

SURVEY AND DRAFTING STANDARDS

SURVEY STANDARDS

All surveys and survey reports shall be prepared under the direct supervision of a person registered to practice land surveying under the provision of [Chapter 18.43 RCW](#). All surveys and survey reports shall be prepared in accordance with the requirements established by the Board of Registration for Professional Engineers and Land Surveyors under the provisions of [Chapter 18.43 RCW](#).

The horizontal component of all surveys shall have as its coordinate base: The North American Datum of 1983/91. All horizontal control of projects must be referenced to or in conjunction with a minimum of two of the City of Renton's Survey Control Network monuments.

The vertical component of all surveys shall be based on NAVD 1988, The North American Vertical Datum of 1988, and tied to at least one of the City of Renton's Survey Control Network benchmarks. If there are two such benchmarks within 3,000 feet of the project site a tie to both shall be made. The benchmark(s) used will be shown on the drawing. If a City of Renton benchmark does not exist within 3,000 feet of a project, one must be set on or near the project in a permanent manner that will remain intact throughout the duration of the project. Source of elevations (benchmark) will be shown on the drawing, as well as a description of any benchmarks established.

Corners and Monuments

At a point on a land boundary, at the juncture of two or more boundary lines, a monument is usually set at such points to physically reference a corner's location on the ground.

As-Built Survey

All improvements required to be "as-built" (post construction survey) per City of Renton Codes, *Title 4 Development Regulations and Title 9 Public Ways and Property*, must be located both horizontally and vertically by a radial survey or by a station offset survey. The "as-built" survey must be based on the same base line or control survey used for the construction staking survey for the improvements being "as-built". The "as-built" survey for all subsurface improvements should occur prior to backfilling. Close cooperation between the installing contractor and the "as-building" surveyor is therefore required. All "as-built" surveys shall satisfy the requirements of the City of Renton and shall be based upon control or base line surveys made in conformance with all requirements herein. The field notes for "as-built" shall meet all requirements and shall be submitted with stamped and signed "as-built" drawings which includes a statement certifying the accuracy of the "as-built".

Monument Setting and Referencing

All property or lot corners, established, or reestablished on a plat or other recorded survey shall be referenced by a permanent marker at the corner point. In situations where such markers are impractical or in danger of being destroyed, e.g. the front corners of lots, a witness marker shall be

set. In most cases, this will be the extension of the lot line to a tack in lead in the curb. The relationship between the witness monuments and their respective corners shall be shown or described on the face of the plat or survey of record, e.g. "Tacks in lead on the extension of the lot side lines have been set in the curbs on the extension of said line with the curb."

DRAFTING STANDARDS

1. All plans shall be prepared on standard mylar sheets. The standard sheet size is **ANSI "D" size, 22 inches x 34 inches** and City of Renton approval block, shall be on all sheets.
2. The Professional Engineer's seal, signature, address, and phone number shall be placed in the title block in the lower right portion of the sheet.
3. The drawing shall be in ink or permanent photo mylar. No "sticky-back" or pasted pieces shall be allowed. The base map showing existing features shall be screened to one-half tone.
4. Use City of Renton Survey Control Network based on NAD 1983/1991 (horizontal) and NAVD 1988 (vertical) datums for survey reference. All projects shall be tied to the City's Survey Control Network, per the [City of Renton Standard Details](#), found in [Section 1-11, City of Renton Supplemental Specifications](#). All horizontal control for projects must be referenced to or in conjunction with a minimum of two of the City of Renton's Survey Control Network monuments. All vertical controls shall be tied to at least one of the City of Renton's Survey Control Network benchmarks.

All existing and proposed improvements shall be referenced to the City of Renton Survey Control Network. All horizontal control for projects must be referenced to or in conjunction with a minimum of two of the City of Renton's Survey Control Network monuments, and conform to the [City of Renton Standard Details](#) per [Section 1-11, City of Renton Supplemental Specifications](#). If a City of Renton benchmark does not exist within 3,000 feet of a project, one must be set on or near the project in a permanent manner that will remain intact throughout the duration of the project. Source of elevations (benchmark) will be shown on the drawing, as well as a description of any benchmarks established.

