



## City of Tulsa

### Plans Review Check List - Wastewater Design Section

Project No. \_\_\_\_\_ Project Name \_\_\_\_\_

#### **A. Cover Sheet**

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- \_\_\_ Project Name, Number and Account Numbers
- \_\_\_ Developer name, address, phone, and contact person (SSID ONLY)
- \_\_\_ Engineering firm name, address, phone, and engineer Seal with signature, date
- \_\_\_ Vicinity Map showing entire City of Tulsa with magnified view of work location
- \_\_\_ Sheet Index
- \_\_\_ Call OKIE and Utility Contact Table (Utility Name & Phone Number)
- \_\_\_ Legend
- \_\_\_ Public Works and Development Director Signature Block with Advertisement Date

#### **B. Construction Notes/Schedule of Quantities/Drainage Basin Map**

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- \_\_\_ All construction to be in strict accordance with current City of Tulsa, Public Works and Development Department Standards and Specifications
- \_\_\_ Contractor will be required to vacuum test all manholes according to City of Tulsa, Public Works and Development Department Standards and Specifications
- \_\_\_ Standard note for traffic control & street closures
- \_\_\_ Schedule of Quantities with pay notes separate from construction notes
- \_\_\_ Contractor shall submit professional engineered trench excavation plan for all excavations in excess of 20 feet.
- \_\_\_ Reference City of Tulsa blasting ordinance if rock excavation is expected and include a pay note stating that blasting is included as unclassified excavation.
- \_\_\_ Drainage Basin Map shall clearly define all areas tributary to the subject property and/or proposed sewer main.
- \_\_\_ Show calculation of ordinance flow.
- \_\_\_ Pay Items Match and Reference the Proper Specifications.
- \_\_\_ Contractor shall repair any irrigation systems damaged during the course of construction. Payment shall be included in Right-of-Way Clearing and Restoring. No additional payment shall be made.
- \_\_\_ Construction adjacent to substandard stormwater inlets shall include replacement of proper sized inlets and the plans shall state hydraulic calculations.
- \_\_\_ Consider impact of multiple phases of construction, over an extended time period, terminating at a single location.
- \_\_\_ Modify the alignments as needed to minimize the disruption to the residential or commercial area.
- \_\_\_ Consider requirements for future access and maintenance when construction is in remote/undeveloped areas. (i.e. low water crossings, gates, access roads etc.)

#### Restoration:

- \_\_\_ Unsewered Areas: Include sod, salvage and replace fences, repair or replace irrigation systems, retaining walls and drainage structures.
- \_\_\_ Rehabilitation and other Pipeline projects: Full restoration, however, no trees replanted within easement

#### **C. Survey Data Sheet**

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- \_\_\_ Include overall plan view showing manhole numbers and control point locations
- \_\_\_ State Plane Coordinates on all proposed and existing manholes
- \_\_\_ USGS Elevations using NAVD 1988 datum
- \_\_\_ Locate and identify property pins on the Survey Data Sheet.
- \_\_\_ Minimum of two land ties (property pin, permanent or temp monument) providing hor./vert. control at each end of project and two land ties (section corners) at each section crossing
- \_\_\_ Survey Data Table (description, location, and coordinates); Table of manhole coordinates (MH #, X, Y, Z)

**D. Right-of-Way Sheet**

- \_\_\_ Show ROW and easements (include width and bearings if unplatted) with book and page or plat number
- \_\_\_ Show ownership name and legal description
- \_\_\_ Confirm dedicated ROW on unplatted properties
- \_\_\_ Verify width of ROW is sufficient for size of pipe and depth of excavation
- \_\_\_ Provide table of all required easements listing ownership and date signed or book and page number

