision shall be the responsibility of the developer. All proposed street names must be approved by the Williamson County Department of Emergency Communications before submission of the preliminary plan to the Planning Commission. Following staff review and recommendation, the Planning Commission shall have final authority to approve or disapprove the names of all streets appearing on the final plat. General requirements for the naming of streets include:

(1) Proposed streets, which are in alignment with others already existing and named, or which are intended eventually connect, shall bear the names of those existing streets.

(2) Street names shall not duplicate, be spelled the same as, or too closely approximate, phonetically or otherwise, the name of any other streets within the City of Brentwood or Williamson County, except as set forth in the above subsection.

(3) In no instance shall the use of a different street type (street, lane, drive, way, court, etc.) constitute a unique name. Example: East Street and East Drive are not unique names, and therefore shall not be used on the same plan.

(4) Proposed street names shall contain no more than 24 characters, excluding spaces and the proposed street types.

(5) No punctuation or other special characters shall be used in street names.

(6) Street names shall not contain more than three words, not including directional and street type.

(7) Street names and types shall be carried, without change, across intersections.

(8) Directional suffixes shall not be used on circular streets.

All proposed street names shall be submitted for staff approval and shown on the preliminary plan. Upon final approval of the preliminary plan, staff from the Brentwood Fire Department shall assign all street addresses prior to the recordation of the final plat. On corner lots in residential districts, the assigned address shall be the street where the front of the residence is located, or if the house is angled on the lot, the location of the main driveway.

3.7 Corrected copies of the Preliminary Plan

Upon Planning Commission approval of a preliminary plan, two (2) complete copies of the revised plan that addresses all conditions of approval and shows any other necessary revisions shall be provided to the staff of the Planning and Codes Department within 60 days of the Planning Commission action.

3.8 Approval or Disapproval of a Preliminary Plan.

Within sixty (60) days after initial consideration of the preliminary plan, the Planning Commission will indicate approval, disapproval or approval subject to some modification; otherwise the preliminary plan shall be deemed approved and a certificate to that effect shall be issued by the Planning Commission, on demand. If a preliminary plan is disapproved, reasons for such disapproval shall be stated in writing. The applicant for a preliminary plan approval may waive the time requirement set in this section and consent to an extension or extensions of the applicable time period. Furthermore, the time requirement set in this section may be adjusted for holidays or unexpected interceding events that close City offices as provided for in T.C.A. Section 13-4-304. Any revised preliminary plans approved by the Planning Commission shall supercede any previously approved plans.

3.9 Approval Not to Constitute Approval of the Final Plat.

The approval of the preliminary plan by the Planning Commission shall not constitute acceptance of the final plat. A final plat based upon the approved preliminary plan shall be submitted for review and approval separately.

3.10 Duration of Approval.

Planning Commission approval of a preliminary plan shall remain valid for a period of **two** years, from the date of the approval, provided a final plat based thereon is approved by the Planning Commission and recorded within twenty-four (24) months from the date of the preliminary plan approval. When a final plat based upon the preliminary plan is recorded, the term of the preliminary plan shall be extended by an additional twelve 12 months. The additional time period shall be calculated from the date of the final plat recording.

Should a plat not be recorded within the original 24 month approval period, an extension of the approval of the preliminary plan may be applied for by the owner and granted by the Planning Commission for up to twelve (12) additional months, after, which the plan must be submitted for approval again and shall be subject to the current rules and regulations as though no previous plan had been submitted.

3.11 New Plan – When Permitted or Required.

If a plan is approved, or approved subject to modifications, and the subdivider desires to make substantial modifications as determined by the Planning and Codes Director, other than those already required by the Planning Commission, a new preliminary plan must be submitted for consideration. If a plan is disapproved, resubmission shall conform with the requirements of Section 78-41 of the Brentwood Zoning Ordinance. The preliminary plan may only be resubmitted after one year has passed since the denial; or

when the reasons for the denial have been resolved by adopted changes to the Code; or when the Planning Commission directs the Planning and Codes Director to accept a new application.

ARTICLE FOUR. CONSTRUCTION DRAWINGS/RECORD DRAWINGS.

4.1 Construction Drawings -- Generally.

The design and preparation of construction drawings for new infrastructure within residential or commercial subdivisions shall be completed following approval of the preliminary plan. Construction drawings must be prepared by a licensed engineer (see Appendix Two for detailed requirements and typical checklist for construction drawings). All new infrastructure proposed in subdivisions shall comply with the technical requirements of this section unless an exception is granted by the Planning Commission. The City's Engineering Department coordinates review and approval of construction drawings. Please note that a final plat for a subdivision cannot be submitted until the construction drawings are approved, and construction has progressed to a point where all streets are at the design sub-grade elevation. Refer to Article Five of these Regulations for detailed requirements for submitting a final plat.

4.2 Submission of Construction Drawings and Construction of Infrastructure.

Because every site is unique, the developer shall meet with staff from the Engineering Department prior to beginning detailed design. Issues such as the location of detention areas, requirements for any off-site improvements, construction traffic routing, construction sequence, protection of non-disturbance or buffer areas, and other special concerns will be discussed and addressed in advance.

The following outline identifies the primary steps in the construction drawing approval process, and the initiation of construction:

(1) Schedule a preliminary meeting prior to drafting the construction drawings with the Engineering Department.

(2) Prepare draft set of construction drawings and deliver three (3) copies to staff of the Engineering Department, following the requirements of these Regulations.

(3) Address comments relative to the construction drawings as provided by staff from the Engineering Department (multiple submissions may be necessary).

(4) Concurrent with the engineering review, coordinate review of the utilities design with the appropriate utility providers.

(5) Submit five (5) copies of the final approved set of construction drawings, including complete utility plans to staff of the Engineering Department.

(6) Prior to the start of construction, the developer or his agent shall contact staff from the Engineering Department staff to schedule a pre-construction meeting. Representatives of the developer, contractor and certified erosion control inspector must be present. At this meeting, the developer shall submit all required Federal, State, and local permits to begin construction for streets and utilities. Non-compliance with this notification requirement may be sufficient cause for rejection of any work performed.

(7) Install erosion/siltation control per the approved erosion/siltation control plan; install the construction entrance, tree protection (if applicable) and stream buffer or non-disturb area protection.

(8) Request inspection of the erosion control measures from staff of the Engineering Department.

(9) Pay grading permit fee and receive grading permit.

(10) Commence active construction in accordance with the approved construction drawings (note that approval by the Engineering Department does not constitute approval of the utility design). Refer to Article Seven of these Regulations, regarding Construction Standards.

(11) Engineering inspectors will routinely be on-site throughout construction; refer to Article 7.8 for detailed information on construction monitoring and inspections.

4.3 Construction Etiquette.

The contractor shall properly plan and coordinate all construction activities. Building operations, construction hours and routes shall be planned to minimize disturbance to the adjacent residences and businesses. Refer to Section 42-137(8) of the Municipal Code regarding construction hours.

4.4 Revisions of Construction Drawings after Commencing Construction.

Unexpected conditions and changes in subdivision layout and infrastructure are common. When changes to the approved drawings are necessary or desired, the developer shall consult with staff from the Engineering Department prior to making any such changes. Failure to do so can result in additional cost, disapproval or extended review times. Any changes to approved construction plans may require review and approval by the Planning Commission and/or the Board of Commissioners.

4.5 Record Drawings.

The developer is responsible for the submittal of the record drawings of the subdivision infrastructure improvements, including:

(1) Storm drainage.

(2) Water and fire hydrants

(3) Sanitary sewer lines and manholes.

(4) Streets.

(5) Above ground electrical facilities.

(6) Street lighting.

(7) Floodway and Floodway Fringe areas.

The record drawings shall be submitted to the Engineering, Water and Sewer, and Public Works Departments upon completion of work and prior to the release of letters of credit securing individual sections of the project associated with the recordation of the final plat. The drawings shall be provided in AutoCAD.DWG or .DXF or other compatible file format as specified by staff, and submitted on a CD-ROM or DVD, or other format specified by staff from the Planning Department. All data shall be based upon the Tennessee State Plane coordinate system, Zone 5301, FIPS Zone 4100, NAD 83 datum.

ARTICLE FIVE. FINAL PLAT.

5.1 Final Plat. General.

The final plat shall conform substantially to the approved preliminary plan. Developers of phased subdivision projects with projected future lots in excess of ten (10) lots are required to submit, sections of the project which contain a minimum of ten (10) lots or a greater number for approval at a time. If in the opinion of the Planning Commission, the public good warrants a larger section to accommodate proper layout of streets, utilities, drainage, and other public improvements a section containing more than ten lots will be considered. Further, water mains, storm sewers, stormwater detention facilities, surface drainage features, trunk sewers, and any sewage treatment plants shall be designed and built to serve the entire area owned by the subdivider or designed and built in a manner that they can easily be expanded or extended to serve the entire area. Sections must be identified numerically following the name of the subdivision as initially submitted or as approved on the preliminary plan. The final plat shall be prepared by a land surveyor registered by the State of Tennessee.

5.2 Submission Deadline and Provided Copies.

The subdivider shall submit five (5) paper copies of the proposed final plat following the submission deadline schedule published by the Planning and Codes Department. Electronic copy of the submission shall also be provided in a format as specified by staff from the Planning and Codes Department. The final plat shall be accompanied by an application form, which shall identify the developer and all persons having any financial interest in the proposed subdivision, and the required review fees. The Planning and Codes Director shall verify that any final plat meets the minimum standards of these Regulations prior to its submission for formal Planning Commission consideration. The necessary forms and a calendar of meeting dates can be found on the City's web site – *www.brentwood-tn.org*.

5.3 Time Limit for Approval or Disapproval -- Duration of Approval.

Within sixty (60) days after initial consideration of the final plat, the Planning Commission will indicate approval, disapproval or approval subject to some modification; otherwise the final plat shall be deemed approved and a certificate to that effect shall be issued by the Planning Commission, on demand. If a final plat is disapproved, reasons for such disapproval shall be stated in writing. The applicant for a final plat approval may waive the time requirement set in this section and consent to an extension or extensions of the applicable time period. Furthermore, the time requirement set in this section may be adjusted for holidays or unexpected interceding events that close City offices as provided for in T.C.A. Section 13-4-304. Planning Commission approval of any final plat shall be effective for one year during which time the subdivider shall complete any measures required for final certification of the completion of improvements according to these Regulations. An expired final plat may be resubmitted by the subdividor for Planning Commission review and approval, but shall be subject to revision to conform to the ordinances and regulations in place at the time of resubmittal.

5.4 Approval Not to Constitute Acceptance of Streets.

Approval of the final plat by the Planning Commission shall not be deemed to constitute or imply the acceptance by the Board of Commissioners of any public rights-of-way as shown on the final plat.

5.5 Improvements Required Before Recordation of the Final Pat

The following improvements shall be completed within each subdivision or section thereof before the approved final plat may be signed for recording.

(1) Grade and improve all lots, streets and alleys.

(2) Installation of the street base per the requirements of these Regulations.

(3) Installation of all curbs and gutters, per the requirements of Section 7.4(3) of these Regulations.

(4) Installation of the binder course, per the requirements of these Regulations.

(5) Installation of all required drainage/stormwater infrastructure, as shown on the approved construction plans.

(6) Installation of all sewer and water infrastructure, per City of Brentwood construction specifications.

(7) Installation of all required monuments .

(8) Any special conditions as required as part of the approval granted by the Planning Commission.

(9) Installation of temporary or permanent street name and other traffic regulatory signage.

(10) Installation of bikeways, pedestrian accessways, walking paths, or other improvements approved by the City of Brentwood as part of a preliminary plan that are adjacent to or behind lots included in the section or phase proposed for platting. This requirement does not apply to sidewalks in the right-of-way (or adjacent to the right-of-way) that the future home builder will be required to construct before issuance of a certificate of occupancy.

(11) Detailed plans for any proposed amenity and/or entrance feature improvements and related site plans shall be approved by the Planning Commission concurrent with approval and recording of the final plat for the first section of the subdivision.

Satisfactory completion of the above improvements must be verified and approved by staff from the Engineering Department.

5.6 Final Plat Specifications.

The approved final plat shall be drawn at a scale of one (1) inch equals one hundred (100) feet (1" = 100') on paper sheets eighteen (18) inches by twenty-four (24) inches (18" x 24"). The use of an appropriate alternate scale is permitted for projects larger than one acre. When more than one sheet is required, an index sheet of the same size shall also be filed showing the entire subdivision, with the sheets numbered in numerical order as a key, and referencing the appropriate project information. Alternate scales may be submitted for review in advance of submission for approval by Planning and Codes Department staff.

The final plat shall show:

(1) The date, title, name and location of the subject subdivision, graphic scale, and true north point.

(2) The lines of all streets and rights-of-way; the size and location of any water mains, hydrants, sewer mains, manholes and other improvements; storm drains, catch basins, and other stormwater detention facilities; reservations for sidewalks, easements, and any areas to be dedicated to public use; alley lines, lot lines, building setback lines, and a building setback table; lots numbered in numerical order with individual address blocks; and any sites for other than residential use with notes stating their purpose and any limitations.

(3) Sufficient data to determine readily and identify on-site the location, bearing, and length of every street line, lot line, boundary line, block line, and building line whether curved or straight. This shall include the radius, central angle, chord length, and tangent distance for the centerline of curved streets and curved property lines.

(4) All dimensions to nearest one hundredth (100^{th}) of a foot and angles to the nearest degree, minute, and second.

(5) The location and description of survey markers, benchmarks, and elevations.

(6) The names, locations, and zoning classifications of adjoining subdivisions and streets, and the location and ownership of adjoining unsubdivided property.

(7) Vicinity map showing site in relation to an area within a 1000-foot radius of the proposed subdivision boundaries.

(8) If any portion of the land being subdivided lies within a floodable area (i.e., floodplain or floodway) as determined by an official Flood Study Map, or special flood study as required by the Director of Engineering or his designee, that portion shall be so indicated with its elevation annotated on the plan. If not within a floodable area, the follow note certifying such must be added to the final plat: "The property described on this final plat does not lie within an area of Special Flood Hazard as delineated on the current Flood Insurance Rate Map, prepared by the Federal Emergency Management Agency (FEMA), Community Panel Number _____ , revised: _____ ."

(9) The LFE (Lowest Floor Elevation) for any lots shown to be within a flood hazard area as determined by a special flood study as required by the Director of Engineering or his designee.

(10) Approved street names as approved by the Williamson County Department of Emergency Communications (also see Section 6.8 regarding street names).

(11) Special designations, encumbrances and/or restrictions for all lots, including but not limited to the Lowest Floor Elevation LFE, grinder pump requirement (GP), hillside protection (HP), transitional lot designation (*), and floodway/floodway fringe areas.

(12) A reference to the Performance Agreement and its location within the public records where it is recorded shall be included on the face of the plat.

5.7 Accompanying Certificates.

The following certificates shall be included as part of the final plat:

(1) **Certificate of Ownership and Dedication** -- showing that applicant is the landowner and dedicates streets, rights-of-way, and any sites for public use (Appendix Three, Form 1).

(2) **Certificate of Approval of Street Names** -- certifying that the Williamson County Office of Emergency Communications has approved the proposed street names (Appendix Three, Form 2).

(3) **Certificate of Approval of Subdivision Name** – certifying approval of subdivision names by the City of Brentwood (Appendix Three, Form 3).

(4) **Certificate of Accuracy** – signed by a surveyor licensed to practice in the State of Tennessee, and certifying the accuracy of the survey and final plat and placement of monuments (Appendix Three, Form 4).

(5) **Certificate of Approval of Water and Sewer Systems** – signed by an authorized official verifying that the utilities, private or otherwise, have been installed in accordance with system requirements (Appendix Three, Form 5).

(6) **Certificate of Provision of Electrical Service** – certifying that the franchised electric provider has agreed to provide electrical service to the project (Appendix Three, Form 6).

(7) **Certificate of Approval of Streets** – signed by the appropriate official, certifying that the subdivider has complied with one of the following alternatives:

a. Installation of all improvements in accordance with the requirements of these Regulations (Appendix Three, Form 7), or

b. Posting of security acceptable by the City in sufficient form and amount to assure such completion of all required improvements.

(8) **Certificate of Approval for Recording** -- signed by the Secretary of the Planning Commission or the Planning and Codes Director (Appendix Three, Form 8).

5.8 Security.

Security in a form and amount acceptable to City staff to insure the completion of the remaining improvements shall be provided with the recording of the final plat in accordance with Article Eight of these Regulations. The required security shall be submitted to Planning & Codes Department staff when the approved final plat is submitted for signatures. The security shall be in the amount determined by City staff to assure completion of streets and other infrastructure work as shown on the approved construction plans.

5.9 Disposition of Original Copy.

The approved final plat shall be produced by the subdivider on four (4) mil reproducible mylar film for assembly of the required certification signatures, and filing with the Williamson County Register of Deeds as the official final plat of record. The property owner or developer shall be responsible for recording the approved final plat with the Williamson County Register of Deeds, upon receipt of all required signatures.

One recorded copy of the final plat mylar shall be delivered to Planning Department staff before any permits will be issued for the project.

5.10 Acceptance of Streets and Associated Infrastructure.

Dedication of public rights-of-way, land, and improvements to the City of Brentwood shall be accomplished via recordation of a final plat, unless City staff determines that a separate legal instrument is appropriate. Acceptance of completed street improvements shall be accomplished by resolution of the Board of Commissioners, after review and recommendation by staff from the Engineering Department.

Initial acceptance of completed street improvements by the Board of Commissioners shall occur after the final topping is applied on the internal streets within a given project. A maintenance period shall begin with this acceptance. The final acceptance of all improvements by the City shall not occur until the maintenance period concludes and follow-up inspections have been performed by City staff or an authorized representative to insure that the improvements comply with the approved construction documents. Upon passage of the follow-up inspection(s) the City will officially release all securities being held for the improvements. Upon completion of the required maintenance period, and correction of any identified deficiencies, all improvements other than streets shall be considered officially accepted for maintenance by the City. Refer to Article Seven of these Regulations for infrastructure requirements that must be completed before final acceptance of the streets within a subdivision or section thereof.

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ARTICLE SIX. DESIGN STANDARDS.

6.1 Streets – Generally.

The layout of streets in a subdivision shall conform to existing regulations and policies, and shall be based on a thorough consideration of:

(1) Topography and drainage.

(2) All new streets shall be constructed a minimum of one foot above the base flood or 100-year floodplain elevation.

(3) Public convenience and safety.

(4) Existing street pattern and future development of adjacent tracts.

(5) Proposed uses of land being subdivided.

6.2 Street Design

The following design requirements shall apply to all publicly and privately maintained streets.

(1) **Crowns.** All pavement surfaces shall drain adequately. If the pavement surface is not super elevated, the crown shall be a minimum two percent (2%) cross slope measured from the roadway centerline to the edge of pavement.

(2) **Grades.**

a. Grades on arterial streets shall not exceed seven (7) percent.
b. Grades on collector streets may exceed seven (7) percent, but not more than nine (9) percent for up to four hundred (400) feet in length measured in the location where the maximum grade is exceeded.
c. Grades on local streets may exceed seven (7) percent, but not more than twelve (12) percent for up to four hundred (400) feet in length and thirteen (13) percent for up to two hundred (200) feet in length.
d. For proper drainage, the minimum grade on any street shall be one (1) percent.
e. On local streets, the Planning Commission may grant a variance in grades (up to a maximum of 15% for 200 feet) consistent with the intent of this section for environmental considerations including but not limited to tree protection and minimization of site disturbance provided that in the opinion of staff from the Engineering Department, such grade does not pose a safety problem for the public.

(3) **Horizontal and Vertical Curves.** Horizontal and vertical curves shall comply with the design standards set for in the American Association of State Highway Transportation Officials' Policy for the Geometric Design of Highway Systems, latest edition. Arterial streets and highways except through residential subdivisions should meet a calculated 40 mile per hour (mph) minimum design speed. Designated arterial streets in residential subdivisions, collector and commercial/service institutional streets should meet a calculated 35 mile per hour (mph) minimum design speed. Minor residential, marginal access and dead end streets shall meet a calculated 30 mile per hour (mph) design speed.

Generally a horizontal curve in a street sixty (60) feet in width shall have a centerline radius of curvature of not less than three hundred (300) feet: on other streets, not less that one hundred (100) feet.

Vertical curves shall be designated with the following K-values, for a 30 mph design speed, crest vertical curve K-value of 30; sag vertical curve, K-value of 40. The City may allow lower K-values when justified for environmental considerations including but not limited to tree protection and minimization of site disturbance provided that in the opinion of the City Engineer, such grade does not pose a safety problem for the public; however, the City will not allow K-values less than 24 for crest curves and 31 for sag vertical curves.

(4) **Intersections.** All streets shall intersect at a ninety (90) degree angle. The minimum length of the intersecting streets at a 90 degree angle shall be 100 feet for local streets and 300 feet for arterial, collector, and commercial/service institutional streets. Property line radii at street intersections shall not be less than twenty five (25) feet.

The subdivision developer shall clear a sufficient area at each intersection to ensure adequate vehicle sight distance of not less than two hundred (200) feet on local streets and two hundred seventy-five (275) feet on all collector and arterial streets.

(5) **Tangents**. A tangent of at least one hundred (100) feet in length shall be introduced between reverse curves on arterial and collector streets.

(6) **Street Jogs**. Street jogs with centerline offsets of less than one hundred twenty-five (125) feet shall not be allowed.

(7) **Traffic Calming.** Traffic calming should be an important consideration when designing residential streets. The design should seek to inherently calm traffic by incorporating curves, intersections and avoiding long straight sections of roadway. When inherent design is not adequate the designer may choose to or be required to incorporate other traffic calming features such as roundabouts (refer to Section 6.5 of these Regulations), speed humps (meeting the City of Brentwood's policy), speed tables or central islands. When no specific guidance is presented herein for a planned traffic calming measure the City will rely on other widely accepted industry standards. The specifications for all traffic calming measures shall comply with applicable standards as established by the City. Refer to the currently adopted policies regarding the installation of speed humps as adopted via Resolutions 95-35 and 97-14 or later subsequent adoptions.

In commercial areas the street layout should consider accessibility by larger vehicles such as tractor-trailers and other vehicles requiring longer turning radii.

(8) **Blocks.**

a. **Length**. Blocks shall not be less than six hundred (600) feet nor more than twelve hundred (1,200) feet in length, except as the Planning Commission considers necessary due to the topography of the land or desired features of street pattern. On streets with long block length, the Planning Commission may require pedestrian cross walks or bikeways to link adjoining or parallel roads with dedicated easements or right-of-way dedication at locations deemed necessary to ensure safe and efficient movement of people within the subdivision.

b. **Width.** Blocks shall be wide enough to allow two (2) rows of lots, except where reverse frontage on major thoroughfares is provided or where prevented by topographical conditions or size of the property; in which case the Planning Commission may approve a single row of lots of minimum depth.

6.3 Street Right-of-Way Widths.

The vehicle access control regulations of the Zoning Ordinance and the Major Thoroughfare Plan identify all collector and arterial streets within the City of Brentwood. All streets formally accepted for perpetual maintenance by the City and not designated as a arterial or collector street shall be considered local streets.

(1) **Minimum pavement thickness designs:**

TABLE ONE
PAVEMENT SECTION DESIGNS

Street Designation	Material Aggregate Base (Inches)	Bituminous Plant Mix Base (Inches)	Asphaltic Concrete Wearing Surface (Inches)
Arterial Streets & Highways	8.0	5.0	2.0
Collector Streets	8.0	3.0	2.0
Local Residential Streets	8.0	3.0	2.0
Commercial or Service Institution Streets	8.0	5.0	2.0

The minimum width of the right-of-way as measured from lot line to lot line shall be no less than as follows:

(2) **Arterial Streets** – The minimum width of the right-of-way is 90 feet. Additional right-of-way may be required for turn lanes, deceleration lanes, medians, sidewalks, and bikeways. Public utility and drainage easements are required outside the right-of-way limits for the extension of utilities and drainage infrastructure.

(3) **Collector Streets** – The minimum width of right-of-way is 60 feet. Public utility and drainage easements are required outside the right-of-way limits for the extension of utilities and drainage infrastructure.

(4) **Local Streets** – The minimum width of the right-of-way is 50 feet. Public utility and drainage easements are required outside the right-of-way limits for the extension of utilities and drainage infrastructure.

(5) **Dead-End Streets (Cul-de-Sac)-Residential** – The minimum radius of the right-of-way is 50 feet, and the radius of the edge of pavement is 35 feet, or 37 feet to face of curb. The maximum length of a dead-end street shall be 1,000 feet, as measured from the end of the cul-de-sac to the radius return of the curb line of the last intersecting street. Public utility and drainage easements are required outside the right-of-way limits for the extension of utilities and drainage infrastructure. If a landscaped island is proposed within a cul-de-sac

the overall diameter of the cul-de-sac and the central island must meet the requirements for roundabouts (refer to Article 6.5 of these Regulations).

(6) **Dead-End Streets (Cul-de-Sac)-Commercial/Service Institution** – The minimum radius of the right-of-way is 60 feet, and the radius of the edge of pavement is 40 feet. Public utility and drainage easements are required outside of right-of-way limits for the extension of utilities and drainage infrastructure. If a landscaped island is proposed within a cul-de-sac the overall diameter of the cul-de-sac and the central island must meet the requirements for roundabouts (refer to Article 6.5 of these Regulations).

(7) **Commercial/Service Institution Streets** – The minimum width of the right-of-way is 60 feet. Public utilities and drainage easements are required outside the right-of-way limits for the extension of utilities and drainage infrastructure.

(8) **Open Space Residential Development – Innovative Project** – Refer to Article 6.11 of these Regulations for specific standards regarding streets within this zoning district.

(9) **Historic Rural Development Standards** -- Please refer to Article 6.12 of these Regulations for specific standards regarding streets within these designated areas.

6.4 Street Pavement Sections.

Minimum pavement widths shall be as follows. All stated widths do not include the width of the required curb and gutter.

(1) **Arterial Streets** – Widths will vary based upon the standards set forth in the Major Thoroughfare Plan.

(2) **Collector Streets**

a. **Residential** – 30 feet wide, provided that the width of a residential collector street connection to an arterial street at the tie-in point shall be 36 feet for a minimum length of 75 feet, plus an additional 75-foot transition pavement width back to the standard pavement section of 30 feet. The radius of the curb returns shall be a minimum of 30 feet to provide adequate turning movements. When a residential collector street connects to an existing street that incorporates a bike route or the new street is deemed to provide a desirable bike route connection the developer may be required to stripe the new collector with a centerline, edge lines establishing 11' driving lanes and 4' bike lanes on each side.

b. **Commercial** – 36 feet wide.

c. **Service Institution** – 36 feet wide.

(3) **Local Streets** – 22 feet wide.

(4) **Dead-End Streets**, **Residential** (Cul-de-Sac) – 35-foot radius.

(5) **Dead-End Streets, Commercial** (Cul-de-Sac) – 40-foot radius.

(6) **OSRD-IP Sections** – Refer to Article 6.12 of these Regulations.

(7) **Historic Rural Development Sections** -- Refer to Article 6.13 of these Regulations.

6.5 Curbs and Gutters.

Within all developments, the developer shall provide six-inch concrete curb with a 24-inch concrete gutter, and under drains shall be required (refer Appendix Two, Drawings 6 and 7). A four-inch perforated plastic drainpipe shall be installed under any curb and gutter located in cut sections to ensure proper drainage. The drain shall be backfilled with stone and encased with fiber cloth. The drainage pipe shall connect to the storm drain at each box/catch basin. All internal islands shall have a mountable curb (refer to Appendix Two, Drawing 29).

6.6 Roundabouts.

(1) General. Roundabouts meeting specific design criteria are allowed in residential and commercial subdivisions in the City of Brentwood. Roundabouts are intended to provide a safe means to control traffic at intersections and serve as a traffic calming measure. The design requirements for roundabouts vary, depending on the street classification and whether it is desirable to have landscaping or other features within the central island. Design standards for each type of roundabout relate to key characteristics and dimensions as pictured in Appendix Two, Drawing 26. There are three types of roundabouts allowed with the City of Brentwood, as follows:

a. **Compact.** Roundabouts along local streets are compact roundabouts. The entire raised central island is mountable at low speeds.

b. **Urban.** Roundabouts along collector streets or at intersections of collector and local streets are urban roundabouts. The apron portion of the central island is mountable by larger vehicles at low speeds. Landscaping or other features may be placed in the central island.

c. **Arterial/Commercial**. Roundabouts along or at the intersection of arterial streets or within a commercial subdivision are arterial/commercial roundabouts.

The following subsections provide detailed specifications and geometric requirements for each roundabout type.

(2) **Compact Roundabouts.** No features, signage, lighting or obstructions of any kind shall be placed within the central island/apron of a compact roundabout. The entire central island/apron shall be fully mountable at low speeds by larger vehicles and shall be six inches high at the highest point and sloped two percent to six percent for proper drainage. The central island shall be stamped concrete or other approved textured finish in a color contrasting with the street. The design vehicle for compact roundabouts is a large semitrailer (WB-55, as outlined in the American Association of State Highway and Transportation Officials (AASHTO) publication, A Policy On Geometric Design of Highways and Streets). The size, configuration and layout of radii, splitter islands, and any other aspect of the roundabout that are not specified in this document shall be designed in accordance with accepted industry standards such as the Federal Highway Administration Publication No. FHWA-RD-00-06, Roundabouts: An Informational Guide.