5. All existing and proposed improvements shall be located and dimensioned to City of Renton survey monuments, monument lines or street centerlines. Dimensioning must be done by stationing and offset from these control lines.
6. Scales: Use Horizontal Scale of 1" = 20', and Vertical Scale of 1" = 10', unless otherwise required or approved by the Technical Services Section. (Note: complex utility locations may require a larger scale plan to show the necessary detail).
7. Draw the plan so the North Arrow points to the left or to the top of the sheet.
8. Control line distances and features shall at no point have an error of 0.2 feet (scaled distance) on a 20-scale drawing.
9. Use the standard Washington State Chapter of the American Public Works Association symbols as supplemented by current [City of Renton Standard Details](#).
10. Match lines with matched sheet number shall be provided where plan is drawn on two or more sheets. Where plan is shown on three or more sheets, include a total site plan key map at scale 1"

= 100' or 1" = 200' to cross reference portions of the project with their corresponding plan sheet location.

11. All division or phase lines shall be indicated showing proposed limits of construction.
12. Existing and proposed topography contours shall cover the entire site and a minimum of 30' beyond the site boundary. Existing topography should be screened. Topography contours shall be shown at 2-foot intervals (5-foot intervals for slopes greater than 15%; 10-foot intervals for slopes greater than 40%). Elevation labeling shall be shown at 10-foot intervals, maximum.
13. Show and clearly label property lines (with distances and bearings), right-of-way lines, sensitive areas, setbacks and all existing and proposed easements with their recording numbers. Show existing and proposed building footprints.
14. Plans shall include a key for abbreviations and a legend for symbols where such are used.

In addition to the survey and drafting standards above, the following information should be included within utility and transportation plans as appropriate:

Plan, Profile and Cross Section Information Required (General):

1. Each submittal shall contain the following project information on the cover sheet or first sheet:
 - Title: Project name (add explanatory note if project name has changed).
 - Table of Contents (if more than 3 sheets).
 - Vicinity Map (Scale sufficient to cover project limits on one sheet or 1" = 200', whichever is greater).
 - General description of site, including Quarter Section, Township and Range.
 - Name and phone number of architect and/or engineering firm preparing plans.
 - City of Renton Permit Number incorporated into the title block on all sheets.
2. Organize the plans such that they are separated into type of improvement and drawing order. Each improvement type should include all plans, profiles, notes, sections, details, schedules, diagrams, etc. for that facility. The required order of drawings is as follows:
 - a) Cover sheet drawing.
 - b) Temporary Erosion and Sediment Control Plans.
 - c) Removal/grading/paving/storm drainage drawings (large projects may require separate removal/paving drawings).
 - d) Structure/retaining wall drawings associated with civil improvements.
 - e) Construction erosion control drawings.
 - f) Sanitary sewer drawings.
 - g) Water systems drawings.
 - h) Street lighting drawings.
 - i) Traffic signals drawings.

- j) Signing/channelization drawings.
 - k) Landscaping drawings (for right-of-way landscaping).
 - l) Traffic control (detouring and/or construction sequencing) plans. See City of Renton website for standards for [Traffic Control Plans](#).
 - m) Miscellaneous drawings.
 - n) Composite utility drawings.
3. Existing Improvements and Topography: Show all existing underground and surface improvements and topography in proximity to the project. The information must be shown for the full width of the right-of-way or the easement and for a sufficient distance on either side of the right-of-way or easement to show possible impacts on adjacent properties and/or the relationship to related facilities. Information on existing surface and underground City of Renton facilities may be obtained from the sixth floor information counter or City of Renton Maps (COR Maps). Other utility information may be obtained from the respective utility owners (i.e. Puget Sound Power and Light, U.S. West, Washington Natural Gas, etc.).
 4. Include a composite utility plan sheet showing existing utilities (half tone) and all new utilities. Scale should be 1" = 50'. Composite utility plan should indicate all utility crossings and call-out invert elevations of pipelines at all crossing points. Utilities of concern include water, sanitary sewer, storm drainage, power, cable TV, gas, telephone, street lighting, traffic signal wiring, signal interconnect and sign wiring.
 5. Label call-out for each section or detail in the plans. Section and detail call-outs should be shown on both the plan and the section detail and should include assigned section/detail numbers and plan sheet location number.
 6. Sewer, Water and Drainage Improvements: Provide profiles of all proposed sewer, water and drain lines. Show existing underground improvements within ten (10) feet of where they cross or connect to the new improvements. Show the storm water drainage discharge point to a public system or natural water course. Provide drainage system details whether or not detention of storm water is required.
 7. Grades: All profile and cross sections must show the proposed as well as the existing grade.
 8. All watermains are required to be within utility easements granted to the City of Renton in a form acceptable to the utility. Easement widths for watermains shall be 15 feet minimum width and shall include area sufficient for all necessary appurtenances such as hydrants, valves, meters, blocking, etc. Easements shall be shown on the watermain plan sets. (See Easement Criteria Section).
 9. Sanitary sewers and storm drain lines not within street right-of-way shall be within easements granted to the City of Renton in a form acceptable to the Utility. The easement widths will vary according to pipe diameter, but shall not be less than 15 feet wide. Easements shall be shown on the sanitary sewer and/or storm drainage plan sheets. (See Easement Criteria Section).
 10. Submit two (2) copies of the drainage report in accordance with RMC 4-6-030K.3

