# Utility (Water and Sanitary) Report Checklist

| DESCRIPTION | PROVIDED (Engineer) | N/A | COMMENTS |
|---|---|---|---|
| **General Info** | | | |
| Cover sheet | ☐ | ☐ | |
| Project name (Legal name: Subdivision, filing, block, lot, address, etc.) | ☐ | ☐ | |
| Date (Revision date, if applicable) | ☐ | ☐ | |
| Applicant & preparer name and firm | ☐ | ☐ | |
| Responsible Party certification | ☐ | ☐ | |
| PE certification statement, seal and signature | ☐ | ☐ | |
| Developer certification statement, signed & notarized | ☐ | ☐ | |
| Table of Contents | ☐ | ☐ | |
| Description of Property and General Information | | | |
| Location | ☐ | ☐ | |
| Township, range, section, quarter section | ☐ | ☐ | |
| City, County, state highway and local streets within and adjacent to the subdivision | ☐ | ☐ | |
| Names of surrounding developments | ☐ | ☐ | |
| General Project Description | ☐ | ☐ | |
| Area in acres (verify with plat if available) | ☐ | ☐ | |
| Major drainageways and facilities w/in and adjacent to the site | ☐ | ☐ | |
| Existing major irrigation facilities such as ditches and canals | ☐ | ☐ | |
| Drainage and utility related easements within and adjacent to the site | ☐ | ☐ | |
| Proposed land use and project description | ☐ | ☐ | |
| Existing Infrastructure | ☐ | ☐ | |
| Water | ☐ | ☐ | |
| Locations and sizes of nearest utility network / point of connection | ☐ | ☐ | |
| Identification of water pressure zone(s) | ☐ | ☐ | |
| Reference to water supply master plan and impacts to project | ☐ | ☐ | |
| Sewer | ☐ | ☐ | |
| Locations and sizes of nearest utility network / point of connection | ☐ | ☐ | |
| Reference to sanitary sewer master plan and impacts to project | ☐ | ☐ | |
| Major basin characteristics with existing and planned land uses | ☐ | ☐ | |
| Confirmation of this system being downstream of a lift station outfall and discussion of project impacts | ☐ | ☐ | |
| Discussion of available capacity within the sanitary sewer system [*contact City Staff for existing mains 10" and larger*] | ☐ | ☐ | |
| Identification of existing utility reports and future anticipated development of adjacent subdivisions | ☐ | ☐ | |
| Detailed Design Criteria and Constraints | | | |
| Regulations | ☐ | ☐ | |
| Discussion of compliance with the City's Code and Standards | ☐ | ☐ | |
| Identification of optional provisions selected or any deviations or variances in the design | ☐ | ☐ | |
| Development Criteria Reference and Constraints | ☐ | ☐ | |
| Discussion of previous utility studies (including reports, master plans, etc.) which impact or are impacted by the design | ☐ | ☐ | |
| Discussion of the effects of adjacent utility studies or anticipated future development (by zoning) | ☐ | ☐ | |
| Discussion of the impacts of site constraints, such as streets, other utilities, existing structures, site plan | ☐ | ☐ | |
| Presentation and justification of other criteria or calculation methods utilized which are not included in the City Standards | ☐ | ☐ | |

| DESCRIPTION | PROVIDED (Engineer) | N/A | COMMENTS |
|---|---|---|---|
| Water System Design | | | |
| Existing Water Lines (size, type, zone, location) | ☐ | ☐ | |
| Disucssion of the proposed water system for the development | ☐ | ☐ | |
| Connections to existing lines (type, size, location, zone) | ☐ | ☐ | |
| Extension of mains or services for adjacent properties (sizing, location, and assumptions) | ☐ | ☐ | |
| Discuss anticipated water pressures based upon pressure zone(s) and site specific elevations | ☐ | ☐ | |
