



DESIGN DRAWING STANDARDS FOR PROPOSED DISTRICT DISTRIBUTION FACILITIES

The following drawing standards apply to the design of any water distribution facilities that are being submitted to the District for approval. In the case of a project that includes the design of multiple utilities, the Design Engineer may use their own AutoCAD standards and cover sheet layout. However, the District still requires that the design of the water distribution facilities be provided separately from the other utilities, following the format as described below.

DRAWING REQUIREMENTS

1. Drawings shall be prepared using the District's drawing standards, including layer names, line types, line weights, symbols, .ctb file, details, etc. All drawings shall be prepared using the District's title block with the Design Engineer's company logo placed in the space provided. All District standards are available at www.skagitpud.org.
2. Final Drawings shall be submitted on good quality reproducible paper copy, along with an electronic file on Compact Disk (CD) media in AutoCAD drawing format and shall be archived so that all x-references, including title block and border, are a permanent part of the drawing. Drawings submitted in .plt or .pdf format are not acceptable.

COVER SHEET

All plan sets must have a cover sheet, followed by the plan and profile sheets, then followed by the detail sheets. The cover sheet shall be Sheet 1 of the plans and must contain the following:

- Project Title: Title shall be in large, bold text, located on the upper center of the cover sheet. Typical project titles shall describe the District area, or primary street name and street termini.
- Project Description: Describe the type of work the project includes, such as: *Replace 100 feet of 4" A.C. pipe with 100 feet of 8" D.I. pipe*
- The District Construction Order Number (C.O. # _____) and the Work Order Number (W.O. # _____).
- Name and contact information of the Engineer.

- Vicinity Map showing the location of the project within the District.
- Sheet index
- Signature block for approval of appropriate fire district.

PLAN/PROFILE/DETAIL SHEETS

- Design drawings for proposed pipelines are required to show a plan view and a profile view of the pipeline on the same sheet.
- Sheet size shall be 22"x34" unless otherwise approved by the District.
- Drawings shall contain a North arrow on each plan /profile sheet with North oriented to the top or right side of the drawing.
- Drawings shall contain a bar scale on each plan sheet. The horizontal scale shall be 1"=20' unless otherwise approved by the District. The vertical scale shall be as appropriate.
- Paper copies of drawings shall contain the stamp and signature of a registered Professional Engineer on each sheet.
- All dimensions shall be shown in feet, tenths and hundredths of a foot.
- Road centerlines in relation to right-of-way shall be shown. The names of public and private roads shall be shown.
- Existing underground utilities, including water mains shall be shown in the appropriate line type.
- All existing underground utilities shown on the plan view that cross the proposed waterline must be shown on the profile at the surveyed depth. If the depth is unknown, then the utility shall be shown at an assumed depth of three feet with a note that states "depth unknown".
- Profile portions of water drawings shall show the proposed waterline in relation to other existing utilities. The profile must include rim elevations of all structures and manholes, invert elevations of all pipes connecting to structures and manholes, length of proposed waterline between structures or pipe grade breaks, pipe grade and utility crossings.
- Items to be called-out on the drawings shall include valves, fittings and their connections, and appurtenances such as air vacuum assemblies, blow-offs, flushing assemblies, hydrants and service connections.

- Drawing Callouts should be formatted as follows:

A. Plan View

- Call out the type of pipe, class of pipe, type of joint and restraint if applicable on plan view.
- Fittings and deflections that affect horizontal alignment should be called out in plan view only.
- Use following format on leader lines for fitting callouts:

STA XX + XX, XX' RT or LT

[number] – [size] [material] [fitting], [connection type] (Direction)

Example: STA 25 + 75, 10' RT

1 – 12" x 8" DI TEE, FL

1 – 8" DI GATE VALVE, FLxMJ (W)

1 – 8" DI SPOOL, PExPE (W)

1 – 8" FLEX COUPLING (W)

1 – 12" DI BUTTERFLY VALVE, FLxMJ (N)

B. Profile View

- Fittings and deflections that affect vertical profile should be called out in profile view only.
- Use same fitting callout format as in plan view
- For storm and sanitary callouts on the profile view, use following format:

SSMH [size] or CB [type] [size]

RIM = XX.XX

IE [size] [material] (IN or OUT) (Direction) = XX.XX

Example: SSMH 60"

Rim = 60.75

IE 12" PVC IN (W) = 49.95

IE 12" PVC OUT (N) = 49.00

CB Type 1 48"

