Washington State Department of Transportation

Stormwater Features Inventory Database: Feature and Attribute Definitions

Version 2.0

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Washington State Department of Transportation

Document Revision History

Revision Date	Revision Number	Summary of Changes	Sections	Reviser
2/1/16	1	Revisited the entire document to include revisions to existing definitions as well as definitions for new database attributes and one additional feature class. Major revision creating document Version 2.0.	All	Tim Hall

Contents

Acronyms

ArcPad	ArcPad® 10.0 with service pack 1
BMP	best management practice
CAD	computer aided drafting
CAE	computer aided engineering
CSS	Combined Sanitary Storm sewer
DMI	distance measuring instrument
Ecology	Washington State Department of Ecology
ESO	Washington State Department of Transportation, Environmental Services Office
Esri	Environmental Systems Research Institute, Inc.®
GIS	Geographic Information System
GNSS	Global Navigation Satellite Systems
GPS	Global Positioning System
GPS Analyst	Trimble® GPS Analyst™
HFSID	Highway Features System Inventory Database
Highway Features	Highway Features is: an agency wide data store for information about roadside assets and landscape characteristics owned, maintained, or of interest to WSDOT; it is a clearinghouse for the exchange of data among different lines of business and can accommodate many different types of features.
HOV	high-occupancy vehicle
HRM	*Highway Runoff Manual*
IDDE	Illicit Discharge Detection and Elimination
NPDES	National Pollutant Discharge Elimination System
Permit	Washington State Department of Transportation Municipal Stormwater Permit, National Pollution Discharge Elimination System and State Waste Discharge Permit for Large and Medium Municipal Separate Storm Sewer Systems.
MS4	Municipal Separate Storm Sewer System
OID	ObjectID field data type
QAPP	Quality Assurance Project Plan
RFIP	Roadside Features Inventory Program
ROW	right of way
RRT	Related Route Type
SI	International System

SFI	Stormwater Features Inventory
SFID	Stormwater Features Inventory Database
SRMP	State Route Mile Post
UIC	Underground Injection Control
WSDOT	Washington State Department of Transportation

Introduction

The Stormwater Features Inventory Database (SFID) was developed in response to WSDOT's 2009 NPDES Municipal Stormwater Permit (permit), issued by the Washington State Department of Ecology (Ecology). Among other elements, the 2009 and reissued 2014 permit requires WSDOT to maintain an ongoing storm sewer system mapping program for areas within the permit's jurisdictional boundaries.

This document provides standard WSDOT definitions for stormwater features and their attributes contained within the SFID. In addition, rules are presented for documenting these features both in the field and in the office. The intent is for this document to supplement both WSDOT's *Stormwater Features Inventory: Standard Operating Procedures for Stormwater Discharge Point Inventory* and *Stormwater Features Inventory Database: Standard Operating Procedures for Office Data Collection*.

Stormwater Features Inventory activities are managed through WSDOT's Environmental Services Office, Stormwater and Watersheds Program. Associated operational procedures are administered by the Stormwater Features Inventory Group. Associated technical systems are administered by the Environmental Services Office, Environmental Information Program, with direction from the Stormwater and Watersheds Program.

Note: The *Stormwater Features Inventory Database: Feature and Attribute Definitions* is a version-controlled document and is subject to modifications that reflect agency needs.

1-0   Organization of This Document

Section 2 of this document provides database field definitions, properties, and rules, as well as domain values and definitions, for attributes common to most stormwater feature types and subtypes in the SFID. Because this attribute information remains consistent across the stormwater feature classes, it is represented only in this section.

Section 3 of this document provides definitions, properties, and rules for each stormwater feature type and subtype in the SFID. These include representations of stormwater feature types and geometry, definitions, feature subtypes (if applicable), in-office or field rules for documenting stormwater features, and definitions of database fields and domains specific to the stormwater feature type.

Where applicable, additional reference materials are included within this document as hyperlinks. Hyperlinks require an internet connection and are activated by pressing the "Ctrl" key on your keyboard and left-clicking the mouse over the link.

Also included are excerpts and references from other WSDOT publications. These materials are included to reduce research time and increase the efficiency of Stormwater Features Inventory processes. While every attempt is made to accurately represent information from source publications, the most recent version of these resources should be consulted directly whenever possible.

2-0 Database Fields Common to Most Stormwater Feature Types and Subtypes

"Common database fields" are attributes commonly recorded for the various stormwater feature types and subtypes in the Stormwater Features Inventory Database. Their definitions, properties, and rules are consistent regardless of where they appear.
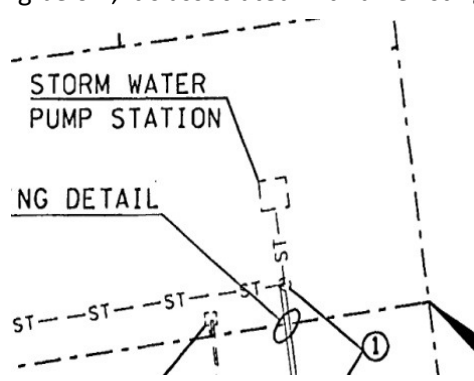
COMMON DATABASE FIELDS FOR STORMWATER CONVEYANCE FEATURES:

AccessInstructions

Database field definitions, properties, and rules	
Field definition	A general note regarding instructions or hints on how to physically access the feature during a field visit.
Field data type	Text; Length: 200
Office vs. Field collection	Both
Data collection rules: Field	• This field should only be used if access to the feature requires something outside of the scope of normal highway work activity. • .Record a note here if the feature is difficult to locate or if special instructions for traffic control, vehicle parking, or approach may be helpful. Also make a note if special tools are required to access the structure, such as a 1-inch socket or ½-inch hex key.
Data collection rules: Office	This space is used primarily to store information copied over from Roadside Features Inventory Program/Highway Features. However, go ahead and try to fill in for features that may be hard to see from the road (either hidden behind something like a noise wall, or set back from the roadway outside the standard right of way). Use local roads data and the air photo to describe access. This is especially good for features such as ponds or vaults.
Database domain values and definitions: None	

AccessoryEquip

Database field definitions, properties, and rules	
Field definition	List of semi-permanent devices or equipment installed in a stormwater feature that is not otherwise included in the Stormwater Features Inventory Database feature list.
Field data type	String; Length: 150
Office vs. Field collection	Both
Data collection rules: Field	• This should not include temporarily installed items such as rock pads, quarry spalls, straw bales, rock (or other) check dams, etc. • This should not include flow restrictor, energy dissipator, or debris rack (these features are collected as a separate feature type in the same location). • If the accessory equipment is not readily identified, a note is recorded and an additional photograph can be taken for identification at a later time.

Data collection rules: Office	• Should only apply to permanent devices or equipment. • Stormwater pump station is an example of accessory equipment. In the drawing below, it's associated with an existing catch basin.
Database domain values and definitions: None	

ActualWorkStartDate

Database field definitions, properties, and rules	
Field definition	The date that physical work started on the project (construction start date).
Field data type	Date; Length: 36
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	May be found in the contract progress schedule or asbuilt cover sheet.
Database domain values and definitions: None	

AheadBackIndicator

Database field definitions, properties, and rules	
Field definition	Indicates that the feature occurs within a highway segment that is classified as a back equation as defined by the WSDOT linear referencing system and listed in the State Highway Log Planning Report. This results in a calculated milepost value that is the duplicate of a milepost value on the route.
Field data type	Text; Length: 1
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	Use the most recent version of the State Highway Log and Planning Report to determine the status of the highway segment where the feature is located.
Database domain values and definitions: None	
B	The feature is located on a highway segment that is classified as a "back" equation.

null	The feature is not located on a highway segment that is classified as a back equation.

ARM

Database field definitions, properties, and rules	
Field definition	Accumulated Route Mile is an accrual of mileage from the beginning of a route to the end of the route as defined by the WSDOT linear referencing system (LRS).
Field data type	Float
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	The ARM value for a feature should be bulk calculated by a database administrator and updated at regular intervals. The ARM is an accrual of actual route distance and does not contain equations. ARM values should be used for computing distance (see SRMP below).
Database domain values and definitions: None	

AsBuiltPlanNum

Database field definitions, properties, and rules	
Field definition	The as-built plan number associated with the project where the feature first appears.
Field data type	String; Length: 50
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	• This is different from the contract number (see "ContractNum" below). • The number may be handwritten on the as-built cover sheet. • If there is no as-built number on the contract, put "none" in AsBuiltPlanNum.
Database domain values and definitions: None	

AssetGUID

Database field definitions, properties, and rules	
Field definition	A globally unique identifier assigned to the feature by the Highway Activity Tracking System (HATS)
Field data type	GUID
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	For all new features this field will be populate automatically in the HATS application during a regularly scheduled ETL process between SFID and HATS. For all features that are newly created in SFID but already exist in HATS, the AssetGUID will be manually copied from the HATS feature and pasted in to the SFID feature.
Database domain values and definitions: None	

AssetReferenceNumber

Database field definitions, properties, and rules	
Field definition	A globally unique identification number assigned to the feature by the Highway Activity Tracking System (HATS)
Field data type	Long Integer; Length: 10
Office vs. Field collection	None- this field will be managed by the HATS application and populated in SFID via regularly scheduled ETL process.
Data collection rules: Field	NA
Data collection rules: Office	NA
Database domain values and definitions: None	

AssetReferenceText

Database field definitions, properties, and rules	
Field definition	A globally unique identification number assigned to the feature by the Highway Activity Tracking System (HATS)
Field data type	Text; Length: 15
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	For all new features this field will be populate automatically in the HATS application during a regularly scheduled ETL process between SFID and HATS. For all features that are newly created in SFID but already exist in HATS, the AssetReferenceText will be manually copied from the HATS feature and pasted in to the SFID feature.
Database domain values and definitions: None	

AverageAccuracy

Database field definitions, properties, and rules	
Field definition	The average of the estimated accuracy values (in meters) for each vertex in a feature as calculated by Trimble® GPS Analyst™ (GPS Analyst) software during postprocessing.
Field data type	Double; Length: 38
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	• This field is filled by the data steward postprocessing field data. • Only applies to features collected using ArcPad® 10.0 with service pack 1 (ArcPad®) and postprocessed using GPS Analyst™. • During postprocessing, GPS Analyst™ calculates the average of the estimated accuracy values for each vertex in a feature.
Database domain values and definitions: None	

