



Private Development Water & Wastewater Design Requirements Manual

THE CITY OF OKLAHOMA CITY
UTILITIES DEPARTMENT
Engineering Division

THE OKLAHOMA CITY WATER UTILITIES TRUST

Private Development Water & Wastewater Design Requirements Manual

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SECRETARY

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RECEIVED by the Council and signed by the Mayor of the City of Oklahoma City this _____ day of _____, 2024.

ATTEST:

CITY CLERK

MAYOR

The City of Oklahoma City – Utilities Department

Private Development Water & Wastewater Design Requirements Manual

This Private Development Water & Wastewater Design Requirements Manual (“Manual”) is a technical resource. The Manual was created to aide applicants, property owners, developers, and professional engineers and to establish the minimum requirements for constructing, extending, expanding, improving and connecting to Oklahoma City Utilities and utility services, but does not create a contract with any applicants, property owners, developers, or professional engineers. The Manual does not create a right or warranty of approval of any application, plans or other request. The Utilities Department expressly reserves the right and authority to add, supplement, modify and amend the Manual and the requirements herein. The Utilities Department reserves the right and authority to make other or additional requirements on a case-by-case basis and/or any individual analyses and evaluation by the Utilities Department of any application, plans or other request. The Manual, the requirements herein, and any other requirements as may be required by the Utilities Department for constructing, extending, expanding, improving and connecting to Oklahoma City Utilities and/or utility services is not subject to amendment, waiver, variance, modification or other exception by the Oklahoma City Planning Commission or the Oklahoma City Board of Adjustment.

DISCLAIMER

This Manual does not obligate the City of Oklahoma City (Oklahoma City) or the Oklahoma City Water Utilities Trust (OCWUT) to approve any plans and does not restrict Oklahoma City or OCWUT from imposing other or additional requirements as a condition of approval of any application, plan, construction, expansion, improvement, connection, or extension of Oklahoma City Utilities.

Applicants, property owners, and developers must engage a professional engineer licensed in the State of Oklahoma to prepare and submit applications and plans for construction, expansion, improvement, connection, or extension of Oklahoma City Utilities.

The professional engineer is solely responsible for all elements of materials and design for the construction, expansion, improvement, connection, or extension of Oklahoma City Utilities. The professional engineer must seal all submittals and all plans for construction, expansion, improvement, connection, or extension of Oklahoma City Utilities.

The professional engineer is responsible for investigating, accumulating, reconciling, evaluating, and accurately representing on plans the existing status of all geotechnical information, existing property ownership and use, easements, existing and planned utilities, all buildings and structures, all setbacks, and all other factors affecting the material and design. Design must include adequate easement and setback for any construction, expansion, improvement, connection, or extension of Oklahoma City Utilities and for construction, operation, maintenance, replacement, and improvement and for ingress and egress access therefor. Professional engineer must design the plans to provide adequate and safe conditions and environments for the construction expansion, improvement, connection, or extension of Oklahoma City Utilities. Professional engineer’s plans and submittals must include permanent easements which provide Oklahoma City and OCWUT as grantees unrestricted ingress and egress access and the unrestricted right to construct, operate, maintain, replace, and improve the Oklahoma City Utility systems on forms approved by the Utilities Director and by the assigned Assistant Municipal Counselor.

Review of plans submitted by the professional engineer does not relieve the professional engineer of any professional responsibility for the plans. Markups by Utilities Department of plans submitted by the professional engineer does not relieve the submitting professional engineer of any professional responsibility or liability. Submitting professional engineer is responsible for designing any construction, extension, expansion, improvement, or connection to Oklahoma City Utility systems to satisfy all professional standards, all applicable laws, all Oklahoma City ordinances, this Manual, and any other or additional requirements from the Utilities Department. Approval of plans by Utilities Director or City Engineer is an administrative process. Plan approval requires the signature of the Utilities Director and/or City Engineer; however such approval does not relieve the applicants, property owners, developers and their professional engineers of any responsibility, does not create a professional liability or responsibility upon the Utilities Director or City Engineer, and does not constitute any representation or warranty, express or implied, to the applicant, property owner, developer or their professional engineer that the plans satisfy all professional standards, all applicable laws, all Oklahoma City ordinances, this Manual or that subsequent changes or revisions to the plans may be required by the Utilities Department.

Oklahoma City and OCWUT reserve the right to require revisions or changes to design, plans, and/or construction, extension, expansion, improvement, or connection to Oklahoma City Utility systems until the design plans are approved by the Utilities Department and City Engineer. Design plans and construction of project must meet the minimum requirements of this Manual, Oklahoma City Standard Specifications for Construction of Public Improvements, the Utilities Department Standard Details, and Oklahoma City Municipal Code as it exists at the time of the plans approval including any corrections or revisions, not at the time of submittal. Changes to the use or zoning of the development, the structures on the development, or to the Oklahoma City Utility systems to be connected or extended to the development or property after approval of the plans by the Utilities Department will require resubmission, revision, re-review, and re-approval of the plans before construction of and connection to the Oklahoma City Utility systems.

Oklahoma City and OCWUT reserve the right to require the professional engineer to revise the design plans for the construction, extension, expansion, improvement, or connection to Oklahoma City Utility systems and to require a new or revised plan and work order, at the applicant's, property owner's, developer's, and/or their professional engineer's expense, if construction does not commence on or before one (1) year after approval of the plans.

Oklahoma City and OCWUT reserves the right to terminate a work order and to require revisions or changes to design, plans, and requirements for the construction, extension, expansion, improvement, or connection to Oklahoma City Utility systems, at the applicant's, property owner's, developer's, and/or their professional engineer's expense, if any utility conflicts, differing field conditions or other changes in conditions are discovered during construction.

Applicants, property owners, developers and/or their professional engineers are responsible for the construction of any extension, expansion, improvement, or connection to the Oklahoma City Utility systems in accordance with all professional standards, all applicable laws, all Oklahoma City ordinances, this Manual, Oklahoma City Standard Specifications for Construction of Public Improvements, the Utilities Department Standard Details, and Oklahoma Municipal Code and approved plans. Neither Oklahoma City nor OCWUT is responsible for any non-compliance.

Oklahoma City and OCWUT reserves the right to apply discretion in the interpretation of this Manual and require the use of other applicable standards and good engineering judgement and the best interest of Oklahoma City and OCWUT when reviewing each plan. The design and plans for any extension, expansion, improvement, or connection to Oklahoma City Utility systems for municipal services must meet the minimum requirements of the most recently issued Manual, Oklahoma City Standard Specifications for Construction of Public Improvements, the Utilities Department Standard Details, and

Oklahoma City Municipal Code in effect at the time of issuance of a work order for construction in accordance with approved plans. In addition, Oklahoma City and OCWUT reserves the right to require design of any extension, expansion, improvement, or connection to Oklahoma City utility systems which exceed the Manual, Oklahoma City Standard Specifications for Construction of Public Improvements, the Utilities Department Standard Details, and Oklahoma City Municipal Code as Oklahoma City or OCWUT deem necessary to serve the development and/or the property, developed and undeveloped, in the area of or affected by the design of the construction, expansion, improvement, connection or extension of the Oklahoma City Utility systems to meet the goals, objectives, plans or capital improvement plans of Oklahoma City or OCWUT. Further, the Utilities Director will determine all questions related to the interpretation of the requirements. Finally, in the event of a conflict between the requirements, the Utilities Director will determine which requirement(s) will control.

Neither Oklahoma City nor OCWUT will be liable in any manner whatsoever to any person, corporation, entity or organization for costs, expenses, damages, injuries, or delays resulting from the use or application of this Manual, Oklahoma City Standard Specifications for Construction of Public Improvements, the Utilities Department Standard Details, and Oklahoma City Municipal Code. Oklahoma City or OCWUT reserves the right to amend, alter and revise the Manual to ensure best practices apply during system expansions. When any revision is made to this Manual, Oklahoma City and OCWUT will provide notification as best as it can and will deem when revisions, corrections, and/or additions to this Manual take effect. It is the user's responsibility to check the Oklahoma City website for the current version of this Manual and to immediately discard and delete superseded and/or cancelled standards.

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DEFINITIONS

The following terms in this Manual have these meanings.

(A.1) Acceptance means after completion of the work, formal recorded acceptance of the work by the City Council of the City of Oklahoma City and/or the Oklahoma City Water Utilities Trust.

(A.2) As-Built Drawings means engineering documents drawn to scale showing the “as is” constructed elevations, location, dimensions and materials of all improvements.

(B.1) Reserved

(C.1) City Engineer means the City Engineer for the City of Oklahoma City and his or her designees.

(C.2) Collector Wastewater Main means a wastewater main that is greater than fifteen (15) inches and less than twenty (20) inches in diameter which cannot be directly tapped with a service line. All connections to a collector wastewater main are required via a manhole.

(C.3) Common Area means all real property within a community which is owned or leased by an association or dedicated for use or maintenance by the association or its members, including, regardless of whether title has been conveyed to the association such as yard space, basketball court, swimming pool, etc. Common areas are managed by the owner or the homeowner’s association (HOA) of the development.

(D.1) Deed means a legal document that states a conveyance of title to real property.

(D.2) Deed Approval means a subdivision of land into a total of no more than three (3) lots, tracts or parcels. Said subdivision must include all processes related to the conveyance of title by: deed described by metes and bounds; deed described by reference to an unapproved plat; and/or deed resulting from the adjustment of lot lines in an approved plat.

(D.3) Design drawing means the plans drafted and created by a licensed professional engineer.

(D.4) Develop means to erect any structure or to install any improvements on a tract of land, or to undertake any activity (such as grading) in preparation thereof.

(D.5) Developer means the legal or beneficial owner of land or property proposed to be developed or subdivided or the owner’s representative who is responsible for any undertaking that requires review and/or approval under these regulations.

(D.6) Development means any development or improvement(s) to a tract of land or property including individual lots or tracts, lot splits, residential units (single-family, duplex, and triplex), multiple residential housekeeping units, industrial units, commercial units, or mixed, whether private, public, or government owned.

(D.7) Distribution Water Mains means water mains that range in size from six (6) inches to sixteen (16) inches that can be tapped for private or public water services (i.e. domestic, irrigation, fire lines, etc.) with pipe sizes less than or equal to sixteen (16) inches in diameter.

(D.8) Drainage Easement means an easement dedicated to the City of Oklahoma City for the use of storm drain lines, structures, manholes, inlets, channels, and other appurtenances for the use of controlling flow of storm water runoff generally indicated on plans as D/E.

(D.9) Duplex Unit – means two (2) single family residential living units separated by wall that is on a single tract of land and must be platted to show two (2) separate lots where each half of the duplex could be sold to different owners.

(E.1) Engineer or Engineer of Record means a professional engineer licensed to practice in the state of Oklahoma.

(E.2) Easement means a property right held by a person, or group of persons, or entity to use the land of another for a special purpose (such as the construction, operation and maintenance of water and/or wastewater facilities).

(F.1) Fire Hydrant means a fire hydrant connected to a water main, which is inspected, accepted, and owned by the City of Oklahoma City.

(F.2) Fire Hydrant Lead means a water main, which is inspected, accepted, and owned by the City of Oklahoma City, connecting a fire hydrant to a water main.

(F.3) Fire Marshall means the Fire Marshall of the City of Oklahoma City or his or her designees.

(G.1) Grade means the slope of the land, pavement, channel, pipe or any other item. The rise over the run of the item.

(H.1) Housekeeping Unit means a single residential structure, duplex, or a residential triplex sharing common walls.

(I.1) Interceptor Wastewater Main means a wastewater main that is greater than twenty (20) inches in diameter which cannot be tapped directly with a wastewater service line. All connections to the interceptor wastewater main are required via a manhole.

(J.1) Reserved

(K.1) Reserved

(L.1) Lateral Wastewater Main means a wastewater main that is equal to or less than fifteen (15) inches in diameter which can be directly tapped with a minimum of four (4) inch diameter service line.

(L.2) Lot means a measured parcel of land having fixed boundaries and designated on a plat of at least sufficient size to meet minimum use regulations and development standards, as are required in the Planning and Zoning Code, exclusive of right-of-way or street easement.

(L.3) Lot Line means a line of record bounding a lot, thereby dividing such lot from another lot or from a right-of-way.

(L.4) Lot Split means the division or subdivision of a lot or tract of land or property into two (2) or more additional lots or tracts of land.

(M.1) Multifamily means a single structure such as, apartments and condominiums with more than three housekeeping units (living spaces).

(N.1) Reserved

(O.1) Oklahoma City means the City of Oklahoma City, a municipal corporation, acting through its City Council.

(O.2) Oklahoma City Easement means an easement to which Oklahoma City and/or Oklahoma City Water Utility Trust (OCWUT) is grantee.

(O.3) Oklahoma City Utilities means Oklahoma City water, wastewater, and/or reuse water systems.

(P.1) Parcel means a lot, or contiguous group of lots, in single ownership or under single control, and usually considered a unit for purposes of development.

(P.2) Plan(s) means the design, survey and design drawings prepared and sealed by a licensed professional engineer, including such supplemental drawings as the Engineer may submit from time to time, in order to clarify other drawings for the purpose of showing changes in the planned work or for illustrating details not shown.

(P.3) Platted Easement means a plat dedicated easement for the use of all or certain public utilities including Oklahoma City Utilities generally indicated on plans as U/E.

(P.4) Plot means an indefinite term usually referring to a piece of usable property, often used synonymously with parcel or site, and mistakenly, to mean plat.

(P.5) Private Development Manager means the Oklahoma City employee designated by the Utilities Director as the Private Development Manager or such other Utilities Director designee.

(P.6) Private Easement means an easement that is dedicated to a private entity or person for private use, such as private service lines, private utilities, private access and not granted to the City of Oklahoma City or OCWUT usually indicated on plans as Private U/E.

(P.7) Private Fire Hydrant means a fire hydrant that is not accepted and not owned by the City of Oklahoma City or OCWUT, and where the owner is responsible for all maintenance and repairs to keep the fire hydrant in working order.

(P.8) Private Wastewater Service Line means the wastewater service line and any facilities or appurtenances from the housekeeping unit to the public main. The private wastewater service line regardless of size is owned by a person or entity other than the City of Oklahoma City or OCWUT.

(P.9) Private Water Service Line means the water service line and any facilities or appurtenances on the outlet (customer) side of the public water meter tailpiece. The private water service line regardless of size is owned by a person or entity other than the City of Oklahoma City or OCWUT.

(P.10) Property Owner means the legal and/or beneficial owner of the land or property.

(P.11) Public means owned by the City of Oklahoma City or OCWUT, dedicated or donated to and accepted by Oklahoma City, or to be dedicated or donated and accepted by Oklahoma City; provided that Oklahoma City must not own or accept any water facility that is not in a public utility or Oklahoma City right-of-way, public right-of-way, or Oklahoma City easement, or on Oklahoma City property, and does not include any water facility that has not been constructed, installed, inspected, dedicated, and accepted in accordance with this Manual.

(P.12) Public Easement means an easement or right-of-way that is dedicated to Oklahoma City and/or OCWUT as grantee for public use for utilities, sidewalks, streets, etc. generally indicated on plans as U/E.

(P.13) Public Fire Hydrant means a public fire hydrant connected to a public water main, which is inspected, accepted and owned by the City of Oklahoma City.

(P.14) Public Improvement means any building, highway, street, storm sewer, pavement, waterline, wastewater line, sidewalk, or any other improvement or structure which is constructed, altered, or repaired under contract or any instrument with Oklahoma City or OCWUT. Public Improvement also includes, but is not limited to, private work in public right-of-way conveyed, dedicated, and accepted by Oklahoma City.

(P.15) Public Property means statutory right-of-way, public utility or right-of-way, or public street in the City of Oklahoma City, any Oklahoma City or OCWUT easement or right-of-way, and any Oklahoma City or any of its Trusts property and right-of-way.

(Q.1) Reserved

(R.1) Residential means a unit or units which are maintained and operated solely for the use and benefit of the occupants dwelling in said unit or units as their primary place of residence, including, but not limited to, residential houses, duplexes, and triplexes.

(R.2) Reuse Water Extension means the extension of the Oklahoma City reuse water system.

(R.3) Right-of-Way (ROW) means the right to use a strip of land for public street, crosswalk, railroad, road, electric transmission line, oil or gas pipeline, water main, wastewater main, storm sewer main, or for another public utility or special use.

(S.1) Setback means the distance of a structure or other feature (such as a curb or street) from the property line or easement, or from another feature.

(S.2) Standard Details means the latest version of the drawings issued and approved by the Utilities Department showing the standard construction methods and details of specific items and appurtenances for Oklahoma City Utilities systems.

(S.3) Standard Specifications means the latest edition of the Standard Specifications for the Construction of Public Improvements as issued by the City of Oklahoma City.

(T.1) Tract means a lot and or parcel of land which can be developed. The term “tract” is also used interchangeably with the term “lot,” particularly in the context of a subdivision, where a “tract” is subdivided into several lots, parcels, sites, units, plots, condominiums, tracts or interests.

(T.2) Transmission Water Main means a water main that is larger than sixteen (16) inches and can NOT be tapped for private or public water services (i.e. domestic, irrigation, fire lines, etc.) with pipe sizes less than or equal to sixteen (16) inches in diameter, unless expressly noted and approved by the Private Development Manager.

(T.3) Triplex Unit – means three (3) single family residential living units separated by wall that is on a single tract of land and must be platted to show three (3) separate lots where each portion of the triplex could be sold to different owners.

(U.1) Utilities means all utilities also including Oklahoma City Utilities and any public utility pipeline, facility or structure carrying water, wastewater, natural gas, electricity, communications, oil, gas, or other product commodity whether for private or public, wholesale or retail, sale or transportation purposes.

(U.2) Utilities Director or Director means the Director of Utilities Department for The City of Oklahoma City and his or her designees.

(U.3) Utility Extensions means any water utility extension(s), wastewater utility extension(s) and/or reuse water extension(s).

(U.4) Utility Services means water, wastewater and/or reuse water services from Oklahoma City and/or OCWUT.

(V.1) Reserved

(W.1) Wastewater Facilities means to include but not limited to public wastewater mains, wastewater service lines, wyes, cleanouts, manholes, lift stations, and other appurtenances.

(W.2) Wastewater Utility Extension means the extension of the Oklahoma City wastewater system.

(W.3) Water Facilities means to include but not limited to public water mains, water service lines, water meters, meter facilities, water meter tiles, water meter pits/vaults, valves, taps, backflow prevention devices, valve, connection, corporation, curb stop, and tailpiece and other appurtenances.

(W.4) Water Main means a public water transmission main or a public water distribution main, which is inspected, accepted and owned by the City of Oklahoma City.

(W.5) Water Service Line means the water line and any facilities or appurtenances between the water main and the inlet (Oklahoma City) side of the water meter, also including the water meter and tailpiece which has been inspected, accepted, and owned by the City of Oklahoma City.

(W.6) Water Utility Extension means the extension of the Oklahoma City water system.