| Pressure Reducing Valves (Size, location, and settings) [***Incorporation must be approved by the City*** ] | ☐ | ☐ | |
| Discussion of water model results [***Coordinate extents of water model with City staff*** ] | ☐ | ☐ | |
| System analysis | ☐ | ☐ | |
| Static System | ☐ | ☐ | |
| Peak hour demands (Demand factors: 5.76 residential; 3.24 commercial) | ☐ | ☐ | |
| Fire flow with maximum daily demand at worst case hydrant(s) | ☐ | ☐ | |
| Maximum velocity of 10 fps in all lines (11.2 fps for 8-inch) | ☐ | ☐ | |
| Fire flows and hydrant locations satisfy requirements of Thornton's adopted Fire Code | ☐ | ☐ | |
| Sleeving locations and specific details (sizing of pipe and casing, type, cathodic protection) | ☐ | ☐ | |
| Offsite improvements required (including easements) | ☐ | ☐ | |
| Sanitary Sewer System Design | | | |
| Existing sanitary Lines (size, type, location) | ☐ | ☐ | |
| Verification of nearest upstream lift station outfall or downstream Metro sewer (within 1500 ft) | ☐ | ☐ | |
| Manhole lining per Detail 300-1 for any MH's within 1500 ft | ☐ | ☐ | |
| Development Sewer basin(s) | ☐ | ☐ | |
| Description of development discharge, and detailed nature and properties of all waste not ordinary to domestic sewage | ☐ | ☐ | |
| Average and hourly peak sewage flow calculations | ☐ | ☐ | |
| Velocity range of proposed sewer flows (2 fps min) | ☐ | ☐ | |
| % of pipe capacity utilized q/Q including anticipated peak flows from upstream properties | ☐ | ☐ | |
| Connections to existing lines (type, size, location, basin) | ☐ | ☐ | |
| Commercial Discharge Details | ☐ | ☐ | |
| Nature and type of activity expected | ☐ | ☐ | |
| Discuss the need if any for interceptors (grease, sand/oil) | ☐ | ☐ | |
| Extension of mains or services for adjacent properties (sizing, location, and assumptions) | ☐ | ☐ | |
| Impact on downstream sewer system | ☐ | ☐ | |
| Monitoring may be required to determine existing flow (if applicable) | ☐ | ☐ | |
| Identification of downstream locations which may require upsizing (if applicable) | ☐ | ☐ | |
| Sleeving locations and specific details (sizing of pipe and casing, type, cathodic protection) | ☐ | ☐ | |
| Offsite Improvements required (including easements) | ☐ | ☐ | |
| Lift Station Design | ☐ | ☐ | |
| Justification for lift station ***(Must be approved by the City and the State)*** | ☐ | ☐ | |
| Peak Wastewater flows (lift station and force main) | ☐ | ☐ | |
| Minimum (2 fps) / Maximum (6 fps) velocity calculations | ☐ | ☐ | |
| Emergency generator design | ☐ | ☐ | |
| Downstream impacts of $H_2S$ (recommendations) | ☐ | ☐ | |
| Conclusions | | | |
| Compliance with City Standards & Specifications, Code, Master Plans, Ordinances, & Policies | ☐ | ☐ | |
| Effectiveness of design to provide efficient supply of public water and wastewater utilities to proposed and upstream development | ☐ | ☐ | |
| Variances | ☐ | ☐ | |
| Identification and justification of sections of Standards for which variances are requested | ☐ | ☐ | |

| DESCRIPTION | PROVIDED (Engineer) | N/A | COMMENTS |
| --- | --- | --- | --- |
| Appendices | | | |
| Overall Utility Map *(Single Sheet, Plan)* | ☐ | ☐ | |
| Sheet size (22"x34") | ☐ | ☐ | |
| Scale provided (clear & legible) | ☐ | ☐ | |
| Show existing utilities adjacent to site and up to proposed points of connection | ☐ | ☐ | |
| Label approximate pressure zones | ☐ | ☐ | |
| Approximate minimum and maximum finished floor elevations and resulting pressures | ☐ | ☐ | |
