



**CITY OF BAINBRIDGE ISLAND
PUBLIC WORKS**

**SURVEY
PROJECT
REQUIREMENTS
&
STANDARDS**

**City of Bainbridge Island
Public Works Engineering Department**

February 29, 2008

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Introduction

The City of Bainbridge Island is constructing a Geographic Information System (GIS) to track legal boundaries, survey control, and constructed features such as utilities and roadway improvements. This information will be used by city personnel, other government agency personnel, developers, engineers, business owners/operators and citizens for planning, design and maintenance purposes. Two of the main sources of information for GIS are the surveys of existing conditions and the drawings of record supplied to the City after features are constructed.

The City of Bainbridge Island requires that survey and engineering consultants performing surveys for the City and constructing improvements in the City provide accurate drawings (Record Drawings) documenting improvements.

The purpose of this document is to provide the surveying and engineering consultants with the appropriate guidelines for completing surveys created for the City of Bainbridge Island. An additional document named "CAD Standards" provides the necessary guidelines for completing drawings for the City.

Compliance with agreed upon project control and data management conventions is important to the City and public in terms of quality control and return on investment. The success of this compliance/cooperation will influence the continuation of the present program of contracting with private surveying firms for City projects.

Record Drawings shall be prepared and certified by a Professional Engineer and/or Professional Land Surveyor currently licensed in the State of Washington.

It is anticipated that all of these standards will be reviewed and revised over time as the variety and complexity of drawings produced increases. Therefore, periodic updates to these standards are anticipated and the latest version should be requested before starting a new project.

City Datum

All project plans shall be accurately located in Washington State Plane Coordinates, North Zone NAD 83/91 (HARN) and the horizontal coordinates shall be tied to two (2) City of Bainbridge Island Horizontal Control Monuments.

In addition, vertical control shall be tied to at least one City of Bainbridge Island Vertical Control Datum monument (NAVD 88).

The City is working towards establishment of a survey control network based on the Washington State Reference Network which is referenced to NAD83 (CORS96) Epoch 2002.00.

General Information

All consultant survey work done for the City shall be coordinated and completed under the direct supervision of a State of Washington Professional Land Surveyor licensed by the State of Washington in accordance with their professional services contract with the City of Bainbridge Island.

Surveys done under contract to the City by private surveyors provide important information to update the City of Bainbridge Island's Geographic Information System (GIS) database as well as meet the surveying and CAD needs for specific projects. The City of Bainbridge Island is interested in maintaining and expanding its GIS and survey base drawing files with information provided through this consulting surveying process.

Since most of the surveying work done by private surveyors will have to be archived and used by City staff and the public for many years, it is essential for surveying work to comply with City of Bainbridge Island Survey and CAD Standards.

All survey data will be submitted to the City in a digital format that is compatible with the version of AutoCAD currently being used by the City of Bainbridge Island. Any departure from the requirements set forth in this document must be approved by the City before any work is started by the consulting survey firm. Surveys not complying with this convention will not be accepted.

Departures from data collection and presentation conventions will be approved by the City Survey Manager and the Project Manager prior to beginning surveying work. **In all cases, the Revised Code of Washington (RCW) and the Washington Administrative Code (WAC) shall take precedence over policy and convention.**

Steps for Satisfaction of Standards Requirements for Survey Projects

- 1. Pre-Project Planning**
- 2. Field Survey Requirements**
- 3. CAD Standards**
- 4. Deliverables**

1. Pre-Project Planning

Prior to the start of any survey work, the following steps will be required:

- A job-specific Survey & Mapping scope of work document (see Appendix) must be coordinated with and approved by the City's Project Manager and the City survey representative prior to beginning surveying work for the City. This scope of work shall include, at a minimum, compliance with this document.
- The Survey firm will be provided a current copy of this document along with a disk including this document, current blocks and templates, and other CAD support files necessary to meet the City's CAD standards.
- The Survey firm will be provided with appropriate monument locations, elevations and coordinates for both horizontal and vertical control points, and additional monument archival information previously coordinated with the City Surveyor, and prints for project area showing existing city utilities.
- A meeting will be scheduled to review the project scope of work, the appropriate vertical and horizontal control for the project and compliance with these standards. At minimum, representatives from the survey firm shall include the Project Manager (PE or PLS) and the CAD manager or operator who will be preparing the digital base maps and associated files. The City will be represented by the Project Engineer, a representative for Surveying and a representative from the City CAD department.
- In addition to survey control, other survey data, which shall be coordinated with the City Project Manager, shall include the data sheet orientation, cross section intervals, stationing requirements and other project specific data collection requirements.
- GPS work for a City project must be coordinated with the City Surveyor prior to beginning work. All GPS data developed as part of a Survey project must be submitted for review and approval to the City along with the other survey data.

