

Report for City of Somerville, Texas

Development Standards

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CHAPTER 1
INTRODUCTION

1.01 GENERAL PROVISIONS

The Design and Construction Standards (Standards) for the City of Somerville, Texas (City) outline specific requirements for the improvement, development, and subdivision of land within the City limits and extraterritorial jurisdiction (ETJ). This document is intended to be used jointly with the City's Standard Details, ~~Standard Specifications~~, Subdivision Ordinance, Zoning Ordinance (if applicable), and other applicable federal, state, and local regulations. Project specifications for specific developments shall be reviewed and approved by the City Engineer.

1.02 AUTHORITY

This document has been prepared pursuant to authority vested in the City.

1.03 PURPOSE

The purpose of these Standards is to achieve uniformity and consistency in the development and subdivision of property in the City limits and ETJ; to achieve a common standard in the improvement of City infrastructure systems; to provide for and promote growth in accordance with comprehensive planning goals and objectives; to further define requirements of the subdivision ordinance; to assure compliance with applicable federal, state, and local regulations; and to serve the citizens in providing for their safety, health, and welfare.

1.04 SCOPE OF THE STANDARDS

These Standards are intended to cover all activities related to the improvement, development, and subdivision of land in the City limits and ETJ. This document outlines specific planning, engineering, construction, and policy provisions, which are requisite to these activities.

1.05 APPLICATION OF THE STANDARDS

Any party desiring to improve, develop, or subdivide land in the City limits or ETJ shall incorporate the requirements of these Standards into the planning, engineering, and construction of its particular project. As previously noted, other pertinent regulations and criteria, including the City of Somerville Standard Details and ~~Standard Specifications~~, shall comply with industry standards and must be used in combination with this document. Project specifications for specific developments shall be reviewed and approved by the City Engineer. Questions concerning the contents of these Standards or other requirements concerning meaning or applicability should be directed to the City Manager.

1.06 PRELIMINARY RESEARCH

City staff will be available for preliminary meetings to discuss a proposed project with the project engineer and/or developer. This preliminary meeting should be scheduled before submittal of any documents for review.

Research of all existing utility and right-of-way information with city, county, state, and other public and private utility agencies shall be completed and documented before submittal of any plans to the City Manager.

The developer shall identify all contiguous property owners. As stated in the Subdivision Ordinance, this notification procedure applies to all developments and shall be completed a minimum of seven days before placement of the project on a planning commission or council agenda for discussion or action.

1.07 FEES

Before beginning construction on a project, all applicable fees shall be paid to the City.

1.08 DESIGN REVIEW REQUIREMENTS FOR PUBLIC WORKS PROJECTS

1. Submit four copies of construction drawings and supporting documentation to the City Manager for review. Drawings will be circulated to appropriate departments and comments will be returned to the applicant in a timely manner.
2. After all comments have been adequately addressed, submit two copies of the revised and final construction drawings, with the redline drawings to the City Manager.
3. Submit original construction drawings to the City Manager for signatures. All sheets will be signed by the City Manager. A City approval signature block shall be provided on all sheets.
4. Submit one copy of the original construction drawings and one copy reduced to 11 inches by 17 inches to the City Manager after the construction drawings have been approved and signed by the appropriate parties.
5. All separate or special easements that may be required for construction shall be recorded in the Burleson County (County) Official Records before final approval of the construction drawings, except with specific approval of the City Manager.

1.09 CONSTRUCTION PROCEDURE REQUIREMENTS FOR PUBLIC WORKS PROJECTS

1. Construction shall not begin until construction drawings are approved by the City Manager and until all required documents (e.g., permits and licenses) have been obtained.
2. A preconstruction meeting is required for the project.
3. Notify the City Manager at least 48 hours before beginning construction, at least 24 hours before each time concrete is placed on the project, and before all required inspections or tests. Inspections shall be conducted by City staff or any City-approved designee.
4. Notify the City Manager at least 24 hours before any final inspection.
5. The project engineer shall provide to the City Manager four sets of project as-built drawings within 30 days after completion of the project.
6. All delivery tickets for all materials (e.g., concrete and cement stabilized sand) shall be maintained by the contractor and, upon written request, be made available for review by the City Manager. These delivery tickets shall be maintained for a maximum of one year from the completion of the project.

7. Changes from approved drawings shall be approved by the City Manager before construction. The project engineer shall submit all change order requests to the City Manager for review and approval. The City Manager will respond in writing within five business days to determine whether City Council approval is required for a project change.

1.10 ACCEPTANCE AND APPROVAL OF PUBLIC WORKS PROJECTS

Public Works projects shall have final approval by the City Manager before placing the facilities in service. Final approval by the City Manager shall be granted when the following items are complete.

1. Construction is completed in accordance with the approved construction drawings and final inspection items have been completed.
2. All required information, including as-built drawings, are submitted to the City Manager. The project engineer shall certify the correctness of the as-built drawings and compliance of construction in accordance with these Standards.
3. The City Manager shall require certification from the project engineer or contractor that confirms all materials installed in the project are completely in place in accordance with the approved drawings and specifications.

Final approval by the City Manager will be documented in writing.

1.11 RIGHT-OF-WAY USE PERMITS

All applicable permits must be obtained from the City, County, the Texas Department of Transportation (TxDOT), and/or any other entity or agency having jurisdiction before construction of any new facilities within a public right-of-way, or utility easement.

A request for a right-of-way use permit issued by the City must be submitted, with drawings and complete supporting information, to the City Manager for consideration. The request will be reviewed, comments will be submitted to the applicant, and, if approved by the City Manager, the right-of-way permit will be issued.

The applicant shall be responsible for the location of all facilities in the area of construction and all disturbed areas are to be restored when construction is completed.

1.12 APPROVALS

Approvals required in these Standards are the responsibility of the applicant. Failure to obtain appropriate approvals may be grounds for suspension of construction until appropriate approvals are granted.

Any work that proceeds without specific approval will be subject to removal and replacement in accordance with these Standards.

Materials and manufactured items used in construction shall be approved by the City Manager before installation.

1.13 EFFECTIVE DATE

The effective date of these Standards is August 28, 2020.

1.14 DEFINITIONS

Accessory Building—A building or structure customarily incidental and subordinate to the principal structure and located on the same lot as the principal building.

Agriculture—Any land or building used for pasturage, floriculture, dairying, horticulture, forestry, livestock, or poultry husbandry.

Alley—A legally established private access easement affording a secondary means of vehicular access to abutting property and not intended for general traffic circulation.

Alterations—Any change, addition, or modification in construction or type of occupancy; and change in the structural members of a building, such as walls or partitions, columns, beams, or girders; or any change that may be referred to herein as “altered” or “reconstructed.”

Apartment—A dwelling unit in a “multiple-family dwelling” as defined herein.

Appeal—For the purpose of flood hazard regulation, a request for a review of the Floodplain Administrator’s interpretation of any provision of this document or a request for variance.

Area of Shallow Flooding—A designation of Zones AO, AH, or VO on a community’s Flood Insurance Rate Map (FIRM) with a 1 percent or greater annual chance of flooding to an average depth of 1 to 3 feet where a clearly defined channel does not exist, where the path of flooding is unpredictable, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

Area of Special Flood Hazard—The land in the floodplain within a community subject to a 1 percent or greater chance of flooding in a given year. The area may be designated as Zone A on the Flood Hazard Boundary Map (FHBM). After detailed rate making has been completed in preparation for publication of the FIRM, Zone A usually is refined into Zones A, AE, AH, AO, A1-99, VO, V1-30, VE, or V.

As-built Drawings—Drawings prepared by a registered professional engineer after the project is completed, showing any or all approved changes or revisions to the project.

Base Flood—The flood having a 1 percent chance of being equaled or exceeded in any given year.

Berm—A man-made, formed, earth mound of definite height and width used for obscuring purposes; the intent of which is to provide a transition between uses of differing intensity.

Block—A tract or parcel of land designated as such on a subdivision plat surrounded by streets or other physical obstructions.

Boundary Sewer Line—A sewer line installed in a street bounding a development or faced on only one side by a development, which can also serve a property not included in the development on the opposite side of the street.

Boundary Water Line—A water line installed in a street bounding a development or faced on only one side by a development, which can also serve a property not included in the development on the opposite side of the street.

Buffer Yard—A strip of land, including any specified type and amount of planting or structures that may be required to protect one type of land from another, or minimize, or eliminate, conflicts between them.

Building—See definition in Building Code.

Building Height—The vertical distance measured from the established grade to the highest point of the roof surface for flat roofs; to the deck line of mansard roofs; and to the average height between eaves and ridges for gable, hip, and gambrel roofs. Where a building is located on a sloping terrain, the height may be measured from the average ground level of the grade at the building wall.

Building Line—A line parallel to the front lot line. A minimum building line is the same as the minimum required front setback line.

Building, Principal—A building in which is conducted the main or principal use of the lot on which said building is located.

Church—A building wherein persons regularly assemble for religious worship and which is maintained and controlled by a religious body organized to sustain public worship, together with all accessory buildings and uses customarily associated with such primary purpose.

City—The City of Somerville, Texas.

City Council—The City Council of the City of Somerville, Texas.

Club—An organization or persons for special purposes or for the promulgation of sports, arts, science, literature, politics, or similar activities; but not operated for profit and open only to members and not the general public.

Commercial Building—Any building other than a single-family residence.

Condominium—See Unified Development.

Critical Feature—An integral and readily identifiable part of a flood protection system, without which the flood protection provided by the entire system would be compromised.

Density—The average number of dwelling units, per acre, for the entire development, including streets.

Development—Any man-made change in improved and unimproved real estate including, but not limited to, mining, dredging, filling, grading, paving, excavation, or drilling operations.

Developer—Any person who improves or subdivides a tract of land or improves or takes any action preparatory to the erection, improvement, or movement of any building or structure on a tract of land.

District—An area of land for which there are uniform regulations governing the use of buildings and premises, density of development, yard requirements, and height regulations.

Dwelling, Multiple-Family—A building used or designed as a residence for three or more families living together independently of each other.

Dwelling, Single-Family—A building designed for single-family occupancy and constructed on-site as a permanent improvement to a legal lot.

Dwelling, Two-Family—A detached building, designed for or occupied by two families living independently of each other.

Dwelling Unit—One or more rooms with bathroom and principal kitchen facilities designed as a self-contained unit for occupancy by one family for living, cooking and sleeping purposes.

Elevated Building—A non-basement building built, in the case of a building in Zones A1-30, AE, A, A99, AO, AH, B, C, X, and D, to have the top of the elevated floor, or in the case of a building in Zones V1-30, VE, or V, to have the bottom of the lowest horizontal structural member of the elevated floor elevated above the ground level by means of pilings, columns (posts and piers), or anchored so as not to impair the structural integrity of the building during a flood or up to the magnitude of the base flood. In the case of zones A1-30, AE, A, A99, AO AH, B, C, X, and D, “elevated building” also includes a building elevated by means of fill or solid foundation perimeter walls with openings sufficient to facilitate the unimpeded movement of flood waters. In the case of Zones V1-30, VE, or V, “elevated building” also includes a building otherwise meeting the definition of “elevated building,” even though the lower area is enclosed by means of breakaway walls if the breakaway walls meet the standards of Section 60.3(e) (5) of the National Flood Insurance Program regulations.

Erected—Includes built, constructed, reconstructed, moved upon, or any physical operations on the premises required for the building. Excavations, fill, drainage, and the like shall be considered a part of erection.

Excavation—Any breaking of ground, except common household gardening, general farming, and ground care.

Existing Construction—For the purpose of flood hazard regulation and for the purposes of determining flood insurance rates, structures for which the “start of construction” commenced before the effective date of the FIRM, or before the effective date of these Standards, for FIRMs effective before that date. “Existing construction” may also be referred to as “existing structures.”

Family—An individual, or two or more persons related by blood, marriage, adoption, or parents, along with their direct lineal descendants and adopted or foster children (including domestic employees), or a group not to exceed two persons not related by blood or marriage, occupying a premises and living as a single housekeeping unit with single cooking facilities. Every additional group of two or less persons living in such housekeeping unit shall be considered a separate family. Said definition shall not apply in instances of group care centers or licensed residential facilities.

Filling—The depositing or dumping of any matter into or onto the ground except common household gardening and general maintenance.

Flag Lot—A lot which has minimum frontage on a public street that is reached via a private drive or lane whose width, some distance back from the street right-of-way, meets all ordinance requirements.

Flood or Flooding—A general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland or tidal waters; or, the unusual and rapid accumulation or runoff of surface waters from any source.

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

Flood Insurance Study–The official report provided by the FEMA. The report contains flood profiles, water surface elevation of the base flood, as well as the Flood Boundary-Floodway Map.

Floodplain or Flood-Prone Area–Any land area susceptible to being inundated by water from any source (see definition of flooding).

Flood Proofing–Any combination of structural and nonstructural additions, changes or adjustments to structures that reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures, and their contents.

Flood Protection System–Those physical, structural works for which funds have been authorized, appropriated and expended, and which have been constructed specifically to modify flooding in order to reduce the extent of the areas within a community subject to “special flood hazard” and the extent of the depths of associated flooding. Such a system typically includes hurricane tidal barriers, dams, reservoirs, levees, or dikes. These specialized flood modifying works are those constructed in conformance with sound engineering standards.

Floodway (Regulatory Floodway)–The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Grade–A ground elevation established for the purpose of controlling the number of stories and the height of any structure. The building grade shall be determined by the level of the ground adjacent to the walls of any structure if the finished grade is level. If the ground is not level, the grade shall be determined by averaging the elevation of the ground for each face of the structure.

Habitable Floor–For the purpose of flood hazard regulation, any floor usable for the following purposes; working, sleeping, eating, cooking, or recreation, or a combination thereof. A floor used for storage purposes only is not a “habitable floor.”

Half-Street–A vehicular access-way created if only a portion of the required right-of-way width or pavement width is dedicated and/or constructed.

Highest Adjacent Grade–The highest natural elevation of the ground surface before construction next to the proposed walls of a structure.

Improvement–Any physical structure or system, including building, drainage work, water system, sewer system, sidewalks, streets, or utility system.

Industrial–A business, plant, or enterprise for production of goods, merchandise, or machines.

Industrialized Building (Refer to Occupations code, Title 7, Subtitle C. Chapter 1202)–A commercial structure that:

1. Is constructed in one or more modules, or constructed using one or more modular components, and built at a location other than the commercial site.

2. Is designed to be used as a commercial building when the module or the modular component is transported to the commercial site and erected or installed.
3. Includes the structure's plumbing, heating, air conditioning, and electrical systems.
4. Is repealed by Acts 2005, 79th Leg., Ch. 714, Sec. 5, eff. September 1, 2005.
5. Includes a permanent commercial structure and is designed to be transported from one commercial site to another commercial site.
6. Does not include a commercial building or structure that is installed in a manner other than on a permanent foundation, is not open to the public, or is less than 1,500 square feet (sq ft) in total area and used other than as a school or a place of religious worship.

Industrialized Housing (Refer to Occupations code, Title 7, Subtitle C. Chapter 1202)—A residential structure that:

1. Is designed for the occupancy of one or more families.
2. Is constructed in one or more modules, or constructed using one or more modular components, and built at a location other than the permanent site.
3. Is designed to be used as a permanent residential structure when the module or the modular component is transported to the permanent site and erected or installed on a permanent foundation system.
4. Includes the structure's plumbing, heating, air conditioning, and electrical systems.
5. Does not include housing constructed of a sectional or panelized system that does not use a modular component.
6. Does not include a ready-built home constructed in a manner in which the entire living area is contained in a single unit or section at a temporary location for the purpose of selling and moving the home to another location.

Lease—A contract by which one owing such property grants to another the right to possess, use, and enjoy it for a specified period of time in exchange for the periodic payment of a stipulated price.

Levee—A man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

Levee System—A flood protection system, which consists of a levee, or levees, and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices.

Lot—An undivided tract or parcel of land having frontage on a public street and which is, or may be, in the future, offered for sale, conveyance, transfer, or improvement.

Lot Depth—The distance on a horizontal plane between the midpoint of the front lot line and the midpoint of the rear lot line.

Lot Lines—The lines bounding a lot as defined herein:

1. Lot Line, Front—In the case of an interior lot, a line separating the lot from the street, as in the case of a corner lot, a line separating the narrowest street frontage of the lot from the street, except in those cases where the deed restrictions specifies another line as the front lot line. The front lot line of a nonresidential lot shall be that side adjacent to the highest volume street.
2. Lot Line, Rear—A lot line opposite and most distant from the front lot line.
3. Lot Line, Side—Any lot line not a front line or rear lot line.

Lot of Record—A lot which is (1) part of a platted subdivision, the plat of which is recorded in the office of the County Clerk; (2) a parcel or lot described by metes and bounds, the deed of which has been recorded in the office of the County Clerk; or (3) a lot which is part of an approved Boundary Line Adjustment, the plat of which is filed with the City.

Lot Width—The distance on a horizontal plane between the midpoint of the side lot lines.

Lowest Floor—For the purpose of flood hazard regulation, the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access, or storage in an area other than a basement area is not considered a building's lowest floor. This is provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of Section 60.3 of the National Flood Insurance Program regulation.

Manufactured Housing—Any one of three types of prefabricated housing products that are typically manufactured or assembled at a location other than the end user's permanent site, and which are regulated by the Texas Manufactured Housing Standards Act (the Act) (Article 5221f and 5221f-1, VACS), For the purposes of this Ordinance, there are three types of manufactured homes.

1. Mobile Home—A moveable dwelling designed to be transported on its own chassis on the highway (either intact or in major sections) by a prime mover, which is constructed with a base section so as to be independently self-supporting, and which does not require a permanent foundation for year-round living. A mobile home is also defined as any manufactured home that was constructed before June 15, 1976.
2. HUD-Code Manufactured Home—A moveable dwelling designed to be transported on the highway (either intact or in major sections) by a prime mover, which can be used as a residential dwelling either with or without a permanent foundation. A HUD-Code Manufactured Home is also defined as a moveable manufactured home that was constructed after June 15, 1976.
3. Industrialized Home (Modular Prefabricated Structure, Modular Home)—A structure or building module, as defined under the jurisdiction and control of the Texas Department of Labor and Standards, that is transportable in one or more sections on a temporary chassis or another conveyance device and that is designed to be installed and used by a consumer as a fixed residence on a permanent foundation system. The term includes the plumbing, heating, air conditioning, and electrical systems contained in the structure. The term does not include mobile homes or HUD-Code Manufactured Homes as defined in the Act. Industrialized homes must meet all applicable local codes and zoning regulations that pertain to the construction of traditional site constructed (stick-built) homes.

Manufactured Home Park—A unified development for manufactured housing spaces arranged on a tract of land in compliance with the City's subdivision ordinance, with the individual lots or parcels being held under a common ownership and rented or leased to the occupants. Such facility may include a residence for the owner or manager of the facility, utility hookups, accessory structures, playgrounds, or other open areas, fenced yard areas for pets, and other similar amenities. In the event of a conflict, the Subdivision Ordinance shall govern.

Manufactured Home Subdivision—A unified development that is designed, platted, improved, and intended for the long-term placement of individually owned HUD-Code Manufactured Homes on platted lots that can be purchased outright by the owners of the manufactured home units. Such developments shall comply with the Subdivision Ordinance and the applicable provisions of the Subdivision Ordinance.

Mean Sea Level—For purposes of the National Flood Insurance Program, the National Geodetic Vertical Datum (NGVD) of 1929 or other datum, to which base flood elevations shown on a community's FIRM are referenced.

New Construction—For floodplain management purposes, structures or additions to existing structures for which the "start of construction" commenced on or after the effective date of a floodplain management regulation adopted by a community.

Nonconforming Building (Nonconforming Structure)—A building or structure (or portion thereof) lawfully existing at the time of adoption of this document or subsequent amendment thereto, that does not conform to the provisions of this document relative to height, bulk, area, placement, or yards for the district in which it is located.

Nonconforming Use—The use of a building or structure or of a parcel of tract or land, lawfully existing at the time of adoption of this document or subsequent amendment thereto, that does not conform to the regulations of the district in which it is situated.

Owner—Any owner, authorized agent, or contractor who constructs, enlarges, alters, repairs, moves, or changes the occupancy of a building or structure.

Owners Front Footage—The pro rata amount of the cost of a water or sewer line extension that is not reimbursable to the person requesting the extension.

Pavement Width—The portion of the surface of the street available for vehicular traffic; if curbed, it is that portion of street between back of curb and back of curb.

Person—An individual, firm, partnership, corporation, company, association, joint stock association, or governmental entity. It includes a trustee, receiver, assignee, or similar representative of any of them.

Planned Unit Development (PUD)—See unified development.

Principal Use—The main use to which the premises are devoted and the principal use for which the premises exist.

Private Street—A vehicular accessway under private ownership and maintenance providing access to building units in the interior of a lot.

Public Street—A public right-of-way, however designated, dedicated, or acquired, that provides vehicular access to adjacent private or public properties.

Public Utility—Any person, firm or corporation, municipal department, board or commission duly authorized to furnish and furnishing under federal, state, or municipal regulations to the public (e.g., gas, steam, electricity, sewage disposal, communication, telephone, telegraph, transportation, or water).

Recreational Vehicle (RV)—A unit that contains facilities either for sleeping, temporary living quarters, or both, and has its own motive power or is designed to be mounted on or towed by another motor vehicle. The term RV shall include, but shall not be limited to, a motor home, truck camper, travel trailer, and camping trailer, provided, however, that a RV as used herein shall not include a boat, a mobile home, or a manufactured home.

Recreational Vehicle (RV) Park—An area set aside and offered by any person for the parking and accommodation of two or more recreational vehicles.

Reserve—A tract of land created within a subdivision plat that is not divided into lots or proposed for development at the time of platting.

Residential—A tract of land designed for or used exclusively to contain a dwelling unit or units. A “primary residential area” shall mean a street or streets in which a majority of the total front footage is used for residential purposes.

Right-of-Way—A street, alley, or other thoroughfare or easement permanently established for the passage of persons, vehicles, or the location of utilities. The right-of-way is delineated by legally established lines or boundaries.

Setback—The minimum unoccupied distance between the lot line and the principal and accessory buildings, as required herein.

Setback, Front—The minimum unoccupied distance, extending the full lot width, between the principal and accessory buildings and the front lot line.

Setback, Rear—The minimum required unoccupied distance, extending the full lot width, between the principal and accessory buildings and the lot line opposite the front lot line.

Setback, Side—The minimum required unoccupied distance, extending from the front setback to the rear setback, between the principal and accessory buildings and the side lot line.

Sign—Any device including words, numerals, figures, designs, pictures, or trademarks painted upon or otherwise affixed to a building, wall, board, or any structure, so as to inform or attract attention.

Site Plan—A plan showing all salient features of a proposed development, so that it may be evaluated in order to determine whether it meets the provisions of this document.

Start of Construction—The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of the slab, or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include excavation for basement, footings, piers or foundations, or the erection of temporary forms; it does not include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or part of the main structures.

Street-Arterial—Roads of regional importance or the main roads of a community; such streets are designed to provide connections between municipalities or major highways.

Street-Collector—A street which collects traffic from local streets and serves as the most direct route to an arterial street.

Street-Local—Provides access to adjacent land. Characterized by a small service and low speeds.

Structure—For floodplain management purposes, means a walled and roofed building, including a gas or liquid storage tank that is principally above ground, as well as a manufactured home.

Subdivision Plat—A map or drawing of a proposed subdivision prepared in a manner suitable for recording in the County records and containing accurate and detailed engineering and survey data, dimensions, dedicatory statements, and certificates.

Substantial Improvement—For floodplain management purposes, any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either (1) before the improvement or repair is started or (2) if the structure has been damaged and is being restored, before the damage occurred. For the purpose of this definition “substantial improvement” is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either (1) any project for improvement of a structure to comply with existing state or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions or (2) any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

Unified Development—The separate ownership of single units or apartments in a multiple unit structure or structures with common elements. (See Tex. Rev. Civ. Stat. Art. 1301a).

Variance—A grant of relief to a person from the requirements of this document when specific enforcement would result in unnecessary hardship. A variance, therefore, permits construction or development in a manner otherwise prohibited by this document. (For floodplain management purposes, see Section 60.6 of the National Flood Insurance Program regulations for full requirements.)

Violation—For floodplain management purposes, the failure of a structure or other development to be fully compliant with the community’s floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in Sections 60.3(b)(5), (c)(4), (c)(10), (d)(3), (e)(2), (e)(4), or (e)(5) of the National Flood Insurance Program regulations is presumed to be in violation until such time as that documentation is provided.

Watercourse—A definite channel of a stream in which water flows within a defined bed and banks, originating from a definite source or sources. (The water may flow continuously or intermittently, and if the latter, with some degree of regularity, depending on the characteristics of the sources.)

Water Surface Elevation—The height, in relation to the National Geodetic Vertical Datum (NGVD) of 1929 (or other datum, where specified, of floods of various magnitudes and frequencies in the floodplains of coastal or riverine areas).

CHAPTER 2
SUBDIVISION STANDARDS

2.01 GENERAL PROVISIONS

Any party desiring to subdivide property shall comply with the City's Subdivision Ordinance. All aspects of these Standards shall be construed to provide additional information that is relevant to the subdivision process.

2.02 ZONING

"RESERVE"

2.03 PLATTING

Platting for subdivisions shall comply with the requirements and format outlined in the Subdivision Ordinance. All material submittals and timelines required by the ordinance shall be satisfied to ensure a timely and responsive action by the City Manager.

2.04 PLANNING, DESIGN, AND CONSTRUCTION

All subdivisions shall be planned, designed, and constructed in accordance with the City's Subdivision Ordinance, City's Standard Details, ~~Standard Specifications~~, and requirements of this document. Project specifications for specific developments shall be reviewed and approved by the City Engineer. Improvements not meeting these criteria will not be accepted by the City Manager as part of its infrastructure system.

2.05 LOTS

- A. General—The lot design should provide for lots of adequate width, depth, and shape to present an open area, to eliminate overcrowding, and to be appropriate for the location of the subdivision and for the type of development and use contemplated. Lots should have the side lot lines at right angles to the streets on which the lot faces of radial to curves street lines.
- B. Rear and Side Driveway Access—Rear and side driveway access to major thoroughfare or freeways shall be prohibited.
- C. Minimum Requirements for Residential Lots
 - 1. Minimum width at front lot line—50 feet.
 - 2. Minimum area of lots within city limits—6,000 sq ft.
 - 3. Corner lots siding on minor streets shall have a minimum width at the building setback line of not less than 70 feet.
 - 4. Corner lots siding on a major thoroughfare or freeway shall have a minimum width at the building setback line of no less than 75 feet.
 - 5. Minimum length of lots shall be 100 feet except lots facing or backing on a major thoroughfare or freeway shall be not less than 120 feet deep.

2.06 BUILDING SETBACK LINES

Subdivisions with single-family dwellings, building setback lines adjacent to streets shall be shown and labeled on all plats, both preliminary and final. For such dwellings and all residential lots, the building setback line shall be as follows:

1. Front yard—25 feet.
2. Side yard, also corner lot—15 feet.

Building setback lines for all residential lots, except as specifically provided elsewhere from side lot lines, not including corner lots, as set forth above, shall be as follows:

1. Side yard—10 feet.
2. Rear yard—15 feet.

Building setback lines for apartment or multi-family developments shall be not less than 15 feet from any side or rear lot lines. Such shall be noted on all plats as a condition to the use of any portion of the property for multi-family or apartment purposes.

CHAPTER 3
PUBLIC EASEMENT STANDARDS

3.01 UTILITY EASEMENTS

A. Easement Criteria

Easements shall be provided as required by the City's Subdivision Ordinance. The location and placement of easements shall be coordinated with the City Manager.

B. Utility Easement Restrictions

The following statement of restrictions shall be placed on the plat whenever easements are dedicated for public use:

PUBLIC EASEMENTS

All public easements denoted on this plat are hereby dedicated to the use of the public. Any public utility, including the City of Somerville, shall have the right at all times of ingress and egress to and from and upon said easements for the purpose of construction, reconstruction, inspection, patrolling, maintaining, and adding to or removing all or parts of its respective system without the necessity, at any time, of procuring the permission of the property owner. Any public utility including the City of Somerville shall have the right to move and keep moved all or part of any building, fences, trees, shrubs, other growths, or improvements that in any way endanger or interfere with the construction, maintenance, or efficiency of its respective systems on any of the easements shown on this plat. Neither the City of Somerville nor any public utility shall be responsible for replacing or reimbursing the property owner because of removal or relocation of any obstructions in the public easement.

C. Utilities

All new utilities shall be placed and constructed within designated easements or street rights-of-way and shall not be located underneath City streets.

D. Requirements

No structure, foundation, slab, or other improvement shall be placed within any dedicated public easement without written permission from the City Manager.

3.02 DRAINAGE AND FLOODWAY EASEMENTS

Drainage easements shall be provided along all natural and man-made drainage channels and floodways, which drain two or more lots or tracts of land according to the following criteria:

1. **Natural Drainage Channels**—Storm drainage easements shall be provided along existing or proposed open channels with sufficient width for the water course to handle the flow from the applicable frequency storm plus a minimum of 20 feet on each side beyond the top of bank. This allows for ingress and egress of maintenance equipment, clearance from fences, maintenance of the channel bank, and adequate slopes necessary along the bank.

2. **Enclosed Drainage Systems**—Where enclosed drainage systems are provided that are not within or adjacent to a public street, storm drainage easements of a 15-foot minimum width shall be provided. Easements shall be centered on the system. If necessary, the larger easements shall be provided. Easements shall be wide enough to encompass the system plus provide ingress and egress for future maintenance operations.
3. See also Chapter 9—Storm Drainage Standards.

3.03 FLOODPLAIN RESTRICTIONS

1. Floodplain restrictions shall be provided where necessary along natural drainageways and lakes. Floodplain restriction shall encompass the area between the dedicated channel and the water surface elevation resulting from a 100-year design frequency storm. The area encompassing the dedicated channel and the Floodplain Restriction shall be referred to as the 100-year Floodplain. The width of the floodplain shall be substantiated by a drainage study, drainage calculations, or other criteria submitted to and approved by the City Manager and City Floodplain Manager.
2. Within the 100-year floodplain, storm drainage easements should be provided that contain storm water resulting from the 100-year frequency storm less the amount of stormwater carried in the enclosed system, if any. The width of the easements shall be substantiated by a drainage study, drainage calculations, or other criteria submitted to and approved by the City Manager and City Floodplain Manager.
3. The following restrictions shall be placed in the dedication instrument:

FLOODPLAIN RESTRICTION

No construction shall be allowed within a floodplain without the written prior approval of the City of Somerville and then only after detailed engineering drawings and studies show that no flooding or obstruction to the natural flow of water will result. If construction is permitted, all finished floor elevations shall be a minimum of 1 foot above the 100-year flood elevation.

The existing creeks, lakes, reservoirs, or drainage channels (not within a public easement, traversing along, or across portions of this subdivision) shall remain as an open channel at all times and shall be maintained by the individual owners of the lot or lots that are traversed by, or adjacent to, the drainage courses along or across said lots. The City of Somerville shall not be responsible for the maintenance and operation of said private drainageways or for the control of erosion. Each property owner shall keep the natural drainage channels, traversing or adjacent to the property, clean and free of debris, silt, or any substance that would result in unsanitary conditions. The City of Somerville shall have the right of ingress and egress for the purpose of inspection and supervision of maintenance work by the property owner and alleviate any undesirable conditions that may occur. If the natural drainage channels are subject to stormwater overflow and natural bank erosion, the City of Somerville shall not be liable for damages of any nature resulting from the occurrence of these natural phenomena, nor resulting from a failure of any structure(s) within the natural drainage channels. The natural drainage channel crossing each lot is shown by the floodplain easement line as shown on the plat.

4. See also, Chapter 9—Storm Drainage Standards.

3.04 EMERGENCY ACCESS EASEMENTS

Emergency access (fire lane) easements shall be provided as required by the City Manager and City Floodplain Manager. These easements shall have a minimum width of 28 feet and a minimum height clearance of 14 feet. Any emergency access easement shall either connect at each end to a dedicated public street or be provided with a turnaround having a minimum diameter of 80 feet with an additional distance of 10 feet on all sides, clear of permanent structures. The driving surface within emergency access easements shall be designed and constructed according to standards established for local public streets. All structures shall be located within 150 feet of a dedicated and improved emergency access easement or public street.

CHAPTER 4
CONSTRUCTION PLANNING STANDARDS

4.01 GENERAL

Before the construction of any facilities related to the improvement, development, or subdivision of land, construction drawings and specifications showing sufficient detail shall be submitted to the City Manager and appropriate reviewing agencies for approval. No construction activities shall begin before approval by the City Manager.

4.02 DESIGN CRITERIA

The design criteria to be used in the preparation of detailed drawings and specifications are those outlined by this document, the City's Subdivision Ordinance, Zoning Ordinance (if applicable), Standard Details, ~~Standard Specifications~~, and other applicable federal, state, and local regulations. Project specifications for specific developments shall be reviewed and approved by the City Engineer. Other considerations shall include the application of generally accepted engineering standards of practice where specific criteria are not mandated.

4.03 PROFESSIONAL PREPARATION

All drawings and specifications shall be prepared under the direction of a Registered Professional Engineer licensed to practice in the State of Texas. All drawings, specifications, and studies shall bear the seal, signature, and date of preparation by the engineer. Subdivision and survey plats shall be prepared by a Registered Professional Land Surveyor licensed to practice in the State of Texas and bear that individual's seal, signature, and date.

4.04 APPROVALS

All drawings and specifications prepared for review shall receive approval from the City and applicable state, and federal agencies. Water and wastewater drawings and specifications shall receive approval from the Texas Commission on Environmental Quality (TCEQ). Other agency approvals shall be obtained as individual projects may dictate.

4.05 STORMWATER POLLUTION PREVENTION

All projects subject to the National Pollutant Discharge Elimination System (NPDES) shall be properly engineered and permitted in accordance with applicable regulations. Provisions to mitigate erosion and control silt problems shall be included in the detailed drawings and/or specifications whether or not a NPDES permit is required.

4.06 OTHER PERMITS

Before construction, all required permits shall be obtained from the TxDOT, TCEQ, Environmental Protection Agency, Corps of Engineers, County, railroad companies, pipeline companies, and other affected authorities.

4.07 ENVIRONMENTAL CLEARANCE

The City Manager may require environmental clearance on projects as deemed necessary. Upon request, documentation (including an assessment or impact statement) shall be completed and approved before the start of construction.

CHAPTER 5
WATER SYSTEM STANDARDS

5.01 GENERAL PROVISIONS

All water supply, distribution, pumping, and storage improvements shall be designed and constructed in accordance with this chapter, the City's Standard Details, ~~Standard Specifications~~, and the TCEQ regulations. Project specifications for specific developments shall be reviewed and approved by the City Engineer.

5.02 DESIGN CRITERIA

A. Minimum Size, Looped

All water mains shall be a minimum of 6 inches in size. All water mains shall be looped, except in the case of dead-ends where provisions shall be made for future extension.

