City of Tulsa Engineering Services
Water Design Checklist

Project Number: _____ **Project Name:** _____

City of Tulsa Project Manager: _____

Consultant Reviewer: _____ **Phone:** _____ **Date:** _____

Professional Engineer: _____ **Phone:** _____ **Date:** _____

☐ **Conceptual Report**
☐ **Preliminary Submittal**
☐ **Final Submittal**
☐ **Pre-Mylar Submittal**
☐ **Mylar Submittal**

Water Construction Budget: _____

Water Construction Cost Estimate: _____

The purpose of this checklist is to offer comments on plan design for construction of water projects within public right-of-way/easement. Source of water and related construction in the public right-of-way/easement design policy are the current City of Tulsa Standard Specifications and complies with all Oklahoma Department of Environmental Quality (ODEQ) requirements.

This checklist serves to minimize redline comments on the check prints and to maintain consistency among plan reviews on plans for water and related construction in the public right-of-way/easement. Plan approval and certain grading/right-of-way clearances depend on compliance with the comments made on the check prints and this checklist. The engineer of record shall satisfy themselves of the completeness and accuracy of the design.

A completed checklist must be attached to the design plans when submitted for review. The following Certification Statement must be signed by the Engineer of record certifying that all applicable requirements on this checklist have been met.

CERTIFICATION

I CERTIFY THAT THE REFERENCED PLANS COMPLY WITH ALL APPLICABLE CITY ORDINANCES AND STANDARDS, INCLUDING FEDERAL, STATE AND COUNTY REQUIREMENTS AND REGULATIONS. IN ADDITION, I CERTIFY THAT THIS CHECKLIST HAS BEEN COMPLETED ENSURING ALL ITEMS LISTED ARE PROPERLY ADDRESSED. I UNDERSTAND THAT IF I FAIL TO ADDRESS ALL APPLICABLE ITEMS IN THIS CHECKLIST, THE PLANS MAY BE IMMEDIATELY RETURNED TO ME WITHOUT ANY FORMAL REVIEW BEING PERFORMED.

Engineer's Name: _____

Engineer's Signature: _____ **Date:** _____

Please complete and return this checklist and the check prints with each submittal. Discussion of redline comments on plans or this checklist should be directed to the plan reviewer listed above.

Engineer of record **(ENG)** must fill out all boxes in the first column as either ✓ (Addressed) or **N/A** (Not Applicable).

Per contract, Consultant Civil QA/QC plan reviewer **(RVW)** shall check the second column as ✓ (Required) when requirements have been properly addressed.

Drawings Required per Submittal	Conceptual Report Submittal[1]	Preliminary Submittal[2]	Final Submittal[2]	Issue for Bid[3]
Cover Sheet		x	x	x
Pay Quantities and Construction Notes		x	x	x
Water Meter Summary Sheet		x	x	x
Project Site Overview Map/Sheet Index		x	x	x
Geometric Data	x	x	x	x
Survey Control Sheets	x	x	x	x
Section Corners/Lines	x	x	x	x
ROW Identification of needs	x	x	x	x
Property Lines/Right-of-Way/Easements		x	x	x
Certified Property Reports and Legal for ROW			x	x
Topographic Survey Sheets	x	x	x	x
Plan & Profile Sheets	x	x	x	x
Fire Hydrant Spacing Map		x	x	x
Construction Sequence/Traffic Control Plan		x	x	x
Intersection Details/Blowups			x	x
Detail Sheets		x	x	x
Erosion Control Notes			x	x
Erosion Control Plans			x	x
City of Tulsa Details		x	x	x
Specifications + Bid Packet (8.5x11)			x	x
Specifications + Contract packet (8.5x11)				
City of Tulsa Utility Conflict List	x[5]	x[5]	x[5]	x[5]
Engineer's Opinion of Probable Cost	x	x	x	
Engineer's Estimate				x[4]

Pre-Mylar Check Set: Three (3) Full-sized sets (22"x34"), Three (3) Half-sized sets (11"x17") + PDF

Quantities:

[1]Five (5) 8-1/2"x11"/Half-sized sets (11"x17") + PDF

[2]Twenty-five (25) Half-sized sets (11"x17") + PDF

[3]Signed Sealed Mylar (Engineer/City), Seven (7) Full-Sized sets (22"x34")+ PDF, Forty-five (45) Half-sized sets (11"x17") + PDF

[4]In Sealed Envelope 48 hours prior to bid opening.

[5]Consultant shall provide most current status of each conflict with every submittal.