BMPTypeID

Database field definitions, properties, and rules	
Field definition	• If the stormwater feature contains a BMP or is acting as a BMP, the BMP type is entered here. • BMPs are "best management practices," or structural devices, that are used singly or in combination to prevent or reduce the detrimental impacts of stormwater, such as pollution of water, degradation of channels, damage to structures, and flooding (WSDOT *Highway Runoff Manual* [HRM], M 31-16).
Field data type	Domain; Long Integer; Length: 4
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	• The BMP type will be recorded in the as-built plan set as part of the drainage sheets or in the drainage details or indicated in a hydraulic report. • Additional BMP attribute information is included in the feature-specific fields "SWPondType" and "StormwaterVaultType."
Database domain values and definitions: "BMPTypeID"	
1 – Biofiltration Swale	Vegetation-lined channels designed to remove suspended solids from stormwater (HRM, 5-4.1.3).
6 – Continuous Inflow Biofiltration Swale	Used when water enters a biofiltration swale continuously along the side slope rather than discretely at the head. The basic swale design is modified by increasing swale length to achieve an equivalent average hydraulic residence time (HRM, 5-4.1.3, AT.06).
8 – Drywell	Subsurface concrete structures that convey stormwater runoff into the soil matrix. Can be stand-alone or part of a large drainage

	system (HRM, 5-4.2.1, IN.05).
9 – Engineered Dispersion	Similar to natural dispersion but area may be landscaped and engineered compost-amended soils may be used. Major to minor construction may be needed depending on topography (HRM, 5-4.2.2, FC.02).
11 – Infiltration Trench	Long, narrow, stone-filled trenches used for collection, temporary storage, and infiltration of stormwater (HRM, 5-4.2.1, IN.03).
13 – Media Filter Drain *(Also ecology bank, ecology embankment, compost-amended vegetated filter strip)*	Linear flow-through stormwater treatment located along highway side slopes and medians (HRM, 5-4.1.3, RT.07).
14 – Natural Dispersion	Use of the natural setting of the highway to remove stormwater (infiltration, evaporation, transpiration); should not discharge to a lake or stream (HRM, 5-4.2.2, FC.01).
15 – Oil Containment Boom	A weather-resistant, hydrophobic, absorbent-filled boom for removing hydrocarbon sheens from water (HRM, 5-4.1.5, RT.22).
16 – Permeable Pavement Surfaces	Can be applied to non-pollution-generating surfaces such as pedestrian/bike paths, raised traffic islands, and sidewalks. Permeable surfaces allow stormwater to pass through and infiltrate the soil below (HRM, 5-4.2.1, IN.06).
17 – Vegetated Filter Strip	Land areas of planted vegetation and amended soils situated between pavement surface and collection system (HRM, 5-4.1.3, RT.02).
18 – Wet Biofiltration Swale	Variation of basic biofiltration swale for use where longitudinal slope is slight, water table is high, or continuous base flow is likely to result in saturated soil conditions (HRM, 5-4.1.3, RT.05).
19 – Stormwater Ponds	Parent value for all features listed in Stormwater SwPondType domain under the StormwaterPondPoint feature class.
20 – Stormwater Vaults	Parent value for all features listed in Stormwater SwVaultType domain under the StormwaterVault feature class.
21 – Other Add Note	Use if the feature is a BMP not listed.
22 – Linear Sand Filter	Linear sand filters are typically long, shallow, two-celled, rectangular vaults. The first cell is designed for settling coarse particles, and the second cell contains the sand bed. Stormwater flows into the second cell via a weir section that also functions as a flow spreader.
23 – Filters	Filtration device placed in a stormwater structure that removes pollutants by passing untreated stormwater through a treatment media.
24 – None	The feature does not act as, or contain, a current BMP
25 – Flow Restrictor	A device such as an orifice or weir that restricts the volume of stormwater flow through or at the outlet of a structure. This may be associated with a "control structure" as part of a "flow restrictor system" (see Standard Plans B-10.40, B-10.60).
26 – Energy Dissipator	• A method to reduce the total energy of flowing water; a mechanism that reduces velocity prior to or at discharge from an outfall in order to prevent erosion (see *Hydraulics Manual*, Section 3-4.7; see also *FHWA Hydraulic Engineering Circular*

	No. 14). • The WSDOT Stormwater Features Inventory Database should not document energy dissipators unless they occur at or near the end of a stormwater system, immediately prior to discharge.
27 – CAVFS	Compost Amended Vegetated Filter Strip
28 – CABS	Compost Amended Biofiltration Swale, Vegetation-lined channels with added compost layer designed to remove suspended solids from stormwater (HRM, 5-4.1.3).
29 – Biofiltration Swale	Vegetation-lined channels designed to remove suspended solids from stormwater (HRM, 5-4.1.3).
30 – Bioretention Area	Shallow landscaped depressions that use designed soils mix and plants to provide runoff treatments and flow control (HRM, RT.08, also known as rain gardens).
40 – Pond Bioinfiltration	Combines grasses (or other vegetation) and soils to remove stormwater pollutants by percolation into the ground (HRM, 5-4.2.1, also known as bioinfiltration swales or grass percolation areas).
41 – Pond Infiltration	Earthen impoundments used for the collection, temporary storage, and infiltration of incoming stormwater runoff to groundwater (HRM, IN.02)
42 – Pond Detention	Open basins that provide live storage volume to enable reduction of stormwater runoff flow rates and matching of predeveloped flow durations discharged from a site (HRM, 5-4.2.3).
43 – Pond Wet	A constructed stormwater pond that retains a permanent pool of water (wet pool), at least during the wet season (HRM, 5-4.1.4).
44 – Pond Evaporation	Pond designed to evaporate water.
45 – Pond Constructed Treatment Wetland	Shallow constructed wetlands designed to treat stormwater through settling, filtering, and the biologic processes associated with emergent aquatic plants (HRM, RT.13).
46 – Pond Unknown Other	The feature can be identified as a constructed ponding area for stormwater but the type of pond is either unknown or is not listed here.
47 – Pond Combined Wet/Detention	A pond that combines the treatment function of a wet pond and the flow control function of a detention pond (HRM, CO.01).
52 – Vault Unknown Other	The feature can be identified as a constructed stormwater vault but the type of vault is either unknown or is not listed here.
53 – Vault Vortex	A vortex tank generally consists of a cylindrical vessel where the inlet flow spirals around the perimeter causing the heavier particles to settle out of the stormwater. It uses a vortex-enhanced settling mechanism (swirl-concentration) to capture settleable solids, floatables, and oil and grease.
54 – Vault Wet	Wet vaults maintain a permanent pool of water, regulated by baffles and tee pipes.
55 – Vault Sand Filter	A sand filter vault incorporates a sand layer and underdrains that are installed below grade in the vault. It consists of presettling and sand filtration cells.
56 – Vault Infiltration	Bottomless underground structures used for temporary storage and infiltration of stormwater runoff (*Highway Runoff Manual,*

	5-4.2.1, IN.04).
57 – Vault Detention	A stormwater detention vault is an underground structure designed to manage excess stormwater runoff on a developed site, often in an urban setting.
58 – Vault Detention Tank	A detention tank delays the flow of rainwater and stormwater to municipal stormwater pipes.
59 – Vault Combined Wet/Detention	A vault with a wet and detention cell. Maintains a permanent pool of water in the wet cell and manages excess stormwater runoff in the detention cell.
60 – Vault Coalescing Plate Separator	Incorporates incline channels, which allow oil drops to collect on the underside of the plates and form larger globules, which then rise toward the surface of the water.
62 – Vault Baffle-Type (API) Oil/Water Separator	Device designed to separate gross amounts of oil and suspended solids from stormwater.
89 – Pond Sand Filter Basin	A constructed depression or basin with a layer of sand that treats stormwater as it percolates through the sand and is discharged via a central collector pipe (HRM).
97 – Pond Combined Treat Wet/Detention	A wetland system that provides for extended detention of runoff during and following storm events (HRM, CO.02).
104 – Vault Vortechs	
31 – Not a Stormwater BMP	

CollectionDate

Database field definitions, properties, and rules	
Field definition	Date the feature was originally created in the field.
Field data type	Date; Length: 36
Office vs. Field collection	Field
Data collection rules: Field	This date field may be auto-filled or may require manual entry.
Data collection rules: Office	NA
Database domain values and definitions: None	

ContractNum

Database field definitions, properties, and rules	
Field definition	The contract plan number associated with the project where the feature was constructed (or first appears).
Field data type	String; Length: 50
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	Entered as the final 4 or 5 digits of the construction contract number. If a "1" has been added to the beginning of a contract number to try to make it unique, include the "1" when filling in the attributes.

Database domain values and definitions: None

DataDevelopmentNotes

Database field definitions, properties, and rules	
Field definition	A field used to nominate new codes for the data steward to approve.
Field data type	String; Length: 150
Office vs. Field collection	Both
Data collection rules: Field	This is a place to suggest new domain values for other fields. Be sure to indicate the field in question.
Data collection rules: Office	This is a place to suggest new domain values for other fields. Be sure to indicate the field in question.
Database domain values and definitions: None	

DesignStandardDate

Database field definitions, properties, and rules	
Field definition	The publication date (version) of the manual followed to construct the feature (month/year) as indicated in the Hydraulic Report.
Field data type	Date; Length: 36
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	• This is the date of the document entered in "DesignStandardRefDoc" (see below). • The Hydraulic Report will have this information. • If needed, we will use the design date to make an estimate for the standard of the time.
Database domain values and definitions: None	

DesignStandardRefDoc

Database field definitions, properties, and rules	
Field definition	The design reference document/manual used to construct the feature as indicated in the Hydraulic Report.
Field data type	Domain; String; Length: 80
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	The Hydraulic Report will have this information.
Database domain values and definitions: "DesignStandardRefDoc"	
Design Manual	WSDOT *Design Manual*, M 22-01
Highway Runoff Manual	WSDOT *Highway Runoff Manual*, M 31-16
Hydraulics Manual	WSDOT *Hydraulics Manual*, M 23-03

Standard Plans	WSDOT *Standard Plans for Road, Bridge, and Municipal Construction*, M 21-01
Standard Specifications	WSDOT *Standard Specifications for Road, Bridge, and Municipal Construction*, M 41-10
External Party	The reference document was generated by a non-WSDOT third party.

DifferentialCorrection

Database field definitions, properties, and rules	
Field definition	This field indicates whether or not a feature collected via GPS has been differentially corrected. To be filled in with either "yes" or "no."
Field data type	String; Length: 20
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	This attribute is entered by the data steward.
Database domain values and definitions: None	

DirectionOfInventory

Database field definitions, properties, and rules	
Field definition	The side of the roadway as defined by the WSDOT linear referencing system where the feature occurs. Features that get tagged with this code occur ON the main traveled way (see LeftRightIndicator for features that occur alongside the main traveled way).
Field data type	Domain; String; Length: 80
Office vs. Field collection	Both
Data collection rules: Field	Identify the location of the feature relative to the main traveled roadway. If the feature occurs on the side of the main traveled way leave this field null and see LeftRightIndicator.
Data collection rules: Office	You can use satellite images and various web image applications to assist in determining the location of the feature relative to the main traveled roadway. If the feature occurs on the side of the main traveled way leave this field null and see LeftRightIndicator.
Database domain values and definitions: None	
I	The feature occurs on the increasing side of the main traveled way.
D	The feature occurs on the decreasing side of the main traveled way.
B	The feature affects both the increasing and decreasing directions of the main traveled way.

DrainageArea

Database field definitions, properties, and rules	
Field definition	• The surface area that contributes flow to a discrete feature, series of features, or a complete stormwater system. • The perimeter of this area may be natural drainage divides or may be defined by engineered structures such as curb, barrier, or berms that contain flow. The drainage area for each feature includes only the area that is "upstream" of that feature. This value can be pulled from the hydraulic model or calculated

	based on field data collection.
Field data type	Double; Length: 8
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	Under development
Database domain values and definitions: None	

DrainageAreaUnits

Database field definitions, properties, and rules	
Field definition	The units of measurement chosen to represent the value recorded in "DrainageArea" (typically, "Acres").
Field data type	Domain; String; Length: 10
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	Units correspond with the value calculated in the DrainageArea attribute.
Database domain values and definitions: "AreaUnits"	
Acres	U.S. survey acre: 43,560 square feet.
Hectares	Metric unit of area, equivalent of 10,000 square meters.
Sq. feet	Use U.S. survey foot.
Sq. meters	Use International System (SI) meter.

