Monthly Developer / Consultant Process Training

Water Department (Customer Care Section)

Session 10 Part 1: Large Water Main shut out limits, Review Process for Water Facility project/ Large Pipe installation

Session 10 Part 2: Installation Policy and Design Criteria Changes

December 12, 2018

Presented by Soon Wong and Jenifer Tatum

Please hold questions until the end of the presentation

Shut Out Limits (large diameter pipe)

- Pre-meeting with Field Operations, Water Production, Water Engineering
- Provide project construction sequence
- Shut out can only be done during non-peak water usage season (Generally late fall and winter season)
- Exercise water valves by Field Operations prior the schedule shut out date to make sure valves can be shut out for isolation
- Provide temporary water service and fire watch for affected customers
- Reconnection of the transmission main must be done around the clock until the reconnection is completed and pass test

Facility Plan Review Process

- Facility Improvements that consist of lift station, pump station, elevated and ground storage water tanks, and metering station
- Pre-Submittal meeting with Water Department
- Engineering Report and Studies
- Review lot size and facility site plan
- Typical 3-4 City review cycles
- Design plans MUST be 95% accepted prior to IPRC review process
- Shop drawings Review and construction management

Offsite Large Diameter Pipe Plan Review Process for pipe 24” and larger

- Alignment studies (Concept plans)
- Pipe alignment walk (cross country)
- Preliminary survey and acquire necessary pipe easements
- Typical 3 City review cycle
- Construction Plans MUST be 95% accepted prior to IPRC Review Process

Information Needed Before Submitting Construction Plans to Infrastructure Plan Review Center (IPRC)

- Required Water/Sewer Study Numbers (Water Dept. Planning Section)
- Need to Include Plat with Construction Plans
- Checklist water and wastewater plan and profile (on Buzzsaw)

Installation Policy and Design Criteria for Water, Wastewater, and Reclaimed Water Infrastructure

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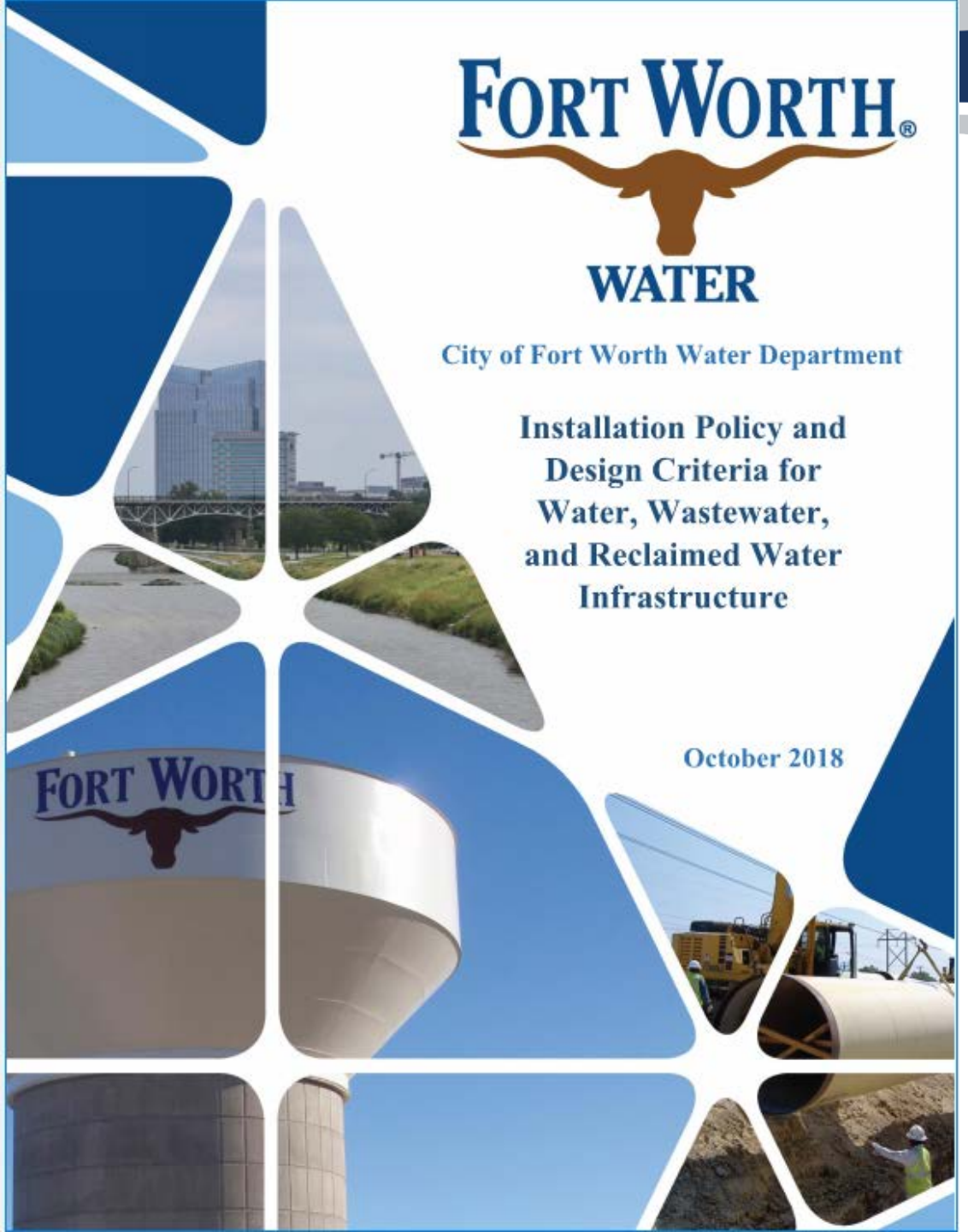
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WATER
City of Fort Worth Water Department
Installation Policy and
Design Criteria for
Water, Wastewater,
and Reclaimed Water
Infrastructure
October 2018
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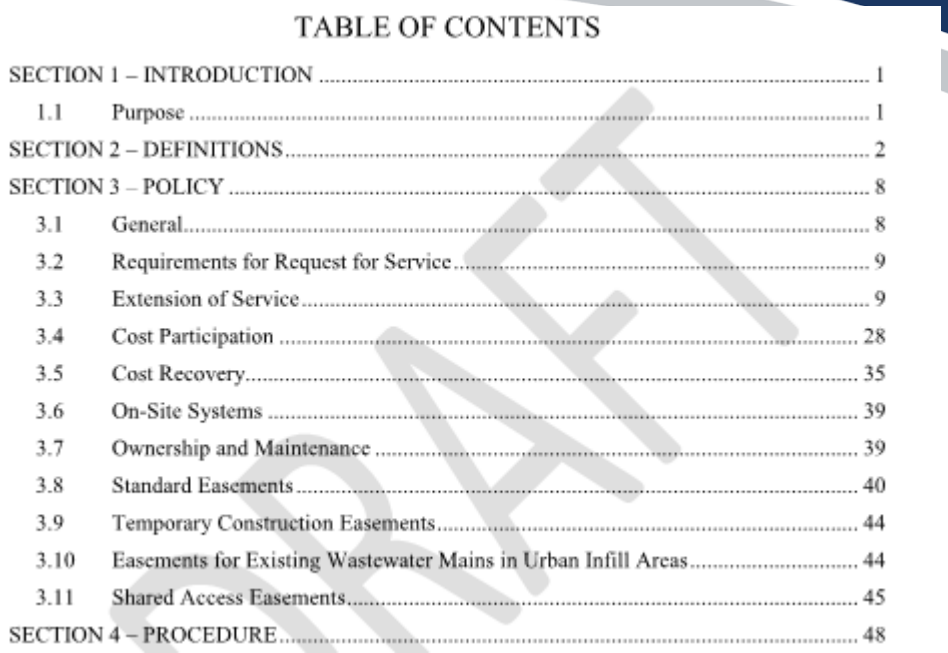

