



# 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
- Construction Budget: \_\_\_\_\_
- 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.

<b>Drawings Required per Submittal</b>	<b>Conceptual Report Submittal<sup>1</sup></b>	<b>Preliminary Submittal<sup>2</sup></b>	<b>Final Submittal<sup>2</sup></b>	<b>Issue for Bid<sup>3</sup></b>
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
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)				
Engineer's Opinion of Probable Cost	X	X	X	
Engineer's Estimate				X <sup>4</sup>

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

**QUANTITIES:**

<sup>1</sup>Five (5) 8-1/2"x11"/Half-sized sets (11"x17") + PDF

<sup>2</sup>Twenty-five (25) Half-sized sets (11"x17") + PDF

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

<sup>4</sup>In Sealed Envelope 48 hours prior to bid opening.

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

**GENERAL PLAN SET REQUIREMENTS (EXCLUDING CROSS SECTIONS)**

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	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**

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	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**

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	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: <ol style="list-style-type: none"> <li>1. Cover Sheet</li> <li>2. Pay Quantities and Construction Notes</li> <li>3. Water Meter Summary Sheet</li> <li>4. Valve and Hydrant Summary Sheet</li> <li>5. Project Site Overview Map/Sheet Index</li> <li>6. Geometric Data</li> <li>7. Survey Control Sheets</li> <li>8. Section Corners/Lines</li> <li>9. ROW Identification of needs</li> <li>10. Property Lines/Right-of-Way/Easements</li> <li>11. Certified Property Reports and Legal for ROW</li> <li>12. Topographic Survey Sheets</li> <li>13. Plan &amp; Profile Sheets</li> <li>14. Intersection Details/Blowups</li> <li>15. City of Tulsa Details</li> </ol>
_____	_____	_____	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**

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	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. For current copy contact Water Design at 918-596-9566
_____	_____	_____	Verify current cost estimate is within the Project Budget.

**PAY ITEM AND CONSTRUCTION NOTES SHEET REQUIREMENTS CONT'D**

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	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**

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	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). <ul style="list-style-type: none"> <li>• 2 feet vertical separation, outside to outside of pipes</li> <li>• 10 feet horizontal separation, outside to outside of pipes</li> <li>• Sewer pipe joints (20' PVC or 18' DIP) must be equidistant from water pipe crossing</li> </ul>
_____	_____	_____	Water and Storm Sewer separation (per ODEQ regulations). <ul style="list-style-type: none"> <li>• 2 feet vertical separation, outside to outside of pipes</li> <li>• 5 feet horizontal separation, outside to outside of pipes</li> </ul>
_____	_____	_____	Water and Contamination Sources separation (per ODEQ regulations). (Raw waterlines, petroleum product lines, natural gas lines and other buried utility lines) <ul style="list-style-type: none"> <li>• 2 foot vertical separation, outside to outside of pipes</li> <li>• 5 feet horizontal separation outside to outside of pipes</li> </ul>
_____	_____	_____	Waterlines shall be located on the East and South side of the street.

**DESIGN CRITERIA CONT'D**

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	Waterline standard location is 8 feet from property line (Right-of-Way): If 8' cannot be met, provide for the following: <ul style="list-style-type: none"> <li>• 5' is minimum clearance from the waterline to Property Line/Right of Way</li> <li>• 3' minimum clearance from the waterline to the back of curb.</li> </ul>
_____	_____	_____	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: <ul style="list-style-type: none"> <li>• Four (4) feet minimum clearance below bottom of creek</li> <li>• D.I.P. only</li> <li>• ODEQ regulations Section 252:626-19-2(9)(B) - Under Water Crossings                             <ul style="list-style-type: none"> <li>○ 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.</li> <li>○ 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</li> </ul> </li> <li>• Provide restrained joints and fittings a minimum of 20 feet into each bank of the crossing.</li> <li>• Bank stabilization (Riprap per COT Standards)</li> <li>• Design the pipe for river crossings and have flexible watertight joints</li> </ul>
_____	_____	_____	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: <ul style="list-style-type: none"> <li>• the water mains are to be three (3) feet minimum below the proposed finished grade over the main,</li> <li>• three (3) feet minimum below the centerline of the street;</li> <li>• 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).</li> </ul>
_____	_____	_____	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

**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"

**PLAN AND PROFILE SHEET REQUIREMENTS CONT'D**

- \_\_\_\_\_ 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.

**RIGHT OF WAY AND SURVEY DATA SHEET REQUIREMENTS**

<u>ENG</u>	<u>RVW</u>	<u>N/A</u>	
_____	_____	_____	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.

**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).

\_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_      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).