NOTE: Project CAD files to be provided to OWNER with each submittal.

Right of Way

Acquisition Document for Right of Way due prior to Final Design Submittal

GENERAL PLAN SET REQUIREMENTS (EXCLUDING CROSS SECTIONS)

ENG	RVW	N/A	
			A current City of Tulsa Standard Title Block shall be located in the lower right hand corner of each sheet.
			North shall be oriented to the top or right side of all sheets.
			All sheets shall have the Oklahoma Professional Engineer/Land Surveyor seal and original signature prior to Issue For Bid submittal (Mylar).
			Designers, technicians, surveyors, dates shall be filled in Title block, as well as Atlas pages pertinent to specific sheet.
			All drafting shall be in accordance with City of Tulsa Engineering Drafting Guidelines for Outside Consultants.
			Cover for underground utilities shall meet current City of Tulsa minimums. For utility relocations, show the specific utility affected and the utility owner responsible (i.e. Telco Box to be relocated by Cox).
			Correct project #, TMUA#, contract, zone, and phase numbers shall be printed on the right border of all water related sheets
			Consultant to provide current plan submittal in PDF Format
			Compare and verification of removal pay item quantities with placement of new replacement items.

COVER SHEET REQUIREMENTS

ENG	RVW	N/A	
			Complete description and location of project.
			Correct project #, TMUA#, contract, zone, and phase numbers.
			Correct account numbers.
			Location map with blow up view of project location.
			North arrow (shown to the top or right of page).
			Legend of symbols on left side of page.
			Engineer's Statement - Current City of Tulsa Standard Specifications and Standard Details govern. All other construction and materials shall be in accordance with the 2009 Oklahoma Standard Specifications for Highway Construction.
			Engineer's Statement – This project complies with all Oklahoma Department of Environmental Quality (ODEQ) requirements

COVER SHEET REQUIREMENTS CONT'D

ENG	RVW	N/A	
			Engineers Statement – Entire project is/is not within corporate limits of City of Tulsa (COT)
			Permanent COT/ADS Benchmark tied to survey. Verify with COT Survey Department. Name, address, phone number and fax number, CA number, and expiration date of consultant
			Sheet index located in upper right hand corner. Sheets are to be in the following order: 1. Cover Sheet 2. Pay Quantities and Construction Notes 3. Water Meter Summary Sheet 4. Valve and Hydrant Summary Sheet 5. Project Site Overview Map/Sheet Index/Fire Hydrant Spacing Map 6. Geometric Data 7. Survey Control Sheets 8. Section Corners/Lines 9. ROW Identification of needs 10. Property Lines/Right-of-Way/Easements 11. Certified Property Reports and Legal for ROW 12. Topographic Survey Sheets 13. Plan & Profile Sheets 14. Construction Sequence/Traffic Control Plan 15. Intersection Details/Blowups 16. City of Tulsa Details
			City of Tulsa Standards listed on right side of page (Detail No. and Exact Title).
			Permanent ADS benchmark location with description and note of referenced datum to include City of Tulsa permanent benchmark reference as well as other permanent benchmarks.
			Advertisement date line under City Engineer's name. Date to be filled in later by City of Tulsa Staff Director Water & Sewer Department Signature Block with Advertisement Date
			Utility Contacts AT&T – Al Nichols 918-596-4237 Cox Comm. - Brandon Wade 918-286-4716 ONG - Craig Powell 918-831-8261 AEP/PSO – Adam Fields 918-250-6257 City of Tulsa Utility Coordinator – Chris Kovac 918-596-9649

PAY ITEM AND CONSTRUCTION NOTES SHEET REQUIREMENTS

ENG	RVW	N/A	
			City of Tulsa Title Block with advertisement date
			Verify that pay items, units and quantity shown on sheet match current Water Standard Notes and Pay Items and are correctly shown on engineers cost estimate.
			Verify current cost estimate is within the Project Budget.