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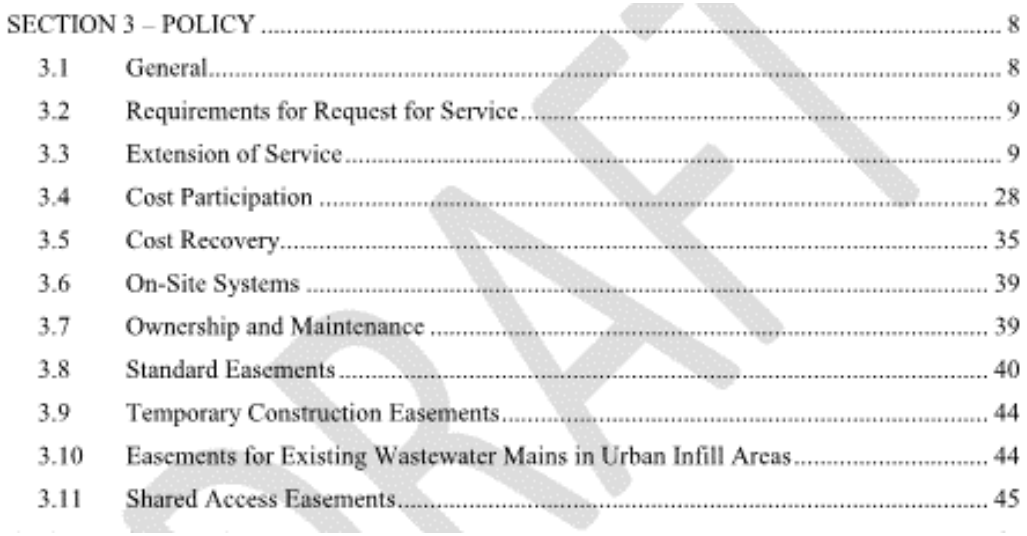
- **Section 4 – Procedure**
- **Section 5 – Design Criteria for Water Systems**
- **Section 6 – Design Criteria for Wastewater Systems**
- **Section 7 – Design Criteria for Reclaimed Water Systems**
- **Section 8 – Drawing Requirements**
- **Section 9 – Variance Process**

Main Topics	Draft	City Review	DAC Sub-Committee Review*
1/2 - Intro/Definitions	★	★	★
3 - Policy	★	★	★
4 - Procedures	★	★	★
5 - Water Criteria	★	★	★
6 - Wastewater Criteria	★	★	★
7 - Reclaimed Water Criteria	★	★	★
8 – Dwg Requirements	★	★	★
9 - Variance Process	★	★	★

*DAC Sub-Committee Members: Kim Cole, Ken Davis, and Joe Schneider

3 - POLICY OUTLINE

- Requirements for Service
- Extension of Service
- Cost Participation
- Cost Recovery
- Standard Easements
- Urban Infill Area Easements
- Shared Access Easements



3 - POLICY - Requirements for Service

- Platting
- Within City Limits or Annexation Agreement
- Within CCN

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CITY OF FORT WORTH PLANNING & DEVELOPMENT DEPARTMENT
1000 THROCKMORTON ST., FORT WORTH, TX 76102 FAX: 817-392-7985
MARY ELLIOTT, PLANNING MANAGER PHONE: 817-392-7844

ANNEXATION APPLICATION AND CHECKLIST

Applicant/Developer:

Contact:

Address:

Telephone: Fax: Email:

Property Information:

Property Address:

Total acres Mapsco No.

Lots(s) Block(s) Subdivision:

Survey Name County

Abstract No Tract Numb(s)

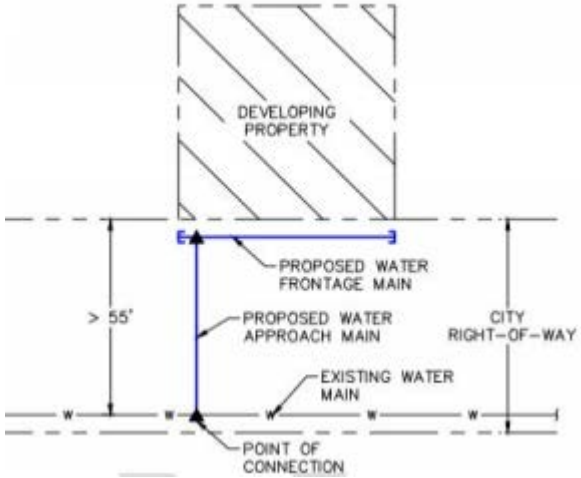
Survey Name County

Abstract No Tract Numb(s)

Survey Name County

Abstract No Tract Numb(s)

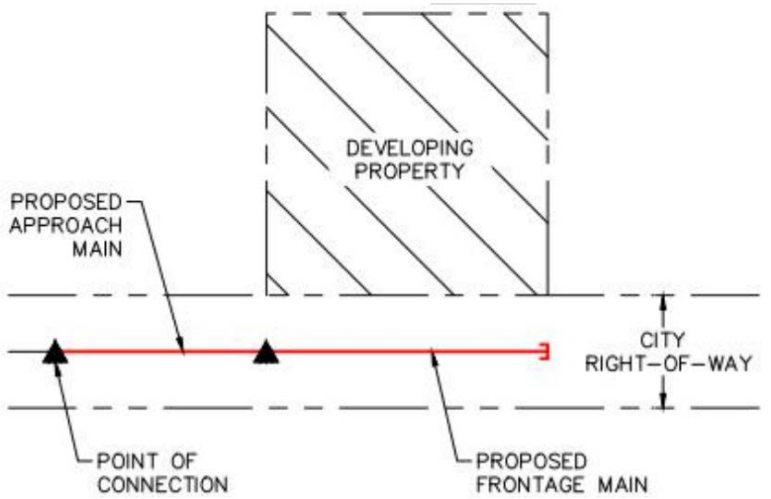
3 - POLICY – Extension Requirements



- General Requirements for Extension
  - Beyond property boundary
  - >16” Water, >15” Wastewater
  - Crossing
    - State Highways, Property Lines, Creek/River, Service Lengths > 55’
  - Depths > 15 feet
  - Relocation due to conflict with existing main
  - Looping
  - Capacity
  - Replacement due to City’s Risk Assessment Program

3 - POLICY - Extension of Service

- “Extension of Service”
  - Aka Main Extension
- “Extension of **a** Service”
  - Tapping a Main for a Service Line
- Full Frontage Concept
  - **Approach Main**
    - Limits: Point of Connection of Existing Main to Frontage Main
  - **Frontage Main**
    - Limits: Point of Connection of Approach Main across one full-frontage of the property



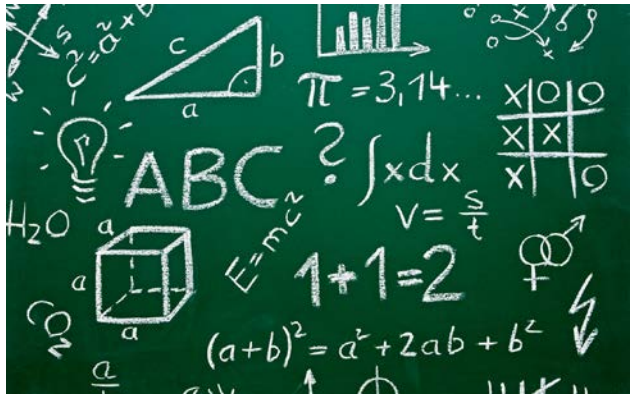
3 - POLICY – Risk Based Assessment

- Age
- Material
- Maintenance/Work Order History
- Pressure Impacts (Water)
- Field Condition Data
- Access Issues
- Critical Customers
- Resiliency
- Customers Served
- Diameter (wastewater)
- Sensitive Areas/Crossings (wastewater)

