City of Tulsa
Plans Review Check List - Wastewater Design Section

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)

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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%)
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### Sanitary Sewer Pipe in Inches (Maximum slope 8%)

<table>
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<th>10</th>
<th>12</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>18</th>
<th>21</th>
<th>24</th>
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<tbody>
<tr>
<td>Min. Slope</td>
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<td>0.29%</td>
<td>0.22%</td>
<td>0.17%</td>
<td>0.44%</td>
<td>0.41%</td>
<td>0.35%</td>
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<td>0.235%</td>
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### Conduit Sizing (Inches)

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<th>10</th>
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<td>42</td>
<td>48</td>
<td>54</td>
<td>62</td>
<td>68</td>
</tr>
</tbody>
</table>

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- 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

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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

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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.

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G. Reviews

- Underground Collections
- Field Engineering
- Water Design

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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: _____________________________