

City of Tulsa

Plans Review Check List - Wastewater Design Section

Project No. _____ Project Name _____

A. Cover Sheet

- ___ Project Name, Number and Account Numbers
- ___ Project Name and Number appear on the right edge of the plan coversheet
- ___ 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 Director Signature Block with Advertisement Date

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

- ___ 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.)
- ___ General note requiring that all signal and electrical work be done by a licensed electrical contractor.
- ___ Verify that all special specifications and special provisions have been included.
- ___ New service connections to private plumbing must be constructed by licensed plumber; reconnection of existing services or extension of service tees and risers (for future service) may be constructed by utility contractor.
- ___ To accommodate laminar flow at horizontal deflections in alignments of 15" ID and larger pipe, manhole configurations shall be designed such that outlet flows deflect from the inlet pipe alignment bearing by no more than 45 degrees unless otherwise approved.
- ___ To accommodate laminar flow no 90 degree bends shall be installed on 15" ID and larger pipe unless otherwise approved by city staff.

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

- ___ 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)

City of Tulsa

Plans Review Check List - Wastewater Design Section

- ___ All Right of Way Maps and Survey Data Sheets shall be sealed by a Professional Land Surveyor Licensed to practice Surveying in the State of Oklahoma.

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

- ___ All Right of Way Maps and Survey Data Sheets shall be sealed by a Professional Land Surveyor Licensed to practice Surveying in the State of Oklahoma.

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 for 12" and smaller lines, 3.5 FPS for 15" and larger lines.(Max. slope 8%)

City of Tulsa Plans Review Check List - Wastewater Design Section

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%	0.44%	0.41%	0.35%	0.28%	0.235%

- 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	20	20	24	24	30	30	30	36	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 properly 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)

- 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)

- 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

- Underground Collections
- Field Engineering
- Water Design

City of Tulsa
Plans Review Check List - Wastewater Design Section

- Storm Water Design
- Transportation Design
- Infrastructure Management
- Park Department
- Surface Drainage
- River Parks Authority
- Local County Agency
- OWRB

H. Release Letter

- Utility Coordinator
- Right-Of-Way Section Manager

I. Permits

- 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

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

Prepared By: _____

Date: _____

Proj. Engineer: _____

Date: _____

Lead Engineer: _____

Date: _____