ExternalAssocID

Database field definitions, properties, and rules	
Field definition	If the data is from a source other than WSDOT (such as a county, city, or other National Pollutant Discharge Elimination System permit holder), this is the unique identification number as assigned by the third-party data provider. For PipeEnds only, this attribute will be calculated to the "parent" pipe's unique ID.
Field data type	Domain; String; Length: 20
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	The value directly matches the unique ID for the feature as assigned by the third-party data provider.
Database domain values and definitions: None	

ExternalAssocIDSource

Database field definitions, properties, and rules	
Field definition	If data is from a source other than WSDOT (such as a county, city, or other National Pollutant Discharge Elimination System [NPDES] permit holder), the source name is entered here.
Field data type	Domain; String; Length: 30

Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	Use the name of the NPDES municipal stormwater permit holder or other source that provided the data, not the contractors or consultants that were contracted to collect it.
Database domain values and definitions: None	

FeatureBuildDate

Database field definitions, properties, and rules	
Field definition	The date a feature was placed in/on the ground, if known. This date is distinct from the "ActualWorkStartDate" as defined above.
Field data type	Date; Length: 36
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	Use the nearest documented date to when the feature was constructed. If the only data known is the "Work Begin" date found on the asbuilt cover sheet, leave this field null
Database domain values and definitions: None	

FeatureCurrentMeasurementDate

Database field definitions, properties, and rules	
Field definition	Most recent date a feature's location was field verified. The location of this feature is "current" as of that date.
Field data type	Date; Length: 36
Office vs. Field collection	Field
Data collection rules: Field	Update this field to the current date when: • The feature is first collected in the field. • The position of an existing feature has been field verified to be correct. The position of an existing feature has been changed during field verification.
Data collection rules: Office	NA
Database domain values and definitions: None	

FeatureDesignDate

Database field definitions, properties, and rules	
Field definition	The initial design date for a feature.
Field data type	Date; Length: 36
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	This date may be recorded in the hydraulic report or as-built plansNA
Database domain values and definitions: None	

FeatureRetireDate

Database field definitions, properties, and rules	
Field definition	The date on which the "LifeCycleCurrentStatus" attribute is changed to: "Removed", "Deactivated", "Other Add Note", "Duplicate", or "Retired".
Field data type	Date; Length: 36
Office vs. Field collection	Both
Data collection rules: Field	Record this date only if the previously documented feature is determined inactive, disconnected, or physically removed.
Data collection rules: Office	Use care when retiring a feature from the office. Most features should only be retired upon field-verification that the feature is no longer actively part of the WSDOT stormwater system. Features may be retired if an as-built plan sheet indicates that the feature was removed, plugged, disconnected, or otherwise abandoned.
Database domain values and definitions: None	

GlobalID

Database field definitions, properties, and rules	
Field definition	A unique value assigned by the Stormwater Features Inventory Database (SFID) when the feature is first created. This ID is retained for the life of the feature and is specific to the SFID.
Field data type	GlobalID; Length: 38
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	This attribute is automatically generated during feature upload.
Database domain values and definitions: None	

GPSDeviceName

Database field definitions, properties, and rules	
Field definition	If the feature location was documented using a GPS/GNSS unit, this is the proprietary name and version of the GPS/GNSS hardware device used.
Field data type	String; Length: 50
Office vs. Field collection	Field
Data collection rules: Field	This device name should accurately reflect the proprietary name and version of the field data collection equipment.
Data collection rules: Office	NA
Database domain values and definitions: None	

HorizontalAccuracy

Database field definitions, properties, and rules	
Field definition	To be determined.
Field data type	Double; Length: 8
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	To be determined.
Database domain values and definitions: None	

HorizontalUnits

Database field definitions, properties, and rules	
Field definition	To be determined.
Field data type	String; Length: 20
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	To be determined.
Database domain values and definitions: None	

LandUse

Database field definitions, properties, and rules	
Field definition	A WSDOT-specific description of the primary use for land on which the feature occurs.
Field data type	Domain; String; Length: 50
Office vs. Field collection	Both
Data collection rules: Field	The land use type should be assumed based on the type of facility where data collection is occurring. For features connecting adjacent land use types, select the value the stormwater feature serves (i.e., if a pipe drains a highway ditch to a maintenance area pond, the land use of the pipe is designated as "highway").
Data collection rules: Office	Land use can be determined from a number of WSDOT's internally available GIS workbench resources.
Database domain values and definitions: "LandUse"	
Airport	Use designated for WSDOT-owned or -operated airport or airport facilities.
Ferry Terminal	Use designated for WSDOT-owned or -operated ferry terminals or marine facilities.
Highway	Use designated for WSDOT-owned or -operated highways.
Maintenance Area	Use designated for WSDOT-owned or -operated maintenance facilities.
Park and Ride	Use designated for WSDOT-owned or -operated park and ride facilities.
Railroad	Use designated for WSDOT-owned or -operated railroad or rail facilities.
Rest Area	Use designated for WSDOT-owned or -operated highway rest areas.
Stockpile	Use designated for WSDOT-owned or -operated stockpile or borrow sites.

LastUpdatedBy

Database field definitions, properties, and rules	
Field definition	The account user name of the person who most recently modified the feature's location or attributes.
Field data type	String; Length: 50
Office vs. Field collection	Both
Data collection rules: Field	This field is "read only" and is automatically populated by a back end process.
Data collection rules: Office	This field is "read only" and is automatically populated by a back end process.
Database domain values and definitions: None	

LifeCycleCurrentStatus

Database field definitions, properties, and rules	
Field definition	The current or last known status of a feature.

Field data type	Domain; String; Length: 30
Office vs. Field collection	Both
Data collection rules: Field	Update this field only if it is determined that the status of a previously documented feature has changed. For example, there may be evidence in the field that a feature has been disconnected, physically removed, or otherwise abandoned. This attribute is tied to the "LifeCycleStatusDate" field defined below. If the "LifeCycleCurrentStatus" field is changed, the "LifeCycleStatusDate" should be updated to reflect this change.
Data collection rules: Office	Use care when assessing the feature's status from the office. Most features' life cycle status should only be updated upon field verification that the status has changed. A feature's status may be changed if an as-built plan sheet indicates that the feature was removed, plugged, disconnected, or otherwise abandoned. Likewise, the feature can be reactivated during a project that might re-establish a tie to that line. This attribute is tied to the "LifeCycleStatusDate" field defined below. If the "LifeCycleCurrentStatus" field is changed, the "LifeCycleStatusDate" should be updated to reflect this change.
Database domain values and definitions: "LifeCycleCurrentStatus"	
Active	The feature actively collects, conveys, or discharges stormwater.
Removed	The feature has been physically removed (as confirmed by as-built plan) or cannot be visually verified to in place during field inspection.
Temporarily Inactive	The feature has been temporarily plugged or circumvented with the intent to reintroduce stormwater flow in the future.
Unknown	At the time of data collection, it is unknown whether the feature actively conveys stormwater.
Deactivated	This feature is no longer active as part of the WSDOT storm sewer system, but can be verified by as-built plan to remain physically in place.
Other Add Note	At the time of data collection, it is determined the feature has a status that is best described in terms other than those presented here. Please add a note to the "Notes" attribute briefly indicating the reason for this selection.
Duplicate	It has been determined that the feature is a duplicate of a feature that already exists in SFID.
Retired	It has been determined that the feature was collected in error or does not conform to updated standard definitions.
Design	Typically used for stormwater BMP features, this indicates that the feature is in design and has not yet been constructed.
Construction	Typically used for stormwater BMP features, this indicates that the feature has completed the design phase and is under construction but has not yet reached a status of operationally complete.

LifeCycleStatusDate

Database field definitions, properties, and rules	
Field definition	The date on which the "LifeCycleCurrentStatus" field was changed or

	the most recent date it was verified as "Active".
Field data type	Date; Length: 36
Office vs. Field collection	Both
Data collection rules: Field	If the "LifeCycleCurrentStatus" field is changed, the "LifeCycleStatusDate" should be updated to reflect this change.
Data collection rules: Office	The project completion date from the as-built cover sheet for the newest contract on which the feature appears.
Database domain values and definitions: None	

LocationCollectionMethod

Database field definitions, properties, and rules	
Field definition	Indicates how the feature was collected. Various office- and field-based data collection methods are distinguished.
Field data type	Domain; String; Length: 50
Office vs. Field collection	Both
Data collection rules: Field	For general field work using a GPS/GNSS data collector, "Field: Mapping Grade GPS" should be used.
Data collection rules: Office	For work on the scanned as-builts, use "Office: GIS WSDOT."
Database domain values and definitions: "LocationCollectionMethod"	
Field: Survey Grade GPS	Feature geometry was determined by device that is accurate to within 1 centimeter, postprocessed or real-time corrected against at least one static base station.
Field: Mapping Grade GPS	Feature geometry was determined by device that is accurate to within 1 meter, often post processed or real-time corrected against a static base station.
Field: Recreational Grade GPS	Feature geometry was determined by device that is accurate to within 10 meters.
Field: MilePost Measured	The feature location was determined in the field using a measuring device such as a vehicle odometer or distance measuring instrument to establish a milepost value based on the WSDOT highway linear referencing system.
Field: MilePost Estimated	The feature location was determined in the field using an estimated milepost value based on the WSDOT highway linear referencing system.
Field: Presumed	The feature location was approximated in the field due to heavy overgrowth of vegetation, inaccessibility, or burial.
Office: Engineering Documents	The feature location was recorded in the office using computer assisted drafting engineering software.
Office: GIS WSDOT	The feature was digitized in the office using a desktop-based Geographic Information System (GIS) using geo-referenced as-built plan sheets.
Office: GIS Web	The feature was digitized in the office using a GIS Web application such as a proprietary satellite image or street view application.
Office: GIS Other Add Note	The feature was digitized in the office using a type of GIS application that is not depicted here.

Office: Presumed	The feature location was approximated in the office if the true point location or linear path could not be determined from available engineering plans.
Office: MilePost Estimated	The feature location was recorded in the office using an estimated milepost value based on the WSDOT highway linear referencing system.
Other Add Note	The feature location was determined using a method that is not represented here.
Office: 3 Inch Pixel 1 Foot Accuracy	The feature location was corrected in the office using high resolution high accuracy aerial photogrammetry images.

LocationCollectionProgram

Database field definitions, properties, and rules	
Field definition	Indicates the internal WSDOT program that documented the feature or, in the case of a third party, the WSDOT group that provided method and oversight during the data collection.
Field data type	Domain; String; Length: 25
Office vs. Field collection	Both
Data collection rules: Field	For general field data collection, use "WSDOT ESO."
Data collection rules: Office	For work on the scanned as-builts, use "WSDOT ESO."
Database domain values and definitions: "LocationCollectionProgram"	
WSDOT ESO	The feature was documented by or with oversight from the WSDOT Environmental Services Office.
WSDOT RFIP	The feature was documented by or with oversight from the WSDOT Roadside Features Inventory Program.
WSDOT Maintenance	The feature was documented by or with oversight from the WSDOT Maintenance group.
WSDOT CAE	The feature was documented by or with oversight from the WSDOT Computer Aided Engineering group.
Other Add Note	The feature was documented by a group other than is indicated here.
Photogrammetry	The feature was documented by the WSDOT Photogrammetry office.

LocationFieldNotes

Database field definitions, properties, and rules	
Field definition	A note field used to record issues with a feature's location or characterization so the data steward can look into correcting it.
Field data type	String; Length: 150
Office vs. Field collection	Field
Data collection rules: Field	This note field is used in the rare case a feature is documented in a location that is known to be incorrect or is "presumed," due to

	difficult field conditions, at the time of documentation.
Data collection rules: Office	NA
Database domain values and definitions: None	

LRSDate

Database field definitions, properties, and rules	
Field definition	The WSDOT linear referencing system (LRS) is an Agency standard for locating events along a linear route feature. This field indicates the date of the TRIPS ARM values used to create the LRS dataset that was used to document the milepost and offset of a feature.
Field data type	Date; Length: 38
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	This date can be found in the metadata sheet for the LRS layer used to calculate values. If the SRMP or ARM fields are populated with linear referenced values, the LRSDate should also be populated.
Database domain values and definitions: None	

MaintenanceArea

Database field definitions, properties, and rules	
Field definition	WSDOT Region Maintenance Area
Field data type	Short Integer; Length: 5
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	This value will be populated by the data steward
Database domain values and definitions: None	

MaintenanceBMPID

Database field definitions, properties, and rules	
Field definition	Unique ID assigned to a single feature, or group of features, that is covered under the same maintenance inspection report.
Field data type	String; Length: 25
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	Will be assigned per the guidance of maintenance.
Database domain values and definitions: None	

MaintenanceConcerns

Database field definitions, properties, and rules	
Field definition	An important note field used to report issues with the feature that can be remedied through maintenance activity. Maintenance-related issues can compromise the design of a conveyance system and facilitate discharge of undesirable pollutants.
Field data type	String; Length: 150
Office vs. Field collection	Field

