RECORD DRAWING REQUIREMENTS

CITY OF REDMOND WASHINGTON Version 10-2005
(Formerly known as As-Built per RCDG 20SD.180.10.220)

APPROVED FOR USE

_____

William J. Campbell, P.E. Date
City Engineer

RECORD DRAWING REQUIREMENTS

The City of Redmond currently maintains a Geographic Information System (GIS) to track constructed features such as utilities and roadway improvements. This information is used by city personnel, other government agency personnel, developers, engineers, business owners/operators and citizens for planning, design and maintenance purposes. One of the main sources of information for GIS is the drawings of record supplied to the City after features are constructed. The City of Redmond requires that persons constructing improvements in the City provide accurate drawings (Record Drawings) documenting improvements. This document outlines the requirements for preparing Record Drawings.

Record Drawing Preparer

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

Datum

All project plans shall be accurately located in state plane coordinates NAD 83-(91HARN) and the horizontal coordinates shall be tied to two (2) City of Redmond Horizontal Control Monuments. In addition, vertical control shall be tied to two City of Redmond Vertical Control Datum monuments (NGVD 29).

The following guidelines are provided for clarification of the record drawing process.

I. APPROVED CONSTRUCTION DRAWING SUBMITTAL

Upon approval of the construction drawings by the City, a copy of the electronic drawings in CAD format shall be submitted along with a completed digital checklist meeting the requirements shown in (Appendix A – Checklist 1) together with the required hard copy (paper) prints.

II. CONSTRUCTION PHASE

During the construction phase of the project, the Contractor/Developer for the project shall maintain one set of full size plans for record drawings. The Contractor's superintendent or authorized representative, together with the City's construction inspector, shall update the plans with record information on a daily basis. Record information includes the final locations of all new materials incorporated into the work and all existing improvements encountered during construction.

III. RECORD DRAWING PREPARATION

Upon completion of construction, the record information will be provided to the Engineer / Surveyor and together with the survey of the as-built conditions, shall be the basis for the record drawing submittal. As-built changes to text: invert elevations, dimensions, notes, etc. will be lined out with the record drawing text placed near it. Do not alter, modify or erase original approved construction drawing text. Refer to Appendix B for specific record drawing requirements.

IV. PRELIMINARY RECORD DRAWING SUBMITTAL AND REVIEW PROCESS

A record drawing submittal shall consist of the following:

A. Record Drawings

TWO full size sets of prints (22" x 34") which shall include **all sheets** of the original city approved construction drawings. These drawings shall be reviewed by City of Redmond staff where comments or recommendations for change or correction shall be provided and returned to the Engineer / Surveyor.

The Engineer/Surveyor shall make all such corrections and resubmit two sets of revised prints together with the redline comment sets. This process shall continue until all comments or recommendations have been satisfied.

B. Digital Site Plan

Once the city is satisfied with the record drawing prints, the Engineer/Surveyor shall provide ONE full size set of prints and the digital submittal completed in accordance with and together with digital submittal checklist 2. This submittal shall be reviewed by City of Redmond GIS staff where comments or recommendations for change or correction shall be provided and returned to the Engineer/Surveyor.

The Engineer/Surveyor shall make all such corrections and resubmit the digital submittal. This process shall continue until all comments or recommendations have been satisfied.

V. FINAL RECORD DRAWING SUBMITTAL PROCESS

When the preliminary record drawing process is complete, the Engineer will be notified that the record drawings are ready for final submittal. The final record drawing submittal includes the following:

One full size set of (22" x 34") OCE type mylars.
Two full size bond prints.
Five half size bond prints (11" x 17").

VI. RECORD DRAWING SUBMITTAL ADDRESS

Public Works Development Services Division
2nd floor Redmond City Hall
15670 NE 85th Street
P.O. Box 97010
Redmond, WA 98073-9710

If you have any questions please call (425) 556-2740.

APPENDIX A: Digital Submittals

Checklist 1: Approved **Construction Drawing** Site Plan Digital Submittal

Once your paper construction drawings are approved, you must submit a digital approved construction drawing site plan. Please use the checklist below in preparing the digital submittal.

IMPORTANT: A completed checklist 1 must be submitted with your Approved Construction Drawing Site Plan Digital Submittal. If you have any question, Please contact Melissa Faga at telephone number 425-556-2134.