TABLE TWO
COMPACT ROUNDABOUT STANDARDS

Central Island Diameter (ft)	Apron Diameter (ft)	Circulatory Street Width** (ft)	Inscribed Circle Diameter* (ft)
30	N/A	19	72
32	N/A	19	74
34	N/A	19	76

* Measured inside of curb to inside of curb, includes 24" wide gutter pans

** Pavement width

(3) **Urban Roundabouts.** The design vehicle for urban roundabouts is a large semitrailer (WB-55, as outlined in the AASHTO publication, A Policy On Geometric Design of Highways and Streets. The size, configuration and layout of radii, splitter islands, and any other aspect of the roundabout that are not specified in the document shall be designed in accordance with accepted industry standards such as the Federal Highway Administration Publication No. FHWA-RD-00-06, Roundabouts: An Informational Guide.

TABLE THREE
URBAN ROUNDABOUT STANDARDS

Central Island Diameter (ft) Includes Apron	Apron Width (ft)	Circulatory Street Width** (ft)	Inscribed Circle Diameter* (ft)
52	21	18	92
55	16	18	94
58	14.5	18	98
61	13	18	101
65	11.5	18	105
69	10	18	109
74	9	18	114
78	8	18	118

* Measured inside of curb to inside of curb, includes 24" wide gutter pans

** Pavement width

(4) **Arterial/Commercial Roundabouts.** Generally, roundabouts along or at intersections of arterial streets or in commercial subdivisions must be designed in accordance with accepted industry standards such as the Federal Highway Administration Publication No. FHWA-RD-00-067, Roundabouts: An Informational Guide. However, the design and acceptability of roundabouts of this type are subject to evaluation on a case by case basis. The design vehicle for roundabouts in this category shall be an interstate highway semitrailer (WB-20, as outlined in the AASHTO, A Policy on Geometric Design of Highways and Streets), or the largest vehicle expected to use the street whichever is larger. Evaluation and final determination is subject to the approval of the Engineering Director or his designee.

(5) **Standard Requirements for Roundabouts** – The following requirements apply to all roundabouts within the City of Brentwood.

a. Signage for all roundabouts shall comply with the Manual on Uniform Traffic Control Devices (MUTCD).

b. Street lighting shall be placed at all approaches to roundabouts and in the central island of urban and arterial/commercial roundabouts. The lighting plan must be approved by the Engineering Director, or his designee.

c. All approaches to all roundabouts shall include raised; fully mountable splitter islands. All splitter islands shall be six-inch high concrete (at the highest point) and a contrasting color to the street.

d. Aprons of urban roundabouts and the entire central island of compact roundabouts must include fully mountable curbing adjacent to the street and the horizontal surface sloped at two to six percent. The surface of all aprons shall be a contrasting color and texture to the street. The materials used must be of suitable strength and design to support heavy traffic. Aprons constructed of individual pavers or other "loose" forms of surface materials are not allowed.

e. The 'inscribed circle diameter' for all types of roundabouts is measured inside of curb to inside of curb, including the 24" wide gutter pans.

f. All roundabouts shall include a standard 30-inch curb and gutter on the outside circumference of the roundabout and be fully mountable curbing on the inside circumference (refer to Appendix Two, Drawing 29 of these regulations).

g. Where sidewalks are incorporated into the subdivision design, crosswalks shall be provided at each approach to the roundabout. All crosswalks, ramps, markings, and signage shall comply with applicable ADA requirements.

h. Where unusual topographic conditions or other factors exist that could impact the functional characteristics of a roundabout, the Engineering Director may require review and recommendation by a third-party traffic engineer. If it is determined by the third-party traffic engineer and/or the Engineering Director that a specific location is not a good application for a roundabout, the roundabout will not be approved. Where specific design changes are recommended by the third-party engineer and/or the Engineering Director, the design will be modified accordingly.

6.7 Sidewalks.

With the submission of a new preliminary subdivision plan and/or site development plan, the following sidewalk requirements shall apply (refer to Appendix Two, Drawings 4 and 18 of these Regulations):

(1) **Arterial and Collector Streets** – Sidewalks six feet wide shall be constructed on both sides of the street.

(2) **Commercial/Service Institution Development** – Sidewalks six (6) feet wide shall be constructed in all projects along all public streets abutting the development.

(3) **OSRD and R-2 Zoning Districts** – Sidewalks five (5) feet wide shall be constructed on both sides of all local streets.

(4) **Other Residential Streets** – Sidewalks five (5) feet wide may be required by the Planning Commission on local streets in other residential zoning districts not named in the previous subsection, including mid-block connections between adjoining or nearby streets, if deemed necessary for the safe and efficient movement of pedestrians.

(5) **Connection to Existing Sidewalks** – When sidewalks are required in a subdivision adjoining a developed area with sidewalks, the new sidewalks shall be connected by the subdivision developer.

(6) **Bikeways** – In lieu of sidewalks, bikeways may be installed in accordance with the adopted standards of these Regulations (see Article 7.4(9)) if deemed acceptable by the Planning Commission for the safe and effective movement of pedestrians.

(7) **Private Streets** – Private street subdivisions shall provide sidewalks as shown on the approved preliminary plan.

(8) **Exemptions** – Sidewalks shall not be required in areas where the projected grade of the street will exceed eight percent (8%). In addition, the installation of sidewalks may be delayed in locations where street improvements are scheduled in the City's officially adopted capital improvements program, subject to the developer providing a cash equivalent contribution to the City for future sidewalk installation. Such exemptions shall be subject to the review and recommendation of the Director of Engineering or his designee, and approval of the Planning Commission.

(9) **Acceptable Surfaces** – Sidewalks shall be constructed of white limestone concrete, four inches thick with a broom brush finish, using six foot by six foot squares or five foot by five foot squares (for narrower width requirement) with grooved expansion joints.

6.8 Street Extensions to/into Adjoining Properties.

Where future street access to an adjoining property is required, the following standards shall apply.

(1) **Specifications** – If the terminus of the dead-end street is less than 250 feet in length, the pavement section shall match the typical width of the street and will not require a temporary turnaround. If the terminus of the dead-end street exceeds 250 feet, a temporary turnaround will be required to facilitate the turning movement of larger vehicles. The radius of the pavement section shall be 35 feet. A temporary public easement shall be identified on the adjoining lot for any portion of the turnaround that extends past the normal right-of-way. The final plat shall state that all such easements will be automatically terminated when the street is extended to the adjacent tract. The bulb of the turnaround shall include the standard depth of stone and binder course. The curbing section for the temporary portion shall be extruded concrete curb. No driveway connections to the temporary cul-de-sac shall be permitted without approval by the Planning Commission. When no driveway to the temporary cul-de-sac connection exists, no final topping shall be installed on the bulb of the cul-de-sac.

(2) **Notice Signage** – When a street is approved by the Planning Commission as a temporary dead-end for future extension into an adjoining tract of land, a sign shall be erected by the developer upon the construction of the temporary dead-end street. The sign shall be of high-intensity reflectivity, measuring 12-inch by 30-inch (12" x 30") with the following text, ***"Temporary Dead-End Street, to be Extended with Future Development of the Adjoining Tract."***

(3) **Future Completion of Connections** – At such time as the permanent street is extended into the adjoining property and the temporary cul-de-sac is to be abandoned, the developer of the adjacent tract shall be required to properly connect this section of the existing street with the new street. This shall include, but is not limited to, removal of excess asphalt in the turning radius, installation of curb and gutter, drainage improvements, driveway connections, final application of the asphaltic concrete wearing surface, and restoration of the adjoining area with topsoil and seed.

(4) **Security** – Refer to Article Eight of these Regulations for detailed information regarding securities.

6.9 Private Streets and Gated Subdivisions.

The design, construction, and inspection of all streets, curbing, drainage, street lighting, utilities, and traffic control devices in a private street subdivision shall conform to the same design and engineering standards as applied to typical development under these Regulations. In addition, the Planning Commission may impose additional requirements for private streets and gated subdivisions as may be necessary to carry out the intent of these Regulations contained herein and within the Brentwood Municipal Code. The following provisions shall apply to private street subdivisions.

(1) **Subdivision of Land.** Each concept plan, preliminary plan, final plat, or revised final plat for a private street subdivision as provided for in this article shall require the approval of the Planning Commission. All private streets within a subdivision shall be identified on the final plat as access easements for the benefit of all lots in the subdivisions. All property within the access easements shall be owned and maintained by the property owners association. All public utility and drainage easements within a private street subdivision shall be formally dedicated on the final plat at locations and widths acceptable to the Public Works, Engineering, and Water and Sewer Departments, as well as other affected utilities. The plat shall further provide that employees of the City and all utilities providing service to the subdivision, when acting in the course of their employment, shall have the right to enter such easements and all vehicle access easements, and to maintain all public utilities and facilities lying therein.

(2) **Conflicts with the Existing Transportation Network.** A private street subdivision shall not cross any existing collector or arterial street as designated on the City's current Major Thoroughfare Plan, nor prevent the construction of such future streets as identified on the plan. No private street or gated subdivision shall be permitted in a location that would prevent vehicular access to future subdivisions on tracts adjacent to the site if such tracts, in the determination of the Planning Commission, lack sufficient alternative access. In addition, a private street or gated subdivision shall not disrupt nor prevent the reasonable establishment of public pedestrian and bikeway connections between adjacent subdivisions, public streets, parks and other facilities used by the public.

(3) **Minimum Access Provisions.** A private street subdivision having more than 150 dwelling units but less than 300 dwelling units shall provide at least two vehicle access points. If the subdivision includes 300 or more dwelling units a minimum of three vehicle access points are required.

(4) **Public Facilities.** No school, park, or other public facility shall be located within a gated subdivision unless it is fully accessible to the general public from a public right-of-way.

(5) **Design of Access Gates.** No gates, structures, or guardhouses for a private street subdivision shall be placed on public right-of-way. All gates and guardhouses shall be located at least 50 feet from the public right-of-way. Guardhouses and gate structures shall be approved by staff from the Engineering Department, the Police Chief, and the Fire Chief, and shall include a standard system, acceptable to the City, for gate operation access to the subdivision. At minimum, gates shall be constructed to permit opening in emergencies by bolt-cutters or breakaway panels. Under no circumstances shall the City or emergency services providers be responsible for the repair of damage to the gates or structures associated with an emergency response into the subdivision.

(6) **Security for Completion of Improvements**. Upon approval of the final plat of a private street or gated subdivision by the Planning Commission, security in a form acceptable to the City shall be prepared and submitted to staff with the Planning and Codes Department with the recording of the final plat. The security shall be in an amount determined by City staff to assure completion of streets and infrastructure work as shown on the approved construction plans. (Refer to Article Eight of these Regulations for additional standards.)

6.10 Storm Drainage.

(1) **Purpose.** The purpose of this section is to provide criteria for drainage system design that accomplishes the following:

a. Accounts for both off-site and on-site storm water flows

b. Protects downstream properties

c. Maintains natural topographic and watershed divides

d. Conveys storm water to a stream, natural channel, or other existing facility in a manner that does not cause flooding or erosion

e. Discharges storm water into the natural channel by connecting the channel at natural elevations, or by discharging the storm water into an existing facility of sufficient capacity to receive it, or by discharging into an approved drainage well

f. Treats storm water quality consistently on new development and significant redevelopment sites as stipulated in these Regulations.

g. Complies with the City of Brentwood and FEMA requirements whichever are more stringent. Refer to the Floodway ordinance regarding development of properties within the floodplain.

(2) **Method.**

a. The Soil Conservation Service (SCS)-Technical Release Number 55 (TR-55) shall be used for calculating runoff unless another technically acceptable method is approved by staff from the Engineering Department.

b. The developer or the developer's engineer, shall be prepared to substantiate the basis for any proposed alternative method.

(3) **Technical guidelines.**

a. **Drainage system.** The overall drainage network is divided into two components, the minor system and the major system.

b. **Minor system-description**. The minor system, which is sometimes termed the "initial system," consists of a wide variety of drainage appurtenances ranging from inlets, manholes, street gutters, streetside ditches, storm sewers less than 54-inch diameter or equivalent and swales to small channels or pipes. This system serves to collect the initial storm water runoff and convey it to a proper outfall within the major system.

c. **Major system-description.** The major system primarily consists of natural waterways, large storm sewers (54-inch diameter or equivalent and greater), and large water impoundments. In addition, the major system includes some less obvious drainage ways such as overland relief swales and infrequent temporary ponding at storm sewer inlets. The major system includes not only the trunk line drain which receives the water from the minor system, but also the natural backup drain which functions in case of overflow from or failure of the minor system. Proper overland relief will not flood or damage homes, businesses, or other property. A major system will function as a drainage basin, whether or not it has been planned and designed, and whether or not development is situated wisely in respect to it.

d. **Minor system design.** The design of the minor storm water drainage system shall be based on a storm frequency of 10 years. This criterion shall be applied to both closed conduit and open channel systems. However, if the 10-year design flow for an open channel system is greater than 100 cubic feet per second (cfs), then the open or closed system shall be capable of passing the 100-year design flow within the drainage easement. Systems relying on sinkholes or drainage wells for discharge shall be capable of passing the 100-year design flow within the drainage easement, assuming plugged conditions (0 cfs drawdown) for the sinkhole. In residential developments where the average lot size is less than 20,000 square feet, the following general guidelines shall be observed in the design of the minor system:

1. Design surface runoff across lots shall not have erosive velocities.

2. Quantities of surface runoff greater than 4 cfs that flow through lots shall be collected and conveyed in a system of open channels, closed conduits, or a combination of both and shown on the construction drawings.

e. **Major System design.** Wherever possible, natural waterways serving the major system shall remain undisturbed. Detention may be required to avoid discharges that exceed the capacity of natural waterways. Modifications to natural waterways are discouraged and require the approval of TDEC. Improvements to natural open channels that are to function primarily as the major system shall be designed to pass the 100-year design flow without damage to the channel. Man-made channels designed to function as the major system shall be capable of carrying a 100-year design flow. Where man-made channels are necessary, the channels should be located as far away from buildings or structures as possible and preferably in established open space or other conservation corridors. This major system should provide relief such that no building will be flooded with a 100-year design flow,

even if the minor system capacity is exceeded. The following requirements pertain to design of the onsite major storm water management system:

1. Areas shall be graded in such a manner, or buildings located or constructed in such a manner that if the capacity of the minor system is exceeded, no building will be flooded by the design flow. Critical areas to consider are sumps, relatively flat areas, and areas where buildings are located below streets or parking lots.

2. The 100-year frequency storm for the duration equivalent to the time of concentration shall be used to compute runoff for the major storm water management system.

3. For the first trial, the same time of concentration values shall be used that were used in designing the minor storm water management system and the minor system should be assumed to be completely inoperable. If no building will be flooded based on these assumptions, then the analysis can be considered complete.

4. If buildings will be flooded based on the assumptions used in the preceding item, more precise hydrologic and hydraulic computations are required. The minor system, overland relief swales, or surface storage shall be designed so that no building will be damaged by flooding.

5. In general, the minor storm water management system should not be oversized as a basis for providing major system capacity. The major storm water management system should be in the form of area grading or the location and construction of buildings in such a manner that overland relief swales or surface storage will provide adequate flood protection. The major storm water management system shall be evident on the drainage plan, including overland relief swales and areas that may be affected by surface storage for a 100-year design storm. Calculations performed for major system design shall be submitted with the drainage plan.

f. **Open channels.** Open channels shall be designed to prevent erosion. Erosion control measures shall be in accordance with the Best Management Practices Manual used by the City of Brentwood. Ditches with a velocity of greater than three ft./sec. shall be lined with "rip-rap", eight-inch to 12-inch stone minimum size, or be lined with a four-foot minimum concrete channel, or other equivalent materials approved by staff from the Engineering Department.

1. **Channel Capacity.** Open channel capacity shall be determined by Manning's equation. Appropriate Manning's n values shall be used for design and are subject to approval from City of Brentwood.

2. **Lined Channels**. Open channels may be designed as hard-armored, geo-synthetic or soil bioengineering lined channels. Geo-synthetic and soil bio-engineering techniques are described in the City's Best Management Practices Manual. Channel lining shall be required when the design velocity exceeds the allowable, non-erosive velocity for a given channel reach and no other erosion control measures provide adequate protection.

3. **Grassed Channels**. The design of grassed channels shall consider the variable degree of flow resistance generated by different types of ground covers. Temporary erosion control shall be utilized during non-growing seasons and during grass cover establishment. The engineer shall note on the drawings or in the specifications that "All grassed channels must be in a well-stabilized condition and show no sign of erosion at the time of final acceptance by the City of Brentwood".

4. **Easement Width.** All open channels shall be located within a public utility and drainage easement. Minimum easement width shall be determined from Table Four.

TABLE FOUR
MINIMUM EASEMENT WIDTHS FOR OPEN CHANNELS

CHANNEL WIDTH	REQUIRED EASEMENT WIDTH
Less than 5 feet	10 feet
5 – 20 feet	10 feet greater than width at top of bank
Greater than 20 feet	15 feet greater than width at top of bank

g. Storm Pipes and Culverts.

1. **Pipe Capacity.** Closed pipe shall be designed for the total flow intercepted by the inlets during the design storm event. The minimum diameter for all storm drains shall be 18 inches.

2. **Easement Width.** Minimum allowable easement width for storm water pipes and culverts shall be determined from Table Six. In the event that easement width requirements change after plans have been approved, plans showing the corrected easement width must be submitted to the City of Brentwood for review and approval.

3. **Drainage structures under public streets.** Drainage structures under streets which are to be dedicated to the City of Brentwood shall safely pass the calculated flows of the post-development storm based on the design year, as shown in Table Five.

TABLE FIVE
DRAINAGE STRUCTURE DESIGN FOR STREETS

Street Classification	Design Year
Local Residential	10 Year
Collector-Commercial/Service Institution	25 Year
Arterial Streets and Highways	50 Year

4. **Culverts.** Culverts shall be sized based on inlet and outlet control conditions. Headwater (HW) created by the worst condition shall neither overtop the proposed street nor cause unduly large impoundment of water behind the culvert. All culverts shall be checked for the effects of the 100-year storm. No flooding of buildings should result from the 100-year design flow. All piping underneath public streets shall be reinforced concrete pipe,

ASTM C-76-60, standard strength. The minimum pipe diameter shall be 18 inches. A Manning's "n" value of 0.012 shall be used for the design value of the concrete pipe. Refer to Table Six. Drainage pipes that are routed along property lines shall be extended to the rear property line at a minimum.

TABLE SIX
MINIMUM EASEMENT WIDTHS FOR STORM DRAIN CONDUITS

Equivalent pipe Diameter	Invert Depth (Feet)	Minimum Easement Width (Feet)
18 inches	0 to 5	15
	6 to 10	20
	11 to 15	35
	16 to 20	45
24 to 30 inches	0 to 5	15
	6 to 10	20
	11 to 15	35
	16 to 20	45
36 to 48 inches	0 to 5	20
	6 to 10	25
	11 to 15	40
	16 to 20	50
54 to 72 inches	0 to 5	N/A
	6 to 10	30
	11 to 15	40
	16 to 20	50

5. **Inlets.** Inlets shall be designed to receive the 10-year storm event.

6. **Outlet Protection.** The outlet ends of discharging pipes shall not result in velocities that equal or exceed the erosive velocity of the receiving channel, unless energy dissipation and permanent erosion protection measures are placed at the outlet. Energy dissipation and erosion control devices shall have no overfall at the terminal end and shall discharge onto a stable section. The terminal section shall be considered stable if the terminal section design velocity is less than the erosive velocity.

7. **Bridges.** All bridges shall be designed for the 100-year, 24-hour storm event. The design flow shall consider runoff from the total tributary area and will require stream channel routing, as appropriate.

8. **Retention/detention ponds-general.** Retention and detention ponds shall be designed to limit the rate of runoff from the site and temporarily store the excess volume. The maximum allowable rate of discharge from the developed site shall be no more than would have occurred from a storm of specified frequency prior to site development. This allowable design storm frequency varies in accordance with the drainage area above the point of discharge as tabulated in Table Seven.

    a. **Retention/detention facilities** -- location. Retention and detention facilities shall not be located on any residential lot, and shall only be

located within designated open space areas, maintained by a homeowners association. Detention/Retention facilities shall also not be located within any required arterial street buffer, as defined within Section 78-184 of the Brentwood Municipal Code.

Exceptions to the pond locations may be considered when the topography dictates drainage patterns. The pond elevation in relation to adjacent streets and properties will be a factor in the consideration of exceptions.

b. **Design specifications.** Runoff from the discharge design storm shall be computed for pre-development conditions at the site. The volume of any required or necessary stormwater detention facility shall be sufficient to safely store the difference between the allowable discharge rate produced by the "discharge design storm" and the actual runoff from the developed site. The actual runoff under post-development conditions shall be computed based on a design frequency for a 24-hour duration storm, which varies in accordance with the drainage area above the point of discharge as tabulated below under "storage design storm". Detention facilities must be designed to safely pass the runoff produced by the 100-year, 24-hour storm under post-development conditions.

TABLE SEVEN
MINIMUM DESIGN STORM FREQUENCIES

Drainage Area (Acres)	Discharge Design Storm Frequency (Years)	Storage Design Storm Frequency (Years)
50 or Less	2	25
Over 50	5	50

9. **Stormwater quality.** The design of stormwater quality control practices shall include structural and non-structural devices and shall be designed in accordance with the following criteria and in accordance with the City's Best Management Practices Manual.

a. There shall be no distinctly visible floating scum, oil or other matter contained in the stormwater discharge.

b. The stormwater discharge must not cause an objectionable odor in the receiving stream.

c. Development will be required to minimize the impact to stormwater quality by applying structural and/or nonstructural management practices selected to address site-specific conditions. The goal for water quality treatment shall be 80 percent removal of the average annual total suspended solids (TSS) load. The water quality volume is that volume of stormwater runoff resulting from the first 1.0 inch of rainfall from a site per storm event.

d. No land disturbance activities, whether by private or public action, shall be performed in a manner that will negatively impact stormwater quality whether by flow restrictions, increased runoff, or by diminishing channel or floodplain storage capacity. Acceleration of erosion or sedimentation, or transport of other pollutants or forms of pollution, due to various land development activities must be controlled.

e. The treatment standards for stormwater quality are the same for all sites within the City of Brentwood unless other secondary pollution reduction goals are established through the establishment of Total Maximum Daily Loads (TMDLs).

10. **Offsite improvements.** Certain areas may provide opportunities to construct downstream improvements in lieu of on-site storage facilities. Downstream improvements will require written permission of all affected property owners, including both property owners who are affected by physical improvements and those affected by increased run-offs.

11. **Minor developments.** Development of small commercial and residential sites may be exempted from providing for increased runoffs. Exemptions will be considered on a case-by-case basis. Before consideration the design engineer shall furnish drainage calculations as requested by staff from the Engineering Department. Consideration shall be based on total runoff increases, historical instances of downstream flooding, adaptability of site to retention/detention facilities, etc.

12. **Previously developed sites.** The City of Brentwood reserves the right to require drainage calculations to be based on pre-existing conditions of developed sites where new development is proposed. Historical instances of downstream flooding will be the basis for requiring these calculations.

13. **Drainage calculations.** All submittals shall include drainage calculations and detailed hydraulic analysis of detention ponds. All detention facilities must be designed in accordance with the Best Management Practices Manual utilized by the City of Brentwood, available from Engineering Department staff. Submittals must clearly show how all values were derived.

14. **Headwalls.** All headwalls shall be constructed of reinforced concrete and include wing walls, unless otherwise approved by the staff from the Engineering Department. A toe shall be added to the headwall if the flow is in excess of ten cfs. Energy dissipaters shall be added to the outlet headwall if the velocity exceeds five ft./sec., if no other form of erosion control is provided.

15. **Drainage pipe outside street.** The City will allow corrugated metal pipe, AASHTO-M-36 (n=0.024), 16 gauge minimum thickness, or High-Density Polyethylene (HDPE) Manning's "n" = 0.013, when placed outside a paved surface. The minimum pipe diameter shall be 18 inches. The pipe shall meet one of the following standards:

a. Galvanized per AASHTO, M-218;

b. Bituminous coated per AASHTO, M-190;

c. Aluminized per AASHTO, M-274; or

d. Polymeric coded per AASHTO, M-245.

e. Corrugated polyethylene tubing with a smooth interior, meeting ASTM, F-667 and AASHTO, M-294, Type.

h. **Sinkholes.** Special precautions must be taken when the natural drainage of an area within a proposed development is found to be served by a sinkhole. The sinkhole cannot be located within a lot or area proposed for any amenity and must be noted on the final plat. If any portion of the drainage basin served by the sinkhole is planned to be developed a special study must be conducted to ensure the preservation of the sinkhole and/or the methods for managing storm water from this area. The study must be conducted by a civil or geotechnical engineer licensed to practice in the State of Tennessee.

6.11 Community Assets and Public Use/Service Areas.

Due consideration shall be given to the allocation of areas suitably located and of adequate size for playgrounds, parks, and open space for public use and services. In all subdivisions, due regard shall be shown for all natural features such as large trees and water courses, and for historically significant sites and similar community assets which, if preserved, will add attractiveness and value to the property and the community. Any property preserved as directed by the Planning Commission for community benefit must be identified on the final plat. The execution of deeds or easements to facilitate or monitor a community asset may be required as a condition of approval of the final plat.

6.12 OSRD-IP Open Space Residential Development -- Innovative Project Design Standards – Zoning District.

Special land use regulations have been enacted to guide innovative projects within the OSRD zoning district to encourage a wider range of housing options for the community and greater preservation of open space, while at the same time maintaining the fundamental density standard of one dwelling unit per acre. This section provides special standards for OSRD-IP developments which shall supersede the general design standards outlined in these Regulations.

(1) **Street and Circulation Standards.** The circulation system shall include an interconnected network of streets designed to provide adequate traffic capacity, provide connected pedestrian and bicycle routes, minimize through-traffic volumes, minimize vehicular speeds, provide access to emergency vehicles, and provide for safe mobility. In addition:

a. The vehicular circulation system shall be designed to minimize conflicts between pedestrians and bicyclists.

b. In order to reduce traffic speeds, traffic calming features such as narrow lanes, medians, curb extensions, roundabouts, traffic circles, and textured pavement crosswalks shall be integrated into the design of the subdivision.

c. Curvilinear street alignment shall also be used where possible to reduce traffic speeds.

d. Sidewalks, bikeways, and multi-use paths are an integral part of the OSRD-IP design. To the greatest extent possible, sidewalks and multi-use paths should connect to adjacent neighborhoods, schools, civic uses, and commercial areas.

(2) **Street Hierarchy.** Streets within an OSRD-IP zoning district shall be classified according to the following standards. (Refer to the standard drawings contained within Appendix Two of these Regulations.)

a. IP collector streets shall meet the following standards:

1. The minimum right-of-way width shall be 98 feet with median or 62 feet without median.

2. The IP collector street is a low speed public street intended to provide the primary access between streets within an OSRD-IP development, and the City's arterial and collector street system. Frontage for lots may be provided by an IP collector.

3. No direct driveway access shall be provided to the IP collector. Lot driveway access shall be provided through a rear service lane.

4. The IP collector may be constructed without lot frontage. Where lot frontage is not provided, the Planning Commission may allow an alternate cross-section for the IP collector which consists of a two-lane street with bike lanes on each side, and ADA compliant sidewalks on both sides of the street. The sidewalks shall be separated from the street by an 8-foot planting strip. When lot frontage is absent, the Planning Commission may allow a multi-use path to provide pedestrian and bicycle access in lieu of sidewalks required for the IP collector.

5. Where lot frontage is provided, the IP collector shall be a median divided street, with one travel lane in each direction. In addition, bike lanes and on-street parking shall be provided on both sides of the street. ADA compliant sidewalks are to be provided on both sides of the street. The sidewalks shall be separated from the street by an 8-foot planting strip.

b. IP local streets shall meet the following standards:

1. The minimum right-of-way width shall be 55 feet.

2. The IP local street is a low-speed public street intended to provide access between the residences and the IP collector streets, and other IP local streets and IP cul-de-sacs. The IP local street provides frontage for the lots in the subdivision.

3. The IP local street shall have one travel lane in each direction with on-street parking on one side of the street. ADA compliant sidewalks shall be provided on both sides of the street, and the sidewalks shall be separated from the street by an 8-foot planting strip.

c. IP cul-de-sacs shall meet the following standards:

1. The minimum right-of-way width shall be 92 feet.

2. The IP cul-de-sac is a low speed public street terminus intended to provide access between residences and IP local streets. The IP cul-de-sac provides frontage for lots.