B. Provision for Future Extensions

All water lines shall be extended, where necessary, to the borders of the development for future extensions of the distribution system. The City may participate in the cost of oversizing lines required to serve land areas or improvements beyond the development.

C. Fire Hydrants

Fire hydrants shall be installed as part of the water distribution system. In residential areas, fire hydrants shall be served by a main line of 6 inches or larger and shall be located at a distance of no greater than 500 feet on a clear path to each residence. In commercial and industrial areas, main lines shall be 8 inches or larger, and fire hydrants shall be located at a distance of no greater than 300 feet on a clear path to each structure.

D. Valves

Valves shall be installed at the intersections of all water mains. In-line valves shall be installed at approximately 1,000-foot intervals.

E. Depth of Cover

The depth of cover of water mains shall be a minimum of 42 inches below the finished grade.

F. Air Relief Valves

Air release valves and/or air vacuum relief valves shall be installed at critical water line high points.

G. Flush Valves

Blowoffs or flushing valves shall be installed at critical water line low points and dead-ends.

H. Public Easement Required

All public water facilities shall be placed in public easements as described in Chapter 3–Easement Standards.

5.03 INDIVIDUAL WATER SERVICE CONNECTIONS

Service connections shall be installed and marked by stakes (water “taps”) for each unit (dwelling, commercial, or industrial) in the development intended for individual ownership at the time of construction of the new water improvements. If individual utility connections for apartments are desired, service connections shall be installed for each apartment at the time of construction of the new water improvements. Such service connections shall be the appropriate size to serve the intended use of the property determined by an engineer, as approved by the City Manager, and shall extend from the public water main to the property lot line or utility easement line, as determined by each project. All corporation stops, service piping, curb stops, meter boxes and vaults, and any other material required for the connection shall be included in the service connection installation.

5.04 ALTERNATIVE POTABLE WATER FACILITIES

Alternative potable water facilities shall not be allowed.

A. Variance Required

A variance from the requirement to provide public water facilities to be connected to the City’s System may be granted by the City Manager at the time of the preliminary plat approval if it is determined that the municipal water system cannot be feasibly made available to the area of development. The City Manager shall be provided with sufficient technical data (e.g., topography, water demand, and existing water systems) and construction cost figures to demonstrate the proposed development’s need for an alternative to public water facilities. A separate water treatment or distribution system, or on-site, individual facilities shall not be constructed unless such separate facilities are more beneficial to the City than constructing an adequate system extension from and connection to the existing municipal system.

B. Approval of Water System

The City Manager shall not approve the final plat until the water system drawings and water wells are approved by the TCEQ and the Post Oak Savannah Ground Water Conservation District.

C. Construction to City Standards

All water lines shall be placed in public rights-of-way or easements and designed or constructed to City Standards.

D. Dedication of Public Utility Easements

If the City Manager approves an alternative water facility’s installation, utility easements shall be dedicated for the future installation of municipal water system improvements. Such easements shall comply with the criteria of Chapter 3 of this document.

CHAPTER 6
WASTEWATER SYSTEM STANDARDS

6.01 GENERAL PROVISIONS

Sanitary sewer improvements shall be designed and constructed in accordance with this chapter, the City's Standard Details, ~~Standard Specifications~~, and TCEQ regulations. Project specifications for specific developments shall be reviewed and approved by the City Engineer.

6.02 DESIGN CRITERIA

A. Minimum Size

No public sewer line shall be less than 6 inches inside diameter.

B. Future Extensions

All sewers shall be designed to serve both the subject property and the full sewershed area tributary to the sewer system. Where necessary, sewer lines shall be extended to the borders of the development to allow for future extensions of the collection system. The City may participate in the cost of any oversizing of lines required to serve land areas or improvements beyond the development.

C. Manholes

Manholes shall be installed at all intersections of other sewers 6 inches in diameter or larger and at intermediate spacings along the line. The maximum spacing shall be in accordance with the TCEQ "Design Criteria for Sewerage Systems." Manholes shall be installed at all changes in grade or direction.

D. Alignment

Sewers shall be designed with straight alignment. If horizontal curvatures must be used, the smallest radius shall not exceed that recommended by the pipe manufacturer. This is provided, however, that any radius shall not be less than 100 feet.

E. Hydraulic Slopes

All sewers shall be designed with hydraulic slopes sufficient to give mean velocities, when flowing full or half full, of not less than 2 feet per second on Ketter's or Manning's formulas using a minimum "n" value of 0.013. Minimum grades shall be those outlined by the TCEQ "Design Criteria for Sewerage Systems."

F. Surface Water and Non-Domestic Waste Prohibited

No connection shall be made to any sanitary sewerage system within the City that permits the entrance of surface water or waste of other than domestic sewage characteristics without the specific authorization by the City Manager.

G. Backfill

All lines, including all service laterals, shall be installed and backfilled below proposed paved areas to meet the City's Standard details before compaction of subgrade and placement of paving.

H. Lift Stations

Lift stations or separate treatment facilities shall not be designed or constructed unless such lift stations or separate facilities are more beneficial to the City than constructing an adequate outfall or approach sewer from the existing system.

I. Public Easements

All public sanitary sewer facilities shall be placed and constructed within designated easements or street rights-of-way and shall not be located underneath City streets as described in Chapter 3–Easement Standards.

6.03 INDIVIDUAL SEWER SERVICE CONNECTIONS

Service connections (sewer “taps”) shall be appropriately sized, installed, and marked by stake for each building in a development at the time of construction of sewer improvements.

A. Duplex and Multi-Family Dwelling Units

Individual sanitary sewer service connections shall be installed for each dwelling unit in duplex or two-family buildings. Buildings containing more than two dwelling units may provide a common sewerage collection system from the building.

B. Standards

Each service connection shall serve only one building (no “sharing” of service connections). The individual service connections shall be a minimum of 4 inches inside diameter and may extend to a common building sewer system or individually to the public sewer. A manhole connection to the public sewer is required for all service connections greater than 4 inches inside diameter.

6.04 ALTERNATIVE SEWAGE TREATMENT FACILITIES

Alternative sanitary sewage treatment systems shall not be allowed.

A. Variance Required

A variance from the requirement to provide a public sewage system to be connected to the City's system may be granted by the City Manager at the time of preliminary plat approval if it is determined that the municipal sewage system cannot be feasibly made available to the area of development. The City shall be provided with sufficient technical data (e.g., topography, soils, existing sewer system, and construction costs) to demonstrate the proposed development's need for an alternative to the public sanitary sewage treatment facilities. Alternative sewage treatment systems shall not be designed or constructed unless such facilities are more beneficial to the City than construction of an adequate system extended from and connected to the existing municipal system.

B. Approval by Texas Commission on Environmental Quality

The City Manager shall not approve a final plat until an engineered sewage disposal plan has been approved by the TCEQ and the County.

C. Dedication of Utility Easements

If the City Manager and the County approves on-site sewage treatment installations, utility easements shall be dedicated for the future installation of a municipal sewage system. Such easements shall comply with criteria of Chapter 3 of this document.

CHAPTER 7
STREET SYSTEM STANDARDS

7.01 GENERAL PRINCIPLES OF STREET SYSTEM LAYOUT

Streets shall be designated and designed according to their expected traffic capacity and function. Streets shall also be designed and constructed to achieve conformance with requirements of the City's Subdivision Ordinance.

A. Classification of Street System

The roadways within the City are classified according to the type of service and the expected traffic capacity to be provided. Each roadway classification has its own general design criteria and primary function. Table 7.01-1 provides a summary of street volume operating ranges by street classification.

Street Classification	Operating Volume Range (Volume per Day)
Freeway	≥30,000
Principal Arterial	10,000–30,000
Minor Arterial	7,000–20,000
Major Collector	5,000–10,000
Minor Collector	2,000–5,000
Local (Residential)	500–1,000
Local (Commercial or Industrial)	500–2,000

Table 7.01-1 Functional Design Capacity of Streets

B. Construction and Design Standards

All roads, sidewalks, parking lots, or other required paving shall conform to this document, Standard Details, and Standard Specification of the City. Project specifications for specific developments shall be reviewed and approved by the City Engineer.

C. Dedication of Street Rights-of-Way

1. The dedication or reservation for acquisition of pedestrian or vehicular rights-of-way shall be required of owners or developers of properties. This is necessary and desirable to lessen or control the impact upon the transportation system created by development.
2. Street right-of-way widths shall meet the requirements established in Table 7.02-2. Minimum required rights-of-way shall be determined by the functional classification of the road.
3. Street right-of-way shall be either dedicated by plat or deed to the City or the anticipated right-of-way area shall be reserved for future acquisition. If it is reserved for future acquisition, no physical improvements such as buildings, parking lots, landscaping, or stormwater retention facilities shall be allowed within the area so reserved. All setbacks shall be calculated from the anticipated right-of-way line.

7.02 STREET ACCESS

A. Direct Public Access

All public streets shall have direct access to another public street.

B. Primary Access

Primary access to large subdivisions, commercial tracts, and industrial tracts shall be provided from public streets designed to carry fairly high traffic loads such as arterials and collectors. Residential tracts shall be protected from the adverse effects of through traffic by locating lots facing local streets.

C. Points of Access

A street system shall be provided within the development with at least two points of access to a public street adjacent to the development. A variance may be granted by the City Manager at the time of preliminary plat approval if it is determined that at least two points of access is not feasible.

Street Classification	Travel Lanes	Parking Lanes	Minimum Row Width (feet)	Minimum Pavement Width (feet)
Principal-Arterial	5	2	110	85
Minor-Arterial	5	0	80	61
Major-Collector	2	—	70	41
Minor-Collector	2	2	60	39
Local-Residential	2	1	60	31
Local-Commercial or Industrial ¹	2	1	60	37
Alternative Local Residential ²	2	0	60	24
Private Streets and Emergency Access Easements	2	0	28	28

¹With City Manager approval, reduced pavement width may be used if "No Parking" signs are furnished and installed in accordance with City Standards. In no case shall pavement width be less than 28 feet, b-b, and increased driveway and intersection radii may be required for truck-turning movements.

²Alternative construction standards, as established in Section 7.14-B and Figure 7-5, may be used where the conditions shown in Section 7.14 exist.

Table 7.02-2 Street Rights-of-Way

7.03 LOCATION OF PUBLIC STREETS

1. A design for the system of streets shall be submitted with a tract. Certain streets should be planned to carry large volumes of through traffic (e.g., arterials and collectors) while other streets (locals) should be laid out to provide access within a development. Arterial and collector streets, if located within a residential subdivision, should follow the continuity of City streets leading to or from the tract and should provide for extensions into adjacent tracts. The City Manager shall approve the final location of all public streets.
2. Local streets shall be designed to serve only the development in which they are contained. Local streets shall be designed to:
 - a. Create building lots of desirable elevation, size, shape, and orientation.

- b. Discourage through traffic.
- c. Ensure access by firemen, police, and other emergency services to all areas of the tract.
- d. Ensure clear line of sight.

7.04 INTERSECTION OF PUBLIC STREETS

A. General

The number of intersections shall be kept to a minimum, consistent with traffic needs. The number of streets permitted to converge at a single intersection shall be minimized. Intersecting streets shall be designed so that they intersect at right angles with variations not to exceed 10 degrees. If jogs are necessary, the streets shall be curved as it approaches the intersection, in order to effect a nearly right-angle alignment to the greatest extent possible. Intersections shall be staggered or offset only if the distance between street centerlines is at least 125 feet.

B. Local to Collector/Arterial Intersections

Local streets intersecting a collector or arterial street shall have a tangent section of centerline at least 50 feet in length, measured from the right-of-way line of the higher traffic volume street. However, no such tangent is required if the minor street curve has a centerline radius greater than 400 feet with the center located in the high traffic volume street right-of-way.

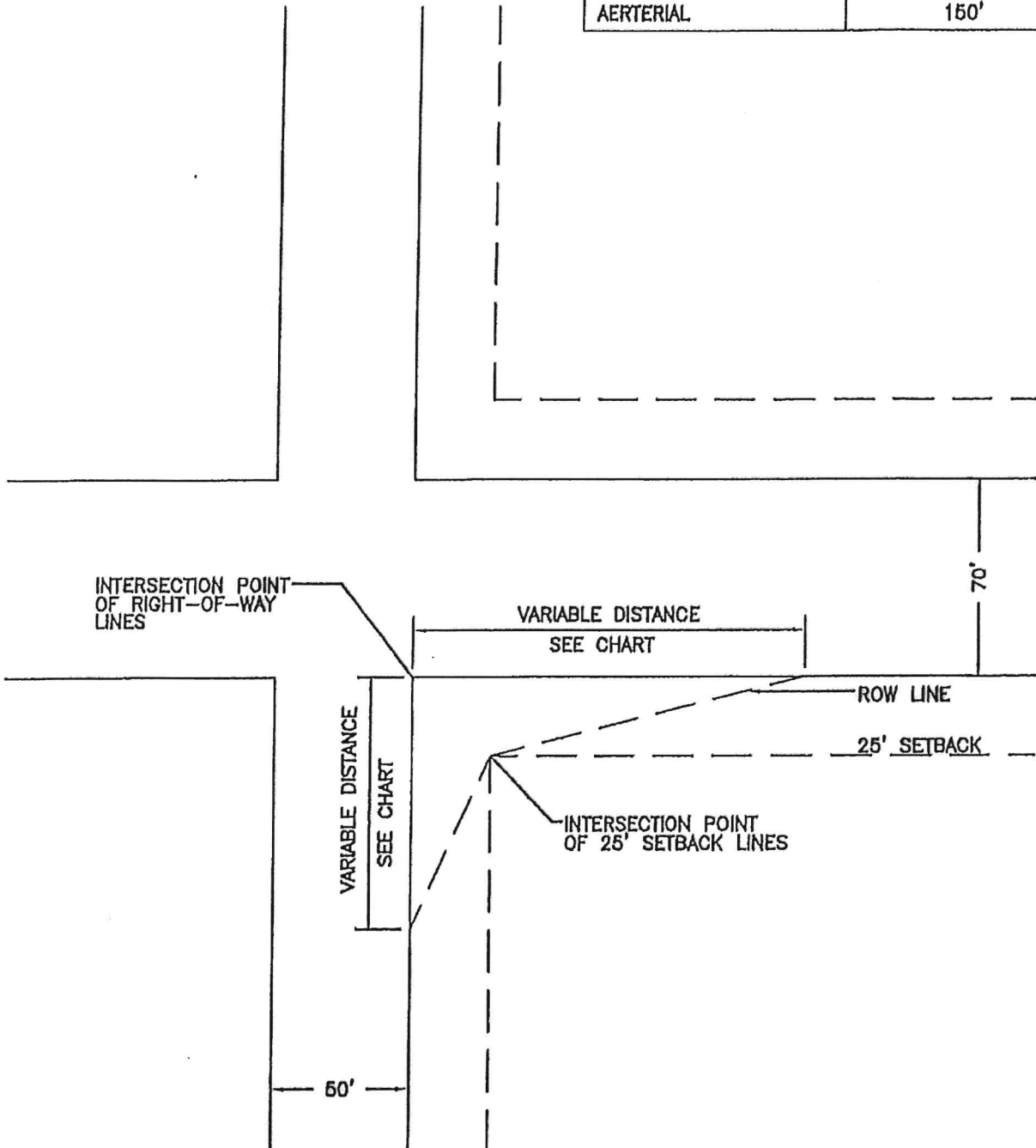
C. Sight Triangle

- 1. In order to provide a clear view of intersecting streets to the motorist, there shall be a triangular area of clear vision formed by two intersecting streets. The size of the triangular area is based on street classification.
- 2. On any portion of a lot that lies within the triangular area, shown in Figure 7-1, nothing shall be erected, placed, planted, or allowed to grow in such a manner as to materially impede vision between a height of 3 to 8 feet above the grade at the two street centerlines.
- 3. The triangular area shall be formed by a point on each proposed street right-of-way line located 75, 110, or 150 feet from the intersection of the street right-of-way lines, as indicated in Figure 7-1, and connected to the intersection point of the 25-foot setback lines.

D. Location of Intersections

- 1. **Arterial Streets**—The maximum distance between streets (centerline to centerline measurement) intersecting arterial streets shall be 1,600 feet; the minimum distance shall be 800 feet.
- 2. **Collector Streets**—The maximum distance between streets (centerline to centerline measurements) intersecting collector streets shall be 1,600 feet; the minimum distance shall be 800 feet.
- 3. **Local Streets**—The maximum distance between streets (centerline to centerline measurement) intersecting local streets shall be 1,200 feet; the minimum desirable distance shall be 600 feet.

ROAD CLASSIFICATION	DISTANCE FROM RIGHT-OF-WAY INTERSECTION
LOCAL	75'
COLLECTOR	110'
AERTERIAL	150'



CITY OF SOMERVILLE SIGHT TRIANGLE

FIGURE 7-1

NOT TO SCALE

7.05 OFF-SET STREETS

Where it is necessary to create staggered or offset streets, the minimum distance shall be 125 feet, centerline to centerline measurement.

7.06 SIDEWALKS

On local streets, the developer shall install sidewalks on their respective lot frontages on both sides of the street. On all streets, the sidewalks shall be installed 3 feet from the edge of pavement and shall conform to all Americans with Disabilities Act (ADA) requirements. A variance may be granted by the City Manager at the time of preliminary plat approval if it is determined that this is not feasible.

7.07 HALF STREETS

Half-streets are prohibited. Full street improvements shall be constructed for any development.

7.08 RESERVE ACCESS STRIPS

Strips of land at the end or alongside offered or existing streets shall not be reserved for ownership for the purpose of controlling access to a property unless the reserve access strip is dedicated to the public under conditions approved by the City Manager.

7.09 ALLEYS

Public alleys shall be prohibited. If secondary access is provided, private alleys shall be constructed to meet or exceed private street standards contained herein.

7.10 CUL-DE-SAC AND DEAD-END PUBLIC STREETS

A. General Standards

The cul-de-sac streets shall be designed to prohibit future extensions by arranging lots around the turnaround. A circular turnaround conforming to City standards for all cul-de-sac and dead-end public streets shall be constructed. The cul-de-sac turnaround shall have a right-of-way radius of 50 feet for single- and two-family use and 60 feet for other uses.

The dead-end street shall not be designed or constructed unless it is intended to connect with a future street on adjacent land. The temporary turnarounds shall be constructed within the standard right of way at the end of any dead-end street. In a commercial or industrial development; however, construction of a temporary turnaround may be waived if adequate alternatives are available for vehicles to turn around.

B. Length

The length of cul-de-sac and dead-end streets is the distance from the right-of-way line of the intersecting street along the centerline of the cul-de-sac or dead-end street to the center of the circular turnaround. The maximum length for cul-de-sacs shall be 600 feet, except in conditions of unusual topography or in rural areas in the extra territorial jurisdiction where the maximum shall be 800 feet.

7.11 PRIVATE STREETS

The private streets shall be designed and constructed in accordance with this section. Private streets shall be designated by plat and in accordance with the City's Subdivision Ordinance.

A. Layout

The private streets shall be designed to:

1. Provide adequate vehicular access to all buildings and facilities within the boundaries of the development.
2. Provide adequate interior traffic circulation and access to all buildings by fire fighting personnel and equipment.
3. Allow for the smooth flow of vehicular traffic, avoiding such traffic hazards as closely offset intersections.
4. Provide direct access to the existing public street system adjacent to the tract boundaries.

B. Intersections of Private Streets with Public Streets

Private streets shall not be direct (straight line) projections of any public street. The private street shall offset a minimum distance of 125 feet centerline to centerline from right angles with variations not to exceed 10 degrees. Right-angle intersections of private streets shall have 20-foot radii from the pavement edge at all corners. Acute angle intersections shall have a 25-foot radii for the pavement edge at the acute corner on both public and private streets. The portion of a private street within a public street right-of-way shall be designed and constructed in accordance with City driveway standards.

C. Access

A street system shall be provided within the development with at least two points of access to a public street adjacent to the development. A variance may be granted by the City Manager at the time of preliminary plat approval if it is determined that at least two points of access are not feasible. Private streets shall serve only the land within each development. Private streets shall not be extended into adjacent tracts under a different ownership or a different property owners association.

D. Design and Construction Standards

1. **Design**—Private streets shall be designed according to the geometric and construction standards established for local public streets.
2. **Pavement Width**—The minimum unobstructed width of any private street shall not be less than 24 feet. If parking is proposed along with a private street, the street shall be widened to accommodate such parking.
3. **Private Street Easement Width**—Private streets shall be located within private access easements of sufficient size to accommodate the private streets and related construction and maintenance activities.

4. **Cul-de-Sac and Dead-Ends**—Cul-de-sac and dead-end private streets shall be terminated by a circular turnaround.
5. **Construction**—Private streets shall be constructed according to the standards for pavement and base for local streets as contained herein.

E. Street Lighting

Adequate lighting shall be provided along all private streets so spaced and equipped with luminaries at such mounting heights as will provide the average levels of illumination as defined herein. Refer to Section 7.16 for further information.

7.12 STREET NAMES

A. Public Street Names

1. Names of new streets, not extensions of existing streets, shall not duplicate any existing street name in the City.
2. If a new street is a direct or logical extension of an existing street, the existing street name shall be used.
3. Street name suffixes such as place, court, circle, and loop shall be designated on streets that are cul-de-sac or loop streets. Suffixes such as boulevard, parkway, expressway, and drive shall be confined to designated arterial or collector streets. Suffixes such as highway or freeway shall be used only on designated highways or freeways falling under the jurisdiction of the TxDOT.
4. Street name prefixes such as North, South, East, and West may be used to clarify the general location of the street; however, such prefixes shall be consistent with the existing and established street naming and address numbering system of the general area in which the street is located.
5. Alphabetical and numerical street names shall not be designated on any development plan unless the street is a direct extension of an existing street with that name.
6. Street names shall fit in with the names of existing streets in the area, if possible.
7. Streets should not be named as a memorial to or in honor of a person either living or deceased unless the person being so honored has, in the opinion of the City Council, made significant contributions to the betterment of the City, state, or nation. Streets, once named, shall not be renamed except by a three-quarter majority of the City Council.
8. Coordination with the local 911 plan.

B. Private Street Names

1. Private street names shall conform to the same standards applicable to public street names as well as the following additional criteria:
 - a. Signs shall be provided for all private streets; the signs shall conform in size, height, and material to City Standards.

- b. Private streets shall be designated as lanes and the suffix “PRIVATE” shall be an integral part of any street sign [example: ROSE LANE (PRIVATE)].
- c. The background color for any private street sign shall be brown.
- 2. No private street name shall be changed without approval of the City Manager.
- 3. No private street sign shall be installed without the approval of the City Manager.
- 4. Private street signs not established in conformance with the provisions of this section and installed within the right-of-way of any public street may be removed from the public street right-of-way without notice.

7.13 GEOMETRIC CRITERIA

Public streets shall be designed according to the minimum geometric criteria established in Table 7.14-3–Geometric Design for Public Streets, and cross sections shown in Figures 7-2 through 7-5.

7.14 CONSTRUCTION STANDARDS AND SPECIFICATIONS

All public streets shall be constructed in accordance with the City’s Standard Details and Standard Specifications. Project specifications for specific developments shall be reviewed and approved by the City Engineer.

A. Noncurb and Gutter Alternative for Local Residential Streets

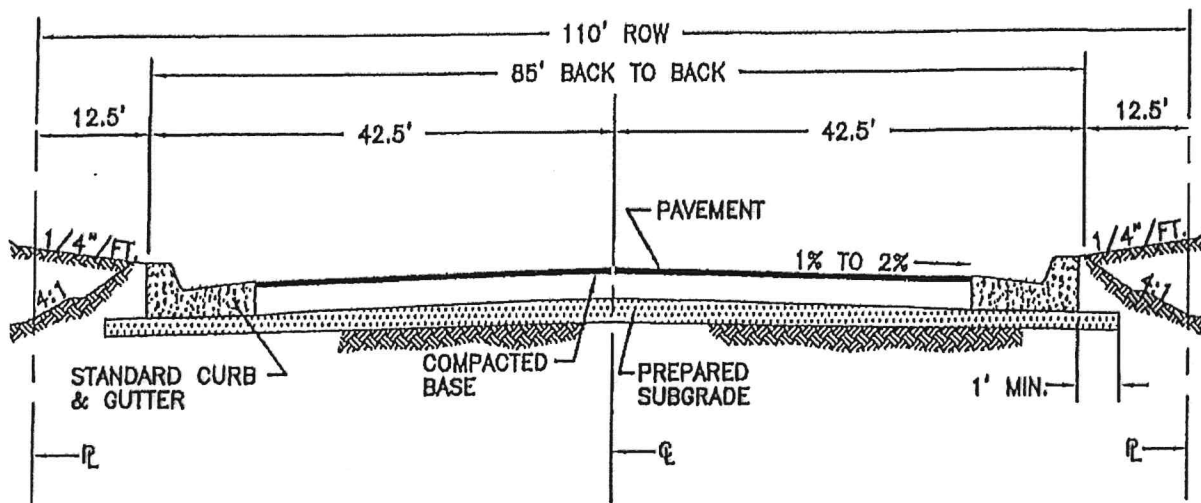
Noncurbed and guttered paved streets may be requested by a variance in residential subdivisions as defined in the City’s Subdivision Ordinance.

B. Pavement Width Alternatives for Local Commercial Streets

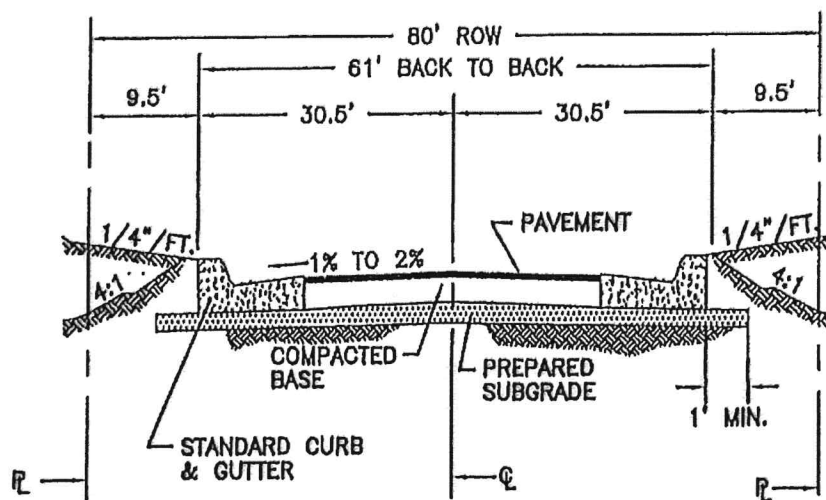
With City Manager approval, local commercial streets may be constructed with reduced pavement width if “No Parking” signs are furnished and installed in accordance with City Standards. Pavement width may be reduced to a minimum of 28 feet, back of curb to back of curb. This is provided that increased driveway and intersection radii may be required for truck-turning movements.

C. Pavement Alternative for Low Density, Rural Subdivisions

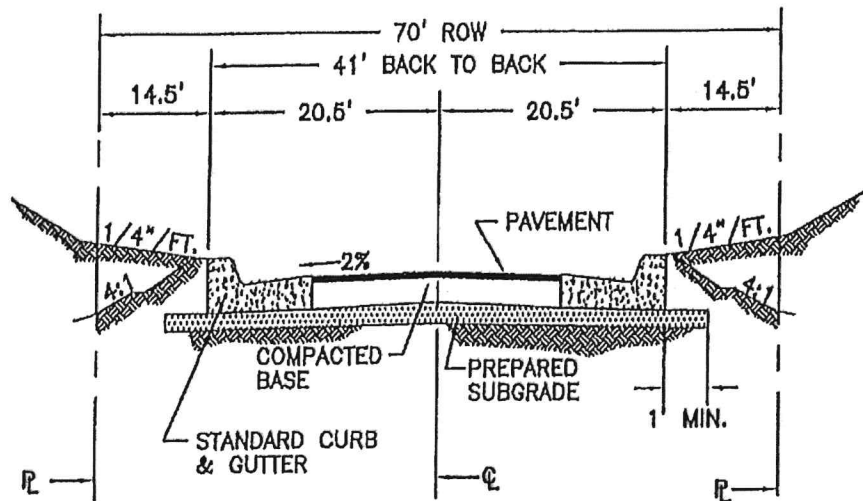
Residential subdivisions located in the ETJ of the City may provide streets constructed according to the low density residential street standards contained in Figure 7-5.



110 FOOT R.O.W.
 FIVE 12 FT. TRAVEL LANES
 TWO 12 FT. PARKING LANES
 PRINCIPAL ARTERIAL STREET

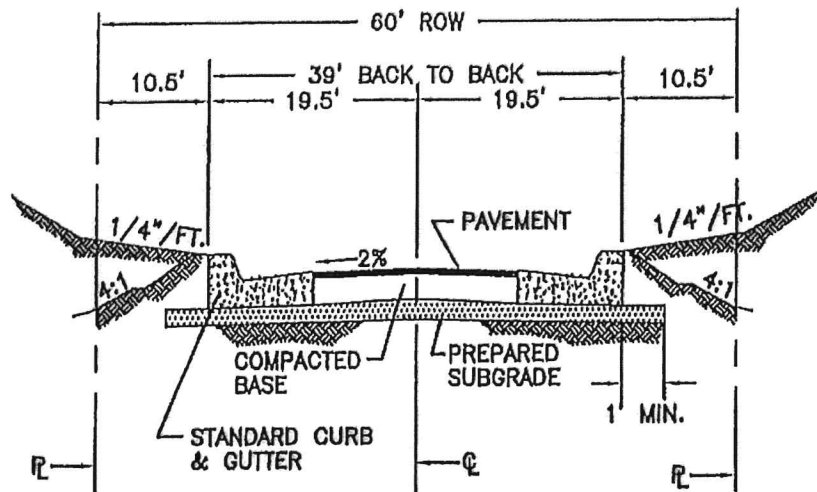


EIGHTY FOOT R.O.W.
 FIVE 12 FT. TRAVEL LANES
 NO PARKING LANES
 MINOR ARTERIAL STREET

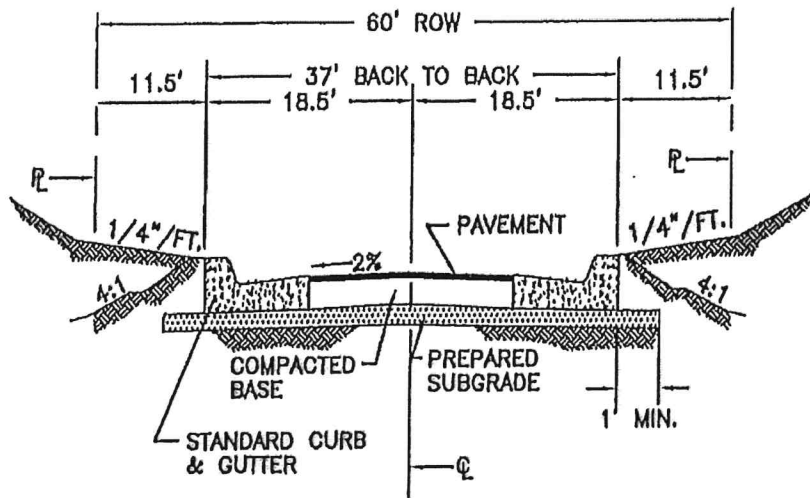


SEVENTY FOOT R.O.W.
TWO 12 FT. TRAVEL LANES(WITH PROVISION FOR FUTURE
TURNING LANE IF ONE PARKING LANE IS DELETED)
TWO 8 FT. PARKING LANES

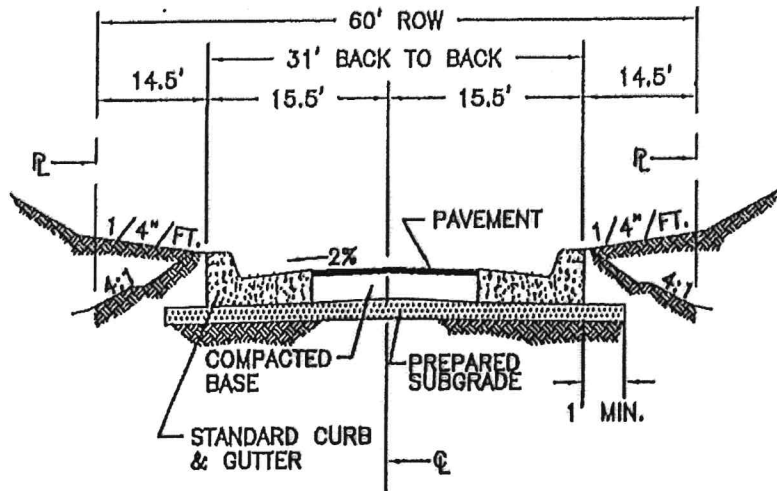
MAJOR COLLECTOR STREET



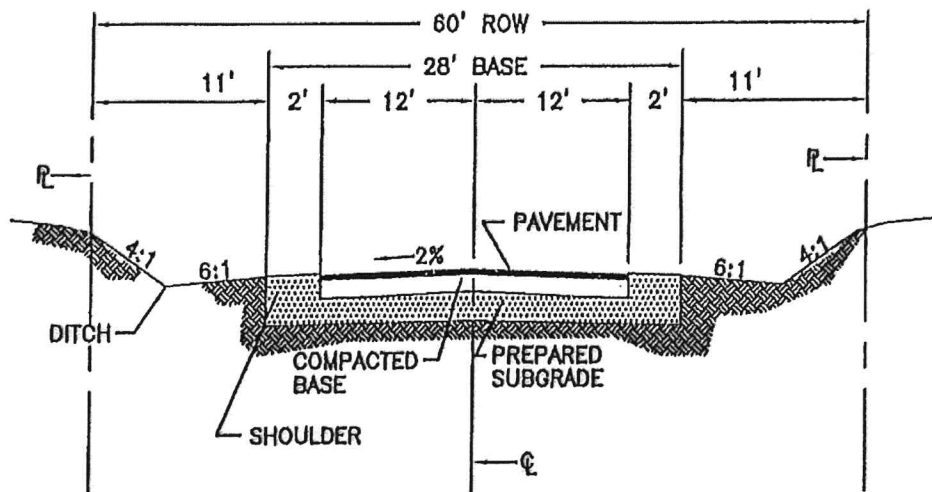
SIXTY FOOT R.O.W.
TWO 11 FT. TRAVEL LANES
TWO 8 FT. PARKING LANES
MINOR COLLECTOR STREET



SIXTY FOOT R.O.W.
TWO 12 FT. TRAVEL LANES
ONE 12 FT. PARKING LANES
LOCAL STREET(COMMERCIAL/INDUSTRIAL)



FIFTY-FIVE FOOT R.O.W.
TWO 11 FT. TRAVEL LANES
ONE 8 FT. PARKING LANE
LOCAL STREET(RESIDENTIAL)



SIXTY FOOT R.O.W.
RURAL-NO CURB & GUTTER
TWO 12 FT. TRAVEL LANES
NO PARKING ON ROADWAY



CITY OF SOMERVILLE
ALTERNATIVE LOCAL STREET (RESIDENTIAL)
LOW DENSITY RURAL

FIGURE 7-5

NOT TO SCALE

Standard Category	Street Classification		
	Arterial	Collector	Local
Maximum Grade	6 percent ¹	8 percent ¹	10 percent
Minimum Grade	0.35 percent	0.35 percent	0.35 percent
Minimum Center Line Curve Radius	1,000 feet	800 feet	300 feet
Minimum Length of Vertical Curves ²	300 feet	100 feet	100 feet
Minimum Sight Distance	400 feet	250 feet	250 feet
Minimum Tangent Length between Curves	300 feet	200 feet	100 feet
Curb Return Radii ³	30 feet	25 feet	20 feet

¹Where existing topography makes conformance to these grades impractical, consideration may be given to allowing an additional 2 percent increase in grade for a distance of less than or equal to 500 feet.