**E1. New Construction Plan and Profile Sheets**

- \_\_\_ Appropriate current City of Tulsa Title Block (Eng. Services vs. Development Services) with advertisement date
- \_\_\_ Profile to dictate position of North Arrow (rising grade from left to right)
- \_\_\_ Atlas Page Number
- \_\_\_ Bench Marks on each sheet
- \_\_\_ Call OKIE on each sheet
- \_\_\_ District Boundary (Dimensions and Bearings – Description matches plans) SSID Only
- \_\_\_ Lettering height 0.10" minimum
- \_\_\_ New Construction shown in **bold** font
- \_\_\_ All pipelines stationed and manholes labeled; Use match lines where appropriate
- \_\_\_ Channel or creek crossing four feet minimum cover, D.I.P. manhole to manhole and Rip Rap channel
- \_\_\_ If less than 4 feet cover then place steel conduit 10' beyond upper toe each bank
- \_\_\_ Show FEMA A-Zone and Regulatory Floodplain
- \_\_\_ Water and sewer separation (two feet vertical and ten feet horizontal or D.I.P. per ODEQ regulations)
- \_\_\_ Pothole high-pressure gas pipelines at all crossings
- \_\_\_ List contact name, phone number, and necessary advance notification time for all impacted utilities and agencies
- \_\_\_ Show service tees in profile with station, size and direction
- \_\_\_ Service lines under paved surfaces shall be D.I.P. from ROW to ROW for public and private streets
- \_\_\_ Maximum depth for service connections to a property is 16 feet
- \_\_\_ Direction arrows on sewer line
- \_\_\_ Sewer located 12.5 feet from property line within 17.5 foot perimeter easement (new development)
- \_\_\_ Sewer located 7 feet south or west of property line within 11 foot easement (new development)
- \_\_\_ Minimum of 7.5 feet clear on each side of alignment along side lot line and D.I.P. only
- \_\_\_ Limits of pavement removal and replacement shown on plan view
- \_\_\_ Street features and special backfill requirements shown in profile
- \_\_\_ Sufficient survey data to reconstruct curbs and streets
- \_\_\_ D.I.P. in fill areas and within street ROW. Backfill/fill compacted to 95% Standard Proctor Density
- \_\_\_ Type "A" aggregate backfill entire trench under all paved driving surfaces
- \_\_\_ Sufficient depth of main to serve all intended properties (check cleanout elevations)
- \_\_\_ Service tee depth sufficient for service line to clear utilities and maintain cover at ditches
- \_\_\_ Sufficient capacity to serve the entire upstream drainage basin (based on revised ordinance flow equation)
- \_\_\_ Capacity to serve other basins if described in the Facilities Plan
- \_\_\_ Provide stub-outs for future extensions per Facilities Plan
- \_\_\_ Finished floor and cleanout elevations
- \_\_\_ Note locations where property owner is required to install backflow preventer (if building site is below the upstream/downstream manhole rim).
- \_\_\_ Two foot contour lines shown on plan view (existing [dashed] and proposed [solid])
- \_\_\_ Manhole spacing shall be no greater than 300 feet in residential areas or 400 feet in open areas. Longer spacing may be allowed on sewers 18" I.D. and greater per ODEQ specifications.
- \_\_\_ Manholes shall have a minimum depth of 4.0 feet, or a special structure will be required.
- \_\_\_ Sufficient pipeline slope considering minimum velocity of 2.0 FPS (Max. slope 8%)

Sanitary Sewer Pipe in Inches (Maximum slope 8%)									
Size	8	10	12	14	15	16	18	21	24
Min. Slope	0.40%	0.29%	0.22%	0.17%	0.15%	0.14%	0.12%	0.10%	0.08%

- \_\_\_ Existing utilities and features in plan view, include stationing of features in profile view
- \_\_\_ Conduit extended from ROW to ROW under all arterial streets
- \_\_\_ All conduits shall be steel with 3/8" wall thickness

## Conduit Sizing (Inches)

Carrier Pipe	6	8	10	12	14	15	16	18	20	24	30	36	42	48
Conduit	18	20	22	26	28	28	32	32	36	42	48	54	62	68