3. The IP cul-de-sac shall be a median divided street with one-way counterclockwise travel flow on either side of the median. ADA compliant sidewalks are to be provided on both sides of the street and the sidewalks shall be separated from the street by an 8-foot planting strip.

4. The maximum length of an IP cul-de-sac shall be 300 feet, as measured from the end of the radius return to the end of the pavement of the cul-de-sac.

d. IP rear service lane.

1. The minimum right-of-way width shall be 27 feet.

2. The IP rear service lane is a low speed public street intended to provide access to the rear of the property. Refer to Section 78-198 of the Brentwood Zoning Ordinance regarding access to lots zoned OSRD-IP.

(3) **Additional IP Design Criteria.**

a. **Sidewalks.**

1. Sidewalks shall be provided on both sides of all IP collector, local, and cul-de-sac streets that have lot frontage. Sidewalks shall be at least five feet wide. All sidewalks and street ramps shall be ADA compliant.

2. In lieu of sidewalks, the Planning Commission may approve a multi-use path to provide pedestrian connectivity.

b. **Bicycle Use Accommodation.**

1. On IP local and cul-de-sac streets, bicyclists shall be considered a normal part of the mix of vehicles on the street.

2. On IP collector streets, bicycle lanes shall be provided.

3. Off-street multi-use paths are encouraged to provide connectivity within the development and to the City's bikeway and pedestrian trail system. Multi-use paths shall be designed to AASHTO standards and shall be at least five feet from the edge of the travelway.

c. **On-Street Parking.**

1. Informal parking, which is parking that is allowed along streets, but is not specifically signed or marked, shall be provided on IP collector, local, and cul-de-sac streets.

2. On-street parallel parking shall be provided along both sides of IP collector streets that have lot frontage.

3. On-street parallel parking shall be provided along one side of IP local streets.

4. For IP cul-de-sacs, on-street parking shall be provided within the median.

d. **Planting Strips.**

1. Planting strips which include street trees shall be provided between the curb and the sidewalk along all IP collector, local, and cul-de-sac streets.

2. Planting strips shall be eight feet wide, unless the width is reduced by the Planning Commission.

(4) **Curb Radii.** The curb radii at intersections shall be as follows:

TABLE EIGHT
CURB RADII

Intersection Type	Curb Radius
IP Collector to Arterial or Collector	25 feet
IP Collector to IP Collector	15 feet
IP Collector to IP Local	10 feet
IP Collector to Rear Service Lane	10 feet
IP Local to IP Local	10 feet
IP Local to Rear Service Lane	10 feet

(5) **Design Speed.** Design speed shall closely match the street type, vehicle use, and the proposed speed limit. The desired upper limit of design speeds for IP collector and IP local streets is 20 mph. The desired upper limit of design speeds for IP cul-de-sacs streets and rear service lanes is 10 mph.

(6) **Minimum Centerline Radii.** Minimum centerline radii shall conform to the design speed for the particular street. Minimum centerline radii for specific design speeds are as follows:

TABLE NINE
MINIMUM CENTER RADII

Design Speed (MPH)	Minimum Centerline Radius
10 mph	25 feet
15 mph	50 feet
20 mph	90 feet

(7) **Stopping Sight Distances.** Minimum stopping sight distances shall conform to the design speed for the particular street and shall account for wet pavement conditions. A sufficient area at each intersection shall be kept clear of vegetation and other obstructions to ensure adequate vehicle sight distance. Stopping distances for specific design speeds are as follows:

TABLE TEN
STOPPING SIGHT DISTANCES

Design Speed (MPH)	Stopping Sight Distance
10 mph	45 feet
15 mph	75 feet
20 mph	110 feet

(8) **Utility Plan.** The layout of all utilities shall be determined in advance of construction. All providers shall be involved in the initial design. Utility easements shall be established according to standards depicted by standard drawings contained within Appendix Two of these Regulations.

6.13 Historic Rural Development Standards

Special rural street construction standards may be approved by the Planning Commission for limited subdivision developments that include structures officially designated as historic sites by the Board of Commissioners. Eligible developments containing the special rural street construction design are limited to a minimum of 50 acres in size. Lots created within such developments must possess an average size of three acres, but in no case shall lots be less than one acre in size.

(1) **Deed Restrictions.**

a. Developments implementing the special rural street construction design shall provide detailed deed restrictions for all affected lots, guaranteeing the lot size and residential density of the subject property in perpetuity.

b. Deed restrictions shall be enforceable by each owner of the affected lots and by the City, and shall be subject to review and approval by the City Attorney, or his designee, in advance of formal subdivision approval.

(2) **Street Standards.** The special rural street construction standard is limited in application to local streets only. This street type shall not be applied to collector or arterial streets, or to streets affording connectivity between adjoining subdivisions or developments. Local streets constructed under this standards shall meet the following technical standards:

a. **Right-of-Way Widths.** The standard right-of-way width shall be 40 feet. Outside the limits of the right-of-way on either side, a minimum width of 15 feet shall be dedicated for public utilities and drainage easements.

b. **Pavement Width and Compacted Stabilized Shoulders.** The minimum pavement widths shall be 22 feet with improved shoulders along each side. The shoulder width shall be a minimum of three feet. This pavement section will not require a curb and gutter section for surface drainage purposes. The drainage design will require streetside ditches to handle the stormwater flows from the street and lots. All driveway culverts shall be designed during the preparation of the subdivision construction plans for future installation by the property owner or builder.

c. **Pavement Section Design.** The pavement design is specified in Section 7.4 of these Regulations for local residential streets. The minimum depth of stone for the shoulders shall be six inches.

d. **Sidewalks.** No sidewalks are required within subdivisions using the Historic Rural Development standards.

6.14 Lots

Every platted lot shall contain sufficient area as defined by the City Zoning Ordinance for the applicable zoning district. Whenever there is a discrepancy between the minimum requirements noted within these Regulations, and those contained in other official regulations, the highest standard shall apply. The size, shape, and orientation of lots shall be such as the Planning Commission deems appropriate for the type of development and use contemplated. The Planning Commission shall ensure that the following provisions are met for new lots created under this authority:

(1) **Arrangement.** Insofar as practical, side lot lines shall be at right angles to straight street lines or radial to curved street lines.

a. **Frontage.** Except as provided for in this section, all lots shall have at least 50 feet of frontage on an arterial street, collector street, local street, as designated in the Zoning Ordinance, or on a private street as permitted under Chapter 58, Article IV of the Brentwood Municipal Code. Lots fronting on a permanent cul-de-sac and located within an Open Space Residential Development (OSRD) zoning district may have frontage of not less than 35 feet, if approved by the Planning Commission upon the preliminary plan or final plat.

b. **Waiver of Frontage Requirement.** The Planning Commission may waive the lot frontage requirement for lots within a planned commercial development that do not front on an arterial street, collector street, or local street, if a permanent private access easement is established to serve such lots. The location of any such easement must be approved by the Planning Commission and identified on the master plan for the development, and the final plat for the lot(s). The minimum width for any such easement shall be 30 feet, provided that the Planning Commission may, in its discretion, require a wider easement in order to prevent traffic congestion and safety hazards. Provisions for repairs and maintenance of the easement shall be clearly established to the satisfaction of the Planning Commission. The Planning Commission may withhold its approval of any lots not fronting a public street if such satisfactory provisions have not been established, or if the Planning Commission determines that the creation of such lots is not in the public interest.

(2) **Building Envelope.** Every platted lot shall contain sufficient building area (building envelope) as defined by building setback lines established by the City's Zoning Ordinance for the applicable zoning district. No portion of the building envelope shall be encumbered by the FEMA 100 year floodplain area.

(3) **Lots with Steep Topography.** Lots containing existing ground slopes of fifteen percent (15%) or greater, anywhere on the lot shall be designated as a "transitional lot." No residence shall be built on a transitional lot without a detailed site plan prepared by a professional engineer or landscape architect licensed by the State of Tennessee. (Also refer to the Brentwood Zoning Ordinance for additional site plan requirements for transitional lots.)

(4) **Water and Sewer Service.** Where public water and sanitary sewer systems are reasonably accessible, the developer shall connect with such systems and provide a service connection or connections to each lot, in accordance with Water and Sewer Department Construction Standards. Where public sewer is not accessible, an alternate method of sewage disposal may be used if it is authorized by the Williamson County Health Department, and is also

approved by the Board of Commissioners. Where a public water supply is not accessible, a water well or other source may be used upon approval of the Board of Commissioners.

(5) **Vehicle Access.** The Planning Commission may impose conditions or limitations pertaining to access to any lots created within a subdivision, including but not limited to private frontage streets, rear access streets, or other shared easements, where based upon commonly accepted and applicable traffic engineering principles, such conditions are necessary to ensure the safe and efficient flow of traffic upon public streets. Where such conditions or limitations are warranted, but not acceptable or feasible, the Planning Commission may disapprove the proposed subdivision or resubdivision.

6.15 Easements.

Easements for stormwater drainage, poles, wires, conduits, sanitary sewer, gas, and water mains or other utility lines along the front, rear, and side lot lines, as necessary or advisable to properly serve the subdivision or provide access through a subdivision shall be required.

a. **Special Utility Easements.** Easements of the same or greater width may be required along the boundary lines of or across lots, where necessary for the extension of existing or planned utilities.

b. **Stream Protection.** Whenever any stream is located in an area that is being subdivided, the developer shall provide a Waterway Natural Area along each side of the stream for the purpose of protecting the stream. (Refer to Chapter 56 of the Brentwood Municipal Code -- Stormwater Management and Erosion Control, of the Brentwood Municipal Code.)

6.16 Large Tracts or Parcels.

When land is subdivided into parcels in excess of one acre, such parcels shall be arranged to allow for the opening of streets in the future at the locations where topographic conditions permit safe and efficient connection of future streets, and for logical further resubdivision.

6.17 Suitability of Land.

The Planning Commission shall not approve the subdivision of land if, from adequate investigations conducted by all public agencies concerned, it has been determined that the site is not suitable for platting and development purposes of the kind proposed. Land subject to flooding and land deemed to be topographically unsuitable for development shall not be platted for residential, commercial, and/or service institution uses, or for any other uses that may increase flood hazard, endanger life, health, or property.

6.18 Dedications.

Land determined unsuitable for development per the preceding subsection, or which in the judgment of the Planning Commission should be maintained as public use areas for greenways, recreation, or access corridors, may be dedicated for public use, provided that acceptance of such land dedication by the City of Brentwood is subject to the approval of the Board of Commissioners.

6.19 Street Lights, Signage and Sign Posts.

The construction design package shall include a street lighting and signage plan per Article Seven. The street lighting and signage plans shall be consistent throughout all sections of a subdivision when the same materials are available unless otherwise approved in writing by the City of Brentwood.

ARTICLE SEVEN. CONSTRUCTION STANDARDS

7.1 Purpose.

The following standards provide information for the installation and construction of public improvements within a proposed development. (Refer to Appendix Two for Construction drawings and field practices.)

7.2 Required Improvements.

(1) Every developer of a major subdivision shall be required to construct streets, lighting, signage and pavement markings, public sanitary sewer lines and services, stormwater systems, public water mains and service lines, fire hydrants, sidewalks, and bikeways, and to establish monumentation for right-of-way points and lot property corners, all in accordance with the approved plan, the conditions of approval and these Regulations.

(2) As each section or subdivision is platted, all public improvements, including, but not limited to streets, bikeways or pedestrian accessways, utilities, and drainage, shall be installed by the subdivision developer to the property line of the next phase of development and/or to any other property abutting the subdivision. (Refer to Article 5.5 of these Regulations regarding improvements that must be completed before recordation of the final plat.)

(3) The Planning Commission may require the upgrade or extension of off-site public utilities to provide service to the development.

(4) The Planning Commission may waive the extension of certain public improvements when deemed in the public interest to do so and an alternative method for future completion of such improvements is determined and documented.

7.3 Grading.

(1) **Clearing and grubbing.**

a. Clearing and grubbing includes the removal and disposal of all vegetation, topsoil and deleterious or unstable materials within the proposed areas of the rights-of-way, slopes and easements and other areas as shown on the site grading plans unless certain areas or objects are noted to remain undisturbed.

b. Erosion-siltation controls and tree protection shall be installed prior to the clearing and grubbing operation.

c. The methods of disposal available to the contractor may include burning, clipping or haul-off. A burn permit, issued by staff from the Brentwood Fire Marshal's office may be required.

d. Roots larger than one inch in diameter must be grubbed out and removed.

e. Land disturbance shall only occur in areas as shown on the site grading plans.

(2) **Topsoil Stripping and Stockpiling**.

a. Topsoil stripping includes the removal of topsoil material from the limits of the right-of-way areas or other areas designated on the site grading plans.

b. Topsoil removal is dependent upon the depth and types of soil and elevations of rock outcropping.

c. The areas for stockpiling shall be designated on the construction plans and shall be in areas that do not conflict with other construction activities, outside of flood plain areas, Waterway Natural Areas (WNA), or areas designated as tree protection areas or required buffers. If a stockpile areas remains more than 14 days then the contractor must provide erosion measures such as seeding, mulching and silt fencing around the perimeter of the stockpile area.

(3) **Street Fill Material.**

a. Fill material must consist of soil, rock, or an approved soil/rock mixture free from roots, wood, organic matter, rubble and any other deleterious material.

b. Soil fills must be free of rock fragments over six inches in maximum dimension and must have a minimum dry density, when compacted of 95 pounds per cubic foot. Soil fill must be placed in maximum lifts of 8 inches and compacted to at least 95 percent of its maximum dry density as determined by ASTM D-698 (Standard Proctor). Soil fill must be stable after compaction, regardless of compaction percentage. Adequate compaction will be verified by in-place density tests performed by staff from the Engineering Department.

c. Rock fill shall consist of durable, clean, well-graded "shot rock" or crushed stone. The maximum dimension of rock fragments used in the rock fill shall be 12 inches and there shall be less than 15 percent fines (soil and rock fragments passing a U.S. No. 200 sieve) in the mass. Rock fill shall be placed in lifts not to exceed 30 inches and shall be compacted with heavy steel-wheeled or tracked vehicles. Adequate compaction will be judged in the field by staff from the Engineering Department, based on stability of the fill in place.

d. An approved soil-rock mixture shall consist of soil interspersed in a well-graded mixture of rock fragments no larger than 12 inches in maximum dimension. The soil-rock mixture shall be placed in lifts not exceeding 12 inches in maximum thickness and compacted with tamping rollers until the soil portion of the mass is compacted to at least 95 percent of its maximum dry density as determined by ASTM D-698. The soil portion of the mass shall be within +/- two percent of its optimum moisture content during placement. Compaction will be verified by in-place density tests where possible, but if excessive rock fragments prevent density tests, adequate compaction will be judged by staff from the Engineering Department based on the stability of the mass under the weight of heavy construction equipment.

e. If fill material is to be transported from an off-site source the contractor shall furnish samples suitable for determining moisture-density relationship of all soil types to be used in fills. These samples shall be furnished at least one week in advance of their use on the project. The contractor shall contact staff from the Engineering Department to allow inspection of the sampling procedures.

f. Immediately before beginning fill placement, and before applying the aggregate base in cut areas, the subgrade must be proof-rolled using a heavily loaded pneumatic-tired vehicle such as a loaded dump truck. This proof rolling must be observed by staff from the Engineering Department. Any soft or unstable areas delineated thereby must be undercut to stable ground and backfilled with approved fill material.

(4) **Street Excavation.**

a. Excavation is the removal of earth from a street subgrade, trench or slope. The means of excavation can be blasting or mechanical means such as a scraper or hoe-ram. The type of materials removed from a mass area or trench is dependent upon the depths of cut and soil types.

b. The materials recovered in an excavated area may be suitable for use in fill areas. The suitability of the material will be dependent upon testing and approval by a geotechnical engineer. The placement of the material shall meet the compacted requirements established in section 7.2 (3) of these Regulations.

c. If excavations are left exposed to the weather for extended periods of time after they are brought to grade, and/or if deterioration of the sub-grade has occurred by either wetting or drying, appropriate corrective actions must be taken. Corrective actions shall consist of scarifying and re-compacting the subgrade or by use of other measures as deemed appropriate by staff from the Engineering Department.

d. Materials that are classified as unsuitable shall be hauled off.

e. Stockpile areas shall be designated areas shown on the construction plans or areas approved by the design engineer.

f. Geologic hazards: Any areas which present geologic hazards must be investigated by a registered geotechnical engineer. If there is a potential for instability, design measures shall be included to minimize the risk.

(5) **Backfilling of Trenches.**

a. The material used for backfilling in a utility trench must be suitable material as monitored and approved by staff from the Engineering Department.

b. The depth of the bedding material in the trench shall be a minimum of 6 inches of #67 stone and brought to level of 12 inches over the top of the pipe.

c. The width of the trench is determined by size of the pipe or culvert.

d. Trenches located in streets shall be backfilled with #67 stone and compacted to a depth below the street subgrade elevation.

e. Trenches located outside of a street can be backfilled with an approved suitable soil mixture and compacted in 8 inch depths as directed by staff from the Engineering Department.

f. Where an unusually wide trench is necessary, such as where blasting of the trench is required and/or multiple utilities must be accommodated in a single trench, staff from the Engineering Department may allow backfilling with soil to a specified depth, topped off with stone. Prior approval by staff from the Engineering Department is required and specific construction techniques and/or materials may be specified.

7.4 Street Construction.

(1) Mineral Aggregate Base Course.

a. The subgrade must be approved by staff from the Engineering Department before placement of the base course.

b. The mineral aggregate base shall consist of hard, durable crushed limestone. The gradation for mineral aggregate base shall be: Class A aggregate, Grading D, as specified by section 903.05 of the Tennessee Department of Transportation's "Standard Specifications for Street and Bridge Construction," latest edition or other approved material. In no case shall the weight of material passing the U.S. No. 200 sieve (wet method) exceed 15 percent of the mass by weight.

c. The mineral aggregate base shall be spread by a mechanical spreader or other approved method which will prevent segregation. The mineral aggregate shall be spread in layers no greater than six inches in thickness and compacted by appropriate means to at least 95 percent of its maximum dry density as determined by ASTM D-1557.

d. Any damage to the base course during construction, including raveling, contamination with silt, loss of density, or loss of material due to construction traffic, shall be repaired by replacing and re-compacting the base.

(2) Concrete Curb and Gutter.

a. The curb and gutter section shall include a 6-inch tall post curb with a 24-inch gutter, per Appendix Two, Drawing 6. Concrete for the curb and gutter shall be Class "A" concrete, with a compressive strength of 4,000 p.s.i. Mountable curbs shall be constructed of Class "A" concrete with a compressive strength of 4,000 p.s.i. (refer to Appendix Two, Drawing 29).

b. Expansion joints shall be placed at intervals no greater than 100 feet using preformed filler ½ inch thick.

c. Contraction joints shall be sawed every 10 feet at a minimum depth of 1/4 inch.

d. Under-drains shall be required along the curb line when the final grade of the ground slopes toward the street, unless exempted in writing by staff from the Engineering Department. A four-inch perforated drainpipe shall be installed under the centerline of the curb and gutter in accordance with Appendix Two, Drawing 7, to ensure proper drainage. The drain shall be backfilled with stone and encased with geo-technical fiber cloth. The drainage pipe shall connect to the storm drain at each box/catch basin.

e. The developer shall assume the responsibility for all curb and gutter damage. All identified damage shall be replaced before placement of the final asphaltic topping.

f. It is recommended that the developer/contractor document any existing driveway or damage adjacent to work areas via photos or other means prior to beginning curb/gutter replacement. The developer/contractor is responsible for any damage attributed to curb/gutter replacement operations.

(3) **Prime Coat.**

a. Prime coat shall be emulsified asphalt, Grade AE-P, or an approved equal.

b. A bituminous prime coat shall be applied uniformly on the surface of the base at a minimum rate of 0.3 to 0.4 gallons per square yard.

(4) **Asphaltic Binder Course.**

a. Asphaltic binder course shall comply with section 308 of the Tennessee Department of Transportation "Standard Specifications for Street and Bridge Construction".

b. The binder course shall not be placed in compacted layers in excess of three inches.

c. The contractor shall provide all necessary equipment for the proper installation of the asphalt surface treatments as outlined in the Tennessee Department of Transportation Standard Specifications - Section 408.03, Equipment.

(5) **Tack coat.**

a. The tack coat shall be cut-back asphalt, Grade RC-70 or emulsified asphalt, SS-1.

b. The bituminous tack coat shall be applied uniformly on the power cleaned surface at a rate of 0.03 to 0.05 gallons per square yard.

(6) **Asphaltic Concrete Wearing Surface.**

a. The asphalt wearing (surface) course shall not be placed for a minimum of one year or until 75 percent (75%) of the building construction has been completed or as determined by the Engineering Director.

b. Bituminous plant mix base (hot mix): The bituminous plant mix base shall comply with section 903.08 of the Tennessee Department of Transportation "Standard Specifications for Street and Bridge Construction".

c. The pavement surface course shall consist of asphaltic concrete surface (hot mix) Grading "411-E" in compliance with section 903.11 of Tennessee Department of Transportation Standard Specifications. Grading "D" may be used where the vertical grades exceed ten percent.

d. Asphaltic concrete layers shall not be placed in excess of two inches per layer.

e. The asphaltic surface course shall be placed with an electronic paving machine with a 40-foot ski, unless otherwise approved by staff from the Engineering Department.

f. The contractor shall provide all necessary equipment for the proper installation of the asphalt surface treatments as outlined in the Tennessee Department of Transportation Standard Specifications - Section 408.03, Equipment.

g. The driving surface must be smooth and comply with the Tennessee Department of Transportation Ridability Special Provision.

h. Alternative pavement sections must be approved by the Planning Commission.

(7) **Sidewalks.**

a. The contractor shall provide for a compacted subgrade for the installation of sidewalks.

b. The minimum depth of the stone base shall be 4 inches.

c. Sidewalks shall be constructed of white limestone concrete, four inches thick with a broom brush finish, using six foot by six foot squares or five foot by five foot squares (for narrower width requirement) with grooved expansion joints. Refer to Section 6.6 regarding sidewalk width requirements based upon street designations.

d. Concrete shall be Class A with a compressive strength of 4000 p.s.i..

e. Cross slopes for the sidewalks should not exceed two percent (2%) grade. Longitudinal slopes shall not exceed eight percent (8%) grade.

f. When installed adjacent to a curb and gutter section, a fiber expansion joint shall be installed between curb and sidewalk.

g. All sidewalks shall be located within the non-vehicular portion of the right-of-way, or within a dedicated sidewalk easement on the abutting private property. The specific location for sidewalks shall be coordinated with utility and other public improvements.

h. Sidewalks along lot frontages shall be installed concurrent with the construction of building improvements on the individual lot and prior to the issuance of the certificate of occupancy.

i. At such time that 75 percent (75%) of the platted lots are developed and/or 75 percent (75%) of the sections of required sidewalks are installed within a subdivision or section thereof, staff from the Engineering Department may require the developer to complete the remaining sidewalk sections in advance of building improvements on the remaining vacant lots. It shall be the developer's responsibility for completing all required sidewalks within a subdivision or section thereof.

j. All sidewalk sections shall be completed before staff from the Engineering Department will authorize the installation of the final asphaltic topping.

k. Sidewalk ramps shall be designed in accordance with the guidelines of the Americans with Disabilities Act (ADA), Public Law 101-336 (refer to Appendix Two, Drawings 4 and 18).

(8) **Bikeways/Bike Lanes/Bike Routes.**

a. Streets and highways designated as bike routes by the City, or constructed with bike lanes shall be appropriately marked and signed by the developer of the subdivision.

b. Design and construction of off-street bikeways shall be in accordance with the alignment and classification denoted on the Bike Route Plan, or Long Range Plan and standards set forth in the AASHTO Guide for the Development of Bicycle Facilities, current edition. The minimum width of all bikeways shall be eight (8) feet. In some cases additional widths may be required.

c. The minimum pavement design for a bikeway will be 6 inches of stone base and 2 inches asphaltic wearing surface.

d. Bikeway ramps shall be designed in accordance with the guidelines of the ADA, Public Law 101-336.

7.5 Street Lighting.

(1) A complete street lighting system shall be designed and approved with the appropriate electric utility. The style and type of the street lights shall be determined through consultation with the electric provider and the City of Brentwood. The same style poles and lighting fixtures shall be used in all phases of a subdivision when the same units are available, unless otherwise approved in writing by the City of Brentwood.

(2) The illumination pattern must be sufficient to ensure safe and adequate pedestrian and vehicular lighting conditions. In general, light poles installed in residential areas should be no greater than 300 feet apart and located at street intersections and at the terminus of all permanent cul-de-sacs.

(3) Light poles in commercial and service institution districts should be no greater than 250 feet apart and located at every street intersection.

(4) Other design aspects, such as spacing of poles, height of poles, type of lighting fixture, distribution of the illumination pattern, intensity of illumination, etc., must be in accordance with the Illuminating Engineering Society (IES), and all applicable electrical codes. A copy of all design data shall be submitted for the review and approval by staff from the Engineering Department.

(5) The complete lighting system shall be designed using underground conduit with metal light poles and installed in such a manner that the system will be accepted for perpetual maintenance by the electric utility. The lighting system must be installed and fully operable prior to 50 percent completion of the proposed structures within a platted section of the subdivision.

(6) All material furnished and all work performed shall be in strict accordance with the latest revision of the National Electric Code, the National Electrical Safety Code, and the codes, regulations, and rules applicable in the area in which the work is being performed.

7.6 Traffic Control, Street Markers and Warning Signage.

(1) All traffic regulatory signage shall conform to the requirements of the MUTCD, latest edition, and shall be installed within the limits of the public right-of-way or approved private access easement.

(2) The edge of the sign shall be placed a minimum of 2 feet from the street, measured from the face of curb and 3 feet (edge of sign) if the street has no curb. The height of the sign shall be a minimum of 6 feet tall, measured from the top of the curb to the bottom of the sign. If the street has no curb, the height shall be measured from the edge of pavement to the bottom of the sign.

(3) The designated speed limit for all streets shall be as provided in the Brentwood Municipal Code or as otherwise established by resolution and approved by the Board of Commissioners.

(4) All street name signs and traffic regulatory signs shall be of high-intensity reflectivity.

(5) Temporary signs may be installed and maintained in lieu of permanent signs until the final asphalt topping has been installed. Temporary signs must meet the same requirements for mounting height, size, and legibility as permanent signs but may be mounted on temporary structures.

(6) The installation of temporary (or permanent) signs in accordance with these standards must be approved by staff from the Engineering Department before building permits can be issued.

(7) The homeowners or property owners association within a subdivision shall retain maintenance responsibilities for any decorative street name signs or regulatory signs and decorative posts. The City of Brentwood shall not be responsible for maintenance of any decorative signs or posts. All decorative signs must comply with the requirements as detailed within the MUTCD. All decorative signage must be reviewed and approved by staff from the Engineering Department. The same style and type of signs and posts must be used in all phases of a subdivision if available unless otherwise approved in writing by the City of Brentwood.

(8) Where arterials or collector streets intersect arterial streets, provide pavement markings and stripping per the requirements as detailed within the MUTCD.

(9) During construction of the subdivision and until at least 75% of all of the building construction has been completed or as determined by the Engineering Director, the developer shall install “no parking” signs in the areas where construction is ongoing, on one side of all designated local streets. The required signage shall comply with the requirements as detailed within the MUTCD. The signs may be removed upon recommendation of the Engineering Director or his designee.

7.7 Driveways.

A driveway is a connection or an access point that connects a lot or tract of land to a public right-of-way (i.e. street or street). A driveway is typically constructed after the infrastructure is completed for a subdivision and therefore, will require modifications to an existing curb and gutter or curb to

construct the improvement. Also, a portion of the work to construct a driveway occurs in the public right-of-way and may impact utilities and easements in the ground and/or a sidewalk.

(1) **Residential driveways.**

a. A driveway shall be constructed to provide a connection to the curb line that does not obstruct or divert flow out of the gutter line. For a driveway that accesses downhill from the street the elevation of the driveway at the right-of-way must achieve a minimum elevation equal to that at the top of the curb. the connection point shall provide an elevated apron to keep surface runoff in the gutter and not allow overflow to discharge into the driveway onto private property.

b. The maximum width of the curb cut at the driveway connection point, at the street or curb and gutter or edge of pavement, where applicable shall be 20 feet, unless otherwise approved by staff from the Engineering Department.

c. If the driveway crosses a sidewalk, then the maximum cross slope allowed within the width of the sidewalk area is two percent (2%). Approval and design of driveway cuts into the curbs shall conform to the construction specifications in these Regulations and all applicable standards established in Chapter 78, Article VII of the Zoning Ordinance -- "Vehicle Access Control."

d. The maximum slope of any residential driveway shall be twenty percent (20%). Refer to Section 78-486 of the Zoning Ordinance.

(2) **Commercial/Service Institution driveways**.

a. Driveway connections for sites in commercial or service institution zoning districts may vary depending on location, number and use.

b. The maximum grades on driveway accesses shall not exceed eight percent (8%). All curb cuts must have the prior approval of the Planning Commission, or as established by the Zoning Ordinance for individual districts.

c. If the driveway crosses a sidewalk, then the maximum cross slope allowed within the width of the sidewalk area is two percent (2.0%).