| Sanitary sewer basin delineation | ☐ | ☐ | |
| Water System Design Calculations *(WaterCAD or acceptable alternative)* | ☐ | ☐ | |
| Summary of projected demands of proposed development with supporting calculations | ☐ | ☐ | |
| Non-residential Developments: Anticipated demand for each tenant (reported in acre-feet) | ☐ | ☐ | |
| Water model plan view (with nodes and pipes labeled consistent with overall CDs) | ☐ | ☐ | |
| Hydrant branch lines over 50.0 ft included in model to demonstrate required flow is met | ☐ | ☐ | |
| Water main sizing utilizes typical sizing only (6" hydrant branches, mains @ 8", 12", 16", 24", 30", 36", 42") | ☐ | ☐ | |
| Water model input/output tables (Nodes, pipe size, type, velocities, pressure, etc.) | ☐ | ☐ | |
| Maximum Hazen-Williams C = 130 | ☐ | ☐ | |
| Maximum pressure scenario (High zone HGL, no demands) | ☐ | ☐ | |
| Maximum 110 psi (static) | ☐ | ☐ | |
| Minimum pressure scenario (Low zone HGL, no demands) | ☐ | ☐ | |
| Minimum 50 psi (static) | ☐ | ☐ | |
| Minimum pressure w/ peak demand scenario (Low zone HGL, peak hour demands) | ☐ | ☐ | |
| Minimum 40 psi (residual), maximum velocity 5 fps | ☐ | ☐ | |
| Minimum pressure with fire flow scenario (Low zone HGL, peak hour and fire flow demands) | ☐ | ☐ | |
| Minimum 20 psi (residual), maximum velocity 11.2 fps (8") and 10 fps (all other) | ☐ | ☐ | |
| Hydrants modeled with maximum 1750 gpm, multiple hydrants used to achieve required flow if needed | ☐ | ☐ | |
| Include Thornton Fire Department fireflow calculation | ☐ | ☐ | |
| Sanitary Sewer Design Calculations *(Spreadsheets, data & equations)* | ☐ | ☐ | |
| Main sizing utilizes typical sizing only (8", 10", 12", 15", 18", 21", 24", 30") | ☐ | ☐ | |
| Manning formula n = 0.013 | ☐ | ☐ | |
| Average and hourly peak quantity of sewage flow generated by project | ☐ | ☐ | |
| Anticipated peak flows from all upstream properties | ☐ | ☐ | |
| Calculated peak flow factor (3.5 maximum, 2.6 minimum) | ☐ | ☐ | |
| Projected average & hourly peak quantity (Wastewater with peak flow & densities) | ☐ | ☐ | |
| Residential: 80 GPD per person | ☐ | ☐ | |
| Low density (less than 5 DU/Ac) = 3.45 people/unit | ☐ | ☐ | |
| Mid density (5 to 12 DU/Ac) = 2.45 people/unit | ☐ | ☐ | |
| High density (more than 12 DU/Ac) = 2.20 people/unit | ☐ | ☐ | |
| Commercial and industrial: 600 gallons/acre/day, or more specific flows with justification | ☐ | ☐ | |
| Capacity | ☐ | ☐ | |
| Designed to carry peak discharge (max q/Q: 50% full < 15 in., 80% full ≥ 15 in.) | ☐ | ☐ | |
| Calculations provided at all critical design points (lowest slope, highest volume) for each pipe size | ☐ | ☐ | |
| Downstream sanitary sewer system capacity | ☐ | ☐ | |
| Existing system flow monitoring results (if applicable) | ☐ | ☐ | |
| Velocity of proposed sewer (2 fps minimum) | ☐ | ☐ | |
| Non-typical discharge quantity and details | ☐ | ☐ | |
| Lift station design supporting references and calculations | ☐ | ☐ | |
| Reference Excerpts | ☐ | ☐ | |
| City of Thornton Master Plans, Pressure Zone Map, and Sewer Basin Map (with markups identifying location of development) | ☐ | ☐ | |
| Previous utility studies or master plans which include the development area (with identification of relevant information) | ☐ | ☐ | |
| Adjacent development utility reports or concept plans (relevant sections with specifically relevant information identified) | ☐ | ☐ | |
| Technical information utilized in preparation of the report not contained within City Standards | ☐ | ☐ | |