(X.1) Reserved

(Y.1) Reserved

(Z.1) Reserved

ABBREVIATIONS

ADA – American with Disabilities Act
ASTM – American Society of Testing Materials
BFE – Base Flood Elevation
BLL – Building Limit Line
B/L – Building Line
CA – Common Area
DCV – Double Check Valve Assembly
D/E – Drainage Easement
DIP – Ductile Iron Pipe
FDC – Fire Department Connection
FFE – Finished Floor Elevation
FL – Flow Line
FPS – Feet per Second
GPS – Global Positioning System
IBC – International Building Code
IFC – International Fire Code
INV - Invert
IPC – International Plumbing Code
NEC – National Electric Code
NFPA – National Fire Protection Agency
PVC – Polyvinyl Chloride Pipe
OCWUT – Oklahoma City Water Utilities Trust
ODEQ – Oklahoma Department of Environmental Quality
PEX – Crosslinked Polyethylene Pipe
PSI – Pounds per Square Inch
ROW – Right-of-Way
SCH – Schedule
SLS – Single Long Service
SS – Sanitary Sewer
SSS – Single Short Service
U/E – Utility Easement
W/L – Water Line

I. WATER DESIGN REQUIREMENTS

1. General

- 1.1. Oklahoma City water mains must be extended or constructed within public easements, which are along, abutting, and adjacent to publicly dedicated Oklahoma City streets. However, the Private Development Manager may permit Oklahoma City water mains to be extended or constructed within public easements, which are along, abutting, adjacent, or in privately-owned streets and/or property within a residential subdivision.
- 1.2. Design plans for proposed water mains, water service lines and related and/or connected facilities must include GPS survey Northing and Easting coordinates in the NAD 1983 State Plane Oklahoma North or South Zone for all taps and/or connections to an existing public water main. Flowlines of all fittings, valves, fire hydrants, and appurtenances must be shown and labeled on all design drawings.
- 1.3. Project numbers for all existing and proposed water facilities and assets must be shown and labeled on all drawings submitted for review and approval for proposed new water facilities and assets.
- 1.4. All water valves, meters, and fire hydrants must be installed in grassy areas outside of paving of streets, driveways, and sidewalks and must not interfere with any ADA ramps or in other utility easements.
- 1.5. Preapproval is required from the Private Development Manager, in the Private Development Manager's sole discretion, for any water valves, meters, or fire hydrants not located in grassy areas due to existing site layout and conditions. If approved, locations in paving require a traffic rated vault and lid and other protective structures or facilities may be required.
- 1.6. Each residential housekeeping unit including single-family, duplexes and triplexes, must have separate water meters and separate private service lines directly connected to an Oklahoma City water main where the housekeeping unit abuts a public street with a Public Easement or an Oklahoma City Easement and where the Oklahoma City water main is in the Public Easement or Oklahoma City Easement abutting the single family, duplex, or triplex residential housekeeping unit. Multiple meters may be off one service connection when expressly noted and approved by the Private Development Manager.
- 1.7. Multifamily residential housekeeping units defined as four (4) or more units must be master metered and share a common private water service line. This includes but not limited to apartment complexes and quadplexes.
- 1.8. Industrial and/or Commercial developments with more than one (1) building and/or structure on the same lot must be master metered and share a common private water service line. Industrial and/or Commercial developments which are subdivided into separate, fee simple lots, must have a separate water meter for each lot.
- 1.9. Design plans for proposed water mains, water service lines and related appurtenances must be separately shown and labeled on all design drawings including surveyed actual locations, dimensions, sizes, ownership and relative distance between all utilities, service lines, structures, paving, and assets that may affect construction, operation, or maintenance of the Oklahoma City Utilities in each easement within which Oklahoma City Utilities are or will be constructed. As-built records may be used to show depths of any existing main and related appurtenances that have not been verified via potholing.
- 1.10. Curbs must be marked with a chiseled "V" to identify locations of all valves, and with a chiseled "W" for location of all water meters. V's must be painted Red and W's must be painted Blue.

- 1.11. A certified fire hydrant flow test must be submitted for every project showing the residual and static pressure along with the current flow of the distribution system.
- 1.12. The maintenance of all landscaping in easements and/or ROW is the responsibility of the property owner and/or homeowners association thereof.
- 1.13. Trees must maintain five (5) feet horizontal separation from water mains four (4) inch and smaller diameter and must maintain ten (10) feet horizontal separation from water mains larger than four (4) inches in diameter. Distance is measured from the outside of water main to the outside of tree trunk. All trees within ten (10) feet of any water main must be in accordance with the approved species in the latest edition of the *Tree and Plants for Oklahoma City* manual as published by the City of Oklahoma City.
- 1.14. No physical connection shall be allowed between a potable and a non-potable water supply system. Any such connection is considered a cross connection and is **STRICTLY PROHIBITED.**
- 1.15. Development fees must be paid prior to the issuance of the work order permitting connection to the Oklahoma City system.

2. Water Main Sizing

- 2.1. Water mains must be designed to provide adequate flow and pressure for both domestic supply and fire protection requirements in accordance with the latest edition of the International Fire Code (IFC) and International Plumbing Code (IPC) as adopted by the City of Oklahoma City
- 2.2. New extension of distribution and/or transmission mains along section line roads, must be a minimum of twelve (12) inches in diameter with a minimum cover of five (5) feet in depth. If a larger diameter main is required by the latest water master plan and/or the Private Development Manager, the developer can apply for a Policy A-1 project in which OCWUT may participate in cost sharing in accordance with its latest policy and ordinance. Funding for cost sharing is dependent upon approval by OCWUT and availability of funds.
- 2.3. Fire suppression systems must be designed in accordance with the latest edition of the IFC as amended by the City of Oklahoma City. The minimum residual pressure of twenty-five (25) psi must be used to determine if the distribution system can provide the fire flow demand. If the required fire flow cannot be met, the developer is required to install any private facilities necessary to meet the minimum design pressure and any other pressure or flow requirements necessary for the function of the fire suppression system design such as but not limited to booster pumps and/or storage tanks to meet the fire code requirements.
- 2.4. Minimum residual system pressure within any point in the Oklahoma City water distribution system is designed to be twenty-five (25) psi in accordance with ODEQ requirements and regulations. If the development and/or improvement requires a higher operation system pressure, private facilities such as but not limited to booster pumps and/or storage tanks will be required at the expense of the developer to meet the demand of the proposed development and/or improvements.
- 2.5. A hydraulic model of the proposed development may be required to be submitted to show proper design and line sizing requirements. The minimum system pressure within the development must be forty (40) psi or greater.

- 2.6. Unless directed otherwise from the Private Development Manager, each subdivision must have a minimum of two (2) separate connections to the Oklahoma City water system with a valve between point of water supply connections establishing an independent water supply point. A twelve (12) inch main must be installed through the development in order to supply water through the development and to establish a looped system. See Figure 1.

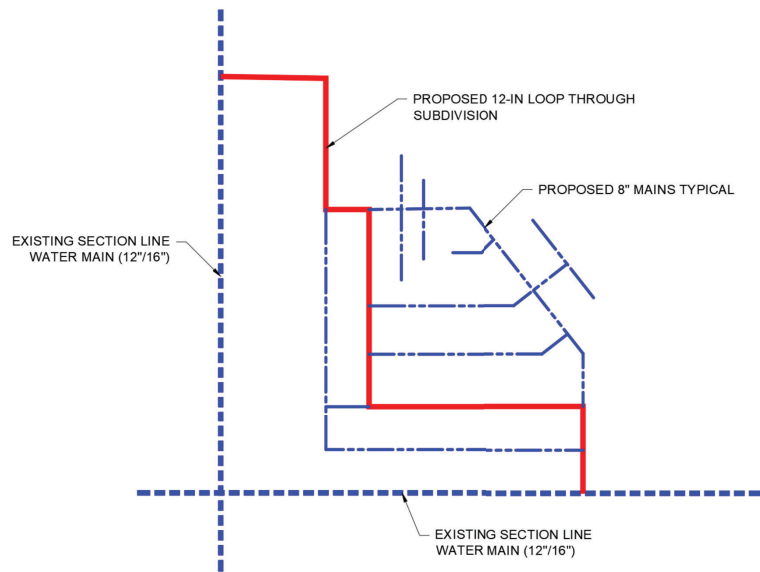


Figure 1 – 12" Water Loop

- 2.7. When a development with multiple lots or tracts is proposed to be built in phases, a minimum twelve (12) inch main must be the connecting point between phases of the development, unless directed otherwise from the Private Development Manager.
- 2.8. Oklahoma City and OCWUT only permit certain size pipe diameters for new water mains: 8-inch, 12-inch, and 16-inch. Larger sizes will be approved on a case-by-case basis by the Private Development Manager. Six (6) inch diameter pipe will only be allowed for fire hydrant leads and for water mains in a short cul-de-sac of 350 feet or less.
- 2.9. Pipe material for 12-inch mains and smaller must be PVC C900 (DR 14) in accordance with the latest Oklahoma City Standard Specifications for Construction of Public Improvements. Ductile Iron Pipe (DIP) can be used if approved by the Private Development Manager for certain circumstances or design requirements if compliant with ODEQ requirements. Pipe material for 16-inch mains and larger must be Ductile Iron Pipe (DIP); however, in areas where corrosive soils may exist, the Private Development Manager may require PVC C900 (DR 14).

3. Water Main Installation

- 3.1. All public water mains must be installed in the ROW, an Oklahoma City Easement, or a Platted Utility Easement adjacent to an improved road as determined by and accepted by the Private Development Manager.
- 3.2. Mains larger than sixteen (16) inches cannot be tapped or shutdown without prior written approval from the Utilities Department and/or Private Development Manager.

- 3.3. For waterlines located outside of the public right-of-way, the minimum required width of an Oklahoma City Easement or Platted Utility Easement for water mains with eight (8) feet of cover or less shall be shown in Table 1 below.

Table 1- Waterline Easement Widths

Main Diameter (inches)	Minimum* Easement Width (feet)
6 – 20	20
24 to 30	25
Greater than 30	30
*Easement may increase depending upon the depth of the pipe.	

- 3.4. All appurtenances must have a contiguous easement and/or clearance as shown in Table 2 below. Additional easement may be required on a case-by-case basis to reflect the required construction, operational, and maintenance activities.

Table 2- Minimum Easement/Clearance for Appurtenances

Appurtenances	Minimum Clearance / Easement (measured from center except where noted)
Air Relief / Valve Vaults	5 feet on all sides
Fire Hydrant	5 feet on all sides
Meters 2 inch and smaller	2-3 feet on all sides
Meters 3 inch and larger	5 feet from outside walls of meter vault

- 3.5. Water main(s) must **NOT** be installed in a Drainage Easement (D/E) or other utility easements. They must be in the ROW, an Oklahoma City Utility Easement, or a Platted Utility Easement.
- 3.6. Water main(s) installed along or under section line roads and commercial/industrial developments must have a minimum depth of five (5) feet from finish grade or top of paving, unless otherwise directed by the Private Development Manager. Water mains must have a minimum depth of four (4) feet below grade or top of pavement in residential areas. All final grades must be in place before installation of water main(s).
- 3.7. Water mains must be installed in the grassy area between the back of curb and property line and must be within the ROW, Oklahoma City Easement or Platted Utility Easement. Water mains must **NOT** be located in or under sidewalk.
- 3.8. Within commercial and industrial developments, water service lines may be installed at the time of the installation of the water main, if the water demand, meter size(s), and building location(s) are known. Otherwise, water service line(s) will not be installed for commercial or industrial developments at the time of water main installation; but will need to be installed by an approved prequalified contractor as each lot/tract gets developed to ensure properly sized service lines and water meters are installed in the proper location.

- 3.9. Water mains must be installed as shown in Figure 2 in residential developments. Water mains installed along section line roads or in industrial or commercial developments must be installed as shown in Figure 3. Exception to this installation must be expressly noted and approved by the Private Development Manager.

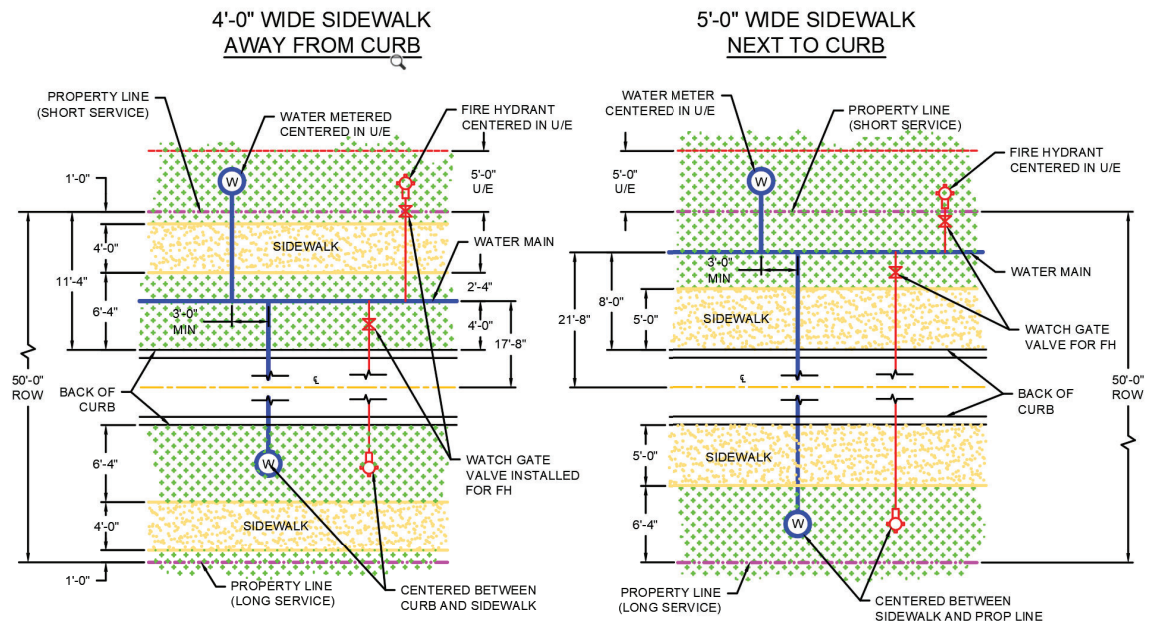


Figure 2 - Typical Residential Development Water Main Installation

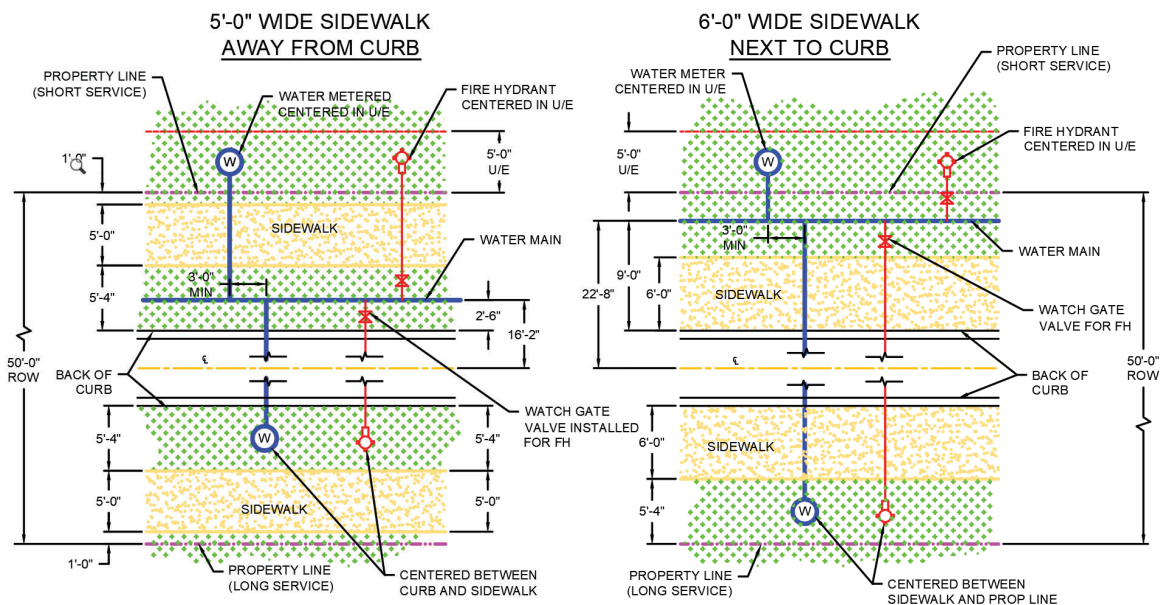


Figure 3 - Typical Section Line & Commercial Industrial Water Main Installation

- 3.10. Water mains installed along 2-lane section line roads (arterial), must be located thirty (30) feet from centerline of existing road.
- 3.11. PVC water mains must be installed at least fifty (50) feet from any petroleum tank or line. DIP with Viton gasket material may be installed a minimum of ten (10) feet from any petroleum tank or line. The location of petroleum tank or line must be indicated on the design drawings and dimension indicated to the water main for reference. If using DIP instead of PVC pipe, include the following note on the design drawings. "Note: DIP is used at this location for protection from petroleum tank or line which is XX feet from the water main."
- 3.12. To minimize the potential for cross contamination and for maintenance purposes, water mains must maintain a minimum horizontal and vertical clearance from other utilities as shown in Table 3 & 4 below.

Table 3 - Horizontal Separation Requirements

	TYPE OF PARALLEL UTILITY					
	Water Main	Water Service Connection	Wastewater Main	Wastewater Service Connection	Dry Utility	Storm Drains / Culverts
Horizontal Separation (outside to outside)	5 ft	5 ft	10 ft	5 ft	10 ft	10 ft

Note: Clearances are measured from outside of pipe to outside of pipe. Any deviations must be expressly noted and approved by the Private Development Manager. Steel casing may be used to reduce spacing as approved by the Private Development Manager.

Table 4- Vertical Separation Requirements

	TYPE OF PARALLEL UTILITY					
	Water Main	Water Service Connection	Wastewater Main	Wastewater Service Connection	Dry Utility	Storm Drains / Culverts
Vertical Separation (outside to outside)	2 ft	2 ft	2 ft	2 ft	2 ft	2 ft

Note: Clearances are measured from outside of pipe to outside of pipe. Any deviations must be expressly noted and approved by the Private Development Manager. Steel casing may be used to reduce spacing as approved by the Private Development Manager.

- 3.13. Water mains crossing wastewater mains must provide a minimum vertical separation distance of at least two (2) feet between the water main and the wastewater main and at least two (2) feet between the water main and all other utilities. All design drawings must show and indicate this minimum clear distance. Design must arrange piping so that joints in a twenty (20) feet length of the water main will be equidistant from the wastewater main crossing or other utility crossings. Embedment material or Type-A aggregate is required under each crossing pipe and below the water main. This requirement must be indicated and labeled on all design drawings submitted for review and approval. Distance must be measured from outside edges of pipes, see Figure 4.