3 - POLICY - Cost Participation

- 100% Developer Cost
  - Full Frontage
  - Capacity improvements
  - Relocations due to a conflict created by the development (regardless of condition)
  - Replacement of mains with insufficient capacity
- City Cost Participation
  - City Oversize
    - Above minimum size
    - Mains and Facilities
  - Risk Based Assessment

3 - POLICY - Cost Calculations



- Calculations
  - Smaller Mains
    - Cost Participation = Cost of Main Size Provided – Cost of Main Size Required
  - Larger Mains
    - Cost Participation = (Capacity Provided – Capacity Required) / Capacity Provided

3 – POLICY - Cost Recovery

- Developer/City Cost Recovery
  - Front Foot Charges
  - Water Main Capacity Charges
  - Wastewater Per Acre Charges

- Eligibility
- Application
- Reimbursement terms

3 - STANDARD EASEMENTS

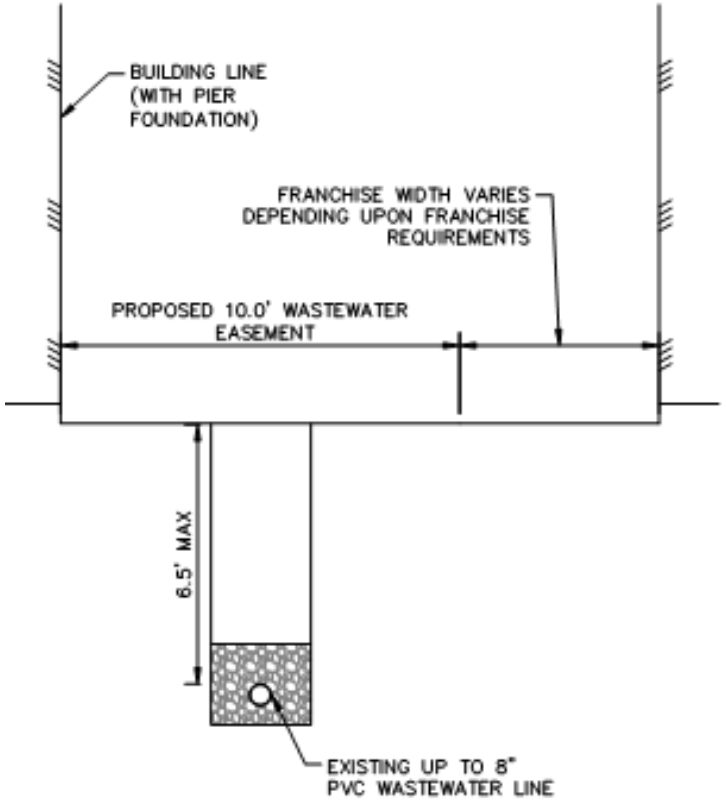
- Tabular Format
- Summary of additions/changes:
  - Calculations for filling on top of any easement
  - 25’ vertical/10’ horizontal clearance
  - Mains centered w/in easement
  - 70’ max width
  - Widths for Facilities/Appurtenances

Table 3-1. Minimum Easement Widths for Mains

Main Type	Main Size	Easement Width (feet)
Water/Reclaimed Water Mains	12-inch or less (adjacent to City right-of-way)	10
	12-inch or less	15
	16-inch	20
	24-inch to 30-inch	25
	36-inch or larger	30
Wastewater/Force Mains	15-inch or less (adjacent to City right-of-way)	10
	15-inch or less	15
	18-inch to 24-inch	20
	27-inch to 48-inch	25
	54-inch or larger	30
Combined Mains	Water mains (12-inch or less) and wastewater or force mains (15-inch or less)	25
	Water and Reclaimed Water mains (12-inch or less) and wastewater mains (15-inch or less)	30
	Two Water mains (12-inch or less)	25
	Other combined mains	Per approval of Water Department Director

3 - URBAN INFILL EASEMENTS

- Existing Alleys/Existing Wastewater
- Summary of requirements:
  - 10’ wastewater easement minimum
  - Franchise utilities located outside of wastewater easement
  - No water/storm drains within alley
  - No physical encroachments
  - Existing pier foundations or analysis by structural engineer
  - 18’ vertical clearance
- Variance Request for any deviations

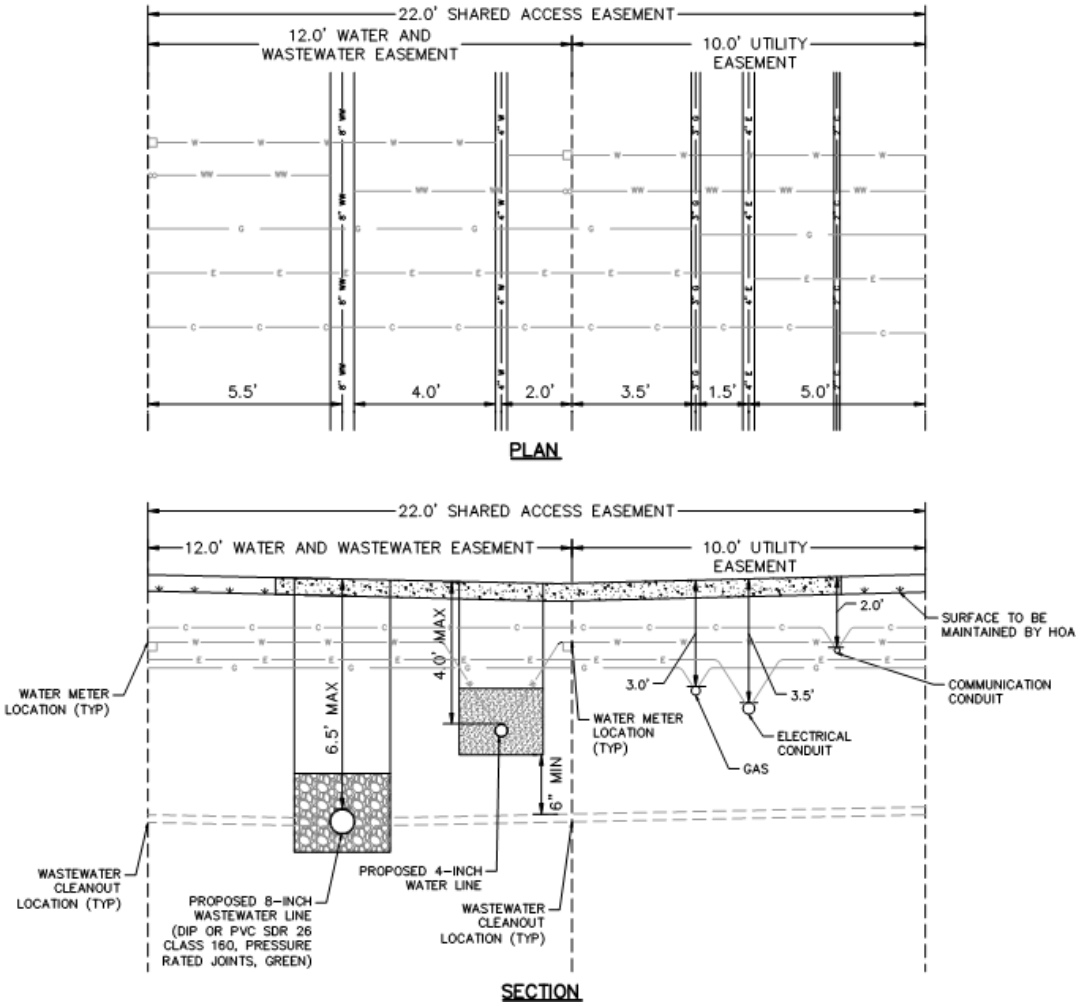


3 - SHARED ACCESS EASEMENTS

- Requires Director Approval
- Summary of Requirements:
  - 22’/20’ Combined Easement
  - 18’ vertical clearance
  - No parking
  - 150’ maximum length
  - 4” water mains/4’ max cover
  - 8” wastewater mains/ 6.5’ max cover