Data collection rules: Field	A maintenance concern note should be limited to specific issues with the feature that will inhibit or compromise proper function. This might include: a missing drainage inlet grate; broken, degraded, or corroded structure walls; a broken or sagging curb line; catch basin sumps that are full of debris, etc. In addition, the field crew should be familiar with best management practice maintenance standards discussed in the *Highway Runoff Manual, Section 5-5 and in the Maintenance Manual, Chapter 4*.
Data collection rules: Office	NA
Database domain values and definitions: None	

Notes

Database field definitions, properties, and rules	
Field definition	A critical note field used to complement the feature data collection and record details about the feature that may not be included in the standard attributes.
Field data type	String; Length: 150
Office vs. Field collection	Both
Data collection rules: Field	The note field should not repeat other attributes that have already been recorded as part of the feature documentation. It should be clear, concise, and brief. A note should not contain abbreviations.
Data collection rules: Office	The note field should not repeat other attributes that have already been recorded as part of the feature documentation. It should be clear, concise, and brief. A note should not contain abbreviations.
Database domain values and definitions: None	

OBJECTID

Database field definitions, properties, and rules	
Field definition	A unique ID assigned to each feature by Environmental Systems Research Institute, Inc. (Esri)® software. This value can change during data reload.
Field data type	OID; Length: 4
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	This value is automatically generated. It should not be used as a long-term unique identifier for the individual feature.
Database domain values and definitions: None	

OffsetDistance

Database field definitions, properties, and rules	
Field definition	The distance from the highway edge stripe to the feature being collected, as measured exactly normal to the edge stripe.
Field data type	Double; Length: 8

Office vs. Field collection	Field
Data collection rules: Field	This field is used to record a distance measurement only when the "normal to edge stripe" offset routine is used.
Data collection rules: Office	NA
Database domain values and definitions: None	

OffsetType

Database field definitions, properties, and rules	
Field definition	The type of offset routine used to record the location of a feature.
Field data type	Domain; String; Length: 40
Office vs. Field collection	Field
Data collection rules: Field	Whenever possible, a feature location should be recorded directly. If conducting an offset routine is absolutely necessary, only use these approved routines for recording a location by offset.
Data collection rules: Office	NA
Database domain values and definitions: "OffsetType"	
None	The feature location was physically occupied during documentation.
Distance Bearing Laser	The "distance-bearing" offsetroutine was used to document the feature location.
Distance Distance Laser	The "distance-distance" offset routine was used to document the feature location.
Normal to Edgestripe Laser	The "normal to edgestripe" offset routine was used to document the feature location.
Other Add Note	An offset routine was used that is not included in this list.
Normal to Edgestripe Other Add Note	The "normal to edgestripe" offset method was used, but a method other than laser was used to generate the measurement.

Photo1ID, Photo2ID, Photo3ID

Database field definitions, properties, and rules	
Field definition	The camera-assigned photo number associated with the feature; up to three photos.
Field data type	String; Length: 255
Office vs. Field collection	Field
Data collection rules: Field	Enter only the camera-assigned sequential photo number.
Data collection rules: Office	NA
Database domain values and definitions: None	

Photo1Descrip, Photo2Descrip, Photo3Descrip

Database field definitions, properties, and rules	
Field definition	A basic description of the photograph recorded; up to three

	photos.
Field data type	String; Length: 255
Office vs. Field collection	Field
Data collection rules: Field	This note provides a brief and helpful description of the photograph taken (e.g., "vicinity looking north" or "detail of pipe end in structure").
Data collection rules: Office	NA
Database domain values and definitions: None	

PhysicalCompletionDate

Database field definitions, properties, and rules	
Field definition	The physical completion date of the project in which the feature was installed or constructed.
Field data type	Date; Length: 36
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	• This can be found in the as-built plan cover sheet or the Contract Progress Schedule and may be listed as "project complete date". • If the feature appears in as-built contract plans as "existing" the PhysicalCompletionDate should be left null.
Database domain values and definitions: None	

PrimaryFunction

Database field definitions, properties, and rules	
Field definition	Indicates the high-level stormwater management function of a feature. For best management practice (BMP) features, this value is specified by the design criteria provided for the feature.
Field data type	Domain; String; Length: 50
Office vs. Field collection	Both
Data collection rules: Field	If the primary function of the feature is unknown or not able to be determined in the field, accessory photographs may be helpful in identifying the feature upon return to the office.
Data collection rules: Office	Most features in a stormwater system will be "conveyance" elements. Those providing a stormwater management function will be described in the as-built plans or the Hydraulic Report. In the case of a BMP, the *Highway Runoff Manual* or other similar design resources may indicate the function of the feature.
Database domain values and definitions: "Function"	
Runoff Treatment	The feature is designed to perform pollutant removal to a specified level prior to discharge.
Flow Control	The feature is designed to mitigate the impacts of stormwater runoff flow rates from the system.
Conveyance	The feature is designed to collect and/or convey stormwater from one point to another.
Energy Dissipation	The feature is designed to reduce the total energy of the flowing water prior to discharge.
System Discharge	The feature facilitates ultimate discharge from the stormwater system. This feature is the system terminus.
Sanitary Sewer	The feature is designed to convey sanitary sewer waste water
Monitoring	The feature is designed to act as part of a water quality monitoring facility
Runoff Treatment and Flow Control	The feature is designed to both treat the stormwater by removing pollutants and to reduce runoff flow rates from the system
Receiving Water	The feature is designed and constructed primarily to convey a surface receiving water.
LID	The feature is designed to act as part of a Low Impact Development (LID)stormwater treatment BMP
Pretreatment	HRM def

ProjectName

Database field definitions, properties, and rules	
Field definition	This field is used to enter the written name of the project during which the feature was installed.
Field data type	String; Length: 150
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules:	The format will be: "StateRouteNumber; Project Title

Office	• State Route Number format: use triple digit route number, preceded by "SR", with a space between "SR" and route number. For example: SR 003. • Separate the State Route Number and the Project Title by a semi colon (;), with a space between the semi-colon and the Project Title • Project Title in ALL CAPS • Example: SR 500; ANDRESEN ROAD TO SR 503 This is found on the various plan set title pages or in the plan sheet title boxes.
Database domain values and definitions: None	

RecordCreatedBy

Database field definitions, properties, and rules	
Field definition	The name of the person who created the feature or most recently modified the feature's location or attributes.
Field data type	String; Length: 50
Office vs. Field collection	Both
Data collection rules: Field	During initial field-based data collection, this will be the name of the person operating the data collector. When a feature's attributes are updated during a field review, the name will be changed to indicate the person who performed the update.

Data collection rules: Office	During initial office-based data collection, this will be the name of the person digitizing the feature.
	• During data review, the data steward will assign names that generalize the group that is responsible for the initial data collection. Examples include:
	    o InternsWinter2013, InternsFall2012, etc.
	    o TetraTech2009, TetraTech2011, etc.
	    o SFI Admin
	SFI FieldCrew

Database domain values and definitions: None	

RecordCreateDate

Database field definitions, properties, and rules	
Field definition	The date when a feature is added to the Stormwater Features Inventory Database (SFID).
Field data type	Date; Length: 36
Office vs. Field collection	Both
Collection rules: Field	This field is "read only" and is automatically populated by a back end process.
Collection rules: Office	This field is "read only" and is automatically populated by a back end process.
Database domain values and definitions: None	

RecordUpdateDate

Database field definitions, properties, and rules	
Field definition	The most recent date on which a feature's attributes or geometry were changed or updated.
Field data type	Date; Length: 36
Office vs. Field collection	Both
Data collection rules: Field	This field is "read only" and is automatically populated by a back end process.
Data collection rules: Office	This field is "read only" and is automatically populated by a back end process.
Database domain values and definitions: None	

Region

Database field definitions, properties, and rules	
Field definition	WSDOT Region
Field data type	Text; Length: 2
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	This value will be populated by the data steward.
Database domain values and definitions: None	

RelRouteQual

Database field definitions, properties, and rules	
Field definition	A six digit field which uniquely identifies the RRT (see below) since there may be more than one type of RRT for a route.
Field data type	Text; Length: 7
Office vs. Field collection	Both
Collection rules: Field	NA
Collection rules: Office	The data steward will populate this field. The RRQ value is assigned to a feature based upon what roadway would be used to access the feature. The values will match those provided on the 24K LRS highway layer.
Database domain values and definitions: None	

RelRouteType

Database field definitions, properties, and rules	
Field definition	Two character abbreviation for a type of roadway as assigned by the WSDOT Linear Referencing System.
Field data type	Text; Length: 2
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	The data steward will populate this field. The RRT value is assigned to a feature based upon what roadway would be used to access the feature. The values will match those provided on the 24K LRS highway layer.
Database domain values and definitions: ""	
AR	Alternate Route (RRQ = descriptive location name)
CO	Couplet (RRQ = descriptive location name)
FD	Frontage Road (Dec) (RRQ = mainline SRMP)
FI	Frontage Road (Inc) (RRQ = mainline SRMP)
FS	Ferry Ship (Boat) (SR=999, RRQ=abbreviated name of ship)
FT	Ferry Terminal (RRQ= abbreviated name of city where located)
PR	Proposed Route (RRQ = descriptive location name)
RL	Reversible Lane (RRQ = mainline SRMP)
SP	Spur (RRQ = descriptive location name)

TB	Transitional Turnback (RRQ = descriptive location name)
TR	Temporary Route (RRQ = descriptive location name)
CD	Collector Distributor (Dec) (RRQ = mainline SRMP)
CI	Collector Distributor (Inc) (RRQ = mainline SRMP)
LX	Crossroad within Interchange (RRQ = mainline SRMP)
P1-P9	Off Ramp (Inc) (RRQ = mainline SRMP)
PU	Extension of P ramp (RRQ = mainline SRMP)
Q1-Q9	On Ramp (Inc) (RRQ = mainline SRMP)
QU	Extension of Q ramp (RRQ = mainline SRMP)
R1-R9	Off Ramp (Dec) (RRQ = mainline SRMP)
RU	Extension of R ramp (RRQ = mainline SRMP)
S1-S9	On Ramp (Dec) (RRQ = mainline SRMP)
SU	Extension of S ramp (RRQ = mainline SRMP)

SpatialAccuracy

Database field definitions, properties, and rules	
Field definition	This attribute is specific to the WSDOT Highway Features agency-wide data store and is populated by data owners with an estimated numeric value of expected accuracy for the feature location.
Field data type	String; Length: 50
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	This attribute is entered only by the data steward prior to upload to the WSDOT Highway Features system.
Database domain values and definitions: None	

SRMP

Database field definitions, properties, and rules	
Field definition	State Route Mile Post. A linear referencing system used to assign a logical number to a given point along a route.
Field data type	Float
Office vs. Field collection	Both
Collection rules: Field	
Collection rules: Office	The SRMP identifies reference points only and should NOT be used for computing distance (see "ARM" above).
Database domain values and definitions: None	

StateRouteNumber

Database field definitions, properties, and rules	
Field definition	A three digit number that identifies a road for which the State of Washington has some level of responsibility.
Field data type	Text; Length: 3
Office vs. Field collection	Both
Collection rules: Field	Use a three digit value (e.g. SR 503 = "503"; SR3 = "003")
Collection rules: Office	Use a three digit value (e.g. SR 503 = "503"; SR3 = "003")
Database domain values and definitions: None	

StormwaterSystemID

Database field definitions, properties, and rules	
Field definition	Unique ID assigned to each "Stormwater System" feature type. All stormwater features, from the discharge point upstream to the first feature where concentrated stormwater starts flowing through the system to the discharge, will have the same unique StormwaterSystemID value.
Field data type	Small Integer; Length: 10
Office vs. Field collection	Office
Data collection rules: Field	NA
Data collection rules: Office	This attribute will be bulk calculated once a completed system is inventoried.
Database domain values and definitions: None	

StormwaterAttributeVerified

Database field definitions, properties, and rules	
Field definition	This value indicates that a field crew from the WSDOT Stormwater Features Inventory group has performed a direct on-site evaluation and documentation of the feature's attributes.
Field data type	Text; Length: 3
Office vs. Field collection	Field
Collection rules: Field	This value is automatically populated to "Yes" when the feature has been assessed by a Stormwater Features Inventory field crew.