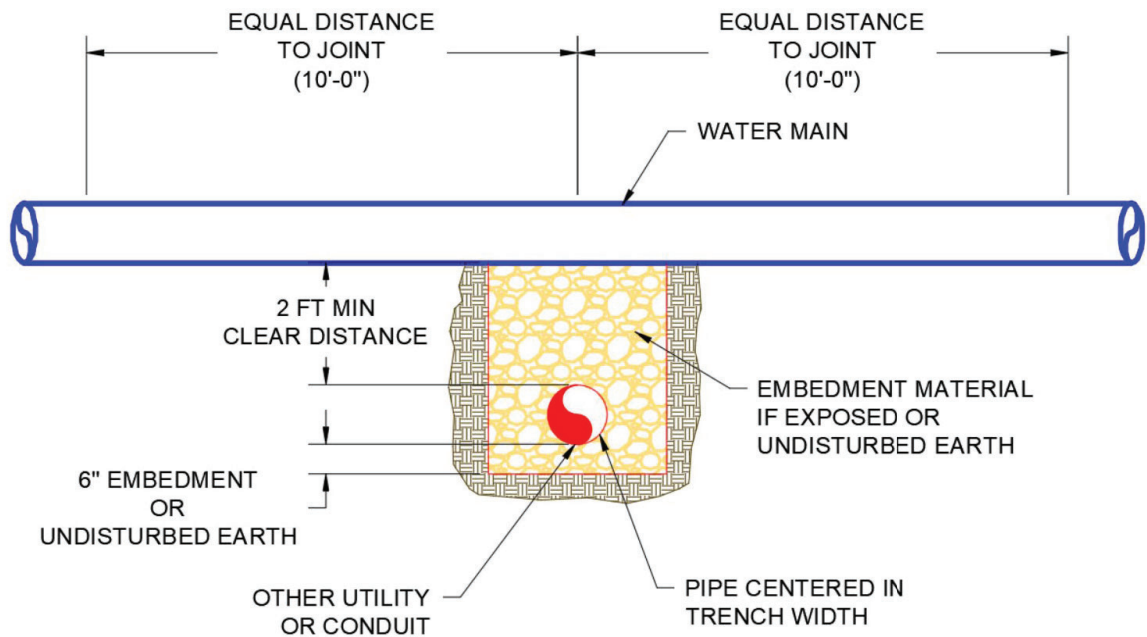


Figure 4- Water Crossing

- 3.14. When a wastewater main crosses the top of a water main, steel encasement of both the water main and wastewater main is required for a minimum distance of ten (10) feet each side of crossing. If the wastewater main is an existing main, concrete encasement of the wastewater main is required. Embedment material or Type-A aggregate is required under the crossing pipe and above the casing of the water main. This requirement must be indicated and labeled on all design drawings submitted for review and approval. If there is more than five (5) feet vertical separation between the water and wastewater main, steel casing or additional embedment material or Type-A aggregate is not required. Distance must be measured from outside edges of pipes. If alignment of water is as such that twenty (20) feet of steel casing cannot be achieved a minimum of pipe diameter plus five (5) feet each side is required. See Figure 5 on the next page.

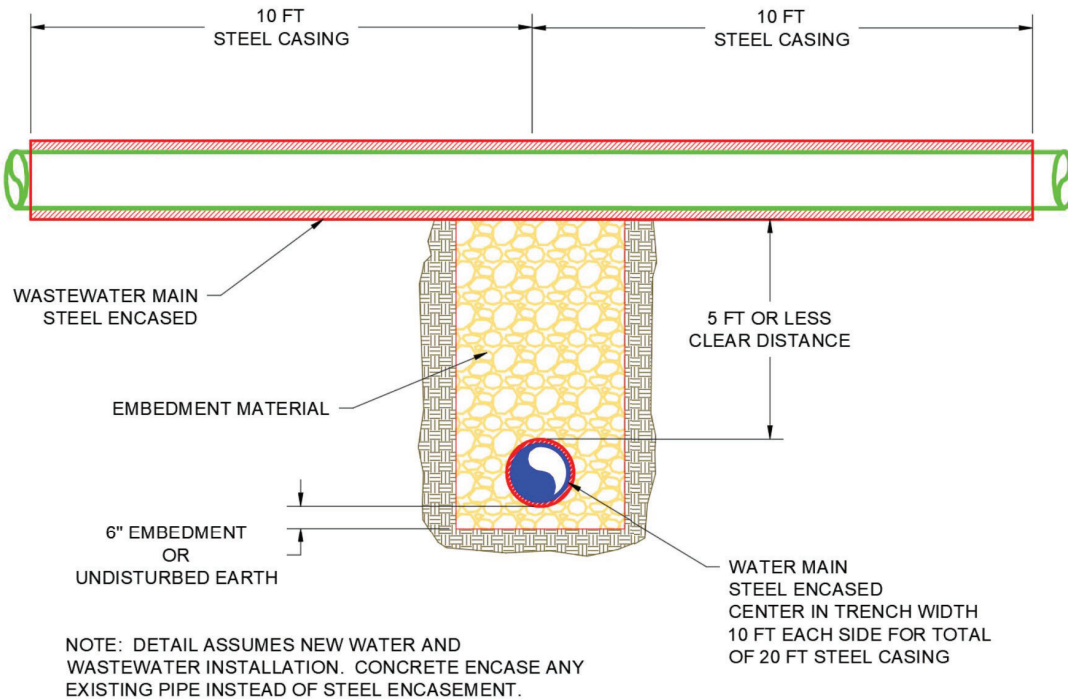


Figure 5- Wastewater Crossing Water

- 3.15. If separation of the water main and wastewater main cannot be achieved horizontally and the wastewater main is not of the same material as the water main and designed to be pressure tested for water tightness, steel encasement of the water main is required that extends along the entire length where horizontal clearance cannot be maintained. This must be indicated and label on all design drawings submitted for review and approval. Distances must be measured from outside edges of pipes. See Figure 6.

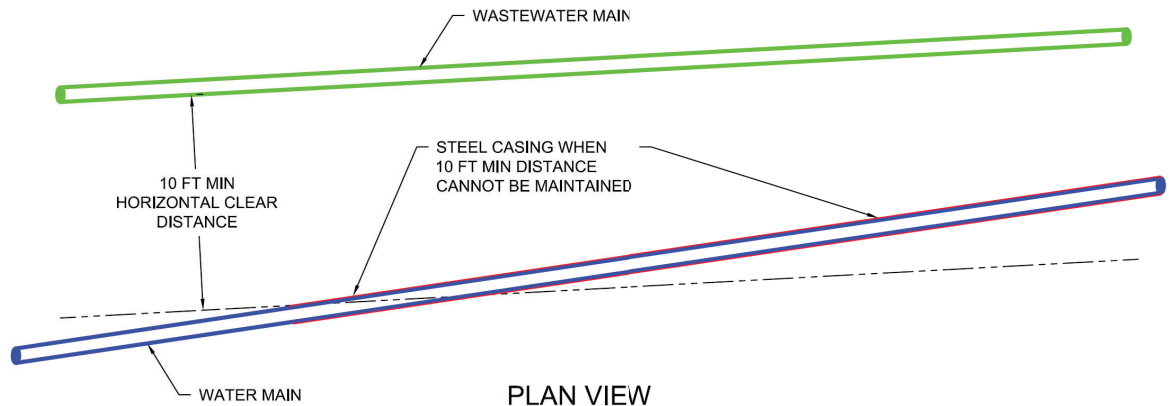


Figure 6- Horizontal Separation Requirements

- 3.16. All water mains that cross under storm sewer mains of thirty (30) inch and larger, must be steel encased a minimum of twenty (20) feet centered under storm sewer crossing. If twenty (20) feet cannot be achieved due to alignment or other issues which will not allow at least three (3) feet spacing between the end of casing and any fitting, then the water main can be steel encased a minimum of five (5) feet past the outside diameter of the storm sewer main (i.e. crossing under a 36-inch storm sewer, minimum steel encasing length is thirteen (13) feet, five (5) feet each side of storm sewer pipe plus the three (3) feet storm pipe equals 13 feet). Embedment Material or Type-A aggregate is required under the crossing pipe and above the casing of the water main. This requirement must be indicated and labeled on all design drawings submitted for review and approval. Distance must be measured from outside edges of pipes. If five (5) feet or greater separation can be maintained, steel encasement or additional embedment material or Type-A aggregate is not required. See Figure 7.

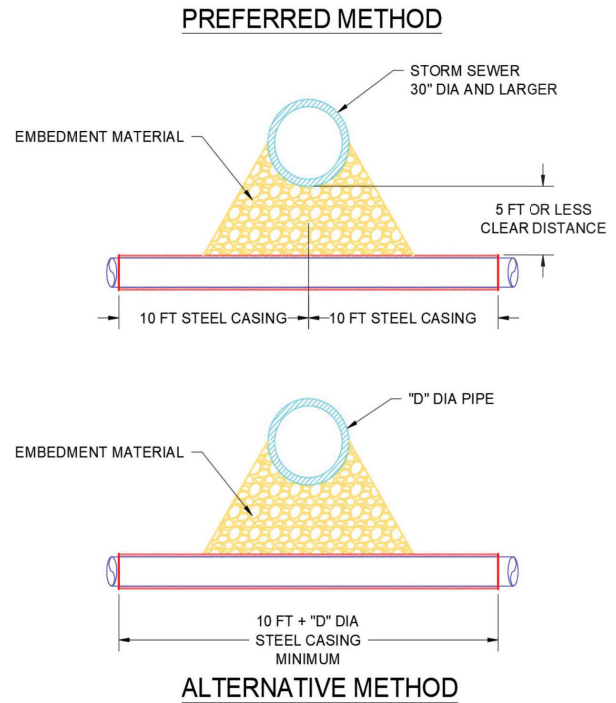


Figure 7- Storm Sewer Crossings

- 3.17. Water service line(s), valve(s), and/or fire hydrant(s) must **NOT** be connected to the water main in the lowering portion of the water main crossing, unless expressly noted and approved by the Private Development Manager. See Figure 8.

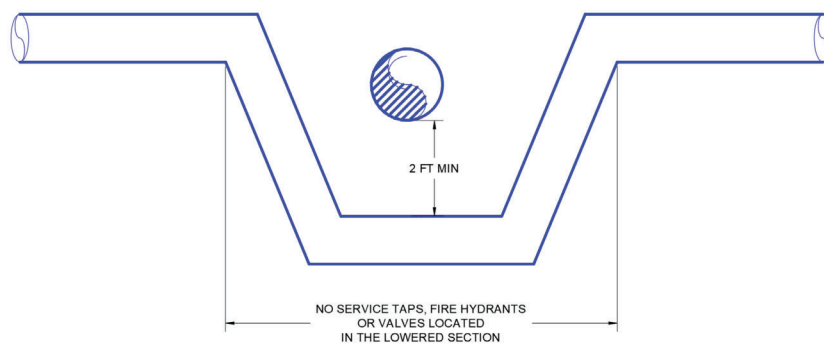


Figure 8- Lowering

- 3.18. A fire hydrant and in-line valves must be installed on each side of a creek crossing in the raised portion of the main for flushing and testing purposes. Valves must be located opposite side of lowered portion of the water main on each side to be able to flush the main from the fire hydrant with the valve closed.
- 3.19. Under **NO** circumstances is a water main allowed to be constructed in the same trench as a wastewater main.

- 3.20. When a water main is proposed to be installed under paving for residential streets, the water main must be installed a minimum of four (4) feet from the top of pavement. When a water main is proposed to be installed under paving for section line roads and arterial streets, the water main must be installed a minimum of five (5) feet from the top of pavement. Type-A aggregate backfill is required above the water main to the bottom of such paving in accordance with the latest edition of Oklahoma City Standard Specifications for Construction of Public Improvements and Utilities Department Standard Details. This requirement must be indicated and labeled on all design drawings submitted for review and approval.
- 3.21. Mechanical joint restraints are required to be installed on all fittings for water line construction. The Engineer of Record must provide restrained joint piping length with the mechanical joint restraint system. A detail or table of required lengths must be included in the drawings. Concrete thrust blocks will **NOT** be accepted as a substitute.
- 3.22. A minimum safety factor of 1.0 to 1.5 must be used when calculating restrained joint pipe and/or fittings.
- 3.23. Avoid dead-end water mains, when possible.
- 3.24. When a dead-end water main is required for future main extension, end the main with a fire hydrant and three (3) feet from the fire hydrant add a reducer (if required), and three (3) feet from the reducer add a gate valve. Restrain joint pipe is required forty (40) feet from the gate valve opposite of dead end, for the purpose of safely removing fire hydrant for future extension of the waterline. List restrained joint pipe separately in pay item quantities table. This provision does not authorize dead-end mains except as required by Oklahoma City for Oklahoma City purposes. See Figure 9.

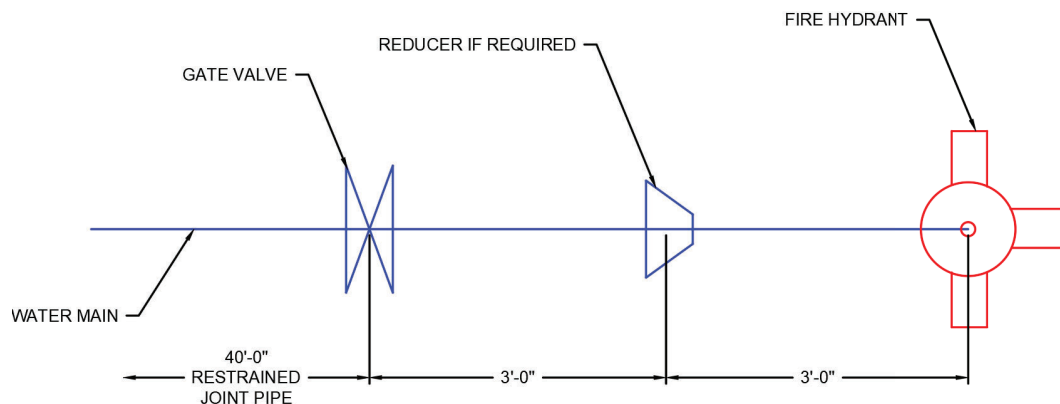


Figure 9- Dead-End Main FH

4. Fire Suppression / Fire Department Connection (FDC)

- 4.1. When a private water system is required for fire coverage there are three (3) different installations that can accomplish this. Figures 10, 11, & 12 shows a concept of the different installations.
- 4.1.1. Installation 1 – Have separate connections and separate water meters for the domestic and irrigation along with a separate connection for the fire line. If any private fire hydrant is required, the fire line must be a minimum of six (6) inches. (Figure 10)
- 4.1.2. Installation 2 – If the domestic demand requires a six (6) inch meter or larger, the fire line and domestic lines can use the same meter by having the fire line split and a DCV installed to separate it from the domestic side. This will require a full-service fire meter. (Figure 11)
- 4.1.3. Installation 3 – If domestic demand requires a six (6) inch meter or larger and the fire line and fire hydrants are connected to the domestic line, a separate DCV must be installed in front of all fire hydrants per the IPC. This will require a full-service fire meter. (Figure 12)