7.8 Inspection/Testing of Streets and Infrastructure.

(1) Staff from the Engineering and Public Works Departments shall periodically inspect the proposed improvements during construction to insure their satisfactory completion.

(2) The applicant shall pay the city all inspection fees, which shall be based upon the hourly cost of field inspecting for qualified personnel, or as established in the City's annual budget.

(3) If it is determined by inspection that any of the required improvements have not been constructed in accordance with the city's construction standards and specifications, the applicant shall be responsible for the correction of all deficiencies in workmanship or materials to complete the proposed improvements.

7.9 Utility Systems.

(1) **General.** There are several providers that furnish utility services to developments in Brentwood. The utility that will provide service to a particular development is determined by the "service area" of the provider. When it is not clear who the provider will be, it is recommended that staff from the City of Brentwood Water and Sewer Department be contacted for direction. A map of the service areas for water and sewer providers is available on the City's website. In some cases there may be several providers for a given tract. For example, it is not unusual for a development to have different utility providers for each type of utility such as water, sewer, electrical, gas, phone and cable. Therefore, coordination of utilities is a critical part of the subdivision process.

Each utility has different requirements for design, construction, approval, fees, security deposits and inspections. It is the developer's responsibility to coordinate with the appropriate utility providers including the City Water and Sewer Department. It is important to be aware that approval by the City of Brentwood's Planning Commission does not constitute approval of the utility services or the availability of utilities.

(2) **Water System.**

a. Distribution lines properly connected with the public water supply system or with an alternate supply approved by the Board of Commissioners and the Tennessee Department of Environment and Conservation shall be constructed in such a manner as to adequately serve both domestic use and fire flow requirements, all lots as shown on the subdivision plat.

b. The applicant shall submit a water availability request to staff from the Water and Sewer Department prior to the start of the project, and receive confirmation of availability before the approval of the preliminary plan.

c. All distribution lines shall be constructed of Ductile Iron Pipe (DIP).

d. Distribution lines of less than six inches in diameter shall not be installed, unless dual supply water lines are installed to serve the development.

e. The distribution system shall be designed as a "loop" system that provides two directions of supply with a minimum of dead ends.

f. Fire hydrants shall be placed in locations acceptable to the Fire Chief, or his designee, to ensure that adequate fire protection to all structures can be provided and that the hydrants will be accessible, will be protected from traffic hazards, and will not obstruct walkways, streets, or parking facilities. Fire hydrants shall be placed no greater than 500 feet apart. Reflective blue pavement markers (Stimsonite 88, or approved equal) indicating the location of the fire hydrants shall be cemented to the street approximately one foot off of the centerline, at right angles, in the lane adjacent to the hydrant prior to the acceptance of the street by the City.

g. For each new platted lot in a subdivision, connections to the water system shall be installed so that future connections will not require digging up or tunneling under streets or interruption of service to other connections on the system.

h. All fire hydrants and distribution lines shall be installed, tested and operational prior to the start of combustible construction.

i. For purposes of these Regulations, flows and pressures shall be measured at the point of private connection to the distribution system. Should topography dictate, pressures may require augmentation by use of private pressure reducing or pressure boosting devices. Pressure reducing valves will be required if the residual pressure is above 80 p.s.i. measured at the water meter.

j. All design and construction shall be in accordance with these Regulations, the City's standard water specifications, and the requirements of the Tennessee Department of Environment and Conservation (TDEC), Drinking Water Section. In cases of conflict, the more stringent requirement shall apply.

k. The more stringent requirement of domestic use or fire flow shall apply.

(3) **Fire flow requirements.**

a. "Fire flow" means the amount of water required to extinguish a fire or stabilize a hazardous incident. Minimum needed fire flow requirements shall be 1,000 gpm with a residual pressure of 20 psi.

b. In areas where the minimum needed fire flow cannot be achieved, automatic fire sprinklers shall be installed in accordance with National Fire Protection Association (NFPA) requirements.

(4) **Sanitary sewer and septic tanks.**

a. The applicant shall submit a sewer availability request to staff from the Water and Sewer Department prior to the start of the project and receive confirmation of availability before approval of the preliminary plan.

b. Where the Board of Commissioners determines that a subdivision is not required to connect to an existing public sewage system, such lots shall not be platted until approval for alternative systems is granted in writing by the county health officer, or an authorized representative.

c. Sanitary sewer service lines to individual lots shall not be less than six inches in diameter; and may be larger, depending on anticipated flow. The size shall be determined by staff from the Water and Sewer Department.

d. Sewer service to a development shall be provided by a gravity flow system. Sewer lift stations and/or pressure systems must be approved by staff from the Water and Sewer Department.

(5) **Accessibility of sewer and/or water supply system.**

a. When a proposed subdivision is not directly adjacent to an area served by a public sewer or water supply system, City staff, shall determine how the subdivider must make connections. If off-site extensions of sewer and water improvements are required of the developer, then the developer may be eligible for credits toward payment of future tap fees in accordance with current city ordinances.

b. If the development is outside the Brentwood water and sewer service area, the utility providing service will determine requirements for connections to public utility lines.

7.10 Suspended Construction. When construction of a subdivision is halted for 60 days or more the site shall be stabilized per Chapter 56 of the Municipal Code, the entrances shall be securely and safely blocked, and signs must be posted at any road connections indicating the road(s) is/are closed. During suspended construction the vegetation on the site must be maintained in accordance with Chapter 30, Article II of the Municipal Code. The City reserves the right to make periodic inspections of the site during the suspended period and require the developer to correct deficiencies that are a deemed a nuisance to surrounding properties or public areas.

ARTICLE EIGHT. SECURITY FOR COMPLETION AND MAINTENANCE OF IMPROVEMENTS

8.1 Guarantee in Lieu of Completed Improvements

Before a final subdivision plat may be recorded, all improvements shall be constructed in a satisfactory manner, and approved by the City of Brentwood in accordance with the requirements of Article Five of these Regulations. The applicant shall post a security in an amount equal to 110% of the estimated cost of the remaining required improvements, based upon the amount of work completed and stipulated by City staff as sufficient to secure the satisfactory construction, installation, and dedication of the required remaining improvements. Security provided in accordance with this section shall be sufficient to provide for the completion of utilities and other improvements. The City may accept security in an amount whereby improvements may be made and utilities installed without cost to the City in the event of default of the subdivider. The security instrument shall comply with all statutory requirements and shall be satisfactory to the City Attorney as to form, sufficiency, and manner of execution as set forth in these Regulations.

The following requirements shall apply to any security posted with the City pursuant to this article:

(1) **General.** Before a final plat of a subdivision which requires improvements can be recorded, the owner or developer must enter into a Performance Agreement with the City, in accordance with these Subdivision Regulations (See Appendix Five).

(2) **Security Instrument.** The security instrument shall reference the performance agreement, which shall stipulate the work to be performed by general categories and the estimated value or cost of each category. The performance agreement shall also stipulate a completion date for all of the work to be performed. Any changes or extensions to the timeframe or other stipulations as detailed within the performance agreement must be reviewed and approved by the Planning Commission.

(3) **State of Tennessee Bank Collateral Pool.** The security shall be issued by a financial institution, which is currently a member of the State of Tennessee Bank Collateral Pool, as maintained by the State of Tennessee Treasury Department.

(4) **Form of Security.** The security instrument shall express the value in a total amount equaling the sum of all work categories, and shall be in one of the following forms:

a. *Irrevocable Standby Letter of Credit.* Issued by or confirmed by a financial institution which is a member of the Tennessee Bank Collateral Pool and located in Williamson County, Tennessee, or an adjoining county. Any such letter of credit shall bear an initial term of at least 24 months, (See Appendix Four). The approved financial institution shall have an office or branch located in the State of Tennessee and shall authorize the surety to be presented for demand or draw at a place physically located within a 60 mile radius of the city limits of Brentwood, Tennessee.

b. *Cashier's or Certified Check.* Issued by a financial institution, which is a member of the Tennessee Bank Collateral Pool, and shall be non-expiring. All Cashier's checks accepted by the City shall be deposited into a special escrow account which will be used to complete the required improvements within a specified project (residential or commercial) should the developer fail to complete the required improvements. Upon completion of all required improvements and completion of the required

maintenance period, if applicable, the remaining amount, less any necessary draws shall be returned to the developer.

The Letter of Credit option shall not be available to an applicant whose past performance has resulted in breached or expired securities.

(5) **Issuing Bank Rating.** Either instrument must be from an approved financial institution having a "C" or better rating as shown in the latest edition of the LACE Quarterly Financial Institution Ratings guide compiled by the LACE Financial Corporation or its successors. An alternate rating issued by Standard & Poor's (S&P), Moody's Investor Service or Fitch Ratings shall be accepted by the City. Should the developer/subdivider elect to obtain an alternate rating using one of the companies shown above, the issuing financial institution shall have a minimum credit rating of "A" at the time of the submittal of the surety to Planning Department staff. The subdivider shall furnish applicable ratings data for the issuing financial institution with the submittal of the final subdivision plat. In no instance will ratings provided by an Internet bank rating company be accepted. Additionally, documentation detailing the issuing financial institution's stability will be required as part of the submittal. All applicable costs associated with providing the alternate rating shall be borne by the developer/subdivider. Approval of the security instrument, by the Finance Director shall be required before the subdivision plat may be recorded.

(6) **Completion of Improvements.** The period within which the required improvements must be completed shall be specified by the City and incorporated within the security instrument. Any changes or extensions to the timeframe or other stipulations as detailed within the performance agreement must be reviewed and approved by the Planning Commission.

(7) **Required Rating.** Should the LACE rating of the issuing financial institution fall below a "C" and/or the alternative credit rating from S & P, Moody's or Fitch falls below an "A" credit rating, the City shall provide written notification to the developer/subdivider to secure a new instrument that meets the requirements of these Regulations within 90 days of the date of the notification. If a new instrument is not in place within 90 days of the City's notification the City shall immediately process a draw on the letter of credit.

(8) **Second Bank Confirmation.** Since a letter of credit represents the obligation only of the issuing bank, a confirmation shall be required stating that a line of credit has been secured from the confirming financial institution, when the financial ratings of the issuing bank falls below those specified as part of these Regulations, or when other ratings or reports are published that indicate the strength of the issuing bank is at risk, or the distance from the City of Brentwood of the branch office authorized to accept draws is more than 60 miles. All documents presented by the confirming bank shall conform to the requirements of the original letter of credit and shall acknowledge the obligation of the confirming bank to assume the same responsibilities as the issuing bank. Including the obligation to pay against presented documents. Payment from the confirming bank must be guaranteed regardless of the stability of the issuing bank. In lieu of a confirmation, a new letter of credit from a financial institution meeting these Regulations may be required.

(9) **Inspections/Reductions.** The progress of the improvements shall be reviewed at least once a year by City staff, at which time the amount and expiration date of the security may be increased, reduced or extended, or the security may be released in recognition of significant work having been completed. If a reduction in the amount of the security for a platted subdivision is requested at any other time during the year by the applicant, a five hundred dollar ($500.00) fee will be charged to defray inspection, processing and administrative costs. If for any reason, the security is not renewed or extended as required

by the Planning Commission within thirty (30) days prior to the expiration date, or if the new documentation submitted is not in accordance with the requirements set forth herein, then the security will be assumed to be in default and the drawing on the security, in its full amount may be completed by City staff.

Staff from the Engineering Department shall be authorized to approve partial reductions in the amount of the security, provided:

a. No more than one (1) partial reduction shall be approved in the amount of the performance security instrument during the construction of the subdivision or section thereof. Partial reductions shall be authorized upon completion of an inspection by staff from the applicable City Departments and only if significant work has been completed since the initial submittal of the security. No reduction will be allowed until installation of the final asphaltic topping on the streets within the development has been completed.

b. In no event shall the amount of the security instrument be reduced to a level which, in the opinion of staff from the Engineering Department, would not allow for completion the subdivision, or affected section.

(10) **Letter of Credit Criteria.** All letters of credit accepted for security for required improvements shall meet the following standards, as applicable;

a. The initial term of the letter of credit shall be for a minimum of two (2) years from date of the recording of the final plat and shall be renewed as detailed within the performance agreement until project completion.

b. All letters of credit shall include an automatic renewal clause that provides at least 90 days advance notice of any decision by the issuing financial institution not to extend the document's expiration date.

c. The initial expiration date shall not fall on a weekend day, or national bank holiday.

d. The following language (or substantially similar language, acceptable to the City) shall be included on all letters of credit accepted for subdivision or commercial building improvements by the City of Brentwood. The blanks shall be completed appropriately.

> *We hereby issue this Irrevocable Standby Letter of Credit in your favor which is available at sight by drafts on (Name of Bank) , bearing the clause "Drawn under Irrevocable Standby Letter of Credit Number _____", accompanied by:*
>
> *Beneficiary's statement signed by one of its officials stating "(Name of the developer) has failed to complete certain improvements and/or has failed to obtain written authorizations for release from all affected agencies for the development project known as (Name of the project)."*

e. Partial drawings shall be permitted.

f. The following statement shall be included on all letters of credit;

> *"The City may complete draws on this Letter of Credit by delivery via Registered or Certified mail, Federal Express or other similar courier service, or by facsimile drawing with the required presentable by facsimile to __(Facsimile #)__, or by electronic mail to the following address _____."*

g. All letters of credit must include a statement detailing the improvements for which they were originally issued.

h. Should a security instrument expire it remains the developer's responsibility to replace the security instrument of complete the remaining outstanding work as identified the approved construction plans.

(11) **Security Instrument.** The security instrument shall name the City of Brentwood as obligee and shall be satisfactory to the City Attorney as to form, sufficiency and manner of execution.

(12) **Term of Security Instrument.** The security instrument shall remain in force in its full face amount, subject to any reductions permitted hereunder, until all public improvements are completed and accepted for maintenance where applicable, by the City.

(13) **Erosion Control.** An initial security for erosion control measures and off-site drainage improvements, shall be provided by the developer if applicable. This security shall conform to all guidelines outlined within these Regulations. Erosion control and off-site drainage security instruments shall be posted at an amount as calculated by staff from the Engineering Department. The security instrument must be in place before a grading permit will be issued. The security will remain in place, with no reductions, until such time as the Director of Engineering or his designee determines that erosion control is no longer needed. At any time, should the erosion control or off-site drainage be determined by the Director of Engineering or his designee to be ineffective, or in need of maintenance, the developer shall be notified and given 24 hours to take the necessary corrective action. After one incident, the City may select a approved contractor to correct the deficiencies without prior notification to the developer. Costs for the corrections will be drawn from the posted security and will be the responsibility of the developer. If, at any time, the amount of the security instrument falls below the current estimate of the cost to complete the work, the developer shall post new or additional security in the amounts required by the Director of Engineering or his designee. Failure to post security instrument in the required amount will result in the withholding of additional permits and/or approvals, including certificates of occupancy.

8.2 Failure to Complete Improvements.

In cases where a security instrument has been posted and required improvements have not been completed within the terms of such security instrument, or the requirements of these subdivision Regulations, City staff may declare the security to be in default and require that all the improvements be installed, regardless of the extent of the building development, or the expiration date of the security instrument, at the time the security is declared to be in default. The funds from the security shall be used to complete the improvements and or to reimburse the City for any and all expenses that may be incurred to complete the improvements. In the event the security instrument does not adequately cover the costs incurred by the City to complete the improvements, the Planning and Codes Director may place a hold on the issuance of building permits for those lots within the development, which have not had permits issued

for construction until such time as the developer has reimbursed the City for the total cost of the improvements, including legal and administrative costs.

8.3 Completion of Approved Facilities within Designated Open Space Areas.

All facilities and improvements proposed for construction or installation by the developer in any designated open space areas shall be completed by the developer or the developer's successor in interest, unless otherwise approved by the planning commission. All such facilities and improvements shall be fully secured, with a letter of credit or other surety acceptable to the City Attorney prior to the recording of the first platted section of the subdivision to ensure completion in accordance with the approved development plan and within the overall timetable for such improvements if the developer fails to complete such obligations.

8.4 Inspection/Testing of Improvements.

If it is determined by inspection that any required improvements have not been constructed in accordance with the City's construction standards and specifications, the applicant shall be responsible for completing the required improvements in accordance with the adopted standards. Wherever the cost of improvements is covered by a security instrument, the developer and the issuing financial institution shall be jointly liable for the cost of completing the improvements according to the approved specifications.

8.5 Maintenance Security.

Upon release of a security instrument, guaranteeing completion of the improvements, the City shall require a maintenance security in an amount as determined by staff from the appropriate City departments. Said maintenance security shall remain valid for a period of time as stipulated within the performance agreement and shall be, subject to the standards established in this Article.

8.6 Maintenance of Improvements.

The applicant shall be required to maintain all improvements including all lot improvements, until acceptance of the public improvements by the City or other appropriate entity.

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ARTICLE NINE. ADMINISTRATION

9.1 Interpretation, Conflict and Separability.

(1) **Interpretation.** In the interpretation and application of the Subdivision Regulations, the provisions of these Regulations shall be held to be adopted for the health, safety, and general welfare of the citizens of the City of Brentwood.

(2) **Provisions.** These Regulations are not intended to interfere with, abrogate, or annul any other resolution, ordinance, rule or regulation, statute, or other provision of law. Where any provision of these Regulations imposes restrictions different from those imposed by any other provision of these Regulations or any other resolution, rule or regulation, or other provision of law, the provisions that are more restrictive or impose higher standards shall control.

(3) **Private Provisions.** These Regulations are not intended to abrogate any easement, covenant or any other private agreement or restriction, provided that where the provisions of these Regulations are more restrictive or impose higher standards or regulations than such easement, covenant, or other private agreement or restriction, the requirements of these Regulations shall govern. Where the provisions of any easement, covenant, or private agreement or restriction impose duties and obligations more restrictive or standards that are higher than the requirements of these Regulations, or the determinations of the Planning Commission or the City in approving a subdivision or in enforcing these Regulations, and the private provisions are not inconsistent with these Regulations, then the private provisions shall be operative and supplemental to these Regulations and the determinations made under these Regulations.

(4) **Severability.** If any part or provision of these Regulations or application thereof to any person or circumstances is adjudged invalid by any court or competent jurisdiction, such judgment shall be confined in its operation to the part, provision, or application directly involved in the controversy in which such judgment shall have been rendered and shall not affect or impair the validity of the remainder of these Regulations or the application thereof to any other person or circumstances. The Planning Commission hereby declares that it would have enacted the remainder of these Regulations even without such part, provision, or application.

9.2 Saving Provision.

These Regulations shall not be construed as abating any action now pending under, or by virtue of prior existing Subdivision Regulations, or as waiving any section or provision existing at the time of adoption of these Regulations or amendments, or as vacating or annulling any rights obtained by any person, firm, or corporation by lawful action of the City, except as shall be expressly provided for in these Regulations.

9.3 Vacation of Plats.

(1) **General.** The vacation of a plat means that the plat is being destroyed and all public rights in the streets, alleys, public grounds, and all dedications laid out or described in the plat are being divested. A plat or any part of a plat may be vacated by the owner of the property, only as set forth in this section.

(2) **Procedure.** No plat may be vacated unless the vacation is approved by the Planning Commission. Any vacation which abridges or destroys any public rights to the use of any

property or any completed streets, alleys or other improvements shall also be submitted to the Board of Commissioners for approval.

(3) **Recordation.** An instrument evidencing the vacation of the plat shall be executed by the owners, acknowledged; and approved, by the City; and recorded in like manner as plats of subdivisions; and being duly recorded shall operate to destroy the force and effect of the recording of the plat so vacated, and to destroy all public rights in the streets, alleys, and public grounds, and all dedications laid out or described in such plat, except as may be reserved in such instrument.

(4) **Vacating Transferred Lots.** When lots have been sold, the plat may be vacated in the manner established herein, provided by all the owners of lots in such plat shall join in the execution of such writing.

(5) **Refund of Fees or Donations**. Regardless of the disposition of the plat vacation petition, the developer or the developer's successors will have no right to a refund of any monies, fees, or charges paid to the City nor to the return of any property or consideration dedicated to or delivered to the City except as may have previously been agreed to by the City and the developer.

9.4 Enforcement.

(1) **General.** The enforcement of these Regulations and penalties for the unapproved subdivision of land are authorized by public acts of the State of Tennessee. The Planning and Codes Director or his designee shall be responsible for investigating repeated violations of these Regulations, and may refer violations to the City Attorney for legal action.

(2) **Submission of Subdivision Plat for Approval.** No plat or plan for the subdivision of land into two (2) or more lots or tracts within the City of Brentwood shall be admitted to the land records of Williamson County or received or recorded by the county register of deeds until said plat or plan has received final approval in writing by the Planning Commission as provided in Section 13-4-302, Tennessee Code Annotated.

(3) **Acceptance of and Improvement of Unapproved Streets**. Pursuant to Section 13-4-307, Tennessee Code Annotated (and except as provided therein) no board, public official, or authority shall accept, lay out, open, improve, grade, pave or light any street or lay or authorize water mains or sewers or connection to be laid in any street within the City of Brentwood, unless such street shall have otherwise received the legal status of a public street prior to the adoption of these Regulations, or unless such street corresponds in its location and lines to a street shown on a subdivision plat approved by the planning commission.

9.5 Penalties.

(1) **Transferring Lots in Unapproved Subdivisions**. Per Section 13-4-306, Tennessee Code Annotated, whoever, being the owner or agent of the owner of any land, transfers, sells or agrees to sell or negotiates to sell such land by reference to or exhibition of or by other use of a plat of subdivision of such land without having submitted a plat of such subdivision to the Brentwood Planning Commission and obtained its approval and before such plat be recorded in the office of the county register, commits a Class C misdemeanor; and the description by metes and bounds in the instrument of transfer or other document used in the process of selling or transferring shall not exempt the transaction from such penalties.

The City, through the City Attorney or other official designated by the Board of Commissioners, may enjoin such transfer or sale or agreement by action or injunction.

9.6 Amendments.

For the purpose of providing for the public health, safety, and general welfare, the Planning Commission may amend the provisions imposed by these Subdivision Regulations. The Planning Commission shall hold public hearings on all proposed amendments as required by State law.

9.7 Variances.

(1) **General.** Where the Planning Commission finds that extraordinary hardships or practical difficulties may result from strict compliance with these Regulations, and the purposes of these Regulations may be served to a greater extent by an alternative proposal, it may approve variances to the Subdivision Regulations so that substantial justice may be done and the public interest secured. A variance shall not have the effect of nullifying the intent and purposes of these Regulations, and the Planning Commission shall not approve a variance unless it shall make findings, based upon the evidence presented to it in each specific case, that:

a. The granting of the variance will not be detrimental to the public safety, health, or welfare, or injurious to other property or improvements in the surrounding area;

b. The conditions upon which the request for a variance is sought, and are not applicable generally to other property;

c. Because of the particular physical surroundings, shape or topographic conditions of the specific property involved, or because of other extraordinary conditions specific to the property, a particular hardship to the owner would result, as distinguished from a mere inconvenience if the strict letter of these Regulations is carried out; and

d. The variance will not in any manner vary the provisions of the Zoning Ordinance, comprehensive plan, or official Zoning map.

(2) **Conditions.** In approving variances, the Planning Commission may require such conditions as will, in its judgment, secure substantially the objectives, standards, and requirements of these Regulations.

(3) **Procedures.** A separate written request for any such variance shall be submitted along with the initial filing of the related subdivision action for consideration by the Planning Commission. The written request shall state fully the grounds for the variance, and all facts relied upon by the applicant.

9.8 Appeals

For matters falling within the scope of the regulation powers granted to the Planning Commission by Tennessee Code Annotated, Title 13, Chapter 4, any person or persons, or any entity aggrieved by any decision, finding or interpretation of the Planning Commission may seek review by the appropriate court of record of such decision, finding or interpretation, in the manner provided by the laws of the State of Tennessee. Administrative appeals of staff interpretations regarding the general application of regulations and standards contained herein shall be appealed to the Planning Commission.

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ARTICLE TEN. ADOPTION AND EFFECTIVE DATE

10.1. Generally

(1) Before adoption of these subdivision regulations, a public hearing as required by Section 13-4-303, Tennessee Code Annotated, was held on December 7, 2009.

(2) These rules and regulations shall be in full force and effect from and after their adoption and effective date.

Adopted by the Planning Commission:

_____
Secretary, Planning Commission

_____
Date

_____
Effective Date

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APPENDIX ONE. DEFINITIONS AND ACRONYMS

Usage.

For the purpose of these Regulations certain numbers, abbreviations, terms, and words shall be used, interpreted, and defined as set forth in this Article.

Unless the context clearly indicates to the contrary, words used in the present tense include the future tense and words used in the plural include the singular.

Words and Terms Defined.

AASHTO. The American Association of State Highway and Transportation Officials.

ADA. The Americans with Disabilities Act.

Alley. A public or private right-of-way primarily designed to serve as secondary access to the side or rear of those properties whose principal frontage is on some other street.

Applicant. The owner of land proposed to be subdivided or their representatives who shall have express written authority to act on behalf of the owner. Consent shall be required from the legal owner of the premises.

Arterial Street. *A* continuous highway or system of highways, carrying heavy and relatively fast traffic, which connects cities and currently absorbs collector traffic, as shown on the major thoroughfare plan of the city.

ASTM. The American Society for Testing and Materials.

Base Flood The flood having a one percent chance of being equaled or exceeded in any given year.

Best Management Practices. That combination of conservation measures, structures or management practices that reduces or avoids adverse impacts of development on an adjoining site's land, water or waterways or water bodies.

Bike Route Plan. A plan, developed by the City identifying the location and alignment of all bikeways, bike routes and other trail systems.

Buffer. A naturally vegetated area or vegetated area along the exterior boundaries, of an entire development processed in accordance with a multiphase or phased subdivision application which is landscaped and maintained as open space in order to eliminate or minimize conflicts between such development and adjacent land uses.

Building Envelope. *The area formed by the front, sides and rear building setback lines of a lot within which the principal buildings or other structures must be located.*

Certify . Whenever these Regulations require that an agency or official certify the existence of some fact or circumstance, the municipality by administrative rule may require that such certification be made in any manner, oral or written, which provides reasonable assurance of the accuracy of the certification.

CFS, Cubic Feet per Second.

CIP Capital Improvements Plan, being a plan of proposed capital outlay appropriations and a means of financing them.

City Attorney. The licensed attorney designated by the City to furnish legal assistance for the administration of these Regulations.

Collector Street. an urban street which collects traffic from minor streets and feeds it into the arterial system; includes the principal entrance streets of a residential development and streets for major circulation within such development as shown on the major thoroughfare plan of the city.

Commercial and Service Institution streets. Streets designed to provide access to a platted commercial development consisting of more than one business, industry or commercial establishment or service institution use (as designated by the Zoning Ordinance).

Common Ownership. Ownership by the same person, corporation, firm, entity, partnership, or unincorporated association; or ownership by different corporations, firms, partnerships, entities, or unincorporated associations, in which a stockbroker, partner, or associate, or a member of the family owns an interest in each corporation, firm, partnership, entity, or unincorporated association

Concept Development Plan. A generalized plan indicating the boundaries of a tract of tracts under common ownership, and identifying proposed land use, land use intensity and thoroughfare alignment to enable the Subdivider to save time and expense in reaching general agreement with the Planning Commission as to the form of the plan and the objectives of these Regulations.

Construction Plan. The maps or drawings accompanying a subdivision plan or plat and showing the specific location and design of improvements to be installed in the subdivision in accordance with the requirements of the Planning Commission as a condition of the approval of the plat.

Conventional Lot. Lots or property with less than 15 percent (15%) grade and not located in a legally designated floodway overlay district.

Cul-de-Sac. A local street with only one outlet that terminates in a vehicular turnaround and having an appropriate terminal for the safe and convenient reversal of traffic movement.

Dead-end street. A permanent terminus of a local street, and the design shall facilitate turning movement of larger vehicles such as a school bus or fire truck.

Developer. The owner of land proposed to be subdivided or a representative who is responsible for any undertaking that requires review and/or approval under these Regulations. See Subdivider.

DIP. Ductile Iron Pipe

DRC. Development Review Committee

Easement. Authorization by a property owner for another to use the owner's property for a specified purpose.

FEMA. The Federal Emergency Management Agency.

FIPS. Federal Information Processing Standards

Front yard The yard extending across the entire width of a lot between the right-of-way line of a

public street and the front elevation of a principal structure, including covered porches, canopies and carports.

Frontage. That side of a lot abutting on a street or way and ordinarily regarded as the front of the lot; but it shall not be considered as the ordinary side of a corner lot.

GPM . Gallons Per Minute

Grade. The slope as specified in terms of percentage.

HDPE . High-Density Polyethylene (pipe)

Health Safety or General Welfare . The purpose for which municipalities may adopt and enforce land use regulations for the prevention of harm or promotion of public benefit to the community; commonly referred to as police power.