Project Name:_____

Please fill out the contact information for the person who drafted the CAD drawing that could answer questions about the digital file:

Name: _____
Company: _____
Telephone: _____
Email: _____

Digital Submittal Specifications: (please initial and date each item below as completed)

_____ Single Site Plan CAD Drawing (all features included in one drawing file - no reference files)

_____ Coordinate System:
____Stateplane Washington North
____Horizontal Datum: NAD 83 (91-HARN),
____Vertical Datum: NGVD 29
____Survey Feet

_____ CAD Format (acceptable versions)
AutoCAD 2000 or Microstation 7 or Microstation V8 (please circle)

_____ CAD Units if Microstation 7 or V8
____1:1 Scale ____Working Units 1:1000 ____Master Units set to survey feet

_____ CAD Units if AutoCAD 2000
____1:1 Scale

_____ Media
CD or DVD (please circle)

_____ Label CD/DVD with:
____Project Name ____ Redmond Project Number ____Construction
____ Company Name ____Contact Name ____Contact Phone Number

_____ Checklist 1 completed and included with CD/DVD

Digital CAD Layer/Level Documentation:

Site Plan CAD Drawing File Name
(i.e. RedmondTownCenter.dwg): _____

Feature Groups	Digital CAD Layer Name or Level Number
New Stormwater Drainage/Mgt and annotation	
Existing Stormwater Drainage/Mgt and annotation	
New Natural Resource and annotation	
Existing Natural Resource and annotation	
New Wellhead Protection and Annotation	
Existing Wellhead Protection and Annotation	
New Water System and annotation	
Existing Water System and annotation	
New Sanitary Sewer and annotation	
Existing Sanitary Sewer and annotation	
Other Utilities and Easements	
New Transportation and annotation	
Existing Transportation and annotation	
New Buildings and annotation	
Existing Buildings and annotation	
Parcels and annotation	

Features to be included on Approved Construction Drawing Site Plan Digital Submittal:

----------->NOTE: Detailed Description of Features included in Appendix B<---------

Stormwater Drainage and Management:
Pipes
Catch basins
Manholes
Inlets
Culverts
Underdrains
Vaults
Ponds
Biofilters/Swales
Infiltration Systems/French Drains
Other Drainage Features (as appropriate)

Natural Resources:
Streams
Wetlands

Wellhead Protection:
Monitoring Wells

Water System:
Pipes and Fittings
Valves
Hydrants
Service Lines
Meters
PRV
Fire System
Private fire Pipe
Monitoring Stations
Backflow Devices

Sanitary Sewer:
Manholes
Pipes and Fittings
Side Sewer
Valves
Air Vacs
Cleanouts
Grease Interceptors
Oil Water Separators

Other Utilities and Easements

Transportation:
Pavement
Curb and Gutter
Driveways
Channelization
Signage
Sidewalk
Street Lighting
Traffic Signals
Monument Cases
Conduit
Junction Boxes

Other Features:

Parcels
Building Footprint

APPENDIX A: Digital Submittals

Checklist 2: Record Drawing Site Plan Digital Submittal

Once your project has been constructed, you are required to submit official Record Drawings to the City of Redmond. Part of this requirement includes a digital CAD drawing for your project. Please use the checklist below in preparing the digital submittal.

IMPORTANT: A completed checklist 2 must be submitted with your Approved Construction Drawing Site Plan Digital Submittal. If you have any questions, please contact Melissa Faga at telephone number 425-556-2134

Project Name:_____

Please fill out the contact information for the person who drafted the CAD drawing that could answer questions about the digital file:

Name:_____
Company:_____
Telephone:_____
Email:_____

Digital Submittal Specifications: (please initial and date each item below as completed)

_____ Single Site Plan CAD Drawing (all features included in one drawing file - no reference files)

_____ Coordinate System:
____Stateplane Washington North
____Horizontal Datum: NAD 83 (91-HARN),
____Vertical Datum: NGVD 29
____Survey Feet

_____ CAD Format (acceptable versions)
AutoCAD 2000 or Microstation 7 or Microstation V8 (please circle)

_____ CAD Units if Microstation 7 or V8
____1:1 Scale ____Working Units 1:1000 ____Master Units set to survey feet

_____ CAD Units if AutoCAD 2000
____1:1 Scale

_____ Media
CD or DVD (please circle)

_____ Label CD/DVD with:
____Project Name ____ Redmond Project Number ____Construction
____ Company Name ____Contact Name ____Contact Phone Number

_____ Checklist 2 completed and included with CD/DVD

Digital CAD Layer/Level Documentation:

Site Plan CAD Drawing File Name
(i.e. RedmondTownCenter.dwg): _____

Feature Groups	Digital CAD Layer Name or Level Number
New Stormwater Drainage/Mgt and annotation	
Existing Stormwater Drainage/Mgt and annotation	
New Natural Resource and annotation	
Existing Natural Resource and annotation	
New Wellhead Protection and Annotation	
Existing Wellhead Protection and Annotation	
New Water System and annotation	
Existing Water System and annotation	
New Sanitary Sewer and annotation	
Existing Sanitary Sewer and annotation	
Other Utilities and Easements	
New Transportation and annotation	
Existing Transportation and annotation	
New Buildings and annotation	
Existing Buildings and annotation	
Parcels and annotation	

Features to be included on Approved Construction Drawing Site Plan Digital Submittal:

----------->NOTE: Detailed Description of Features included in Appendix B<---------

Stormwater Drainage and Management:
Pipes
Catch basins
Manholes
Inlets
Culverts
Underdrains
Vaults
Ponds
Biofilters/Swales
Infiltration Systems/French Drains
Other Drainage Features (as appropriate)

Natural Resources:
Streams
Wetlands

Wellhead Protection:
Monitoring Wells

Water System:
Pipes and Fittings
Valves
Hydrants
Service Lines
Meters
PRV
Fire System
Private fire Pipe
Monitoring Stations
Backflow Devices

Sanitary Sewer:
Manholes
Pipes and Fittings
Side Sewer
Valves
Air Vacs
Cleanouts
Grease Interceptors
Oil Water Separators

Other Utilities and Easements

Transportation:
Pavement
Curb and Gutter
Driveways
Channelization
Signage
Sidewalk
Street Lighting
Traffic Signals
Monument Cases
Conduit
Junction Boxes

Other Features:

Parcels
Building Footprint

APPENDIX B – Specific Record Drawing Requirements

Construction Features

1. Record Drawings 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.

2. 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 ..... +/-0.01'
     Includes pipe invert elevations, top of casting (manholes, inlets, etc.)
   - Surveyed Water elevations..... +/-0.25'
   - Horizontal and vertical alignment..... +/-0.10'

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 field verified and/or surveyed as outline in the following table. Generally the following information is required who should provide the information is shown in parentheses:

Storm drainage features	**Field verify** *Mark On field drawing plan set all changes from design drawings* (Contractor and Inspector)	**Survey** (Licensed Surveyor)	**Indicate on record drawings** (Record Drawing Preparer/Engineer)
Pipes	Material, diameter	**Inverts** – (All pipe ends in structures or out) **Location of ends** – (not in structures)	**Redraw** pipe on drawings if it moved two feet or more. **Recalculate** slope based on record length and surveyed inverts. **Indicate** new information on plans (ex. slope, length, diameter, etc.)
Catch basins/manholes /inlets	Size, type, cover type (throat, vane grate, etc.)	**Rim elevation** **Location of structure**	**Redraw** structure on drawings if it moved two feet or more. **Indicate** new information on plans

			(ex. size, type, etc.)
Culverts	Material, shape, size	**Location of ends** **Inverts –** (Of structure ends and of stream if flowline natural or filled with earth)	**Redraw** culvert on drawings if it moved two feet or more. **Recalculate** slope based on record length and surveyed inverts. **Indicate** new information on plans (ex. slope, length, diameter, etc.)
Underdrains	Pipe location, material, cleanout locations		**Redraw** underdrains on drawings if it moved two feet or more.
Other drainage features			**Redraw** feature on drawings if it moved two feet or more.

Stormwater Management

Stormwater Management features are intended to control the rate and/or quality of the rainwater runoff. Record drawings shall indicate all necessary information about the stormwater management system to evaluate whether the constructed features will be able to function as intended by the design. Information shall be field verified and/or surveyed as outline in the following table. Generally the following information is required who should provide the information is shown in parentheses:

Stormwater Management feature	**Field verify** *Mark On field drawing plan set all changes from design drawings* (Contractor and Inspector)	**Survey** (Licensed Surveyor)	**Indicate on record drawings** (Record Drawing Preparer/Engineer)
Vaults	Material, type, size, control systems (orifice size, weir dimensions)	**Control structure location** **Control elevations** (orifice inverts, weir elevations) **Bottom elevation** **Access locations**	**Redraw** structure on drawings if it moved two feet or more. **Indicate** new information on plans (ex. size, type, etc.)
Ponds	Size, shape	**Control structure location** **Control elevations** (orifice inverts, weir elevations) **Overflow elevation** **Bottom elevation**	**Redraw** pond on drawings if it moved ten feet or more. **Recalculate size** based on water surface shape. **Indicate** new information on plans