- \_\_\_ Pipe length, I.D. and slope identified
- \_\_\_ QA/QC for Schedule of Quantities; Match with items listed in proposal
- \_\_\_ Detail existing manhole connection with step location
- \_\_\_ Place manholes on lot lines where possible
- \_\_\_ Elevate manholes 1.0 foot above FEMA 100-year floodplain or provide sealed lids with approval
- \_\_\_ Offset dimensions of sewer line from property line
- \_\_\_ Allow for alternate pipe materials except where restricted
- \_\_\_ No flexible pipe at depth greater than 16 foot deep, larger than 15" ID, under paved surfaces, or within floodway
- \_\_\_ Safety considerations at schools, playgrounds, etc.
- \_\_\_ No service connections on mains 16" ID and larger (15" ID with UC approval only)
- \_\_\_ All trunk mains 16" ID and larger shall be D.I.P. with approved epoxy lining
- \_\_\_ All manholes associated with mains 15" ID and larger shall have interior epoxy coating
- \_\_\_ Match manhole diameter to appropriate pipe size (8" - 12" pipe: 4ft ID; 15" - 21" pipe: 5ft ID; 22" - 36" pipe: 6ft ID)
- \_\_\_ Provide restoration details of retaining walls, improved channels, and other special structures
- \_\_\_ Sewers terminating in a manhole shall project a minimum of 15.0 feet into property served, or 10.0 feet where a lamphole is used
- \_\_\_ Redevelopment involving the demolition of existing residential or commercial structures shall include a complete rehabilitation of all existing sewer facilities servicing the redevelopment. The developer shall be responsible for the cost associated with internal inspection, rehab plan preparation, and construction.
- \_\_\_ All sanitary sewer service lines 8-inch I.D. and larger shall be designed according to City of Tulsa public main line Standards, be reviewed by Development Services as part of SSID project, and be inspected by Development Services. The service line shall be clearly labeled "PRIVATE SERVICE LINE" on the plan sheets to clarify that the City of Tulsa will **NOT** maintain these lines. Development Services will obtain ODEQ permit for construction.

### **E2. Rehabilitation Plan and Profile Sheets (in addition to section E1 above)**

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- \_\_\_ Proper reference to Rehabilitation Specifications
- \_\_\_ Feasibility of bypass pumping
- \_\_\_ Plan and Profile shown for all open cut pipelines
- \_\_\_ Confirm sufficient capacity exists for all rehabilitation methods that reduce cross sectional area
- \_\_\_ Cost efficiency of multiple point repairs versus pipe lining

### **F. Detail Sheet(s)**

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- \_\_\_ Details of all manhole inverts
- \_\_\_ Show to scale, manhole diameter, pipe O.D., invert, minimum radius of invert (per Standard 366), location of manhole steps and list deflection angles.
- \_\_\_ Allow 1.0-foot clear space between O.D.'s of adjacent pipe.

### **G. Reviews**

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- \_\_\_ Underground Collections
- \_\_\_ Field Engineering
- \_\_\_ Water Design
- \_\_\_ Storm Water Design
- \_\_\_ Transportation Design
- \_\_\_ Infrastructure Management
- \_\_\_ Park Department
- \_\_\_ Surface Drainage
- \_\_\_ River Parks Authority
- \_\_\_ Local County Agency

### **H. Release Letter**

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- \_\_\_ Utility Coordinator
- \_\_\_ Right-Of-Way Section Manager

### **I. Permits**

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- \_\_\_ Corp of Engineers
- \_\_\_ Levee Authority
- \_\_\_ Railroad Crossing
- \_\_\_ ODOT
- \_\_\_ Turnpike Authority

- \_\_\_ Engineering Report Form for ODEQ Permit for construction (New sewer or increased capacity only)
- \_\_\_ NPDES (SWP3 required for all projects disturbing one (1) acre or more; NOI and NOT form to be completed by contractor)
- \_\_\_ Watershed Development Permit if constructing within floodplain

**J. Design Criteria**

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- \_\_\_ All City of Tulsa Design Criteria met
- \_\_\_ All ODEQ Design Criteria met

**Prepared By:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Proj. Engineer:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Lead Engineer:** \_\_\_\_\_

**Date:** \_\_\_\_\_