Rim = 31.75

IE 6" CONC IN (N) = 27.25

IE 12" CONC OUT (E) = 26.95

- Standard details and other project specific details should be consolidated and placed on sheets at the end of the plan set. Plan/profile sheets and detail sheets shall be cross referenced with the sheet and detail numbers of appropriate details.
- The Districts General Notes shall be included and District standard details shall be used unless a specific detail has not been developed and an alternative has been approved by the District.
- All new District pipelines shall be shown in bold and referenced to and stationed along the centerline of the street or right of way from West to East or South to North. Stationing shall start at most westerly point and increase to the east, or start at most southerly point and increase to the north. Start all stationing at 1+00. Stationing for points of curve, points of tangent and intersections shall be shown. For pipelines located within easements, stationing shall be along pipeline centerline.
- All existing District pipelines shall be shown on the plan view, along with the District CO number and year of installation. Coordination will be required with the District to research existing pipelines and their location.
- Show all existing water meters along the route and specify that the services are to be re-instated with new 1" Rehau Municipex Type A pipe, unless otherwise specified.
- All new and existing District pipelines shall be drawn utilizing an offset from the existing right-of-way and/or road centerline.
- Road centerlines shall include length and bearings of all straight lines, curve radii, curve delta angles and arc lengths.
- A typical road or street section with roadway prism, ditches, underground utilities, etc. shall be included.

REVISION BLOCK

- Original submittal of plan set to District for review shall be noted in the revision box located on the District title block.
- All design changes made after District approval shall be noted in the revision box and revised plans shall be re-submitted to District for review.

RECORD DRAWINGS

- Upon completion of the project, the original drawings shall be changed to reflect the actual construction of the project and be submitted to the District as **Record Drawings**. Each sheet shall bear the stamp and signature of the Engineer of Record and the words "Record Drawings" shall be prominently shown.

- All changes made during construction shall be noted in the revision box. Plan and profile sheets should be clouded and noted in all areas where revisions have occurred and cross referenced with the revisions entered in the revision box. Revision clouds and notes shall be placed on a “Revision_#” layer so they can be isolated during review.

DESIGN REQUIREMENTS

The following design requirements apply to all new water pipeline construction within the District, regardless of whether the project is being designed for the District, a Developer or another jurisdiction within the District.

- Any new pipelines shall be offset a minimum of 5 feet center to center from existing or retired water pipelines. Department of Health guidelines require a 10-foot horizontal separation and an 18-inch vertical separation between water pipelines and sewer mains. The District requires a minimum 12inch vertical separation between water pipelines and other utilities.
- Include a 1-inch air/vac assembly for a proposed 8-inch pipeline or a 2-inch air/vac assembly for a 12-inch pipeline at any high points as determined by the profile.
- Include a 2-inch flushing assembly for proposed pipelines, 8-inch diameter or less, and a 3-inch flushing assembly for proposed 12-inch pipelines at the ends of new proposed pipelines. For pipelines larger than 12-inch diameter, contact the District for requirements.

SURVEY REQUIREMENTS

The following survey requirements apply to all survey only projects put out for bid and awarded by the District. Contractors doing work for developers or other jurisdictions may use their own survey standards. The District still requires, however, that NAD83/91 horizontal datum and NAVD 88 vertical datum be used.

1. All surveys shall be completed to NAVD 88 vertical datum, and NAD83, Washington State Plane Coordinates, North Zone horizontal datum. A copy of the original survey notes must be submitted to the District for future reference.
2. The Surveyor shall locate and show on the topographic survey drawing the following information located within the road right of way or other project limits as determined by the District:
 - The location of permanent structures including retaining walls, bridges, and culverts.
 - Description, location and elevation of bench marks used in the survey.

- All found monuments and property corners shall be shown. All survey points shall also be provided to the District in digital format.
- Right of way lines and easements shall be shown with appropriate dimensions. Easements shall be labeled with the Auditor's File Number or Book and Page of each referenced document and the name of the owner of the property over which the easement is located.
- Location and the top elevation of soil borings or monitoring wells if ascertainable.
- Road cross-sections including road centerline at 50-foot intervals. The location of curbs, gutter lines, sidewalks and ditch centerlines.
- Intersecting streets shall be shown along with their names, accompanying topography, utilities and other improvements for at least 100 feet on each side of the intersection point.
- Existing contours shall be drawn to show abrupt elevation changes.
- Location, diameter, and species of all trees over an 8-inch diameter. Perimeter outline only of thickly wooded areas unless otherwise directed.
- Electric utilities – the location of power poles, guy wires, anchors, vaults, etc., within the right-of-way or project limits as defined by the District.
- Storm, sanitary or combined sewers – the location of all observable manholes and other structures such as culverts, headwalls, catch basins and clean-outs within road right-of-way. Include elevations of the top of manholes and catch basins. Show type, size, direction of flow and invert elevation of all pipes or culverts.
- Water – the location of any water valves, water line markers, standpipes, meters, regulators, fire hydrants, etc. that are visible within the road right-of-way.
- Gas – the location of all valves, meters, and gas line markers that are visible within the road right-of-way.
- Telephone – the location of all poles, manholes, boxes, etc. that are visible within the road right-of-way.
- Street lighting – the location of all lamp poles, boxes etc.
- Location of any existing buildings, tanks, fences, miscellaneous structures and driveways within the road right-of-way.
- The Surveyor shall provide the survey data in AutoCAD drawing format. All survey points shall consist of point number, elevation and point description.