Collection rules: Office	Once the attributes of a feature have been verified by a Stromwater Features Inventory field crew they should not be changed.
Database domain values and definitions: None	

StormwaterLocationVerified

Database field definitions, properties, and rules	
Field definition	This value indicates that a field crew from the WSDOT Stormwater Features Inventory group has performed a direct on-site GNSS survey of the feature's location.
Field data type	Text; Length: 3
Office vs. Field collection	Field
Collection rules: Field	This value is automatically populated to "Yes" the first time that a Stormwater Features Inventory (SFI) field crew creates or moves a feature using GPS field data collection equipment. Once a feature's location has been field verified by a SFI crew, it should not be moved again unless a significant error is detected.
Collection rules: Office	Once a feature's location has been field verified by a SFI crew, it should not be moved. One exception to this is a process by which the location accuracy can be improved using high-resolution high-accuracy aerial imagery or 3rd party survey-grade geometry.
Database domain values and definitions: None	

Units-Area

Database field definitions, properties, and rules	
Field definition	The units of measurement used when entering values for the surface area of a feature.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Data collection rules: Field	Enter the appropriate units.
Data collection rules: Office	Enter the appropriate units.
Database domain values and definitions: "AreaUnits"	
Acres	U.S. survey acre: equivalent to 43, 560 square U.S. survey feet
Hectares	An area equivalent to 10, 000 square meters
Sq feet	Use U.S. survey feet
Sq meters	Use standard International System (SI) meters

Units-Depth/Width/Length

Database field definitions, properties, and rules	
Field definition	The units of measurement used when entering values for the depth, width, or length of a feature (includes "BottomDepthUnits," "BottomWidthUnits," "PipeSizeUnits," etc.).
Field data type	Domain; String; Length: 15

Office vs. Field collection	Both
Data collection rules: Field	Measure all dimensions in inches up to the value of 119. Measure dimensions in feet for all values greater than 119 inches.
Data collection rules: Office	Use the units provided in the engineering document being digitized (e.g. if the contract is represented using the metric system, a PipeSizeUnits value of 12 Inches will be represented in the contract as and recorded as 300 "mms."
Database domain values and definitions: "DepthLengthUnits"	
Feet	U.S. survey feet
Meters	International System (SI) meter
Inches	1/12 of one U.S. survey foot
cms	International System (SI) centimeter
mms	International System (SI) millimeter

Units-Volume

Database field definitions, properties, and rules	
Field definition	The units of measurement used when entering values for the volume of a feature.
Field data type	Domain; String; Length: 12
Office vs. Field collection	Both
Data collection rules: Field	The volume of a feature can be calculated based on field measurements and careful geometric calculations, but it should be checked and verified upon return to the office.
Data collection rules: Office	The volume may be available in the as-built plans or the Hydraulic Report.
Database domain values and definitions: "VolumeUnits"	
Cubic Feet	U.S. survey feet
Cubic Meters	International System (SI) meter
Gallons	U.S. liquid gallon (3.79 liters)
Acre Feet	One acre surface area to a depth of one foot; use U.S. survey acre, U.S. survey feet

WaterFlowDirection

Database field definitions, properties, and rules	
Field definition	Primary direction, relative to true north, that water flows through the feature. For a point feature, this is the direction water flows *out* of the structure. In the event of bidirectional flow (e.g., tidal influence or flood conditions), the feature will typically have a primary flow direction during periods of ebb tide or low flow.
Field data type	Domain; String; Length: 8
Office vs. Field collection	Both
Data collection rules: Field	Make sure to account for magnetic declination when using a compass. The value is assigned relative to true north.
Data collection rules: Office	• This is the primary flow direction through a feature. In the situation below, where water flows into a drainage inlet from two directions

and then out through a third direction, WaterFlowDirection for the drainage inlet would be where it flows out.
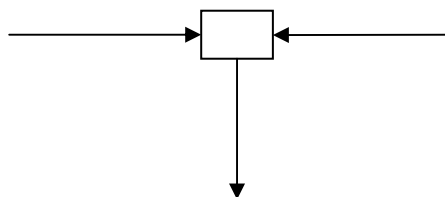
- A discharge point feature should have the same flow direction as the final feature in the system (system discharge feature).
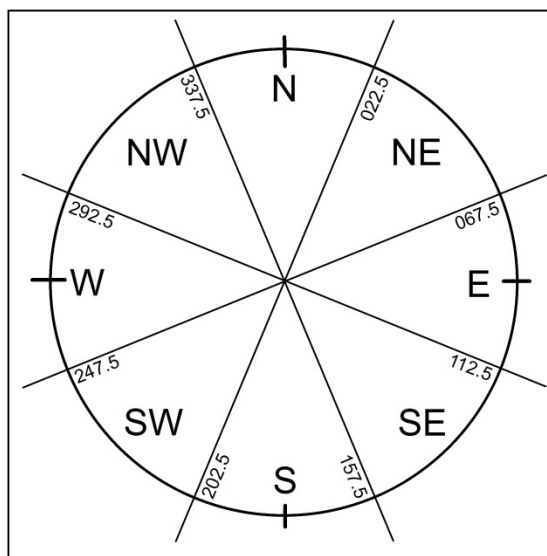
Database domain values and definitions: "WaterFlow"	
N	North (bearing 337.5-022.5)
NE	Northeast (bearing 22.5-67.5)
E	East (bearing 67.5-112.5)
SE	Southeast (bearing 112.5-157.5)
S	South (bearing 157.5-202.5)
SW	Southwest (bearing 202.5-247.5)
W	West (bearing 247.5-292.5)
NW	Northwest (bearing 292.5-337.5)
Unknown	The water flow direction is unclear at the time of documentation.

WorstAccuracy

Database field definitions, properties, and rules	
Field definition	This value is the estimated accuracy of the vertex that has the lowest estimated accuracy value.
Field data type	Double; Length: 8
Office vs. Field collection	Office

Data collection rules: Field	NA
Data collection rules: Office	This data field applies only to features collected using ArcPad® 10.0 with service pack 1 (ArcPad®) and is post processed using Trimble® GPS Analyst™ (GPS Analyst™). During post processing, GPS Analyst™ calculates the worst estimated accuracy for a feature. This attribute is a calculated value that is generated by the data steward.
Database domain values and definitions: None	

WSDOTFeatureNumber

Database field definitions, properties, and rules	
Field definition	This field has been replaced by the field "AssetReferenceText" above. This is a unique ID that is assigned to the feature during its initial upload to the WSDOT Highway Features agencywide data store and is retained for the life of that feature.
Field data type	String: Length: 20
Office vs. Field collection	Office
Data collection rules: Field	This attribute is not recorded during field data collection. However, the value should be noted during a field review that includes data from multiple sources. It will help to identify the same feature collected by multiple groups.
Data collection rules: Office	If there is an existing feature that is already assigned a WSDOTFeatureNumber, such as StormwaterPondPoint, and you add a different geometry (e.g. creating a stormwater pond polygon), be sure to copy the WSDOTFeatureNumber of the existing feature to the new representation.
Database domain values and definitions: None	

WSDOTTownership

Database field definitions, properties, and rules	
Field definition	Indicates if WSDOT has ownership over a feature. The final determination regarding ownership will rest with the WSDOT Real Estate Services office and/or Washington State Attorney General. (See also "City Streets as Part of State Highways.")
Field data type	Domain; String; Length: 8
Office vs. Field collection	Both
Data collection rules: Field	If the feature location falls within the "MapAreaBoundary" layer then the value should be set to "Yes."
Data collection rules: Office	If the feature location falls within the "MapAreaBoundary" layer polygon or within right of way lines on a right of way plan sheet (NOT an as-built contract plan right of way sheet) then the value should be set to "Yes." Note: It is common for WSDOT to construct various features and relinquish them to local municipalities upon project completion.
Database domain values and definitions: "YNUnk"	

Yes	This feature is owned by WSDOT.
No	This feature is not owned by WSDOT.
Unknown	At the time of data collection, it is unclear who owns this feature.

WSDOTresponsible

Database field definitions, properties, and rules	
Field definition	Indicates whether WSDOT has responsibility for operating and maintaining a feature, regardless of ownership. The final determination regarding responsibility will rest with the WSDOT Real Estate Services office, WSDOT Maintenance and Operations, and/or Washington State Attorney General. (See also "City Streets as Part of State Highways.")
Field data type	Domain; String; Length: 8
Office vs. Field collection	Both
Data collection rules: Field	If the feature location falls within the "MapAreaBoundary" layer then the value should be set to "Yes."
Data collection rules: Office	If the feature location falls within the "MapAreaBoundary" layer polygon or within right of way lines on a right of way plan sheet (NOT an as-built contract plan right of way sheet) then the value should be set to "Yes." Note: It is common for WSDOT to construct various features and relinquish them to local municipalities upon project completion.
Database domain values and definitions: "YNUnk"	
Yes	WSDOT is responsible for operating and maintaining this feature.
No	WSDOT is not responsible for operating and maintaining this feature.
Unknown	At the time of data collection, it is unclear who is responsible for operating and maintaining this feature.

3-0 Stormwater Feature Type and Subtype Definitions

FEATURE TYPES:

ARTIFICIAL DISCHARGE POINT

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Point
Feature definition	An artificial discharge point used to represent the estimated discharge point for systems ending in a polygon feature type (roadside slope polygon, dispersion area, infiltration pond, evaporation pond, etc.) where there is no discrete point of discharge.
Feature subtypes	None
Collection location	The location where WSDOT's stormwater system discharges to the dispersion area best management practice.
Collection rules: Field	This feature type should only be documented in the office.
Collection rules: Office	• Use for dispersion areas, roadside slope polygons, or infiltration ponds where there is no single discharge point.

Note: Only relevant common fields are documented for this feature type (see Section 2-0).

ARTIFICIAL PATH

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Polyline
Feature definition	Maintains continuity of the GIS stormwater system geometric network in a location where there is no constructed linear feature to indicate that flow continues across an area. Examples include: • Stormwater flow through a dispersion area, roadside slope polygon, or stormwater pond polygon when there is no other conveyance feature from the inlet to outlet structure. • Where stormwater flow is briefly dispersed to sheet flow from the end of a conveyance and then concentrated again by another downstream conveyance prior to discharge.
Feature subtypes	None
Collection location	• Place the end vertices on inlet and outlet points for the polygon structure –or on the end verticies of the linear or point features that you are connecting. • Place additional vertices to approximate the center line for the area of dispersion.

Collection rules: Field	Determine if flow that disperses at the end of a feature:
	    • Infiltrates to ground. Place a "subsurface" discharge point here (see Discharge Point feature class below).
	    • After a short distance is recollected by another feature and continues to a discharge point at a downstream location. Use

	the Artificial Path to show this connectivity.
Collection rules: Office	• In the case of a dispersion area or a roadside slope polygon, the artificial path is used to connect stormwater flow to the artificial discharge point.
	• In the case of a stormwater pond polygon, the artificial path may be used to represent flow through the pond or to connect stormwater flow to the artificial discharge point within the pond, depending on what type of pond is involved.

Note: Only relevant common fields are documented for this feature type (see Section 2-0).

CABINET

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Point
Feature definition	• A cabinet is an enclosure of various material types and dimensions that houses WSDOT water quality monitoring equipment.
	• Only stormwater monitoring cabinets will be documented by Stormwater Features Inventory personnel.
Feature subtypes	None
Collection location	Directly under/adjacent to the cabinet equipment mast.
Collection rules: Field	Document a stormwater monitoring cabinet location only at the request of the stormwater monitoring group.
Collection rules: Office	Document a stormwater monitoring cabinet location only at the request of the stormwater monitoring group.