Table 3-3. Minimum Width Requirements

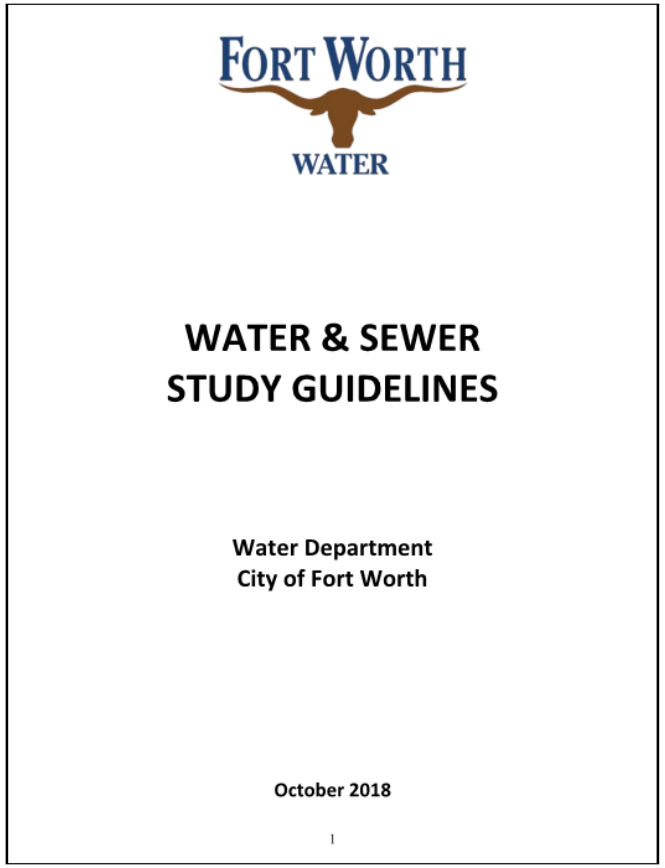
Shared Access Easement	Water and Wastewater Easement
22 feet*	12 feet
20 feet**	18 feet



4 – PROCEDURE – Outline

4 – PROCEDURE - Summary

- Determination of Water/Wastewater needs prior to IPRC Pre-Submittal
- Clarifications
  - Loading Analysis
  - Comprehensive Water/Wastewater Study
- Cost Participation
  - Staff Review/Recommendations
  - Reference to CFA Policy
  - Miscellaneous Contracts requirements
- Fees/Charges
  - Impact Fees
  - Tap Fees
  - Meter Deposits
  - Wastewater per Acre Charges/ Water Main Capacity Charges



4 – Procedure – Contractor Pre-Qualification

- ANY project containing public infrastructure must be performed by a pre-qualified contractor/sub-contractor
- Include Pre-qualification Statement, or
- Pre-qualification Application – 7 days in advance of Bid Opening

SECTION 00 45 12
PREQUALIFICATION STATEMENT

Each Bidder for a City procurement is required to complete the information below by identifying the prequalified contractors and/or subcontractors whom they intend to utilize for the major work type(s) listed.

Major Work Type	Contractor/Subcontractor Company Name	Prequalification Expiration Date
Water Transmission, Urban/Renewal, All Sizes	Circle C Construction	4/30/2019
Auger Boring - 24-Inch diameter casing and greater	Circle C Construction	4/30/2019
Asphalt Paving Construction/Reconstruction (LESS THAN 15,000 square yards)	Circle C Construction	4/30/2019
N/A	Company Name Here or space	Date Here or space

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5 – DESIGN CRITERIA FOR WATER SYSTEMS

Outline

TOC

5 – DESIGN CRITERIA FOR WATER SYSTEMS

- Minimum Water Main Size
  - 8” (4” in certain residential cul-de-sacs)
- Standard Main Sizes: 8, 12, 16, 24, 30, 36, multiples of 6 thereon
- Alignment Walks
  - Outside of ROW, 16” mains and larger, Special Circumstances for 12” and smaller
- Updated per Capita Demand
  - Single Family = 200 gpcd
- Typical Layouts (Residential, Roundabouts, Cul-de-sacs)

5 – DESIGN CRITERIA FOR WATER SYSTEMS

- Depth of Cover
  - 12” and smaller – 48” cover
  - 16” and larger – 60” cover
- Horizontal/Vertical Clearance Requirements
  - Other Water Mains
  - Storm Drain
  - Franchise Utilities
  - Non-Franchise Utilities
  - Drilled Shafts
  - Drainage Headwalls/Inlets
  - MSE/Other Retaining Walls
  - Other Bridge Features

5 – DESIGN CRITERIA FOR WATER SYSTEMS

- Connections to Existing Mains
  - Cut-In Tees preferred
  - No size-on-size tapping sleeves and valves
- Dead-end Main Requirements
  - 4” mains for cul-de-sacs less than 250’
  - Flushing Requirements
- Valve – spacing and type requirements
- Service Lines/ Meters
  - No bending/splicing typically allowed
    - Bending allowed in some cul-de-sac configurations
  - 1” services require 100’ copper roll if >55’ in length
  - No more than 4 meters per lot

5 – DESIGN CRITERIA FOR WATER SYSTEMS

- Air Release Valves
- Blow Off Assemblies
- Cathodic Protection
  - Study required for metallic mains (ductile iron, steel, bar-wrapped concrete steel cylinder)
  - Drawings and specifications, if warranted by study
- Abandonments
  - Abandon by removal, or grout filled if not within the same trench
  - Remove and salvage all appurtenances
- Critical Facilities
  - 2 domestic and fire services for redundancy
  - Isolation Valves – allow service from 2 directions
  - Looped mains – no services from dead-end mains
- Crossings
  - TxDOT, Railroad, Creek, River, or other Water Feature
  - Trenchless, Elevated

6 – DESIGN CRITERIA FOR WASTEWATER SYSTEMS

Outline

TOC

6 – DESIGN CRITERIA FOR WASTEWATER SYSTEMS

- Standard Main Sizes: 8, 12, 15, 18, 21, 24, 27, 30, mult. of 6
- Updated per Capita Demand Calculations
  - Single Family = 100 gpcd
- Typical Layouts (Residential, Roundabouts, Cul-de-sacs)
- Horizontal/Vertical Requirements
  - No curved mains
  - No placement within top of bank
  - Depth of Cover
    - 72” standard
    - 42” minimum
  - Deep Mains: >15’ no services allowed

6 – DESIGN CRITERIA FOR WASTEWATER SYSTEMS

- Clearance Requirements
  - Similar categories to Water
- Manhole Flowlines
  - 0.10’ drop across MH for > 60 degree horizontal deflections
  - Hydraulic Slide for ≤ 24” elevation changes
- Manhole Lining Requirements
  - ≥ 15” wastewater mains, or >3% slopes
  - Force to gravity main transitions
  - Drop Manholes
  - Hydraulic Slides
  - > 15’ Depth
- Concrete Collars
  - Required for manholes within asphalt pavement, unpaved alleys, load bearing areas

6 – DESIGN CRITERIA FOR WASTEWATER SYSTEMS

- Service Line Requirements
  - 36” minimum depth of cover
  - Service lines cannot cross property lines
- New Sections:
  - Cleanouts, CCTV, Odor Control, Low-Pressure Systems, Bypass Pumping
- Updated Sections:
  - Inverted Siphons, Lift Stations,
- Abandonments, Crossings
  - Similar to Water Section