Hillside Protection Overlay. An overlay zoning district established to meet the challenges of development in the higher elevation areas of the city. The district shall include all areas with an elevation of 850 feet or greater. Any development or land disturbance within this area shall comply with the technical and development standards of Division 14 of the Zoning Ordinance and the associated requirements of the underlying zoning district.

IES. Illuminating Engineering Society

Individual Sewage Disposal System. A septic tank, seepage tile sewage disposal system, or any other approved sewage treatment device.

LFE Lowest floor means the lowest floor of the lowest enclosed area (including basement). The lowest floor of a deck shall be the top of the lowest finished surface.

Local Government . The municipality of Brentwood.

Local (Minor) Street. A street whose principal function is to provide access to abutting properties rather than move large volumes of traffic.

Lot. A tract, plot, or portion of a subdivision or other parcel of land intended as a unit for the purpose, whether immediate or future, of transfer of ownership, or possession, or for building development.

Lot Improvement . Any building, structure, place, or other object situated on a lot constituting a physical betterment of real property.

Major Subdivision. The division of land either commercial or residential into multiple lots, where new infrastructure is required.

Minor Subdivision. A minor modification of an existing lot either commercial or residential such as a change in setback or a shift in property line, or a minor division of property into two or more lots where no new infrastructure is required.

Major Thoroughfare Plan The street map adopted by the City, pursuant to law, showing the configuration and classification of existing and proposed streets, and highways.

MPH. The rate of speed measured in miles traveled per hour.

MUTCD. Manual for Uniform Traffic Control Devices.

NAD. North American Datum.

NAVD North American Vertical Datum, 1988

New Development . A project involving the construction, reconstruction, redevelopment, conversion, structural alteration, relocation, or enlargement of any structure; or any use or extension of land, which requires either the approval of a plat pursuant to these Regulations, the issuance of a building permit, or connection to the City's water or sanitary sewer system.

NFPA. National Fire Protection Association.

Non-Residential Subdivision. A subdivision whose intended use is other than residential, such as commercial or industrial.

Off-Site. Any premises not located within the area of the property to be subdivided, whether or not in the common ownership if the applicant for subdivision approval.

Ordinance . Any legislative action, however denominated, of a local government, which has the force of law, including any amendment or repeal of any ordinance.

OSRD. A City of Brentwood zoning district – Open Space Residential Development.

OSRD-IP. A City of Brentwood zoning district – Open Space Residential Development – Innovative Project.

Owner. The person who holds the fee simple title to the property, and the person of persons who have acquired any interest in the property by contract, or purchase or otherwise.

Person . Any individual or group of individuals; or any corporation, general or limited partnership, or other business entity; or any joint venture, unincorporated association, or any other group or organization acting as a unit.

Planned Commercial Development. An interrelated development adhering to a master development plan and located on a single tract of land, or on two or more tracts of land which may be separated only by a street or other right-of-way. A planned development may be characterized by two or more adjoined structures in separate ownership and having zero-foot side setbacks on internal lot lines or by two or more tracts in separate ownership and with separate structures.

Preliminary Plan. The preliminary drawing or drawings, described in these Regulations, developed to identify the location and general relationship between sections, in a phased development, land uses, improvements, structures, circulation systems, landscaping and design elements.

Private Street. Any street that is not publically owned and maintained and used for access by the occupants of a specific development, property owners, their guests and the general public.

Property Owners Association (Homeowners Association). An association or organization, whether or not incorporated, which operates under and pursuant to recorded covenants or deed restrictions, through which each owner of a portion of a subdivision-be it a lot, parcel site, unit plot,

condominium, or any other interest-is automatically a member as a condition of ownership and each such member is subject to a charge or assessment for a pro-rated share of expense of the association which may become a lien against the lot, parcel, unit, condominium, or other interest of the member.

Public Improvement. Any drainage ditch, street, parkway, sidewalk, pedestrian way, tree, lawn, off-street parking area, lot improvement, or other facility for the local government may ultimately assume the responsibility for maintenance and operation, or which may effect an improvement for which local government responsibility is established.

Public Meeting. A meeting of the Planning Commission or Governing Body proceeded by notice, open to the public and at which the public may, at the discretion of the body holding the public meeting is heard.

R-2 A City of Brentwood zoning district – Suburban Residential

Rear yard The yard extending across the entire width of the lot between the rear lot line and the rear elevation of the principal building, including covered porches, canopies and carports.

Registered Architect. An individual registered in the State of Tennessee to practice in the field of architecture.

Registered Engineer. An engineer properly licensed and registered in the State of Tennessee.

Registered Landscape Architect. An individual registered in the State of Tennessee to practice in the field of landscape architecture.

Registered Land Surveyor. A land surveyor properly licensed and registered in the State of Tennessee.

Resubdivision. Any change in a map of an approved or recorded subdivision plat that affects any street layout, any area reserved for public use, any lot line, or that affects any map or plan legally recorded prior to the adoption of any regulations controlling subdivisions.

Right-of-Way. A strip of land acquired by reservation, dedication or condemnation and intended to be occupied by a public road and other public utilities, (Also referred to as Street Right-of-Way width.)

Roundabout. A circular intersection with a raised island that is usually landscaped and located at the intersection of two street legs used to reduce traffic speeds and accidents without diverting traffic onto adjacent residential streets.

Screening. A method of visually shielding or obscuring one abutting or nearby structure or use from another by fencing, walls, berms, or densely planted vegetation.

SCS. The United States Soil Conservation Service

Security Instrument. An Irrevocable Standby Letter of Credit or Cashier's check, that meets the requirements of Article Eight of these Regulations submitted to insure the completion of required improvements, within residential, commercial and service institution projects.

Setback. The minimum distance by which any building or structure must be separated from a street right-of-way or lot line.

Side yard A yard extending along the side lot line from the front yard to the rear yard and

lying between the side lot line and the side elevation of the principal building, including covered porches, canopies and carports.

Sinkhole A hole or irregularly shaped depression usually formed in rock or soil by the action of water that is connected to an underground passage or hollow area.

Site-related facility. An improvement or facility which is for the primary use or benefit of a new development and/or which is for the primary purpose of safe and adequate provision of [identify categories of public facilities for which an impact fee is to be charged] to serve the new development, and which is not included in the capital improvements program and for which the developer or property owner solely responsible under subdivision or other applicable regulations.

Splitter Island. A raised, mountable, triangular island meant to guide traffic and separates the opposing lanes of each street where it intersects a roundabout.

Steep Lots. Lots or property with 25 percent (25%) grade or greater.

Street Classification. For the purpose of providing for the development of the streets, highways and rights-of-way in the governmental unit, and for their future improvement, reconstruction, realignment, and necessary widening, including provision for curbs and sidewalks, each existing street, highway, street, and right-of-way-way, and those located on approved and filed plats, have been designated on the Major Thoroughfare Plan of the City and classified therein. The classification of each street, highway, street, and right-of-way is based upon its location in the respective zoning districts of the local government and its present and estimated future traffic volume and its relative importance and function as specified in the Master Plan of the local government. The required improvements shall be measured as set forth for each street classification on the Major Thoroughfare Plan.

Subdivide. The act or process of creating a subdivision.

Subdivider. Any person who (1) having an interest in Land, causes it, directly or indirectly, to be divided into a subdivision or who (2) directly or indirectly, sells, leases, or develops, or offers to sell, lease, or develop, or advertises to sell, lease, or develop, any interest, lot, parcel site, unit, or plat in a subdivision, or, who (3) engages directly or through an agent in the business of selling, leasing, developing, or offering for sale, lease, or development a subdivision or any interest, lot, parcel site, unit, or plat in a subdivision, and who (4) is directly or indirectly controlled by, or under direct or indirect common control with any of the foregoing.

Subdivision. The division of a tract or parcel of land into two or more lots, sites, or other divisions requiring new street or utility construction, or any division of less than five acres, for the purpose, whether immediate or future, of sale or building development, and includes resubdivision and when appropriate to the context, relates to the process of resubdividing or to the land or area subdivided. In the event the definition of "subdivision" contained within T.C.A. § 13-4-301(4)(B) is amended or replaced, or any other statute hereafter makes another definition of "subdivision" applicable to the city, then such newly adopted definition shall supersede the definition set forth herein.

Subdivision Performance Agreement. A contract entered into by the applicant and the Planning Commission on behalf of the municipality by which the applicant promises to complete the required public improvements within the subdivision in a specified time period following final subdivision plat approval.

Subdivision Plat . The final map or drawing, described in these Regulations on which the subdivider's plan of subdivision is presented and approved by the Planning Commission for approval and which, if

approved, may be submitted to the County Clerk or Recorder of Deeds for filing. (Also referred to as a Final Subdivision Plat.)

T.C.A. The Tennessee Code Annotated

TDEC. The Tennessee Department of Environment and Conservation.

TDOT. The Tennessee Department of Transportation.

Temporary Improvement. An improvement built and maintained by a subdivider during construction of the subdivision and prior to release of the required security.

TMDL. Total Maximum Daily Loads.

Traffic Impact Study. An analysis of the effect of traffic generated by a development on the capacity operations and safety of the public street and highway system.

Transitional Lot. Lots or property having a grade of at least 15 percent (15%), but less than 25 percent (25%) grade.

Travelway. An area intended for traffic, including highways, local streets, private roads, and trafficways within private property area that have some form of traffic control.

TSS. Total Suspended Solids.

USGS. The United States Geological Survey.

WNA. Waterway Natural Area means the area adjacent to, on either side, an intermittent or perennial stream waterway, as determined by the city, state, or USGS topographic information that is to remain in its natural state to protect the quality and ecology of the stream.

Yard The entire area of the lot including front, side and rear yards. The buildable or usable area of the yard is subject to restrictions on the location and placement of structures through the establishment of minimum separation requirements (setbacks) from the adjoining lots and right-of-way and by the recording of public utility and drainage easements.

Zoning Ordinance. Chapter 78 of the City of Brentwood Municipal Code.

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APPENDIX TWO. CONSTRUCTION DRAWINGS – CHECKLIST AND STANDARD DRAWINGS

The developer shall submit to both the Engineering Department and the Water/Sewer Department three (3) sets of construction drawings and applicable engineering calculations stamped by a civil engineer licensed to practice in the State of Tennessee. Upon the initial review by these departments, all comments and corrections will be sent to the developer for correction. Once all the comments are addressed to the satisfaction of the City, the developer will re-submit six (6) sets of plans to be stamped approved for construction.

The following list of plans is an overview of a typical set of construction drawings for submittal purposes:

(1) Cover Sheet.

a. Name of the project.

b. Section number or phase of the project.

c. Vicinity map – scale to be determined by the applicant.

d. Name, address, and phone number of the engineering company.

e. Name, address, and phone number of the developer.

f. List of sheet titles and sheet numbers contained in the construction drawings.

g. Date of submittal and list of revision or addendum dates.

(2) Preliminary Plan. Copy of the current approved preliminary plan as a reference plan.

(3) Overall Site Grading and Drainage Plan.

a. Boundary data of the project area; bearing and distances shall be based on Tennessee State Plane Coordinate System, 4100 ADS Zone: 5301 UTM Zones: 16 and 17, North American Datum (NAD) 83 datum.

b. North arrow to specify horizontal datum.

c. Topographic data showing two-foot contour intervals and based upon North American Vertical Datum (NAVD) 1988.

d. Extend contour information a minimum of 100 feet outside of the boundary of the project.

e. Scale shall be a minimum of one inch equals 100 feet.

f. Benchmark elevations and locations.

g. Lot line bearings and distances; curve data shall include the delta angle in degrees, minutes and seconds, length of curve, tangent length, chord length, and bearing.

h. Street centerline bearings and distances; curve data shall include the delta angle in degrees, minutes and seconds, length of curve, tangent length, chord length, and bearing.

i. Area of each lot.

j. Minimum building setback lines.

k. Public utility and drainage easements along rights-of-way and lot lines.

l. Label transitional lots (lots containing 15 percent and greater slopes existing and proposed ground slopes).

m. Label all open space areas (if applicable).

n. Label all notable features such as tree masses, cemeteries, fence rows, sinkholes, and ponds.

o. All wetlands and streams, and provide classification of stream types.

p. Location of all stream buffers and label widths of no-disturbance areas.

q. 100-year floodplain from the most recently adopted Flood Insurance Rate Map (F.I.R.M.) or calculated floodplain from a flood study by an engineer licensed in the State of Tennessee; differentiate the floodway and floodway fringe on the drawings.

r. Label 850-foot and 930-foot contour elevation lines (if applicable).

s. Location and description of any encroachments on the subject property.

t. Grading plan, showing the finished grade elevations of streets and lots.

u. Grading plan for all stormwater quantity and quality control features.

v. Drainage inlets and piping system.

w. Drainage schedule of proposed structures including material type, size of pipe, type of grate, inverts of structures, length of pipe and slope.

x. Location and description of off-site drainage structures and easements including size of pipe, invert elevations, and length of pipe.

y. Sidewalk locations.

z. Bike path locations.

aa. Streetlight locations, details of post and fixture type, the type shall be the same as other sections.

bb. Drainage schedule table.

cc. Entrance features including walls, fences and landscaped areas.

dd. Location of all tree protection measures.

(4) Plan and Profile Sheets.

a. Plan scale shall be a minimum of one inch equals 50 feet.

b. Profile scale shall be a minimum horizontal one inch equals 50 feet and vertical one inch equals five feet.

c. Plan view area and profile area.

d. North arrow.

e. Centerline and stationing of the street.

f. Label beginning of vertical curve, point of intersection of slope change, and the end of the curve.

g. Calculate the K-value of each curve based upon design speed.

h. Profile the location of any drainage, sanitary sewer, or waterline crossings to verify minimum cover requirements.

i. Existing ground elevation and finished pavement grade elevation at every 50-foot station on the profile view.

j. Low point and high point station and elevation of each vertical curve.

(5) Construction Details.

a. Street typical section.

b. Curb and gutter section.

c. Pavement section.

d. Sidewalk detail.

e. Underdrain detail.

f. Drainage inlet and grates detail.

g. Utility trenches within pavement areas and outside paved areas.

h. Headwalls.

i. Stone rip-rap aprons.

j. Erosion-siltation controls.

k. Tree protection measures.

l. Detail of stormwater quality and quantity control features.

m. Detail of sedimentation controls.

(6) Erosion-Siltation Control Plans.

a. Prepare Pre-Construction site plan of controls and measures to be installed in the initial phase of construction including sedimentation ponds, diversion ditches, silt fences, grassed swales, and construction entrances.

b. Provide information to the contractor and owner pertaining to the maintenance and inspection schedule for each control measure as required by the Notice of Coverage.

c. Prepare During-Construction site plan showing the relocation of erosion-siltation control measures and additional measures to be installed during various phases of construction.

d. Post-Construction site plan.

e. Additional measures required for sedimentation controls.

(7) Traffic Signage Plans.

a. Location of stop signs, street name signs, dead-end signs, speed limit signs, and notice signage at the end of temporary turnarounds.

b. Detail of the size of sign, size of lettering, typical dimension of the height of sign and post, and distance from the curb.

(10) Water and Sanitary Sewer Plans.

a. Refer to the latest adopted water and sewer specifications of the City of Brentwood.

STANDARD DRAWINGS.

(1) General: The purpose of this section is to include drawings of details for construction. These drawings are to be used in conjunction with the specifications. Details concerning the construction of sewer and service lines shall be referenced to the "Standard Specifications for Collector Sewers, Service Lines and House Connections for the City of Brentwood, Tennessee." Any special construction problems or conditions not covered by the Specifications or Drawings shall be submitted to the City of Brentwood for approval.

(2) List of Drawings:

1. The following Standard Drawings are included in this section.

Drawing 1	-	Reinforced Concrete Headwall
Drawing 2	-	Straight Endwall for Pipe Arch
Drawing 3	-	Straight Endwall for Circular Pipe
Drawing 4	-	Standard Concrete Sidewalk
Drawing 5	-	Standard Driveway Ramps
Drawing 6	-	Standard Curbs and Gutter
Drawing 7	-	Underdrain Details
Drawing 8	-	Standard Catch Basin
Drawing 9	-	Typical Roadway Section
Drawing 10	-	Details of Single Inlet Precast
Drawing 11	-	Area Drain
Drawing 12	-	Details of Double Inlet Precast
Drawing 13	-	RESERVED
Drawing 14	-	Detail of Standard Ladder Bars
Drawing 15	-	Combination Manhole Inlet Shallow Type
Drawing 16	-	Combination Manhole - Inlet
Drawing 17	-	Concrete Protection
Drawing 18	-	Handicap Ramp Detail
Drawing 19	-	IP Collector With Median-Plan View
Drawing 20	-	IP Collector With Median-Cross Section
Drawing 21	-	IP Collector Without Median-Plan View
Drawing 22	-	IP Collector Without Median-Cross Section
Drawing 23	-	IP Local-Plan View
Drawing 24	-	IP Local-Cross Section
Drawing 25	-	IP Local (Abutting Open Space) - Plan View
Drawing 26	-	Roundabout Details
Drawing 27	-	IP Cul-De-Sac - Plan View
Drawing 28	-	IP Rear Service Lane - Cross Section
Drawing 29	-	Extruded and Ribbon Curb

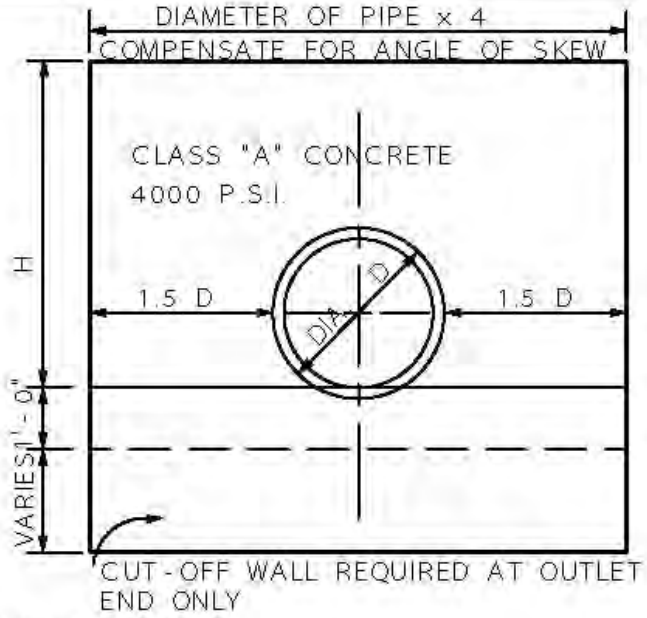
NOTE:

DIMENSION H = D + 1'-6" MIN. OR AS CALLED FOR ON PLANS

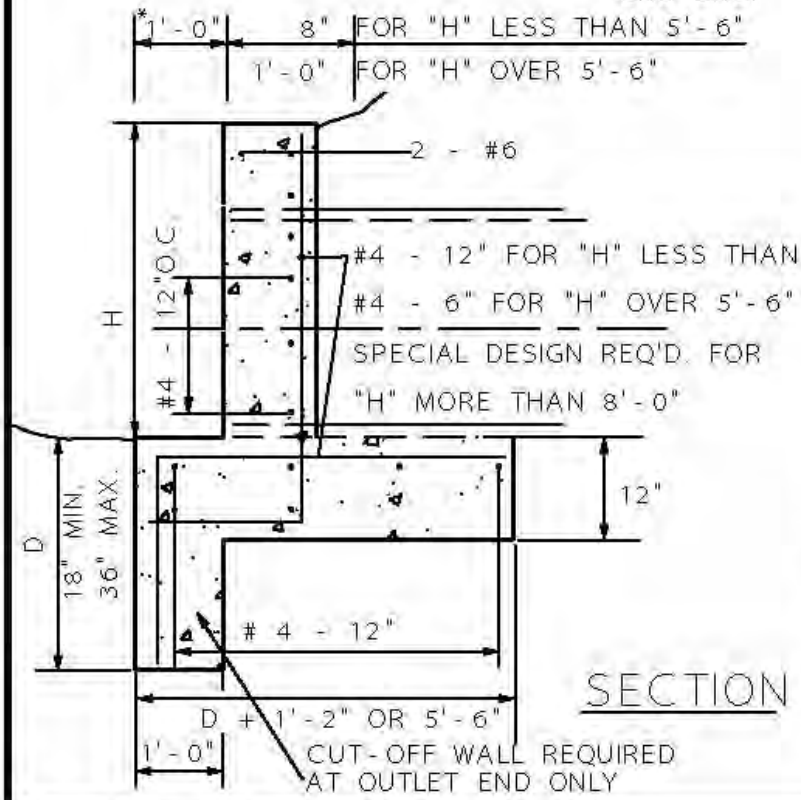
* 1' - 10" WHERE TRASH RACK IS REQUIRED

** QUANTITIES INCLUDE CUT-OFF WALL

REQUIRED TO ACCOMODATE DITCH GRADES



PLAN



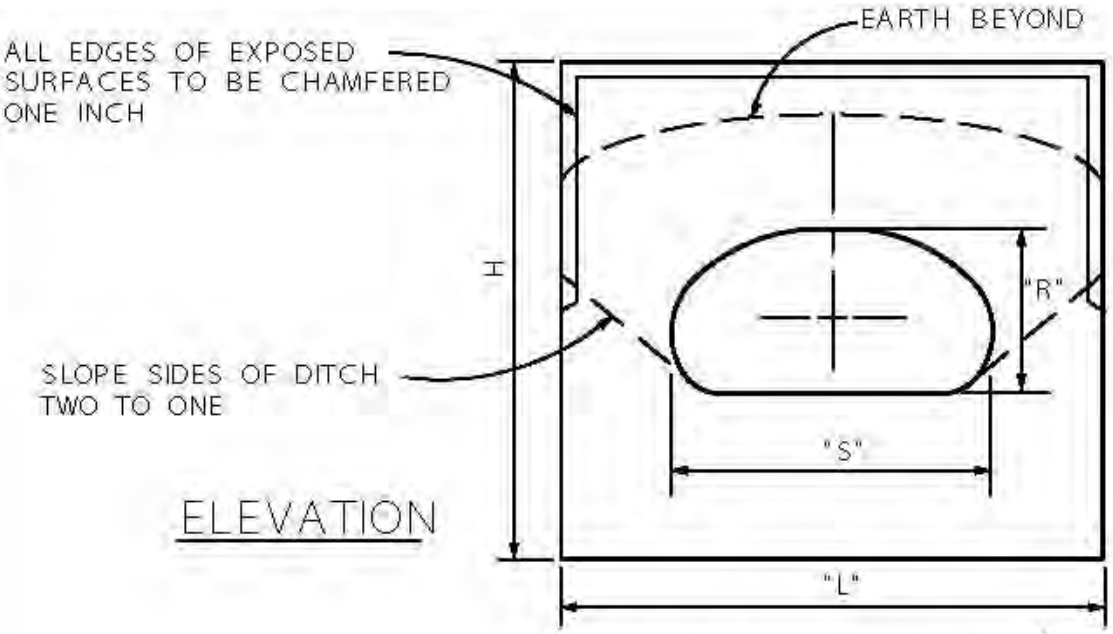
SECTION

DIAMETER OF PIPE	CONC. C. Y. **	REINF. STL. LBS. **
18"	1.2	55
24"	2.3	105
30"	3.0	130
36	4.3	180
42	5.5	230
48	7.9	350
54	9.6	410
60	11.0	480

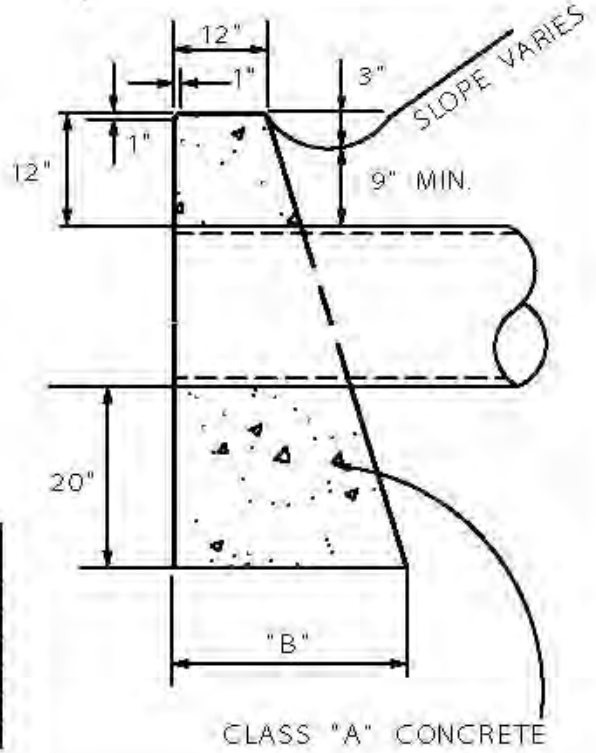
REINFORCED CONCRETE HEADWALL

DRAWING NO. 1

(NOT TO SCALE)



ELEVATION

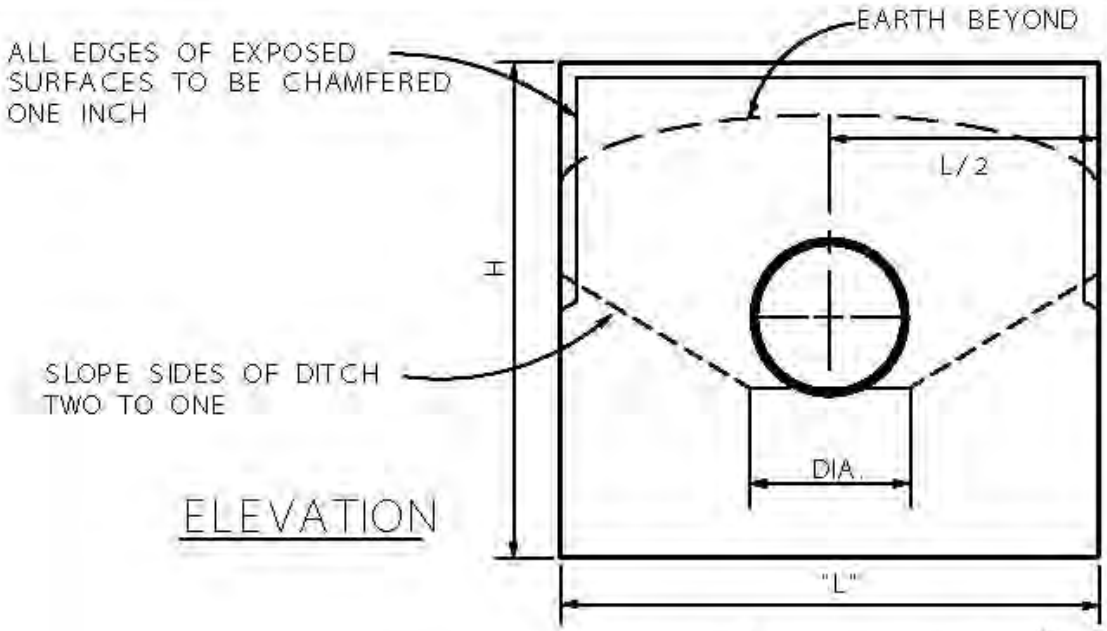


SECTION

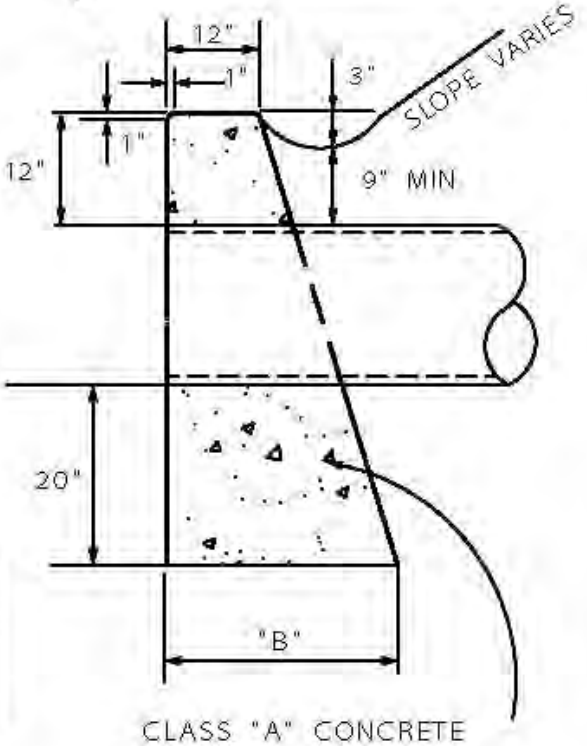
"S"x"R"	"H"	"B"	"L"
22"X13"	3' - 9"	1' - 11 1/4"	5' - 1"
25"X16"	4' - 0"	2' - 0"	6' - 1"
29"X18"	4' - 2"	2' - 0 1/2"	6' - 11"
36"X22"	4' - 6"	2' - 1 1/2"	8' - 6"
43"X27"	4' - 11"	2' - 2 3/4"	10' - 4"
50"X31"	5' - 3"	2' - 2 3/4"	11' - 11"

STRAIGHT ENDWALL FOR PIPE ARCH DRAWING NO. 2

(NOT TO SCALE)



ELEVATION



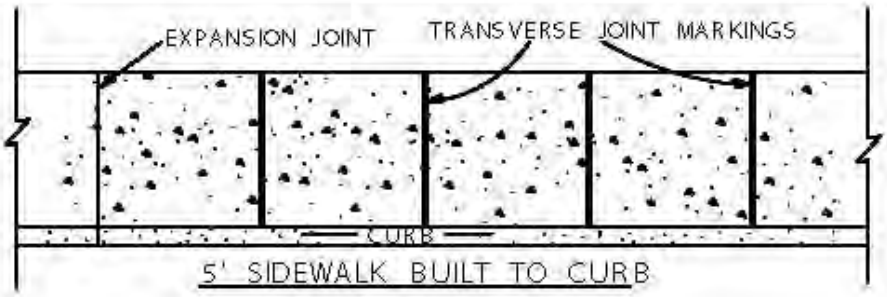
SECTION

DIA.	"H"	"B"	"L"
18"	4' - 2"	2' - 0 1/2"	6' - 0"
21"	4' - 5"	2' - 1 1/4"	7' - 0"
24"	4' - 8"	2' - 2"	8' - 0"
30"	5' - 2"	2' - 3 1/2"	10' - 0"

CLASS "A" CONCRETE

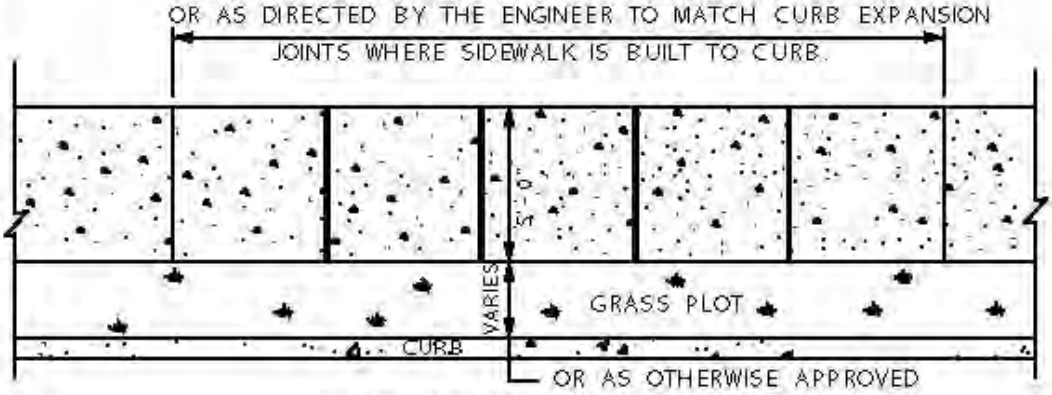
STRAIGHT ENDWALL FOR CIRCULAR PIPE DRAWING NO. 3

(NOT TO SCALE)



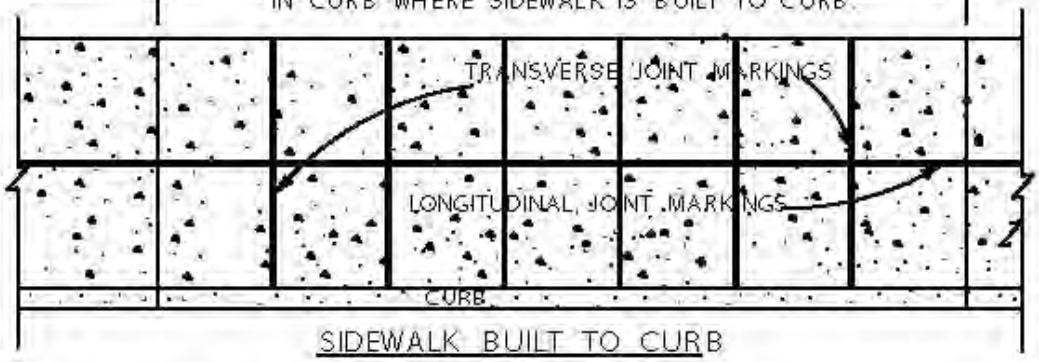
5' SIDEWALK BUILT TO CURB

EXPANSION JOINT TO BE SPACED A MAXIMUM OF 20' APART
OR AS DIRECTED BY THE ENGINEER TO MATCH CURB EXPANSION
JOINTS WHERE SIDEWALK IS BUILT TO CURB.