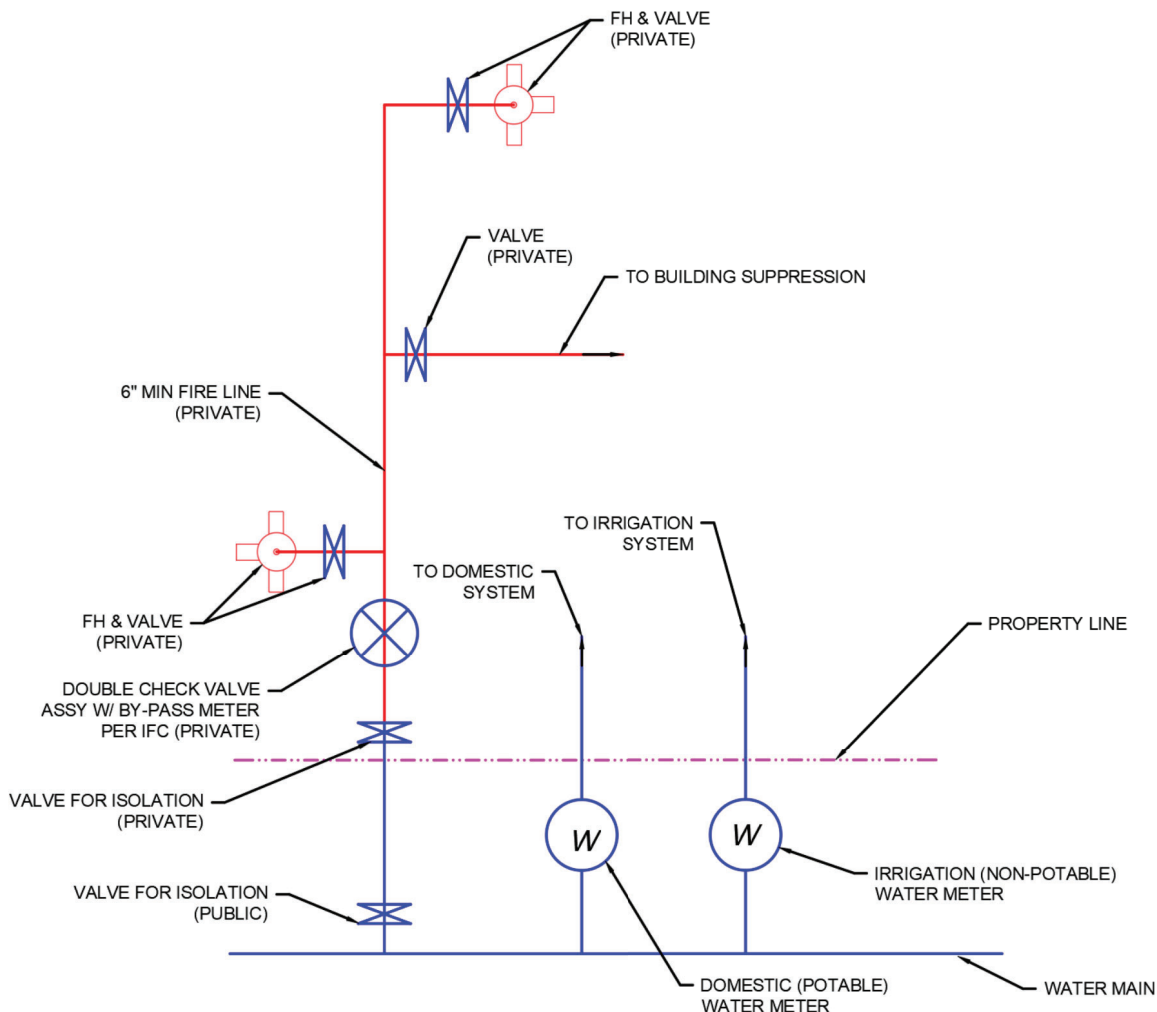


Figure 10- Fireline Installation Option 1

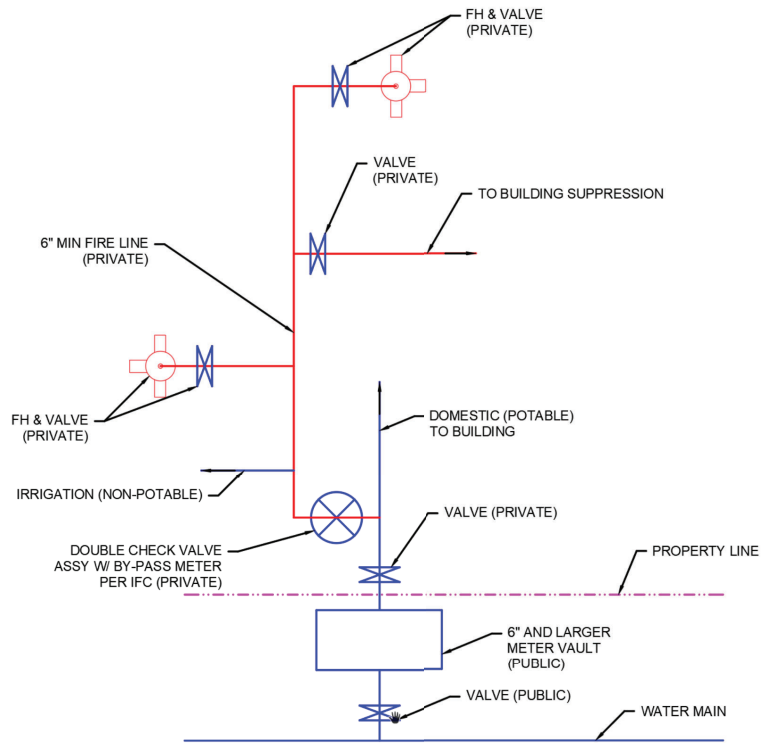


Figure 11- Fireline Installation Option 2

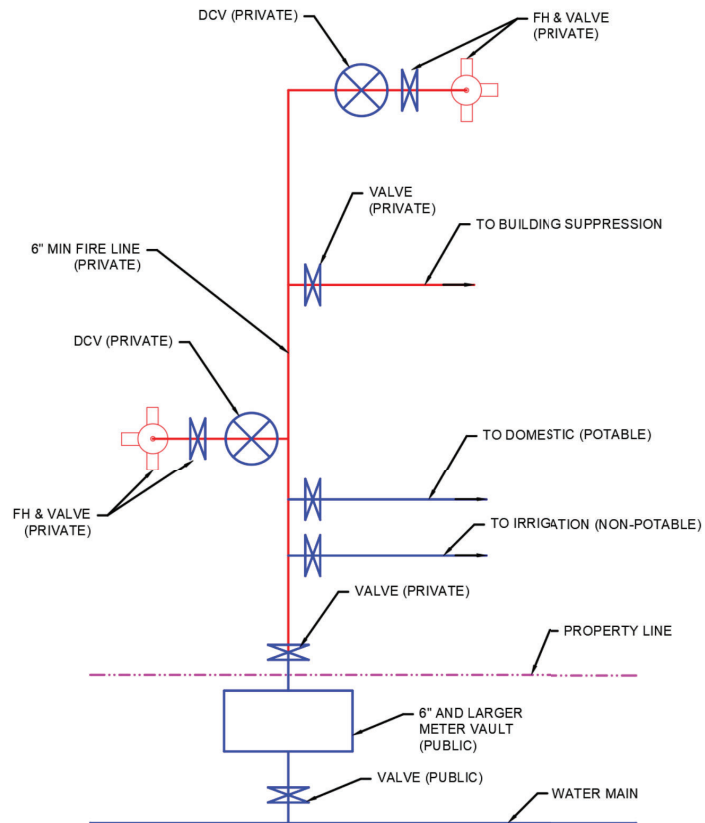


Figure 12- Fireline Installation Option 3

- 4.2. When an FDC is required, it must be located within ten (10) feet of a hard surface for connection to the fire truck and within 100 feet of a fire hydrant for hose connection. The location of the FDC must be approved by the Fire Marshall prior to installation.
- 4.3. When a water main provides a direct connection to the building fire suppression system and not used and/or connected to a domestic line/service, a double check valve assembly with bypass meter (DCV) is required in the fire riser room located inside the building or at the property line. DCV must be in accordance with latest edition of the IPC as amended by Oklahoma City.
- 4.4. Anytime a private water main is dedicated to providing a direct connection to any private fire hydrant, and not connected to a domestic service line, the DCV must sit adjacent to the ROW or U/E inside the property line on private property. The DCV and private fire hydrant must be maintained and owned by the property owner.
- 4.5. A fire flow test of the nearest public fire hydrant connected to the public water main that is being extended or connected to, must be submitted for approval.
- 4.6. A minimum system residual pressure of 25 psi is required for a fire line connection or tap within the Oklahoma City water distribution system in accordance with DEQ regulations. The design must address the fact that system pressure can fluctuate over time as the system and/or demand increases. If more pressure and/or flow is required or continuous static pressure is required, a storage tank, fire pump and/or domestic water pump must be designed, constructed, and maintained on the private system at the cost of the developer and/or building owner.
- 4.7. Contact the Fire Marshall's office at fireprotection@okc.gov with any questions concerning Fire Suppression requirements and FDCs.

5. Fire Hydrants

- 5.1. Fire hydrants must always have a three (3) feet minimum clear space around the fire hydrant and must be located in a minimum of five (5) feet easement (Oklahoma City Easement, ROW, or platted U/E) around the fire hydrant in all directions.
- 5.2. Fire hydrants must be ordered with the correct length of bury required. **ONLY** one (1) fire hydrant riser can be used to raise the fire hydrant. Riser must be an OEM part from the same fire hydrant manufacturer. Vertical shoe fire hydrants may be used to achieve correct bury length.
- 5.3. Fire hydrants must be installed to ensure the steamer nozzle is eighteen (18) inches to twenty-four (24) inches above final grade in accordance with the manufacturer installation instructions.
- 5.4. Fire hydrants must be located within ten (10) feet of a paved or hard surface such as a driveway, parking lot, or street and be located within the ROW or an approved U/E.
- 5.5. Fire hydrants must be installed such that there is a maximum spacing of five hundred (500) feet between fire hydrants in residential developments.
- 5.6. Fire hydrants located along rural section line roads, that are used for flushing and air relief purposes, must be installed at a maximum spacing of one thousand (1,000) feet.
- 5.7. For multifamily, commercial and/or industrial developments, fire hydrants must be installed such that the entire building can be reached within a maximum four hundred (400) feet as the hose lays unless the building has a private fire suppression system. If a building has a private fire suppression system, then as to that building a maximum six hundred (600) feet as the hose lay length is required. Any deviation from these requirements requires a written approval from the Fire Marshal.

- 5.8. Fire hydrants in residential developments are required to be located at the common lot line between two (2) properties to avoid conflicts with driveways.
- 5.9. Fire hydrants in residential developments are also to be located at intersections of streets where applicable.
- 5.10. Fire hydrants must be installed on both sides of each creek/river crossing for flushing and air relief purposes.
- 5.11. Fire hydrants must be installed such that there is a minimum distance of ten (10) feet from any proposed electrical equipment which will be installed at ground level and/or in accordance with the latest edition of the NFPA and NEC.
- 5.12. Fire hydrants must be installed such that the steamer nozzle is pointed perpendicular to the street, unless expressly written and noted by the Private Development Manager.
- 5.13. Fire hydrants that only serve the property owner and do not directly and primarily benefit the public, are considered “private” and must have a DCV installed at the property line on private property. Private hydrants must be maintained and maintenance by the property owner. A copy of the Fire Department requirements for maintenance can be found at the following website: <https://www.okc.gov/departments/fire/permits-inspections-code-enforcement/ahj-policies-procedures>.
- 5.14. Private fire hydrants must be painted “Canary Yellow” (Sherwin Williams 3060) and comply with NFPA 24, NFPA 25 including required testing and permits from the Fire Marshal. A handout is available at the Fire Marshall’s office or on the Utilities Department website at <https://www.okc.gov/departments/utilities>. Office number 405-297-3584. Public Fire Hydrants must be painted with two (2) coats of high gloss “International Orange” (Sherwin Williams 4082) enamel paint.
- 5.15. When a fire hydrant is removed and does not leak and meets current requirements, it can be relocated by the developer at the developer’s cost, as necessary.
- 5.16. Fire hydrants must not be located within five (5) feet in any horizontal direction of a wastewater main, lateral, or service regardless of material of construction of the main.
- 5.17. Fire hydrants and gate valves isolating the hydrants must be installed to **NOT** interfere with sidewalks, ADA ramps, driveways, dumpsters, streetlights, sign foundations, etc.
- 5.18. Fire hydrants must be installed on the last property line near the point of curvature of the street in a cul-de-sac design. See Figure 13.

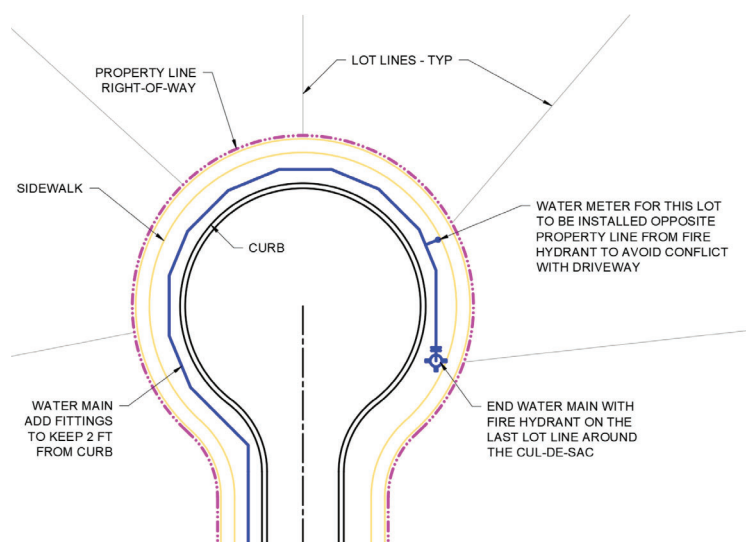


Figure 13 - Cul-de-sac Water line

6. Water Service Lines

- 6.1. Public water service lines (short services and long services) connecting to Oklahoma City water mains must be installed within public easements and/or ROW.
- 6.2. Public water service lines extend from the Oklahoma City water main to the Oklahoma City water meter including the tailpiece.
- 6.3. Private water service lines extend from the tailpiece of the Oklahoma City meter to the private water facilities.
- 6.4. The minimum size of a tap for all water line services is one (1) inch.
- 6.5. If a water main is sixteen (16) inches in diameter or greater, preapproval from the Private Development Manager is required to verify if the water main can be tapped to provide service. Contractor must be prequalified as Water Pipeline Contractor – Class C or greater.
- 6.6. A “*Large Main Tap / Shutdown*” form is required to be submitted by the contractor and approved by Private Development Manager prior to any work commencing on water service lines that require tapping or connecting to any water main sixteen (16) inches or greater in diameter. Submit form to wwprivdev@okc.gov for review and approval.
- 6.7. A minimum separation of three (3) feet is required between all water service line taps and all fittings for pipe sizes twelve (12) inches and smaller in diameter. For pipe sizes sixteen (16) inch in diameter and larger, a minimum separation of five (5) feet is required between all water fittings and valves.
- 6.8. Only irrigation service lines can be tapped off a fire hydrant lead and/or fire lines. Irrigation service lines tapped off a fire hydrant lead and/or fire line requires an Oklahoma City meter with an approved Oklahoma City Easement.
- 6.9. No back taps or reverse taps of water mains are permitted unless expressly noted and approved by the Private Development Manager.
- 6.10. All water service lines must be labeled with the size of line and Single Short Service (SSS) or Single Long Service (SLS).
 - 6.10.1. SSS means service line from main to meter is less than ten (10) feet.
 - 6.10.2. SLS means service line is longer ten (10) feet.
- 6.11. SLS where PEX piping is used for crossing an existing or proposed road must be encased with a SCH 40 PVC casing as per Oklahoma City Standard Specifications for Construction of Public Improvements and Utilities Department Standard Details.
- 6.12. When any water service line crosses any other utility, a detail must be shown on design drawings indicating a minimum vertical separation distance of two (2) feet.
- 6.13. All service lines must be a single service to the water meter. Splitting of services lines for multiple meters will not be accepted unless expressly noted and approved by the Private Development Manager.
- 6.14. Water service lines must be installed perpendicular to the water main. **NO** bends or fittings are allowed to be installed anywhere along the service line from the water main to the meter.

7. Water Meters

- 7.1. Single-family residential house services, residential duplex services, and residential triplex services must have a separate water meter for each housekeeping unit within the public easement along, abutting, and adjacent to a dedicated Oklahoma City street. Single-family residential house is a single housekeeping unit structure. A residential duplex is a single structure with two housekeeping units. A residential triplex is a single structure with three housekeeping units.
- 7.2. Multifamily residential services, commercial services, industrial services, and manufacturing services will have one master meter in the public easement along, abutting, and adjacent to a dedicated Oklahoma City street. Multifamily residential services, commercial services, industrial services, and manufacturing services may have multiple private water service lines and private meters supplied by the developer on the customer side of the Oklahoma City master meter. Multifamily residential service is service to more than three housekeeping units in a single structure such as, apartments, quadplexes, and condominiums with more than three housekeeping units. Mobile home parks must be master metered regardless of the number of pads or sublots.
- 7.3. All water meters must be designated as domestic, fire, or irrigation. In residential developments all meters will be considered domestic unless otherwise noted on approved plans.
- 7.4. Water meters must be placed within the ROW or U/E within a grassy area. No meters and/or meter vaults shall be installed in any paving such as streets, driveways, sidewalks, parking lots, concrete, etc. unless preapproved by the Private Development Manager.
- 7.5. If a U/E is provided for water meters, a minimum five (5) feet U/E is required around the meter and/or meter vault walls.
- 7.6. **NO** water meters are allowed to be installed behind fences. Water meters must be located in a U/E or ROW so as to be readily accessible by vehicles for reading of the meter and maintenance purposes.
- 7.7. Water meters must be installed in the ROW or U/E on a dedicated water service line between the Oklahoma City water main and the housekeeping unit that it is serving. **NO** reverse service lines are allowed.
- 7.8. Any existing meter not being used, must be removed and the service line abandoned at the main per Oklahoma City Standard Specifications for Construction of Public Improvements and Utilities Department Standard Details. Abandoned services are required to be indicated and labeled on all design drawings and be listed in the summary of public quantities.
- 7.9. If an existing meter is in a paved area of a redevelopment such as a lot split or property improvement, the meter must be relocated to a grassy area. Any deviation requires express notation and approval from the Private Development Manager.
- 7.10. When tapping or connecting to the water main for water services, the minimum size of tap must be one (1) inch for one (1) inch and smaller water meters. For water meters larger than one (1) inch the tap size must be the same size as the water meter size.
- 7.11. The curb next to all water meters must be marked with a “W” and painted blue.
- 7.12. Water meters must be located directly adjacent to the lot that it will be serving without having the private service line cross another’s private property. For duplexes that have half lots, the water meter must sit in the half of the lot it will be serving.
- 7.13. After approval of plans, if the lot lines shift or additional lots were added and/or subtracted, a change order plan is required to be submitted to ensure that each service falls within the new lot lines and that any existing services or taps into the main are plugged and abandoned at the main.

8. Meter Vaults

- 8.1. Meter vaults are required for any meter that is three (3) inch or larger. The tap size and valve will be the same size as the meter. Any deviation requires express notation and approval from the Private Development Manager.
- 8.2. Meter vaults must sit in grassy areas in the ROW or approved U/E. Other installations will require approval from the Private Development Manager. If approved to be in paved areas, a traffic rated meter box must be installed as per the requirements of the Oklahoma City Standard Specifications for Construction of Public Improvements and Utilities Department Standard Details.
- 8.3. Meter vaults must have a minimum of five (5) feet approved U/E measured from the outside walls, around the entire vault and must be within ten (10) feet of a paved or hard surface area and within the ROW or approved U/E.
- 8.4. All meter vaults must be designed and constructed per Oklahoma City Standard Specifications for Construction of Public Improvements and Utilities Department Standard Details.

9. Valves

- 9.1. Valves must be located at the point of curvature (PC) or point of tangency (PT) of the curb return at street intersections.
- 9.2. Valves must be located aligned with a property or lot line at midblock.
- 9.3. Valves must NOT be installed in driveways, sidewalks, curbs, or gutters and must NOT interfere with any ADA sidewalk ramps.
- 9.4. Valves must be located at the entrance to developments at the PC or PT of the development entrance.
- 9.5. Valves must be located inline before or after all fire hydrants and must include a valve (watch gate) for isolation of the fire hydrant.
- 9.6. Valves must be at any dead-end main that will be extended in the future to remove the necessity of shutting down residences and/or business to extend the main. Forty (40) feet restrained joint pipe is required before the valve to ensure that existing main is restrained when the valve is closed, and the fire hydrant removed for main extension.
- 9.7. A valve must be located on each side of a creek/river crossing, railroad crossing, state highway crossing, state interstate crossing, and/or state turnpike crossing within twenty (20) feet from the starting and ending point of crossing.
- 9.8. Valves shall **NOT** be located in any portion of a waterline lowering section of main.
- 9.9. Valve boxes and covers must be provided for all valves twelve (12) inches and smaller. Valves sixteen (16) inches and greater must be located within a vault.
- 9.10. Twelve (12) inch and smaller valves must be gate valves. Sixteen (16) inch and larger valves must be butterfly valves, unless expressly noted and approved by the Private Development Manager.
- 9.11. A minimum of three (3) feet of separation between valves and other fittings, taps, and appurtenances is required. A minimum of five (5) feet of separation between valves and other fittings, taps, and appurtenances is required.

- 9.12. All curbs along inline valves must be marked with a “V” and painted red. Valve covers for inline valves must also be painted red. The valve covers for watch gate valves on fire hydrants must be painted white.

10. Bores and Steel Encasement

- 10.1. Steel encasement is required for pipe crossings per Oklahoma City Standard Specifications for Construction for Public Improvements and Utilities Department Standard Details. Total length of steel encasement must be twenty (20) feet minimum and must extend a minimum of five (5) feet beyond the pipe diameter that it is crossing. If twenty (20) feet is not obtainable due to conflicts, the minimum length of casing must be ten (10) feet plus the diameter of the pipe to ensure the casing extends five (5) feet beyond from each side of the pipe.
- 10.2. There must be a minimum of three (3) feet separation from the end of the casing and any fittings, valves, etc.
- 10.3. All design drawings must label all bores and encasement as either “Bore and Steel Encasement for a XX-inch Main” or “Steel Encasement for XX-inch Main by Trenching” where XX-inch is the diameter of the main being encased.
- 10.4. Starting and ending points of all bores and/or encasement must be labeled with the alignment stationing on all design drawings.
- 10.5. When a water main is crossing under any City street, State or Federal Highway/Turnpike and/or railroads, steel encasement pipe is required and the steel encasement pipe must meet the requirements and specifications of the agency crossing and this Manual, whichever is more stringent.
- 10.6. When both the water and wastewater main require steel encasement due to the inability to maintain two (2) feet vertical separation, a minimum of six (6) inches between the steel encasement pipes is required unless expressly noted and approved by the Private Development Manager.
- 10.7. When boring under city streets, the bore must extend a minimum distance from curb to curb or three (3) to four (4) feet from the back of curb if space will allow.