7 – DESIGN CRITERIA FOR RECLAIMED WATER MAINS

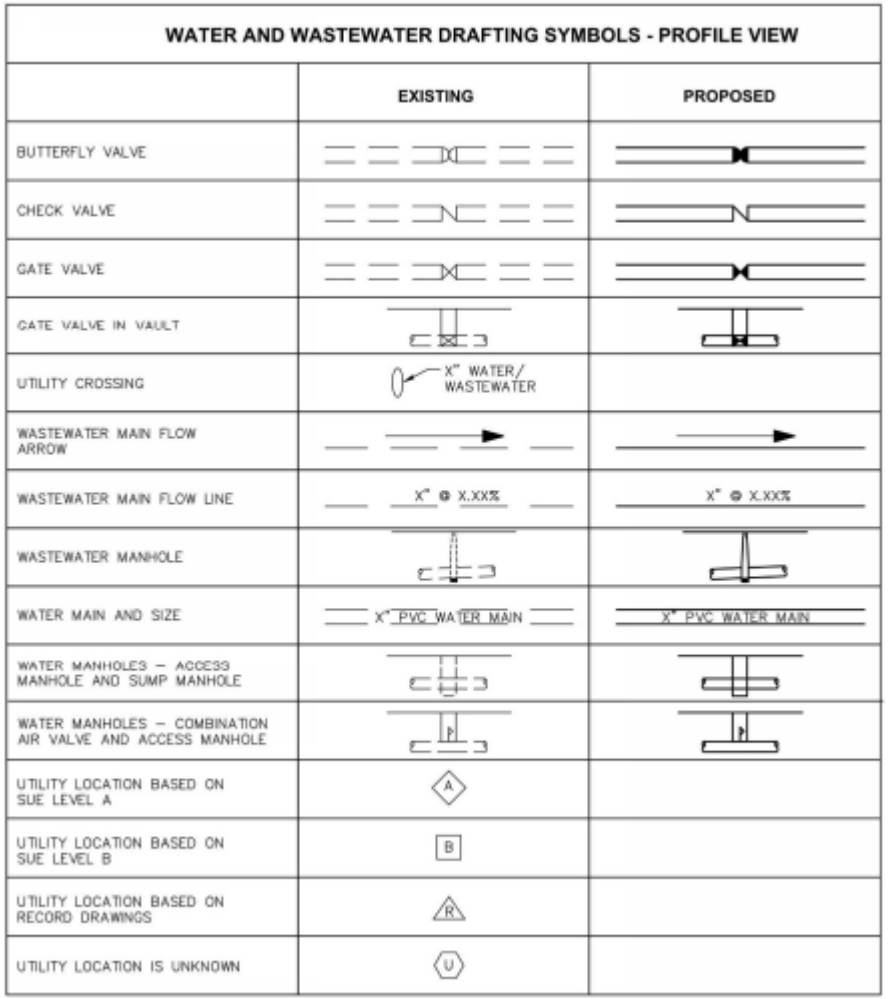
Outline

7 – DESIGN CRITERIA FOR RECLAIMED WATER MAINS

- Similar layout to water design criteria
- Minimum Water Main Size
  - 6” (4” in certain residential cul-de-sacs)
- Standard Main Sizes: 4, 6, 8, 12, 16, 24, 30, 36, multiples of 6
- Horizontal/Vertical Clearance Requirements
- Gate Valve requirements/spacing
- Cleaning, Testing, and Sampling
- Others:
  - Air/Blow-off Valves, Backflow Prevention Device, Service Lines, Meters, Cathodic Protection, Abandonments, Critical Facilities, Crossings

8 – Drawing Requirements Outline

- General Plan Sheet Requirements
- Survey Requirements
- Plan/Profile Sheets
- Standard Abbreviations
- Standard Drafting Symbols



WATER AND WASTEWATER DRAFTING SYMBOLS - PROFILE VIEW		
	EXISTING	PROPOSED
BUTTERFLY VALVE		
CHECK VALVE		
GATE VALVE		
GATE VALVE IN VAULT		
UTILITY CROSSING	X" WATER/ WASTEWATER	
WASTEWATER MAIN FLOW ARROW		
WASTEWATER MAIN FLOW LINE	X" @ X.XX%	X" @ X.XX%
WASTEWATER MANHOLE		
WATER MAIN AND SIZE	X" PVC WATER MAIN	X" PVC WATER MAIN
WATER MANHOLES – ACCESS MANHOLE AND SUMP MANHOLE		
WATER MANHOLES – COMBINATION AIR VALVE AND ACCESS MANHOLE		
UTILITY LOCATION BASED ON SUE LEVEL A	A	
UTILITY LOCATION BASED ON SUE LEVEL B	B	
UTILITY LOCATION BASED ON RECORD DRAWINGS	R	
UTILITY LOCATION IS UNKNOWN	U	

8 – General Plan Sheet Requirements

- Cover Sheet
- Scales
- Seal
- Layout Sheets
  - Sheet Index/Notes
  - Control Points
  - Existing Water/Wastewater Layouts
  - Proposed Water/Wastewater Layouts*
  - Water/Wastewater Abandonments*
  - Existing/Proposed Easements
  - Wastewater Bypass Pumping
  - Water Main Shut-down/Sequencing

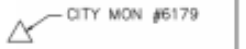
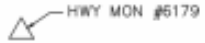
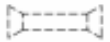
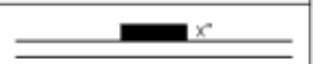
8 – Survey/Plan/Profile Requirements

- Horizontal/Vertical Control
- Baseline/Route Survey with property information
- Survey Width
  - Outside of City ROW: 10’ beyond required easement
  - Within ROW – 10’ beyond ROW
- General Plan/Profile
- Water/Wastewater Plan Sheets
- Water/Wastewater Profile Sheets