2. Field Survey Requirements

Coordinate System and Datum Requirements

The coordinate system for the city is Washington State Plane, North Zone.
The horizontal datum is NAD 83/91 (HARN)
The vertical datum is NAVD88.

Survey Control

The appropriate vertical and horizontal control for a project will be discussed and agreed upon at a coordination meeting with the City's Project Manager, City Surveyor and the private surveyor before work begins on a project. Local monumentation should be researched, reviewed and shared by the City and the private surveyor for the specific project. The selection of control should be based upon the appropriate instrumentation, methodology and required control closures for the project. The project budget, scope and quality control should be considered as well as City GIS database enhancement. Field surveying instruments and measuring techniques to be used on the project should also be discussed and agreed upon. In general, a 1:20,000 minimum closure will be regarded as an appropriate closure for project control surveys although a 1:10,000 minimum closure may be accepted under some circumstances.

In order for projects to be incorporated into the City's GIS mapping, project coordinates must be in the Washington State Plane Coordinate System, North Zone which is used for the City's GIS mapping system. If you are using GPS ties to City control, the GPS work for the City project must be coordinated with the City Surveyor prior to beginning work. All GPS data developed as part of a Survey project must be submitted for review and approval to the City along with the other survey data. Data submitted for each monument shall include but shall not be limited to the information requested on the included "Survey Recovery Form". GPS data shall conform to the section titled "Requirements for Submission of GPS Data".

Horizontal coordinate datum for the GIS control network is presently based on the NAD 83/91 (HARN). Locations, elevations and coordinates of both horizontal and vertical control points for use on a project shall be provided by or approved for use by the City Surveyor prior to beginning the survey.

Satisfying the Horizontal coordinate/datum requirement

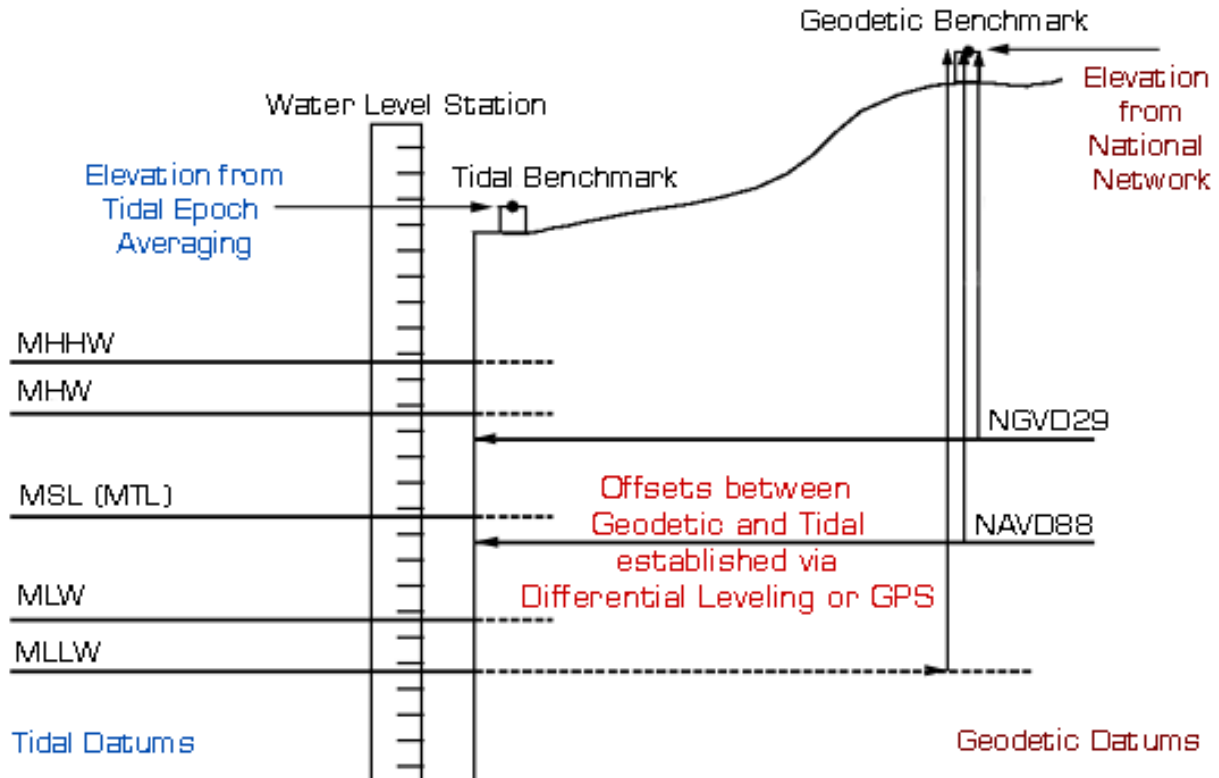
There are two ways to satisfy this requirement:

1. Tie the agreed upon two City control monuments and submit your northings and eastings in the City coordinate system and horizontal datum.
2. If approved by the City Surveyor, you may submit your northings and eastings in your own local ("project") coordinate system and datum, tie your survey to the agreed upon two City control monuments, and provide the required information to convert to City coordinates as described below.

Satisfying the Vertical datum requirement

The survey should be tied and adjusted to the agreed upon vertical control point using standard level loop procedures. All elevations submitted to the City for the project should reflect the adjustment to the Vertical datum.

City of Bainbridge Island Vertical Datum (NAVD 88)



* Note: To convert from the NGVD 29 datum to NAVD 88 datum, add approximately 3.50 feet to the NGVD 29 elevations.

The 3.50 feet is approximate since the distance between these two datums varies from place to place and can only be accurately determined by knowing the latitude and longitude at a specific location. Within the City of Bainbridge Island this distance varies from about 3.51 feet to 3.47 feet depending on the location, 3.50 feet being the mean. The exact difference between the two datums can be found by using a computer program such as NGS's "VERTCON" program (<http://www.ngs.noaa.gov/TOOLS/Vertcon/vertcon.html>) or download and install the free VDatum Transformation Tool from NOAA (<http://nauticalcharts.noaa.gov/csdl/vdatum.htm>).

Monument Naming Standards

Names/numbers for monuments are assigned to monuments according to function, i.e. Right-of-Way Monuments, Public Land Survey System (PLSS) Monuments or GIS Monuments as follows:

Right-of-way monument:

(4 spaces)	(3 spaces)	(2 spaces)
Field Book #	Page #	Point #

Example: Point No. 3 on Page 13 of field book No. 614 should be written as 061401303

Sections/Quarter Corners:

<u>(2 spaces)</u>	<u>(2 spaces)</u>	<u>(3 spaces)</u>
Township #	Range #	Section # *

*Section number used DNR alpha/numeric convention (see key on page 10)

Example: The northwest corner of Sec. 17, T. 28 N., R 5 E. should be written as 2805J05

COBI Control Monument:

<u>(5 spaces)</u>
Number/Name

Example: A typical City GIS monument will be a 4-digit number preceded by a "B"
such as: B0001

New or existing monuments, if un-named/numbered, shall be named/numbered by the City Surveyor prior to recording of monument data for the project. If the City has already established names/numbers for project monuments, the surveyor shall use the City's designations. Monument references submitted to the City as part of a City project shall not be assigned names/numbers without prior approval of the monument names/numbers by City Surveyor.