11. Water Main Abandonment

- 11.1. Water mains that are required to be abandoned and/or removed must be designated and labeled on all design drawings showing the linear footage (LF) of pipe that is being abandoned in place and/or removed and must be listed in the public pay items summary of quantities listed on the drawings.
- 11.2. Water services lines connected to the public water main must be removed per the Oklahoma City Standard Specifications for Construction for Public Improvements and the Utilities Department Standard Details and included in the public pay items summary of quantities listed on the drawings.

II. WATER DESIGN PLAN REQUIREMENTS

1. General Requirements

- 1.1. All design plans must use the standard Oklahoma City Private Development Cover Sheet located on the internet at the following website <https://www.okc.gov/departments/public-works/engineer-architect-resources/standards>.
- 1.2. All general notes on the standard cover sheet must not be modified and/or deleted, however project specific notes can be added if required.
- 1.3. The paper size of all design plans must be Architectural Size D (24" x 36") when submitted and must be to scale. Each plan sheet must have a scale bar indicating scale and North arrow.
- 1.4. All design plans should be designed to ensure the North direction is up or to the right. The North arrow should never be pointed downward unless the continuation of alignment dictates this and is necessary for continuation of the alignment.
- 1.5. All design plans must be submitted through the Citizen Access Portal located on the internet at the following website <https://access.okc.gov/> for review and approval. All plan sheets must be combined in a single pdf electronic format when submitted.
- 1.6. Complete plan set must be included in every submittal including but not limited to Cover Page, General Notes, Topographical and Existing Utility Plan, Site Plans, Plan and Profiles, and Details.
- 1.7. Utilities Department Standard Details do not need to be included in the plan set for submittal, however a list of all required details must be included on the cover sheet. A current copy of all the Utilities Department Standard Details can be found on the Public Works website. <https://www.okc.gov/departments/public-works/engineer-architect-resources/standards>
- 1.8. Minimum font size on all drawings must be at least 10-12 point or one-eighth (1/8) inch or greater.
- 1.9. The Cover Page Drawing Index must list all sheets included in the design drawing submittal.
- 1.10. "Public" and "Private" Pay Items must be listed separately on the cover sheet in the Pay Items Summary table.
- 1.11. A vicinity map must be located in the upper right-hand corner of the Cover Page showing the location of the project with correct section line roads, section number, township, and range indicated along with a polygon of the project location and boundaries.
- 1.12. Project name, location, and description including section, township, range and county information must be shown on the Cover Sheet as indicated by the Oklahoma City Private Development Cover Sheet template.
- 1.13. Building Permit Number (BLDC-20XX-XXXX) as appropriate and Storm Water Quality Permit (SWL-20XX-XXXXX) numbers must be shown on the Cover Sheet. Final Approval will not be given until all required Permit Numbers have been received and indicated on the Cover Sheet.
- 1.14. Contour Lines must **NOT** be included on the Plan and Profile sheets of the design drawing submittals.
- 1.15. Include an overall final grading plan sheet showing all retaining walls and other grading structures. This sheet can be the overall grading plan that is submitted with the PD plans.
- 1.16. A plat drawing of the development and/or improvement must be included in the plan submittal if proposed property is or will be platted in the future.

- 1.17. Statements such as “As per Oklahoma City Atlas” or “As per GIS”, will not be accepted to indicate location and depths of existing utilities. Information obtained from as-built plans is acceptable to show location and depths of existing utilities, but drawings must state “Per As-Built” and include the project number. As-built plans can be obtained through open records request through the City Clerk office web site. <https://www.okc.gov/departments/city-clerk/records-request-form>
- 1.18. If as-built information differs from field surveyed include note stating all data is from new field survey.
- 1.19. Include as-built drawing(s) for references when abandoning or connecting to existing water services. Cloud all services in the as-built drawing to indicate which services are being abandoned and/or to which new or extended utilities are to be connected. If revised plans adjust lot lines, show the new lot lines to ensure existing services will be within the lot they will be serving.
- 1.20. An “Overall Water Meter Layout” sheet is required for all plans submitted for review. The drawing must clearly show all lot and block numbers; street names; service lines; all necessary dimensions and pipe sizes. No other information shall be on the sheet. If the general overall layout sheet is adequate and provides the desired information and is presented clearly as determined by the Private Development Manager, the Overall Water Meter Layout sheet will not be required.

2. Plat Drawing Requirements

- 2.1. All proposed and existing easements must be shown including the book and page of record for any existing easements. Type of easement must be labeled (i.e. D/E, OG&E, ONG, etc.) and size of easement must be dimensioned.
- 2.2. Lot and block numbers must be shown on all plan sheets and/or plan views of the proposed utility improvements.
- 2.3. Street names must be shown for each street on each plan sheet.
- 2.4. All existing and all proposed easement(s) and ROW(s) must be shown, labeled, and dimensioned on all drawings
- 2.5. If the street(s) will be considered “Private” and any water and/or wastewater main is within the ROW, the street(s) will need to be labeled as “Private Street & Public U/E”.
- 2.6. Building Limit Lines (BLL) and setbacks must be shown for each building on each plan sheet.
- 2.7. No private improvements may be located within any U/E and/or ROW unless approved by the Private Development Manager and an approved Revocable Permit is obtained and noted on the plans.
- 2.8. Limit dead-end streets and cul-de-sacs where possible.

3. General Layout Sheet

- 3.1. The entire site including full legal boundary of the parcel, plot, lot, or tract being improved and/or developed must be shown.
- 3.2. Street names, ROW, and easements owned by other agencies must be shown, labeled, and dimensioned on all drawings.
- 3.3. All existing U/Es must be labeled with the recorded book and page numbers.

- 3.4. Surrounding properties and/or developments must be indicated and labeled with subdivision name, lot and block numbers as required. Label surrounding properties as undeveloped/unplatted if applicable.
- 3.5. The water main location (alignment) and size of main must be indicated.
- 3.6. The dimension from the center line of street to the water main, the distance from an easement to the water main, and the distance from property line and/or lot lines to the water main.
- 3.7. All service connections for proposed water meters must be shown and labeled clearly for all lots being served.
- 3.8. All water services to be abandoned must be shown and label accordingly and be included in the Public Pay Items Summary table.
- 3.9. All proposed public water service lines are to be labeled with size and use (irrigation/domestic/fire). If residential development and/or subdivision, all services will be domestic unless, otherwise specifically noted.
- 3.10. Add the following note: *“WATER METERS, GATE VALVES & FIRE HYDRANTS MUST SIT OUTSIDE OF PAVING FOR SIDEWALKS & DRIVEWAYS.”*
- 3.11. Clearly label and indicate the delineation of different water mains and sizes.

4. Plan and Profile Sheets

- 4.1. Lots and blocks must be shown on all drawings for reference of location of water main, water services, meters, and other appurtenances.
- 4.2. Street names, ROW, and easements owned by other agencies must be shown, labeled, and dimensioned on all drawings.
- 4.3. All existing U/Es must be labeled with the recorded book and page numbers.
- 4.4. The water main location (alignment), depth and size of main along with pipe material must be indicated with stationing one hundred (100) feet and tick marks fifty (50) feet along the centerline of construction.
- 4.5. The dimension from the center line of street to the water main, the distance from easement to the water main, and the distance from property line and/or lot lines to the water main must be indicated on all sheets.
- 4.6. All fittings, services, existing and/or proposed valves and fire hydrants must be shown with stationing and flowlines on all sheets.
- 4.7. All tapping and/or connection to existing water mains must include Northing and Easting coordinates based in the Oklahoma State Plane North or South, NAD 1983 coordinate system.
- 4.8. All public water services lines to be abandoned must be shown and labeled accordingly with quantity included in the Public Pay Items table.
- 4.9. All proposed public water service lines and meters are to be labeled with size and use (irrigation/domestic/fire). All services will be domestic unless otherwise expressly noted in a residential development. The type of service line must be indicated as SSS, or SLS accordingly.
- 4.10. Location of all public water service lines must be indicated with stationing along the alignment of the water main on all sheets.
- 4.11. Add the following note to all plan and profile sheets: *“WATER METERS, GATE VALVES & FIRE HYDRANTS MUST SIT OUTSIDE OF PAVING FOR SIDEWALKS & DRIVEWAYS.”*

- 4.12. A three (3) feet minimum separation between all fittings and/or services are required for pipe sizes twelve (12) inches or smaller in diameter. For pipe sizes sixteen (16) inch and greater in diameter, five (5) feet separation is required between valves and fittings.
- 4.13. Gate valves must be shown at corner of intersections, after fire hydrants, and located on the point of curvature (PC) or near PC to avoid conflicts with driveways. Butterfly valves must be used for any pipe sixteen (16) inch diameter and greater.
- 4.14. Proposed location of in-line gate valves must be such that at any single point on a water main may be isolated by closing no more than five (5) valves and isolating no more than a one (1) block.
- 4.15. Locate all public water service lines such that the water meters will be located in grassy areas within ROW or U/E on the property the meter is going to serve.
- 4.16. Match Lines and sheet numbers must be shown on all plans.
- 4.17. Profile view must align with the plan view and the stationing must match.
- 4.18. The existing and proposed grade elevations at the center line of construction must be shown in the profile. The flow line of the new water main must be shown and labeled at one hundred (100) feet intervals along the alignment.
- 4.19. All valves, fittings, fire hydrants, and other appurtenances must show the alignment stationing and flowline in the Profile View. Stationing must match the Plan View.
- 4.20. Plan and profile sheet must show existing water main size and project number of existing water mains to which a public water service line or new water main is to be tapped and/or connected.
- 4.21. Plan and profile sheet must show any crossings of the proposed water main with a minimum vertical separation of two (2) feet and a minimum horizontal separation distance of ten (10) feet. Dimensions must be shown on the drawings showing this requirement.
- 4.22. Plan and profile sheets must show and label “Embedment Material” or “Type-A” aggregate backfill under all crossings of other utilities or pipelines.
- 4.23. Plan and profile sheet must show and label “Type-A” aggregate backfill for any portion of the water main that is installed under existing and/or proposed paving such as parking lots, streets, paved alleys, roads, etc.
- 4.24. Plan and profile sheet must show and label the beginning and ending station for all bores and steel encasements.
- 4.25. Steel Encasement must be labeled as “Steel Encasement for XX-inch main by Bore” or “Steel Encasement for XX-inch main by Trenching”, where XX-inch is the diameter of the proposed water main.
- 4.26. Tees, crosses, and other fittings and appurtenances that are located on multiple sheets at connecting points, must be labeled with stations or station equations for each connecting main. Flowline elevations of the connecting points must match on all sheets.
- 4.27. Plan and profile sheet must show and dimension the water main having a minimum depth cover of four (4) feet. Any water main installed along a section line road must have a minimum depth of cover of five (5) feet. Dimensions must be shown on all sheets showing the minimum depth of cover for the water main.
- 4.28. When a private service line is crossing any other public utility, a detail of crossing must be included in the design drawings.

III. WASTEWATER DESIGN

1. General

- 1.1. Engineer must provide demand capacity for proposed improvements for each connection point to the existing wastewater system(s) when requested.
- 1.2. Residential wastewater system(s) must be designed to the minimal design parameters as follows:
 - 1.2.1. Average Person Demand: 100 gpd/person, and
 - 1.2.2. Average Person / Residential Unit: 3 persons / housekeeping unit, and
 - 1.2.3. Peaking Demand Factor: 2 times demand.
- 1.3. All residential developments (single, duplex, and triplex housekeeping units) must have a separate wastewater service line connection for each housekeeping unit and will not be allowed to share a common service line.
- 1.4. Industrial developments must have a separate wastewater service line connection for each building or structure and flows will be reviewed on a case-by-case basis for required discharged limits through the Industrial Wastewater Permit process from the Wastewater Quality Division
- 1.5. All restaurants, automotive repair shops, etc. are required to show a grease trap (oil/water separator) on design drawings and must install it and obtain a wastewater discharge permit from the Wastewater Quality Division.
- 1.6. For multiple housekeeping unit developments that are not platted as individual lots (fee simple), a private wastewater system is required. If a wastewater system is private, then the water system must be private and must be master metered.
- 1.7. Wastewater mains must have a horizontal clear distance of five (5) to ten (10) feet from any houses, garages, structures, etc.
- 1.8. Wastewater mains must **NOT** be installed under any detention basin or water body and must be located at least ten (10) feet horizontally located from the top of bank of the detention basin.
- 1.9. **NO** inverted siphon structures will be allowed.
- 1.10. Minimum depth of cover over wastewater pipes must be four (4) feet with manhole bases/bottoms being a minimum depth of six (6) feet unless expressly noted and approved by the Private Development Manager.
- 1.11. Development fees must be paid prior to the issuance of the work order permitting connection to the Oklahoma City system.
- 1.12. Trees must maintain ten (10) feet horizontal separation from wastewater mains. Distance is measured from the outside of wastewater main to the outside of tree trunk. All trees within ten (10) feet of any wastewater main must be in accordance with the approved species in the latest edition of the *Tree and Plants for Oklahoma City* manual as published by the City of Oklahoma City.

2. Pipe Sizes

- 2.1. The minimum diameter of a public gravity flow wastewater main must be eight (8) inches in diameter.
- 2.2. The following pipe sizes are allowed for gravity wastewater mains; 8-inch, 12-inch, 15-inch, 18-inch, 21-inch, 24-inch. Larger sizes must be approved on a case-by-case basis by the Private Development Manager.
- 2.3. Wastewater private service lines must be a minimum of four (4) inches in diameter. Any service line eight (8) inch or greater must be connected to the wastewater main via a manhole.
- 2.4. Wastewater force mains will not be approved where the development may be served by gravity flow despite requiring a longer wastewater main extension. Cost savings to developer will not be the basis for approval of a wastewater force main. Wastewater force mains must be designed as required to achieve adequate flow and velocity required for the application per the Oklahoma City Standard Specifications for Construction of Public Improvements and Utilities Department Standard Details.

3. Velocities and Slope

- 3.1. Slopes on all public wastewater mains must be designed and constructed to maintain a minimum velocity of greater or equal to three (3) feet per second (fps) and a maximum velocity of eight (8) feet per second. The velocities calculations must be based upon Manning's Formula with "n" pipe coefficient of 0.013.
- 3.2. The following table is the minimum / maximum slope required for public wastewater mains installed in Oklahoma City (OKC).

Table 5 - Wastewater Mains Slope Design Requirements

Pipe Size (in)	DEQ Min Slope (%)	OKC Min Slope (%)*	OKC Max Slope (%)**
8	0.40	0.50	5.30
12	0.22	0.30	3.10
15	0.15	0.20	2.30
18	0.12	0.12	1.80
21	0.10	0.10	1.47
24	0.08	0.08	1.23

*Although DEQ allows less slope on smaller diameters, OKC minimum slopes must be established and maintained on all wastewater mains unless expressly noted and approved by the Private Development Manager.

** Maximum slopes are set to limit the velocity so to avoid turbulent flow and releasing gases that will cause odors, corrosion and/or scouring of the pipe.

- 3.3 The design must not compensate for lack of slope by using a larger diameter pipe than what is required to convey the design flow.

4. Wastewater Main Location

- 4.1. All public wastewater mains must be located in a U/E or ROW width in accordance with Table 6. Any deviation from this table must be specifically noted and approved by the Private Development Manager.

Table 6 - Easement Width (ft) vs Trench Depth (ft)

	Minimum Easement Width (ft)				
Trench Depth	Pipe Diameter	Pipe Diameter	Pipe Diameter	Pipe Diameter	Pipe Diameter
(ft)	8" – 12"	15" – 18"	21" – 27"	30" – 36"	42" – 54"
0-10	20*	20*	25	25	30
>10-12	20	20	25	30	30
>12-16	20	25	30	35	35
>16-18	25	30	35	40	40
>18-20	30	35	40	45	45
*If adjacent to public right of way, easement width of fifteen (15') foot is acceptable.					

- 4.2. Public wastewater main must be located between the back of adjacent lots, with at least a ten (10) feet U/E in each lot. A total of twenty (20) feet U/E is required or as per Table 2. The wastewater main must be a minimum of two and one half (2-1/2) feet from the property line to avoid conflict with any future fence(s). See Figure 14.

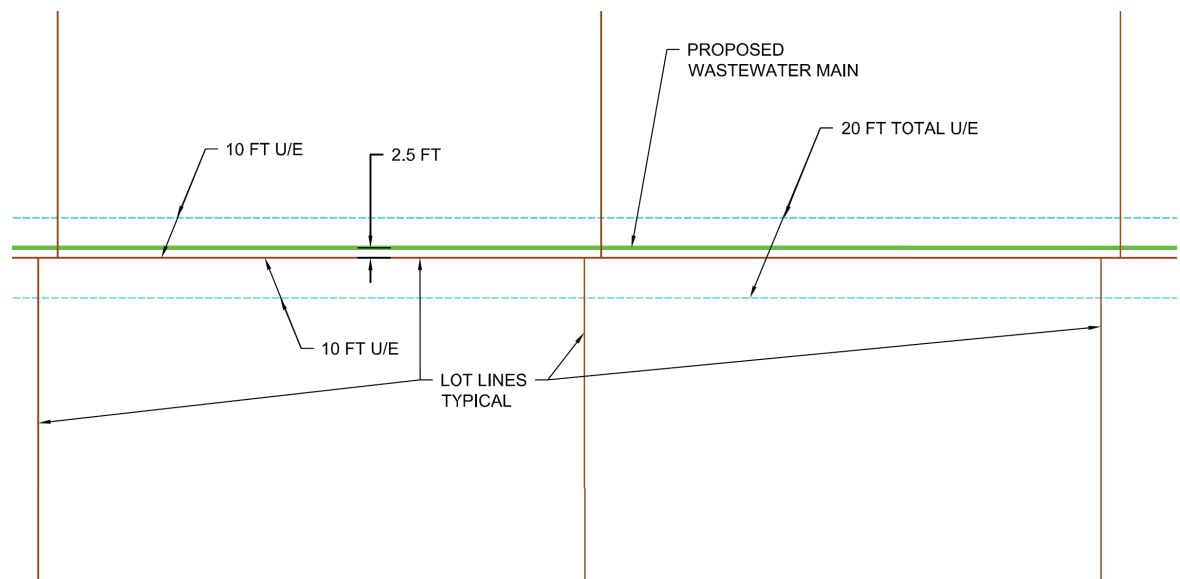


Figure 14- Sewer Back Lots

- 4.3. When a public wastewater main is located between two lots that are located mid-block a minimum twenty (20) feet U/E is required. Seven feet six inches (7'-6") U/E on one lot and twelve feet six inches (12'-6") is required on the other to make up the total twenty (20) feet. The wastewater main must be installed two feet six inches (2'-6") from the property line on the larger U/E side. This ensures that the wastewater main is located the farthest distance possible in between the two lots. See figure 15.