		Water surface shape (spot locations around edge of water surface - enough to indicate shape/location six shots minimum)	(ex. size, shape, etc.)
Biofilters/swales	Length, width	**Inlet invert** **Outlet invert**	**Redraw** biofilter/swale on drawings if it moved two feet or more.
Infiltration systems/French drains	Material, size, pipe (size, type and diameter)	**Inlet invert** **Bottom elevation**	**Redraw** feature on drawings if it moved two feet or more.

Natural Resources

Natural Resources features are non structural features that convey and/or hold water. Record drawings shall indicate all necessary information about the Natural resources to evaluate whether the constructed features will be able to function as intended by the design. Information shall be field verified and/or surveyed as outline in the following table. Generally the following information is required who should provide the information is shown in parentheses:

Natural Resources feature	**Field verify** *Mark On field drawing plan set all changes from design drawings* (Contractor and Inspector)	**Survey** (Licensed Surveyor)	**Indicate on record drawings** (Record Drawing Preparer/Engineer)
Streams		**Centerline of stream**	**Redraw** stream on drawings if it moved two feet or more.
Wetlands		**Boundary of created or modified wetlands**	**Redraw** wetland on drawings if it moved ten feet or more. **Recalculate size** based on wetlands shape. **Indicate** new information on plans (ex. size, shape, etc.)

Wellhead Protection

Wellhead Protection features are systems that provide for monitoring of the groundwater.
Record drawings shall indicate all necessary information about the Natural resources to evaluate whether the constructed features will be able to function as intended by the design. Information shall be field

verified and/or surveyed as outline in the following table. Generally the following information is required who should provide the information is shown in parentheses:

Wellhead Protection	**Field verify** *Mark On field drawing plan set all changes from design drawings* (Contractor and Inspector)	**Survey** (Licensed Surveyor)	**Indicate on record drawings** (Record Drawing Preparer/Engineer)
Monitoring wells	**Size** (diameter of well) **State Reference Number**	**Locations** **Cap elevation** **Ground elevation** (if different then cap elevation)	**Redraw** monitoring well on drawings if it moved two feet or more.

Water System

Water system features are intended to move or hold potable water. Record drawings shall indicate all necessary information about the water system to evaluate whether the constructed features will be able to function as intended by the design. Information shall be field verified and/or surveyed as outline in the following table. Generally the following information is required who should provide the information is shown in parentheses:

Water system feature	**Field verify** *Mark On field drawing plan set all changes from design drawings* (Contractor and Inspector)	**Survey** (Licensed Surveyor)	**Indicate on record drawings** (Record Drawing Preparer/Engineer)
Pipes and Fittings	1) Manufacturer - material, size, joint type, fitting 2) Measure distance between fittings (center of tees, crosses, bends) 3) Crossing invert – location and invert of any utility crossings 4) 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.)	**Redraw** pipe on drawings if it moved two or more feet horizontal or 0.5 or more feet vertical. **Indicate** new information on plans (ex. diameter, horizontal and vertical location of main, length between fittings, joint type, backfill material, etc.)

Valves (GV, BFV, AV and BO)	Size, type Valve brand, depth of operating nut, length of valve nut extension used	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	**Redraw** valve on drawings if it moved two feet or more. **Indicate** new information on plans (ex. size, type, etc.)
Hydrants	Manufacturer Hydrant bury depth	1) Horizontal location of hydrant (center of valve stem) 2) Vertical elevation of safety flange	**Redraw** hydrant on drawings if it moved two feet or more. **Indicate** new information on plans
Service Lines	Material, size, location		**Redraw** service line and setter on drawings if it moved two feet or more. **Indicate** new information on plans (ex. size, type, etc.)
Meters	Type, size, vault or box and size	1) Horizontal location of center of box 2) Horizontal location of 4 corners of vault	**Redraw** box or vault on drawings if it moved two feet or more. **Indicate** new information on plans (ex. size, type, etc.)
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	**Redraw** vault on drawings if it moved two feet or more. **Indicate** new information on plans (ex. size, type, etc.)
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	**Redraw** pipe, vault, PIV, FDC on drawings if it moved two feet or more. **Indicate** new information on plans (ex. size, type, etc.)