11. Incorporate City of Renton storm water, sanitary sewer, water and temporary erosion control plan notes into appropriate plan sheets, which can be found on the City of Renton website on the [City of Renton Standard Details](#) page.
12. For building permit applications, submit the quantity copies of the plans as are required by the City's Building Section. For non-building permit related submittal of engineering plans, submit four (4) copies of the plans along with two (2) copies of the Storm Drainage Report, to the 6th floor Customer Service counter.
13. Stationing shall be provided on all centerlines and reference lines. All intersecting street centerlines, utility crossings, right-of-way lines, property lines, railroad crossings, drainage structures and signal and light poles shall be referenced by station and offset. Curve data shall be provided for roadway centerline and right-of-way curves. All PC's, PT's, PRC's, PCC's and AP's shall be stationed and offset.

In addition to the items listed above, the following should be included within the plans:

Storm Water Utility Plans:

1. Label all manholes, clean outs and catch basins in sequential number. Label rim and invert elevations and catch basins and manhole size and type.
2. Include flow direction arrows on all storm lines.
3. Label pipe size, length, material and slope.
4. Include datum and benchmark information on each plan and/or profile sheet.
5. Show spot elevations of pavement in parking lots, and runoff flow direction arrows.
6. Show roof leaders and footings drains connecting into conveyance system.
7. Show all stub-out locations for future connections.
8. Include section details for rockeries in grading/paving plans.
9. Show the following for all storm water facilities:
 - a) Show and label at least two cross-sections through detention pond. One cross-section shall show the control structure.
 - b) Show location and detail of emergency overflows and spillways.
 - c) Provide invert elevations of all pipes, inlets, tanks, vaults and spot elevations of the pond bottom. Call out pond volume and dimensions, and design surface elevation.
 - d) Provide plan and section views and details of all rock protection and energy dissipaters.
 - e) Section and plan view on restrictor/control structure must be shown and adequately detailed, including size and elevation of orifices.
 - f) Show length, width, and bottom width dimensions for all bio-filtration, water quality swales and storm water conveyance swales. Include sectional view, showing side slopes and design depth of flow.
 - g) Include seeding material information.

10. The Temporary Erosion and Sedimentation Control (TESC) plan should show the following:

- a) Tree protection details and locations.
- b) Proposed topography.
- c) Clearing limits.
- d) Location and details for construction entrance.
- e) Specify the construction sequence.
- f) Provision for perimeter runoff control at property boundaries.
- g) Show all cut and fill slopes, indicating the top and bottom of slope catch lines.
- h) Provide all necessary details to illustrate the intent of the TESC plan.
- i) Show interim catch basin sedimentation protection.
- j) Show all drainage pipes and ditches. Include pipe inverts, minimum slopes and cover, and ditch grades and dimensioning.
- k) Specify areas to receive special treatment such as jute matting, rock lining, sod, mulching and seeding.
- l) Provide all necessary dimensioning and details for sediment traps, berms, pond storage, pond outlet structure, filtering devices, inlet/outlet stabilization techniques, control/restrictor devices, rock check dams, silt fabric fences, pond inlet baffles, and other design elements.

Waste Water Utility Plans:

1. Label all manholes and clean outs in sequential number. Label rim and invert elevations and manhole size and type.
2. Include flow direction arrows on all sewer lines.
3. Label pipe size, length, material and slope.
4. Include datum and benchmark information on each plan and/or profile sheet.
5. Show spot elevations of pavement in parking lots, and runoff flow direction arrows.
6. Show all stub-out locations for future connections and side sewer connection stubs.

Water Utility Plans:

1. Show "before" and "after" connection details for watermain connections. Refer to [City of Renton Standard Details](#) for samples of connection details.
2. For utility crossings which involve vertical offsets in water line, provide detail showing the crossing, including vertical bends, blocking, shackle rods, and pipe invert elevations.
3. Watermains south of SW Sunset and west of SR 167 will be polywrapped.
4. Show locations of vertical crosses for polypigging of new mains.
5. Call out types of fitting connections (MJ = mechanical joint, FL = flanged; PE = plain end; RJ = restrained joint).