²Arterial—or 50 times the algebraic difference in grades, whichever is greater.
Collector or Local—or 20 times the algebraic difference in grades, whichever is greater.

³Acute angle intersection shall have 25-foot radii.

⁴Alternative designs using superelevation and other generally accepted transportation methods to reduce radii will be considered by the City on a case-by-case basis.
See Figures 7-2 through 7-5 for additional details.

Table 7.14-3 Geometric Design Criteria for Public Streets

7.15 STREET STRUCTURAL THICKNESS DESIGN

A. Engineered Design of Street Structural Section

1. Except as provided by Section 7.15.B, a registered engineer shall design the street structural sections (structural thickness) in accordance with the following:
 - a. American Association of State Highway & Transportation Officials (AASHTO), Flexible-Pavement Design Method
 - b. Portland Cement Association, Rigid Pavement Design Method
 - c. Any other design methods not specifically mentioned in this manual may be used, with approval of the City Manager.
2. The street structural section design shall be based on the total number and weight (plus configuration) of the axles expected to go over the street section during a design life of 20 years. The concept of “Equivalent Axle Loadings” shall be used to express the total number and mixture of loadings that will occur during the street section’s expected life. If a roadway is proposed, it will be designated as an arterial, collector, or local street and the street structural section design shall be based on the loadings shown in Table 7.15-4—Street Design by Equivalent Axle Loads.

Street Classification	Axle Loads Equivalent to 18,000 pounds
Principal Arterial	5,000,000
Minor Arterial	5,000,000
Major Collector	5,000,000
Minor Collector	400,000
Local—Commercial or Industrial	400,000
Local—Residential	9,000

**Table 7.15-4 Street Design by Equivalent Axle Loads
(20-year Design Life)**

B. Standard Structural Section Design for Paved Local Streets

In lieu of a designed street structural section, local street pavement sections (see also Sections 7.15.A and 7.15.C) may be designed as follows:

1. Use 6-inch reinforced Portland cement concrete [with 2-inch sand cushion permitted] and 6-inch stabilized subgrade, where necessary (see Section 7.15.C).

C. Soils Testing and Subgrade Stabilization

1. A soil test report for each 1,000 square yards of paved surface proposed or for each type of soil encountered in the subgrade shall be submitted to the City Manager.
2. The following data as part of the soil test report shall be submitted to the City:
 - a. Soil classification.
 - c. Optimum moisture/density (Standard Proctor, ASTM D-698).
 - d. Atterberg Liquid Limits and Plasticity Index (P.I.).
 - e. Stabilization requirements for subgrade soil (percent lime for clay or percent cement for sandy soils), if street structural section is to be designed by an engineer.
 - f. All tests shall be performed by a certified testing laboratory.
3. All subgrade soils with a P.I. of 16 or more shall be stabilized. If the standard structural section design for paved local streets is used, 5 percent lime by weight may be used. Otherwise, a certified testing laboratory shall conduct lime (or other approved material) series test to determine the percent of stabilizing agent necessary to lower the P.I. below 17 if the standard structural section design for paved local streets is not used.
4. All subgrade soils with a P.I. under 17 shall be stabilized with 5 percent by weight Portland cement.
5. Subgrade soils evaluation shall generally apply to the top 6 inches of soil measured down from the proposed subgrade surface.

D. Other Basic Criteria

1. All subgrade materials shall be compacted to 95 percent relative density, Standard Proctor Test (ASTM D-698).
2. All individual layers of base and paving materials shall be compacted to 95 percent relative density, Modified Proctor Test (ASTM D-1557).
3. The total design thickness of the street structural section shall be rounded up to the nearest whole inch.
4. The area shall be completely cleared and grubbed within the street right-of-way before construction of any street improvements.
5. The design requirements set forth in this chapter are minimum design standards. The City reserves the right to require additional precautions or treatments consistent with sound engineering practice to provide for conditions not specifically covered herein.
6. Any other design methods not specifically mentioned in this document may be used with approval by the City Manager.

E. Construction Quality Control and Material Testing

Construction quality control and material testing shall be performed, and the results shall be provided to the City to verify acceptability of specific work.

1. All tests and retests shall be performed by an approved commercial testing laboratory. All related costs shall be the developer's responsibility.
2. Copies of all materials test reports shall be submitted to the City Manager.
3. Subgrade shall be tested a minimum of every 500 feet for density and depth. The job mix formula shall be designed in accordance with TxDOT standards.
4. Surface course thickness shall be tested by the coring method.
5. Concrete shall be tested for compressive strength at 7 and 28 days. One set of cylinders [three] shall be tested for each 1,000 square yards of pavement. Structures shall be tested on the basis of one set per 100 cubic yards.
6. Concrete pavement shall be tested by coring a minimum of every 1,000 feet for thickness. A minimum of three tests are required.

7.16 STREET LIGHTING STANDARDS

A. Location

Street lights shall be installed at all street intersections, at the end of all cul-de-sac or dead end streets, and at all significant changes in direction of the roadway. All streetlights shall be installed in accordance to Table 7.16-5—Street Lighting Intensity.

Street Classification	Lighting Intensity in foot candles (fc)
Arterial	1.0
Collector	1.0
Local Commercial	1.0
Local Residential	0.2
Private Street	0.2

Table 7.16-5 Street Lighting Intensity

B. Installation

Street lights shall be mast arm mounted to the light pole. If the electrical system for the development is installed underground, the electrical service to the street lights shall also be underground. If the electrical system for the development is overhead wires with power poles located along the rear lot lines, the electrical service to the streetlights shall be underground. If the power poles are located adjacent to the street, the electrical service to the streetlights may be overhead and the street light mast arms may be mounted on the power poles provided that the required lighting intensity is maintained. In any case, Entergy shall be contacted for requirements.

CHAPTER 8
OFF-STREET PARKING AND DRIVEWAY STANDARDS

8.01 OFF-STREET PARKING

A. Minimum Number of Parking Spaces

Off-street parking spaces shall be provided in accordance with the standards outlined in the City's Zoning Ordinance (if applicable) or the following tables.

Land Use	Required Off-street Parking Spaces
Residential Uses	
Single-family Detached (patio or garden home)	Two spaces per du ¹ .
Single-family Detached (patio or zero lot line home)	Two spaces per du.
Single-family Attached (duplex, condominium townhome)	Two spaces per du.
HUD-Code Manufactured Home or Manufactured Home Park	Two spaces per du.
Mobile Home	One space per du.
Multi-family:	
a. Townhome	Two spaces per du.
b. Live-work Townhome	Three spaces per du.
c. Multiplex	Studio or one-bedroom units: 1.5 spaces per du.
d. Apartments	Two or more-bedroom units: 2.5 spaces per du.
Industrialized Home or Modular Home	Two spaces per du.
Residential and Predominantly Mixed-Use Neighborhoods	
Mixed Housing Neighborhoods	Same requirements as individual housing types previously listed.
Single-family Cluster	Two spaces per du, plus one guest parking space per each five du.
Commercial Use of the Home	
Bed and Breakfast Inns and Homes	One space per bedroom (including those used by residents and guests; additional spaces for the du are not required).
Family Home	Two spaces per du, plus two additional spaces.
Foster Home	Two spaces per du, plus two additional spaces.
General Residential Operation (children's homes, halfway houses, residential treatment centers, emergency shelters, and therapeutic camps)	One space per two bedrooms.
Group Day Care Home	Two spaces per du, plus two additional spaces.
Home Business	Two spaces per du, plus one space per 200 sq ft of space dedicated to the home business.
Home Occupation	Two spaces per du.
Recreational Vehicle (RV) Park	One space per recreational vehicle (does not include RV).

¹dwelling unit (du)

Table 8.01-1 Parking for Residential and Commercial Uses of the Home

Land Use	Required Off-street Parking Spaces
Institutional Uses	
Assisted Living and Congregate Care Facility	One space per three du. If not configured as du, then one space per three bedrooms.
College, University, or Vocational School	One space per 50 sq ft of classroom space, plus one space per 300 sq ft of office space.
Day-care Center (Adult and Child)	One space per 300 sq ft PFA.
Emergency Residential	One space per 200 sq ft PFA.
Hospital and Surgical Facility	Two spaces per 200 sq ft PFA.
Library	One space per 300 sq ft PFA.
Post Office	One space per 300 sq ft PFA.
Private Club	One space per 125 sq ft PFA not used for dining area plus one space per 75 sq ft PFA dining area.
Places of Public Assembly:	One space per 100 sq ft PFA. See standards for specific public assembly users in the following.
a. Pre-Kindergarten School	One space per employee, plus one space per five students, plus five spaces for short-term loading and unloading.
b. Elementary School	One space per employee, plus one space per five seats in the auditorium or assembly area.
c. Middle or Jr. High School	The greater of: one space per ten students or one space per five seats in the auditorium or assembly area.
d. High School	One space per 65 sq ft of classroom space, plus one space per 300 sq ft of office space.
Public Safety Facility (Police or Fire Station):	
a. Police Station	One space per 250 sq ft PFA.
b. Fire Station	Four spaces per emergency vehicle bay plus one space per 100 sq ft parking floor area (PFA) public meeting area.
Walk-in Clinic	One space per 200 sq ft PFA.
Recreation and Amusement Uses	
Campground	One space per camp site, located at camp site plus three spaces per fifty camp sites, located at office.
Indoor Commercial Amusement:	
a. Generally (not listed in the following)	One space per 150 sq ft PFA.
b. Bowling Alley	Three spaces per lane, plus one space per 100 sq ft PFA of the restaurant or bar area.
c. Pool Rooms and Billiard Halls	One space per 150 sq ft PFA, plus two spaces per pool or billiard table.
d. Indoor Arenas and Movie Theaters	Two spaces per five seats.
e. Skating Rinks and Indoor Playgrounds	One space per five seats.
Indoor Recreation and Personal Fitness	One space per 300 sq ft PFA.
Outdoor Recreation:	
a. Generally (not listed in the following)	Twelve spaces per acre.
b. Day Camp	One space per employee, plus one space per three campers.
c. Golf Course and Driving Range	Six spaces per hole plus four spaces per driving platform.
d. Swimming Pool	One space per 100 sq ft of water surface area.
e. Tennis or Racquetball Club	Four spaces per court, plus one space per two courts for employee parking if the courts are attended.
f. Athletic Fields	Thirty spaces per field, plus one space per four seats.
g. Passive Recreation (e.g., picnic area and nature trails)	Five spaces per acre.
h. Arena or Stadium	One space per three seats.

Table 8.01-2 Parking for Institutional, Recreation, and Amusement Uses

Land Use	Required Off-street Parking Spaces
Adult Business	One space per 300 sq ft PFA.
Alcoholic Beverage Sales, Off-site Consumption	One space per 300 sq ft PFA.
Alcoholic Beverage Sales, On-site Consumption	One space per 75 sq ft PFA.
Animal Boarding Facilities, Small Animal	One space per 400 sq ft PFA.
Animal Grooming Facilities	One space per 400 sq ft PFA.
Animal Veterinary Services, Small Animal	One space per 200 sq ft PFA.
Automobile Sales, Rental, and Service Establishments:	
a. Sales	One space per 1,000 sq ft PFA of showroom plus one space per 20,000 sq ft of inventory storage.
b. Rental	Five spaces, plus spaces for rental car inventory.
Automotive Repairs, Heavy	Four spaces per service bay.
Automotive Repairs, Light	Three spaces per service bay.
Automobile Washes	Three spaces per bay or stall, plus one space per two stalls, if attended.
Commercial Retail	One space per 200 sq ft PFA.
Day Care Center	One space per employee, plus one space per five students, plus five spaces for short-term loading and unloading.
Event Facility (banquet hall, dance hall, and lodge)	One space per 75 sq ft PFA.
Farmer's Market, Permanent	One space per 300 sq ft PFA.
Fueling and Charging Stations:	
a. With Convenience Store ¹	One space per four pump stations or Level 3 charging stations, plus three spaces per service bay, plus one space per 200 sq ft PFA for the convenience store.
b. Without Convenience Store ¹	One space per four pump stations or Level 3 charging stations, plus three spaces per service bay.
General Professional or Medical Office	One space per 300 sq ft PFA.
Heavy Retail or Home Center	One space per 250 sq ft PFA, plus one space per 1,000 sq ft of outdoor sales or display area.
Mixed-use	One space per 200 sq ft PFA.
Nursery, Retail	One space per 250 sq ft PFA of office or sales floor area, plus one space per 3,000 sq ft of outdoor nursery area.
Office	One space per 300 sq ft.
Overnight Accommodations (hotels, motels, and commercial inns)	One space per guest room plus one space per 300 sq ft of meeting rooms, ballrooms, administrative offices, and areas used for self-service breakfast for guests only, plus 75 percent of parking requirements for integrated restaurants and bars that are open to the public.
Pet Stores (with and without on-site animals)	One per 200 sq ft PFA.
Restaurant (no drive-through)	One space per 75 sq ft PFA.
Restaurant (with drive-through or drive-in)	One space per 200 sq ft.
Shopping Center	One space per 200 sq ft PFA.
Truck Stop or Truck Wash	One space per four pump stations, plus three spaces per service bay, plus one space per 200 sq ft PFA. for the convenience store.
Vending Kiosks and Automated Teller Machines (ATM):	
a. Generally (not listed below)	One space per kiosk.
b. Ice, Water, or Food	Three spaces per vending kiosk.
c. Media (e.g., video rental)	Two spaces per vending kiosk.
d. ATMs	Two spaces per ATM
Wholesale	One space per 500 sq ft PFA.

¹Level 3 charging stations include all charging stations that provide comparable or faster charging services. Level 1 and Level 2 charging stations are accessories to parking lots.

Table 8.01-3 Parking for Commercial Uses

Land Use	Required Off-street Parking Spaces
Agricultural Uses	
Agriculture, General	Not Applicable
Commercial Stables	One space per two stalls.
Nursery or Greenhouse, Wholesale; Agricultural Production	One space per 300 sq ft PFA of office or sale floor area, plus one space per 5,000 sq ft of outdoor nursery area.
Industrial Uses	
Broadcasting Center (satellite farm, server farm, and switching facility)	One space per 250 sq ft PFA of office or sales floor area, plus one space per 3,000 sq ft of additional floor area.
Heavy Retail, Lumberyards and Equipment	One space per 250 sq ft PFA of office or sales floor area, plus one space per 3,000 sq ft of outdoor storage or display area.
Light Industry	One space per 500 sq ft PFA.
Research and Testing Laboratory	One space per 300 sq ft PFA.
Warehousing (logistics; distribution)	One space per 300 sq ft of office area, plus one space per 1,000 sq ft of warehouse.
Utility Uses	
Power Generation, Small-scale (renewable; noncombustible)	Not Applicable
Public Utility Plant, Municipal	One space
Public Utility Plant, Neighborhood	One space
Public Utility Plant, Regional	One space
Transportation Uses	
Bus Depot	One space per 500 sq ft PFA.
Heliport	Two spaces
Self-storage (boat storage or marina)	One space per 25 storage units, plus one space per 300 sq ft of office space, plus one space per bedroom of any on-site caretaker residence.
Trucking	One space per 400 sq ft PFA of retail, wholesale, and office floor area, plus one space per 1,000 sq ft PFA of other floor area, plus one space per loading dock.
Communication Uses	
Attached Facilities	Not Applicable
Non-stealth Freestanding Facilities	Two spaces per tower.
Stealth Freestanding Facilities	Two spaces per tower.

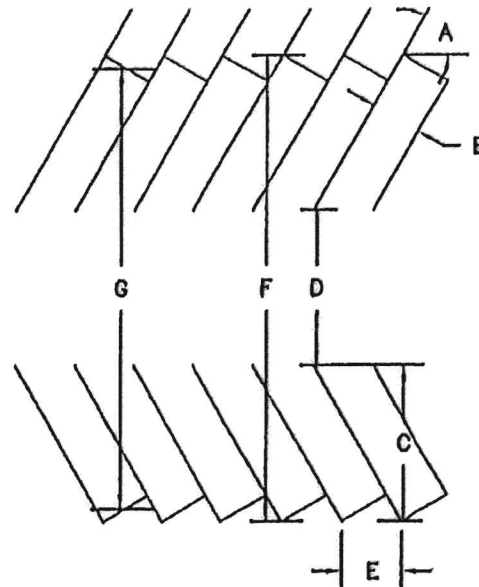
Table 8.01-4 Parking for Agricultural, Industrial, Utility, Transportation, and Communication Uses

B. Parking Lots

1. All parking lots, parking spaces, maneuvering aisles, loading areas and driveways shall be asphalt or concrete. The base of the asphalt or concrete shall be a minimum of 6 inches of approved crushed rock base material on compacted or undisturbed subgrade, or an approved equal, and must be approved by the City Manager.
2. Location, size, and number of handicapped parking spaces shall conform to the latest building codes as well as state and federal laws.
3. All other parking spaces and lots shall meet the standards provided in Figure 8-1.

A	B	C	D		E	F	G
			a	b			
0°	8.0'	8.0'	12.0'	24.0'	23.0'	28.0'	---
30°	9.0'	17.3'	12.0'	---	18.0'	45.6'	37.5'
45°	9.0'	19.6'	13.0'	---	12.7'	52.5'	46.5'
60°	9.0'	21.0'	18.0'	---	10.4'	60.0'	65.5'
90°	9.0'	19.0'	24.0'	24.0'	9.0'	62.0'	---

- A PARK ANGLE
- B STALL WIDTH
- C 19' STALL TO CURB
- D AISLE WIDTH
 - (a) ONE WAY TRAFFIC
 - (b) TWO WAY TRAFFIC
- E CURB LENGTH PER CAR
- F CENTER TO CENTER WIDTH (CURB TO CURB MODULE)
- G CENTER TO CENTER WIDTH MODULE (ASSUMING FRONT BUMPER OVERHANG)



4. All paved parking spaces shall be clearly delineated and designated by means of painted stripes, wheel stops, signs, or other approved methods.
5. Parking lots and loading areas shall be designed to allow all vehicle maneuvers, such as backing, parking, and turning the vehicle, to take place on the lot.

C. Off-Street Loading Requirements

1. Any use that receives or distributes materials or merchandise by vehicle shall provide an off-street loading space in accordance with the requirements detailed in the following.
 - a. Industrial uses shall provide one loading space for 10,000 sq ft of floor area.
 - b. Business uses shall provide one loading space for each 15,000 sq ft of floor area.
2. The following rules shall be applied in computing the number of off-street loading spaces required:
 - a. Floor area shall mean the gross floor area of use.
 - b. Fractional spaces shall be rounded to the next higher whole space.
3. The required off-street loading spaces shall be located on the same lot as the building or use served.
4. A loading space shall contain a minimum of 420 sq ft and shall be approximately 12 feet in width and 35 feet in depth. All loading spaces, maneuvering aisles, and driveways shall be paved with an all-weather surface.

8.02 DRIVEWAY DESIGN STANDARDS

Driveway or other facilities for access to lots shall be designed, constructed, upgraded, reconstructed, or repaired according to the standards of this section. Driveways shall be permitted only upon streets where full street improvements exist and are maintained as a public street by the City. Low volume (residential) driveways may be permitted on public lanes, alleys, or other accepted public access facilities in existence before adoption of this document.

A. Location and Construction of Driveways

The location of driveways is based on a number of factors, including the location of individual property lines and available street frontage, requirements or internal site design, number of vehicles to be accommodated, and traffic safety. As a general rule, the farther from an intersection a driveway can be located, the less it will affect through traffic and the less it will cause a delay to vehicles using the driveway.

1. High volume driveway approaches shall be located entirely within the frontage of the lot and not less than 10 feet from any side property line. Joint driveway approaches may be permitted where a permanent joint access is provided by the respective property owners either through platting or a mutual access easement (see 8.02.A.7). Low volume (residential) driveway approaches shall be located entirely within the lot dimensions and not less than 5 feet from any side or rear property line.

2. Location of driveways on the opposite side of the street shall be considered when locating a proposed driveway. Where possible, driveways on both sides of the street shall be aligned in order to minimize adverse effects on through traffic and to optimize efficiencies of the driveway. Driveways directly opposite each other shall be given preference over staggered driveways. Where it is not possible to place driveways directly opposite each other, a driveway shall be placed so that adequate left-turn storage capacity is provided in advance of each driveway in order to avoid the overlap of left-turn movements.
3. Driveway approaches shall be constructed so as not to interfere with pedestrian crosswalks.
4. Driveways shall be constructed a minimum of 3 feet from any obstruction, such as a street light or utility pole, fire hydrant, traffic signal controller, or telephone junction box.
5. Low volume driveways (single-family residential) shall be constructed to conform to the criteria shown in Figure 8-2.
6. High volume driveways shall be constructed to conform to the criteria shown in Figure 8-3.
7. When the owner or owners of two adjacent lots with high volume driveway approaches agree to permanently combine access points, the City Manager shall grant an incentive bonus. The total lot width normally required will be reduced by 15 percent for each lot. In addition, where the agreement also includes a permanent mutual parking agreement, the required number of parking spaces may be reduced by 15 percent for each development.
8. The maximum number of driveways per lot, based on the street classification and lot width shall be as shown in Table 8.02-1—Maximum Driveways per Lot.

Street Type	Lot Width	Permitted Driveways
Local	<100 feet	1
	101–200 feet	2
	Over 200 feet	1 per additional 100 feet
Collector	<100 feet	1
	100–250 feet	2
	Over 250 feet	1 per additional 200 feet
Arterial	<100 feet	1
	101–300 feet	2
	Over 300 feet	1 per additional 300 feet

Table 8.02-1 Maximum Driveways per Lot

B. Driveway Spacing for High Volume Driveways

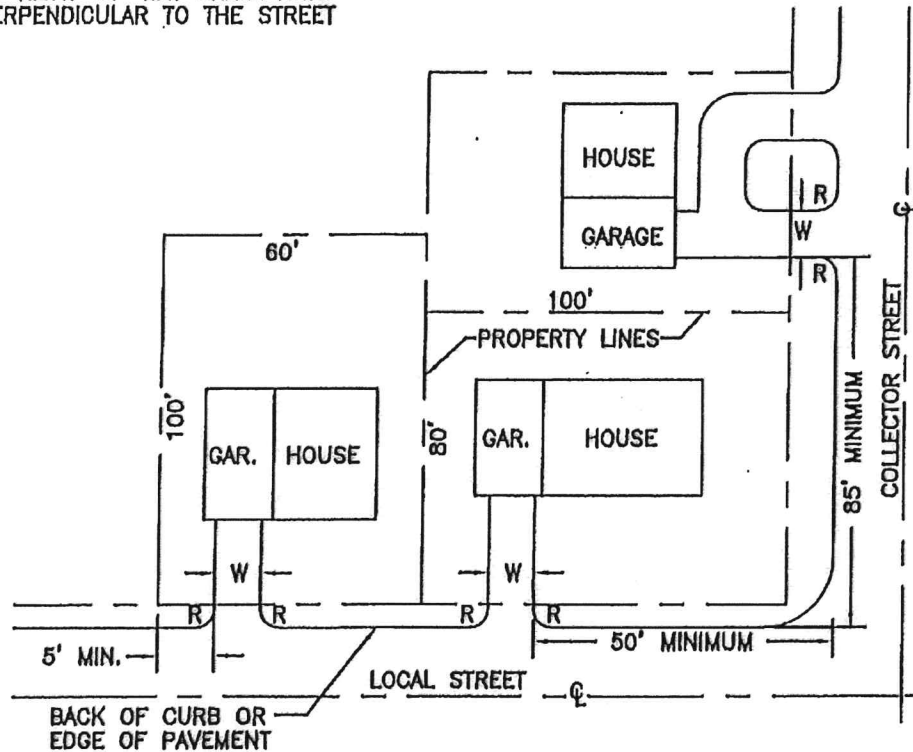
High volume driveways shall be designed and constructed according to the spacing standards shown in Figure 8-4. Driveways are subject to approval by TxDOT if in a TxDOT right-of-way.

C. Driveway Design

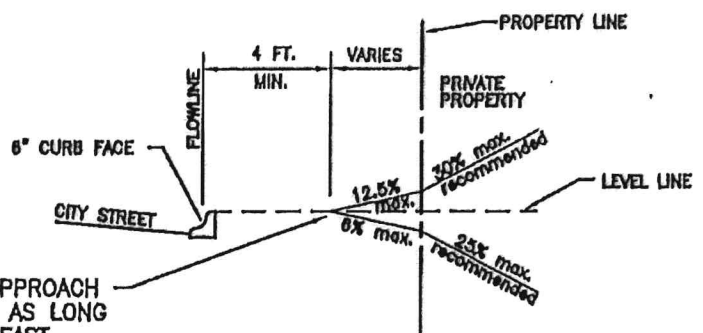
Driveway design will depend on the land use, volume, character of both through traffic and driveway traffic, and speed of traffic on the through street. Dependent upon these factors, the critical design elements include radii of curb returns, driveway throat width, and the angle between the driveway centerline and the edge of the roadway.

NOTE:

THAT PORTION OF THE DRIVEWAY APPROACH
WITHIN THE PUBLIC RIGHT-OF-WAY SHALL HAVE
ITS CENTERLINE PERPENDICULAR TO THE STREET
CENTERLINE.



ST TYPE	R FT	W - FT	
		MIN	MAX
WITH CURB	5	12	30
NON-CURBED	5	12	30



NOTE: A PARABOLIC APPROACH
PROFILE MAY BE USED AS LONG
AS THIS POINT IS AT LEAST
LEVEL WITH THE TOP OF CURB.

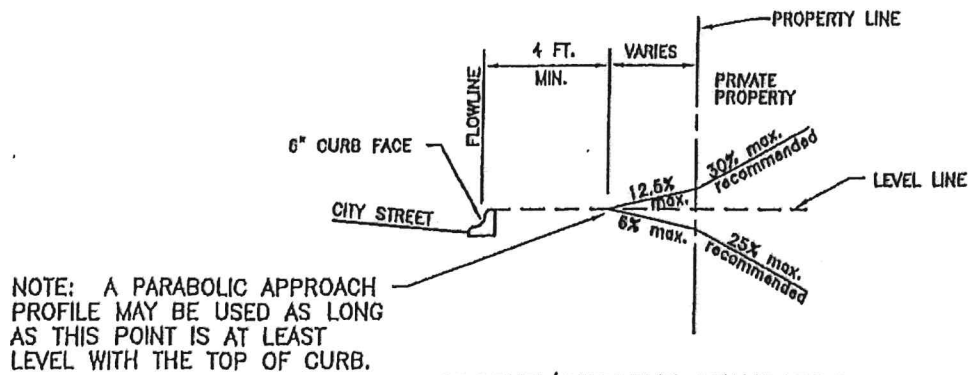
ASCENT/DESCENT STANDARDS



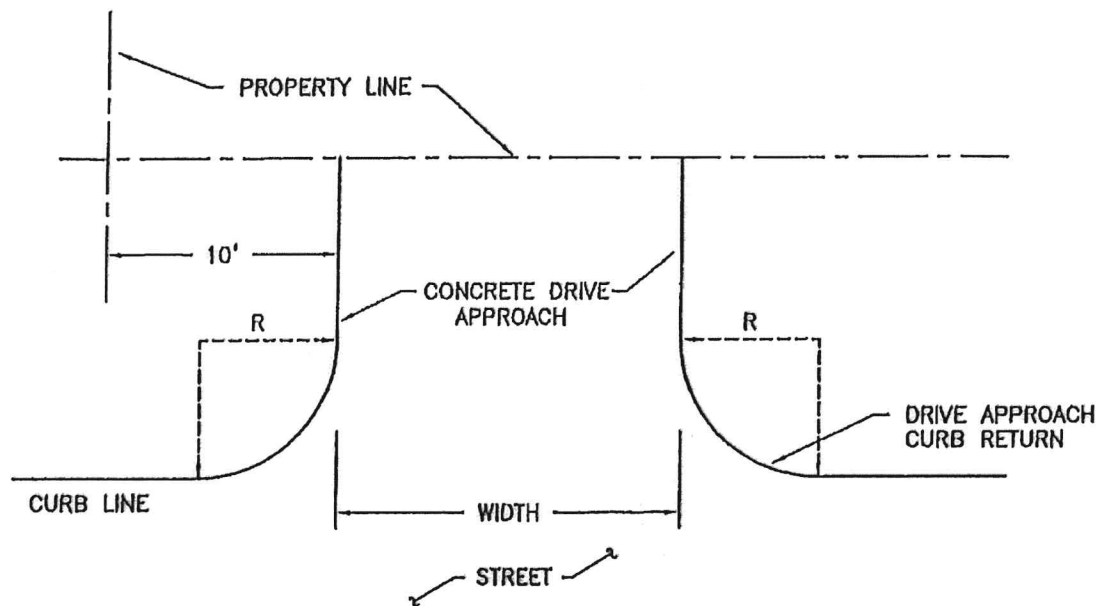
CITY OF SOMERVILLE
RESIDENTIAL (LOW VOLUME)
DRIVEWAY CRITERIA

FIGURE 8-2

NOT TO SCALE

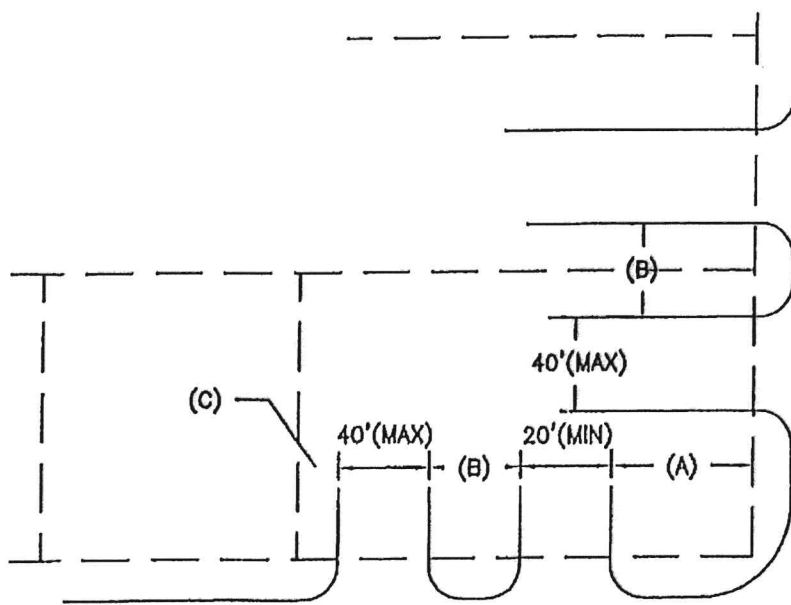


ASCENT/DESCENT STANDARDS

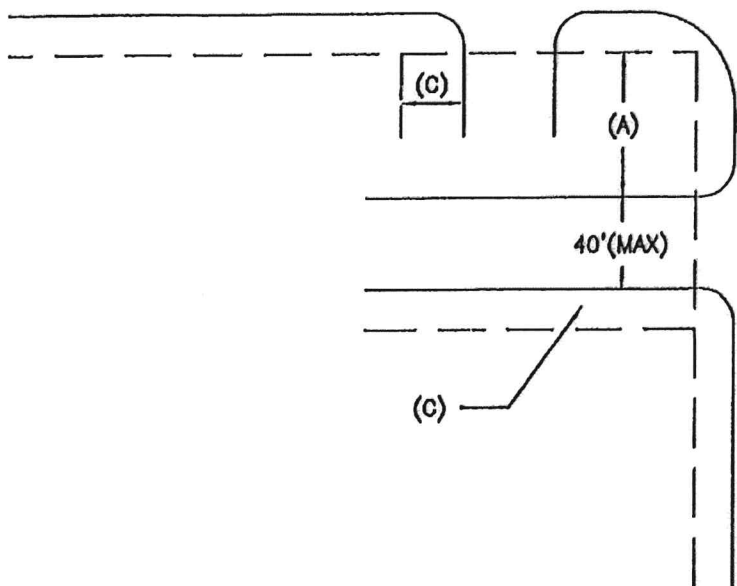


DRIVE TYPE	MINIMUM WIDTH	MINIMUM RADIUS, R
ONE-WAY ENTRANCE	20 FEET	SEE TABLE 8.02.2
ONE-WAY EXIT	20 FEET	SEE TABLE 8.02.2
TWO-WAY ENTRANCE/EXIT	20 FEET	SEE TABLE 8.02.2

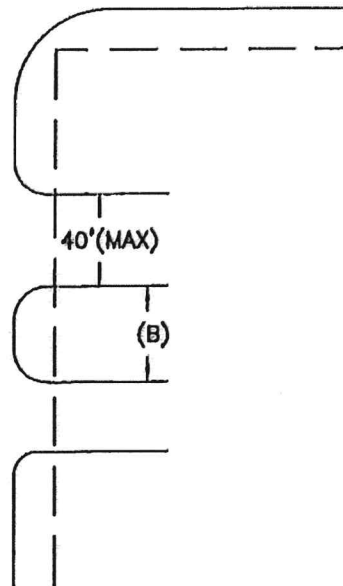
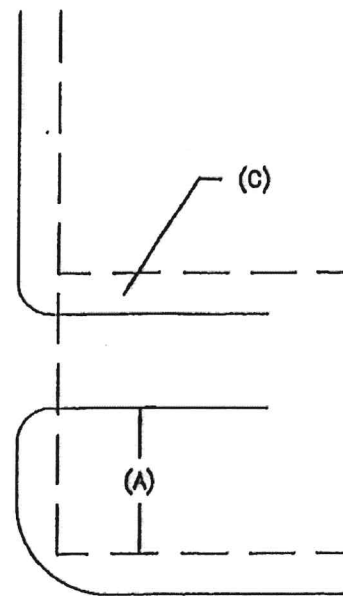
NOTE: MAXIMUM WIDTH FOR ALL TYPES IS 40 FEET.



MINOR STREET



MAJOR STREET



	MINIMUM SEPARATION (FT)		
	ARTERIAL	COLLECTOR	LOCAL
A	65	55	35
B	20	20	20
C	10	10	10



CITY OF SOMERVILLE HIGH VOLUME DRIVEWAY SPACING CRITERIA

FIGURE 8-4

NOT TO SCALE

1. Driveway entrances shall be designed to accommodate all vehicle types having occasion to enter the lot, including delivery vehicles.
2. Driveways shall be designed with curb return radii according to the type of driveway and the classification of the street as provided in Table 8.02-2–Minimum Curb Return Radii.