5' SIDEWALK WITH GRASS PLOT

EXPANSION JOINT TO BE SPACED A MAXIMUM OF 20' APART
DEPENDING ON MARKINGS, FIXED EXPANSION JOINTS AND JOINTS
IN CURB WHERE SIDEWALK IS BUILT TO CURB.

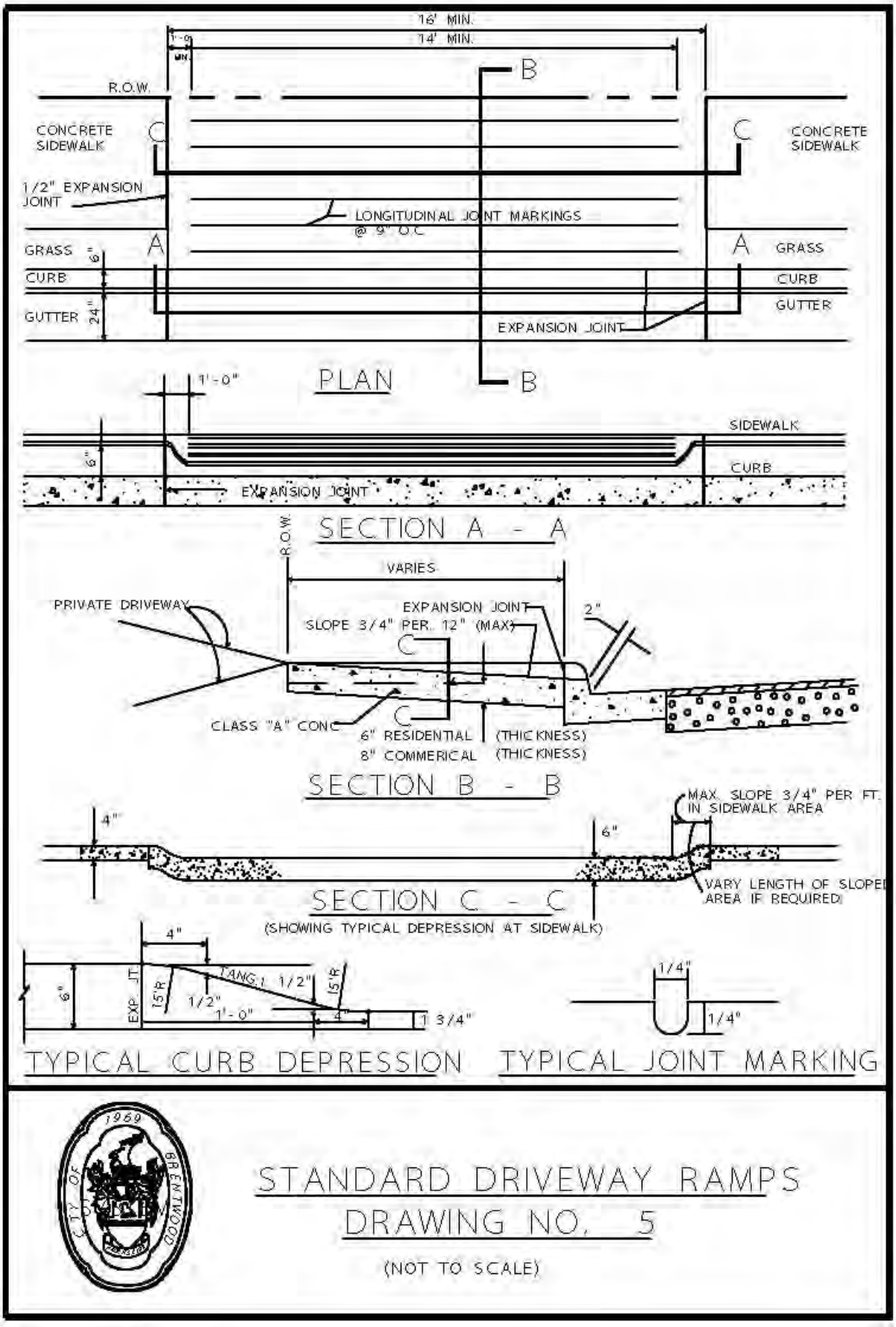


SIDEWALK BUILT TO CURB
(WIDTH GREATER THAN 6')

NOTE:
SIDEWALKS SHALL BE 4" MIN. THICKNESS CLASS "A" CONCRETE

STANDARD CONCRETE SIDEWALK
DRAWING NO. 4

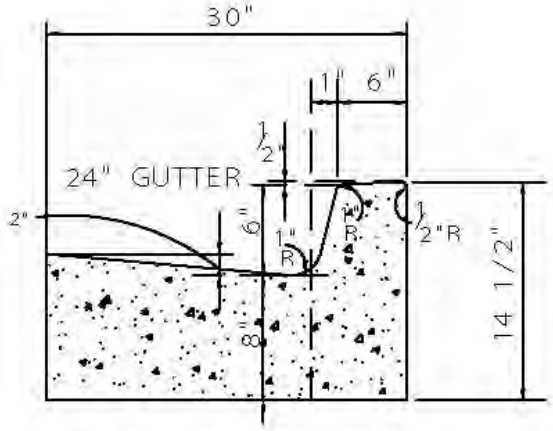
(NOT TO SCALE)



STANDARD DRIVEWAY RAMPS

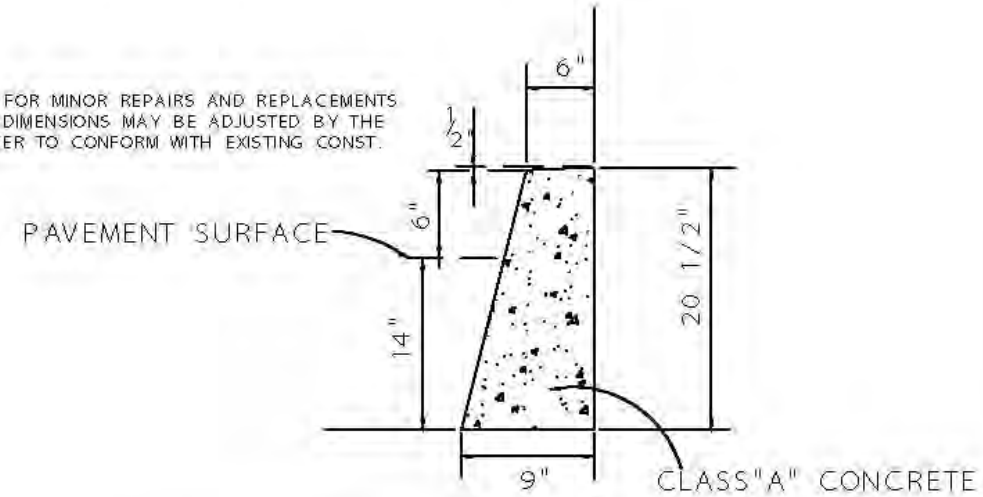
DRAWING NO. 5

(NOT TO SCALE)



TYPICAL CROSS-SECTION OF CURB & GUTTER

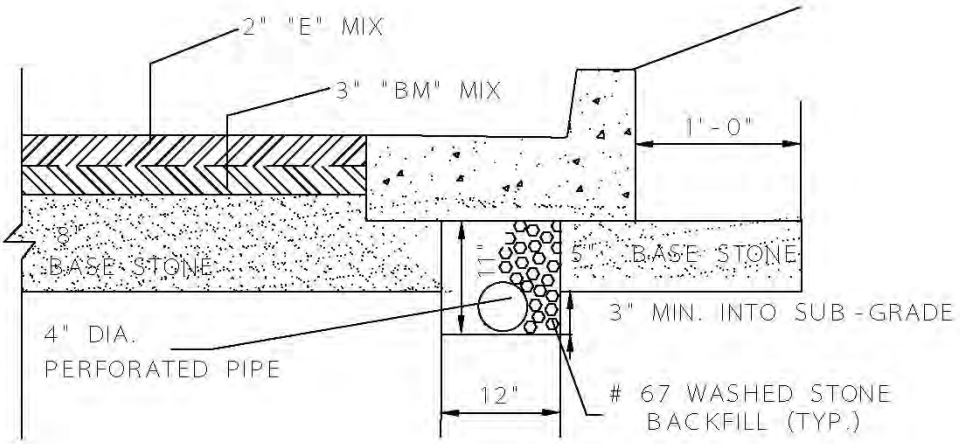
NOTE: FOR MINOR REPAIRS AND REPLACEMENTS CURB DIMENSIONS MAY BE ADJUSTED BY THE ENGINEER TO CONFORM WITH EXISTING CONST.

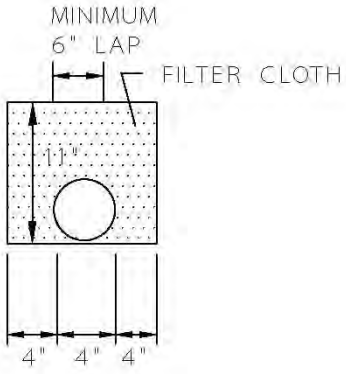


TYPICAL CROSS-SECTION OF CURB WITHOUT GUTTER

STANDARD CURBS & GUTTER
DRAWING NO. 6

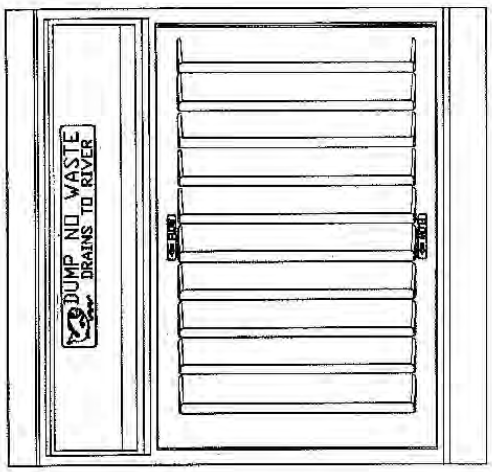
(NOT TO SCALE)

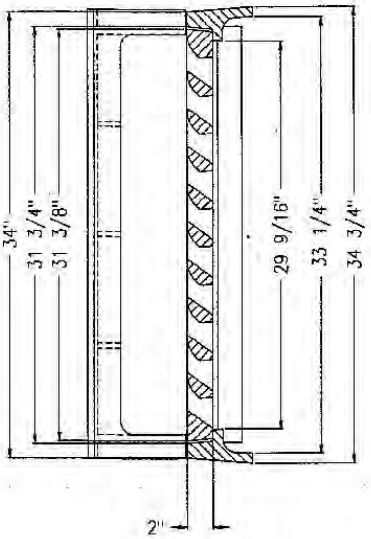


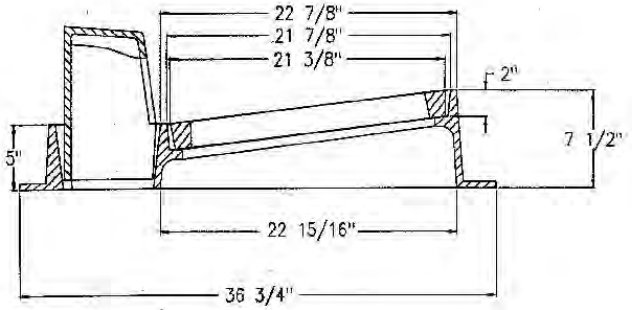


UNDERDRAIN DETAIL
DRAWING NO. 7

(NOT TO SCALE)



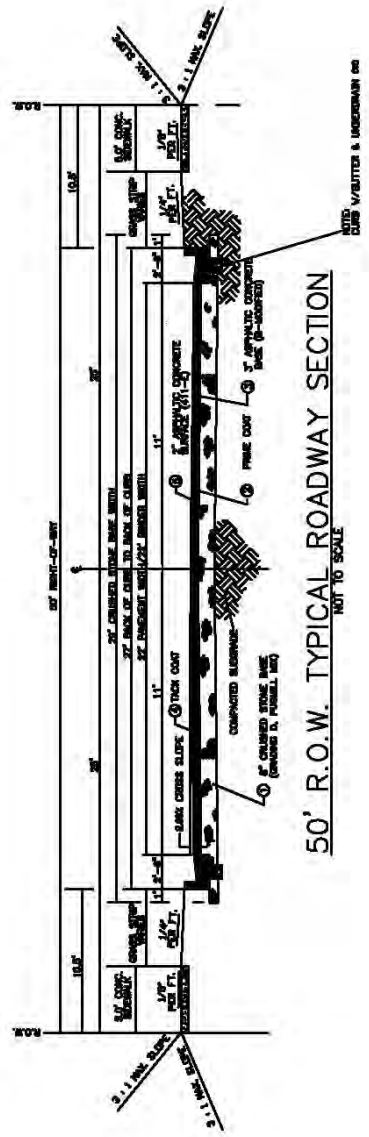




* MODEL 3300-V CURB INLET AS MANUFACTURED BY JBS OR EQUIVALENT.
** OPEN AREA = 1.88 SQ. FT.

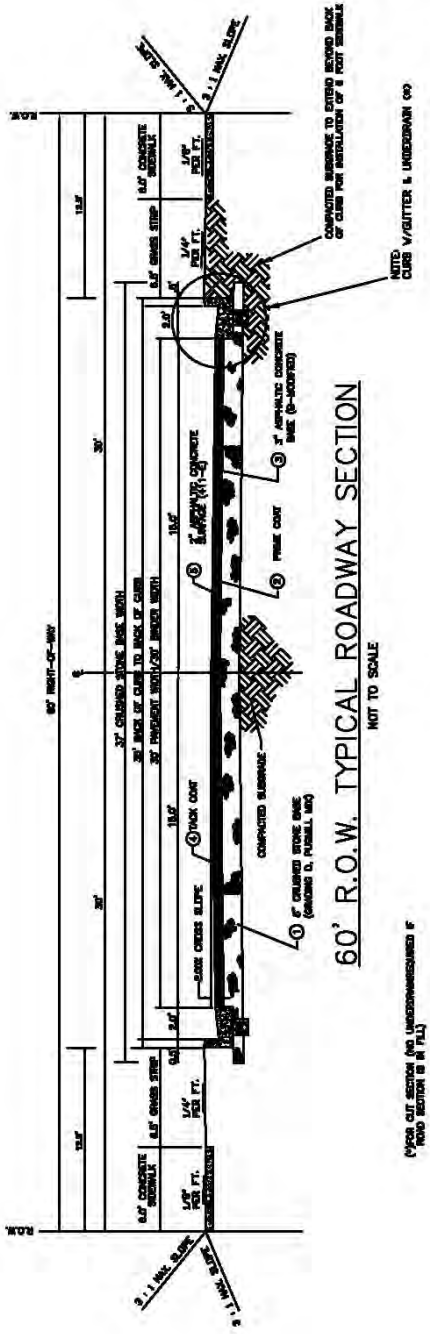
STANDARD CATCH BASIN
DRAWING NO. 8

(NOT TO SCALE)



50' R.O.W. TYPICAL ROADWAY SECTION

NOT TO SCALE



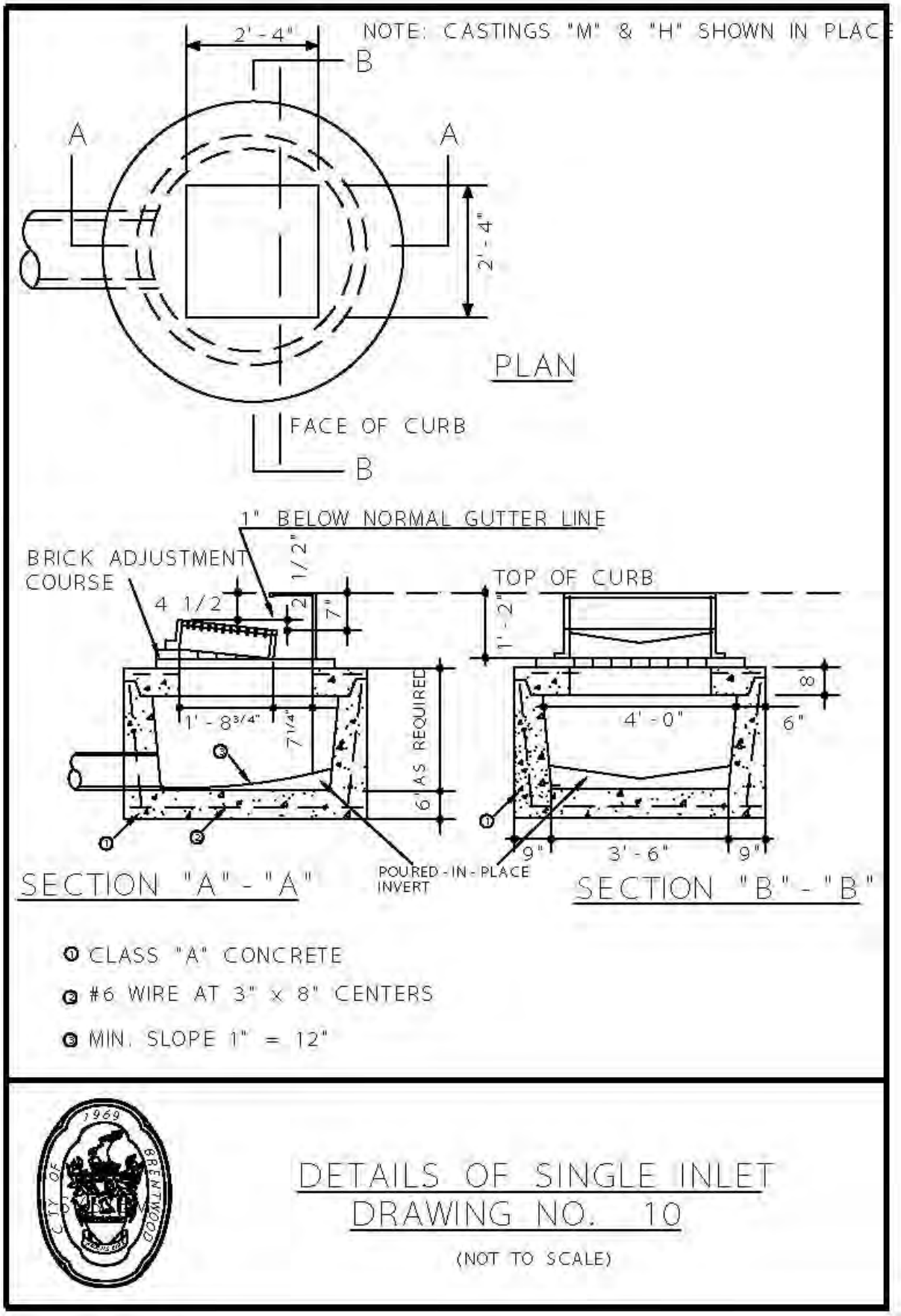
60' R.O.W. TYPICAL ROADWAY SECTION

NOT TO SCALE

TYPICAL ROADWAY SECTION

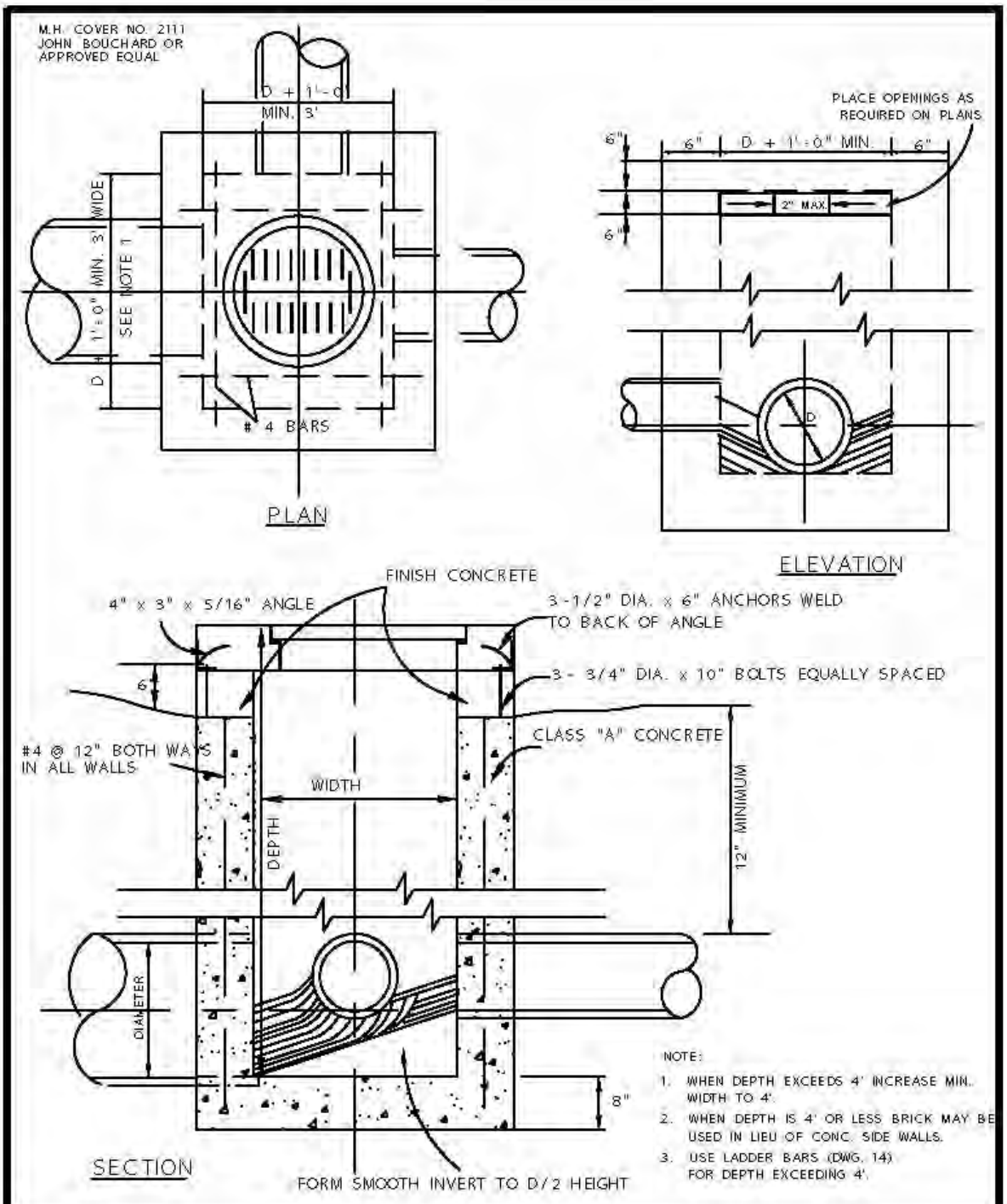
DRAWING NO. 9

(NOT TO SCALE)



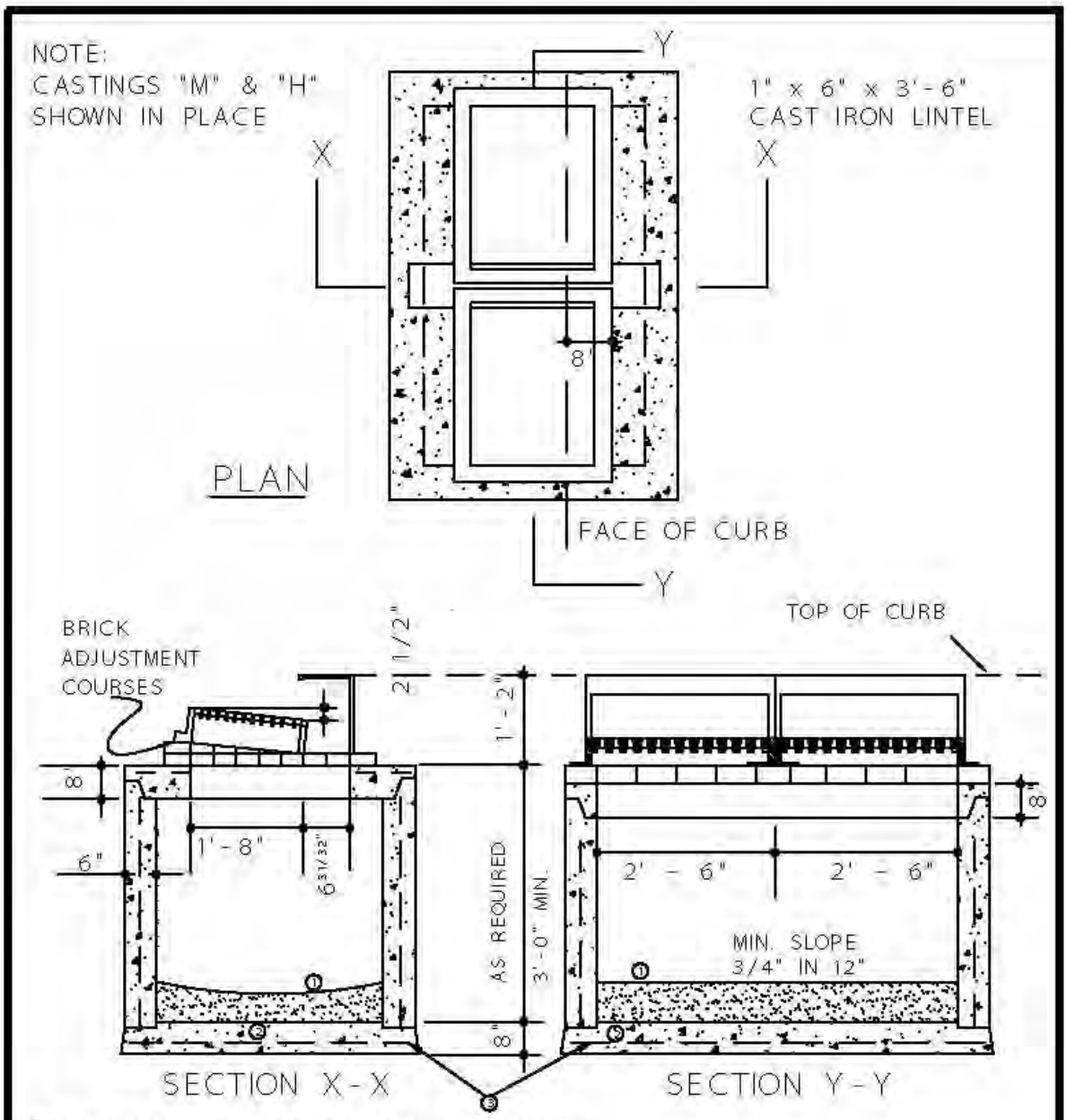
DETAILS OF SINGLE INLET
DRAWING NO. 10

(NOT TO SCALE)