8 – Standard Abbreviations

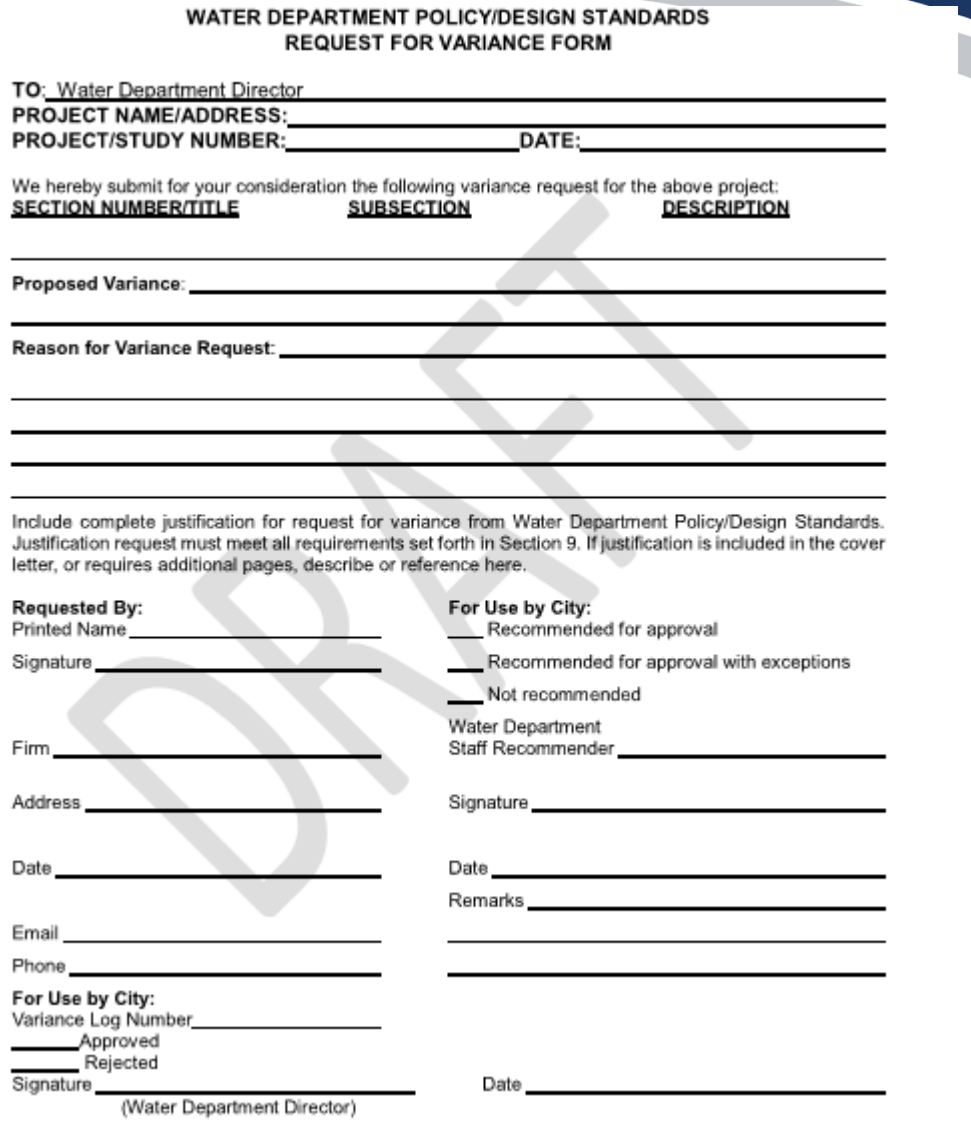
STANDARD ABBREVIATIONS			
∠	ANGLE	LF	LINEAR FOOT
Δ	DELTA ANGLE	MH	MANHOLE
ARV	AIR RELEASE VALVE	MAX	MAXIMUM
AC	ASBESTOS - CEMENT	MJ	MECHANICAL JOINT
AFD	AUTOMATIC FLUSHING DEVICE	MIN	MINIMUM
ARV	AIR RELEASE VALVE	OHE	OVERHEAD ELECTRIC CABLE
BO	BLOW OFF	OHT	OVERHEAD TELEPHONE CABLE
BFV	BUTTERFLY VALVE	PE	PLAIN END
CI	CAST IRON	PCC	POINT OF COMPOUND CURVE
CL	CENTERLINE	PC	POINT OF CURVE
CONC	CONCRETE	PRC	POINT OF REVERSE CURVE
DM	DEAD MAN	PT	POINT OF TANGENCY
DI	DUCTILE IRON	PP	POLYPROPYLENE PLASTIC
ESMT	EASEMENT	PVC	POLYVINYL CHLORIDE PLASTIC
ELEV	ELEVATION	PP	POWER POLE
FRP	FIBERGLASS REINFORCED PIPE	RC	PRE-CAST REINFORCED CONCRETE
FOC	FIBER OPTIC COMPONENTS	PPV	PRESSURE PLANE VALVE
FH	FIRE HYDRANT	RCCP (C-301)	PRE-STRESSED CONCRETE CYLINDER (C-301)
FL	FIRE LINE	RCCP (C-303)	PRE-STRESSED CONCRETE CYLINDER (C-303)
FLG	FLANGE	R	RADIUS
FL	FLOWLINE	RCW	RECLAIMED WATER
GKT	GASKET	RT	RIGHT
G	GAS LINE	ROW	RIGHT OF WAY
GM	GAS METER	SS	SANITARY SEWER
GV	GATE VALVE	STA	STATION
GCD	GENERAL CONTRACT DOCUMENTS	SD	STORM DRAIN
GP	GRINDER PUMP	T	TANGENT
GL	GROUND LINE	UE	UNDERGROUND ELECTRIC CABLE
HDPE	HIGH DENSITY POLYETHYLENE	UT	UNDERGROUND TELEPHONE CABLE
HORIZ	HORIZONTAL	VERT	VERTICAL
IAW	IN ACCORDANCE WITH	VCS	VITRIFIED CLAY (EXTRA STRENGTH)
IAB	IN ALLEY BETWEEN "STREET" AND "STREET"	VC	VITRIFIED CLAY (STANDARD STRENGTH)
IEB	IN EASEMENT BETWEEN "STREET" AND "STREET"	WAD	WASTEWATER ACCESS DEVICE
IP	IRON PIN/PIPE	W	WATER
IPF	IRON PIN/ROD FOUND	WM	WATER METER
IPS	IRON PIN/ROD SET	WSS	WATER SAMPLE STATION
LT	LEFT		

8 – Standard Symbols

GENERAL DRAFTING SYMBOLS		
	EXISTING	PROPOSED
BENCHMARK		
BLOCK LINE		
CENTERLINE		
CITY OR HIGHWAY MONUMENT		
CONCRETE CULVERT (RCCP)		
CONCRETE CURB AND GUTTER		
CONCRETE DRIVEWAY AND SIDEWALK		
CONCRETE INLET AND SIZE		
CREEK		
EASEMENT		
EDGE OF PAVEMENT		
FENCE (BARBED)		
FENCE (CHAIN LINK)		
FENCE (OTHER)		
FENCE (WOOD)		
GAS LINE		

9 – Variance Process

- Requests in writing via form
  - Staff recommendation
  - Director approval
- Department will keep log
- Table of minor deviations
  - No variance required
  - Staff discretion



WATER DEPARTMENT POLICY/DESIGN STANDARDS
REQUEST FOR VARIANCE FORM

TO: Water Department Director
PROJECT NAME/ADDRESS: _____
PROJECT/STUDY NUMBER: _____ **DATE:** _____

We hereby submit for your consideration the following variance request for the above project:
SECTION NUMBER/TITLE **SUBSECTION** **DESCRIPTION**

Proposed Variance: _____

Reason for Variance Request: _____

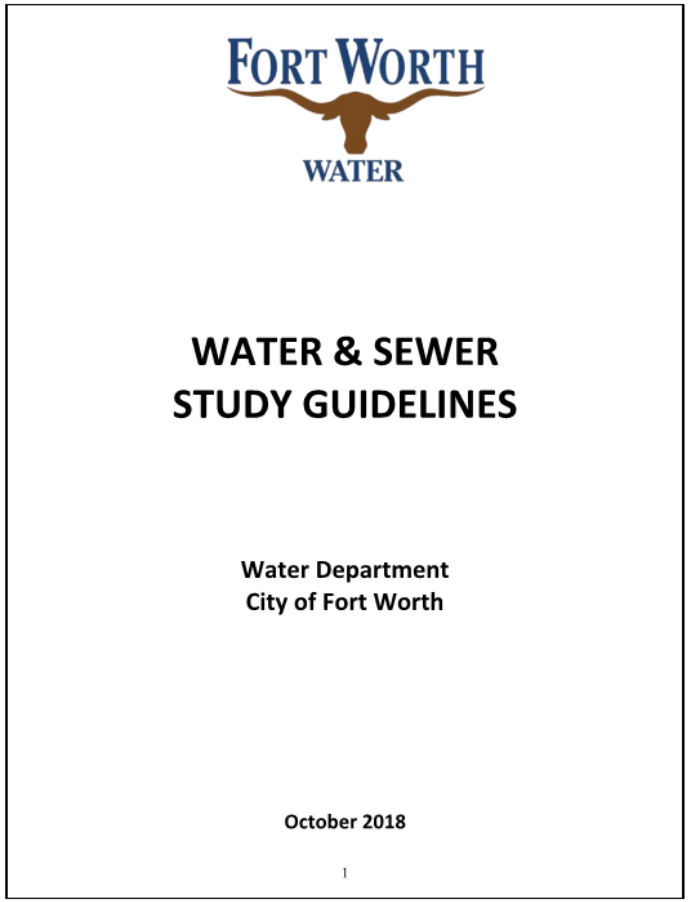
Include complete justification for request for variance from Water Department Policy/Design Standards. Justification request must meet all requirements set forth in Section 9. If justification is included in the cover letter, or requires additional pages, describe or reference here.