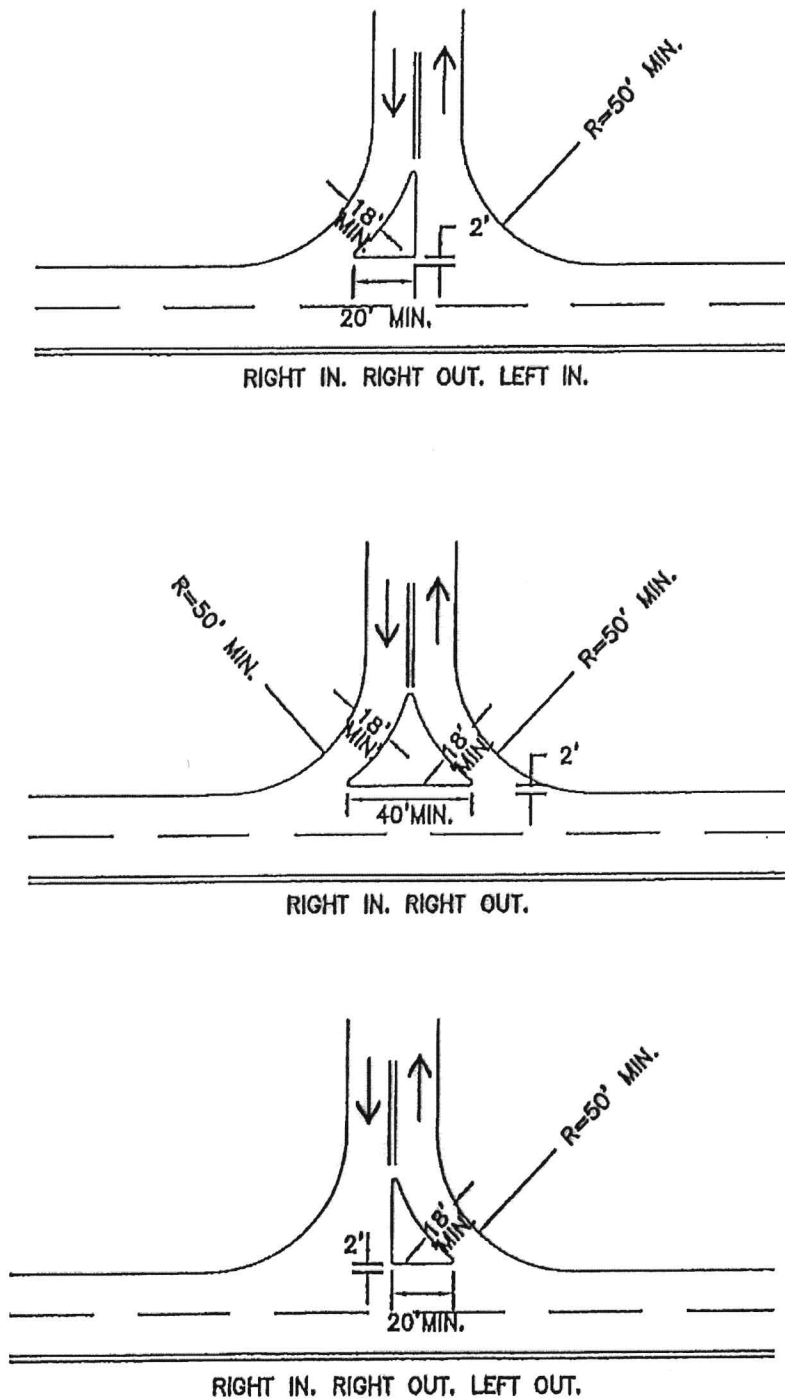
Street Classification	Low Volume Driveway	High Volume Driveway
Local	5 feet	10 feet
Collector	5 feet	10 feet
Arterial	10 feet	20 feet

Table 8.02-2 Minimum Curb Return Radii

3. Tapered or channelized deceleration lanes for vehicles turning right into high volume or intersection type driveways may be required on arterial streets. Where such lanes are necessary, additional rights-of-way may also be required.
4. The use of one-way driveways, supported by an appropriate internal circulation system, is encouraged so that entrances and exits can be separate driveways. This will promote smoother traffic flow into and out of the driveways and reduce traffic congestion in through lanes on the street.
5. In some cases, where necessary for the safe and efficient movement of traffic, the City Manager may require special design techniques be employed to restrict or limit turning movements into or out of a driveway before the driveway can be approved. Such restrictions do not affect the number and location of access points as specified elsewhere. Figure 8-5 gives approved minimum design criteria for limited movement driveways. Deceleration lanes may also be required to be incorporated into the design.
6. Driveway design standards for sites that include fuel pumps parallel to the adjacent street are necessary because of the special access needs that characterize such developments. Sites shall be designed for fuel pumps according to the following standards:
 - a. The minimum corner clearance shall be a distance of 35 feet measured from the point of intersection right-of-way lines to the point of tangency of the curb return radii leading to the driveway approach. The point of tangency of the curblane corner radius and that of the curb return radius of the driveway approach shall not be compounded.
 - b. The minimum spacing between driveway approaches within the same property lines shall be 25 feet of tangent curb length.
 - c. A minimum distance between the fuel pump, island, and the right-of-way or property line shall be 25 feet.

D. Restrictive Provisions

Access to public streets will not be provided where the conditions described in the following restrict or compromise the safety and efficiency of the access.



1. **Backing Maneuvers**—Access points shall not be approved for parking or loading areas that require backing maneuvers in a public street right-of-way except for single-family or duplex residential uses on local streets.
2. **Sight Distance Requirements**—The minimum sight distance shall be provided at all access points as shown in Figure 8-6.
3. **Signalized Intersections**—Access drives within the area of intersection of public streets where traffic signals are installed, or are anticipated to be installed in the future, will not be permitted.
4. **Provision of Access**—If a lot has frontage on more than one street, access will be permitted only on those street frontages where standards can be met. If a lot cannot be served by any access point meeting these standards, access point(s) shall be designated by the City based on traffic safety, operational needs, and conformance to as much of the requirements or these guidelines as possible.
5. Driveway approaches shall not be constructed or used for the standing or parking of vehicles.

E. Driveway Construction

1. The portion of the driveway approach within the street right-of-way shall be paved with concrete as follows:
 - a. Commercial, Multi-Family, or Industrial—All pavement shall be concrete.
 - b. Residential—All driveway pavement abutting curb and gutter streets shall be concrete. All driveway pavement abutting on noncurb and guttered streets shall be concrete.
2. Property owners developing multi-family, commercial, or industrial driveways located on noncurbed and guttered streets are responsible for all culvert installations.

F. Abandoned Driveway Approaches

Whenever the use of any driveway approach is abandoned and not used for ingress or egress to the property abutting, it shall be the duty of the property owner of such abutting property to restore the curb according to the City's specifications.

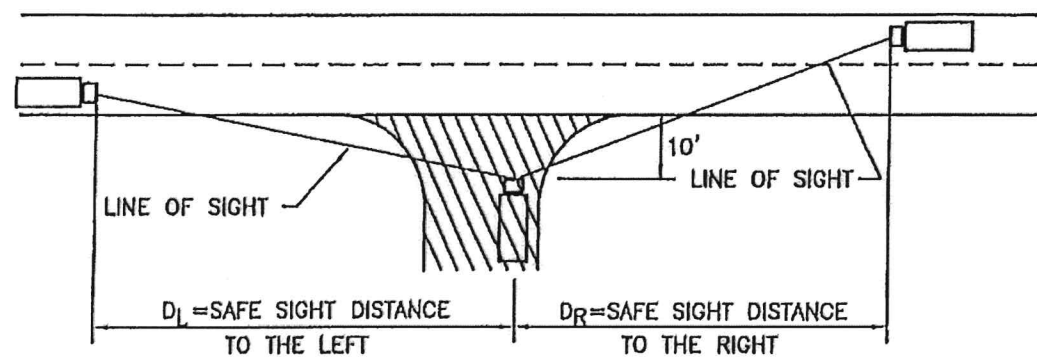
8.03 REFUSE CONTAINER PADS

Refuse container pads, where necessary, shall be installed according to the standards contained in Figure 8-7.

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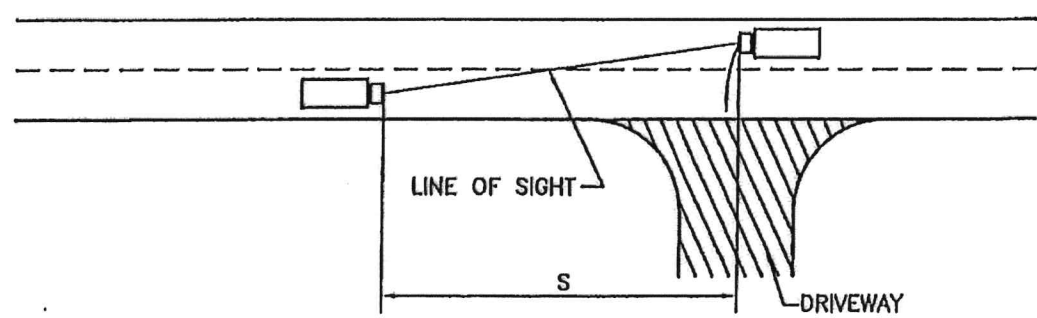
SIGHT DISTANCES AT ENTRANCES

D = DISTANCE ALONG MAJOR ROAD FROM DRIVEWAY TO ALLOW VEHICLE TO ENTER SAFELY (FEET)																
30 MPH				40 MPH				50 MPH				60 MPH				
2 LANE		4 or 6 LANES		2 LANE		4 or 6 LANES		2 LANE		4 or 6 LANES		2 LANE		4 or 6 LANES		
D _L	D _R	D _L	D _R	D _L	D _R	D _L	D _R	D _L	D _R	D _L	D _R	D _L	D _R	D _L	D _R	
PASSENGER CARS	350	260	220	260	530	440	360	440	740	700	620	700	950	1050	950	1050
TRUCK	500	400	400	400	850	850	850	850	1800	1800	1600	1600	2500	2500	2500	2500



LEFT TURN SIGHT DISTANCE AT ENTRANCES

S = DISTANCE ALONG MAJOR ROUGE FOR VEHICLE TO SAFELY TURN LEFT ONTO DRIVEWAY (FEET).												
30 MPH			40 MPH			50 MPH			60 MPH			
2 LANES	4 LANES	6 LANES	2 LANES	4 LANES	6 LANES	2 LANES	4 LANES	6 LANES	2 LANES	4 LANES	6 LANES	
PASSENGER CARS	230	250	270	370	390	420	520	550	580	700	740	780
TRUCK	400	440	480	570	620	670	810	880	9550	1000	1100	1200



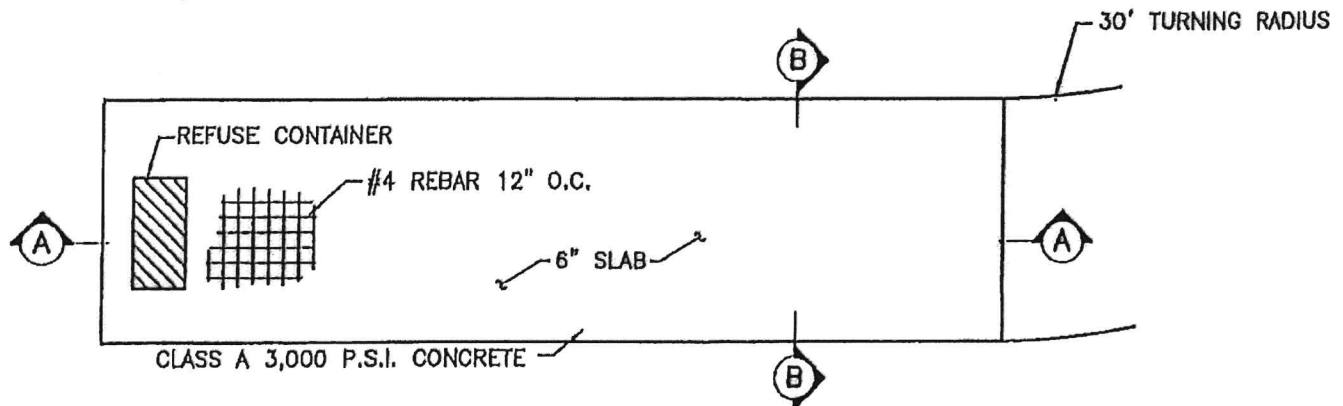
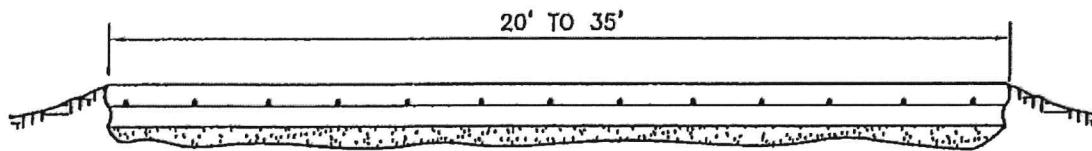
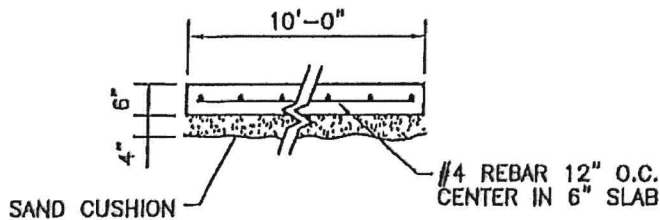
CITY OF SOMERVILLE
SIGHT DISTANCES FOR
DRIVEWAY DESIGN

FIGURE 8-6
NOT TO SCALE

REQUIREMENTS FOR CONTAINER LOCATION AND PADS

SHOW PAD AND LOCATION FOR DUMPSTER CONTAINERS ON ALL PLANS FOR BUSINESSES, COMMERCIAL BUILDINGS, SERVICE STATIONS, APARTMENTS, ETC.,

1. OVERHEAD CLEARANCE OF 20 FEET REQUIRED.
 - a. NO OVERHEAD ELECTRICAL WIRES, OVERHANGS, OR EAVES.
2. A MINIMUM 50 FOOT STRAIGHT APPROACH TO THE CONTAINER SHALL BE PROVIDED.
3. MINIMUM 10 FEET CLEAR SPACE EACH SIDE OF CONTAINER.
4. ADEQUATE TURN-AROUND OR BACKING AREA.
5. CONTAINER PAD AND CONTAINER CANNOT BLOCK ROAD, STREET RIGHT-OF-WAY, DRAINAGE DITCHES, TRAFFIC OR SIGHT TRIANGLE.
6. AREAS IN FRONT AND ALONG THE SIDE OF CONTAINERS SHALL BE MARKED AS "NO PARKING ZONE" OR "TOW AWAY ZONE."
7. THE COLLECTION VEHICLE WEIGHS 64,000 LBS. THE DRIVEWAYS SHOULD BE CONSTRUCTED WITH THIS LOAD IN MIND. THE CITY IS NOT RESPONSIBLE FOR DAMAGE TO PRIVATE PARKING LOTS OR DRIVEWAYS.
8. DUMPSTER SHOULD BE LOCATED AT THE REAR OF THE BUILDING.



CHAPTER 9
STORM DRAINAGE STANDARDS

9.01 GENERAL PROVISIONS

Drainage facilities shall be designed and constructed in accordance with this chapter and the City's Standard Details and ~~Standard Specifications~~. Project specifications for specific developments shall be reviewed and approved by the City Engineer. The following design criteria are the City's minimum methods and standards. Other hydrologic and hydraulic design methods may be used to satisfy drainage requirements with previous approval of the City Manager.

A. Upstream Conditions

All drainage facilities shall be designed based on potential and fully developed upstream conditions. A minimum runoff coefficient of 0.75 shall be used for all undeveloped upstream property.

B. Downstream Conditions

Downstream water surface elevations shall be determined for a 100-year design frequency storm in order to define the downstream flood hazards created by the proposed development.

C. Protection of Downstream Properties

A downstream drainage improvement or retention system shall be designed and constructed to protect downstream properties from any increase in stormwater runoff level.

D. Discharge Points

All drainage improvements shall be terminated at a discharge point approved by the City Manager. Such discharge point, or outlet, shall be designed and constructed to prevent damage to or overflowing into the adjacent property. The City Manager may require creek improvement, channel lining, energy dissipaters, or other improvements for such outlet to prevent erosion or increase the flow capacity.

E. Public Streets as Drainage Facilities

1. Maximum spread of water to be allowed in local streets at a 5-year design flow shall allow for one clear lane of traffic (12 feet wide).
2. Maximum spread of water in collector streets at a 10-year design flow shall allow for one clear lane of traffic each way (12 feet wide each).
3. Maximum spread of water in arterial streets at a 10-year design flow shall allow for two clear lanes of traffic (24 feet wide).

F. Drainage Channels and Structures

1. An underground storm drain on curb and gutter streets shall be installed beginning at the point where the calculated storm water runoff is of such a quantity that it exceeds the height specified above. The storm drain system from this point shall be constructed to an approved outlet.
2. For noncurb and gutter streets, open channel (channel or ditch) methods may be used to dispose of stormwater runoff of such a quantity that it exceeds the height specified above. Such channels may be in dedicated drainage easements outside the standard street right-of-way upon City Manager approval of the location and alignment of such easements. Alternatively, the street right-of-way may be widened to accommodate an open channel of greater capacity than the standard street or ditch section.

3. If the channel is located in a widened street right-of-way, the City Manager shall approve the right-of-way width and channel configuration.
4. All channels shall be designed and constructed to terminate at an approved outlet.

G. Habitable Structures

Adequate means for stormwater runoff in excess of the street's "design storm" capacity (i.e., 5- and 10-year storm) shall be provided to flow around habitable structures for areas not in the floodplain. Any area in FEMA floodplain needs to comply with FEMA guidelines.

1. If adjacent topography rises away from the street, a grading or drainage plan shall be provided that shows all building sites can provide a finished floor elevation to meet one of the following.
 - a. At least 1 foot above the top of the curb, using the highest point along the portion of such curb fronting the building site.
 - b. At least 1 foot above the top of ditch elevation, using the highest point along the portion of such ditch fronting the building site.
2. If adjacent topography falls away from the street, a grading or drainage plan shall be provided that shows that all building sites can provide a finished floor elevation at least 1 foot above the ground elevation along all sides of the building site.
3. Provisions shall be made in the subdivision grading plan that will contain stormwater on each lot and discharge it to either the street or a drainageway at the rear of the lot. If necessary, drainage swales shall be constructed on the low side of each lot, which will prevent stormwater migration to adjacent lots.
4. All streets shall be designed and constructed to minimize any fill required to bring building pads into compliance with this document.
5. Alternate methods of building protection of those above may be accepted by the City Manager upon submittal of detailed, engineered drawings.

H. Drainage System Criteria

If an underground drainage system is required, and a 60-inch or smaller pipe will handle the design flow, reinforced concrete pipe shall be used. If a 60-inch pipe is not adequate, reinforced concrete pipe or natural and/or a lined open drainage channel may be used. If reinforced concrete pipe is selected, the maximum allowable velocity shall be 12 feet per second in the pipe. Lining materials, if used, shall be approved by the City Manager.

I. Line of Flow

Water courses shall be allowed to follow their natural lines of flow. Rechanneling or rerouting of water courses may be permitted where approved by the City Manager provided that the point at which the water course enters the lot and the point at which it leaves the lot are not changed.

J. Bridges and Box Culverts

Bridges or box culverts shall be designed and constructed at all street crossings over all drainageways and floodways in accordance with Table 9.02-2–Design Storm Frequency.

K. Valley Gutters

Concrete valley gutters shall be provided if the gutter flow must be carried across intersections of curbed streets.

L. Public Easements Required

All public drainage facilities shall be placed in public easements as described in Chapter 3–Public Easement Standards.

9.02 DESIGN CRITERIA

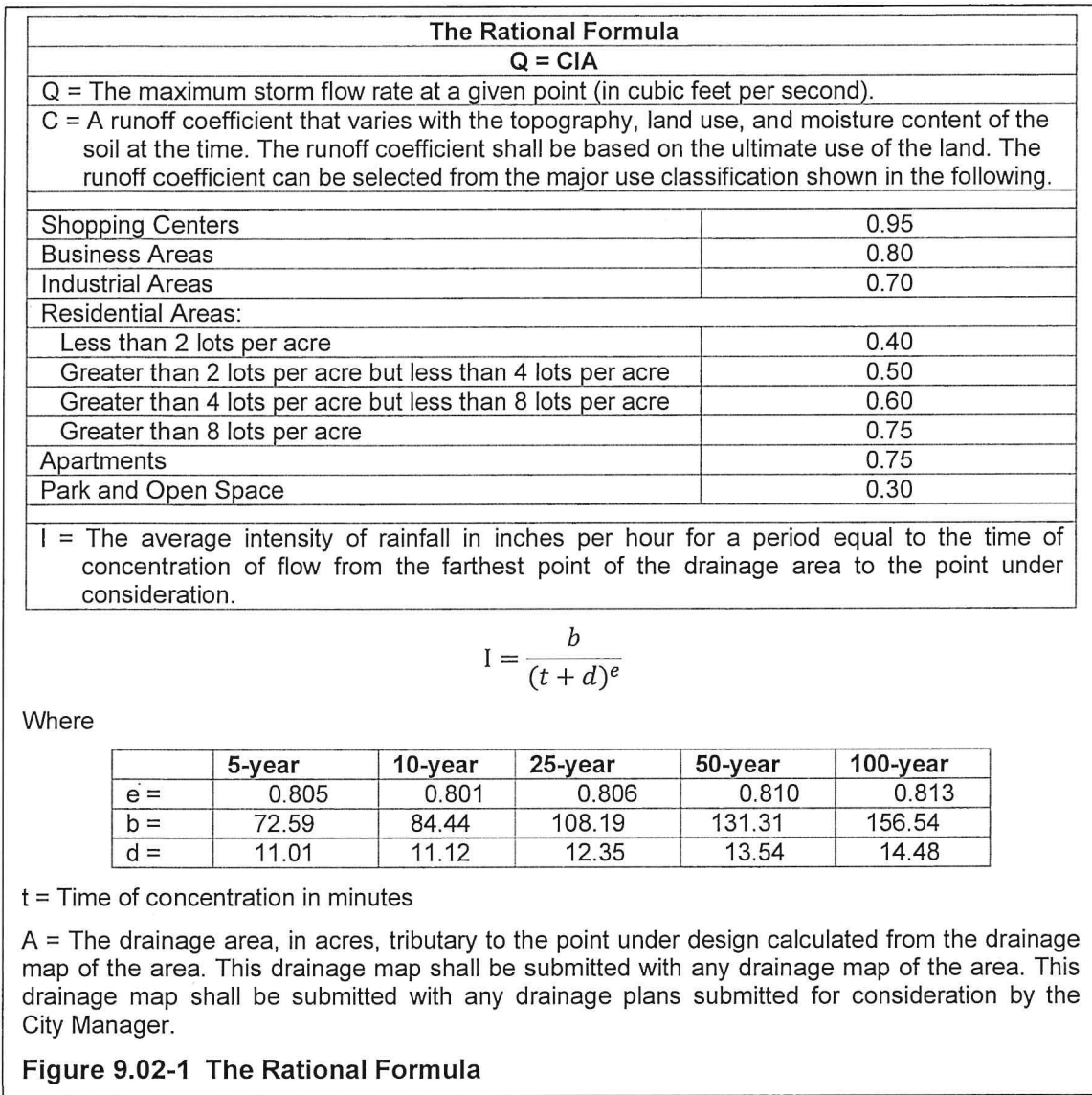
A. Basis for Discharge

For sizing of stormwater conveyance systems with drainage areas less than 100 acres and situations where reflecting storage volume routing effects is not necessary, the Rational Method is acceptable. The Rational Formula for calculating storm flows is shown in Figure 9.02-1. The United States Soil Conservation Service (now called National Resources Conservation Service) unit hydrograph methods are acceptable for any size drainage area and are required for the design of stormwater conveyance measures that have drainage areas larger than 100 acres. Unit hydrograph methods shall be used for the design of all stormwater storage measures (detention basins). When unit hydrograph methods for computing runoff are proposed, appropriate NOAA Atlas 14 rainfall depths shall be used, applying the appropriate NOAA Atlas 14 temporal rainfall distributions. The engineer can propose to use other hydrologic methods but must have their use approved by the City Manager.

For street or gutter flow, the velocity shall be based on the grade of the street. In the absence of detailed calculation by Manning's Formula for the specific street section, the average velocities shown in Table 9.02-1 may be used.

Slope of Gutter	Assumed Velocity (feet per second)
0.5%	1.5
1.0%	2.2
2.0%	3.1
3.0%	3.8
4.0%	4.3
5.0%	4.9
6.0%	5.3
8.0%	6.1
10.0%	6.9

Table 9.02-1 Average Velocities of Runoff



Using the average velocities in Table 9.02-1, the time of concentration shall be calculated by the formula shown in Figure 9.02-1 or by other recognized methods such as the TxDOT formulas unless more data is shown on the drawings for calculating time of concentration.

B. Storm Frequency

Design storm frequencies for storm drainage improvements are shown in Table 9.02-2.

Type of Facility	Description of Area to be Drained	Minimum Design Frequency (years)
Streets and Storm Sewers or Side Ditches, Combined*	Residential, Commercial, and Industrial	Local–10 years Collector–10 years Arterial–10 years
Culverts, Bridges, Channels, and Creeks	Any Type of Area Greater Than 1,000 Acres	25 years
Culverts, Bridges, Channels, and Creeks	Any Type of Area Greater Than 1,000 Acres	100 years

*If a storm drain (an inlet) is located at a low point so that flow in excess of the storm drain capacity would be directed onto private property, and such overflow could cause damage or serious inconvenience in the opinion of the City Manager, the design frequency shall be 25 years.

Table 9.02-2 Design Storm Frequency

C. Underground Drainage Facility Design

The underground drainage facility (storm drain) capacity shall be calculated by Manning's Formula as follows:

$$Q = \frac{1.486}{n} AR^{2/3} S^{1/2}$$

where

Q = The discharge in cubic feet per second

A = The cross-sectional area of flow in square feet

R = The hydraulic radius in feet equals area or wetted perimeter

S = The slope of the hydraulic gradient in feet per foot

n = The coefficient of roughness

The elevation of the hydraulic gradient of the storm sewer shall be a minimum of 1.0 feet below the elevation of the adjacent street gutter. The stormwater pipe shall be sized so that the average velocity in the pipe will not exceed 12 feet per second.

$$T = \frac{D}{V \times 60}$$

where

T = Time of concentration in minutes for use in Figure 9.02-1

D = Distance in feet from point of concentration to the most hydraulically distant part of the drainage basing under construction.

V = Velocity calculated by an engineer for streets and/or storm sewers.

D. Open Channel Design

Open channel facilities shall be designed and constructed based on frequencies shown in Table 9.02-2 and calculated by Manning's Formula with roughness coefficients and velocities as shown in Table 9.02-3. Side slopes of channels shall be no steeper than 4 to 1 in earth and 1 to 1 when lined with concrete.

Open Channels	Maximum Permissible Velocity in feet per second	Coefficient* "n"
Paved		
Concrete	8	0.011 to 0.020
Asphalt	8	0.013 to 0.017
Rubble or Riprap	8	0.017 to 0.030
Earth		
Bare, Sandy Silt, Weathered	2.0	0.020
Silt Clay or Soft Shale	3.5	0.020
Clay	6.0	0.020
Soft Sandstone	8.0	0.020
Clean Gravelly Soil	6.0	0.030 to 0.150
Turf		
Shallow Flow	6.0	0.060 to 0.08
Depth of Flow over 1 Foot	6.0	0.040 to 0.06

*Will vary slightly with straightness of alignment, smoothness of bed and side slopes, and whether the channel has light vegetation or is choked with weed and brush.

Table 9.02-3 Coefficient of Roughness

E. Culvert Design

Enclosed culverts shall be installed if a creek or ditch crosses proposed roadway improvements. The quantity of flow to be carried by the culvert shall be determined by the Rational Formula. The size of the culvert required shall be the larger size, checking both inlet and outlet flow control.

Design of culverts shall include the determination of upstream and downstream backwater conditions, velocities, and flooding conditions. Culverts with discharge velocities that exceed those provided in Table 9.02-4 shall not be designed or installed.

All culverts shall be provided with safety end treatments or other appropriate termination structures.

Culvert Discharging onto Surface	Maximum Allowable Velocity (fps)
Earth	6
Sod Earth	8
Paved or Riprap Apron	8
Shale	8
Rock	8

Table 9.02-4 Culvert Discharge—Velocity Limitations

9.03 MINIMUM DESIGN STANDARDS

The design requirements set forth in this chapter are minimum design standards. The City Manager reserves the right to require additional precautions or treatments consistent with sound engineering practice to provide for conditions not specifically covered in this chapter.

9.04 STORMWATER DETENTION

A. General

Stormwater detention facilities shall be required where deemed appropriate by the City Manager when it is determined that adverse downstream flooding would occur because of a proposed development. Runoff detention storage shall be used, wherein the storm volume is held back in the watershed and released at an acceptable rate. This section presents information on storage techniques, including guidance for the design of appropriate storm runoff storage facilities.

B. Downstream Impacts

If it is anticipated that additional runoff caused by the development will overload any existing downstream drainage facility, whether natural or improved, and result in hazardous conditions, approval of the improvements for the proposed subdivision may be withheld until appropriate provisions have been made to resolve the problem. If existing capacity is not available downstream and property damage could occur, the applicant or developer shall provide a drainage system or detention facility to mitigate the deficiency.

C. Funding of Improvements

The developer shall pay for the cost of all drainage improvements required, including any necessary off-site channels or storm sewers and acquisition of the required easements.

D. Floodplain Preservation

Preservation of major floodplains is strongly encouraged, and detention or retention may be required if a proposed drainage improvement is found to create actual or potential upstream, adjacent, or downstream property damage because of the creation of excessive flood velocities or heights.

E. Design Procedures

The following design procedures are intended to ensure new development (with detention) will not cause any adverse impacts on existing flooding conditions downstream. Stormwater detention shall be used to reduce the net increase in stormwater runoff because of development of the property at the 2-, 10-, 25-, and 100-year events, unless a downstream assessment shows that none is required. Multi-stage outlet structures may be required. (Note: The design engineer should contact the City Manager for any specific requirements for the watershed in which the proposed facility is to be located).

F. Hydrology Methods

All storage facilities shall be designed and analyzed using reservoir routing of an inflow unit hydrograph. The software program or computational method must be approved by the City Manager. The analysis should consist of comparing the design flows at a point or points downstream of the proposed storage site with and without storage. Design calculations shall show the effects of the detention facility in each

of the 2-, 10-, 25-, and 100-year storm events. This may require the use of multi-stage control structures. The detention facility shall be designed to provide the required detention for all the above-listed frequencies.

Rainfall estimates should be based on published values in the National Oceanic and Atmospheric Administration (NOAA)14, Volume 11–Precipitation-Frequency Atlas of the United States.

A calculation summary shall be provided on construction drawings. For detailed calculations of unit hydrograph studies, a separate report shall be provided to the City Manager for review and referenced on the construction drawings. Stage-storage-discharge values shall be tabulated and flow calculations for discharge structures shall be shown on the construction drawings.

G. Design Tailwater Depth

In order to route the inflow hydrograph through the detention facility, a relationship must be established between the volume of storage in the pond and the corresponding amount of discharge through the outflow structure. In most cases, this relationship is directly dependent on the elevation of the tailwater at the outlet of the outflow structure.

For the purpose of establishing an outflow rating curve, the tailwater in the receiving channel shall be assumed to be (at all times) at the level of the same frequency storm being analyzed. In certain situations where this assumption may be shown not to be reasonable, an alternative tailwater condition can be presented for approval to the City Manager.

H. Final Sizing of Pond Storage and Outflow Structure

Detention facilities shall be sized such that at least 1 foot of freeboard shall be maintained during the 100-year storm event, as measured from the top of the detention or retention facility berm.

The minimum recommended outflow pipe for a detention facility is 12 inches. When further flow restriction is necessary, the restriction should be located at a separate manhole outside of the receiving channel.

I. Storm Sewer Hydraulic Gradients

The hydraulic gradients in storm sewers shall be determined using procedures outlined in previous sections of these guidelines. The starting water surface elevation for these calculations shall be the 25-year maximum pond elevation.

J. Allowances for Extreme Storm Events

Design consideration must be given to storm events in excess of the 100-year flood. An emergency spillway, overflow structure, or swale must be provided, as necessary, to effectively handle the extreme storm event. In places where a dam has been used to provide detention directly in a channel, due consideration must be given to the consequences of a failure and, if a significant hazard exists, the dam must be adequately designed to prevent such hazards.

In addition, detention facilities that measure greater than 6 feet in height are subject to Title 31 Texas Administrative Code (TAC) Chapter 299 (Subchapters A through E), which went into effect May 13, 1986, and all subsequent changes. The height of a detention facility or dam is defined as the distance from the lowest point on the crest of the dam (or embankment), excluding spillways, to the lowest elevation on the

centerline or downstream toe of the dam (or embankment), including the natural stream channel. Subchapters A through E of TAC Chapter 299 classify dam sizes and hazard potential and specify required failure analyses and spillway design flood criteria.

K. Erosion Controls

The erosional tendencies associated with a detention pond are similar to those found in an open channel. For this reason, the same types of erosion protection are necessary, including the use of backslope swales and drainage systems, proper revegetation, and pond surface lining where necessary. Proper protection must especially be provided at pipe outfalls into the facility, pond outlet structures, and overflow spillways where excessive turbulence and velocities will cause erosion.

L. Multipurpose Land Use

The amount of land required for a stormwater detention facility is generally quite substantial. For this reason, it is logical that storage facilities could serve a secondary role as parks or recreational areas whenever possible. Such dual use areas will be allowed only after proper review of the design scenario and approval of the specific project by the City's Manager.

When a dual-use facility is proposed, a joint use agreement is required between the City and the entity sponsoring the secondary use. This agreement must specify the maintenance responsibilities of each party.

M. Approval of Private and Dual-Use Facilities

For privately maintained or dual-use systems, each stormwater detention facility will be reviewed and approved only if the following are met:

1. The facility has been designed to meet or exceed the requirements contained within this document.
2. Provisions are made for the facility to be adequately maintained.

N. Maintenance

In general, the City will only be responsible for maintenance of stormwater detention basins that serve public facilities such as dedicated public streets or parks and recreational areas. Responsibility for the maintenance of any portion of a facility not designed for flood control will not rest with the City, nor will the City be responsible for any damage that may occur resulting from flooding of the facility. The maintenance of new and existing stormwater detention or retention basins shall be the responsibility of the owner. The owner of the basin(s) shall maintain them in such a manner as to provide a neat and aesthetically appealing area. Vegetation shall be controlled and mowed periodically. The City will inspect each pond annually and identify any deficiencies that exist in the pond maintenance. The owner will be notified of these deficiencies and required to make corrections. Corrections may include vegetation control, erosion repairs, silt removal, seeding of bare or disturbed areas, and repairs to outfall structures, orifices, and pumping units. Aboveground pumps and piping shall be kept in a neat appearance with well-maintained protective coatings. It is the intent of this ordinance to require that each detention pond be annually restored to its original design dimensions and function as a minimum.