Survey Monument Recovery Form

**City of Bainbridge Island
Department of Public Works**

**State: Washington
County: Kitsap**

Station Name: _____

Horizontal Datum: NAD 83/91(HARN)

Vertical Datum: NAVD88

Established by:

Control Point ID: Book: Page: Pt#:

Date:

Section: _____ **Township:** _____ **Range:** _____

LATITUDE: (5 decimal places) _____

LONGITUDE: (5 decimal places) _____

ORTHOMETRIC HEIGHT: _____ Feet
 _____ Meters

Washington State Plane Coordinates – North Zone (Submit both Feet and Meters)

	Northing (4 decimal places)	Easting (4 decimal places)	Point Scale Factor (to 9 decimal places)	Convergence Deg Min Sec
Feet				
Meters				

HORIZONTAL DATA:

Horizontal position established by:

_____ resection survey, comments: _____

_____ GPS survey, GPS adjustment software used: _____

_____ other, explain: _____

surveyor's estimated relative positional accuracy: _____ ft @ _____ % confidence

surveyor's estimated absolute positional accuracy: _____ ft @ _____ % confidence

VERTICAL DATA:

vertical position established by:

_____ differential leveling to: _____ order accuracy

_____ GPS survey, accuracy within _____ ft. _____ meters

surveyor's estimated relative positional accuracy: _____ ft. @ _____ % confidence

surveyor's estimated absolute positional accuracy: _____ ft. @ _____ % confidence

MONUMENT DESCRIPTION

TO REACH

REFERENCES:

Az from North	Distance	Reference Description
---------------	----------	-----------------------

Month & Year Recovered: _____ **Condition Mark:** _____ **Recovered By:** _____

MARK THE CORNER LOCATION BELOW AND FILL IN THE CORNER CODE BLANK ON THE OTHER SIDE:

For corners at the intersection of two lines, the corner code is the alphanumeric coordinate that corresponds to the appropriate intersection of lines.

For corners that are only on one line, the corner code is the line designation and the related line segment; i.e., a corner on line 5 between "B" and "C" is designated BC-5.

For corners that are between lines, the corner code is both line segments; i.e., a corner in the SE1/4 of the SE1/4 of section 18 is designated MN 4-5.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
A																										A
B																										B
C			6				5				4				3				2					1		C
D																										D
E																										E
F																										F
G			7				8				9				10				11					12		G
H																										H
J																										J
K																										K
L			18				17				16				15				14					13		L
M																										M
N																										N
O																										O
P			19				20				21				22				23					24		P
Q																										Q
R																										R
S																										S
T			30				29				28				27				26					25		T
U																										U
V																										V
W																										W
X			31				32				33				34				35					36		X
Y																										Y
Z																										Z
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	

RCW 58.09.060 (2) requires the following information on this form: an accurate description and location, in reference to the corner position, of all monuments and accessories (a) found at the corner and (b) placed or replaced at the corner; (c) basis of bearings used to describe or locate such monuments or accessories; and (d) corollary information that may be helpful to relocate or identify the corner position.

SPACE FOR ADDITIONAL COMMENT:

Survey Field Books

Basic horizontal and vertical survey control information on all City projects must be recorded in field books. This requirement is particularly important as it pertains to control monuments, right-of-way and property corner locations. For surveys done with data collectors, the work recorded in the field books, although limited, should include sketches and diagrams of the survey control base lines, horizontal and vertical control monument descriptions, the basis for horizontal and vertical control on a project such as the state plane coordinates for control monuments and the benchmark elevations. This information will be included in the digital drawing files on the appropriate control, monument and GIS layers.

All work must be recorded in field books and shall provide the following information:

- The name or title of the project as assigned by the City Project Manager.
- The date the work was done on each page of the field book.
- The pages of the field book shall be numbered.
- The names of members of the field party doing the work.
- Weather conditions
- Equipment used

All work shall be indexed in the front of the field book.

References and/or descriptions of all PLSS land record monuments, City of Bainbridge Island GIS monuments, NGS monuments, an other governmental land record or mapping monuments utilized during the course of the work shall be indexed independently in a monument index at the front of the field book.

Field notes shall be clear, concise, and legible and shall contain sufficient information for ease of use by unfamiliar parties.

Copies (letter size) of all field notes, index pages and field books shall be submitted to the City's Project Manager at the completion of the survey tasks. An alternative method is to scan paper records into .pdf files to submit electronically.

Field books shall be *Rite in the Rain*® FIELD – All-Weather Notebook No. 351 or equivalent.

Stationing

The following stationing conventions will be followed and provided in the base drawing on a stationing layer with ties to existing City monumentation. Deviations from these conventions may be necessary on certain utility projects as determined by the City's Project Manager.

