First UTILITY DISTRICT OF KNOX COUNTY *Where community comes first.*

Design Criteria Checklist for Water Distribution Systems

	Design Plans - General Information
	Vicinity Map
	Key Map, for linear or large projects
	Clear depiction of future phases of Development
	Location of Water Lines relative to bridge, structures, and identifiable objects
	Location of proposed valves, hydrants, fittings, and appurtenances
	Location of existing and proposed utilities (water, sewer, gas, power, communication, etc.)
	Profile of proposed Water Main(s), including: existing and proposed Utility and Storm crossings, and existing and proposed ground surfaces.
	Stream Crossing details, including construction methods and materials used.
	Locations of permanent Utility Easement(s) and temporary Construction Easement(s).
	Sealed by a TN-Licensed Professional Engineer.
	Design Report
	Summarize population served, domestic demands, fire flow requirements, corresponding pressures and hydraulic grade lines, pumping requirements, etc.
	Identify future phases of development. Verify initial design is adequate to serve future growth.
	<u>Design Calculation Criteria:</u> Per Capita Demands • 2.0 gpm/connection: 1 – 100 residential connections • 1.5 gpm/connection: 101 – 150 residential connections • 1.0 gpm/connection: 151 – 300 residential connections • 0.75 gpm/connection: 301 – 500 residential connections • 0.50 gpm/connection: 501 – 1,000 residential connections Min. Pressure Requirements • Domestic Flow: 20-psi across the property based upon a hydraulic grade line at mid-level elevation of the water storage tank. • Fire Flow: 20-psi at any meter during a fire flow at the most hydraulically remote hydrant. If providing fire protection, Engineer shall provide a stamped set of calculations for fire protection conditions.
	Sealed by a TN-Licensed Professional Engineer.
	Material & Construction Requirements

	Main Line – Size and Material (Specification 33 11 13 and related sections)
	• 6” diameter is minimum size for fire hydrants
	• 2” minimum size; subject to FUD Approval
	• 3” not allowed
	• Minimum cover, bedding, and backfill per FUD Specifications and TDEC Criteria.
	• Clearance with other underground utilities:
	  • Sewer – 10-ft horizontal, 18-in vertical
	  • Other underground – 3-ft horizontal, 12-in vertical

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	Material & Construction Requirements (continued…)
	Line Valves • Spacing at no greater than 1,500-ft apart, or as directed by FUD. • Placed on each main branching from a Tee. • Whenever possible, valves shall be placed outside of pavement. • >2" Gate Valve. Refer to Specification Section 33 12 16. • ≤2" Ball Valve. Refer to Specification Section 33 12 16.
	Service Lines & Meters • Specification Section 33 12 13 for product and execution requirements. All taps shall be made by FUD. • For single-family residential, each Lot shall be provided for by a service line and meter. • Water meters shall be set near the property corners. Where possible, meters shall be double set at a common property corner of two adjacent lots. • 1" and smaller service lines under sidewalks, driveways, or pavement shall be encased in 2" Sch40 PVC. • For multi-family residential, provide a separate meter for each building complex. • Set top of meter boxes at four to six inches (4" – 6") above top of curb elevation. • Meter size shall be determined by property owner or Engineer of Record and subject to FUD Engineering Department approval.
	End of Line Blow Off • Per FUD Standard Drawings • End-of-line blow off shall be sized to allow a minimum velocity of 2 ft/sec in the water main. • Blow off valve shall be a minimum of 2" diameter. Where feasible, hydrants are preferred at the end of line.
	Booster Stations
	Public booster stations shall be owned by FUD and located on fee simple property under FUD ownership.
	Booster stations shall be designed and constructed per FUD's Standard Specifications and Drawings.
	FUD reserves right to provide input on booster station capacity.
	Fire Protection
	Provide Static Pressure, Residual Pressure, and Flow Rate for existing hydrant test on Design Plans and Design Report.
	Provide proposed fire flow requirements for hydrant and fire protection systems on Design Plans and Design Report. • NOTE: Proposed System improvements as needed to meet fire flow conditions shall be subject to FUD's review and acceptance.
	Fire Hydrant Spacing & Location • Fire hydrant shall be provided at the entrance to subdivision. • Additional hydrant spacing as required by local jurisdictional authority.
	Minimum fire flow rate at hydrant shall be 500-gpm.
	Fire Protection Lines are not metered in FUD's distribution system. User will be billed annually in accordance with FUD's Rate Structure, latest version.

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	Fire Protection (continued…)
	Fire Protection lines shall be constructed of ductile iron pipe.
	All fire line taps to existing mains shall be made by FUD.
	Fire Protection lines shall be disinfected, tested, and accepted in accordance with FUD Standard Specifications before being placed in service.
	Cross Connection Control
	Refer to Cross Connection Manual, Cross Connection Policy, and FUD Standard Specification 33 14 00.
	Irrigation systems are required to install an RPZ Backflow Preventer.
	Chemical Fire Protection systems require an RPZ Backflow Preventer. Non-Chemical Fire Protection systems will allow a DCDA Backflow Preventer.
	Multifamily residential, commercial, and any non-single family residence are required to install an RPZ Backflow Preventer on “domestic” water lines. These users are required to install two RPZ devices in parallel.
	For private fire protection lines, FUD reserves the right to require an RPZ backflow preventer installed in a heated enclosure at the property line.
	Easements & Property
	15-ft Utility Easement (o.c.) is required for all public water mains. Plans to reference Instrument #200908100011396 at Knox County Register of Deeds Office.
	Property for Water Booster Station shall be deeded to FUD. Depending on location, FUD may require a dedicated 20-ft wide access easement to booster station.
	Utility Easements or subdivision plats must be recorded before the system will be accepted by FUD.