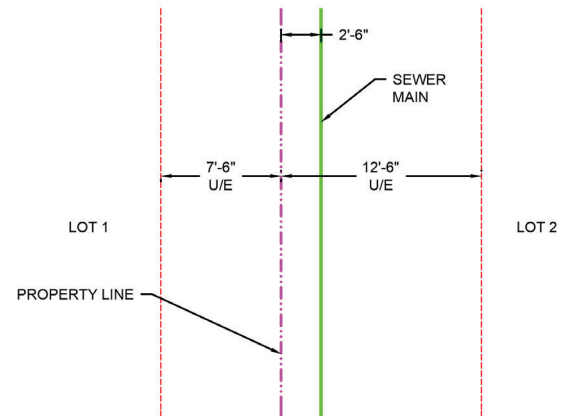


Figure 15 - Wastewater Installation Mid-Block

- 4.4. When a public wastewater main is adjacent to Common Areas (CA), the public wastewater main is required to be located in a twenty (20) feet U/E or as per Table 2. Typically, easements widths are fifteen (15) feet U/E on the property/lot and five (5) feet in the CA. However, any combination is acceptable as long as the total easement is twenty (20) feet or as per Table 2. The wastewater main must be centered as possible within the U/E. See Figure 16.

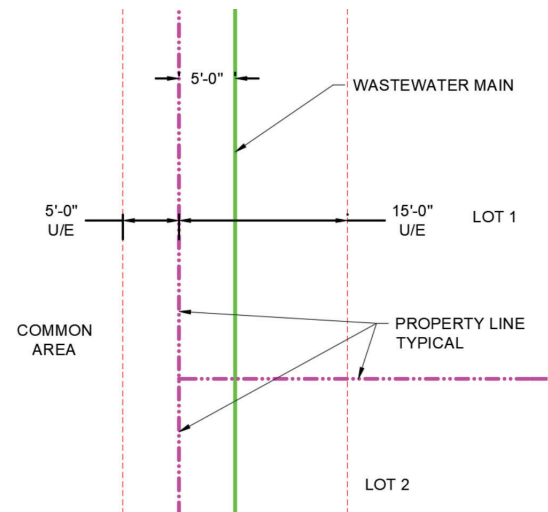


Figure 16 - Wastewater Installation Common Area

- 4.5. When a public wastewater main is adjacent to ROW, the public wastewater main is required to be located a minimum of five (5) feet from the property line in a minimum twenty (20) feet easement or as per Table 2. However, five (5) feet of the total easement can be included in the ROW. See Figure 17.

- 4.6. Public wastewater mains crossing public water mains or any other utility, must provide a minimum vertical separation distance of two (2) feet between the public wastewater main and the public water main or other utility. All design drawings must show and indicate this minimum clear distance. Piping must be arranged so that joints in a twenty (20) feet length of the water main will be equidistant from the wastewater main. "Type A" stone backfill is required under the crossing pipe and above the public water or wastewater main being crossed. These crossing requirements must be indicated and labeled on all design drawings submitted for review and approval. See Figure 18 shown on the next page.

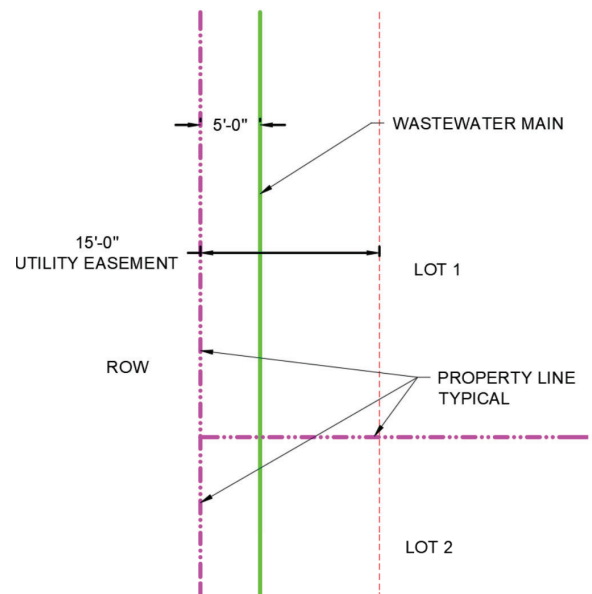


Figure 17 - Sewer Side Lots

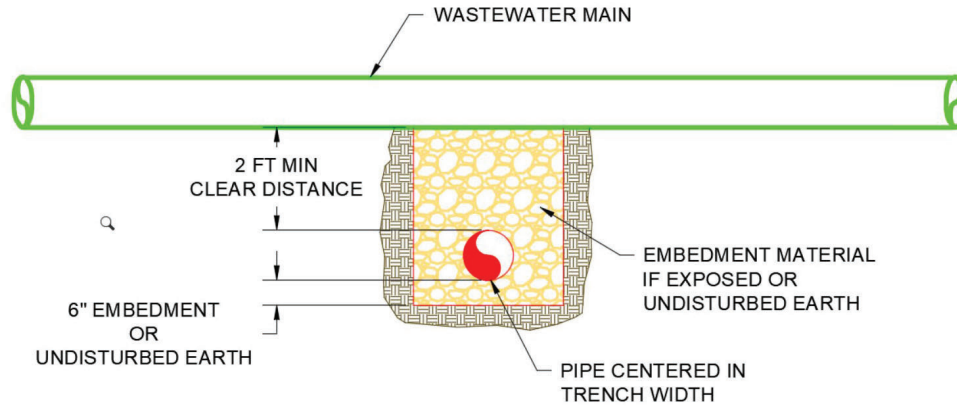


Figure 18 - Sewer Crossing

- 4.7. When a public wastewater main crosses the top of a public water main, steel encasement of both the public water main and public wastewater main is required a minimum distance of ten (10) feet each side of crossing. Embedment material or "Type-A" aggregate stone backfill is required under the crossing pipe and above the casing of the public water main. These crossing requirements must be indicated on all design drawings submitted for review and approval. If there is more than five (5) feet separation between the public water and public wastewater main, steel casing is only required for the public wastewater main. See Figure 19.

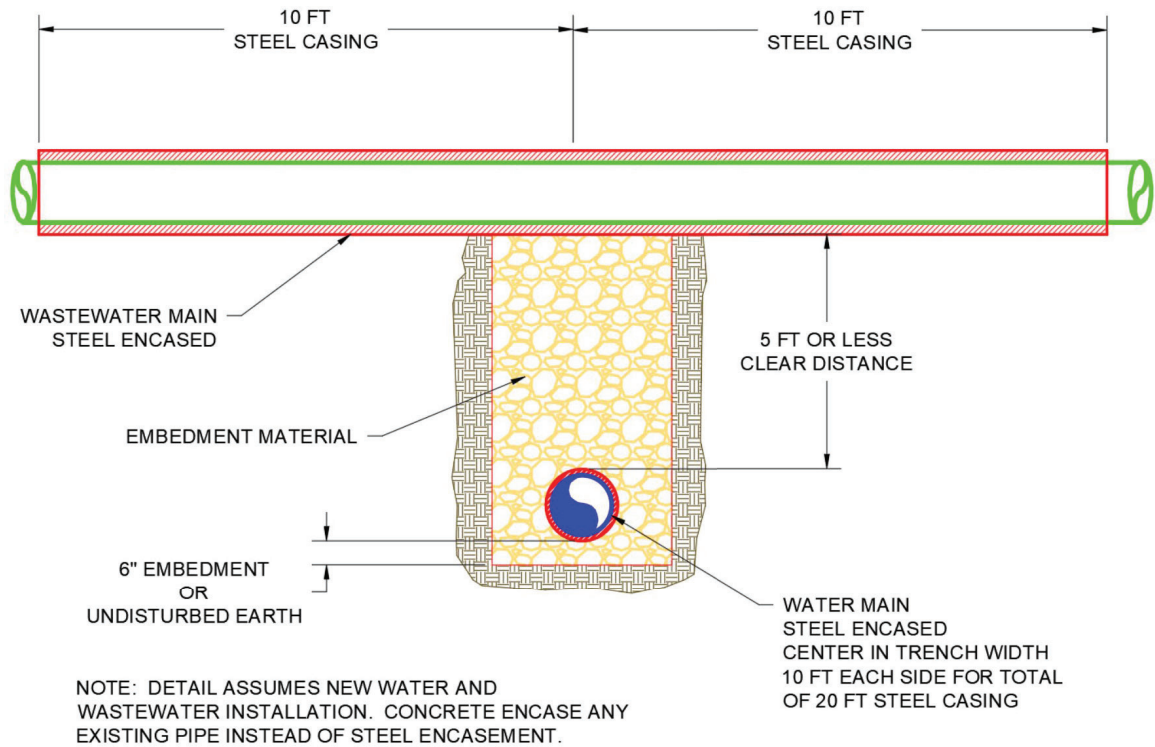


Figure 19 - Sewer Crossing Water

- 4.8. The public wastewater main must be located a minimum of ten (10) feet horizontally from any public water main and ten (10) feet horizontally from any other utility, unless otherwise specifically noted and approved by the Private Development Manager.
- 4.9. If separation of the public wastewater main and public water main cannot be achieved either horizontally and the public wastewater main is not design equal to the public water main (equal of same material and pressured tested to be watertight), steel encasement of the public water main is required that extends along the entire length where horizontal clearance of ten (10) feet cannot be maintained. These crossing requirements must be indicated and labeled on all design drawings submitted for review and approval. See Figure 20.

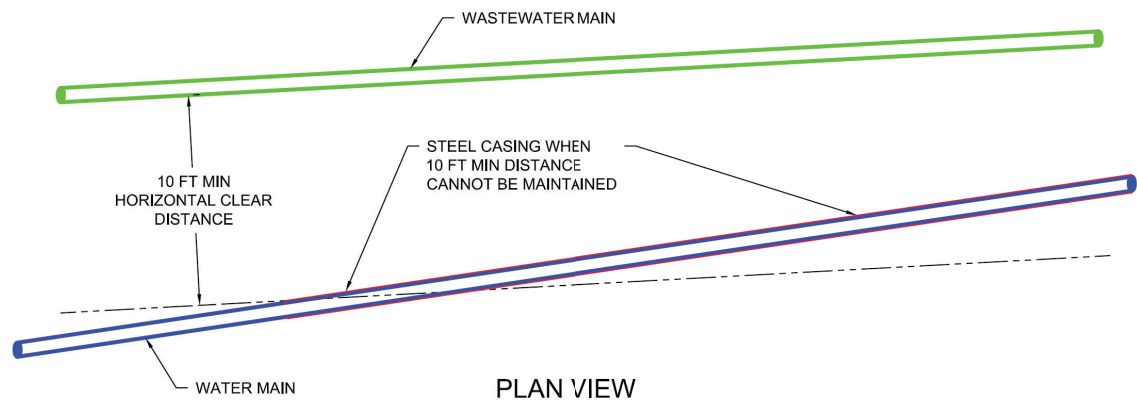


Figure 20 - Horizontal Separation

- 4.10. All public wastewater mains that cross under storm sewer mains thirty (30) inch and larger, must be steel encased a minimum of twenty (20) feet centered under the storm sewer if the vertical distance between the storm drain and public wastewater main is less than five (5) feet. Embedment material or "Type-A" stone backfill is required under the crossing pipe and above the casing of the public wastewater main. If the horizontal alignment is such that twenty (20) feet of steel casing cannot be maintained, a minimum length of five (5) feet past the diameter of the storm pipe on each side of the pipe is required. These crossing requirements must be indicated and labeled on all design drawings submitted for review and approval. See Figure 21.

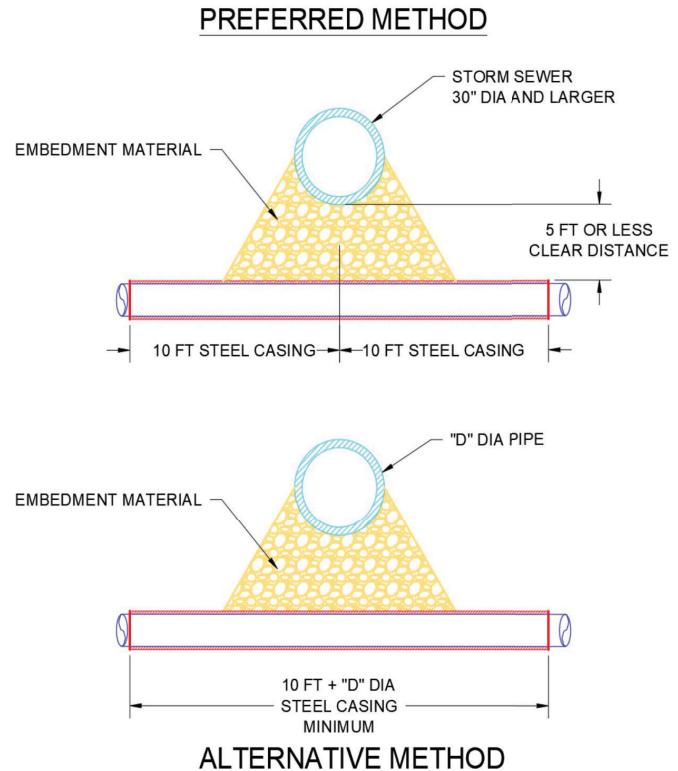


Figure 21- Large Mains Crossing

- 4.11. When the horizontal or vertical separation distance from a public wastewater main and a public water main cannot be achieved, the public wastewater main can be design and constructed equally to the water main and pressure tested for water tightness of the joints that are adjacent to the public water main prior to backfilling. Meeting these requirements does not require steel encasement of either the public water and or public wastewater main.
- 4.12. All public wastewater mains must be installed so that they are a minimum of four (4) feet deep and not to exceed eighteen (18) feet in depth and manholes shall have a minimum depth of six (6) feet deep unless expressly noted and approved by the Private Development Manager.
- 4.13. If wastewater mains are installed in the front of the lots, the design plans must designate the BLL as a U/E or a separate U/E for the installation of the public wastewater main with the required easement width per Table 2 and to maintain a minimum separation of ten (10) feet from any public water main.
- 4.14. Wastewater mains must be located at least fifty (50) feet from any private water well and three hundred (300) feet from any public water supply well.
- 4.15. Wastewater mains must be installed a minimum distance of ten (10) feet from any drainage pond, drainage ditch, or area that is designed to hold water. Distance must be measured from the top of bank to the edge of pipe.

5. Manholes

- 5.1. Manholes must be pre-cast or cast-in-place concrete and must be constructed in accordance with Oklahoma City Standards of Construction for Public Improvement and Utilities Department Standard Details. Brick manholes shall **NOT** be allowed.
- 5.2. All manholes must be a minimum of depth of six (6) feet. Inside diameters of manholes are determined by pipe size in Table 7, unless expressly noted and approved by the Private Development Manager.

Table 7-Required Manhole Diameters

Pipe Size (in)	Minimum MH Inside Diameter* (ft)
$8 \leq 12$	4
$>12 \leq 21$	5
$> 24 \leq 48$	6
> 48	8
*Unless otherwise shown on plans.	

- 5.3. When a manhole has a main inside drop connection, the manhole must have a minimum inside diameter of five (5) feet.
- 5.4. Manholes must be installed such that the maximum spacing between manholes is four hundred (400) feet or less.
- 5.5. Manholes must be installed at all horizontal and/or vertical alignment changes of the wastewater main and when the public wastewater main pipe size diameters and/or pipe material changes.

5.6. Dead-end manholes must be installed a minimum of fifteen (15) foot inside the last property line that is going to be serviced. See figure 22.

5.7. All wastewater force mains must discharge into a manhole a minimum of four (4) feet from the top of the manhole. Manhole must be coated with 100 mils of approved coating as per Utilities Department Standard Details.

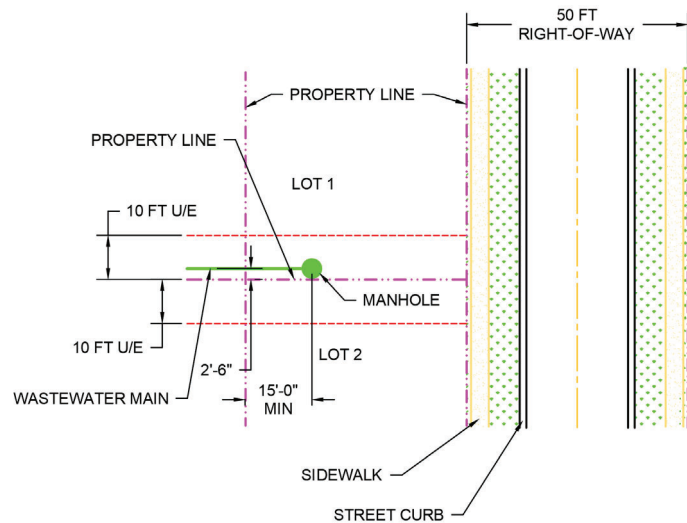


Figure 22 – Wastewater Main Manhole Extension

- 5.8. Non-vented manhole lids with infiltration covers are required to be installed on all manholes that are in paving and areas with drainage issues and as specifically noted and directed by the Private Development Manager. Infiltration covers must be manufactured by *No Flow In Flow* or as approved by the Private Development Manager.
- 5.9. All manholes installed in the flood plain must include non-vented manhole lids with infiltration covers, and the manhole top of rim elevation must be a minimum of one (1) foot or greater than the floodplain elevation in accordance with ODEQ requirements. Infiltration covers must be manufactured by *No Flow In Flow* or as approved by the Private Development Manager.
- 5.10. Invert drops greater than two (2) feet are not allowed, unless specially noted and approved by the Private Development Manager via an inside drop manhole. **NO** outside drop manholes will be allowed. Match crowns of pipe when possible.
- 5.11. Manholes must be located outside of streets, sidewalks and driveways unless specifically noted and approved by the Private Development Manager.
- 5.12. Public wastewater mains eighteen (18) inches and greater requires a manhole for any private service line connections.
- 5.13. Manholes must be located a minimum of ten (10) feet from any edge or creek/river crossing. Distance is measured from center of manhole to edge of waterline.

6. Service Lines

- 6.1. Each lot must have a separate private wastewater service line connection to the public wastewater main which is adjacent to the property.
- 6.2. Wye services must connect to the public wastewater main adjacent to the lot they are serving without crossing any other private property. Connection to the main must be a minimum of five (5) feet from the property line within the lot it will serve.
- 6.3. All private wastewater service lines must be a minimum of four (4) inches in diameter and in compliance with the latest edition of the IPC that has been adopted and amended by The City of Oklahoma City.

- 6.4. All private wastewater service lines and connections to the wastewater main must maintain five (5) feet separation from any other wastewater service lines, connections, and any manhole.
- 6.5. Private wastewater service lines must be installed with a wye saddle or wye fitting connection to the public wastewater main in accordance with Oklahoma City Standard Specifications for Construction of Public Improvements and Utilities Department Standard Details.
- 6.6. Private Wastewater service lines connections to wastewater mains twenty-four (24) inches and greater must connect to the wastewater main by installing a new manhole with an eight (8) inch pipe that connects to an existing manhole which serves as a vacuum break. Invert of eight (8) inch pipe must match the crown of the existing main. If depth of main is greater than fifteen (15) feet, and inside drop connection is allowed. A sewer backflow prevention device is recommended on the private service line. See Figure 23.