PAY ITEM AND CONSTRUCTION NOTES SHEET REQUIREMENTS CONT'D

ENG	RVW	N/A	
			Summary of pay quantities table shall list Item No., Spec No., Pay Item/Description, Pay item note No., Units, Total quantity.
			Pay Item Notes are correctly referenced in the table of Water Line Quantities
			Summary table breakout all pay items per Street, Per Line or Per Sheet
			Summary of pay quantities/spec no. in a table with a proper heading (Water Line Quantities)
			Summary of Water Meters with Station, Offset, Address, Service Size, Meter Can Size
			Summary of Valves and Hydrants with Northing, Easting, Station, Offset and Elevation (Water Valve and Fire Hydrant Summary)
			All construction to be in strict accordance with current City of Tulsa, Engineering Services Department Standards and Specifications
			General notes/symbols/schedules
			Reference City of Tulsa Blasting Ordinance if rock excavation is expected and include a pay note stating that blasting is included as unclassified excavation
			Testing and Chlorination Requirements with General Specifications Section 109.3
			Legend

DESIGN CRITERIA

ENG	RVW	N/A	
			All City of Tulsa (COT) Design Criteria met.
			All Oklahoma Department of Environmental Quality (ODEQ) Design Criteria met, (see ODEQ Section 252:626).
			Water and Sanitary Sewer separation (per ODEQ regulations). • 2 feet vertical separation, outside to outside of pipes • 10 feet horizontal separation, outside to outside of pipes • Sewer pipe joints (20' PVC or 18' DIP) must be equidistant from water pipe crossing
			Water and Storm Sewer separation (per ODEQ regulations). • 2 feet vertical separation, outside to outside of pipes • 5 feet horizontal separation, outside to outside of pipes
			Water and Contamination Sources separation (per ODEQ regulations). (Raw waterlines, petroleum product lines, natural gas lines and other buried utility lines) • 2 foot vertical separation, outside to outside of pipes • 5 feet horizontal separation outside to outside of pipes
			Waterlines shall be located on the East and South side of the street.

DESIGN CRITERIA CONT'D

ENG	RVW	N/A	
			Waterline standard location is 8 feet from property line (Right-of-Way): If 8' cannot be met, provide for the following: • 5' is minimum clearance from the waterline to Property Line/Right of Way • 3' minimum clearance from the waterline to the back of curb.
			Maximum waterline depth of 8'-0" unless approved by COT Water Design Section. With the exception of creek crossings, and road crossings, etc.
			Channel or creek crossing: • Four (4) feet minimum clearance below bottom of creek • D.I.P. only • ODEQ regulations Section 252:626-19-2(9)(B) - Under Water Crossings o Provide valves at both ends of water crossings so that the section can be isolated for testing or repair. The valves must be easily accessible and not subject to flooding. The valve closest to the supply source must be in a manhole, and have a tap on either side. o Make permanent taps on each side of the valve within the manhole to allow insertion of a small meter for testing to determine leakage and for sampling purposes • Provide restrained joints and fittings a minimum of 20 feet into each bank of the crossing. • Bank stabilization (Riprap per COT Standards) • Design the pipe for river crossings and have flexible watertight joints
			Mega lugs are not a separate pay item
			No service taps on waterlines larger than 16-inch, please discuss with Project Manager
			Fire hydrants shall be spaced (recommend 300' (Commercial) to 500' (Residential) apart) to meet the COT requirements and on property lines
			Independent valves on fire hydrant on lines 12" and larger or 6" & 8" along Arterial Streets
			Valves shall be added as necessary to allow for isolating portions of waterlines.
			All fittings shown as restrained. Engineer to provide Calculations.
			Minimum cover of 36" over waterline using lowest grade in the vicinity. In general: • the water mains are to be three (3) feet minimum below the proposed finished grade over the main, • three (3) feet minimum below the centerline of the street; • and four (4) feet minimum below the grade if the water main is under the pavement, below the invert of a bar ditch, or creek crossing).
			Minimum pipe size is 6".
			All dead ends must have a fire hydrant or automatic blow off assembly.
			Conduit must be installed level

DESIGN CRITERIA CONT'D

ENG	RVW	N/A	
			Pipe must be level where valves and fire hydrant are to be installed.
			Street Crossings: **Non-arterial** street crossings shall be DIP/PVC/HDPE **Arterial** street crossings shall be DIP only
			Provide updated City of Tulsa Utility Conflict List.