- Stationing shall read left (10+00) to right (?+??). The minimum stationing start point will be 10+00. Negative stationing will not be allowed.
- Stationing shall run from south to north or west to east.
- North shall be to the top or right of the printed page. On the data file, north shall be up (World Coordinate System).
- Centerline stationing shall have tick marks (on layer SV-STA-T) every 50 or 20 feet with annotation at 100 foot intervals

Specific Surveyed Feature Requirements

Record Drawings ("As Builts") will show accurate locations of storm, sewer, water mains and other water appurtenances, structures, conduits, power poles, light standards, vaults, width of streets, sidewalks, landscaping areas, building footprints, channelization and pavement markings, property lines, easements, etc.

The following is a partial list of the tolerance limits and construction features to be incorporated into the Record Drawings.

Tolerance Limits:

- Surveyed Sewer and Storm water elevations..... +/-0.10'
Includes pipe invert elevations, top of casting (manholes, inlets, etc.)
- Surveyed Water elevations..... +/-0.25'
- Horizontal and vertical alignment..... +/-0.10'

See "Specified Surveyed Feature Requirements Details" at the end of the Survey Standards sections for details of feature requirements.

3. Following CAD Standards

Overview

The City of Bainbridge Island, Department of Public Works Engineering has prepared a detailed set of standards for preparing CAD drawings. Drawing files provided to the City in a digital format shall be compatible with the version of AutoCAD presently being used by the City. Third party fonts, hatch patterns, or linetypes shall not be used in CAD files submitted to the City. All final data files shall be provided to the City on CD-ROM. Preliminary files can be electronically transmitted to the City Project Manager via email or through and ftp site.

These standards are flexible enough to handle all types of AutoCAD drawing needs, but specific enough to provide uniformity between drawings. They provide the ability to create entity or layer selection sets during drawing production.. These standards were designed to allow data to be exchanged with the City's GIS, which is based on the Washington State Plane Coordinate System. Therefore, it is imperative that all survey and design data files be convertible to this coordinate system. This requirement allows information from either system to be combined for comparison or planning.

These standards include layer definition and assignment, symbol or block naming and placement, customized linetypes and abbreviation conventions plus drawing construction and layout (templates provided, see Appendices).

These CAD standards are presented in detail in the document named **CAD Standards**.

Control Ties Must Be Documented

Prior to final submittal to the City, the surveyor shall provide the following information on each base drawing **in a size that is clearly legible when viewing the entire base drawing:**

Set the current layer to: "VF-ANNO-CORD."

For horizontal control point(s), insert the block: "TB-SURVY-2". (Insertion point and scale as required to be visible and not interfere with existing TOPO)

For vertical control point, insert the block: "TB-VERT CNTR". (Insertion point and scale as required to be visible and not interfere with existing topo)

Answer the attribute questions and the information will be inserted on the drawings in the format shown in the **Survey Control Data Tables** included in the Appendix. Note: the block should not be exploded when inserted into base map. Leader lines will point to the control points referenced in the table. This layer would normally not be printed.

Survey Control and traverse drawing

In addition to documenting the control ties as stated above, final submittal must include a drawing showing the control (horizontal and vertical) and traverse points set and used for the survey. Each point must include point number, northing, easting and elevations. Differences from provided COBI control points must be documented.

4. Deliverables

Field Notes

Copies (letter size) of all field notes, index pages and field books shall be submitted to the City's Project Manager at the completion of the survey tasks or scanned into .pdf files.

Digital Survey Data

The following instructions must be followed on all survey projects, unless prior approval is obtained from the City:

1. Digital survey data shall be provided to the City on CD-ROM.
2. Survey point data files containing the final edited point data submitted to the City in a PNEZD comma delimited ASCII digital format shall include the following:
 - Point numbers will numerically designate survey points. Points will be sequentially numbered.
 - Horizontal coordinates shall be shown to 4 decimal places.
 - Elevations shall be shown to the nearest hundredth of a foot.
 - Descriptions: If City descriptor codes are not used in the project, then the AutoCad Descriptor Key translator table shall be provided to the City.

Requirements For Submission Of GPS Data

All hard copy and digital data files, as indicated in Typical Files Table, shall be bound/included in a binder for easy review and analysis by City Personnel.