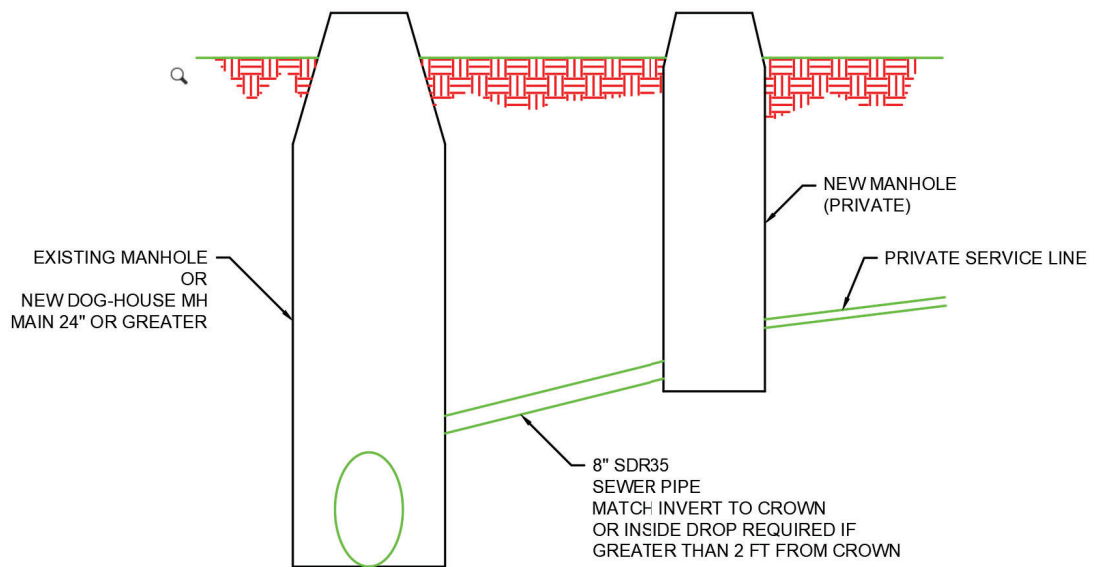


Figure 23 - Large Wastewater Main "Private" Service Connection

- 6.7. When any private wastewater service line crosses any public water and/or public storm sewer mains, a detail must be included showing the crossing of pipes and must maintain a minimum of two (2) feet vertical separation.
- 6.8. Private industrial wastewater service lines will require sampling and inspection ports when waste monitoring is required per Wastewater Quality Division requirements.
- 6.9. All private wastewater service lines from grease and waste traps must have a wastewater discharge permit from Wastewater Quality. Call 405-297-3810 for more information and application instructions.

7. Bores and Encasement

- 7.1. There must be a minimum of five (5) feet separation from the end of the steel casing and any manhole and/or service connection.
- 7.2. All design drawings must label all bores and encasement as either “Bore and Steel Encasement for a XX” Main” or “Steel Encasement for XX” Main by Trenching” where XX is the diameter of the main being encased.
- 7.3. Starting and ending points of all bores and/or steel encasement must be labeled with the alignment stationing on all design drawings.
- 7.4. When a public wastewater main is crossing under any city street, state or federal Highway/Turnpike and/or railroads, steel encasement is required and must meet the requirements and specifications of the agency crossing, these requirements, and Utilities Department Standard Details whichever is more stringent.
- 7.5. Encasement for pipe crossings must be steel per Oklahoma City Standard Specifications for Construction of Public Improvements and extend ten (10) feet on either side of pipe and/or utility that is being crossed for a total of twenty (20) feet minimum total of steel casing.
- 7.6. Horizontal directional drilling (HDD) is **NOT** allowed for installation of any wastewater mains and/or wastewater services.

8. Lift Stations

- 8.1. A preliminary analysis must be submitted to the Private Development Manager for review of any proposed public lift station design.
- 8.2. The preliminary analysis must include a map showing the natural drainage basin that depicts the location of the proposed lift station and the area upstream of the proposed development to be served by the lift station.
- 8.3. The preliminary analysis must include the approximate area to be served (including the proposed development and upstream areas), the number of lots and estimated peak flow rates must be calculated and included in the drainage basin map.
- 8.4. The preliminary analysis must include a hydraulic capacity analysis of the receiving wastewater main to confirm that the additional flows from the proposed lift station will not overload the receiving wastewater main. The capacity analysis must consider current and anticipated full development of the areas located upstream of the receiving wastewater manhole within its respective drainage basin.
- 8.5. The preliminary analysis must include a preliminary design of the future gravity interceptor to serve the entire natural drainage basin. This design must indicate the proposed size, alignment, and profile of the future gravity interceptor to eliminate the lift station.
- 8.6. The design must also verify that all future wastewater mains within the natural drainage basin will be able to gravity flow into the future interceptor.
- 8.7. Lift stations will only be approved on a case-by-case basis by the Private Development Manager. Wastewater lift stations and force mains will not be approved where the development may be serviced by gravity flow despite requiring a longer wastewater main extension. Cost savings to the developer will not be the basis for approval of a wastewater lift station and force main.

- 8.8. Lift stations must conform to the latest design standards and requirements from the Utilities Department and/or Wastewater Quality Division as well as this Manual, and ODEQ specifications and regulations.
- 8.9. All lift stations will require a natural gas generator unless otherwise specifically noted and approved by the Private Development Manager.
- 8.10. The location for the lift station must be designed to withstand floatation and be a minimum of two (2) feet above the 100-year flood plain elevation.
- 8.11. All lift stations must be designed to have improved roads and/or driveways for maneuvering and parking vehicles during maintenance operations.
- 8.12. Outside light(s) must be positioned at the lift station for proper lighting needs required for operation and maintenance.
- 8.13. A six (6) foot high fence must be installed around the entire perimeter of the lift station with a vehicle entry gate. Types of fencing material can be plastic coated chain link, wood stockade, or metal clad. Other types of fencing may be considered and must be expressly noted and approved by the Private Development Manager.
- 8.14. Signs must be installed on the fence along the lift station identifying the lift station address and ownership with contact information in case of emergency and must state "NO Trespassing." Signs must be installed at the entry gate of the lift station and at additional locations along the fence or as determined by the Private Development Manager.
- 8.15. Installation of a jib crane may be required depending on the size of pumps required for operation. After submittal of proposed pumps, this requirement for a jib crane will be determined by the Private Development Manager.
- 8.16. An approved frost-free yard water hydrant is required to be installed at all lift stations for washing down pumps for maintenance.
- 8.17. If fiber optic communications are not available, a radio study must be performed by the developer to ensure that proper signal, strength, direction, and uninterrupted communication is established between the lift station and SCADA system and the Oklahoma City SCADA system.
- 8.18. Combination air release / vacuum valves must be installed on all high points of the wastewater force main or as deemed necessary by the Private Development Manager.
- 8.19. Interior lighting in process equipment rooms shall be wall mount type (wall pack). These wall mounted lights shall be eight (8) to ten (10) feet from finished floor elevation. Avoid mounting any devices on high ceilings, unless a permanent approved platform is provided for their access.
- 8.20. All lift stations shall have a bypass piping configuration to allow a portable pump to be connected and pump the lift station.
- 8.21. Developer and/or Contractor is responsible to ensure that the Lift Station can operate locally. Oklahoma City will provide additional equipment to connect the Lift Station to the City SCADA system.
- 8.22. Lift stations must be located on property where the property must be deeded to The City of Oklahoma City at no costs before final completion and acceptance.

IV. WASTEWATER DESIGN PLAN REQUIREMENTS

1. General Requirements

- 1.1. All design plans must use the standard OKC Private Development Cover Sheet located on the internet at the following website <https://www.okc.gov/departments/public-works/engineer-architect-resources/standards>.
- 1.2. All general notes on the standard cover sheet must not be modified and/or deleted, however project specific notes can be added if required.
- 1.3. The paper size of all design plans must be Architectural Size D (24" x 36") when submitted and must be to scale with scale bar indicating scale, as well as a North arrow shown on all plan sheets where required.
- 1.4. All design plans must be designed to ensure the North direction is up or to the right. The North arrow should never be pointed downward unless the continuation of alignment dictates this and is necessary for continuous directional stationing alignment.
- 1.5. All design plans must be submitted through the Citizen Access Portal located on the internet at the following website <https://access.okc.gov/> for review and approval. All sheets must be combined in a single pdf electronic format when submitted.
- 1.6. Complete plan set must be included in every submittal including but not limited to Cover Page, General Notes, Topographical and Existing Utility Plan, Site Plans, Plan and Profiles, and Details.
- 1.7. Minimum font size on all drawings must be 10-12 point or one-eighth (1/8) inch or greater.
- 1.8. The Cover Page Drawing Index must list all sheets included in the drawing submittal.
- 1.9. "Public" and "Private" Pay Items must be listed separately on the cover sheet in the Pay Items Summary table.
- 1.10. A vicinity map must be located in the upper right-hand corner of the Cover Page showing the location of the project with correct section line roads, section number, township, and range indicated along with a polygon of the project location and boundaries.
- 1.11. Project name, location, and description including Section, Township, Range and County information must be shown on the Cover Sheet as indicated by the OKC Standard Cover Sheet template.
- 1.12. Building Permit Number (BLDC-20XX-XXXX) and Storm Water Quality Permit (SWL-20XX-XXXX) numbers must be shown on the Cover Sheet. Final Approval will not be given until all Permit Numbers required have been received and indicated on the Cover Sheet.
- 1.13. Contour Lines must **NOT** be included on the Plan and Profile sheets.
- 1.14. Include an overall final grading plan sheet showing all retaining walls and other grading structures. This sheet can be the overall grading plan that is submitted with the PD plans.
- 1.15. The Plat drawing of the development and/or improvement must be included in the plan submittal if proposed property is or will be platted in the future.
- 1.16. Statements such as "As per Oklahoma City Atlas" or "As per GIS", will not be accepted to indicate location and depths of existing utilities. Information obtained from as-built plans is acceptable to show location and depths of existing utilities, but drawings must state "Per As-Built" and include the project number. As-built plans can be obtained through open records request through the City Clerk office web site. <https://www.okc.gov/departments/city-clerk/records-request-form>

- 1.17. Include as-built drawing for references when abandoning or connecting to existing wastewater services. Cloud all services in the as-built drawing to indicate which services are being abandoned and/or connected, whenever adjusting lot lines, the plans must show the new lot lines and services must be within the lot they will serve.
- 1.18. Utilities Department Standard Details do not need to be included in the plan set for submittal, however a list of all required details must be included on the cover sheet. A current copy of all the Utilities Department Standard Details can be found on the Public Works website. <https://www.okc.gov/departments/public-works/engineer-architect-resources/standards>

2. Plat Drawing Requirements

- 2.1. All proposed and existing easements must be shown and labeled including the book and page for any existing easements that have been recorded.
- 2.2. Lot and block numbers must be shown on all plan sheets and/or plan views of the proposed utility improvements.
- 2.3. Street names must be shown on all design plans.
- 2.4. All existing (statutory), proposed easement(s) and/or ROW(s) must be shown, labeled, and dimensioned on all design drawings.
- 2.5. If a street will be considered “Private” with any water and/or wastewater main within the private ROW, the street must be labeled as “Private Street & Public U/E”.
- 2.6. Building Limit Lines (BL or BLL) must be shown on all plan sheets.
- 2.7. No private improvements may be located within any U/E and/or ROW unless expressly noted on the plans and approved by the Private Development Manager and an approved revocable permit is obtained and noted on plans.

3. General Layout Sheet

- 3.1. The entire site including full legal boundary of the parcel and/or tract being improved and/or developed must be shown.
- 3.2. Street names, Oklahoma City ROW, ROW and easements owned by other agencies, all proposed and/or existing U/Es with book and page numbers must be shown.
- 3.3. Surrounding properties and/or developments must be indicated and labeled with subdivision name, lot and block numbers as required. Label surrounding properties as undeveloped/unplatted if applicable.
- 3.4. When the public wastewater main is proposed to be in the front of the lots, location of manholes and private service connections must be located in the ROW or U/E and at least five (5) feet from the driveways and any other structure and additional ROW or U/E may be required.
- 3.5. The public wastewater main location (alignment) and size of main must be indicated on all drawings.
- 3.6. The plans must provide the dimension and the location of the water and wastewater main and the distance from the property line, the BLL, and/or both U/E limits.
- 3.7. All existing and/or proposed manholes must be shown with Northing and Easting coordinates for each manhole location. If a table and/or listing is shown with coordinates on the layout sheet, Northing and Easting coordinates are not required to be included on Plan View and Profile View of the Design Drawings.

- 3.8. All wastewater services and connections to be abandoned must be shown and labeled accordingly and must be included in the Public Pay Items Summary table.
- 3.9. Add the following note: *“MANHOLES AND WYE SERVICES MUST SIT OUTSIDE OF PAVING FOR SIDEWALKS & DRIVEWAYS.”*
- 3.10. Clearly label and indicate the delineation of different water and wastewater mains and sizes as required.
- 3.11. All water and wastewater service lines and connections must be shown to ensure all lots are being served. Water and wastewater service lines must have minimum of five (5) feet separation from each other.
- 3.12. Show all existing water & wastewater facilities and label existing project numbers for reference.

4. Plan and Profile Sheets

- 4.1. Plan and profile sheets must include the location and dimensions of water and wastewater mains from property line, BLL, and all easement boundaries. If installed in front of the lots, also include dimensions to the center line of street.
- 4.2. Lots and blocks numbers must be shown on all design drawings.
- 4.3. U/Es and BLLs must be shown on all design drawings.
- 4.4. Location of start and end of construction with stationing along the centerline of construction with tick marks every fifty (50) feet and labeled every one hundred (100) feet.
- 4.5. Match lines must be at manholes and show corresponding sheet number for continuation of alignment.
- 4.6. Manholes must be labeled with Northing/Easting coordinates and with all invert and top of rim elevations. Northing and Easting coordinates do not have to be included if shown on the Overall Layout page.
- 4.7. Show and label existing and proposed grade at centerline of construction.
- 4.8. Finish Floor Elevations (FFE) must be shown on all lots that will be served.
- 4.9. When private service lines are crossing any public utility, a detail of crossing must be included in the drawings.
- 4.10. The slope of main, length of pipe, diameter of pipe, and type of pipe must be shown and labeled on all drawings.
- 4.11. Manholes must have top of rim (TR) and all invert/flowline (INV/FL) elevations labeled on all drawings.
- 4.12. All crossing of other utilities must be shown with two (2) feet vertical separation and labeled accordingly on all drawings.
- 4.13. Location of private service lines and connections with distance from the downstream manhole must be shown and labeled on all drawings.
- 4.14. Length of riser pipe for service line and connections must be shown and labeled on all drawings and included in the public pay quantities.
- 4.15. Length of extra service line for long wyes must be shown and labeled on all drawings and included in the public pay item quantities.
- 4.16. The beginning and ending stations must be shown for steel encasement and/or boring locations.

- 4.17. Steel Encasement must be labeled as “Steel Encasement for XX-in main by Bore” or “Steel Encasement for XX-in main by Trenching” if required. Where XX-in is the size of the wastewater or water main.
- 4.18. Show all existing water and wastewater mains and/or manholes with the size of the main and project numbers on all drawings.
- 4.19. If the project is within a flood zone, the base flood elevation (BFE) must be shown and labeled on all drawings.
- 4.20. Type-A aggregate backfill must be shown and labeled when any proposed wastewater main under any existing and or proposed street.
- 4.21. Add the following note to all plan and profile sheets: “*MANHOLES AND WYE SERVICES MUST SIT OUTSIDE OF PAVING FOR SIDEWALKS & DRIVEWAYS.*”

V. DUPLEX REQUIREMENTS

1. General Requirements

- 1.1. A Duplex development must be platted with an “A” and “B” half of the lot in order to receive two water connections and two wastewater connections.
- 1.2. Water and wastewater connections must be shown connecting to the mains within the half of the lot they will serve.
- 1.3. Duplexes must show proposed structure and driveway locations on design plans to ensure water and/or sewer connections do not interfere with the driveways and that proper separation between water and wastewater services is met.
- 1.4. Water meters are typically located one and one-half (1.5) feet from the property line of the lot that will be served.
- 1.5. Water and wastewater service lines must maintain a minimum of five (5) feet horizontal separation.

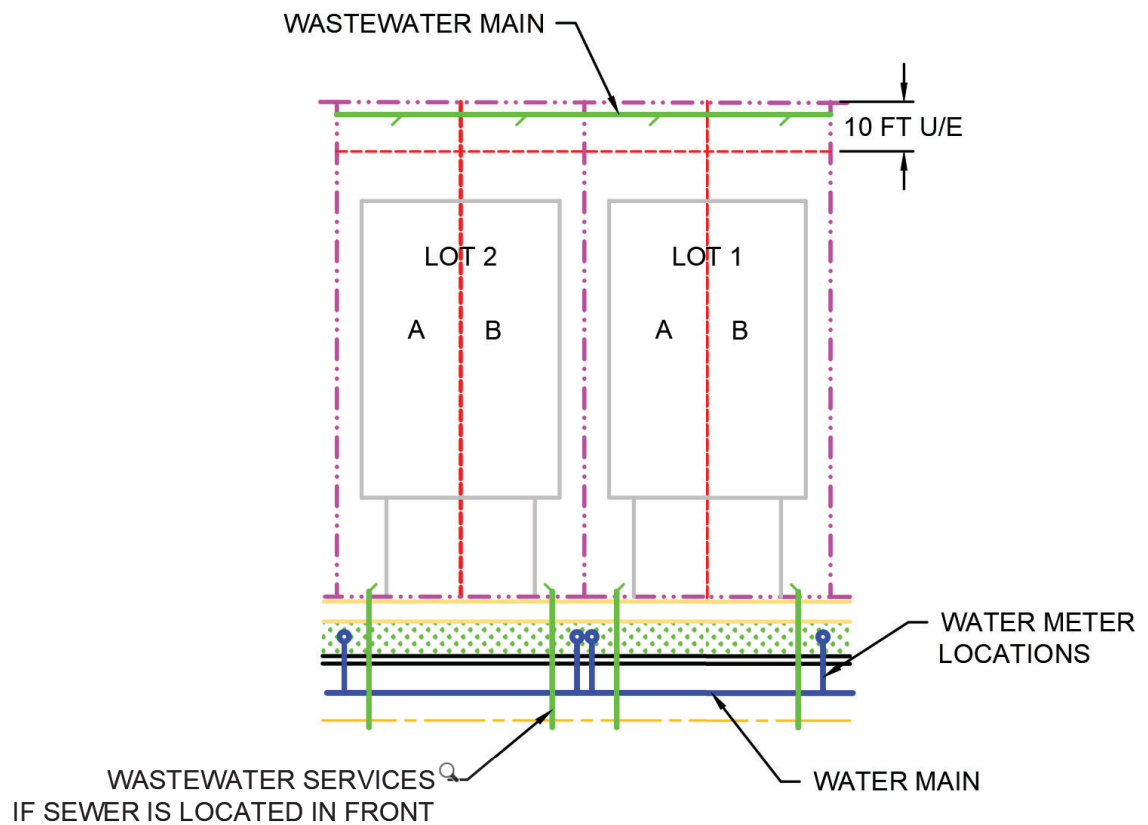


Figure 24 - Duplex Layout

VI. AS-BUILT DRAWING REQUIREMENTS

1. General Requirements

- 1.1. Oklahoma City must receive and approve As-Built drawings of any completed project(s) before the project(s) will be docketed for acceptance. Contemporaneously with the acceptance of the project(s) the maintenance bond will be placed into effect. Once the project(s) are accepted then the project(s) will become part of the Oklahoma City water and wastewater system and water meters may be installed at this time, if the final plat has been properly filed and recorded with the county clerk's office within the county it resides.
- 1.2. All items changed must be redlined (red ink when printed) by striking through the item changed and placing the revised information correctly on the drawings. Clouding is not required on the final As-built drawing, however all changes must be indicated in red.
- 1.3. Pay Item Summary must be updated to show actual installed quantities.
- 1.4. Final location of all valves, fire hydrants, water meters, fire hydrants, manholes, wye services, and similar appurtenances must be shown.
- 1.5. Northing and Easting coordinates must be updated for all wastewater manholes and water tap/connections into the existing water system.
- 1.6. All manhole top of rim elevations and invert elevations must be updated and shown.
- 1.7. All wastewater wye connection locations must be updated with the correct distance from the downstream manhole.
- 1.8. All horizontal and vertical alignment changes must be updated in both the plan and profile view per actual installation.