6. Hydrants shall be free and clear of all structures. Landscaping or other interferences for a minimum of 3 feet of clearance around the hydrant.
7. Show Renton details for the following items:
 - a) Fire hydrant.
 - b) Appropriately sized water services and meters.
 - c) Compound meter, when used.
 - d) Temporary or permanent blow-offs, when used.
 - e) 12-inch gate valve or \geq 16-inch butterfly valve in vault, when used.
 - f) Air-vacuum release valve, when used.
 - g) Irrigation water double check valve assembly, when used.
 - h) Detector double check valve assembly for fire sprinkler vault, when used.
 - i) Details of watermain connections. Note that the correct detail(s) should be selected.
8. Plans for watermains located in easements over, on and across private property shall contain the following information and standards:
 - a) Locate watermains in driving lanes (not under parking stalls).
 - b) Show locations of all hydrants (proposed and existing) within 300-feet of site.
 - c) Show location and size of Detector Double Check Valve assembly for fire sprinkler vaults. Also, show location of fire department connections, direction of pumper ports, and distance from curb.
 - d) Show size and location of domestic water meters and of irrigation water meters and the associated double check valve assembly.
 - e) Show location of carports, dumpsters, and mailboxes.
 - f) Show primary hydrant within 150-feet of structure, and no closer than 50-feet. Hydrant leads over 50-feet long shall be minimum 8-inch diameter.

Transportation Plans:

Roadway improvements include but are not limited to paving, curbs, gutters, sidewalks, driveways, curb ramps, storm drainage structures, street lighting, traffic signals, signing, channelization, ADA ramps, and landscaping plans.

1. Establish base line or centerline adequately dimensioned from at least two known reference points or monuments approved by the City of Renton.
2. Adequately dimension all improvements off of established base line or centerline.
3. All plans shall be stationing, with true point of origin for stationing dimensioned from monument. If 0+00 stationing point does not coincide with monument, tie in with station equation. Stationing should increase from left to right or bottom to top.

4. When possible street improvements in right-of-way should have profile drawing beneath plan view.
5. Provide adequate cross-sections to assure that proposed improvements will correspond with existing conditions, and with City requirements for improvements.
6. Provide adequate information on roadway geometry, including PC, PT, PRC, PCC, AP, radius, curve angle, tangent length, curve length and all other information required to adequately establish the geometry. Provide adequate information on roadway profile, including vertical curve approach grades and length of vertical curve and all other information required to adequately establish the profile.
7. Provide spot elevations and slope call-outs where improvements abut with existing pavement. Show top of curb elevation at suitable intervals along curblines, and all break in grades.
8. Provide profile drawings for all private roads, and for driveways whose slope exceeds 5%.
9. Include all appropriate [City of Renton Standard Details](#) in plans.
10. Show bearings and distances for all new roadway alignments.
11. Clearly call-out existing and proposed right-of-way, and dimension.
12. Show all existing and proposed easement on plans.
13. Design street lighting, signals, signing and channelization, per City standards, and include appropriate [City of Renton Standard Details](#). Also include table of wiring schedule, wiring schematic, table for luminaire schedule, notes, and details.
14. Traffic control plan is required on all projects and must be approved by the City of Renton.
15. On composite utility plan, show overhead and underground electrical and communication facilities.
16. Plans for structures shall be fully dimensional and shall show complete construction elevations. All plans shall provide the necessary detail required for preparation of bar schedules and bar placement without the necessity of making separate shop or placement drawings. Structural steel use shall include such detail that shop drawings can be prepared without additional design.

Easement Criteria:

Utilities and roadway improvements that are to be a part of the public system and represent a part of the City's capital improvements shall be constructed in public rights-of-way or easements. Easements granted to the City of Renton for the placement of public utilities shall be in a form acceptable to the City. The following information shall be provided for all easements:

1. Legal description, which shall be certified by a registered Land Surveyor or Professional Engineer if it is a Metes & Bounds or a Centerline based description.
2. A scaled drawing on 8 ½" by 11" sheet showing the easement in a clear legible manner.
Then a separate right of way plan shall be prepared giving the following plan information:
 - a) Easement limits, easement centerline, centerline stationing, bearings and distances.
 - b) Location of the utility within the easement.

- c) Distance from the utility line to the easement centerline.
- d) Centerline stationing and offset for all valves, fittings, meters, hydrants, vaults, manholes, blow-off assemblies, bends, outfall structures, utility crossings, intersection with street centerlines and property lines.
- e) Watermains, sanitary sewers and storm drain lines shall normally be located within center of easement if possible. If not, please identify if not the case.
- f) Easements for utilities shall be fifteen (15) feet in width or greater if required by the Utility Director to accommodate larger pipe sizes, access needs or other special requirements.