Feature Type-Specific Fields and Domains

CabinetType

Definitions, properties, and rules	
Field definition	This refers to the functional purpose of the cabinet that is being documented.
Field data type	Domain; String; Length: 30
Office vs. Field collection	Both
Collection rules: Field	Stormwater monitoring cabinets will be documented by Stormwater Features Inventory personnel.
Collection rules: Office	Defer to the stormwater monitoring group for cabinet locations.
Domain values and definitions: "CabinetType"	
Stormwater Monitoring	This cabinet is used by the WSDOT Environmental Services Office, Stormwater and Watersheds Program's stormwater monitoring group for the purpose of compliance with WSDOT's National Pollutant Discharge Elimination System municipal stormwater permit.

CONCRETE BARRIER

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Polyline
Feature definition	Concrete barriers or walls, such as single-slope or K-barriers, which concentrate and convey stormwater flows, even if they were not designed or installed with the primary intent of being a stormwater conveyance. Only concrete barrier segments actively concentrating and conveying stormwater flows should be documented (i.e., a barrier located at the high side of a super elevated roadway will not concentrate and convey stormwater flows and therefore will not be mapped).
Feature subtypes	None
Collection location	Beginning and ending vertices should be placed at points defining the barrier segment actively conveying flow. Additional vertices may be placed at the front face (conveyance side) of the barrier. A minimum of two vertices are collected for a straight line barrier segment with additional vertices adequate in number and spacing to approximate a curved barrier segment.
Collection rules: Field	• A long, continuous barrier should be collected in segments that begin and end wherever the primary flow direction changes. These segments should begin at a drainage divide and end at the point where flow is transferred to another conveyance element or point of discharge (e.g., scupper, precast barrier abutment joint, bridge abutment joint, and barrier end). • A new line feature will be collected for each segment of the barrier having discrete dimensions, composition, or properties (within reason). For example, if a barrier changes from joined precast segments (that can be relocated or removed) to cast-in-place barrier (that will be permanently in place for the life of the feature), these segments should be collected as separate features.
Collection rules: Office	Most concrete barriers will only be collected in the field, where it can be determined whether they're participating in stormwater flow. In cases where as-built plans contain adequate information in the Roadway Section and Roadway Profile sheets, barriers can be mapped in the office.

Note: Only relevant common fields are documented for this feature type (see Section 2-0).

CURB

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Polyline
Feature definition	A curb is the raised edge or perimeter barrier of a roadway surface or impervious paved surface such as a parking lot, foot path, or bike

	path. Only curb segments actively concentrating and conveying stormwater flows should be documented (i.e., a curb located at the high side of a superelevated roadway will not convey stormwater flow and therefore will not be mapped).
Feature subtypes	None
Collection location	Beginning and ending vertices should be placed at points defining the curb segment actively conveying flow. Additional vertices may be placed at the front face (conveyance side) of the curb. A minimum of two vertices are collected for a straight line curb segment with additional vertices adequate in number and spacing to approximate the radius of a curved curb segment.
Collection rules: Field	• A new line feature will be collected for each segment of curb that has discrete dimensions, composition, or properties (within reason). For example, if a curb changes from extruded asphalt to concrete curb with a gutter, these segments should be collected as separate features. • A long continuous curb should be collected in segments that begin and end wherever the primary flow direction changes. These segments should begin at a drainage divide and end at the point where flow is transferred to another conveyance element or point of discharge (e.g., drainage inlet, designed or intentional curb gap, or curb end). • Short depressions in a curb line that do not allow flow to discharge will be included in the single line feature. For example, a pedestrian ramp or driveway ramp.
Collection rules: Office	• Most curbs will be collected in the field, where it can be determined whether they're participating in stormwater flow. • In cases where as-built plans contain adequate information in the Roadway Section and Roadway Profile sheets, curbs can be mapped in the office.

Note: Only relevant common fields are documented for this feature type (see Section 2-0).

DEBRIS RACK

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Point
Feature definition	A structural device such as grates or rods used to prevent debris from entering a drainage structure. Can include a barred culvert end if the bars are intended to keep debris from entering the pipe. (Also *"trash rack"* or *"bee hive"* are additional terms used to describe this type of structural devices). **Note:** Bars are also added to culvert ends greater than 36 inches in diameter as a safety measure during vehicle impact.
Feature subtypes	None
Collection location	The point should be collected as close to the center of the rack as possible.
Collection rules: Field	Debris racks are placed at a structure's INLET. A similar device

	placed at a structure's outlet is likely to inhibit access by animals, children, or vehicles and should not be documented as a debris rack feature.
Collection rules: Office	Addition of a debris rack is often indicated in the Structure Notes, General Notes, or Drainage Detail sheets.

Feature Type-Specific Fields and Domains

Location

Definitions, properties, and rules	
Field definition	Location of the debris rack in relation to the feature it is associated with.
Field data type	String; Length: 50
Office vs. Field collection	Both
Collection rules: Field	Examples: Pipe Inlet, Pipe Outlet, Catch Basin top, etc.
Collection rules: Office	Examples: Pipe Inlet, Pipe Outlet, Catch Basin top, etc.
Domain values and definitions: None	

DISCHARGE POINT

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Point
Feature definition	The point at which WSDOT loses, or obtains, jurisdictional responsibility of concentrated stormwater from a constructed stormwater conveyance feature. This includes locations where stormwater infiltrates into the ground at the end of a constructed stormwater conveyance, or enters surface waters of the state through a constructed stormwater conveyance.
Feature subtypes	Incoming; Land Surface; Managed System; Subsurface; Surface Water
Collection location	The discharge point should be placed at the physical location where stormwater is entering or leaving WSDOT jurisdiction (e.g., right of way boundary) or where it infiltrates to the ground or enters a water body of the state within the area of WSDOT jurisdictional responsibility.
Collection rules: Field	The method for documenting discharge points is described in detail in WSDOT's *Stormwater Features Inventory: Standard Operating Procedures for Stormwater Discharge Point Inventory*.
Collection rules: Office	• Discharge points should be placed at the location where a stormwater conveyance crosses the right of way (ROW) boundary, as indicated on the Right of Way plan sheets. • If no ROW boundary is marked on the as-built plan sheets, or the boundaries of responsibility are unclear, place the discharge point at an "estimated" location and make sure to select the "Office: presumed" value for the "LocationCollectionMethod" field.

Feature subtype definitions

Incoming	Incoming concentrated stormwater or other flow routed through a constructed conveyance that enters WSDOT property from a non-WSDOT-owned or -operated facility or system. This may include a direct connection of non-WSDOT conveyance features to elements of WSDOT's stormwater system network. In addition, incoming discharges include indirect connections of non-WSDOT conveyance features that route flow to WSDOT property where it infiltrates into the ground. To qualify as an incoming-type discharge, the incoming flow must cross the right of way (ROW) boundary in a concentrated form. The incoming discharge type does not include incoming flow from waters of the state in a natural channel.
Land Surface	Outgoing concentrated stormwater flow, routed through a constructed conveyance from WSDOT property that flows over the surface of the land to a field, forest, or landscaped area. To qualify as a land surface-type discharge, the concentrated flow must leave WSDOT's property in excess of 50 feet from a qualifying "water body of the state" and must not be seen to mix with a water body outside the ROW. This flow may be conveyed away from the ROW by a channel naturally eroded into the land surface or may disperse and infiltrate into the ground outside the ROW.
Managed System	Outgoing concentrated stormwater flow, routed through a constructed conveyance from WSDOT property, entering and mixing with a managed stormwater drainage network. This network can include both private drainage networks and those managed by a municipality (municipal separate storm sewer system or constructed storm sewer) and will consist of at least one constructed stormwater conveyance element.
Subsurface	Concentrated stormwater flow, routed through a WSDOT conveyance, which terminates within WSDOT property where flow is infiltrated into the ground in excess of 50 feet from a qualifying water body of the state. This can include either untreated infiltration via flow dispersion from the end of the conveyance or designed best management practices constructed to infiltrate water.
Surface Water	Concentrated stormwater flow, routed through a constructed WSDOT conveyance, enters then mixes with a regulated receiving "water body of the state." To qualify as a surface water-type discharge, the conveyed flow must be discharged directly into or within 50 feet of a qualifying water body, or can be visually confirmed to convey and enter the water body at a reasonable distance outside the WSDOT ROW boundary.

Feature Type-Specific Fields and Domains

AssociatedFeatureID

Definitions, properties, and rules	
Field definition	This value corresponds to the "AssetReferenceText" for the discharging stormwater feature, as assigned by the Highway Activity Tracking System (HATS).
Field data type	String; Length: 20
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	This field is populated by the data steward after the associated stormwater feature has been uploaded to, and then retrieved from, the HATS application. (The feature's AssetReferenceText field is populated during initial upload.)
Domain values and definitions: None	

AssociatedFeatureType

Definitions, properties, and rules	
Field definition	The final feature in a stormwater system network prior to the discharge point.
Field data type	Domain; String; Length: 40
Office vs. Field collection	Both
Collection rules: Field	Assess what type of stormwater conveyance feature is discharging at this location. This attribute indicates only the final conveyance element of a stormwater system.
Collection rules: Office	Assess what type of stormwater conveyance feature is discharging at this location. This attribute indicates only the final conveyance element of a stormwater system.
Domain values and definitions: "AssociatedFeatureType"	
Ditch Vegetated	A majority of the ditch bottom is vegetated.
Ditch Bare Soil	A majority of the ditch bottom is bare soil.
Ditch Rock	A majority of the ditch bottom is lined with rock (such as rip rap).
Ditch Asphalt	A majority of the ditch bottom is lined with asphalt.
Ditch Concrete	A majority of the ditch bottom is lined with concrete.
Ditch Other Add Note	A majority of the ditch bottom is composed of material other than what is noted here. Briefly describe the material type in the "Notes" field.
Ditch Unknown	The feature type of "Ditch" is confirmed, but the material type is unknown.
Pipe Concrete	The pipe is constructed of concrete material.
Pipe Plastic	The pipe is constructed of plastic material.
Pipe Metal	The pipe is constructed of metal material.
Pipe Clay	The pipe is constructed of clay material.
Pipe Other Add Note	The pipe is constructed of a material other than what is listed here. Briefly describe in the note field the material type.
Pipe Unknown	The feature type of "Pipe" is confirmed, but the material type is unknown.
Curb Concrete	The curb is constructed of a concrete material.
Curb Asphalt	The curb is constructed of an asphalt material.

Curb Unknown	The feature type of "Curb" is confirmed, but the material type is unknown.
Infiltration Facility	This is to be used when there is a designed stormwater infiltration facility discharging stormwater to the subsurface. These include facilities such as infiltration trenches, dry wells, infiltration ponds, and infiltration vaults.
Maintenance Concern Add Note	Stormwater is being discharged from a system that has maintenance concerns.
Unknown	At the time of documentation, it is unclear what the discharge is associated with.
Other Add Note	The feature type does not fall under any of the existing categories. Briefly describe in the notes field the feature and material type.

ConveyanceMode

Definitions, properties, and rules	
Field definition	Indicates the "open" or "closed" and permeability characteristic of the conveyance receiving the discharge.
Field data type	Domain; String; Length: 25
Office vs. Field collection	Both
Collection rules: Field	Determine this value based on the feature immediately down flow from the discharge point.
Collection rules: Office	Determine value based on the feature immediately down flow from the discharge point.
Domain values and definitions: "ConveyanceMode"	
Open Pervious	An "Open Pervious" conveyance is a permeable channel in which water flows with a free surface open to the atmosphere. Open pervious conveyances typically include roadside ditches and swales, which have a general geometric cross section.
Open Impervious	An "Open Impervious" conveyance is an impermeable channel in which water flows with a free surface open to the atmosphere. Open impervious conveyances typically include roadside channels, curbs, gutters, and asphalt-lined ditches that usually have a general geometric cross section.
Closed Pervious	A "Closed Pervious" conveyance is a permeable conduit in which water flows with no surface open to the atmosphere. Closed pervious stormwater system conveyances typically include box culverts and covered roadside ditches.
Closed Impervious	A "Closed Impervious" conveyance is an impermeable conduit in which water flows with no surface open to the atmosphere. Closed impervious stormwater system conveyances typically include concrete, plastic, and metal pipe series as well as culverts, storm drains, and catch basins.
NA	The discharge is not being received by a stormwater system; for example, natural dispersion and infiltration in a forest.
Open	An "Open" conveyance is designated when the associated feature is known to be open, such as a ditch, but the material type is unknown to make the determination of permeability.
Closed	A "Closed" conveyance is designated when the associated feature is known to be closed, such as a pipe, but the material type is unknown to

	make the determination of permeability.