2. File Format Requirements

- 2.1. As-built submittal must be submitted electronically in the following formats.
- 2.2. PDF Format (.pdf)
 - 2.2.1. The file must include all plan sheets and detail sheets in landscape orientation with all comments, changes or other markings in RED.
 - 2.2.2. Pages must be printed to scale on 24 x 36 format (ARCH D) size.
 - 2.2.3. All sheets must be combined into one single pdf file.
- 2.3. CAD File (.dwg)
 - 2.3.1. The file must contain the base file showing the approved public improvements and the revisions to the drawings with the existing conditions and external references as shown on the plans.
 - 2.3.2. The file must be in AutoCAD format, Version 2010 or earlier.
 - 2.3.3. The file must be in Oklahoma State Plane Coordinates, NAD 1983/CORS 96 (feet).
 - 2.3.4. The actual sheets or layouts are not required within the CAD File.

2.4. ESRI Shape File (.shp or .shx)

- 2.4.1. Only include the alignment of the improvements when submitting the ESRI shape file.
- 2.4.2. All digital data files must include the base file showing all layers, object classes, feature classes, nodes, topology, polylines, and polygons for the approved public improvements and revisions to the drawings with the existing conditions and external references.
- 2.4.3. All data must be thematically organized. The data must be separate layers for road edges, road centerline, buildings, and other impervious surface. Streams, water and sewer mains, hydrants, gate valves, control valves, water meters, easements, parcels, storm sewers, water bodies, etc. should also be provided in separate layers for each.
- 2.4.4. The file must be in Oklahoma State Plane Coordinates, NAD 1983/CORS 96 (feet).

3. SUBMITTAL PROCESS

- 3.1. Files may be submitted electronically via email to wwprivdev@okc.gov if the files do not exceed 30 MB in size.
- 3.2. Subject line of email must include the project number.
- 3.3. Files may be uploaded to an ftp site, drop box, or other electronic transfer method. Information on how to download and access files must be emailed to wwprivdev@okc.gov.
- 3.4. A CD or USB can be mailed or dropped off at the following location:
Attn: Utilities Private Development
420 W. Main, Ste 430
Oklahoma City, OK 73102

VII. DEVELOPMENTS, LOT SPLITS, DEED APPROVALS, REVOCABLE & BUILDING PERMITS

1. Development, Lot Splits, & Deed Approvals

1.1. Any residential subdivision and/or commercial complex development where any exterior boundary of the development is within one-half (1/2) mile of an existing main or main under construction, the development is required to extend public water mains to and across the development in accordance with this Manual. See Figure 24.

1.2. Any residential subdivision and/or commercial complex development within the same wastewater shed subbasin, as delineated by the United States Geological Survey (USGS), and where any exterior boundary of the development is within one-half (1/2) mile of any an existing public wastewater main or main under construction the development is required to extend the public wastewater mains to and across the development in accordance with this Manual. See Figure 24.

1.3. If extending and/or connecting to the public wastewater system, connection and/or extension of the public water main is also required. Connection to the Oklahoma City wastewater system without connection to the City water system will **NOT** be allowed unless expressly noted and approved by the Private Development Manager.

1.4. Easements must be granted to Oklahoma City and/or OCWUT by the property owner(s) for the public water and wastewater main extensions in the size and locations in accordance with this Manual on forms provide and approved by the Private Development Manager and the assigned Oklahoma City Assistant Municipal Counselor.

1.5. Lot Split applications are required to include the lot size and legal description of the boundary of the existing lot and proposed lots with the legal descriptions. A survey of all lots showing existing utility easements and setbacks is also required.

1.6. Lot Splits are required to provide public water and public wastewater main extensions to the furthest property line when public water and/or wastewater mains is adjacent to the proposed and/or existing pre-split lot. For a single lot split, the public utility main must be within 100 feet. For multiple lot splits the public utility main must be within 200 feet to any existing or proposed public water and/or public wastewater main for required extension. The cost of any public water or public wastewater main extension will be paid for by the applicant and/or developer. See Figure 25 & 26 respectively.

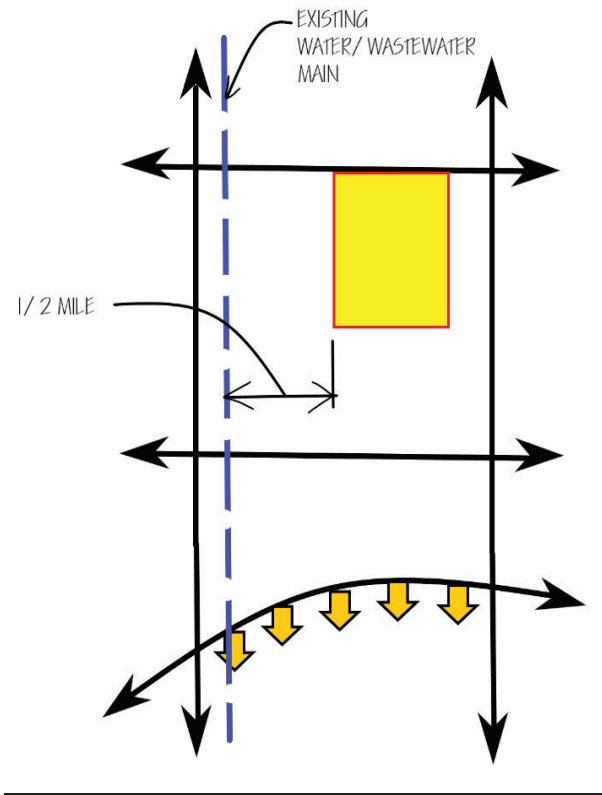


Figure 25 Utility Extension Requirements

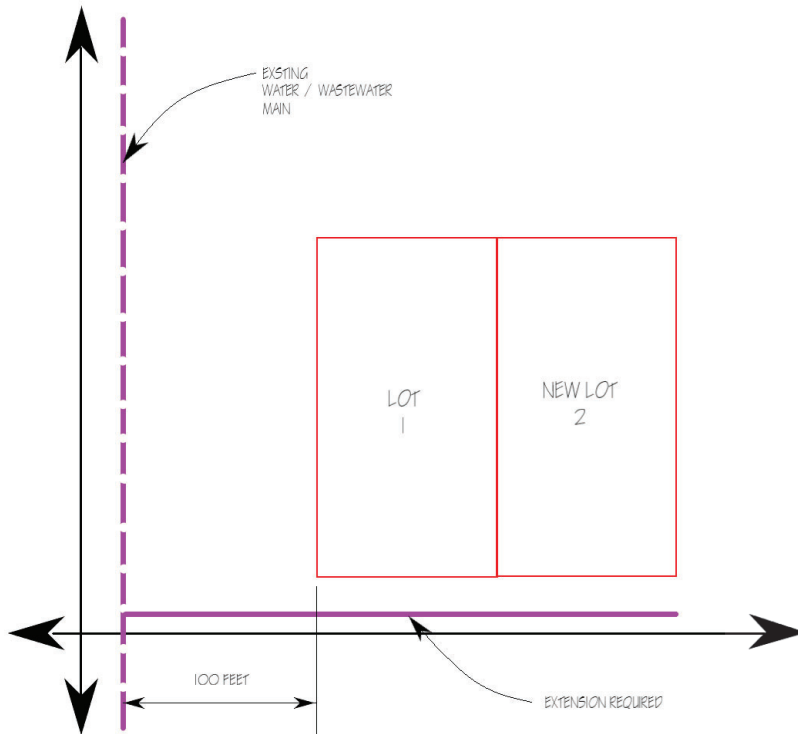


Figure 26 Lot Split Water and Wastewater Main Extension Requirement

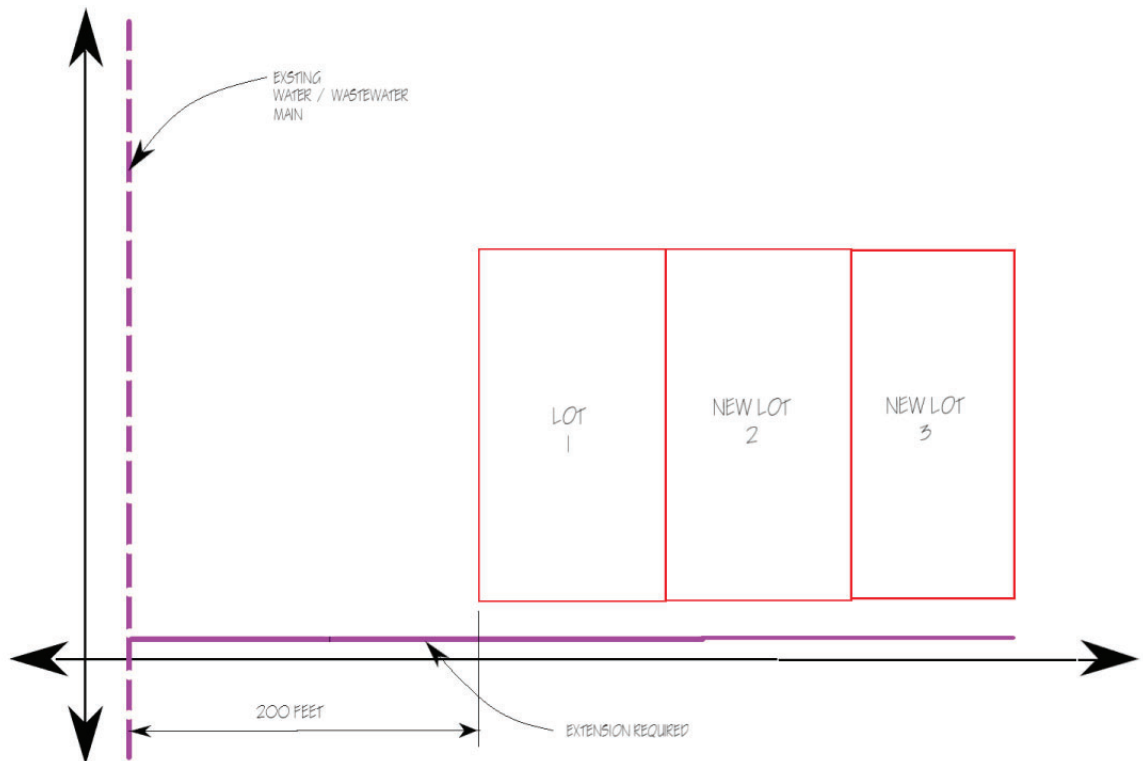


Figure 27 - More Than Single Lot Split

- 1.7. When a parcel or lot is adjacent to any existing public water and/or public wastewater main and a Lot Split will make the new proposed lot not adjacent to the existing public water and/or public wastewater main, an extension of the public water and public wastewater main is also required.
- 1.8. Private water and/or wastewater service lines and connections may not be used to avoid public water and public wastewater main extensions as required by this Manual.
- 1.9. Private service lines cannot be installed parallel within the right-of-way (ROW) or public utility easement (U/E). Private service lines may only cross perpendicular to the ROW and/or U/E.
- 1.10. When a development is located adjacent to two (2) separate section line roads, the public utilities must be extended along both section lines roads adjacent to the property to the furthest extent of the property boundary. See Figure 27.

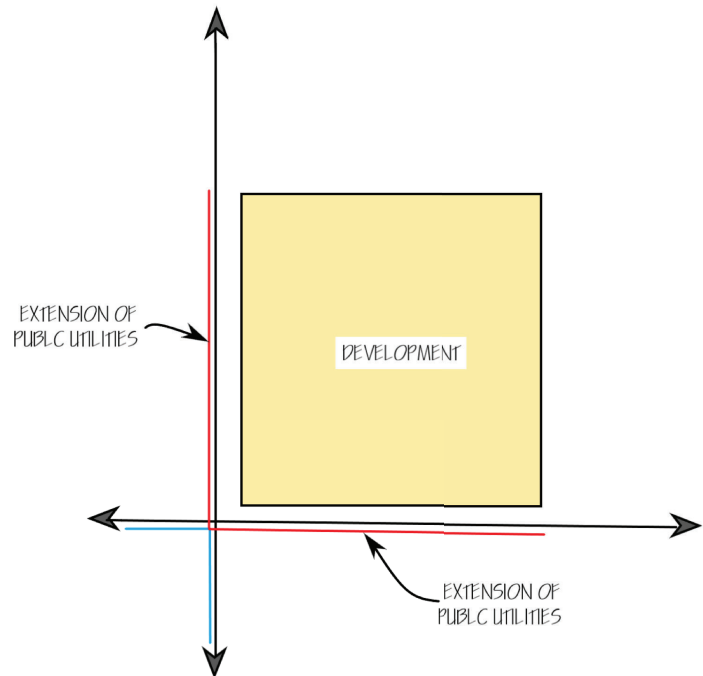


Figure 28 - Section Corner Extension

2. Revocable Permits

- 2.1. No private permanent improvement(s) and/or structure(s) may be constructed and/or installed in any public U/E and/or in the ROW without an approved Revocable Permit.
- 2.2. An application for a revocable permit must be filed and approved by the Utilities Department Private Development Division prior to installation or construction of the temporary movable improvement(s) and/or temporary or movable structure(s).
- 2.3. Improvement(s) and/or structure(s) installed or constructed within a public utility easement and/or ROW are at the sole risk and cost of the property owner whenever that improvement(s) and/or structure(s) is damaged, relocated or removed by Oklahoma City and/or OCWUT as part of construction, operation or maintenance of the water or wastewater system within the ROW or U/E or as part of a public improvement project.
- 2.4. Landscaping including but not limited to trees, shrubs, bushes, flowers, sprinkler system, sprinkler head, sprinkler pipe, mailboxes, etc. must have an approved revocable permit when installed within a public U/E or ROW.
- 2.5. No trees may be within ten (10) feet of any water and/or wastewater main and appurtenances.
- 2.6. All revocable permit applications must include a drawing showing all existing and proposed utilities locations and dimensions and the distance to any proposed improvement(s) and/or structures(s).

3. Building Permits

- 3.1. When a building permit is required for any major improvement(s) to the lot and/or tract of land, the property owner(s) must update the water and/or wastewater utilities to comply with current Oklahoma City Standard Specifications for Construction of Public Improvements as well as this Manual if existing or proposed utilities are within one hundred (100) feet of the lot and/or tract of land. See Figure 28.

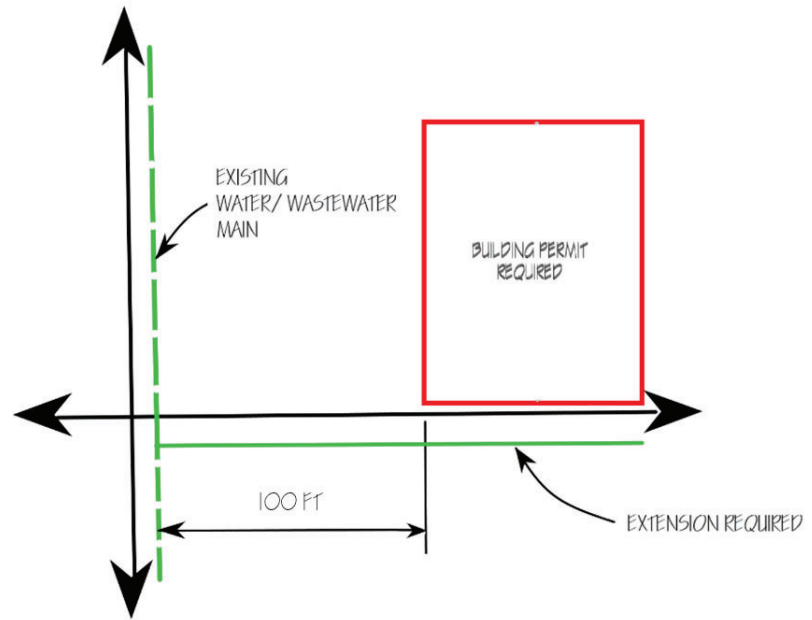


Figure 29 Building Permit Extension Required

- 3.2. Where an alteration to an existing building or use that requires additional plumbing fixtures, a utility main extension(s) is/are required, if the building is within one hundred (100) feet of an existing water and/or wastewater main. See Figure 28.
- 3.3. Existing and proposed utilities, utility service lines, U/E, ROW, setbacks, and meter location and size and BLL must be shown on the utility plan for all building permit drawings.
- 3.4. When connecting to any existing public water and/or wastewater main, any unused service taps, connections and/or lines must be capped and/or plugged and abandoned at the main in accordance with the Oklahoma City Standard Specifications for Construction of Public Improvements as well as this Manual.
- 3.5. When a utility main extension(s) is required, separate plans (SD, WA, WF) must be created and sealed by a professional engineer licensed in Oklahoma for the water and/or wastewater mains design. Such plans must be submitted by the professional engineer for review and approval through the Utilities Department Private Development Division.
- 3.6. A Certificate of Occupancy (CO) will not be released from the Utilities Department until all water and/or wastewater improvements have been completed and final inspection of such improvements have been completed and determined that said water and wastewater improvements were constructed in accordance with the approved plans and specifications and in accordance with Oklahoma City Standards Specifications for Construction of Public Improvements as well as this Manual.
- 3.7. As-built plans of each water and/or wastewater improvement must be submitted to and approved by the Utilities Department Private Development Division prior to the issuance of any water meters for installation and use of lots or tracts in the development.
- 3.8. Plans will be reviewed for approval in order of receipt of all plans. If plans are returned for correction, the corrected plans will be reviewed in the order of receipt of all plans.