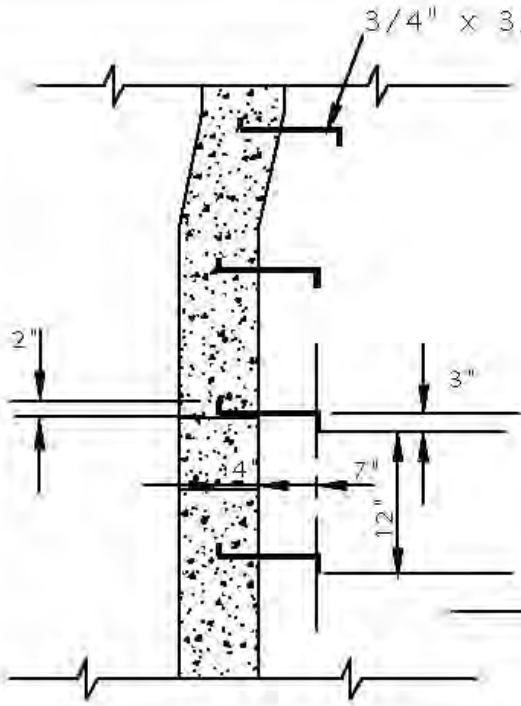
AREA DRAIN
DRAWING NO. 11

(NOT TO SCALE)

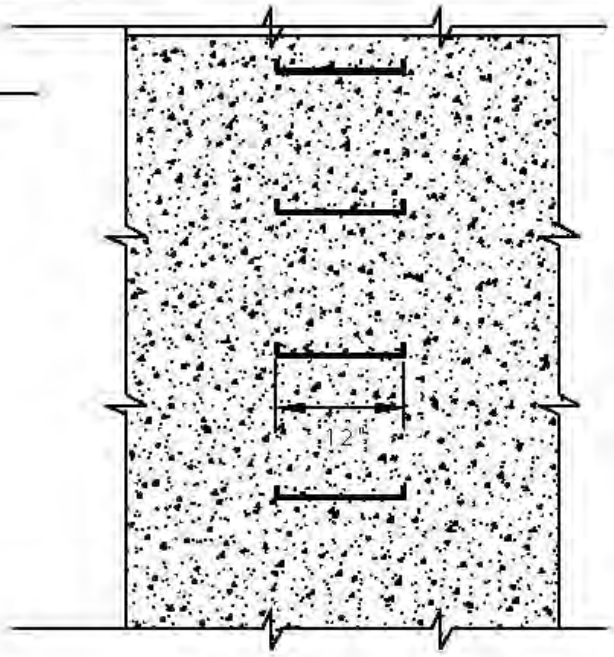


DETAILS OF DOUBLE INLET
DRAWING NO. 12

(NOT TO SCALE)



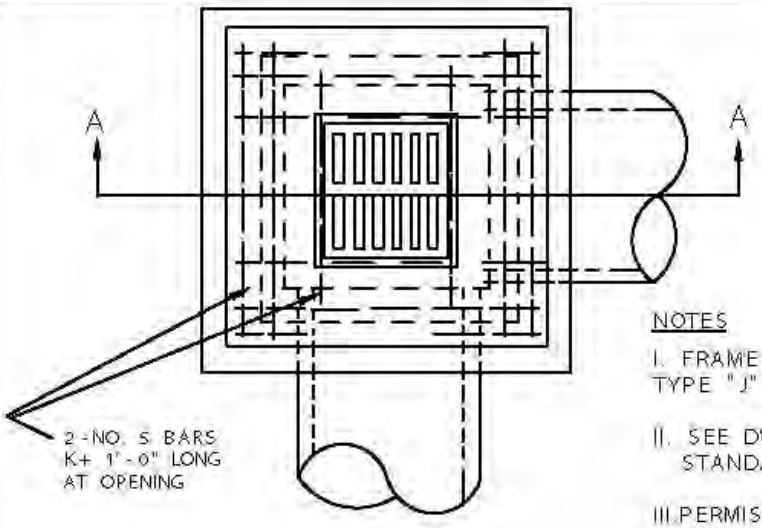
SECTION



ELEVATION

DETAIL OF STANDARD LADDER BARS DRAWING NO. 14

(NOT TO SCALE)



PLAN

NOTES

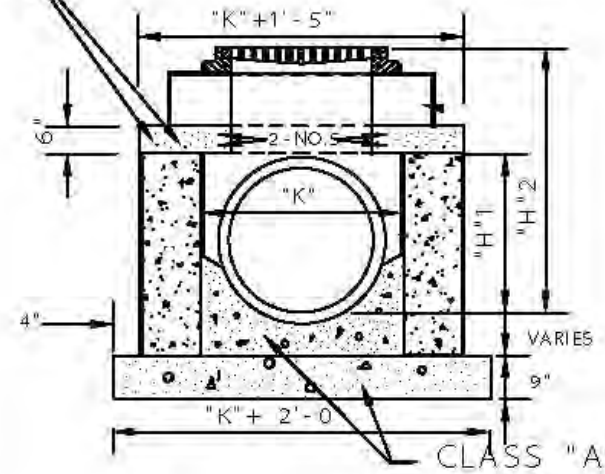
I. FRAME & GRATE ARE STANDARD TYPE "J" OR "K".

II. SEE DWG. 14 FOR DETAIL OF STANDARD LADDER BARS.

III. PERMISSION REQUIRED FROM ENGINEER FOR "H2" LESS THAN MINIMUM SHOWN.

NO. 5 BARS K + 1'-0" LONG AT 6" BOTH WAYS AT BOTTOM ONLY WHEN "K" = 5'-0" OR 6'-0"

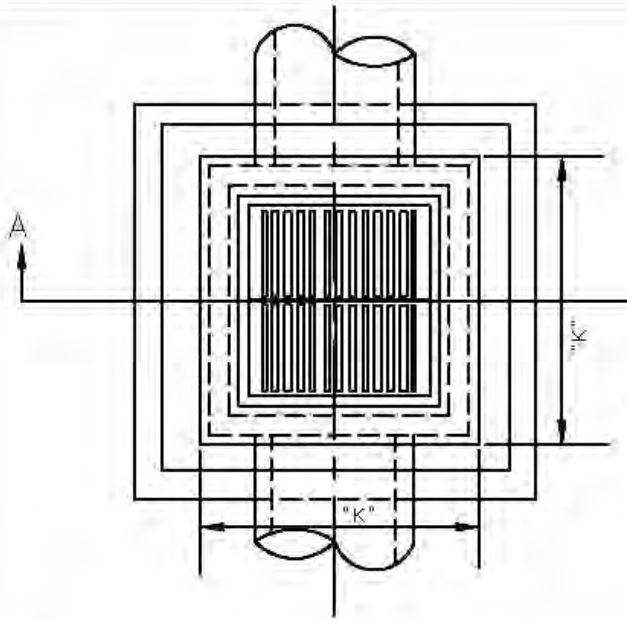
DIMENSION			
PIPE DIA.	MIN. K	MIN. H1	MIN. H2
36"	4'-0"	3'-10"	5'-0"
42"	5'-0"	4'-5"	5'-7"
48"	5'-0"	4'-11"	6'-1"
54"	6'-0"	5'-6"	6'-8"
60"	6'-0"	6'-0"	7'-2"



SECTION "A"

COMBINATION MANHOLE INLET
SHALLOW TYPE
DRAWING NO. 15

(NOT TO SCALE)

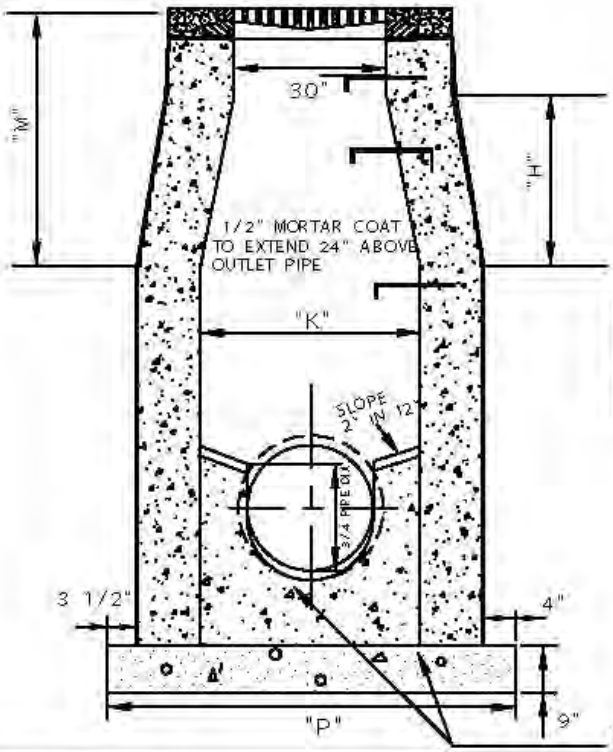


PLAN

NOTES:

I. FRAME & GRATE ARE STANDARD TYPE "J" OR "K".

II SEE DWG. 14 FOR DETAIL OF STANDARD LADDER BARS.



SECTION "A"

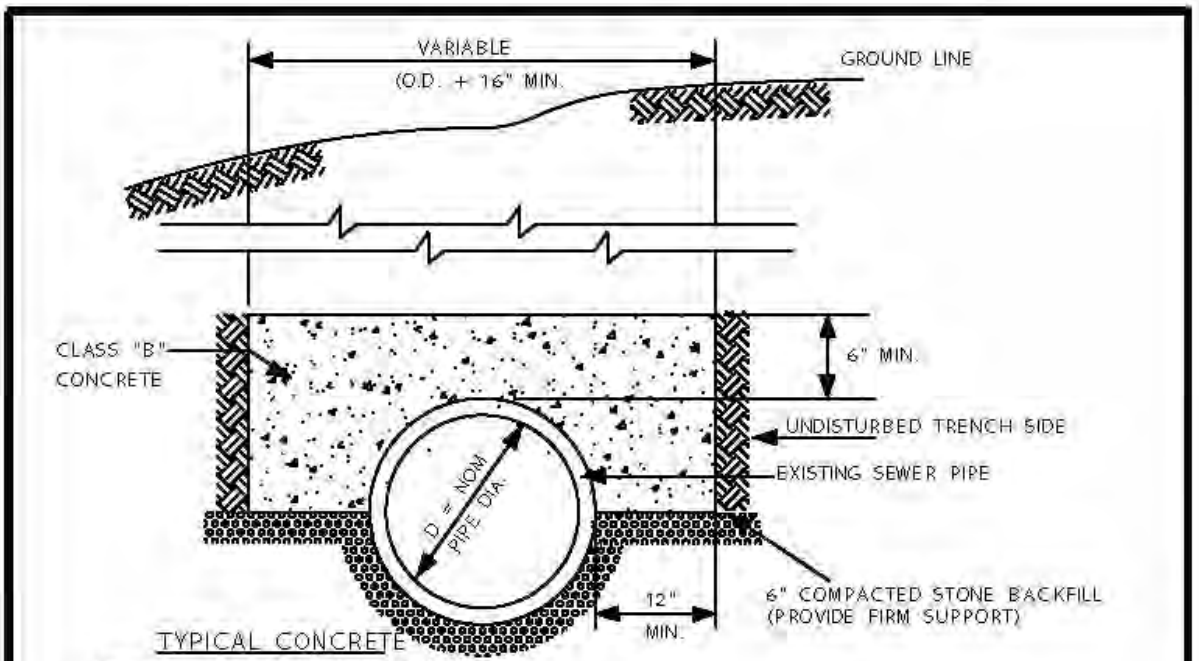
DIMENSION			
K	M	H	P
48"	331/2"	20"	6'-0"
60"	36"	22 1/2"	7'-0"

CLASS "A" CONCRETE

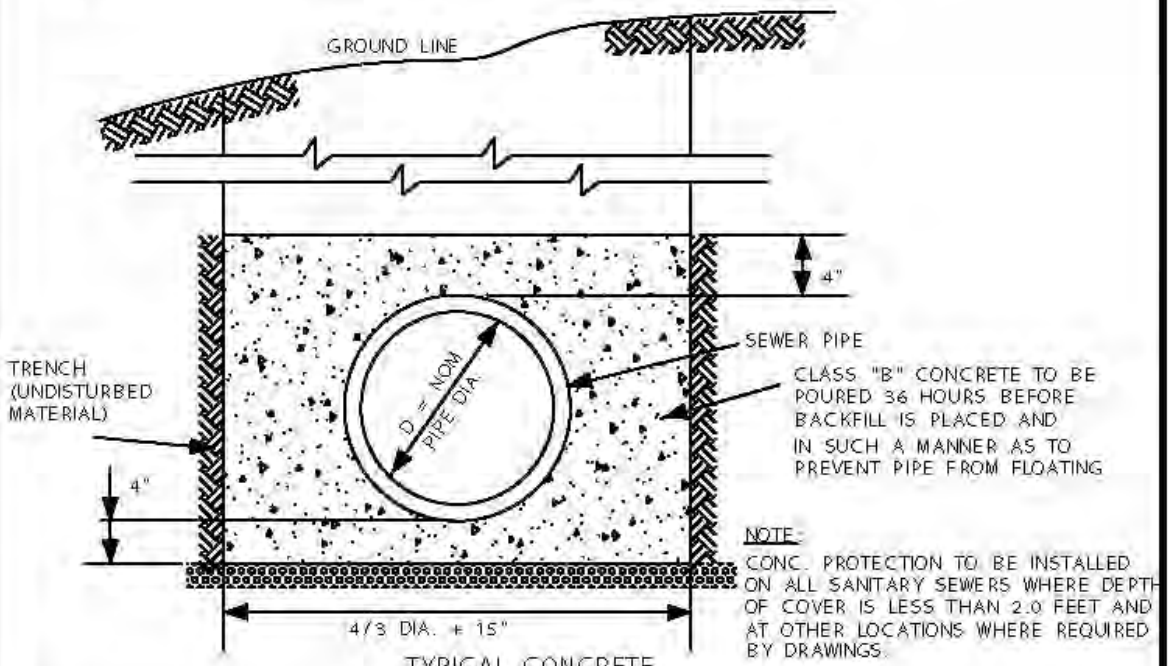
CITY OF BRENTWOOD 1969

COMBINATION MANHOLE INLET
DRAWING NO. 16

(NOT TO SCALE)



TYPICAL CONCRETE
PROTECTION FOR NEW SEWERS

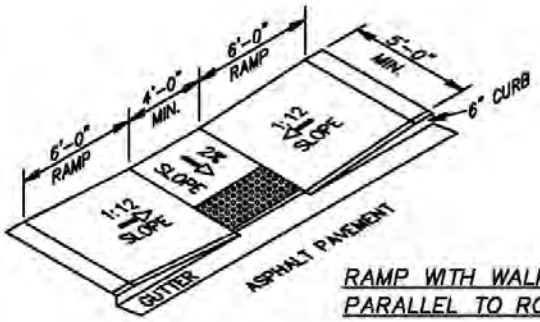


NOTE:
CONC. PROTECTION TO BE INSTALLED ON ALL SANITARY SEWERS WHERE DEPTH OF COVER IS LESS THAN 2.0 FEET AND AT OTHER LOCATIONS WHERE REQUIRED BY DRAWINGS.

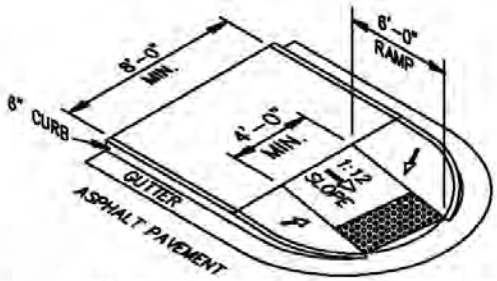
TYPICAL CONCRETE
PROTECTION FOR NEW SEWERS

CONCRETE PROTECTION
DRAWING NO. 17

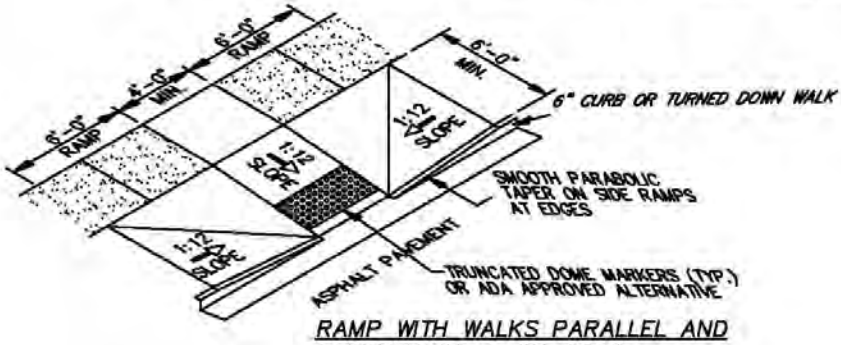
(NOT TO SCALE)



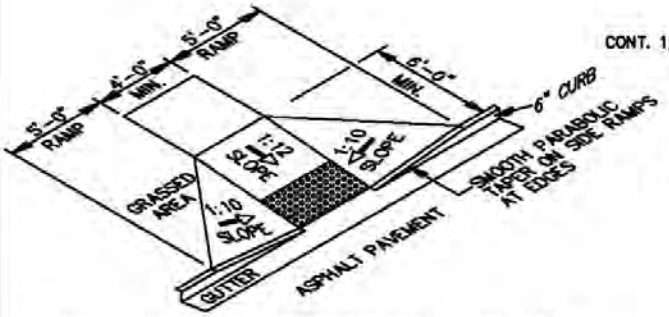
RAMP WITH WALK PARALLEL TO ROAD



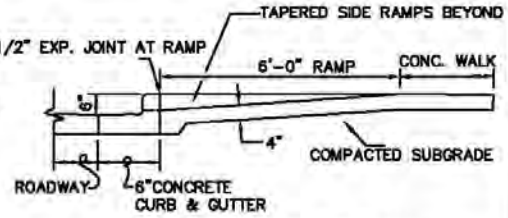
RAMP W/WALK ON RAISED ISLAND



RAMP WITH WALKS PARALLEL AND PERPENDICULAR TO ROAD



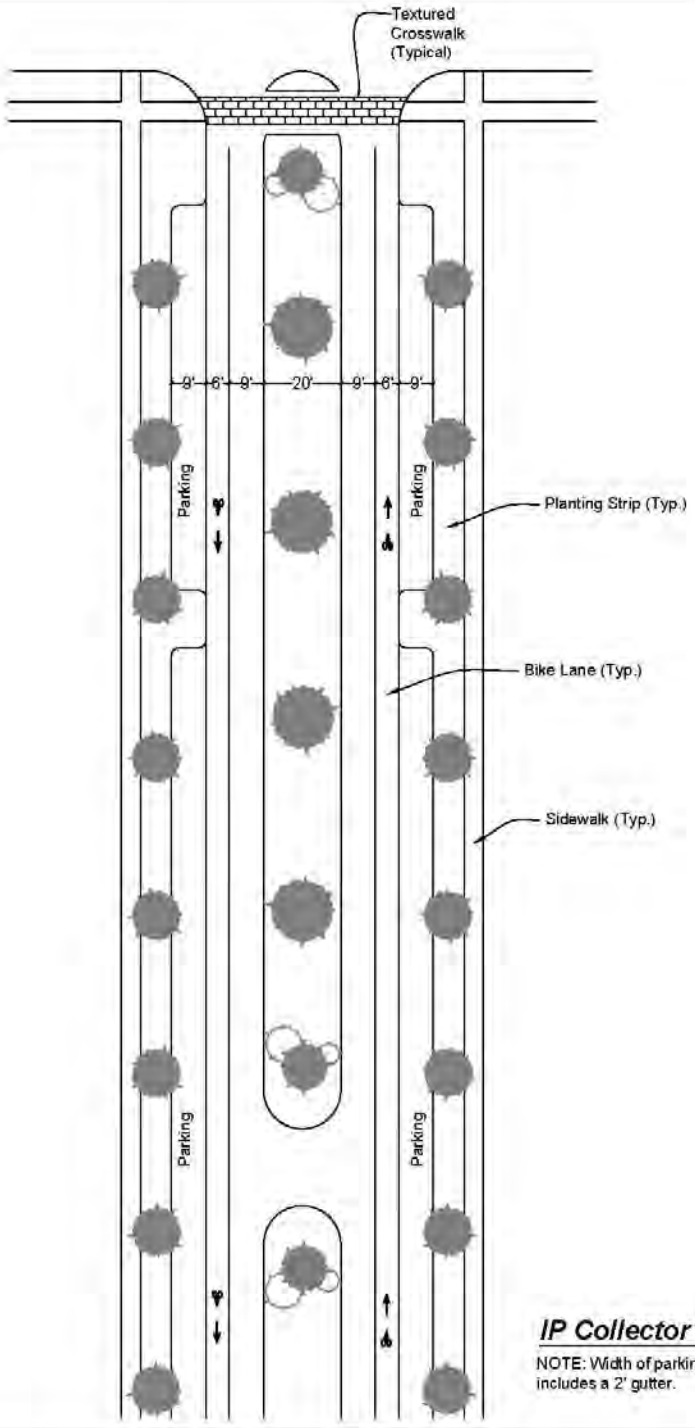
RAMP WITH WALK PERPENDICULAR TO ROAD



TYPICAL RAMP SECTION

HANDICAP RAMP DETAILS
DRAWING NO. 18

(NOT TO SCALE)



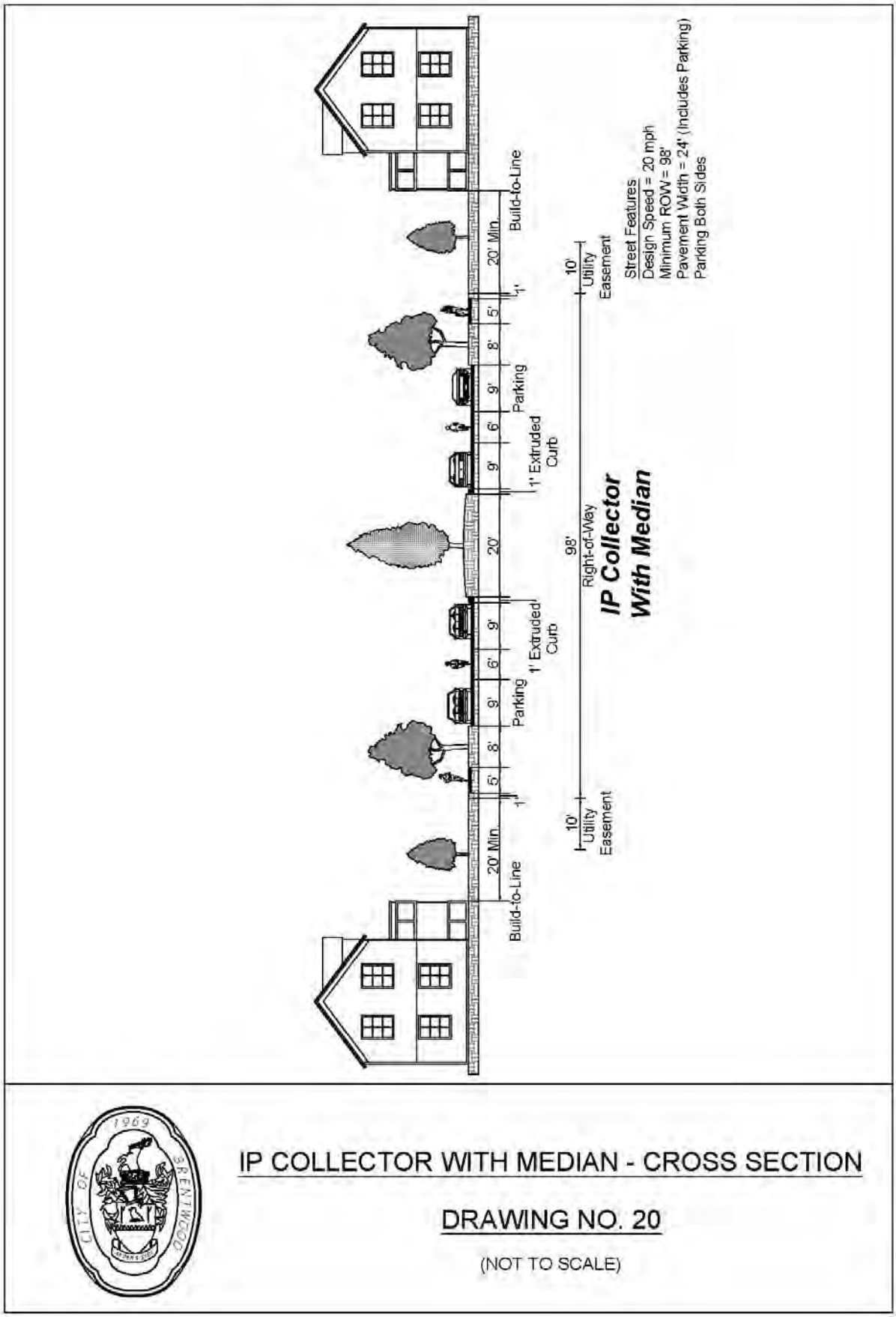
IP Collector With Median

NOTE: Width of parking includes a 2' gutter.