DischargeName

Definitions, properties, and rules	
Field definition	The unique ID assigned to each discharge point, based on state route number, Related Route Type, State Route mile post, and direction of inventory. The standard notation is "SR_RRT_Mile(with unique number)"
Field data type	String; Length: 40
Office vs. Field collection	Both
Collection rules: Field	The method for assigning discharge names is described in detail in WSDOT's *Stormwater Features Inventory: Standard Operating Procedures for Stormwater Discharge Point Inventory*.
Collection rules: Office	The method for assigning discharge names is described in detail in WSDOT's *Stormwater Features Inventory: Standard Operating Procedures for Stormwater Discharge Point Inventory*.
Domain values and definitions: None	

DischargePointRole

Definitions, properties, and rules	
Field definition	Indicates whether the feature associated with the discharge point is designed as the primary discharge point for the stormwater system or as a system overflow.
Field data type	Domain; String; Length: 15
Office vs. Field collection	Both
Collection rules: Field	• Assess whether the associated feature is the primary point of discharge for the system or whether it is a point designed to accommodate overflow. For example, a detention pond spillway is designed to provide a regulated point of outflow from the pond only during periods when the primary pond outfall structure is plugged or overwhelmed by high flow volumes. • The feature can be photographed and reassessed by office personnel or against as-built plan sheets.
Collection rules: Office	Research the as-built plan sheets to determine whether the discharging feature is designed to act as the primary discharge or as a system overflow.
Domain values and definitions: "DischargePtRole"	
Primary	The associated feature is designed to act as the primary discharge location for the stormwater system.
Overflow	The associated feature is designed to act as a system overflow.

DischargeRecipientCategory

Definitions, properties, and rules	
Field definition	This is a selection list of the discharge point feature subtypes, as defined above.

Field data type	Domain; Short Integer; Length: 2
Office vs. Field collection	Both
Collection rules: Field	The discharge point is assessed against the five subtype definitions presented above, and the appropriate value is selected.
Collection rules: Office	The discharge point is assessed against the five subtype definitions presented above, and the appropriate value is selected.
Domain values and definitions: Feature subtype selection list	
Incoming	The discharge point meets the WSDOT definition of a "incoming" discharge.
Land Surface	The discharge point meets the WSDOT definition of a "land surface" discharge.
Managed System	The discharge point meets the WSDOT definition of a "managed system" discharge.
Subsurface	The discharge point meets the WSDOT definition of a "subsurface" discharge.
Surface Water	The discharge point meets the WSDOT definition of a "surface water" discharge.

DischargeRecipientType

Definitions, properties, and rules	
Field definition	• A description of the immediate recipient of the stormwater discharge. • Each domain is feature subtype-specific and displays automatically based on the subtype chosen.
Field data type	Domain; String; Length: 40
Office vs. Field collection	Both
Collection rules: Field	Select the feature subtype as defined below that best fits the discharge scenario.
Collection rules: Office	Select the feature subtype as defined below that best fits the discharge scenario, using the as-built plan sheets and an air photo for context.
Subtype "Incoming" domain values and definitions: "IncomingRecType"	
WSDOT Property	The structure conveying the incoming flow discharges to ground or other part of WSDOT right of way that is not part of WSDOT's stormwater system.
WSDOT MS4	The structure conveying incoming flow is physically connected to the local WSDOT stormwater system.
Subtype "Land Surface" domain values and definitions: "LandSurfaceRecType"	
Pasture, Field, Prairie	The stormwater conveyance discharges to a pasture, field, or prairie (typically indicated by planted or natural grass or small shrub vegetation).
Forest	The stormwater conveyance discharges to a forest (typically indicated by trees and large woody undergrowth).
Grass, Turf, Lawn	The stormwater system discharges to privately or publicly maintained grass, turf, or lawn.
Impervious Surface,	The stormwater system discharges to an impervious surface or rock

Rock	surface.
Subtype "Managed System" domain values and definitions: "ManagedSystemRecType"	
Municipality	The WSDOT stormwater system discharges to a stormwater system owned or maintained by a local municipality.
Private Party	The WSDOT stormwater system discharges to a stormwater system that is owned or maintained by a private party.
Subtype "Subsurface" domain values and definitions: "SubsurfaceRecType"	
Engineered	The WSDOT stormwater system discharges to the ground via a constructed stormwater best management practice (BMP) that is designed to facilitate infiltration (e.g., dry well).
Passive	The WSDOT stormwater system discharges to the ground via natural infiltration in a local low area or slope that is not a dispersion area BMP.
Subtype "Surface Water" domain values and definitions: "SurfaceWaterRecType"	
River or Stream	The WSDOT stormwater system discharges to a flowing body of fresh water (perennial) or a water course (intermittent).
Marine	The WSDOT stormwater system discharges to a saltwater body, such as the Puget Sound or Pacific Ocean or peripheral waters, that is subject to the ebb and flow of the tide.
Lake or Non-stormwater Pond	The WSDOT stormwater system discharges to a relatively still, fresh water body, localized in a basin, and surrounded by land. These can include constructed impoundments such as reservoirs, but should not include impoundments for the specific purpose of stormwater treatment.
Wetland	The WSDOT stormwater system discharges to an area where local hydrologic conditions are sufficient to support, and under normal circumstances do support, vegetation typically adapted for life in saturated soil conditions, and **has been confirmed** through research of existing wetland delineations to be a Wetland area.
Irrigation Channel	The WSDOT stormwater system discharges to a body of water flowing in a ditch or channel that is designed and constructed to convey water for the purposes of irrigation.
Other Add Note	The WSDOT stormwater system discharges to a body of water that, at the time of documentation, is determined to be of a type not included on this list.
Wet Area	The WSDOT stormwater system discharges to an area where local hydrologic conditions are sufficient to support, vegetation typically adapted for life in saturated soil conditions, but **has not been confirmed** through research of existing wetland delineations to be a Wetland area.
Flood Plain	The WSDOT stormwater system discharges to a level area bordering a stream or river channel that was built by sediment deposition from the stream or river under present climatic conditions and is inundated during moderate to high flow events.

FranchisePermitID

Definitions, properties, and rules	
Field definition	This is the identification number (if registered) from the Utility

	Permit or Franchise issued by WSDOT to the owner of an incoming line that is physically connected to the WSDOT stormwater system. These Utility Permits and Franchises are issued to persons, associations, private or municipal corporations, the U.S. Government, or agencies.
Field data type	String; Length: 20
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	This field should be maintained by the IDDE Lead.
Domain values and definitions: None	

FromOpenChannelDitchShape

Definitions, properties, and rules	
Field definition	Approximate geometric shape of the open channel or ditch flowing to the discharge point (see *Hydraulics Manual* , Figure 4-2.2.1).
Field data type	Domain; String; Length: 30
Office vs. Field collection	Both
Collection rules: Field	• Only chosen when the AssociatedFfeatureTtype (as defined above) is a ditch. • This value should match the value selected for the "DitchShape" field for the Ditch that is associated with the discharge. • Most soil- and rock-bottom ditches will have trapezoidal geometry with a flat bottom and semi planar fore slope and back slope. • Reserve the use of "rectangle," "triangle," and "u-shaped," for ditches designed and constructed to these geometries; for example, concrete- or asphalt-lined ditches.
Collection rules: Office	• Only chosen when the "AssociatedFeatureType" (as defined above) is a ditch. • This value should match the value selected for the "DitchShape" field for the ditch that is associated with the discharge. • If geometry is not specified in the drainage details for each individual ditch-line, use the geometry indicated by the "typical ditch section" detail included with the plan set.
Domain values and definitions: "DitchShape"	
Rectangle	The ditch geometry is defined by a flat bottom and vertical sides.
Trapezoidal Equal Sides	The ditch geometry is defined by a flat bottom and sloped sides, with the foreslope and backslope having the *same* "slope" range value as defined in the "Slope" domain of the "ForeSlope" and "BackSlope" fields of the "Ditch" feature type defined below.
Trapezoidal Unequal Sides	The ditch geometry is defined by a flat bottom and sloped sides, with the foreslope and backslope having a *different* slope range value as defined in the "Slope" domain of the "ForeSlope" and "BackSlope" fields of the "Ditch" feature type defined below.
Triangle	The ditch geometry is defined by sloped sides and negligible bottom width.

U-Shaped	The ditch geometry is defined by a pronounced curvature near the bottom and has vertical walls.
Other Add Note	The ditch geometry is better characterized by a value that is not included here.
NA	Not applicable for the associated feature type selected.

IDDERecordNum

Definitions, properties, and rules	
Field definition	Specific to the "Discharge Point" feature subtype "Incoming," and use only if the discharge has been identified as a potential illicit discharge. It is the unique record number assigned by the internal WSDOT Illicit Discharge Detection and Elimination (IDDE) web application/database.
Field data type	String; Length: 25
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	This field should be maintained by the IDDE Lead.
Domain values and definitions: None	

IllicitDischargeFlag

Definitions, properties, and rules	
Field definition	Specific to the "Discharge Point" feature subtype "Incoming," this field indicates whether or not the incoming discharge was identified as potentially conveying pollutants to WSDOT's stormwater system.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Field
Collection rules: Field	This attribute is specific to potential illicit *discharges*. These are distinct from possible illicit *connections,* which are researched and reported differently from illicit discharges. The field crew should be trained in WSDOT's *Standard Operating Procedure for Identification of Illicit Discharges and Illegal Connections*.
Collection rules: Office	This field should be maintained by the IDDE Lead.
Domain values and definitions: "LicitIllicit"	
Licit	There are no identifiable criteria present indicating the incoming discharge is conveying pollutants to the WSDOT stormwater system.
Illicit	There are identifiable criteria present indicating the incoming discharge is potentially conveying pollutants to the WSDOT stormwater system.
Unknown	At the time of data collection, it is unclear whether the incoming connection is conveying pollutants to the WSDOT stormwater system.
NA	This attribute is not applicable to the feature type being documented.

InvolvedNonWSDOTPartyName

Definitions, properties, and rules	
Field definition	The name of the non-WSDOT party involved in a discharge scenario, if applicable. For example, "Incoming" or "Managed System" discharge scenarios may include a physical connection to a system managed by a private party or a municipality. A "Land Surface" discharge scenario may include land owned by a private party or a federal or state forest. This attribute is distinct from the "NonWSDOTJusrisdiction" field defined below.
Field data type	String; Length: 100
Office vs. Field collection	Both
Collection rules: Field	• Care should be taken when assessing where a connecting system might originate. Improperly assigning non-WSDOT party involvement may create tension for utility personnel who follow up on the documented connection. • Private parties and businesses should be identified by an address whenever possible, as the resident of the building may change over time, but the address will likely remain consistent. • Street names should always accompany a city or county name in the case of discharges to and from systems for local roads, as the entity responsibe for the roadway may not be clear from a field perspective. • The "c" in "County" should be capitalized (e.g. "King County")
Collection rules: Office	For Managed System and Incoming points, determine if system is going to or coming from land managed by a city or county The "c" in "County" should be capitalized (e.g. "King County")
Domain values and definitions: None	

LeftRightIndicator

Definitions, properties, and rules	
Field definition	The physical location of a discharge point relative to the roadway centerline and based on the increasing direction of travel ("ahead" on milepost) as based on the highway linear referencing system (see State Highway Log Planning Report, Section 1).
Field data type	Domain; String; Length: 5
Office vs. Field collection	Both
Collection rules: Field	Determine the side of the roadway relative to facing in the increasing direction.
Collection rules: Office	Determine the side of the roadway relative to facing in the increasing direction.
Domain values and definitions: "LeftRightIndicator"	
L	Represents features located along side the decreasing traveled way.
LC	Represents features located along side the median side of the decreasing traveled way.
C	Represents a feature that occurs between the increasing and decreasing traveled way.
RC	Represents features located along side the median side of the increasing traveled way.