Requested By:
Printed Name _____
Signature _____
Firm _____
Address _____
Date _____
Email _____
Phone _____

For Use by City:
Variance Log Number _____
_____ Approved
_____ Rejected
Signature _____ Date _____
(Water Department Director)

For Use by City:
___ Recommended for approval
___ Recommended for approval with exceptions
___ Not recommended
Water Department
Staff Recommender _____
Signature _____
Date _____
Remarks _____

Appendix A – Water/Sewer Comprehensive Study Guidelines



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WATER

WATER & SEWER
STUDY GUIDELINES

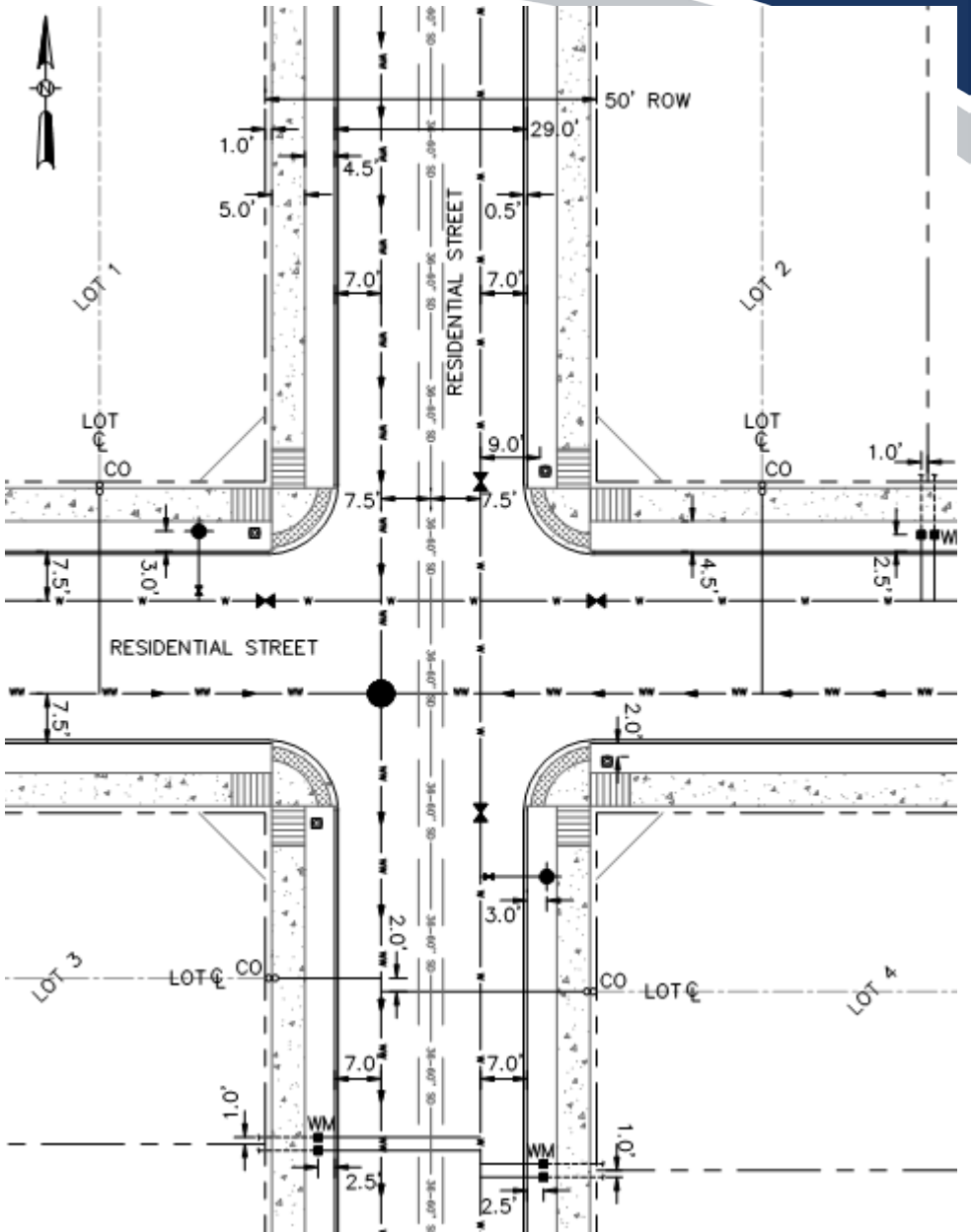
Water Department
City of Fort Worth

October 2018

1

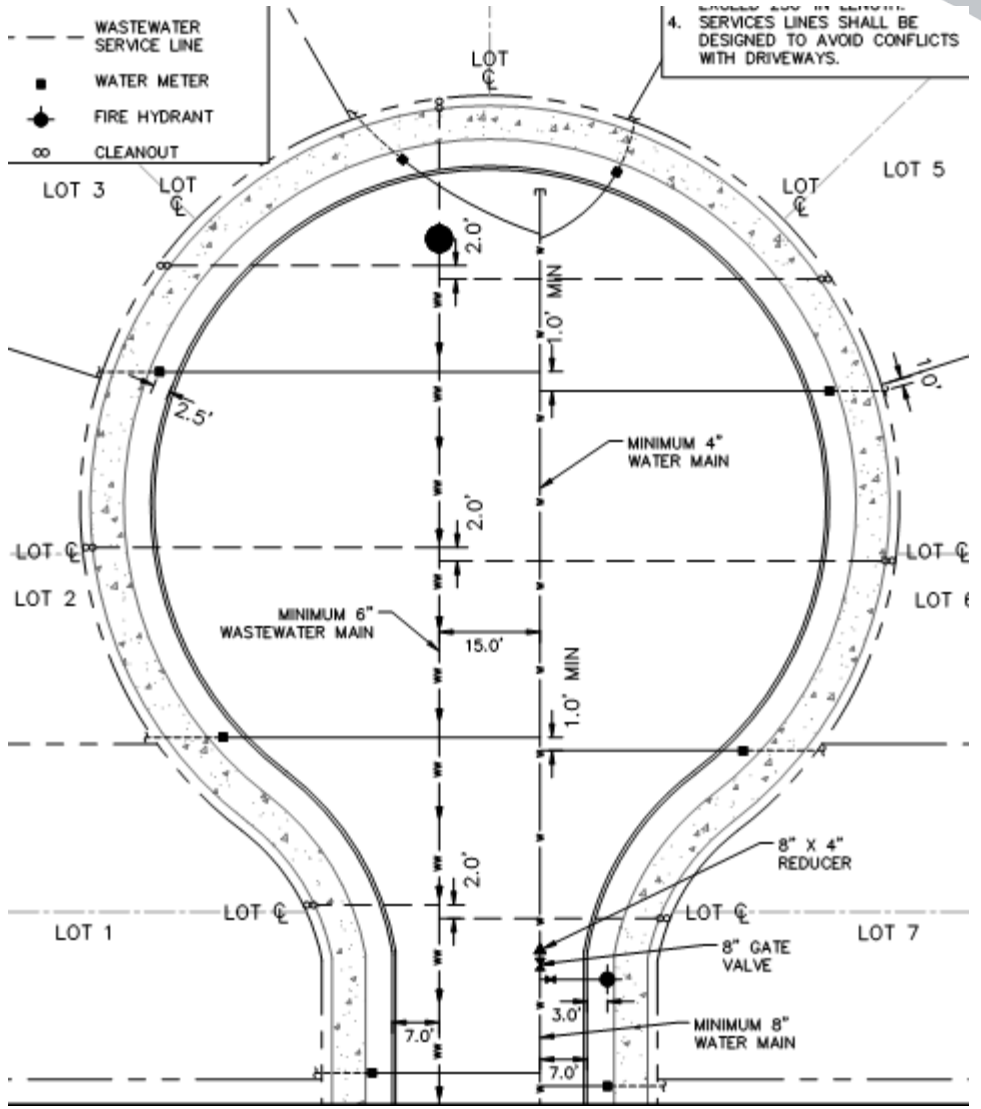
Appendix B – Typical Layouts

- Residential Street
  - Water Main within Pavement
    - Avoids conflicts
      - Curb Ramps
      - Street Lights
      - Signal Poles
      - Franchise Utilities