IP COLLECTOR WITH MEDIAN - PLAN VIEW

DRAWING NO. 19

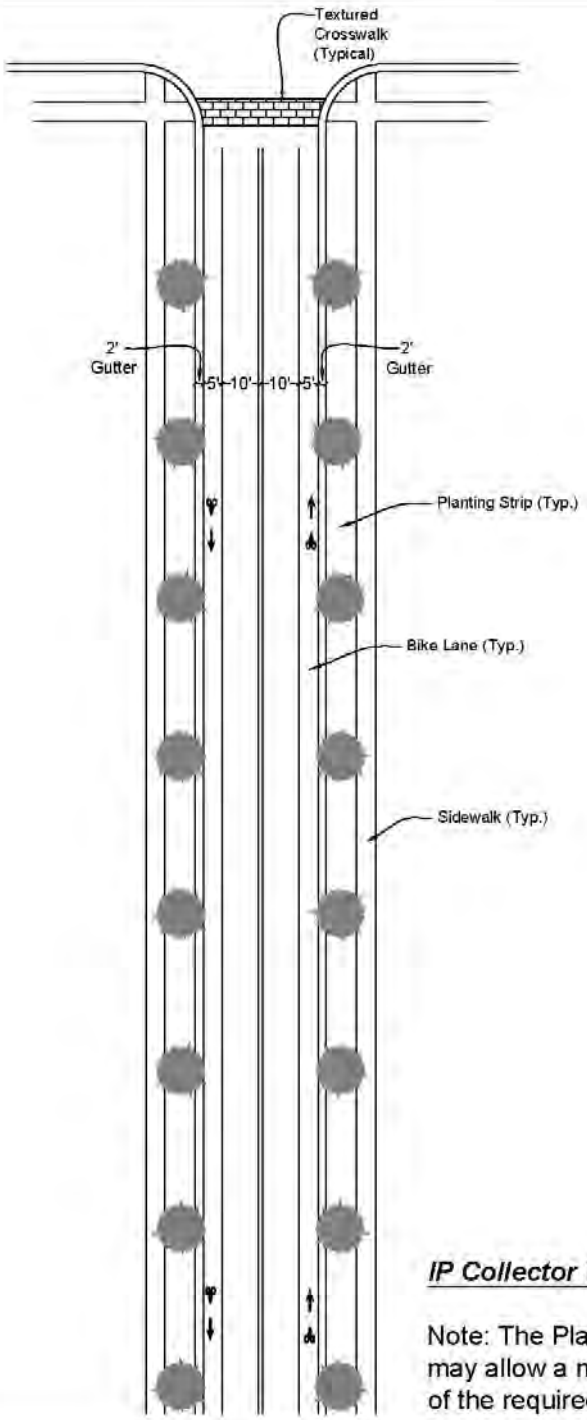
(NOT TO SCALE)



IP COLLECTOR WITH MEDIAN - CROSS SECTION

DRAWING NO. 20

(NOT TO SCALE)



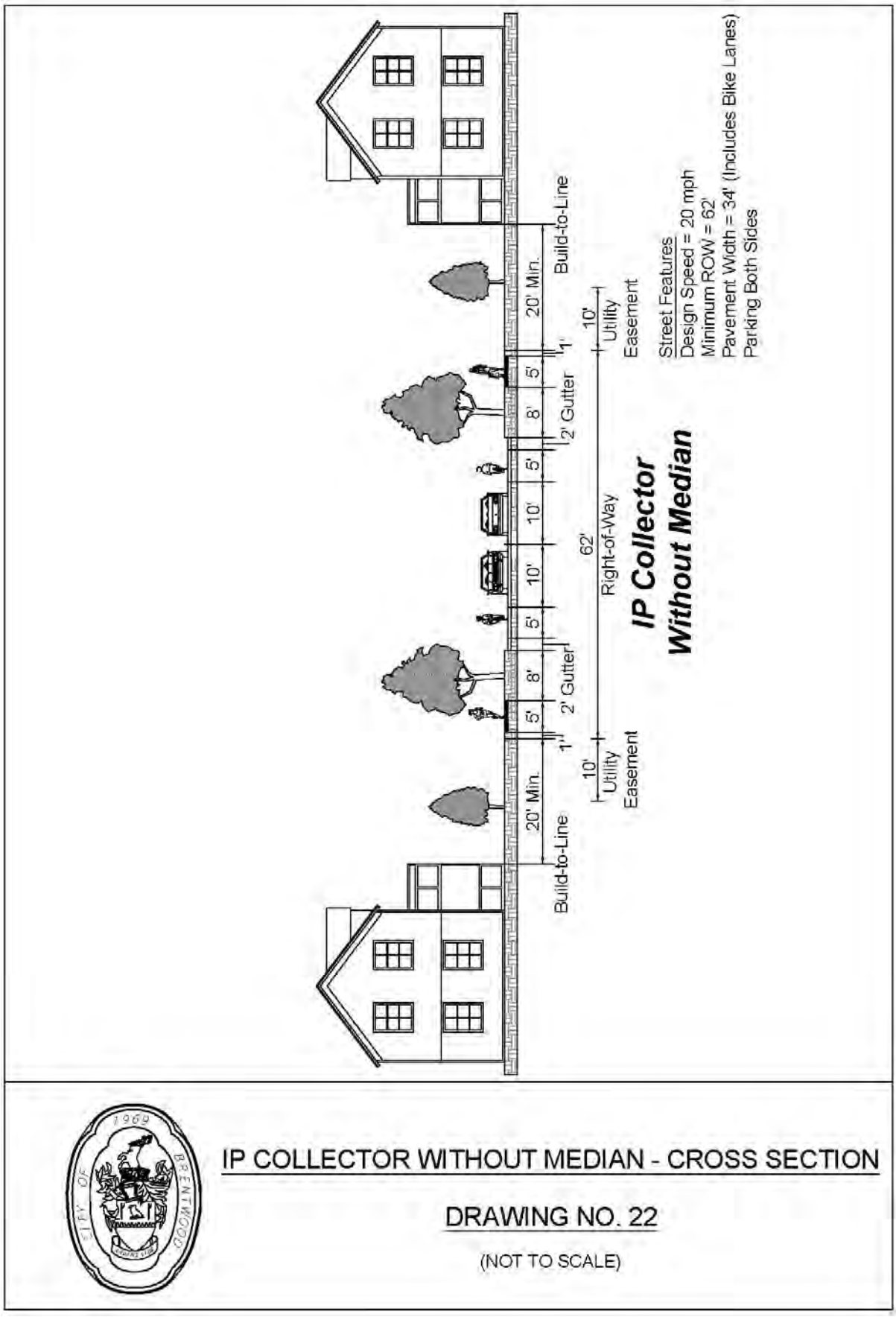
IP Collector Without Median

Note: The Planning Commission may allow a multi-use path in lieu of the required sidewalk.

IP COLLECTOR WITHOUT MEDIAN - PLAN VIEW

DRAWING NO. 21

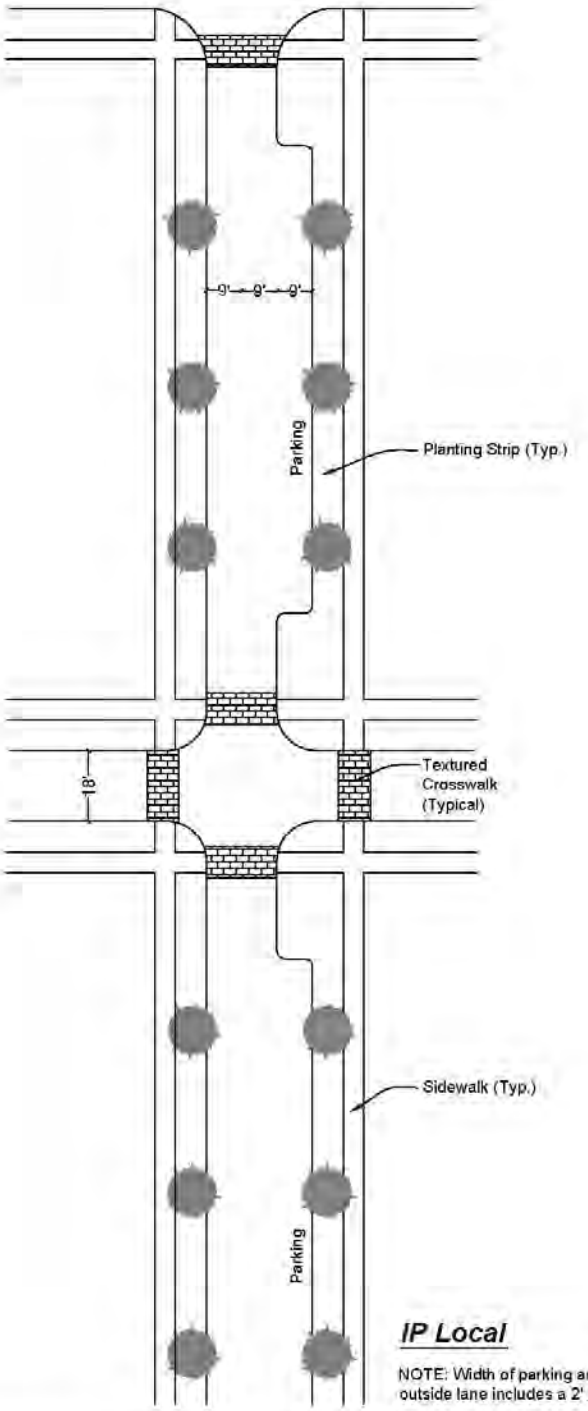
(NOT TO SCALE)



IP COLLECTOR WITHOUT MEDIAN - CROSS SECTION

DRAWING NO. 22

(NOT TO SCALE)



IP LOCAL - PLAN VIEW

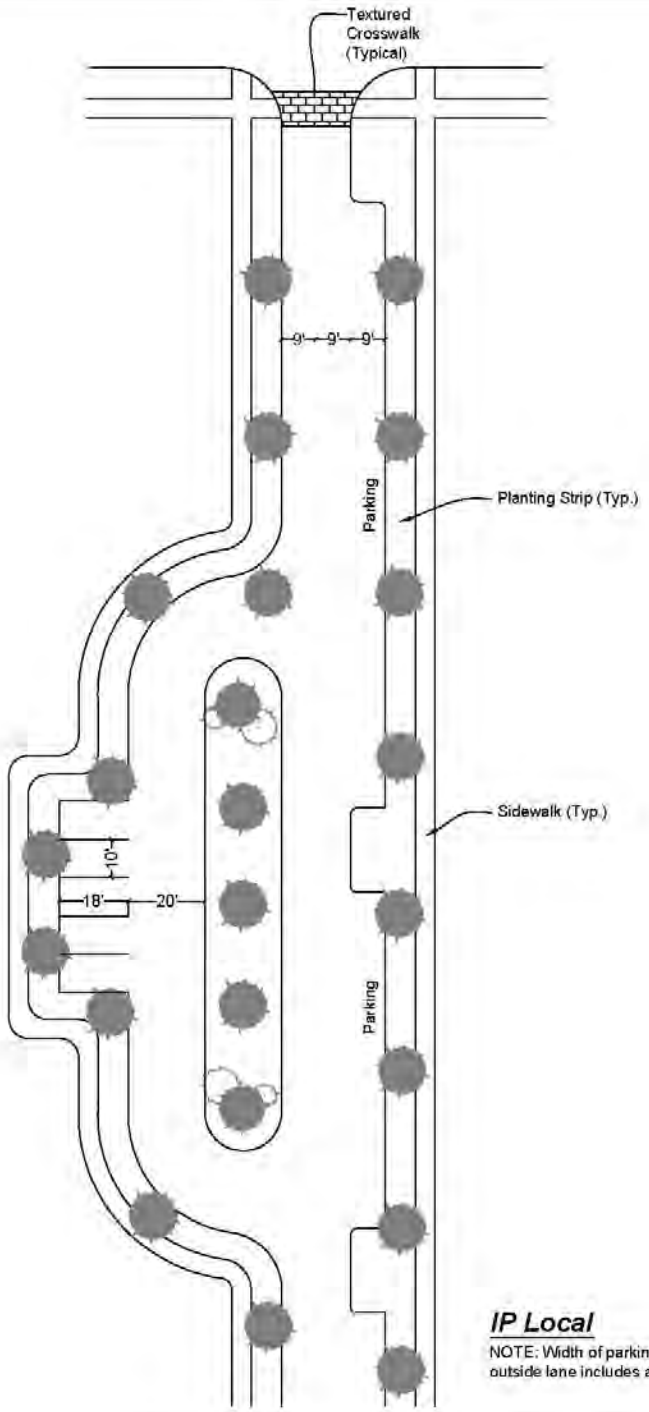
DRAWING NO. 23

(NOT TO SCALE)

IP LOCAL - CROSS SECTION

DRAWING NO. 24

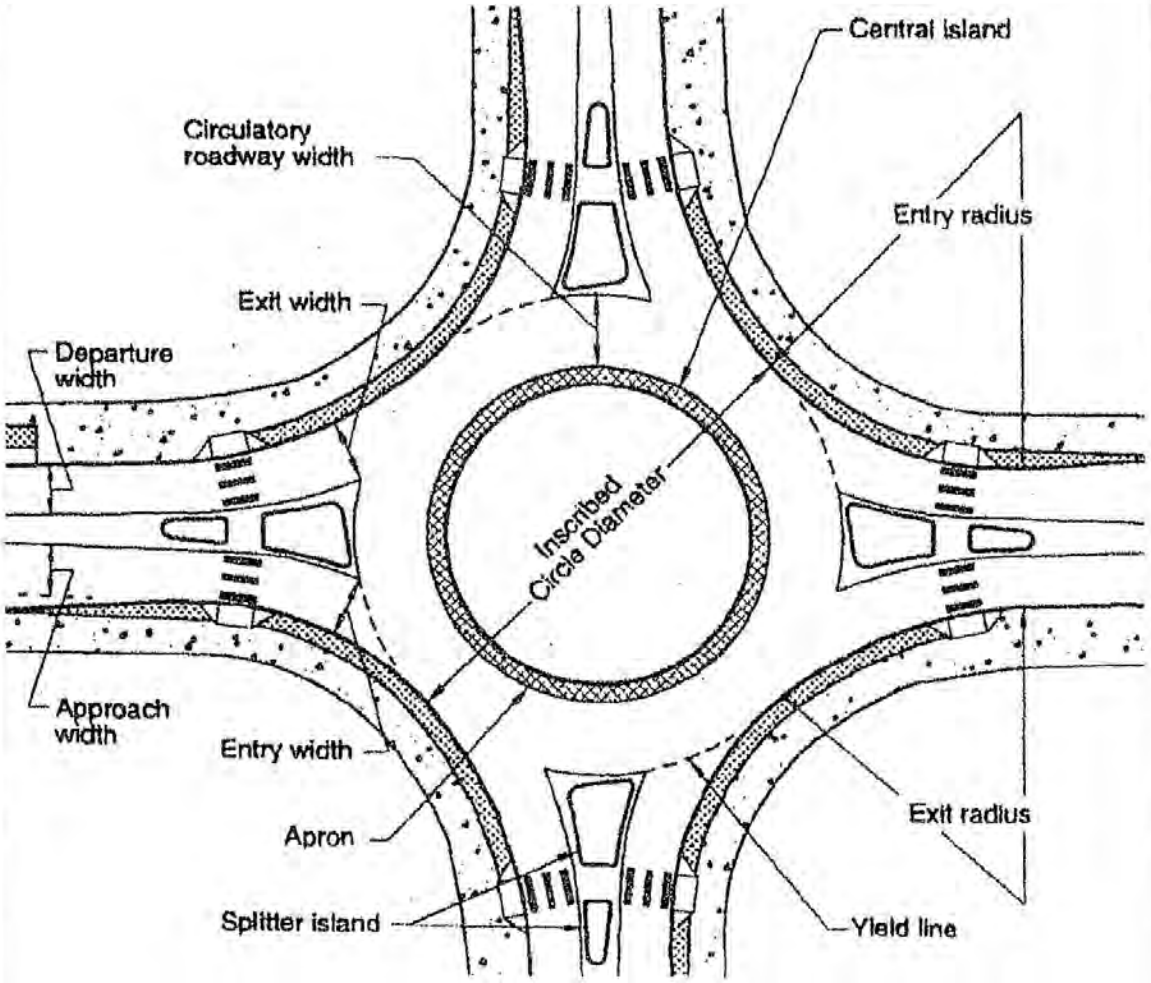
(NOT TO SCALE)



IP LOCAL (ABUTTING OPEN SPACE) - PLAN VIEW

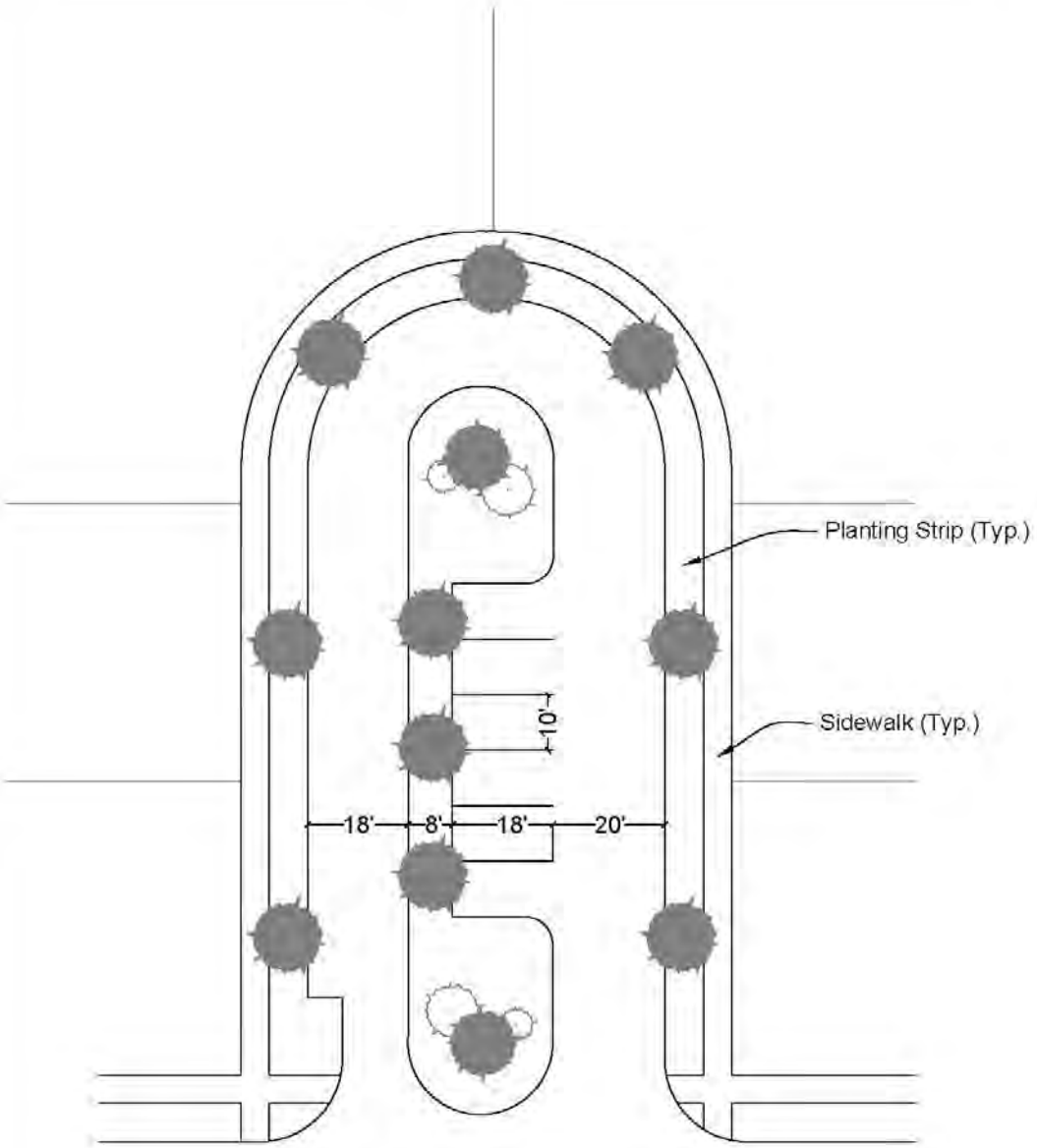
DRAWING NO. 25

(NOT TO SCALE)



ROUNDABOUT DETAILS
DRAWING NO. 26

(NOT TO SCALE)



IP Cul-de-sac

NOTE: Width of travel lanes includes a 2' gutter.

IP CUL-DE-SAC - PLAN VIEW

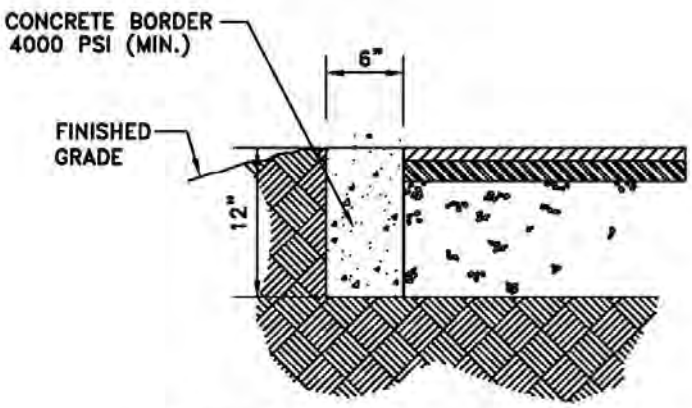
DRAWING NO. 27

(NOT TO SCALE)

IP REAR SERVICE LANE - CROSS SECTION

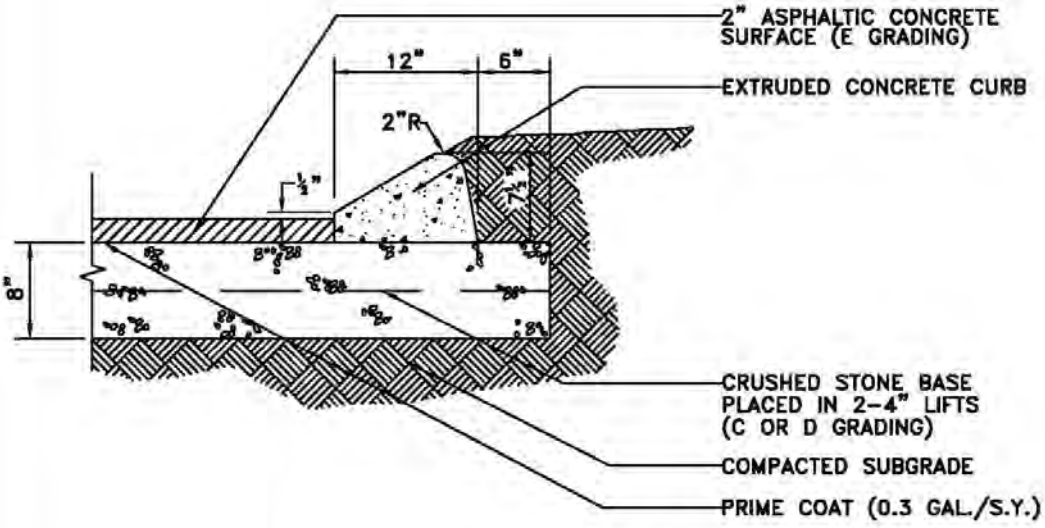
DRAWING NO. 28

(NOT TO SCALE)



CONCRETE RIBBON CURB

NOT TO SCALE



EXTRUDED CURB & LIGHT DUTY PAVEMENT

NOT TO SCALE

EXTRUDED & RIBBON CURB
DRAWING NO. 29

(NOT TO SCALE)

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APPENDIX THREE. FORMS FOR FINAL PLAT CERTIFICATIONS.

The City of Brentwood is served by a number of utility providers. Each may have adopted specific wording and/or certificates designed to address their individual needs. Additional certifications may be required on the final plat by these agencies depending upon the utility service area in which the particular property is located. The appropriate certificates must be included as part of the final plat.

Form 1 -- Certificate of Ownership and Dedication

I (we) hereby certify that I am (we are) the owner(s) of the property shown and described hereon and that I (we) hereby adopt this plan of subdivision with my (our) free consent, establish the minimum building restriction lines, and dedicate all streets, alleys, walks, parks and other open spaces to public or private use as noted.

Owner Name: _____

Title: _____ Date: _____

Form 2 -- Certificate of Approval of Street Names

I hereby certify that the Williamson County Department of Emergency Communications has approved the street name(s).

_____ Date: _____
Williamson County Department
of Emergency Communications

Form 3 -- Certificate of Approval of Subdivision Name

I hereby certify that the City of Brentwood Planning Department has approved the subdivision name.

_____ Date: _____
Secretary, Planning Commission
or Planning and Codes Director

Form 4 -- Certificate of Accuracy

I hereby certify that the plan shown and described hereon is a true and correct survey to the accuracy required by the specifications of the Brentwood Planning Commission.

Name: _____

BY: _____ Date: _____

Form 5 -- Certificate of Approval of Water and Sewer Systems

I hereby certify that the following utility systems outlined or indicated on the final subdivision plat entitled _____ have been installed in accordance with current applicable regulations.

Water System: _____ Date: _____
Name, Title and Agency of
Approving Agent

Sewer System: _____ Date: _____
Name, Title and Agency of
Approving Agent

Form 6 -- Certificate of Provision of Electrical Service

I herby certify that all of the _____ regulations, checklists and guidelines have been met. Any approval is at all times contingent upon continuing compliance with _____ requirements.

_____ Date: _____
Electric Provider

Form 7 -- Certificate of Approval of Streets

I hereby certify that all streets designated on the final subdivision plat have been constructed in accordance with current applicable regulations.

_____ Date: _____
Director of Engineering

Form 8 -- Certificate of Approval for Recording

I hereby certify that the subdivision plat shown hereon has been found to comply with the subdivision regulations of the City of Brentwood, with the exception of such variances and/or modifications, if any, as are noted in the minutes of the Planning Commission.

_____ Date: _____
Secretary, Planning Commission or
Planning and Codes Director

APPENDIX FOUR. BRENTWOOD MUNICIPAL PLANNING COMMISSION -- IRREVOCABLE STANDBY LETTER OF CREDIT STANDARD FORM

Beneficiary:

City of Brentwood
Planning Department
P.O. Box 788
Brentwood, TN 37024-0788

Applicant:

Name:
Address:
City, State, Zip

We hereby issue this Irrevocable Standby Letter of Credit in your favor which is available at sight by drafts on (Name of Bank) , bearing the clause "Drawn under Irrevocable Standby Letter of Credit Number _____", accompanied by:

Beneficiary's statement signed by one of its officials stating "(Name of the developer) has failed to complete certain improvements and/or has failed to obtain written authorizations for release from all affected agencies for the development project known as (Name of the project)."

Partial drawings shall be permitted.

Draft(s) and documents may be presented at our offices Name, address, telephone number and contact name, of Issuing Bank and Name and address, telephone number and contact name of Local Branch authorized to accept draws, or may be delivered to the above address via registered or certified mail, or by Federal Express or other similar courier service.

This Letter of Credit has been established for (Streets, Drainage, Street Lighting, Water and Sewer, Landscaping improvements) for (Name of Subdivision or Project)." (Insert the name of the appropriate improvement.)

It is a condition of this letter of credit that it shall be deemed to be automatically extended, without amendment for period(s) of one year each from the current expiration date hereof or any future expiration date, unless at least ninety (90) days prior to any expiration date we notify you by registered or certified mail or overnight courier at the above listed address that we elect not to consider this letter of credit renewed for any such period.

"The City may complete draws on this Letter of Credit by delivery via Registered or Certified mail, Federal Express or other similar courier service, or by facsimile drawing with the required presentable by facsimile to Facsimile # , or by electronic mail to the following address _____."

Additional information required as part of the submittal of security for required improvements:

(1) The contact name and related information for a representative of the developer.

(2) The contact name and related information for a representative of the issuing financial institution.

APPENDIX FIVE. BRENTWOOD PLANNING COMMISSION -- PERFORMANCE AGREEMENT

PERFORMANCE SECURITY FOR _____
(Subdivision or Project Name)

KNOWN ALL MEN BY THESE PRESENTS that _____,
(Name of Developer or Property Owner)
and _____ a Principal, and Letter of Credit # _____

Issued by _____, as Surety, are bound unto the City of Brentwood for the use and benefit of the City of Brentwood Planning Commission, and for the use and benefit of all future lot holders within the hereinafter named subdivision, in the amount of $ _____ for payment of which well and truly to be made we bind ourselves, successors and assigns jointly and severally by these presents.

The condition of this security is that,

WHEREAS, the Principal has submitted a plat/plan known as _____ _____. For approval by the City of Brentwood Planning Commission, which approval is a condition precedent to the right of the Principal to have such plat recorded in the Registers Office of Williamson County, Tennessee; and

WHEREAS, the City of Brentwood Planning Commission is unwilling to approve said plat for recordation until all required improvements and facilities are constructed, installed and completed, especially including, but not limited to, the construction of streets, grading, drainage, erosion control, water, sewer, landscaping, signage, amenity and other miscellaneous items, or until a security is executed and filed with said City of Brentwood Planning Commission providing for and securing to the public the actual construction and installation of said improvements and facilities; and

WHEREAS, the principal has commenced construction of said streets and improvements and desires to have said plat of said subdivision recorded in the Resister's Office of Williamson County, Tennessee, so as to provide for the orderly development and transfer of the property in said subdivision; and

WHEREAS, the estimated cost of construction, installation and completion of the required improvements and facilities is $ _____ and the Planning Commission may, in lieu of the prior construction of said improvement and facilities, the said Commission is willing to accept such security and approve said plat for registration as it is authorized to do by Tennessee Code Annotated section 13-4-30.

NOW THEREFORE, if the Principal shall within _____ (__) months from the date hereof construct, install and complete all of said improvements and facilities above mentioned as shown on said final plat and in particular shall build, construct and complete all streets, grading, drainage, erosion control, water, sewer, landscaping, signage, and other miscellaneous items, in proper and workmanlike manner to the satisfaction of the City of Brentwood Planning Commission and the Director of Engineering or his designee, and following approval shall then execute and file a proper maintenance security guaranteeing said streets, drainage culverts and facilities, etc., for a period of time of not less than _____ (__) months and continuing until acceptance of said streets, drainage culverts and facilities, etc. by the City of Brentwood, in the amount of not less than _____ percent (__%) of the actual construction costs, as required by the Planning Commission and staff from the Engineering Department this obligation shall be void; otherwise it shall remain in full force and effect for the City of Brentwood Planning commission for the purposes set forth herein subject to provisions of Tennessee Code annotated.

IN THE EVENT, the Planning Commission determines that the Principal has failed to meet the conditions and has failed to perform the obligations of this security it may draw a draft or drafts on said Letter of Credit for such amounts as it may determine to be proper.

EXECUTED at the City of Brentwood, Tennessee, this _____ day of _____ 20__.

Witness my hand this the _____ day of _____, 200____.

_____ _____

BY: _____

TITLE: _____

STATE OF TENNESSEE)

COUNTY OF _____)

Personally appeared before me, _____, a Notary Public of said County and State, _____, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who, upon oath, acknowledged (her)himself to be the _____ of _____ and that (s)he as such _____, being authorized so to do, executed the foregoing instrument for the purposes contained therein.

Witness my hand and seal this the ____ day of _____, 2008.

My Commission Expires:_____

NOTARY PUBLIC