A 30-foot-wide access and maintenance easement shall be provided around the entire detention pond. This is in addition to the dedication required for the pond itself. All owners must prepare and submit a Stormwater Management Maintenance Plan for the proposed detention basin and a long-term Stormwater Management Maintenance Agreement.

O. Pump Detention

Pumped detention systems will not be maintained by the City under any circumstances and will be approved for use only under the following conditions:

1. A gravity system is not feasible from an engineering and economic standpoint.
2. At least two pumps are provided, each of which is sized to pump the design flow rate. If a triplex system is used, any two of the three pumps must be capable of pumping the design flow rate.
3. The selected design outflow rate must not aggravate downstream flooding. (Example: A pumping system designed to discharge at the existing 100-year flow rate each time the system comes online could aggravate flooding for more frequent storm events).
4. Fencing of the control panel is provided to prevent unauthorized operation and vandalism.
5. Adequate assurance is provided that the system will be operated and maintained on a continuous basis.
6. Emergency source of power is provided.

It is recommended that if a pumping system is desired, review of the preliminary conceptual design be obtained by the City Manager before any detailed engineering is performed.

P. General Requirements for Detention Pond Construction

The City encourages the use of innovative and aesthetically appealing construction techniques for detention storage. Any detention storage that is not underground or in a parking lot shall be landscaped to ensure the facility is an aesthetic asset to the City. An approved landscaping plan prepared by a registered landscape architect shall be required for all detention areas except those designed underground or in parking areas. The depth of water in parking areas shall not exceed 9 inches. For large regional detention ponds, a landscaping plan may not be required if it will have a multipurpose land use as described in Section L “Multipurpose Land Use.” Detention methods not specifically mentioned above shall be submitted for prior approval of the City's Manager or its designee.

The structural design of detention facilities is very similar to the design of open channels. For this reason, all requirements pertaining to the design of lined or unlined channels shall also apply to lined or unlined detention facilities.

In addition, the following guidelines are applicable:

1. **Pond Bottom Design**—A pilot channel shall be provided in detention facilities to ensure that proper and complete drainage of the storage facility will occur. Concrete pilot channels shall have a minimum depth of 2 inches and a minimum flowline slope of .0005 feet per

foot. Unlined pilot channels shall have a minimum depth of 2 feet, a minimum flowline slope of .001 feet per foot, and maximum side slopes of 4 to 1.

The bottom slopes of the detention basin should be graded toward the pilot channel at a minimum slope of 0.005 feet per foot and a recommended slope of 0.0075 feet per foot.

Detention basins that make use of a channel section for detention storage may not be required to have a pilot channel but should be built in accordance with the requirements for open channels.

Vegetated slopes shall be less than 10 feet in height and shall have side slopes no steeper than 4 to 1.

2. **Outlet Structure**—The outlet structure for a detention pond is subject to higher than normal head water conditions and erosive velocities for prolonged periods of time. For this reason, the erosion protective measures are very important.

Reinforced concrete pipe used in the outlet structure should conform to American Society for Testing and Materials (ASTM) C-76 Class III with compression-type rubber gasket joints conforming to ASTM C-443. Pipes, culverts, and conduits used in the outlet structures should be carefully constructed with sufficient compaction of the backfill material around the pipe structure. Generally, compaction density should be the same as the rest of the structure. The use of cement stabilized sand backfill around the outlet conduit should be considered where soil types or conditions may prevent satisfactory backfill compaction. Cement stabilized sand backfill should also be used where headwater depths could cause backfill to wash out around the pipe.

Where possible, the location and orientation of the flow discharged from a detention pond shall duplicate the predevelopment conditions and minimize increased concentration of discharges.

Q Abandonment of Existing Facilities

Abandonment of existing detention ponds may be approved by the City Manager if development schemes in a particular area have changed such that they are no longer required, or an acceptable alternative to the detention pond is used as provided by this chapter. Any abandonment will require that the current detention pond be completely filled with material approved by the City. Any alternatives to filling the detention pond must be approved by the City Manager. Abandonment plans are subject to review and approval by the City Manager.

CHAPTER 10
CONSTRUCTION SAFETY STANDARDS

10.01 GENERAL PROVISIONS

The construction of facilities to improve, develop, or subdivide land shall be conducted in a safe manner to protect human life and property.

10.02 TRANSPORTATION SAFETY

All projects undertaken on or near public rights-of-way shall be controlled in accordance with the *Texas Manual on Uniform Traffic Control Devices* (TMUTCD). Traffic control plans and measures, including but not limited to, signing, marking, barricading, flagging, detouring, and closure shall all be conducted in accordance with TMUTCD criteria.

10.03 EXCAVATION AND TRENCH SAFETY

In projects where mass excavation or trenching is required, provisions to comply with the Occupational Safety Health Administration (OSHA) and Texas state law shall be specifically addressed during design and construction. Contractors shall comply with specific OSHA regulations set forth in 29 CFR, Part 1926.

10.04 PROTECTION OF LIFE AND PROPERTY

Construction activities shall progress in a manner that places the highest priority on the protection of human life and property. Work shall be conducted in a manner that complies with OSHA standards and other applicable federal, state, and local regulations.

10.05 INSURANCE

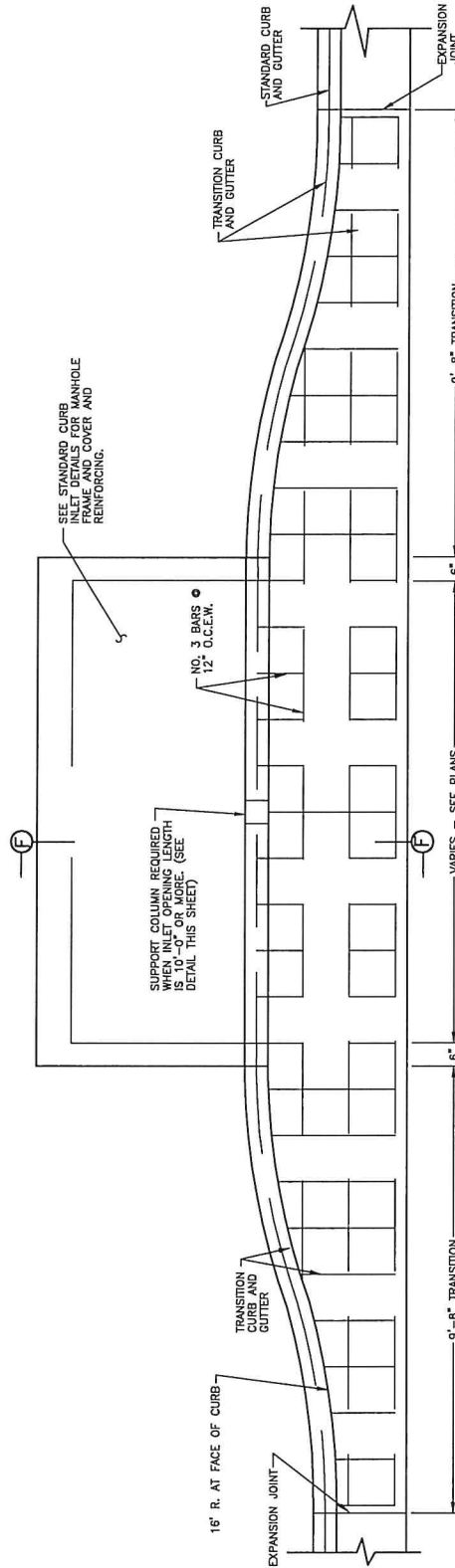
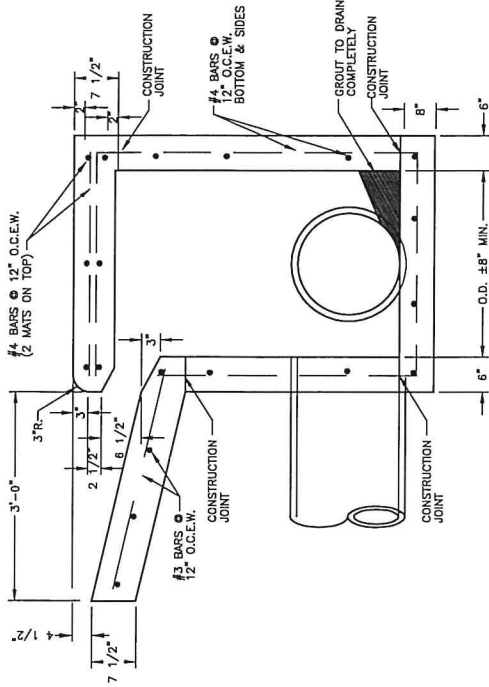
Companies that construct facilities to improve, develop, or subdivide property shall provide written proof of insurance coverage for no less than the statutory amounts required by law.

**APPENDIX A
DRAINAGE**

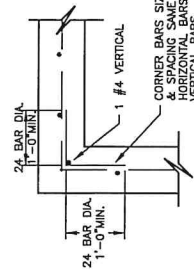
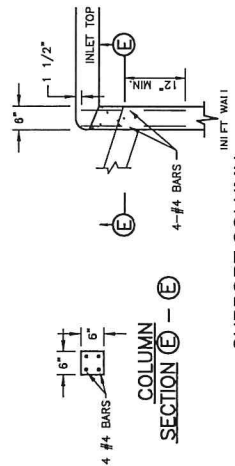


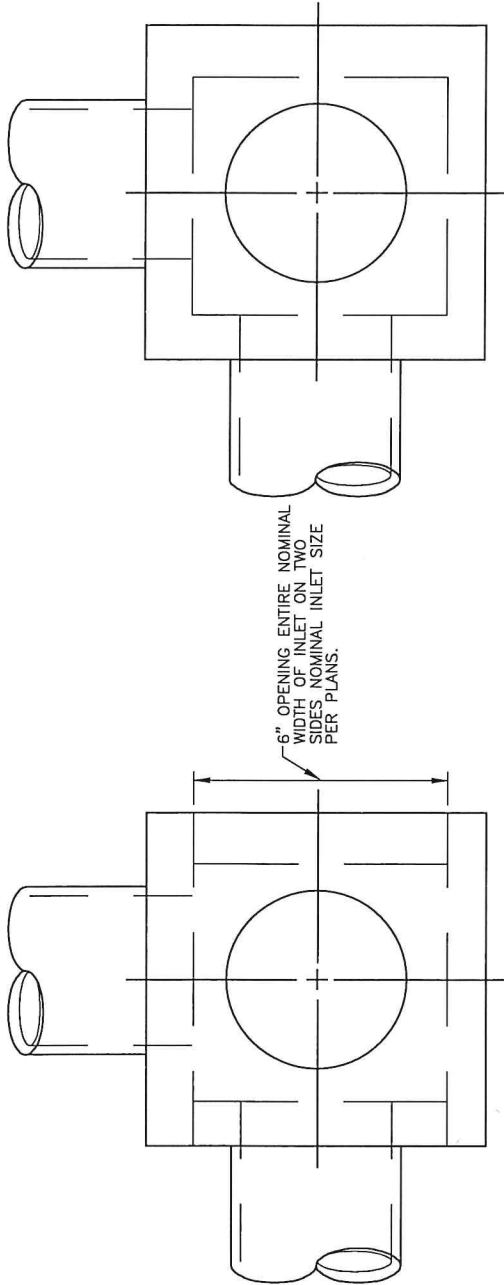
CITY OF SOMERVILLE RECESSED CURB INLET DETAIL

DRAWING NO.
STM-01
NOT TO SCALE



NOTE: CORNER REINFORCING REQUIRED ON ALL CORNERS OF INLETS AND JUNCTION BOXES.

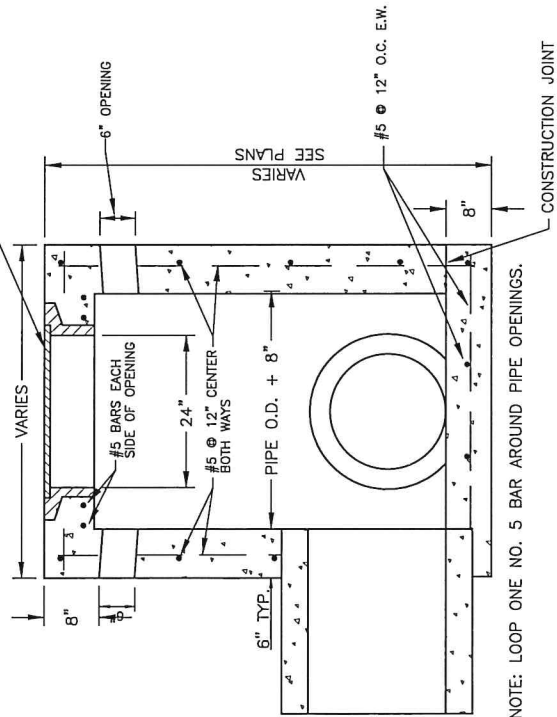




PLAN

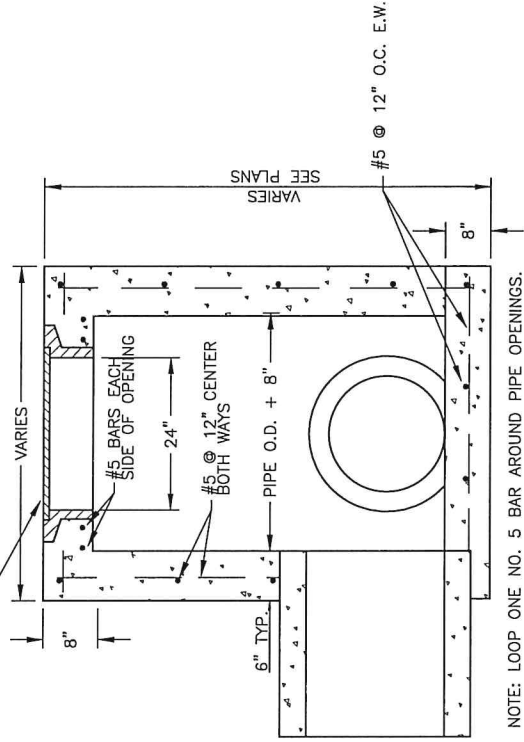
PLAN

NEENAH R-6142 MANHOLE FRAME
AND COVER, OR APPROVED EQUAL



SECTION

TYPE X INLET



SECTION

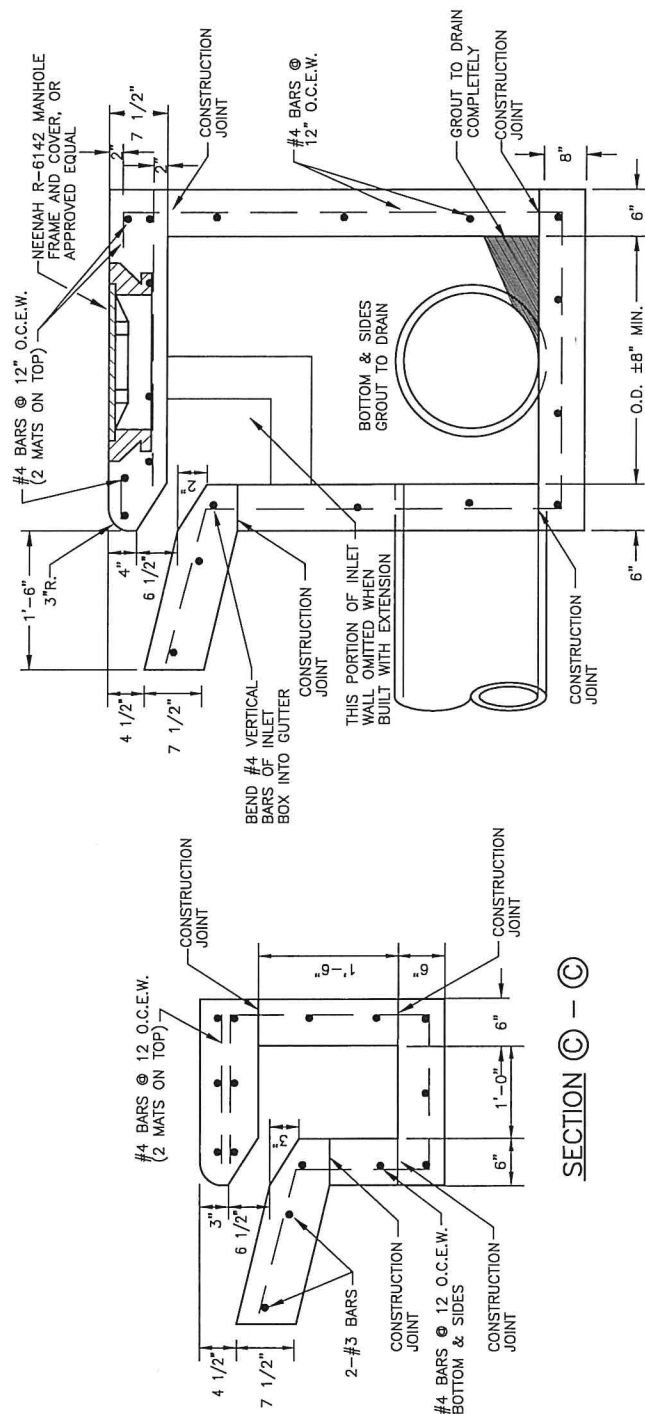
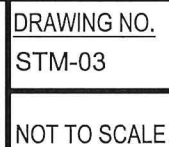
JUNCTION BOX

DRAWING NO.
STM-02

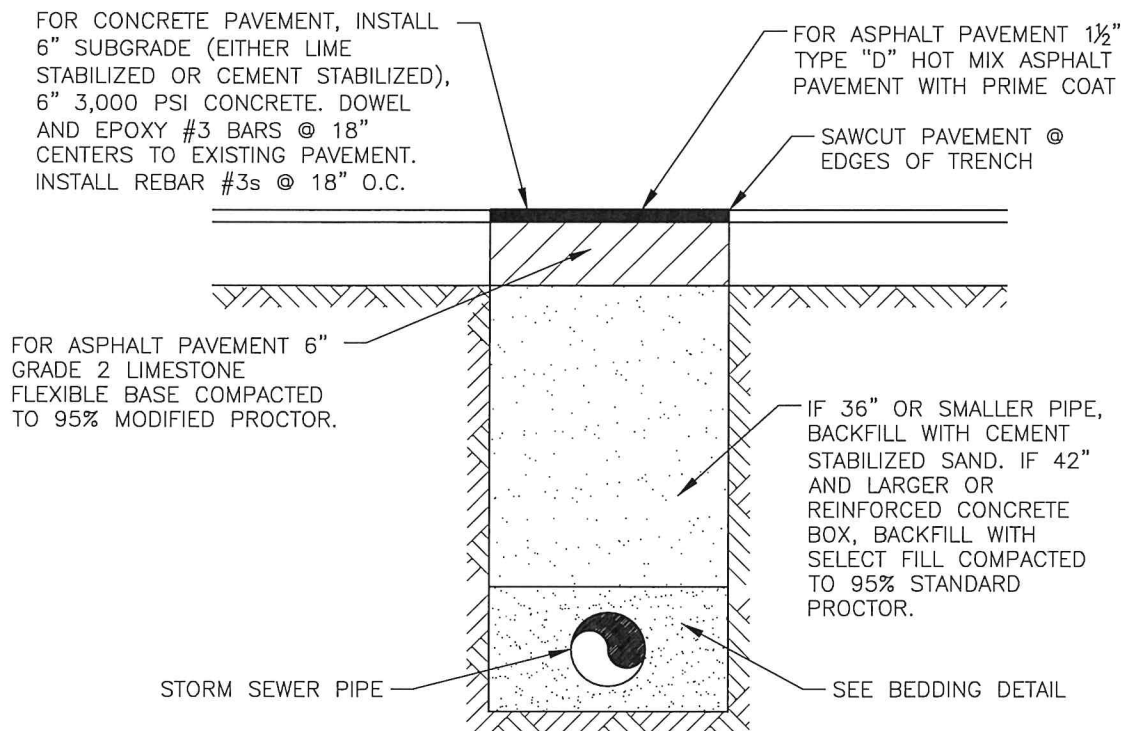
NOT TO SCALE

CITY OF SOMERVILLE TYPE X INLET/JUNCTION BOX





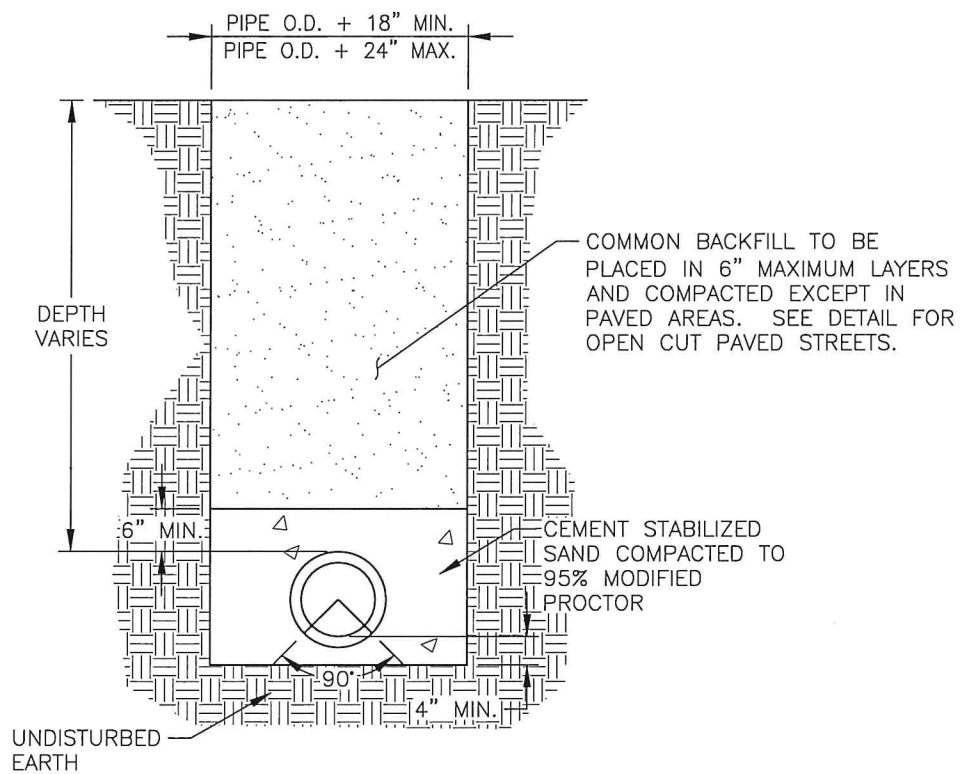
SECTION D - D



CITY OF SOMERVILLE
TYPICAL SECTION OPEN CUT PAVED
STREET, DRIVEWAY, OR ALLEY

DRAWING NO.
STM-04

NOT TO SCALE

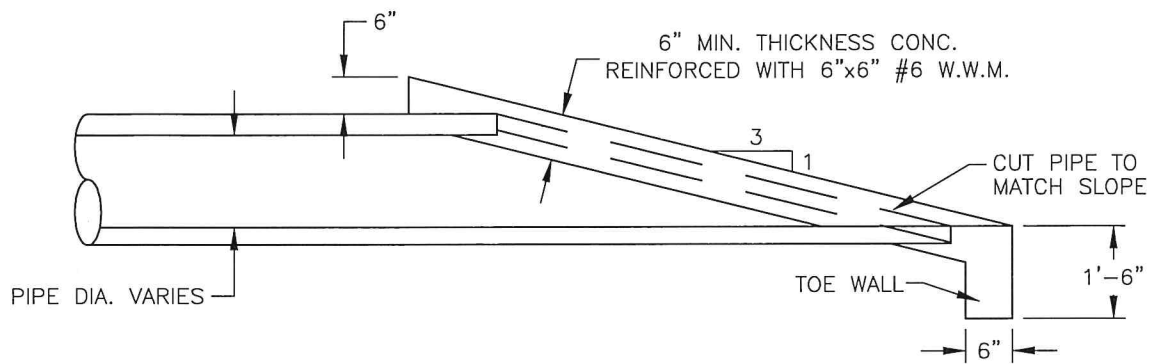
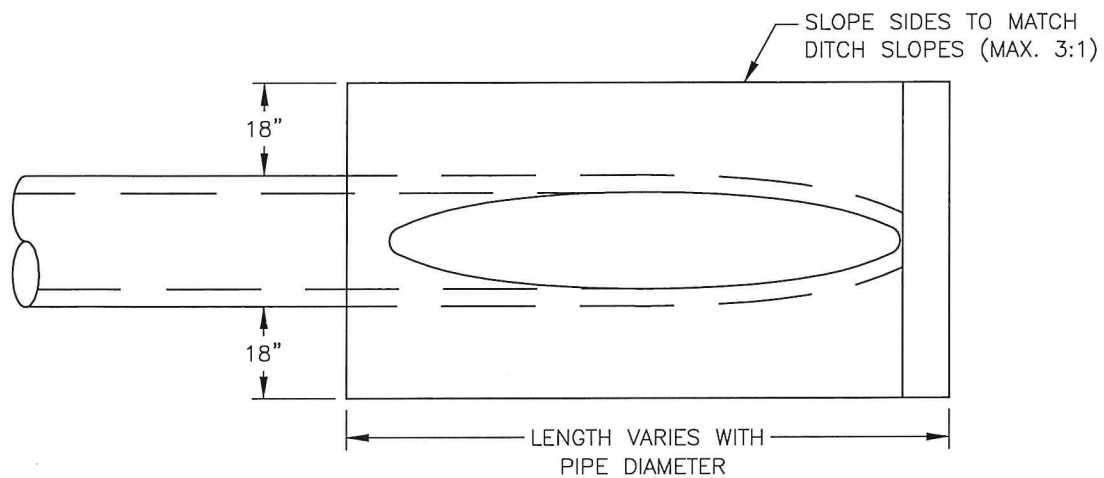


CITY OF SOMERVILLE
EMBEDMENT CROSS SECTION FOR
REINFORCED CONCRETE PIPE

DRAWING NO.
 STM-05

NOT TO SCALE

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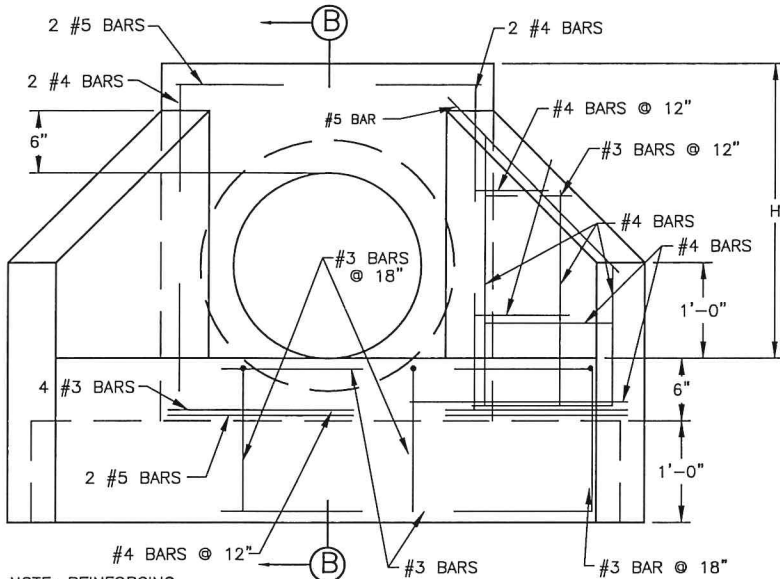


CITY OF SOMERVILLE
SLOPED END TREATMENT FOR CULVERTS
AND STORM SEWERS

DRAWING NO.
STM-06

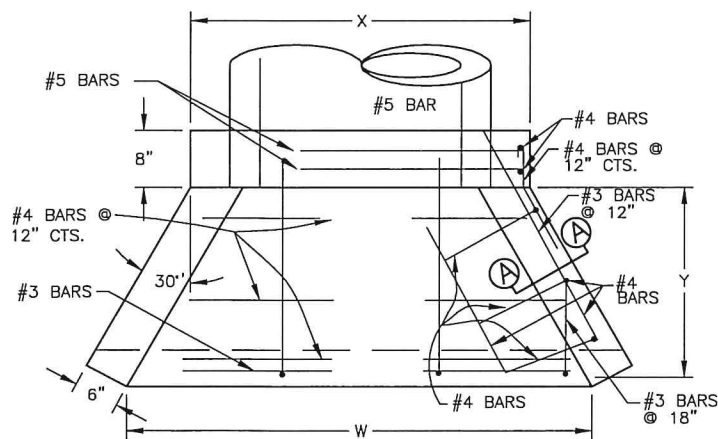
NOT TO SCALE

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NOTE: REINFORCING TYPICAL, BOTH SIDES.

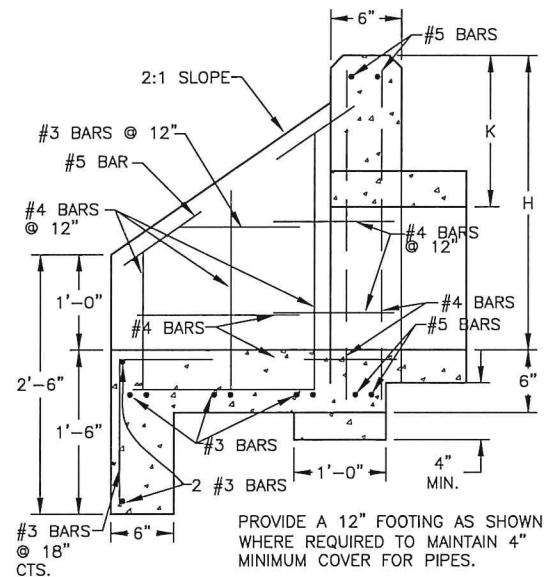
ELEVATION



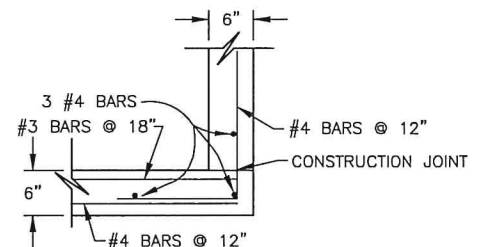
PLAN

NO. OF PIPES	DIAMETER OF PIPES	TYPE "B" HEADWALL TABLE OF DIMENSIONS					
		G	K	X	H	Y	W
1	12	—	12"	2'-4"	2'-0"	1'-0"	2'-4"
2	12	10	12"	4'-2"	2'-0"	1'-0"	4'-2"
1	18	—	12"	2'-11"	2'-6"	2'-0"	4'-0 7/8"
2	"	1'-2"	12"	5'-7"	2'-6"	2'-0"	6'-8 7/8"
1	24	—	12"	3'-6"	3'-0"	3'-0"	5'-9 3/4"
2	"	1'-5"	12"	6'-11"	3'-0"	3'-0"	9'-2 3/4"
1	36	—	12"	4'-8"	4'-0"	5'-0"	9'-3 3/4"
2	"	1'-11"	12"	9'-7"	4'-0"	5'-0"	14'-2 1/2"
1	48"	—	15"	5'-10"	5'-3"	7'-0"	12'-9 1/8"
1	60"	—	15"	7'-0"	6'-3"	9'-0"	16'-2 7/8"

ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
"G" DIMENSION IS BETWEEN INSIDES OF PIPES FOR MULTIPLE PIPE HEAD WALL.