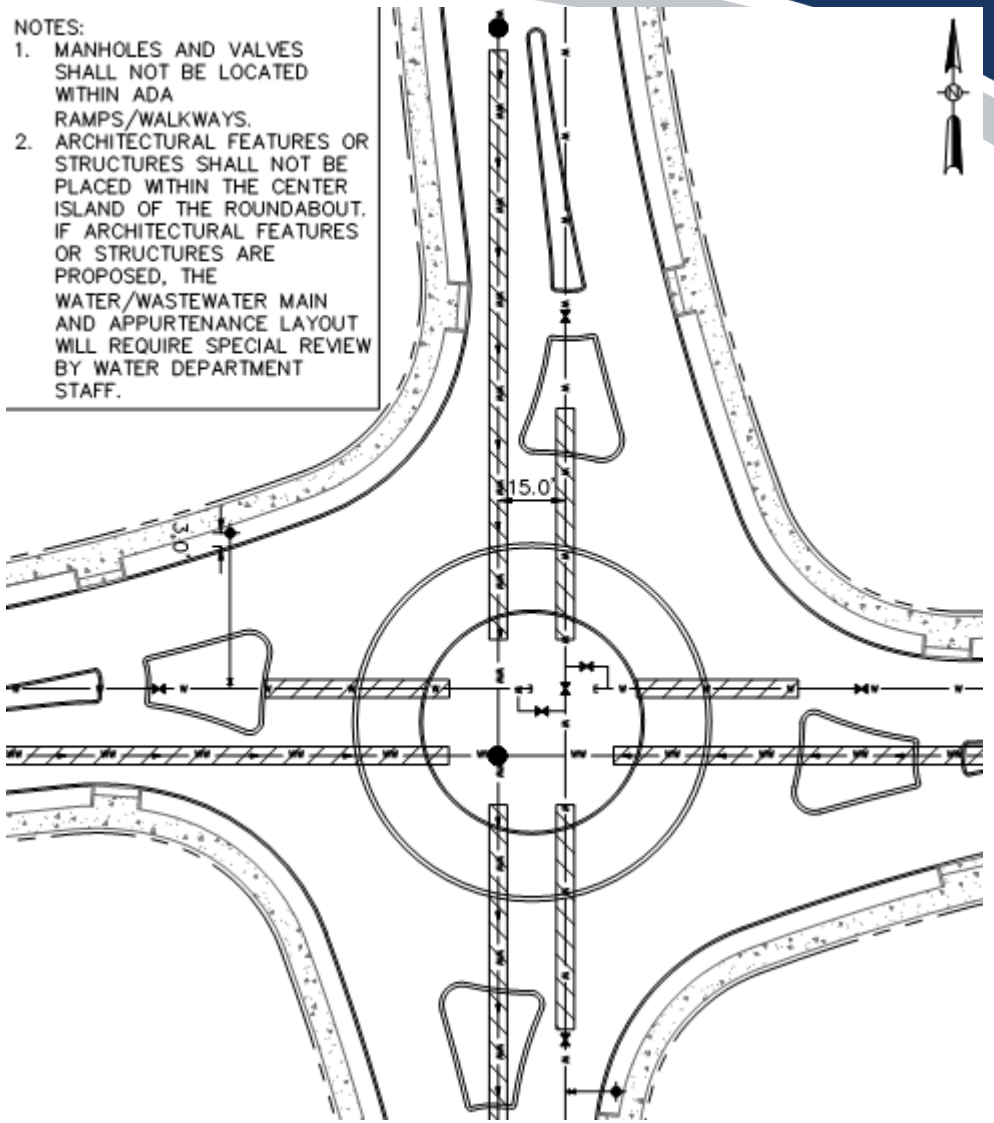
Appendix B – Typical Layouts

- Residential Cul-De-Sac

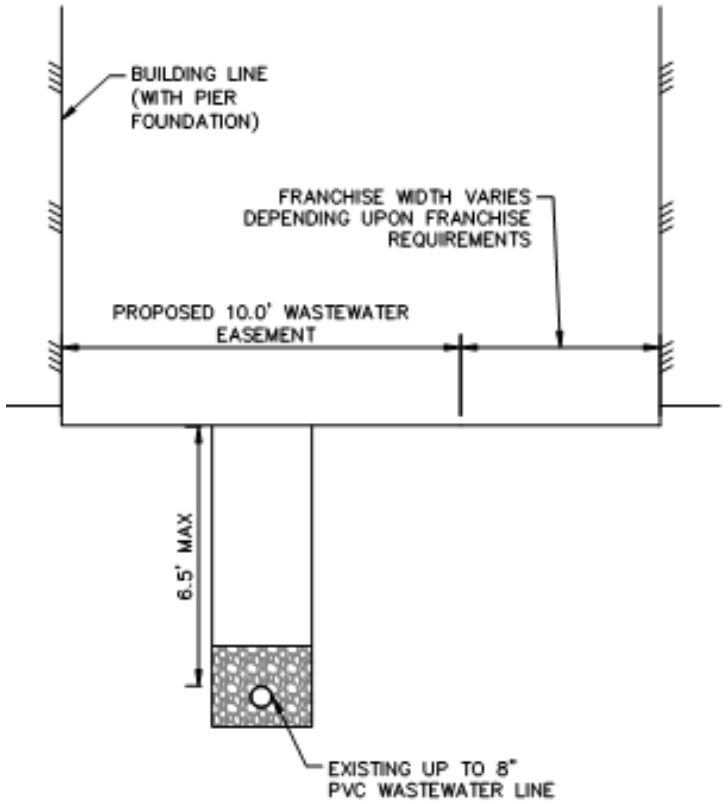


Appendix C – Typical Layouts

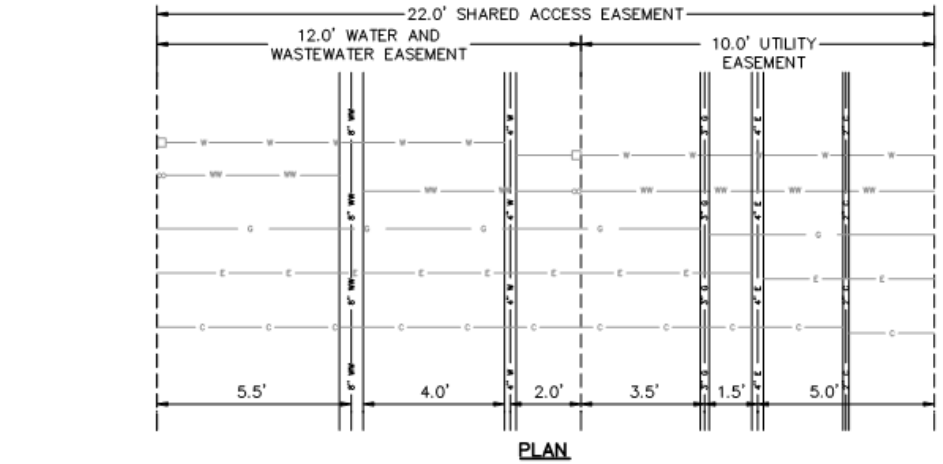
- Residential Roundabouts



Appendix D – Urban Infill Easements



Appendix E – Shared Access Easements



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Comments/Questions