Information provided shall include:

1. The make and model of all equipment used in data collection.
2. The serial number of each instrument
3. The type of method or procedure used for the project, i.e., Static, Fast Static or other used
4. Single or dual frequency

For all GPS stations used as a starting point for a project. The City requires at least two vectors from stations approved by the City Surveyor, Additional GPS positions required for any other reasons, including temporary points, must be approved by the City Surveyor.

Data sheets will be filled out as outlined:

- a. State Plane Coordinates in US survey feet "WA NORTH ZONE," three decimal places
- b. State Plane Coordinates in meters "WA NORTH ZONE," four decimal places
- c. Final Coordinates in latitude and longitude, five decimal places
- d. Final orthometric heights, if leveling was used to derive:
 - In US survey feet to three decimal palaces
 - In meters to four decimal places
- e. Final orthometric heights, if GPS was used to derive:
 - In US survey feet to two decimal places
 - In meters to two decimal places
- f. Convergence angle in degrees, minutes and tenths of seconds
- g. Scale factor to at least eight decimal places
- h. Fill out text with pertinent information, description of monument and how to get to the point

Static or rapid static will be used for all GPS control surveys. Kinematic GPS will not be acceptable for control surveys.

Minimal satellite conditions:

- a. Check satellite almanac prior to GPS session to determine optimum time/day for GPS sessions.
- b. PDOP for all observations shall be five or less.

Pertinent information describing the GPS session shall be recorded in the field book, including:

- a. Project description including names of constrained (stationary) position
- b. Monument description
- c. Receiver (start time)
- d. Receiver (stop time)
- e. Height of instrument
- f. Offset distance
- g. At least three reference azimuths at each monument
- h. Diagram of monument location

Any other information of interest about the monuments or the GPS session

Different types of equipment will produce their own formats, please send similar files.

Typical Files	Digital	Hard Copy
Diagram of points and vectors		X
Raw data files	X	
Corrected vector files	X	
Session log files	X	X
Minimally Constrained Adjustment	X	X
a. Analysis data	X	X
b. Adjustment parameters	X	X
c. Statistical summaries	X	X
Fully Constrained Adjustment	X	X
a. Analysis data	X	X
b. Final adjustment iterations	X	X
c. Final adjustment parameters	X	X
d. Final weighting parameters	X	X
e. Final adjustment closures and statistical data	X	X
f. Final state plane coordinates in US survey feet	X	X
g. Final orthometric heights: In US survey feet (two decimal places) In meters (three decimal places)	X X	X X
h. Convergence angle in degrees, minutes & tenths of seconds	X	X
i. Final ellipsoid heights	X	X
j. Final	X	X
Vertical adjustment files, if vertical adjustment is done separately, submit the same files as in Number 6	X	X
Conversion files from State plane coordinates, Washington North Zone, to latitude & longitude & metric coordinates.	X	X

Specific Surveyed Feature Requirements Details

The following define the type of information to be documented in the field by surveyors producing Record Drawings.

Storm drainage

Storm drainage features are intended to move rainwater and/or groundwater. Record drawings shall indicate all necessary information about the storm drainage system to evaluate whether the constructed features will be able to function as intended by the design. Information shall be surveyed as outlined in the following table

Storm drainage features	Data to be documented
Pipes	Material & diameter Inverts – (All pipe ends in structures or out) Location of ends – (not in structures) Direction of pipe away from structure
Catch basins/manholes /inlets	Size, type, cover type (throat, vane grate, etc.) Rim elevation Location of structure
Culverts	Material, shape, size Location of ends Inverts – (Of structure ends and of stream if flowline natural or filled with earth)
Underdrains	Pipe location Material Cleanout locations

Stormwater Management

Stormwater Management features are intended to control the rate and/or quality of the rainwater runoff.

Stormwater Management feature	Data to be documented
Vaults	Material, type, size, control systems (orifice size, weir dimensions) Control structure location Control elevations (orifice inverts, weir elevations) Bottom elevation Access locations
Ponds	Size, shape Control structure location Control elevations (orifice inverts, weir elevations) Overflow elevation Bottom elevation
Biofilters/swales	Length, width Inlet invert Outlet invert
Infiltration systems/French drains	Material & size Pipe (size, type and diameter) Inlet invert Bottom elevation

Natural Resources

Natural Resources features are non structural features that convey and/or hold water.