SECTION (B) - (B)



SECTION (A) - (A)



CITY OF SOMERVILLE
TYPE B HEADWALL

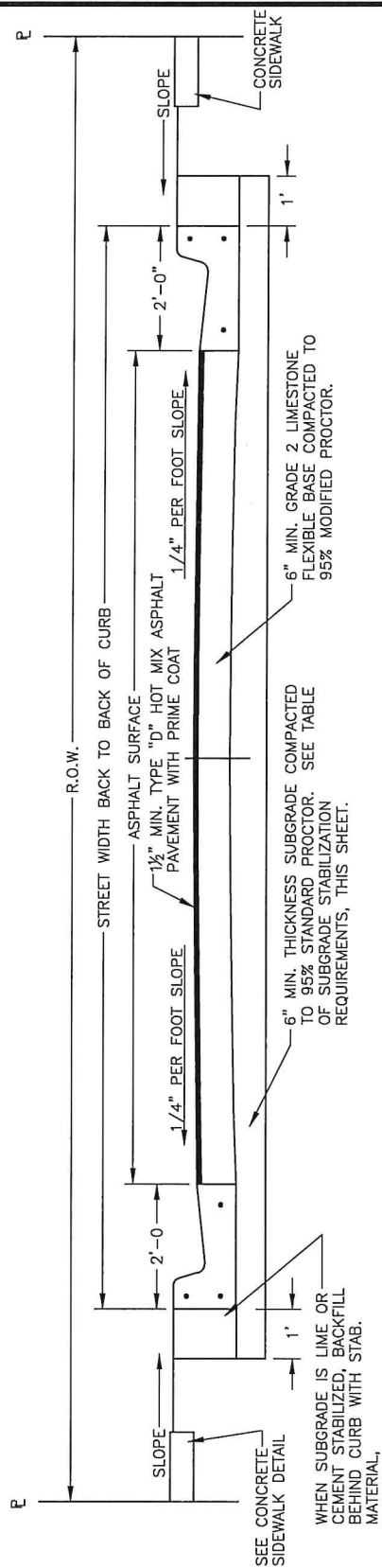
DRAWING NO.
STM-07

NOT TO SCALE

APPENDIX B
PAVING

TABLE OF SUBGRADE STABILIZATION REQUIREMENTS

P.I.=PLASTICITY INDEX	
L.L.=LIQUID LIMIT	
IF P.I.>20 AND L.L.<35, LIME STABILIZE SUBGRADE	
IF P.I.>15 AND L.L.>36, LIME STABILIZE SUBGRADE	
IF P.I.<5, CEMENT STABILIZE SUBGRADE	
PERCENT OF LIME OR CEMENT REQUIRED (BY WEIGHT):	
P.I.	MATERIAL
≤5	CEMENT
<25	5
26 TO 33	LIME
34 TO 40	6
>40	7
DETERMINE BY ASTM C977	
	LIME



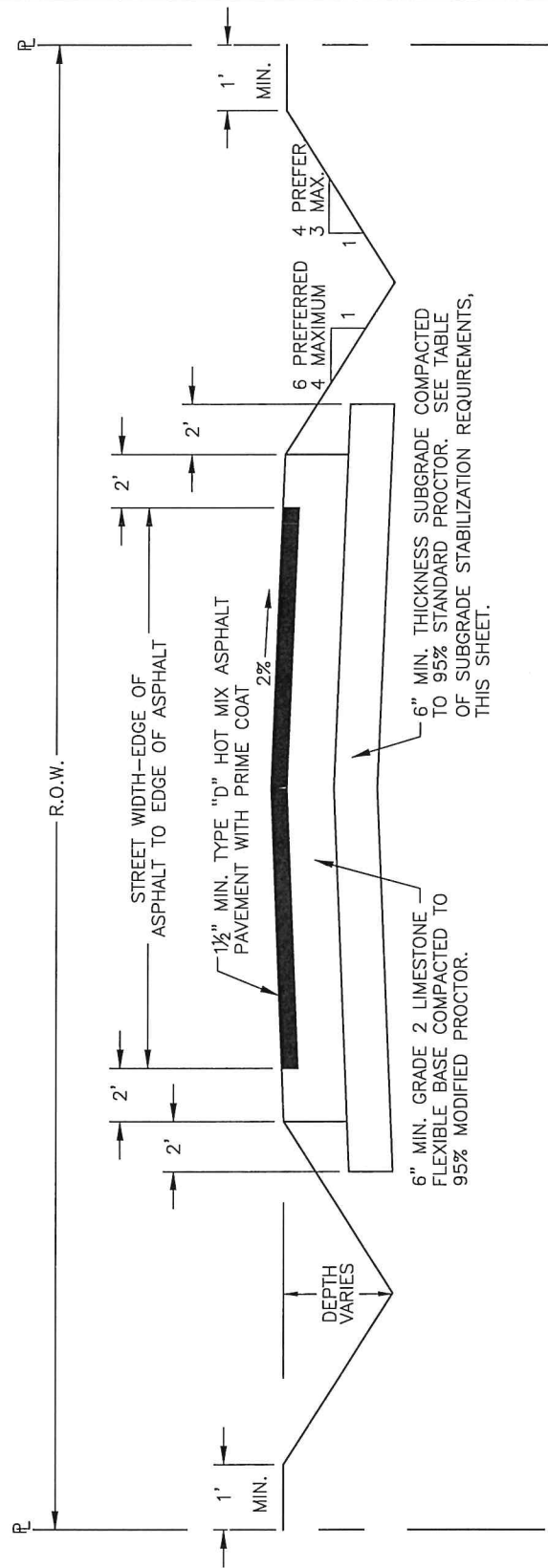
CITY OF SOMERVILLE
TYPICAL ASPHALT PAVEMENT
SECTION WITH CURB & GUTTER

DRAWING NO.
PVG-01

NOT TO SCALE

TABLE OF SUBGRADE STABILIZATION REQUIREMENTS

P.I.=PLASTICITY INDEX		
L.L.=LIQUID LIMIT		
IF P.I.>20 AND L.L.<35, LIME STABILIZE SUBGRADE		
IF P.I.>15 AND L.L.>36, LIME STABILIZE SUBGRADE		
IF P.I.<5, CEMENT STABILIZE SUBGRADE		
PERCENT OF LIME OR CEMENT REQUIRED (BY WEIGHT):		
P.I.	PERCENTAGE REQUIRED	MATERIAL
≤5	5	CEMENT
<25	5	LIME
26 TO 33	6	LIME
34 TO 40	7	LIME
>40	DETERMINE BY ASTM C977	



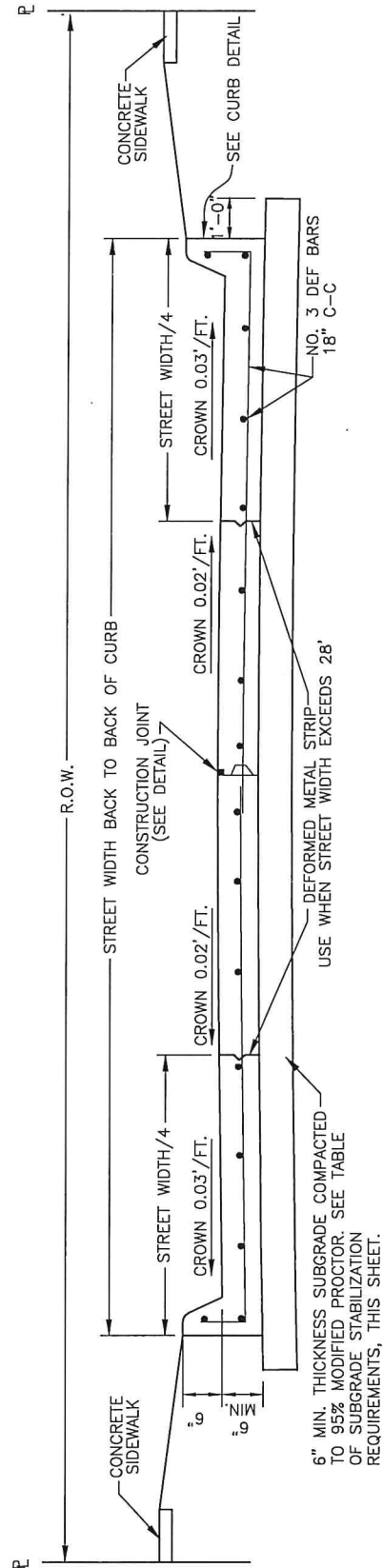
CITY OF SOMERVILLE TYPICAL ASPHALT PAVEMENT SECTION WITH NO CURB & GUTTER

DRAWING NO.
PVG-02

NOT TO SCALE

TABLE OF SUBGRADE STABILIZATION REQUIREMENTS

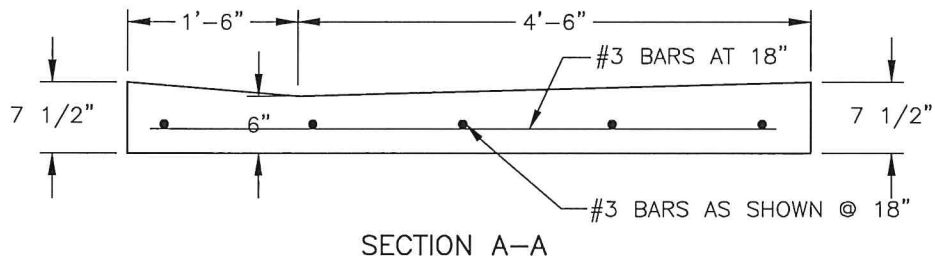
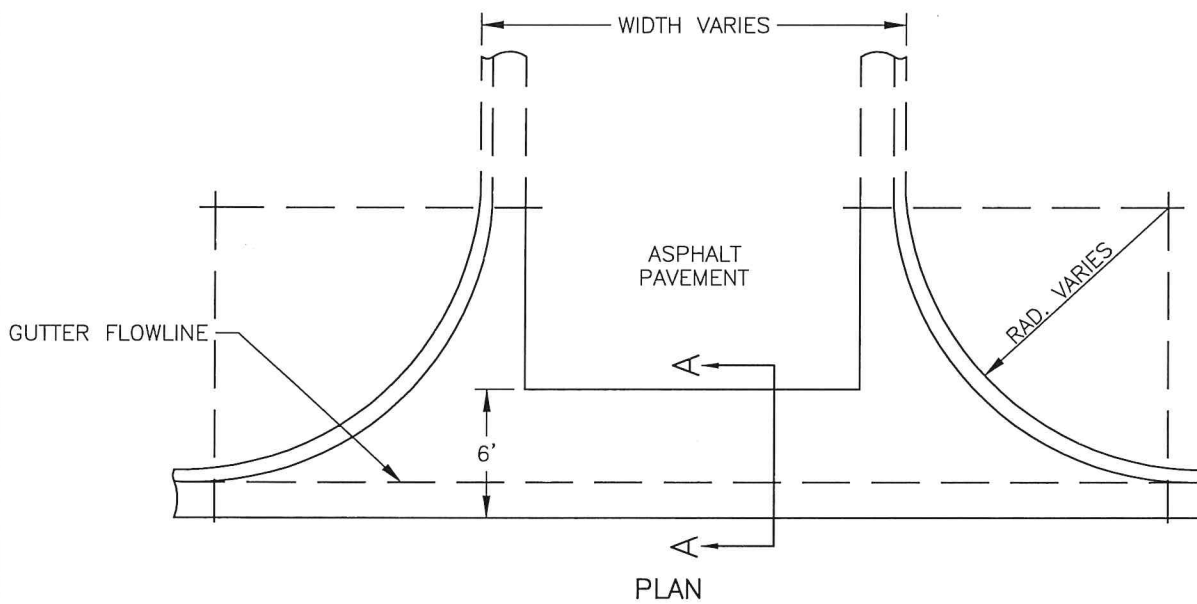
P.I.=PLASTICITY INDEX		
L.L.=LIQUID LIMIT		
IF P.I.>20 AND L.L.<35, LIME STABILIZE SUBGRADE		
IF P.I.>15 AND L.L.>36, LIME STABILIZE SUBGRADE		
IF P.I.<5, CEMENT STABILIZE SUBGRADE		
PERCENT OF LIME OR CEMENT REQUIRED (BY WEIGHT):		
P.I.	PERCENTAGE REQUIRED	MATERIAL
≤5	5	CEMENT
<25	5	LIME
26 TO 33	6	LIME
34 TO 40	7	LIME
>40	DETERMINE BY ASTM C977	
		LIME



CITY OF SOMERVILLE TYPICAL CONCRETE PAVEMENT SECTION

DRAWING NO.
PVG-03

NOT TO SCALE

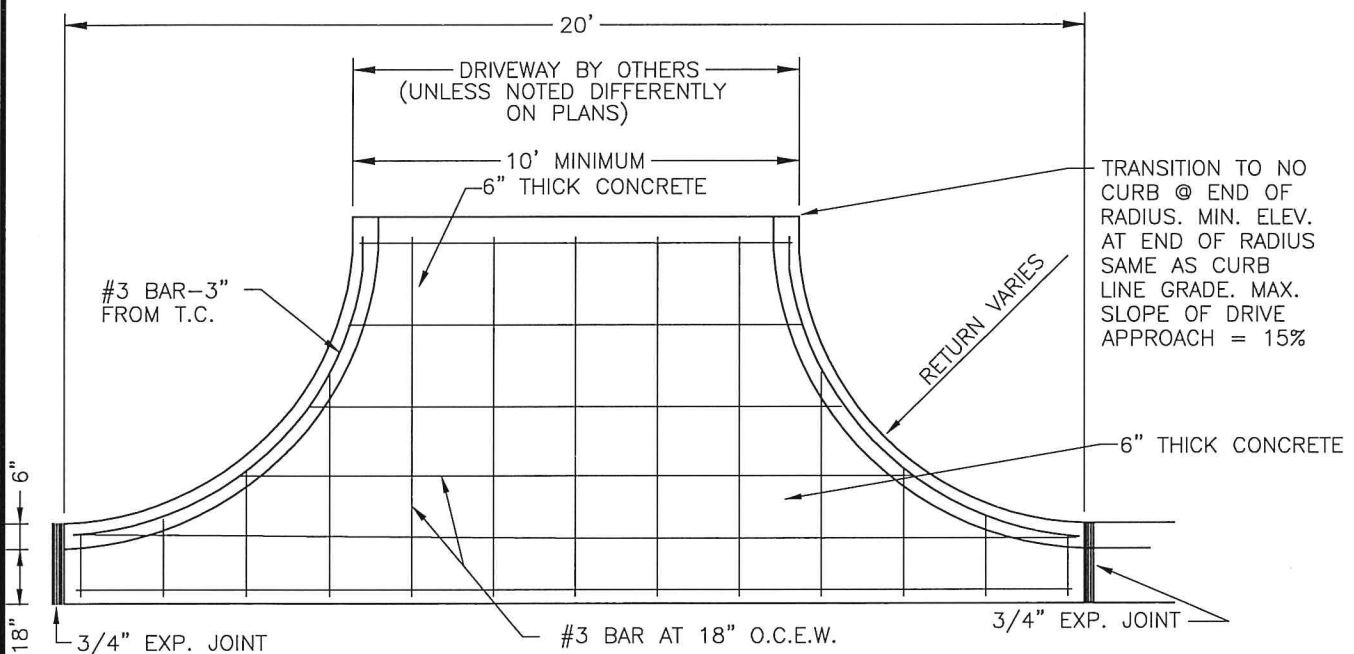


CITY OF SOMERVILLE
TYPICAL VALLEY GUTTER AND
INTERSECTION LAYOUT

DRAWING NO.
PVG-04

NOT TO SCALE

File: S:\BRE\4400--4499\4421\Drawings\CAD\Somerville Std Details\Paving Details.dwg Time: Jun 26, 2020 - 11:05am



NOTE:
MATCH TOP OF CURB AND SIDEWALK. TOP OF
CURB AND DRIVE APRON WILL COME TOGETHER
AT THE END OF THE CURB RETURN.

FOR NEW DRIVEWAY ON EXISTING
STREET, SAWCUT AND COMPLETELY
REMOVE EXISTING CURB AND
GUTTER SECTION. TIE INTO CURB
AND GUTTER REINFORCING WITH
NEW DRIVEWAY REINFORCING. SEAL
CRACK WHERE ASPHALT MEETS NEW
CONCRETE WITH JOINT SEALER.

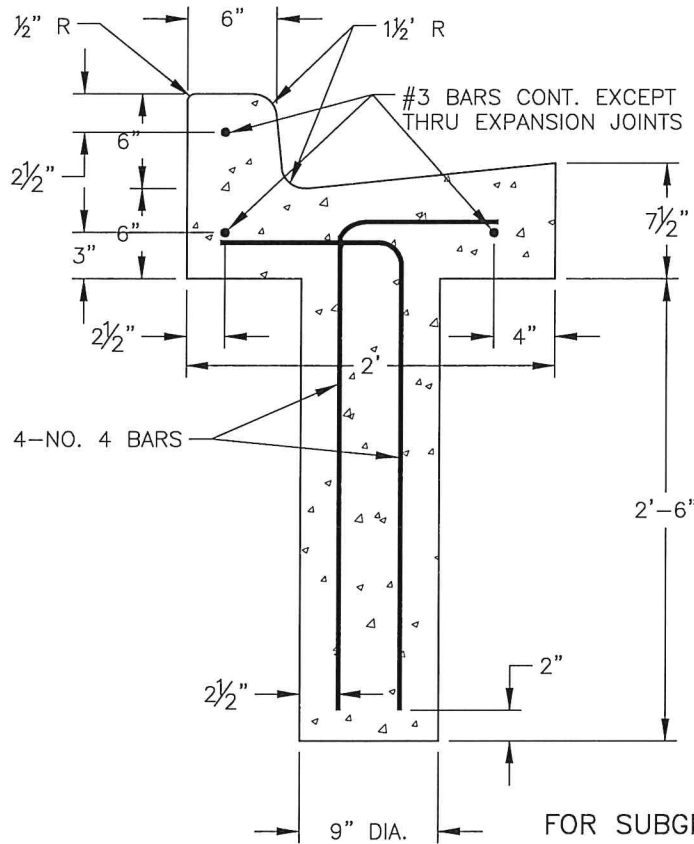


CITY OF SOMERVILLE

STANDARD DRIVE APPROACH

DRAWING NO.
PVG-05

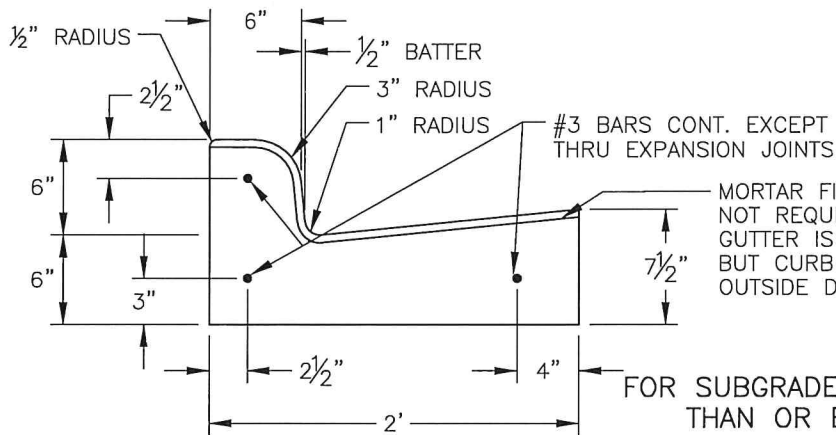
NOT TO SCALE



FOR SUBGRADES WITH P.I. GREATER THAN 25

NOTE:

EXPANSION JOINTS ARE TO BE CONSTRUCTED AT CURB RETURNS, DRIVEWAY APPROACH SLABS, AND AT 80' MAXIMUM INTERVALS. 3 EACH - 3/4" x 10" DOWEL PINS WITH PVC SLEEVES TO BE USED AT EXPANSION JOINTS. CONSTRUCT CONCRETE PIERS AT 10' O.C. CENTER PIERS BETWEEN DUMMY GROOVE CONTRACTION JOINTS. CONCRETE FOR CURB AND GUTTER AND PIERS TO BE PLACED IN ONE (1) MONOLITHIC POUR.



FOR SUBGRADES WITH P.I. LESS THAN OR EQUAL TO 25

NOTE:

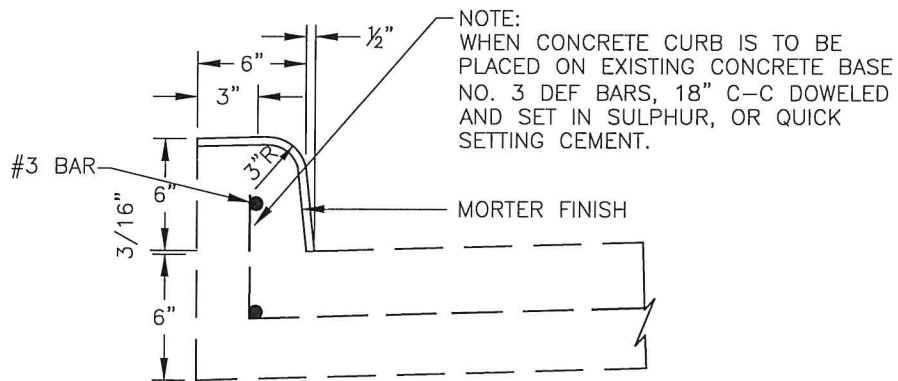
EXPANSION JOINTS ARE TO BE CONSTRUCTED PER DETAIL PVG-11 AT CURB RETURNS, DRIVEWAY APPROACH SLABS, AND AT 40' MAXIMUM INTERVALS. CONTRACTION JOINTS SHALL BE CONSTRUCTED PER DETAIL PVG-12 AT 10' MAXIMUM INTERVALS.



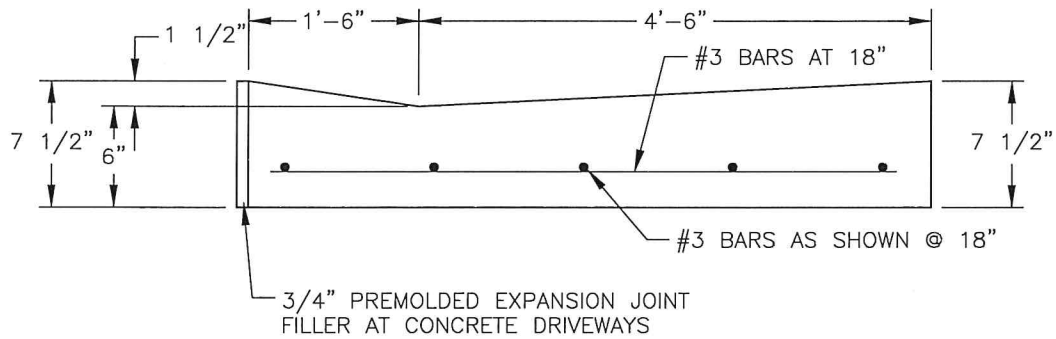
CITY OF SOMERVILLE
CONCRETE CURB AND GUTTER

DRAWING NO.
PVG-06

NOT TO SCALE



MORTAR FINISH NOT REQUIRED WHEN CURB
IS PLACED BY A MACHINE, BUT CURB SHALL
HAVE THE SAME OUTSIDE DIMENSION.



(WHEN DRIVEWAY LOCATIONS ARE KNOWN
WHEN CURB AND GUTTER IS INSTALLED)

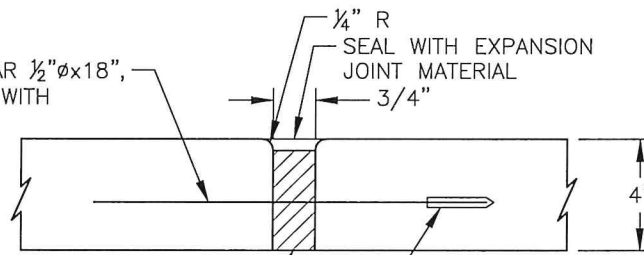


CITY OF SOMERVILLE
GUTTER AT DRIVE
WHEN DRIVEWAY LOCATIONS ARE KNOWN WHEN
CURB AND GUTTER IS INSTALLED

DRAWING NO.
PVG-08

NOT TO SCALE

SMOOTH DOWEL BAR $\frac{1}{2}"\phi \times 18"$,
12" O.C. (COATED WITH
HEAVY GREASE)

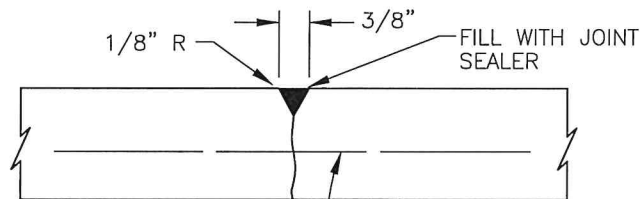


RECYCLED MATERIAL, $\frac{1}{2}"$ THICK AS
MANUFACTURED BY J.D. RUSSELL
CO. OR APPROVED EQUAL.

3" LONG METAL OR PLASTIC CAP, INSIDE
DIAMETER TO BE $\frac{1}{8}"$ GREATER THAN DIAMETER
OF DOWEL BAR. CAP MUST BE LONG ENOUGH
TO COVER 2" OF DOWEL AND HAVE STOP SO
END OF CAP IS 1" FROM END OF BAR.

DOWEL TRANSVERSE EXPANSION JOINT

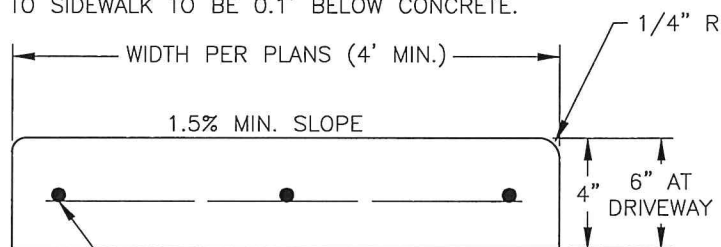
CONTRACTION GROOVE DEPTH SHALL
BE A MIN. OF $\frac{1}{4}"$ OF THICKNESS
OF CONCRETE



NO. 3 BARS @ 18"
ON CENTER

DUMMY GROOVE CONTRACTION JOINT FOR SIDEWALK

DUMMY GROOVE CONTRACTION JOINTS TO BE @ 5'
SPACING. EXPANSION JOINTS TO BE $\frac{1}{2}"$ BITUMINOUS
JOINT FILLER @ 20' SPACING. SEAL EXP. JOINT WITH
 $\frac{1}{2}"$ THICK JOINT SEALER. FINISHED GRADE ADJACENT
TO SIDEWALK TO BE 0.1' BELOW CONCRETE.



#3 DEF BARS @ 18" O.C.E.W. FOR 6"
SIDEWALK. 6"x6" #6 WELDED WIRE
MESH FOR 4" SIDEWALK.

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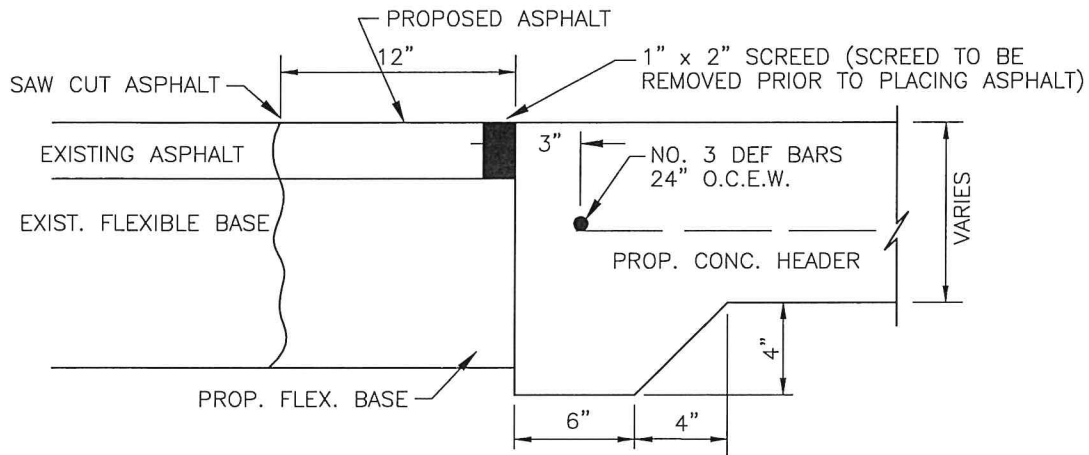


CITY OF SOMERVILLE CONCRETE SIDEWALK DETAILS

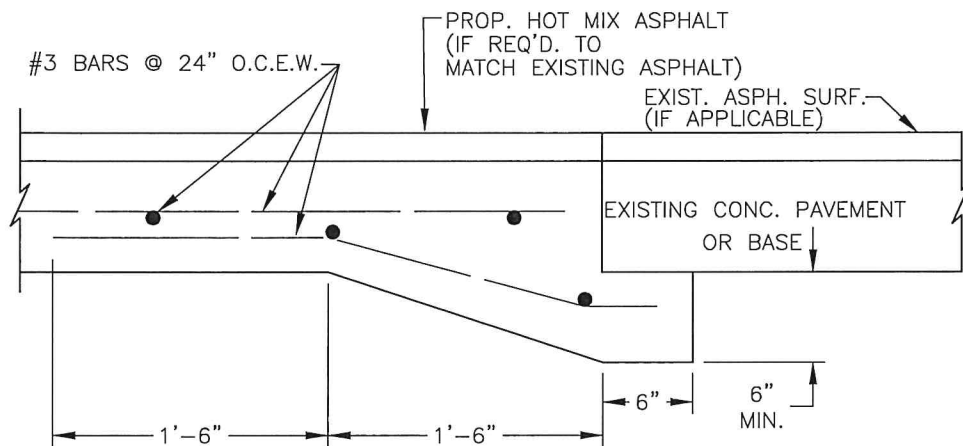
DRAWING NO.
PVG-09

NOT TO SCALE

File: S:\BRE\4400--4499\Drawings\CAD\Somerville Std Details\Paving Details.dwg Time: Jun 04, 2020 - 4:17pm



FOR USE IN CONNECTING CONCRETE
PAVEMENT TO ASPHALT PAVEMENT



FOR USE IN CONNECTING NEW
CONCRETE PAVEMENT TO EXISTING
CONCRETE PAVEMENT

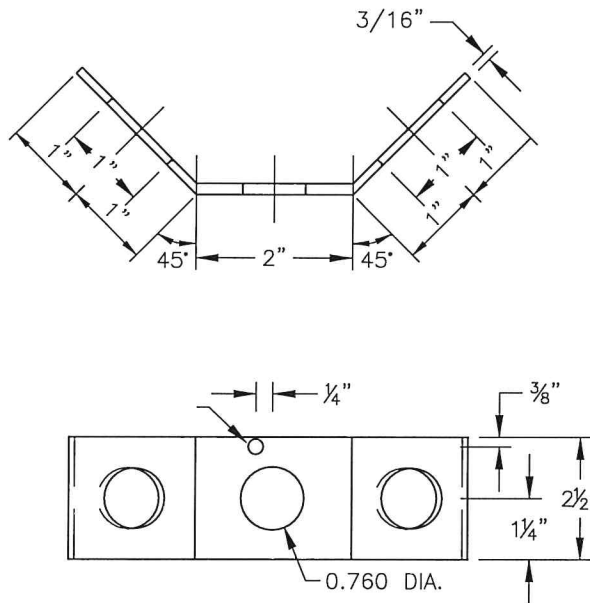


CITY OF SOMERVILLE
TIE TO EXISTING PAVING DETAILS

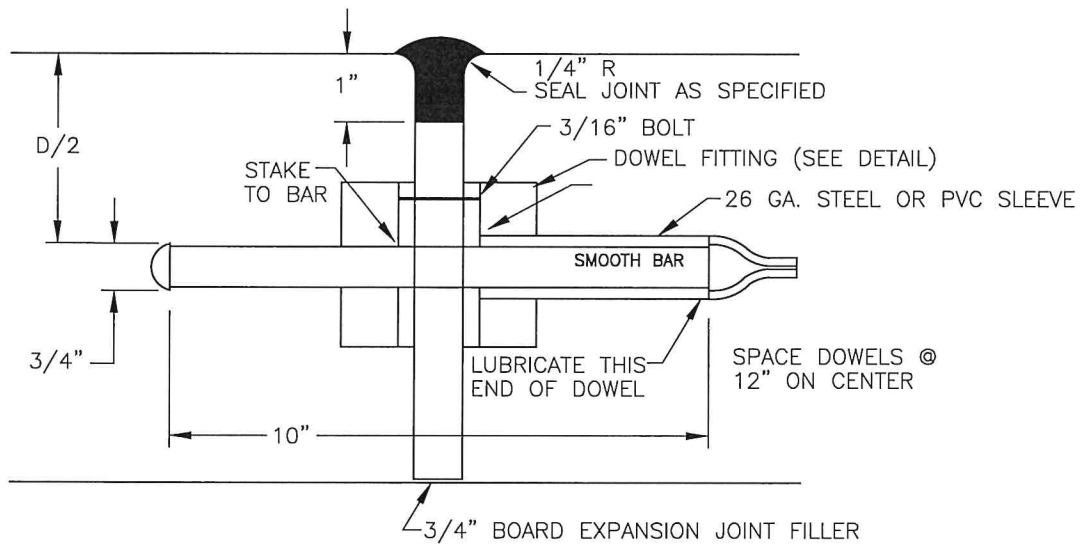
DRAWING NO.
PVG-10

NOT TO SCALE

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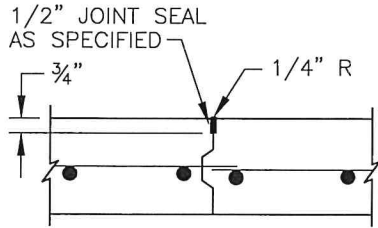
DOWEL FITTING



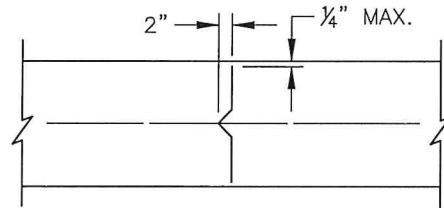
CITY OF SOMERVILLE
DOWEL TYPE EXPANSION JOINT IN
CONCRETE PAVEMENT & SIDEWALK

DRAWING NO.
PVG-11

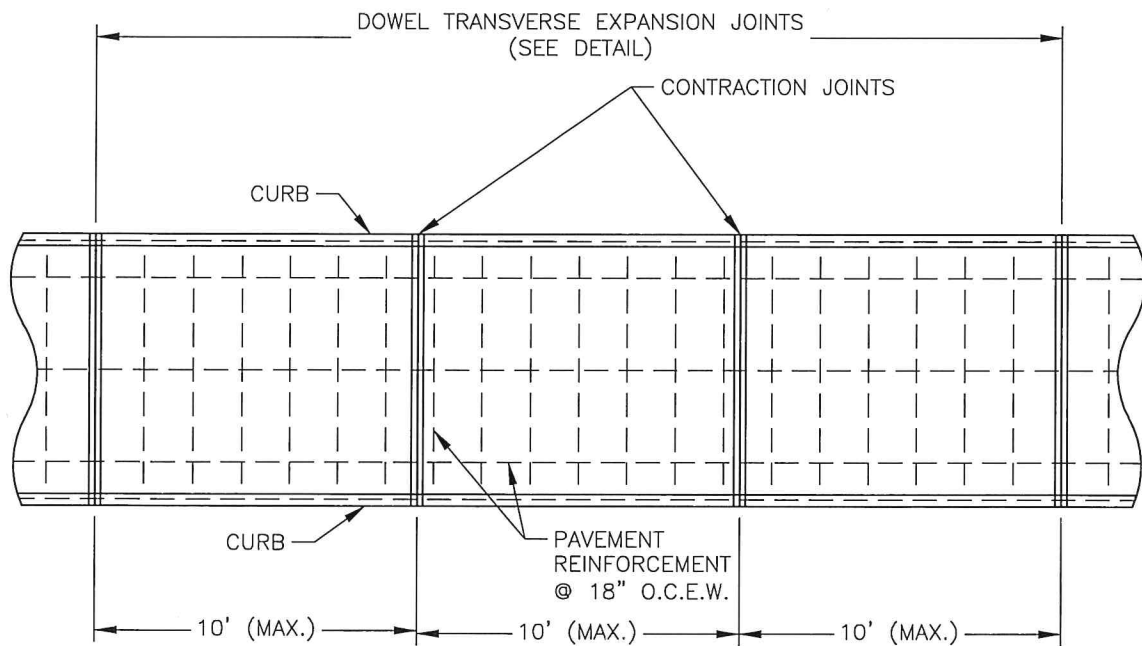
NOT TO SCALE



CONSTRUCTION JOINT — KEYED



DEFORMED METAL STRIP
CONTRACTION JOINT



EXPANSION AND CONTRACTION JOINT
LOCATIONS ON CONCRETE PAVEMENTS

File: S:\BRE\4400--4499\Drawings\CAD\Somerville Std Details\Paving Details.dwg Time: Jun 26, 2020 - 11:05am

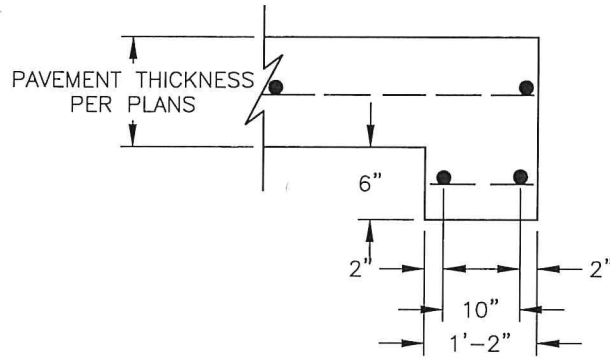


CITY OF SOMERVILLE
CONTRACTION, EXPANSION, AND CONSTRUCTION
JOINT LOCATIONS ON CONCRETE PAVEMENTS

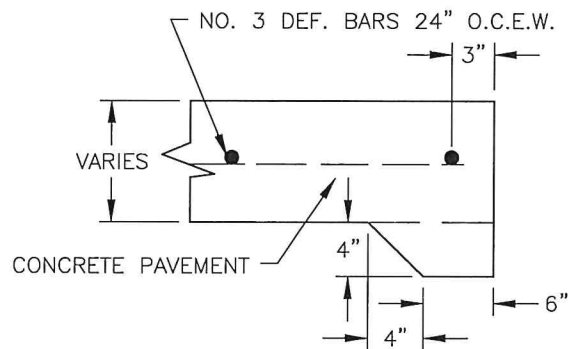
DRAWING NO.
PVG-12

NOT TO SCALE

File: S:\BRE\4400---4499\Drawings\CAD\Somerville Std Details\Paving Details.dwg Time: Jun 04, 2020 - 4:17pm



CONCRETE PAVEMENT RAILROAD HEADER



FOR USE AT END OF ANY CONCRETE
PAVEMENT WHICH DOES NOT TIE TO CONCRETE

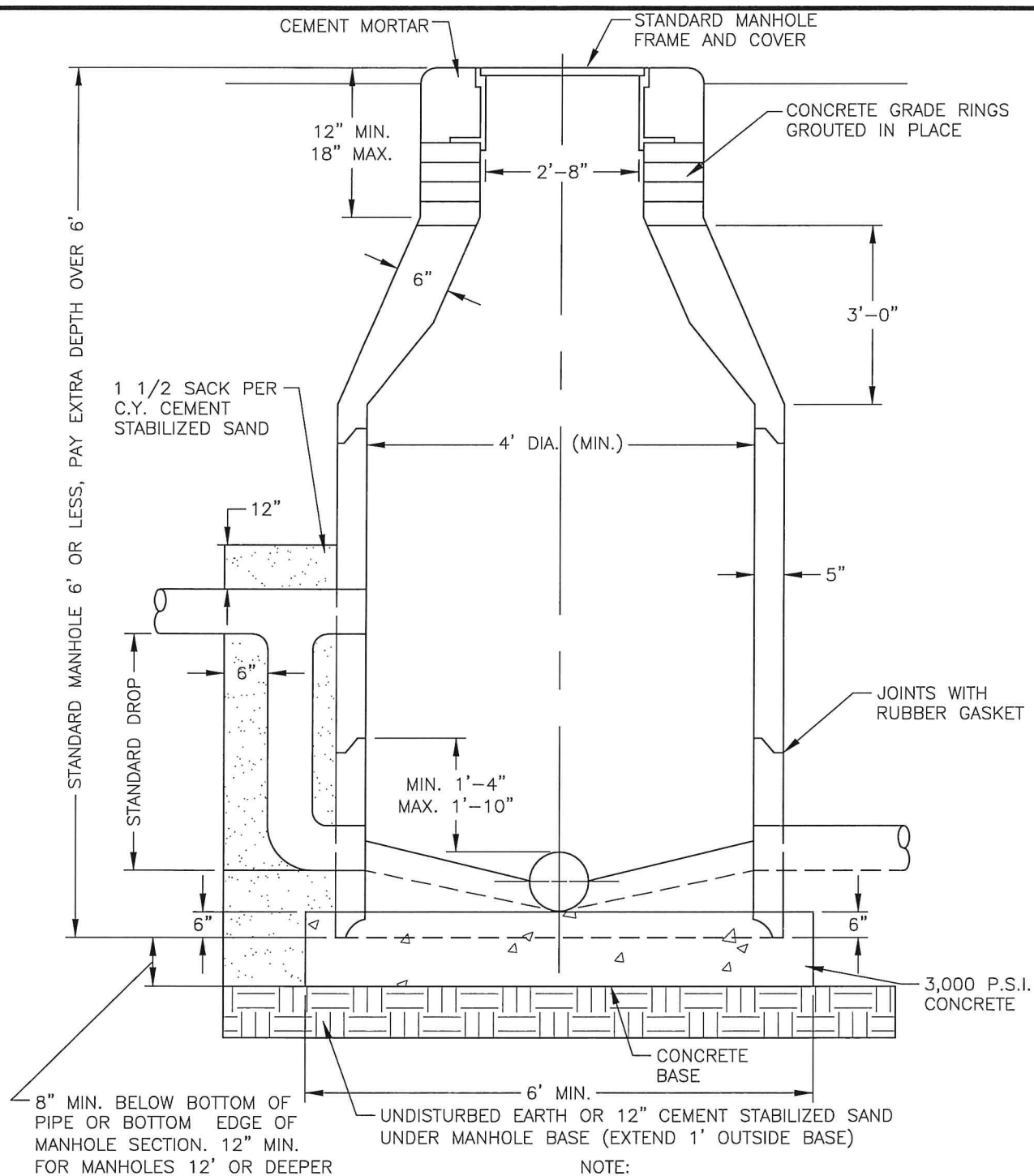


CITY OF SOMERVILLE
STANDARD CONCRETE PAVEMENT HEADERS

DRAWING NO.
PVG-13

NOT TO SCALE

APPENDIX C
SANITARY SEWER



NOTE:
ALL MANHOLES SHALL BE FABRICATED WITH
XYPEX ADMIXTURE PER THE MANUFACTURER'S
RECOMMENDATION.