Monitoring Stations	Service line size, drain	1) Horizontal location of station (center) 2) Horizontal location of tap 3) Horizontal location of drain	**Redraw** station on drawings if it moved two feet or more. **Indicate** new information on plans (ex. size, type, etc.)
Backflow Devices (exterior to building)	Device brand, type, size, service line size, location of drain	1) Horizontal location of 4 corners of vault or center of box	**Redraw** vault or box on drawings if it moved two feet or more. **Indicate** new information on plans (ex. size, type, etc.)
Backflow Devices (interior to building)	Device brand, type, size, service line size, general location within building		

Sanitary Sewer

Sanitary Sewer system features are intended to transport sanitary waste into a collection system. Record drawings shall indicate all necessary information about the sewer system to evaluate whether the constructed features will be able to function as intended by the design. Information shall be field verified and/or surveyed as outline in the following table. Generally the following information is required who should provide the information is shown in parentheses:

Sanitary Sewer feature	**Field verify** *Mark On field drawing plan set all changes from design drawings* (Contractor and Inspector)	**Survey** (Licensed Surveyor)	**Indicate on record drawings** (Record Drawing Preparer/Engineer)
Manholes	Manhole diameter, type, manufacturer	1) Horizontal location of center of manhole. 2) Horizontal location of center of lid. 3) Rim elevations and all invert elevations.	1) Note all changes and correct elevations.
Pipe (Gravity Sewer Main)	Material, Size Distance to each side sewer tee location from the downstream manhole.	Length (horizontal length of pipe from center of manhole to center of manhole)	**Redraw** pipe on drawings if it moved two feet or more. **Recalculate** slope based on record length and surveyed inverts. **Indicate** new information on plans (ex. slope, length,

			diameter, etc.)
Pipe and fittings (Force Main)	1) Manufacturer - Material, size, joint type, fittings 2) Measure distance between fittings (center of tees, crosses, bends) 3) Crossing invert – location and invert of any utility crossings 4) 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.)	**Redraw** pipe on drawings if it moved two feet or more. **Indicate** new information on plans (ex. slope, length, size, etc.)
Side Sewer	**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.	1) Note all changes. 2) Show side sewer tee station. 3) Show length of stub. 4) Show invert elevation **Commercial** 1) Note all changes. 2) Show location and ground elevation of side sewer cleanouts. 3) Side sewer asbuilt
Valves	Size, type Valve brand, depth of operating nut, length of valve nut extension used	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	**Redraw** valve on drawings if it moved two feet or more. **Indicate** new information on plans (ex. size, type, etc.)
Air Vacs	Size, type	1) Horizontal location of center of meter box assembly and center of stand pipe at post	Redraw valve on drawings if it moved two feet or more. Indicate new information on plans (ex. size, type, etc

Cleanouts	Size	1) Rim elevation center of box 2) Horizontal location of center of box	Redraw structure on drawings if it moved two feet or more. Indicate new information on plans
Grease Interceptor/Oil Water Separators	1) Pipe materials, size 2) Vault dimensions and size.	1) Horizontal location of 4 corners of the vault.	1) Show vault dimensions and size. 2) Show pipe elevations.

Water and Sanitary Sewer

Water and Sanitary Sewer	**Field verify** *Mark On field drawing plan set all changes from design drawings* (Contractor and Inspector)	**Survey** (Licensed Surveyor)	**Indicate on record drawings** (Record Drawing Preparer/Engineer)
Other Utilities	1) Identify location and depth of all existing utilities encountered and new utilities constructed.		1) Show utilities encountered and their depth.
Easement		1) Coordinate easement area with all facilities to be included in easement. 2) Plot easement legal description.	1) Show easement edges from surveyor's legal description.

Transportation

Transportation	**Field verify** *Mark On field drawing plan set all changes from design drawings* (Contractor and Inspector)	**Survey** (Licensed Surveyor)	**Indicate on record drawings** (Record Drawing Preparer/Engineer) *Redraw on record drawings any and all transportation features listed if moved two feet or more*
Pavement	Material, depth, width		
Curb and Gutter	Location of face of		

	curb, type		
Driveways	Location, width, type		
Channelization	Materials, layout		
Signage	Location, size, type		
Sidewalk	Location, material, width		
Street Lighting	height, wattage, materials	Pole locations	
Traffic Signals		Pole locations	
Monument Cases	Location, materials	Horizontal coordinates	
Conduit	Location, depth, materials, size		
Junction Boxes	Location, type, conduit entrances		

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