Natural Resources feature	Data to be documented
Streams	Centerline of stream Width of stream Top of bank
Wetlands	Boundary of created or modified wetlands as delineated by qualified personnel.

Wellhead Protection

Wellhead Protection features are systems that provide for monitoring of the groundwater.

Wellhead Protection	Data to be documented
Monitoring wells	Size (diameter of well) State Reference Number Locations Cap elevation Ground elevation (if different than cap elevation)

Water System

Water system features are intended to move or hold potable water.

Water system feature	Data to be documented
Pipes and Fittings	1) material & size 2) Crossing invert – location and invert of any utility crossings 3) Depth of pipes during installation at every fitting and appurtenance. Horizontal location of main: 1) Outside of ROW –every 100 feet 2) Within ROW - distance off centerline of road. (Use pipe locator for location.)
Valves (GV, BFV, AV and BO)	Size & type Horizontal locations as follows: 1) GV – center of valve (same as center of box) 2) BFV – center of valve and box 3) AV – center of meter box assembly and center of stand pipe at post 4) BO – center of meter box assembly
Hydrants	Horizontal location of hydrant (center of valve stem)
Service Lines	Material, size, location
Pressure Relief valve (PRV)	Size, vault size, vault drain data 1) Horizontal location of 4 corners of vault 2) Horizontal location of relief pipe, catch basin, and air vac stand pipe

Fire System (PIV, FDC) Private fire pipe	Materials, sizes, locations of pipe and appurtenances 1) Horizontal location of PIV, FDC (center) 2) Horizontal location of 4 corners of vault 3) All valves, connections to City mains
PIV=Post & Indicator Valve FDC=Fire Dept. Connect	Service line size, drain 1) Horizontal location of station (center) 2) Horizontal location of tap 3) Horizontal location of drain
Monitoring Stations	Type, size, service line size, location of drain 1) Horizontal location of 4 corners of vault or center of box
Backflow Devices (exterior to building)	

Sanitary Sewer

Sanitary Sewer system features are intended to transport sanitary waste into a collection system.

Sanitary Sewer feature	Data to be documented
Manholes	Manhole diameter, type 1) Horizontal location of center of manhole. 2) Horizontal location of center of lid. 3) Rim elevations and all invert elevations.
Pipe (Gravity Sewer Main)	Material, Size Length (horizontal length of pipe from center of manhole to center of manhole)
Pipe and fittings (Force Main)	1) Measure distance between fittings (center of tees, crosses, bends) 2) Crossing invert – location and invert of any utility crossings 3) Depth of pipes during installation at every fitting and appurtenance.
Side Sewer	Horizontal location of main: 1) Outside of ROW – every 100 feet 2) Within ROW - distance off centerline of road. (Use pipe locator for location.) Plats 1) Pipe material, size Length of side sewer stub. Length of side sewer 2 x 4 Commercial 1) Pipe materials or size. 2) Length of side sewer stub. 3) Distance between each cleanout. Plats 1) Location of end of side sewer (marked by 2 x 4) 2) Ground elevation (at 2 x 4) 3) Measure length of exposed 2 x 4 4) Calculate side sewer invert elevation. Commercial 1) Horizontal location and ground elevation of all side sewer surface cleanouts.
Valves	Size, type 1) Horizontal location of GV – center of valve (same as center of box) 2) AV – center of meter box assembly and center of stand pipe at post 3) BO – center of meter box assembly

Air Vacs

Size, type

1) Horizontal location of center of meter box assembly and center of stand pipe at post

Grease Interceptor/Oil
Water Separators

1) Pipe materials, size

2) Vault dimensions and size.

1) Horizontal location of 4 corners of the vault.

Transportation

Transportation

Pavement

Curb and Gutter

Driveways

Channelization

Signage

Sidewalk

Street Lighting

Traffic Signals

Monument Cases

Conduit

Junction Boxes

Data to be documented

Material, depth, width

Location of face of curb, type

Location, width, type

Materials, layout

Location, size, type

Location, material, width

height, materials

Pole locations

Pole locations

Location, materials

Horizontal coordinates

Location, depth, materials, size

Location, type, conduit entrances

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