STANDARD DROP CONNECTION ON MANHOLE

STANDARD MANHOLE

SECTION VIEW



CITY OF SOMERVILLE
SANITARY SEWER
PRECAST CONCRETE MANHOLE

DRAWING NO.
SAN-01

NOT TO SCALE

File: S:\BRE\4400--4499\4421\006\Drawings\CAD\Somerville Std Details\Sanitary Sewer.dwg Time: Jun 26, 2020 - 11:06am

FOR CONCRETE PAVEMENT, INSTALL 6" SUBGRADE (EITHER LIME STABILIZED OR CEMENT STABILIZED SAND) & INSTALL 6" 3,000 P.S.I. CONCRETE. DOWEL & EPOXY #3 BARS @ 18" CENTERS TO EXISTING PAVEMENT. INSTALL REBAR #3s @ 18" O.C.

MATCH ASPHALT PAVEMENT OR MIN. 1½" TYPE "D" HOT MIX ASPH. PAVEMENT WITH PRIME COAT

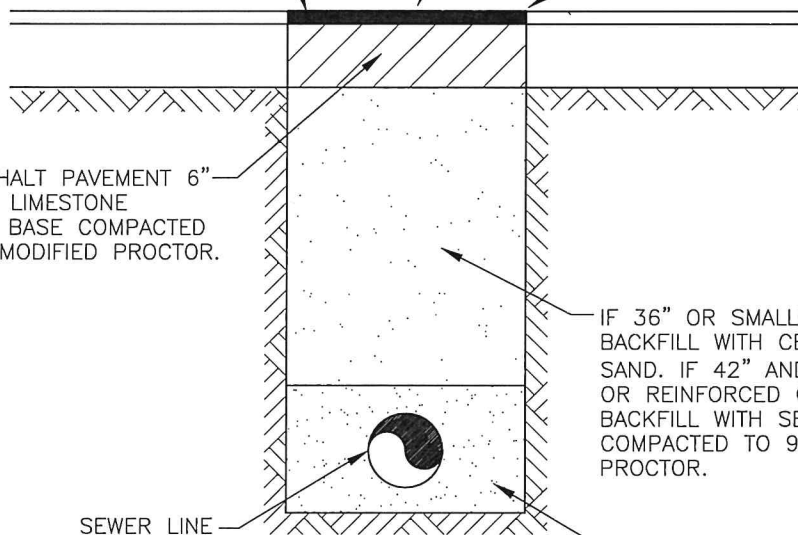
SAWCUT PAVEMENTS @ EDGES OF TRENCH

FOR ASPHALT PAVEMENT 6" GRADE 2 LIMESTONE FLEXIBLE BASE COMPACTED TO 95% MODIFIED PROCTOR.

IF 36" OR SMALLER PIPE, BACKFILL WITH CEMENT STABILIZED SAND. IF 42" AND LARGER PIPE OR REINFORCED CONCRETE BOX, BACKFILL WITH SELECT FILL COMPACTED TO 95% STANDARD PROCTOR.

SEWER LINE

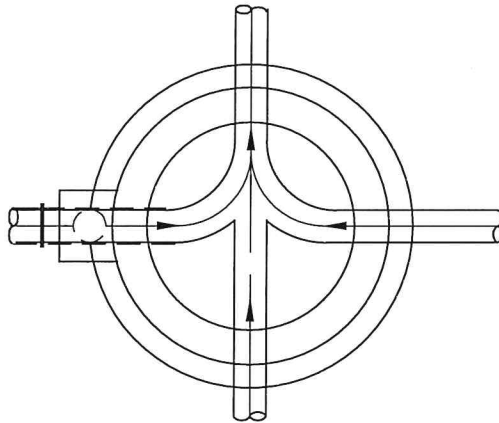
SEE BEDDING DETAIL



CITY OF SOMERVILLE
TYPICAL SECTION OPEN CUT PAVED
STREET, DRIVEWAY, OR ALLEY

DRAWING NO.
SAN-02

NOT TO SCALE



NOTE: PROVIDE HARD SMOOTH SURFACE
TO MANHOLE INVERTS.

MANHOLE PLAN VIEW

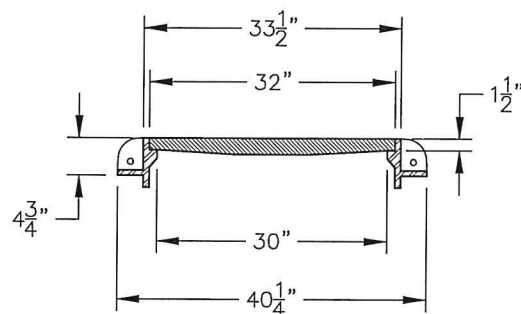
NTS



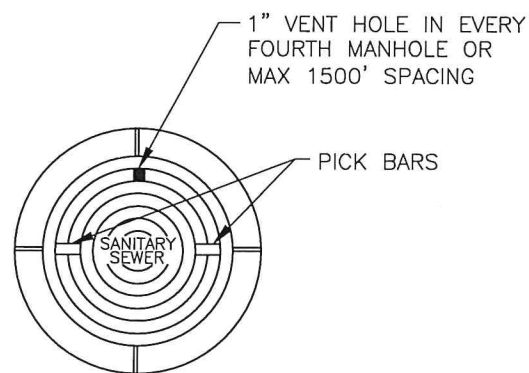
CITY OF SOMERVILLE
MANHOLE PLAN VIEW

DRAWING NO.
SAN-03

NOT TO SCALE



SECTION



TOP PLAN

NOTES:

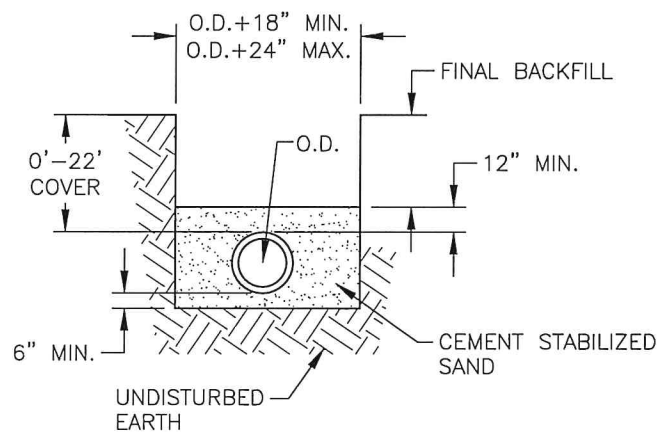
1. MANHOLE COVER AND FRAME SHALL HAVE A MINIMUM TOTAL WEIGHT OF 295 LBS.
2. MANHOLE FRAME SHALL HAVE A MINIMUM CLEAR OPENING OF 30".
3. APPROVED MANHOLE RING AND COVERS ARE AS FOLLOWS: EAST JORDAN IRON WORKS 32" MODEL V 1342 WITH 2-TYPE 6 PICK BARS, OR APPROVED EQUAL. WORDS "SANITARY SEWER" SHALL BE ON LID.
4. IN STREET RIGHTS-OF-WAY, INSTALL MANHOLE TOP 3" ABOVE FINISHED GRADE. IN UNDEVELOPED AREAS INSTALL TOP 6" ABOVE EXISTING GRADE. INSTALL MANHOLE FRAME TO MATCH FINISHED SLOPE IN GRADED AREAS.
5. ALL MANHOLES LOCATED IN DRAINAGE DITCHES OR IN PONDING AREAS SHALL BE BUILT TO A HEIGHT OF 1'-0" ABOVE FLOW LINE GRADE OF DITCH AND SHALL HAVE AN INFLOW PROTECTION COVER INSTALLED UNDER THE LID.



CITY OF SOMERVILLE
STANDARD CAST IRON MANHOLE
COVER AND FRAME

DRAWING NO.
SAN-04

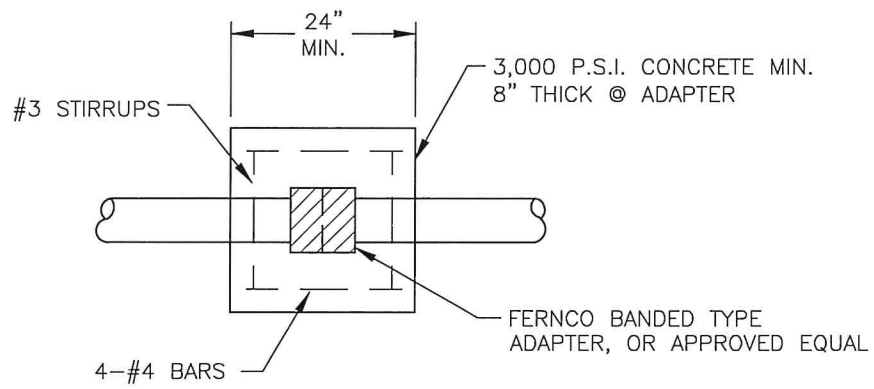
NOT TO SCALE



CITY OF SOMERVILLE
EMBEDMENT CROSS SECTION
FOR PVC SEWER PIPE

DRAWING NO.
SAN-05

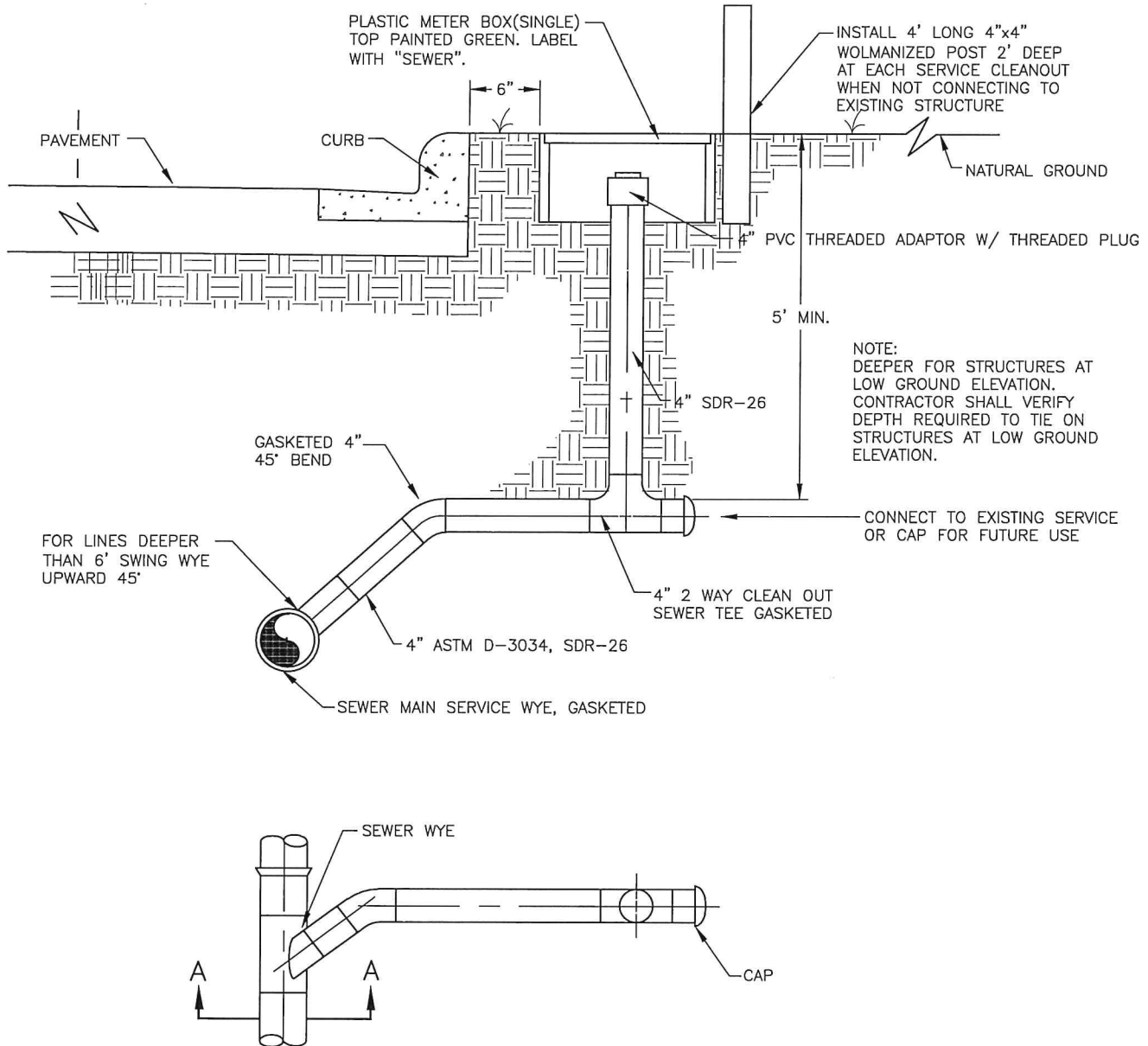
NOT TO SCALE



CITY OF SOMERVILLE
DETAIL FOR JOINING PIPES OF
DIFFERENT TYPE MATERIAL

DRAWING NO.
SAN-06

NOT TO SCALE



NOTES:

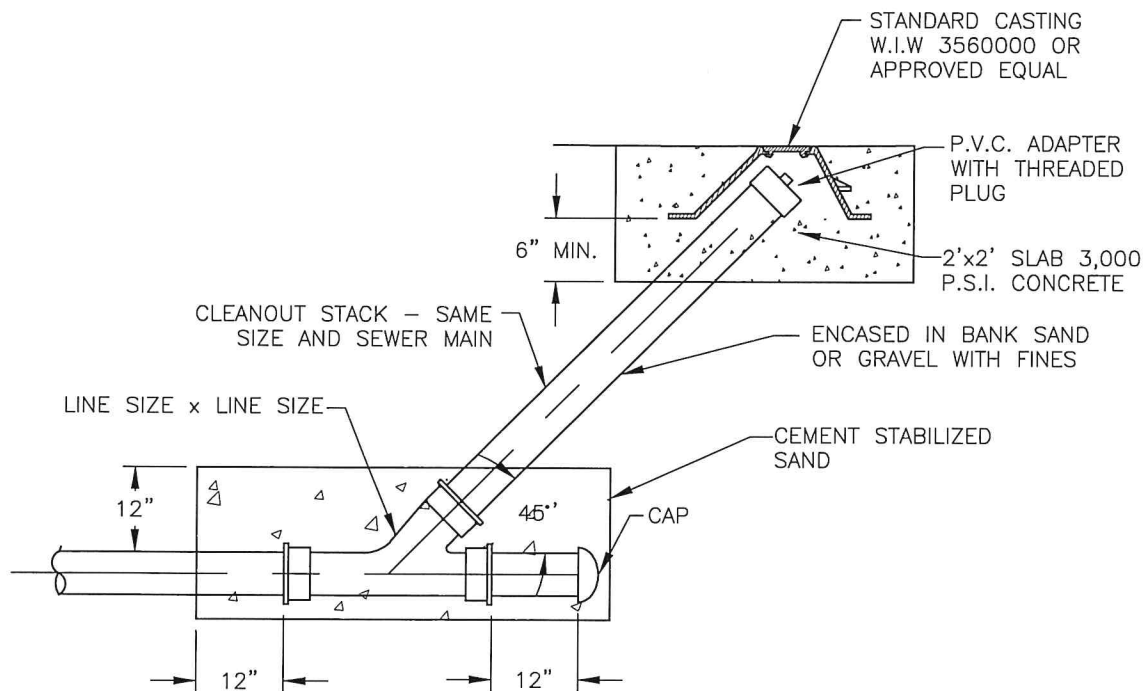
1. ALL SERVICE LINES SHALL BE 4" SDR-26 P.V.C. PIPE TO THE SERVICE CLEANOUT. FROM CLEANOUT TO STRUCTURE, 4" SCH. 40 SHALL BE USED.
2. SERVICE TAPS ON V.C.P. SHALL BE MADE WITH A 4" 'Y' TAP SADDLE DICKEY MODEL NO. YT0400003 OR EQUAL. A 4" E.T.C.O. ADAPTER DICKEY MODEL NO. 442 ZE 042000 OR APPROVED EQUAL SHALL BE USED TO ADAPT FROM THE ABOVE TAP SADDLE TO 4" SDR-26 P.V.C. PIPE.
3. SERVICE TAPS ON DUCTILE IRON PIPE SHALL BE MADE WITH A 4" P.V.C. SADDLE AS MANUFACTURED BY GPK PRODUCTS OF FARGO N.D. OR EQUAL.
4. SERVICE CONNECTIONS FOR P.V.C. PIPE SHALL BE MADE WITH SERVICE WYES OF THE SAME A.S.T.M. DESIGNATION AS THE MAIN LINE.
5. ALL SERVICE WYES AND P.V.C. SERVICE LINE SHALL BE ENCASED IN SAND OR GRAVEL WITH FINES.



CITY OF SOMERVILLE
TYPICAL SERVICE CONNECTION

DRAWING NO.
SAN-07

NOT TO SCALE



CITY OF SOMERVILLE
STANDARD CLEANOUT

DRAWING NO.
SAN-08

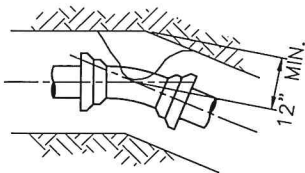
NOT TO SCALE

APPENDIX D
WATER

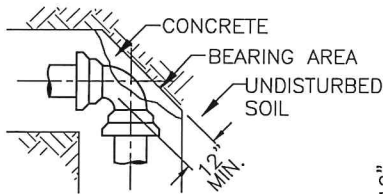
File: S:\BRE\4400--4499\4421\006\Drawings\CAD\Somerville Std Details\Water Details.dwg Time: Jun 04, 2020 - 5:12pm

NOTES:

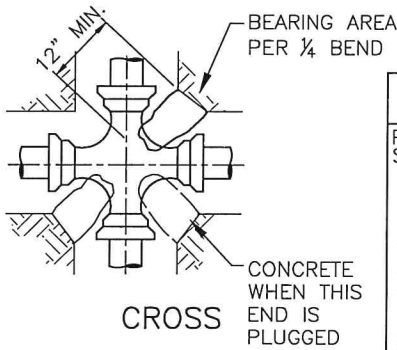
1. LOCATIONS OF THRUST BLOCKING SHOWN ARE TYPICAL BUT ARE NOT ONLY LOCATIONS BLOCKING MAY BE NEEDED.
2. ALL CONCRETE TO BE CLASS "B".
3. ALL CONCRETE TO BE POURED AGAINST UNDISTURBED SOIL.
4. TABLES PROVIDE MINIMUM BEARING AREA REQUIREMENTS.
5. CONTRACTOR SHALL EXERCISE CARE NOT TO GET CONCRETE ON MECHANICAL JOINT NUTS OR BOLTS.



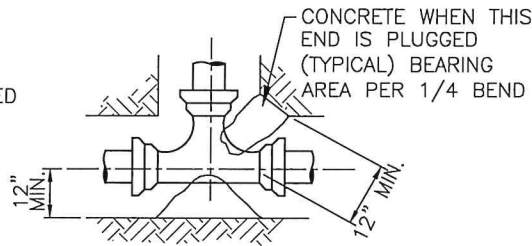
22½° BEND



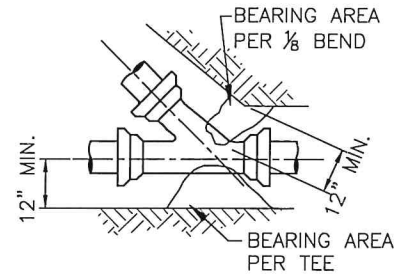
90° BEND



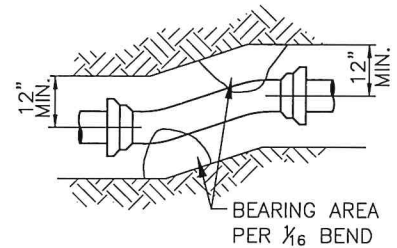
CROSS



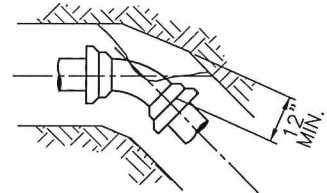
TEE



WYE



OFFSET



45° BEND

1/16 BEND (22 1/2°)		1/8 BEND (45°)		1/4 BEND (90°)		TEE	
PIPE SIZE	BEARING AREA	PIPE SIZE	BEARING AREA	PIPE SIZE	BEARING AREA	PIPE SIZE	BEARING AREA
4"	1 S.F.	4"	1 S.F.	4"	3 S.F.	4"	2 S.F.
6"	2 S.F.	6"	3 S.F.	6"	6 S.F.	6"	4 S.F.
8"	3 S.F.	8"	5 S.F.	8"	10 S.F.	8"	7 S.F.
10"	4 S.F.	10"	8 S.F.	10"	16 S.F.	10"	11 S.F.
12"	6 S.F.	12"	12 S.F.	12"	22 S.F.	12"	15 S.F.
14"	8 S.F.	14"	16 S.F.	14"	30 S.F.	14"	21 S.F.
18"	13 S.F.	18"	26 S.F.	18"	49 S.F.	18"	34 S.F.
20"	16 S.F.	20"	33 S.F.	20"	62 S.F.	20"	43 S.F.
24"	24 S.F.	24"	47 S.F.	24"	87 S.F.	24"	62 S.F.

FITTINGS	MINIMUM LENGTH — FT.
90° BEND (4")	36
90° BEND (6" TO 8")	54
90° BEND (10" TO 12")	72
90° BEND (14")	84
45° BEND (< 6")	18
45° BEND (8" TO 14")	36
22½° BEND (< 14")	18
11¼° BEND (< 14")	9
FIRE HYDRANT LEADS	ALL JOINTS
END OF LINE TEES (4")*	18 (ALONG BRANCH)
END OF LINE TEES (6" TO 8")*	36 (ALONG BRANCH)
END OF LINE TEES (10" TO 12")	54 (ALONG BRANCH)
END OF LINE TEES (14")*	66 (ALONG BRANCH)

*RESTRAINED RUN LENGTH ON TEES ASSUMED 18 FEET ON EACH SIDE OF FITTING.

THIS TABLE ASSUMES HORIZONTAL ORIENTATION OF FITTINGS, 150 PSI TEST PRESSURE PLUS A 100 PSI WATER HAMMER ALLOWANCE, DUCTILE IRON PIPE, AND A 3-FOOT BURY. LENGTHS SHALL BE ADJUSTED FOR OTHER CONDITIONS AND FITTINGS. SEE THE DRAWINGS.



CITY OF SOMERVILLE
RESTRAINED JOINT AND
THRUST BLOCKING DETAILS

DRAWING NO.
WTR-01

NOT TO SCALE

File: S:\BRE\4400--4499\Drawings\CAD\Somerville Std Details\Water Details.dwg Time: Jun 26, 2020 - 11:06am

FOR CONCRETE PAVEMENT, INSTALL 6" SUBGRADE (EITHER LIME STABILIZED OR CEMENT STABILIZED SAND) & INSTALL 6" 3,000 P.S.I. CONCRETE. DOWEL & EPOXY #3 BARS @ 18" CENTERS TO EXISTING PAVEMENT. INSTALL REBAR #3s @ 18" O.C.

FOR ASPHALT PAVEMENT 1½" TYPE "D" HOT MIX ASPH. PAVEMENT WITH PRIME COAT

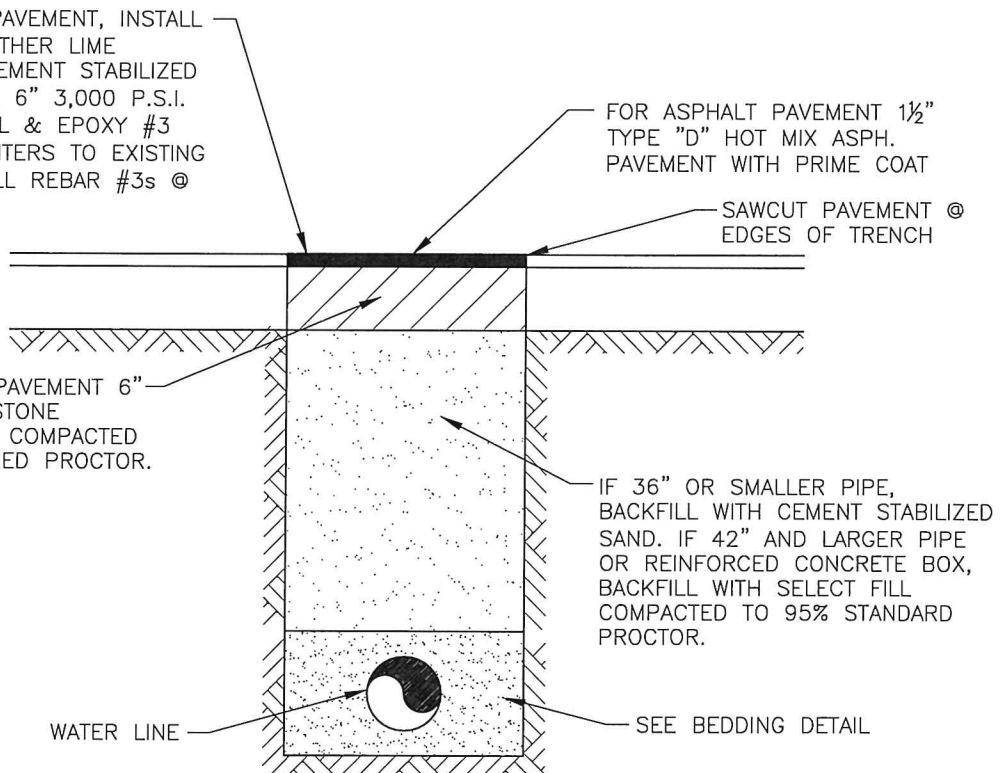
SAWCUT PAVEMENT @ EDGES OF TRENCH

FOR ASPHALT PAVEMENT 6" GRADE 2 LIMESTONE FLEXIBLE BASE COMPACTED TO 95% MODIFIED PROCTOR.

IF 36" OR SMALLER PIPE, BACKFILL WITH CEMENT STABILIZED SAND. IF 42" AND LARGER PIPE OR REINFORCED CONCRETE BOX, BACKFILL WITH SELECT FILL COMPACTED TO 95% STANDARD PROCTOR.

WATER LINE

SEE BEDDING DETAIL

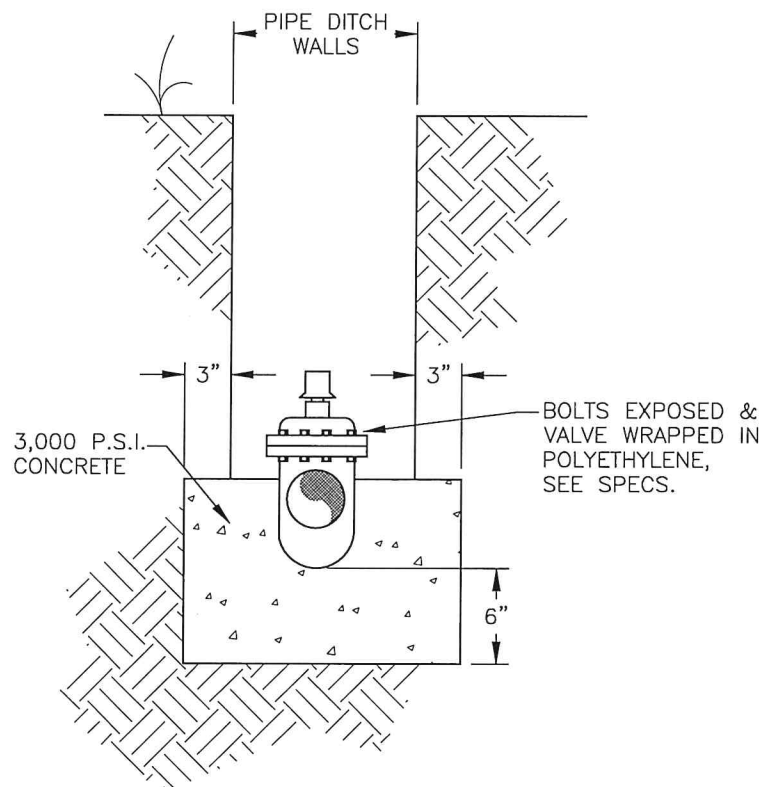


CITY OF SOMERVILLE
TYPICAL SECTION OPEN CUT PAVED
STREET, DRIVEWAY, OR ALLEY

DRAWING NO.
WTR-02

NOT TO SCALE

File: S:\BRE\4400--4499\4421\006\Drawings\CAD\Somerville Std Details\Water Details.dwg Time: Jun 04, 2020 - 5:12pm



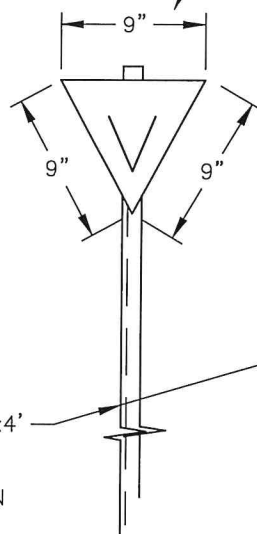
CITY OF SOMERVILLE
BLOCKING DETAIL FOR VALVES
ON PLASTIC PIPE

DRAWING NO.
WTR-03

NOT TO SCALE

File: S:\BRE\4400--4499\Drawings\CAD\Somerville Std Details\Water Details.dwg Time: Jun 04, 2020 - 5:13pm

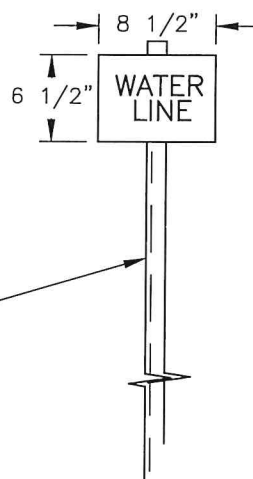
16" GAGE STEEL, BLACK "V"
ON ORANGE BACKGROUND,
BAKED ENAMEL FINISH



1'x1"x1/8"x4'
STANDARD
GALVANIZED
ANGLE IRON

VALVE MARKER

16" GAGE STEEL, BLACK LETTERS
ON WHITE BACKGROUND, BAKED
ENAMEL FINISH © PROPERTY
FENCE CROSSINGS



WATER LINE MARKER

NOTE: VALVE AND WATER LINE MARKERS ARE TO BE INSTALLED AT
LOCATIONS AS SHOWN ON PLANS. WATER LINE MARKER IS TO BE
INSTALLED NEAR THE R.O.W. LINE AT ROAD AND RAILROAD CROSSINGS.