RIGHT OF WAY AND SURVEY DATA SHEET REQUIREMENTS

ENG	RVW	N/A	
			Map of area showing areas included in project.
			Label CRL with bearings and distances.
			Key reference points showing Northing's, Easting's, and elevations.
			Control Points/Benchmarks referenced with both coordinates and stationing along CRL.
			Description of monument types i.e.: metal caps, pk nails, chiseled crosses, iron pins, etc.
			Established vertical and horizontal datum used for survey; Tie to COT/ADS Permanent Benchmark as verified by COT Survey Department.
			Survey Limits should run past Right-of-Way to include as much data as possible to ensure proper tie in locations and elevations (example porch to porch or driveway limits).
			Provide proposed map showing ROW acquisition areas (Fee Simple, Permanent easements, Construction Easements). Include Parcel Table with property and tract details and descriptions.
			Right-of-Way to Right-of-Way both sides of the street.
			Right-of-Way and Survey sheets signed by Oklahoma Licensed Surveyor.
			Pull water valve lids and pick up elevation of top of nut, to identify waterline elevation.
			Show tree trunk and drip line, fences, building faces close to Right-of-Way, culverts, drives, flow lines, retaining walls, and all other unmovable objects.
			Include any ROW negotiation items (special construction or agreements made as part of the ROW negotiation). Verify with COT ROW Group.
			Include Addresses for all properties within project limits.
			Show all existing ROW and Existing Easements within work area.
			Horizontal control shall have bearings, length and control.

			Current ROW Checklist

RIGHT OF WAY AND SURVEY DATA SHEET REQUIREMENTS CONT'D

			Prior to scheduling survey, call Okie for "geotech work". Once locates have been performed, survey to pick all utilities.

PLAN AND PROFILE SHEET REQUIREMENTS

ENG	RVW	N/A	
			City of Tulsa Title Block with advertisement date
			Project Location Map showing waterline sheet breakout.
			North arrow (Top of page or to the Right) with plan scale – written and graphic
			Atlas Page Number (P&P sheet specific)
			Bench Marks (USC&GS Datum) on each P&P sheet
			Existing utilities and features shown in plans
			New Construction shown in bold (both line & text)
			Easements (distance and bearings) width dimensions/ Right-of-Way
			Pipe type and size shown
			Vertical scale 1" = 10' / 1"= 5'
			Horizontal scale shall be 1"=20'
			Valve, fire hydrant, fitting, air release valve or other appurtenance shall be shown on P/P sheets with Station Number, Horizontal Offset, Invert and Size
			Plan includes detail of both sides of the street
			Show FEMA A-Zone and Regulatory Floodplain
			Master meter vault locations with reference to detail sheet. New/replacement residential meters located within Right-of-Way and 2'-0" off property line Separate meter box for residential service pressure reducing valve (PRV) shall be located between property line and meter box
			All list of material's boxes shall show: "Furnished by Contractor", "Installed by Contractor"
			Show pipe elevations and vertical separations for all wastewater, storm sewer, electrical duct banks and high pressure gas line crossings and verify that required separation is met.

			Waterline shall be designed/labeled with a station and offset (typically roadway centerline). Callout Station and Offset for all fittings.
			Include Addresses for all properties within project limits.

CONSTRUCTION SEQUENCE AND TRAFFIC CONTROL REQUIREMENTS

ENG	RVW	N/A	
			Construction Phasing signage and layout per current MUTCD manual is required for all Projects Arterial/ Non Arterial & Residential.
			Verify project can be constructed as phased and continuous access is provided.
			Project Sign (COT STD 102) pay item required on all projects.
			Construction traffic signs over 16 S.F. shall be included.
			Barrels – recommendation that non-arterials should have at least 30 barrels per construction day. Arterials - project length and speed limit determine the max spacing between barrels (up to 50’ max).
			Changeable message sign(s) for all Arterial Street Projects.
			Provide listing of valves required to be operated to isolate the system for each tie-in phase.
			On any project that requires a tie-in to a Transmission Main, at Preliminary Design the plans shall be coordinated with Distribution. Distribution will assist in identifying what water valves that will be required to perform the Transmission main Shutdown. If valves are found to not be operable, consultant shall include valves that require replacement as part of the plans and identify them in the construction sequence.

PERMITS REQUIREMENTS

ENG	RVW	N/A	
			Corp of Engineers.
			Levee Authority.
			Railroad Crossing.
			ODOT.
			Turnpike Authority.
			ODEQ Permit for construction and engineering Report Form (New water or revised design).
			NPDES (SWP3 required for all projects disturbing one (1) acre or more; Notice of Intent (NOI) to be completed by contractor).

ENG	RVW	N/A	
			Watershed Development Permit if construction is within the floodplain.
			Other:

STANDARD DETAIL SHEETS

ENG	RVW	N/A	
			Standard Details are shown as part of the specifications with the exception of the following: • Air/vacuum/release valve for waterlines 16" and larger, or elevation changes of 15' or more • Specials (Booster Pump Station, Water Towers, River Crossings, Storage Tanks).