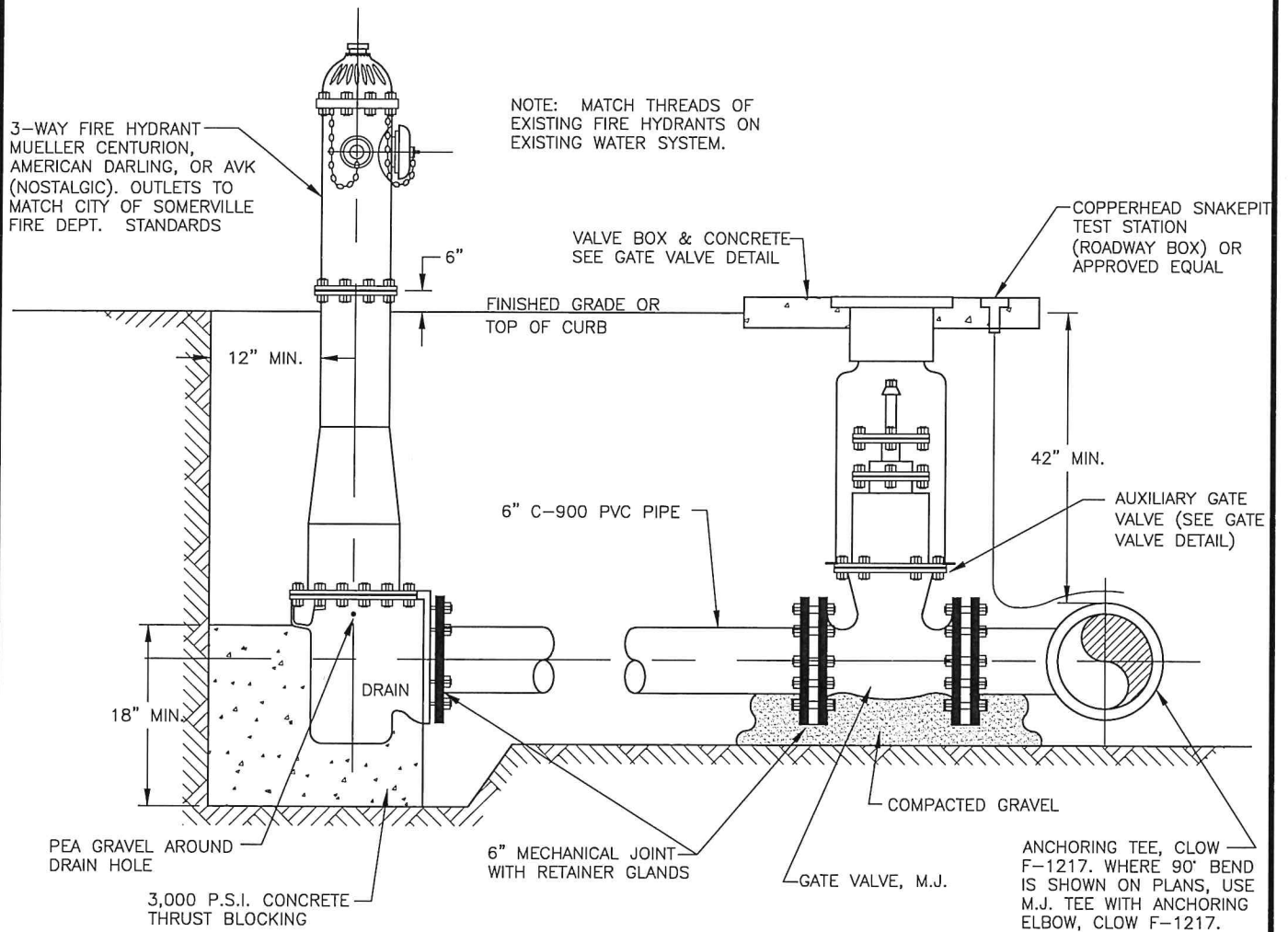


CITY OF SOMERVILLE
VALVE MARKER AND WATER
LINE MARKER

DRAWING NO.
WTR-04

NOT TO SCALE

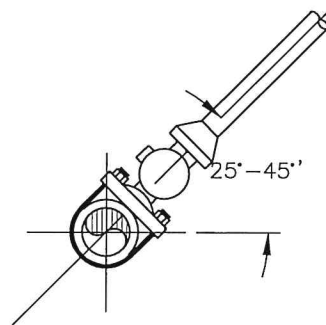
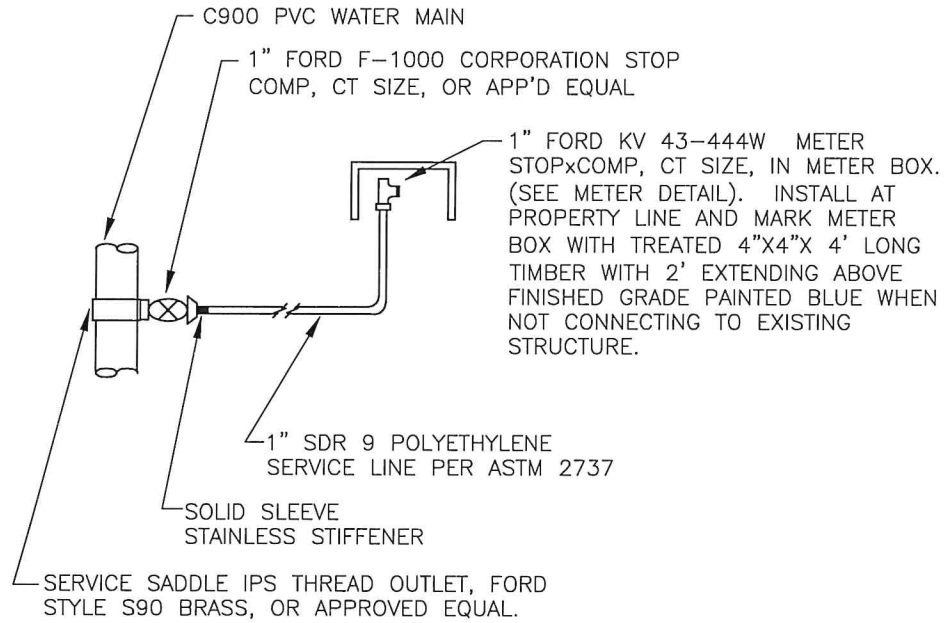
File: S:\BRE\4400--4499\4421\006\Drawings\CAD\Somerville Std Details\Water Details.dwg Time: Aug 25, 2020 - 3:44pm



CITY OF SOMERVILLE
FIRE HYDRANT UNIT

DRAWING NO.
WTR-05

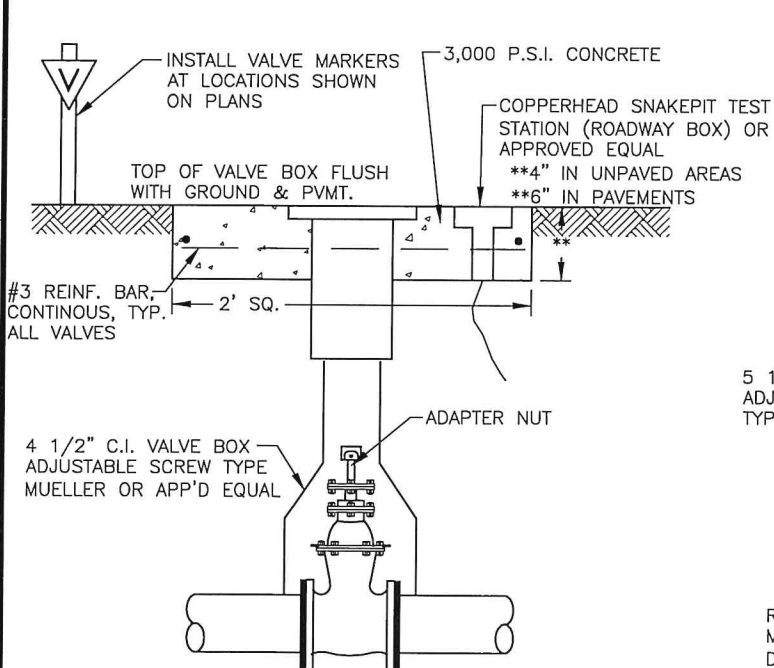
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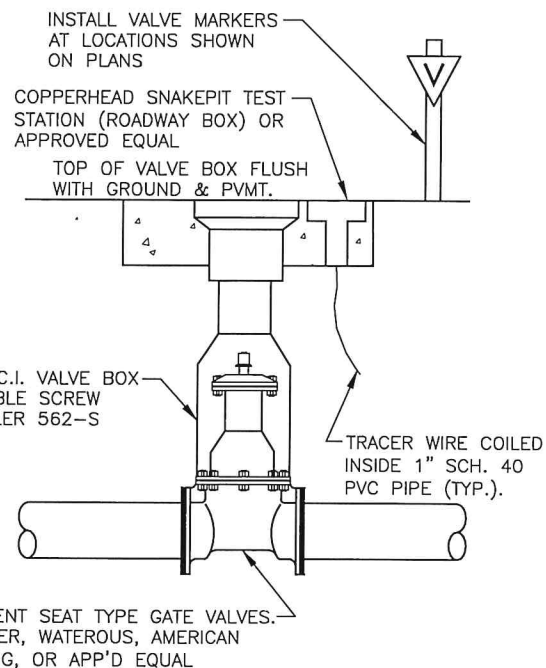
NOTE: 45° MIN. FOR
SERVICES ON HIGH POINTS.

DUCTILE IRON OR PVC PIPE

File: S:\BRE\4400--4499\4421\006\Drawings\CAD\Somerville Std Details\Water Details.dwg Time: Aug 25, 2020 - 3:45pm



BRASS BALL VALVES 2" & SMALLER
W/BRASS 2"x2" ADAPTER NUT



3" & LARGER

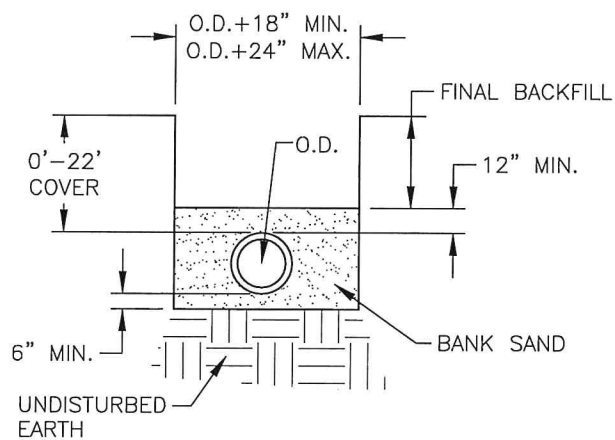
NOTE: ALL GATE VALVES SHALL TURN
CLOCKWISE TO CLOSE AND
COUNTERCLOCKWISE TO OPEN.



CITY OF SOMERVILLE
GATE VALVE

DRAWING NO.
WTR-07

NOT TO SCALE

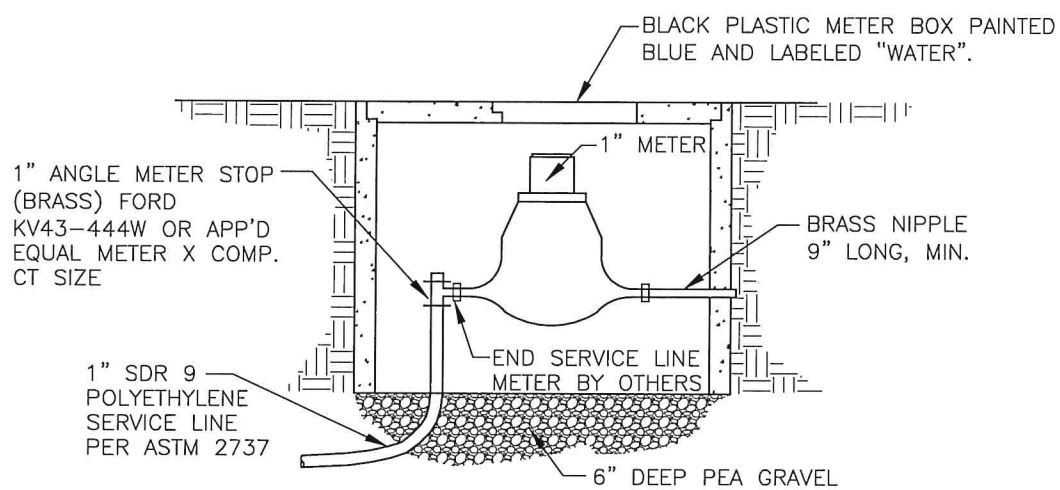


CITY OF SOMERVILLE
EMBEDMENT CROSS SECTION
FOR PVC WATER PIPE

DRAWING NO.
WTR-08

NOT TO SCALE

File: S:\BRE\4400--4499\4421\006\Drawings\CAD\Somerville Std Details\Water Details.dwg Time: Jun 04, 2020 - 5:13pm

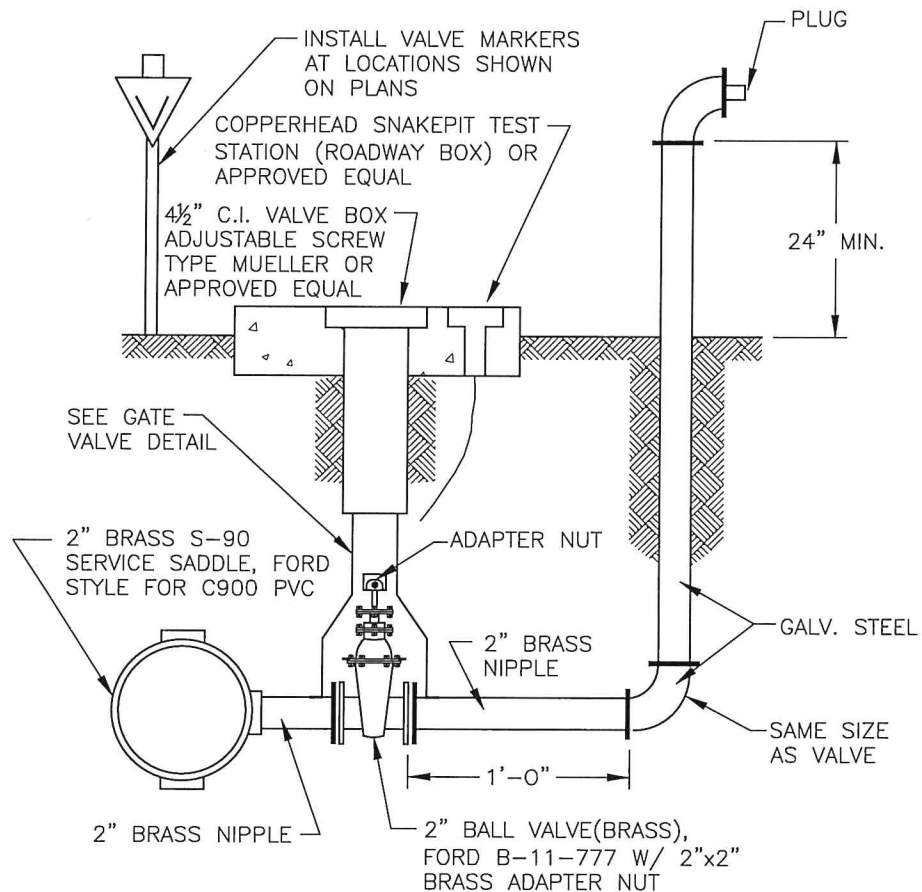


CITY OF SOMERVILLE
WATER METER

DRAWING NO.
WTR-09

NOT TO SCALE

File: S:\BRE\4400--4499\4421\006\Drawings\CAD\Somerville Std Details\Water Details.dwg Time: Aug 25, 2020 - 3:45pm

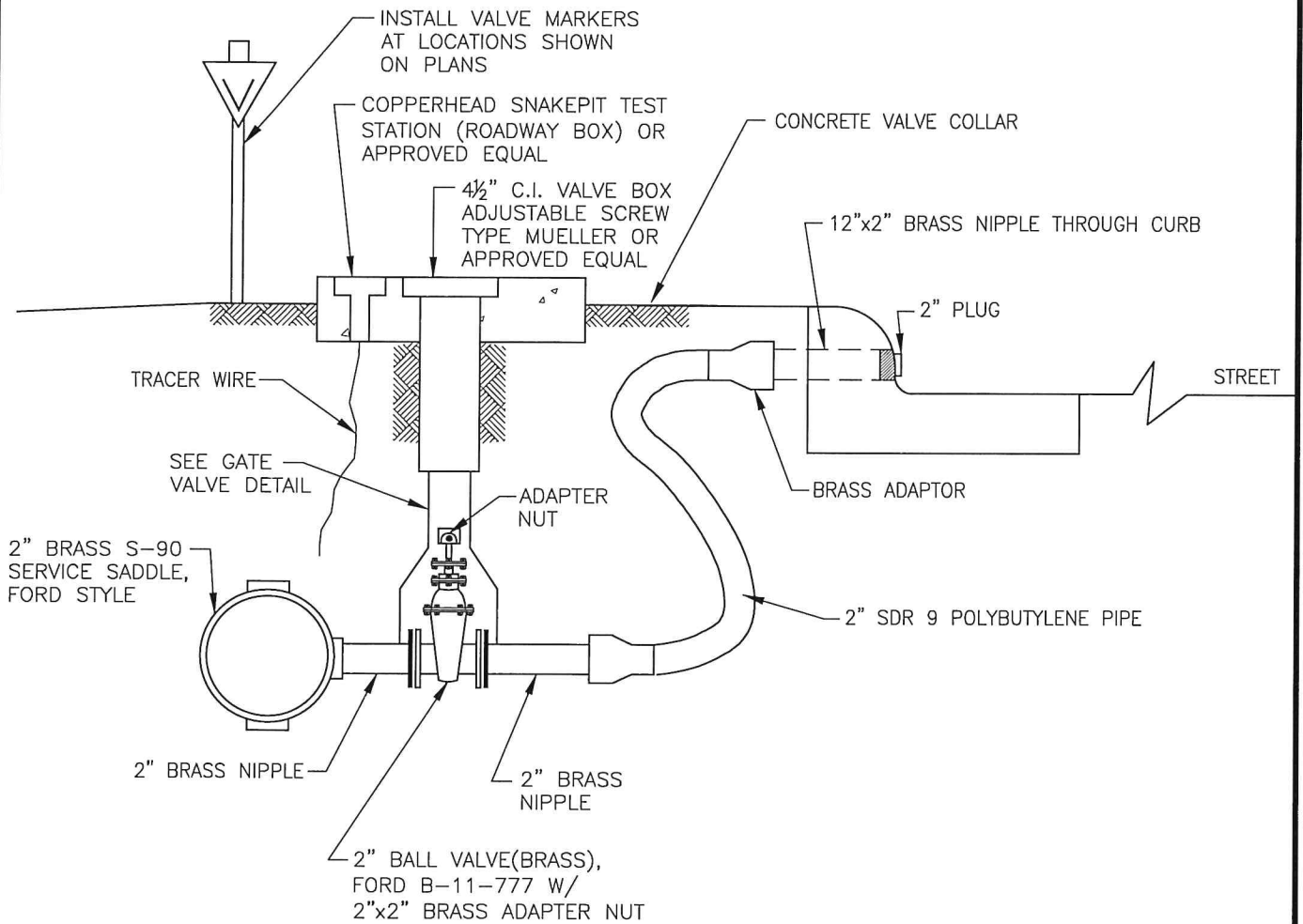


CITY OF SOMERVILLE
FLUSH VALVE UNIT IN
UNIMPROVED AREAS

DRAWING NO.
WTR-10

NOT TO SCALE

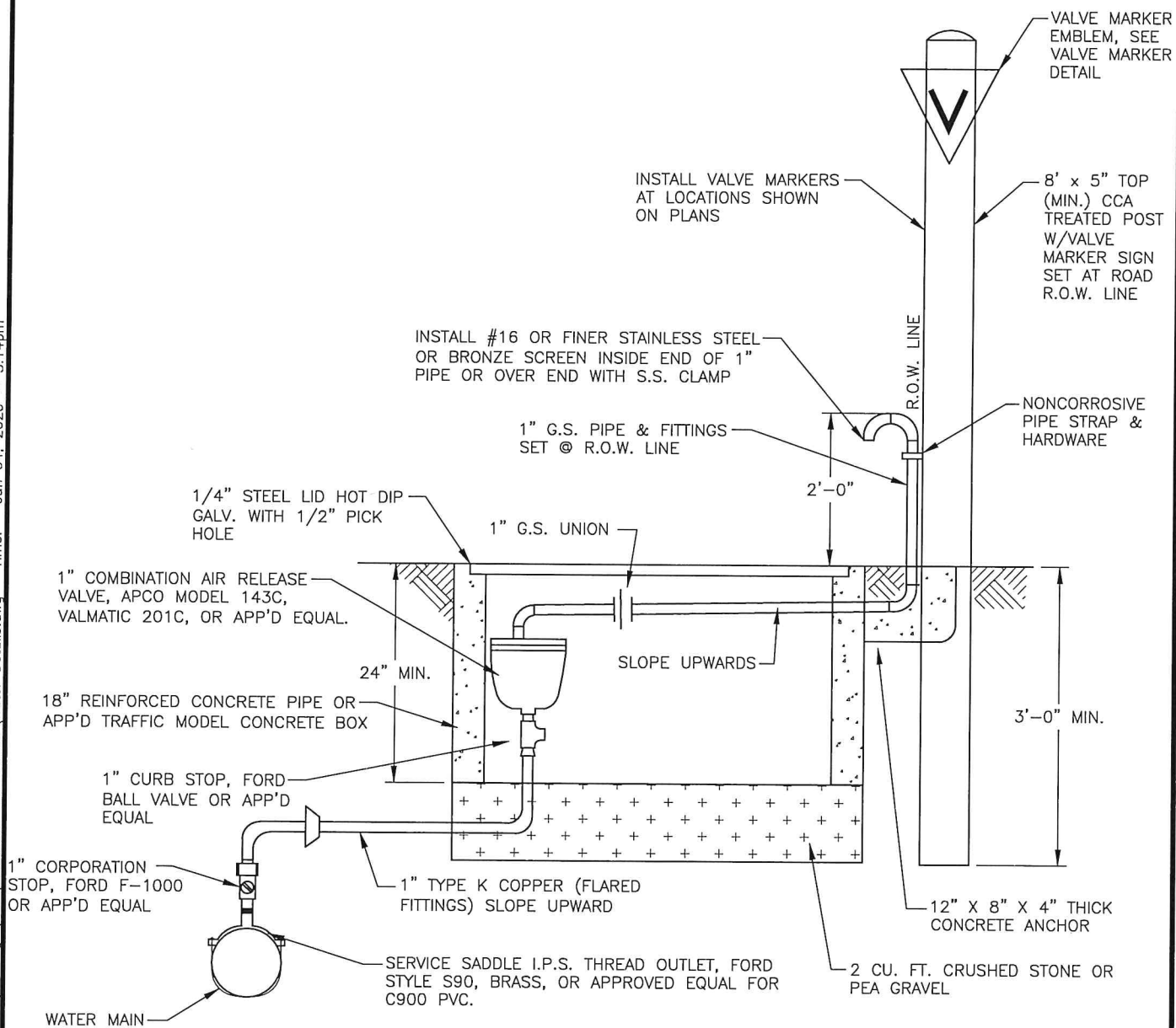
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CITY OF SOMERVILLE
FLUSH VALVE UNIT
IN STREET

DRAWING NO.
WTR-11

NOT TO SCALE



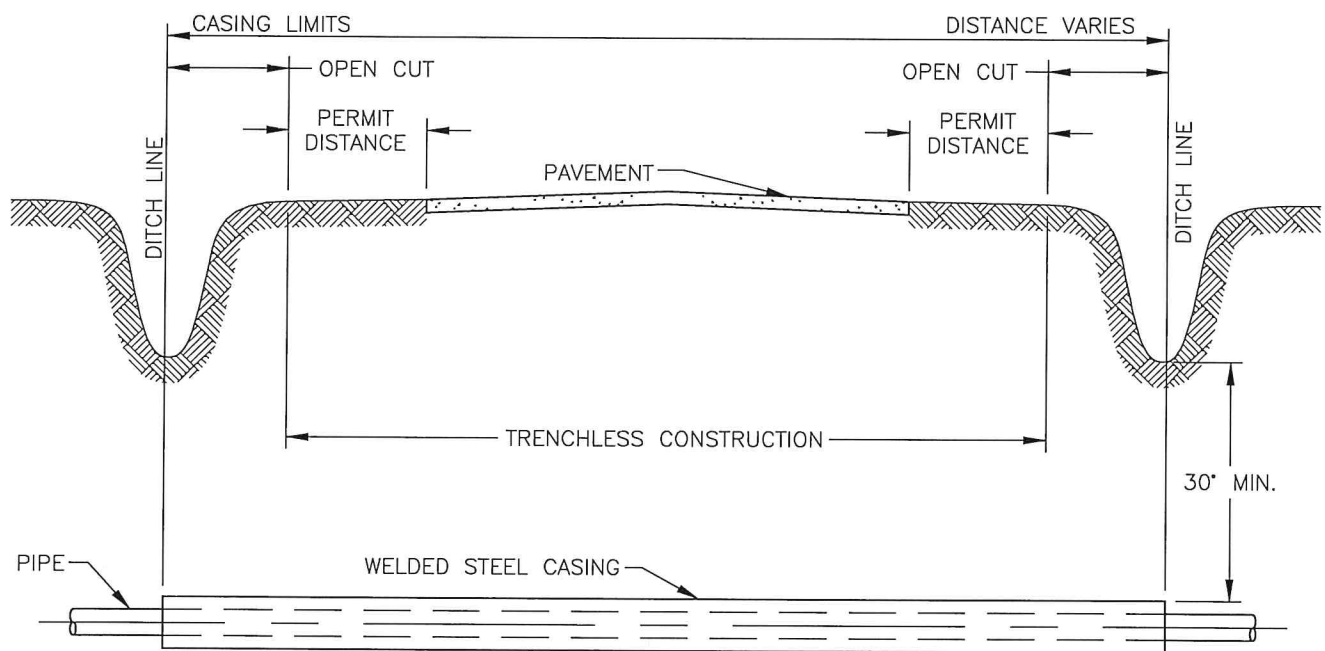
CITY OF SOMERVILLE

AIR RELEASE VALVE INSTALLATION

DRAWING NO.
WTR-12

NOT TO SCALE

File: S:\BRE\4400--4499\4421\006\Drawings\CAD\Somerville Std Details\Water Details.dwg Time: Jun 04, 2020 - 5:14pm

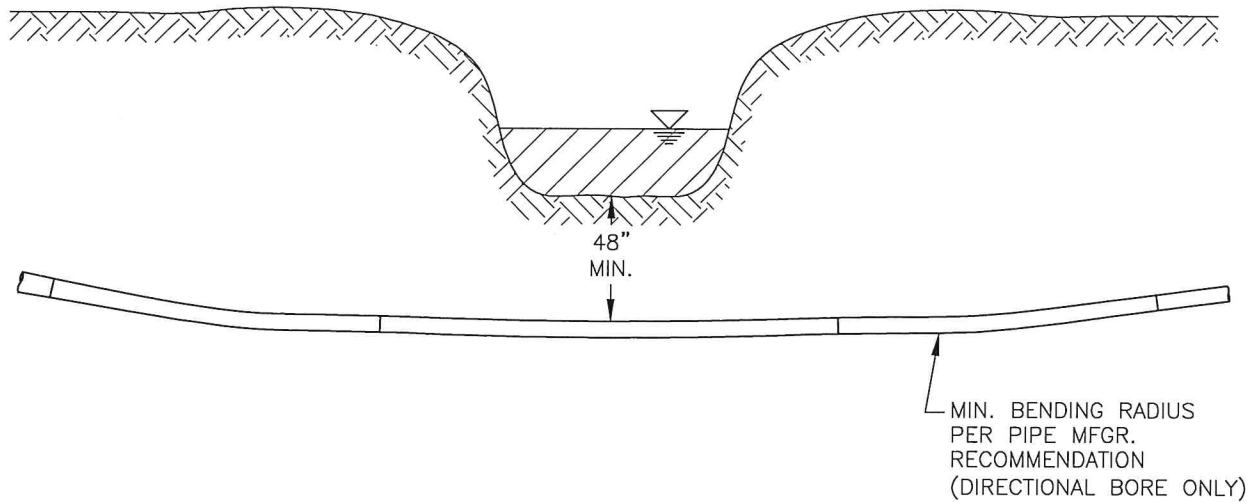


CITY OF SOMERVILLE
TYPICAL TRENCHLESS ROAD
CROSSING SECTION

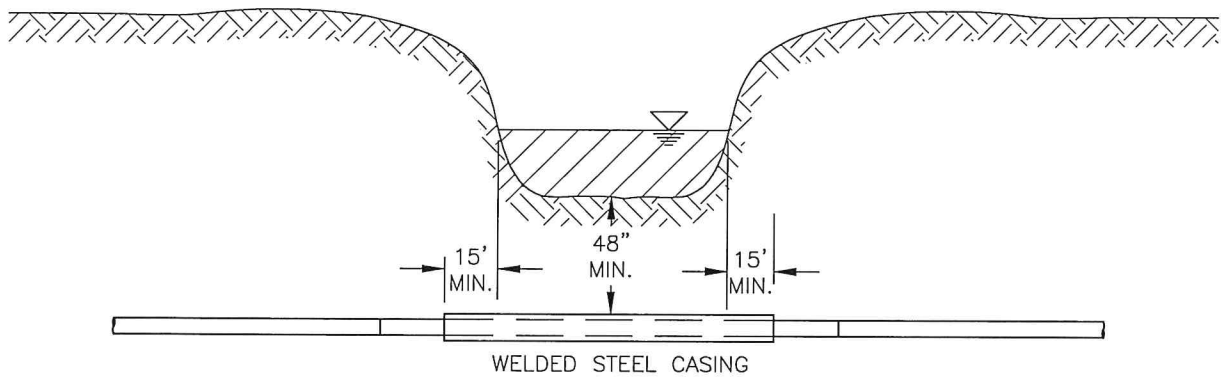
DRAWING NO.
WTR-13

NOT TO SCALE

File: S:\BRE\4400--4499\Drawings\CAD\Somerville Std Details\Water Details.dwg Time: Jun 04, 2020 - 5:14pm



BY DIRECTIONAL BORE



NOTE: CASING NOT REQUIRED FOR
NORMALLY DRY CREEK

BY BORE WITH CASING

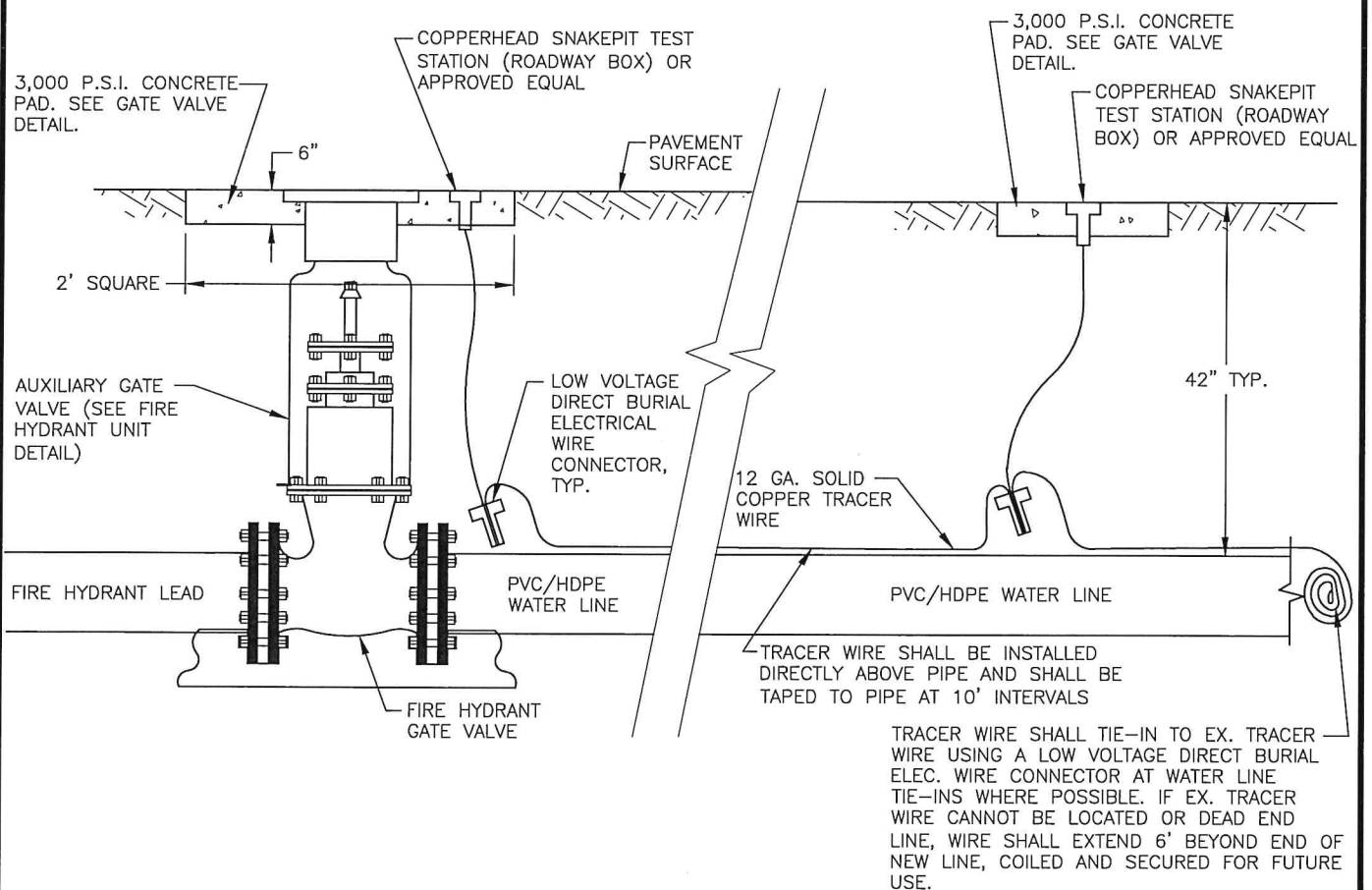


CITY OF SOMERVILLE
TYPICAL CREEK CROSSING

DRAWING NO.
WTR-14

NOT TO SCALE

File: S:\BREV\4400--4499\4421\006\Drawings\CAD\Somerville Std Details\Water Details.dwg Aug 25, 2020 3:45pm



CITY OF SOMERVILLE
COPPERHEAD SNAKEPIT
TEST STATION

DRAWING NO.
WTR-15

NOT TO SCALE