R	Represents features located along side the increasing traveled way.

MixedFlow

Definitions, properties, and rules	
Field definition	This field addresses scenarios in which a stream or other water body of the state has been intercepted and re-routed by the WSDOT stormwater system. A "mixed flow condition" indicates whether or not stormwater is mixed with waters of the state at the point of discharge. "Mixed flow" is discussed in detail in WSDOT's *Stormwater Features Inventory: Standard Operating Procedures for Discharge Point Inventory*.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	The field crew should be familiar with WSDOT's *Stormwater Features Inventory: Standard Operating Procedures for Discharge Point Inventory*.
Collection rules: Office	The office personnel should be familiar with WSDOT's *Stormwater Features Inventory: Standard Operating Procedures for Discharge Point Inventory*.
Domain values and definitions: "MixedFlowFlag"	
NA	The "mixed flow" condition is not applicable to this discharge scenario.
Irrigation	This stormwater system discharge includes water used for irrigation purposes.
Waters of the State	This stormwater system discharge includes waters of the state.

NonWSDOTJurisdiction

Definitions, properties, and rules	
Field definition	The local jurisdiction that has legal authority over the area where a stormwater discharge is located.
Field data type	String; Length: 100
Office vs. Field collection	Both
Collection rules: Field	Be aware of your planned work location in relation to city and county limits. The "c" in "County" should be capitalized (e.g. "King County")
Collection rules: Office	Use a combination of the GIS layers for "Political and Administrative Boundaries" and city and county limits to determine jurisdiction. The "c" in "County" should be capitalized (e.g. "King County")
Domain values and definitions: None	

PermitID

Definitions, properties, and rules	
Field definition	Determined by the Permit Number of WSDOT's active National Pollutant Discharge Elimination System municipal stormwater permit during the time of data collection. For example, discharge points collected for compliance with WSDOT's 2009 municipal

	permit will have a "PermitID" value of WAR043000A
Field data type	String; Length: 20
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	This value can be assessed and entered by the data steward.
Domain values and definitions: None	

PipeDiameter

Definitions, properties, and rules	
Field definition	The internal diameter of the pipe that is flowing to the discharge.
Field data type	Single; Length: 4
Office vs. Field collection	Both
Collection rules: Field	Only used if the "AssociatedFeatureType" (as defined above) is a Pipe. The value entered here should match the value entered in the "PipeDiameter" field for the associated Pipe feature. Measure the full *internal* diameter of the pipe with consideration for possible error due to pipe deformation or debris.
Collection rules: Office	Only used if the "AssociatedFeatureType" (as defined above) is a pipe. The value entered here should match the value entered in the "PipeDiameter" field for the associated Pipe feature. The *internal* pipe diameter value, recorded on the as-built plan Drainage Sheets, for that structure.
Domain values and definitions: None	

ReachCode

Database field definitions, properties, and rules	
Field definition	Specific to the "Surface Water" discharge point subtype. A unique identifier that indicates the segment of a waterbody that the stormwater system is discharging to. A reach code is a numeric code that uniquely labels segments of a surface waterbody. Reach codes are assigned and maintained under the authority of the United States Geological Survey and are stored in the National Hydrography Dataset.
Field data type	Text; Length: 25
Office vs. Field collection	Both
Collection rules: Field	Reach code values should be entered in the office but can be carefully verified in the field to assure that the correct code has been chosen.
Collection rules: Office	This task should be performed by the data steward. To reduce potential for error, values should be copied from the NHD and pasted into this field.
Database domain values and definitions: None	

ReceivingWaterbodyName

Definitions, properties, and rules	
Field definition	Specific to the "Surface Water" discharge point subtype. This is the name of the water body receiving the discharge. The name entered here should be as recorded in the "GNIS Name" field of the National Hydrography Dataset (NHD). If no name value is provided in the NHD, a local or history
Field data type	String; Length: 40
Office vs. Field collection	Both
Collection rules: Field	• Be aware of the major rivers and streams in the area where work is planned for the day. • A stream layer may be loaded on the data collector to aid in identifying smaller streams. • The name entered here should be as recorded in the "GNIS Name" field of the National Hydrography Dataset (NHD). • If no name value is provided in the NHD, a local or historical names may be used. • Use "unknown" or "unnamed" where applicable.
Collection rules: Office	• Use the National Hydrography Dataset to identify named streams. • The name entered here should be as recorded in the "GNIS Name" field of the National Hydrography Dataset (NHD). • If no name value is provided in the NHD, a local or historical names may be used. • Use all other GIS layer resources available from WSDOT's GIS Workbench, including "Bing Maps," "USGS Topo Quads," etc., to identify named streams. • Use "unknown" or "unnamed" where applicable.
Domain values and definitions: None	

RelatedRouteType

Database field definitions, properties, and rules	
Field definition	Two character abbreviation for a type of roadway as assigned by the WSDOT Linear Referencing System.
Field data type	Text; Length: 2
Office vs. Field collection	Both
Data collection rules: Field	Be aware of the RRT value for the highway segment that you are working on.
Data collection rules: Office	The data steward will populate this field. The RRT value is assigned to a feature based upon what roadway would be used to access the feature. The values will match those provided on the WSDOT 24K LRS highway layer.
Database domain values and definitions: ""	
AR	Alternate Route
CO	Couplet
FD	Frontage Road (Dec)
FI	Frontage Road (Inc)
FS	Ferry Ship (Boat)
FT	Ferry Terminal)
PR	Proposed Route
RL	Reversible Lane
SP	Spur
TB	Transitional Turnback
TR	Temporary Route
CD	Collector Distributor (Dec)
CI	Collector Distributor (Inc)
LX	Crossroad within Interchange
P1-P9	Off Ramp (Inc)
PU	Extension of P ramp
Q1-Q9	On Ramp (Inc)
QU	Extension of Q ramp
R1-R9	Off Ramp (Dec)
RU	Extension of R ramp
S1-S9	On Ramp (Dec)
SU	Extension of S ramp

StateRoute

Definitions, properties, and rules	
Field definition	The state route number for the highway that the stormwater system associated with the discharge is serving, using a three-digit format. For example, the "StateRoute" value for highway 3 is "003."
Field data type	String; Length: 5
Office vs. Field collection	Both
Collection rules: Field	Use care in assigning associated route numbers in the vicinity of

	highway interchanges.
Collection rules: Office	State highway layers available on WSDOT's GIS Workbench include a field that indicates the state route number for a highway segment.
Domain values and definitions: None	

Status

Definitions, properties, and rules	
Field definition	This field records whether the discharge point being collected is intended to replace an existing "legacy" data point, being collected for the first time, orthe feature needs to be retired from the database.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	• In addition to collecting new data, Stormwater Features Inventory (SFI) crews are tasked with updating existing stormwater features data. This pre-existing data is given the term "legacy" and refers specifically to discharge point information collected at various times in the past. Much of this data is out of date in regard to current definitions of a discharge point, and does not reflect attributes collected in the current schema. The purpose of this process is to evaluate legacy points for inclusion in the SFI database. • Upon finding a legacy point, you will need to assess it, applying the most recent criteria being used to identify a "discharge point." If the point does not meet the new criteria, edit the "Status" attribute in the Legacy layer to indicate "No" – not confirmed/delete status. If the point does meet the new criteria, you will update the status to indicate "Yes" – confirmed/update. If the legacy point is confirmed, a new discharge point should be collected in the same location. You will then need to update the legacy point attributes to record the "new name" of the point. Then, close out of the legacy point attribute table and go through the standard procedure to collect a new discharge point at this location with its status marked "Existing" to indicate it is replacing a legacy point. • If the feature is: no longer functioning as part of the stormwater conveyance system, or being reassessed as a non-discharge point location under the current definition, the "Status" attribute should be marked "Retired".
Collection rules: Office	Based on the best professional judgment of the editor. Use all applicable office information to help make a determination.
Domain values and definitions: "Status"	
New	The point being collected was not previously documented in the legacy data layer.
Existing	The point being collected is documented in the legacy data layer and this new point is intended to replace it.
Retired	Use this for features where the "LifeCycleCurrentStatus" attribute has been changed to: "Removed"; "Deactivated"; "Duplicate" or "Retired". This denotes that the feature is no longer considered active.

DISPERSION AREA

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Polygon
Feature definition	• A natural or engineered feature where stormwater is spread over a wide area and is located so as not to allow flow to concentrate anywhere upstream of a drainage channel with erodible underlying granular soils. • This area must meet the requirements of BMP FC.01.1 (natural dispersion) or FC.02.01 (engineered dispersion) from the *Highway Runoff Manual*. It must also be included in an as-built plan sheet as an indication that it has been approved for use as a best management practice (BMP) for this location.
Feature subtypes	None
Collection location	Place the polygon boundaries at the perimeter of the dispersion area as defined on the as-built plan sheet.
Collection rules: Field	Due to the specific criteria required to meet the definitions of dispersion area BMPs, these should only be mapped in the office using as-built plans.
Collection rules: Office	• For every dispersion area, identify an artificial outflowing discharge point at the middle of the side farthest away from the roadway. • Dispersion area polygons should only be mapped from as-built plans.

Feature Type-Specific Fields and Domains

ApproximateLocation

Definitions, properties, and rules	
Field definition	General information regarding the location of the dispersion area. This is to help personnel locate the feature during a field visit.
Field data type	String; Length: 50
Office vs. Field collection	Both
Collection rules: Field	If the feature is observed during a field visit, include a short note regarding where to park or how to access the location.
Collection rules: Office	Include only brief and helpful information to personnel in the event of a field visit. This can include a GIS calculated/measured milepost range, other nearby or adjacent stormwater features, structures appearing on the as-built plan set, or structures visible in imagery.
Domain values and definitions: None	

DispersionAreaType

Definitions, properties, and rules	
Field definition	Is the dispersion area "natural" or "engineered" as defined by the *Highway Runoff Manual*?
Field data type	Domain; String; Length: 20
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	This information should be obtained from the as-built plan details and Hydraulic Reports.
Domain values and definitions: "DispersionAreaType"	
Natural	This feature is indicated in the as-built plan set as a "natural dispersion area." Natural dispersion requires that runoff cannot become concentrated in any way as it flows to a preserved naturally vegetated area. The preserved naturally vegetated area must have topographic, soil, and vegetation characteristics that provide for the removal of pollutants (WSDOT, 2011).
Engineered	This feature is indicated in the as-built plan set as an "engineered dispersion area." Engineered dispersion techniques use the same processes as natural dispersion. For engineered dispersion, a constructed conveyance system directs concentrated runoff to the dispersion area (via storm sewer pipe, ditch, or other methods). The concentrated flow is dispersed at the end of the conveyance system to mimic sheet flow conditions into the dispersion area. Engineered dispersion techniques enhance the modified area with compost-amended soils and additional vegetation. These upgrades help ensure the dispersion area has the capacity and ability to infiltrate surface runoff (WSDOT, 2011).

TotalSurfaceArea

Definitions, properties, and rules	
Field definition	The total surface area of the "Dispersion Area" feature.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	• The boundaries of the dispersion area should be measured in the field only with assistance from the plan sheets, and only if perimeter boundaries remain clear at the time of documentation. • The dimensions should be physically measured, not estimated. Acceptable measuring devices include a tape or laser range finder. • Upon return to the office, a detailed field sketch, including area dimensions, should be compared to geo-referenced as-built plans and satellite imagery.
Collection rules: Office	The design plan (as-built plan view) generated surface area value should be differentiated from in-field measured surface areas whenever possible (i.e., a sloped surface will have a greater surface area than is represented on a plan view). Additionally, only use a GIS-calculated value when you cannot find another source.
Domain values and definitions: None	

TotalSurfaceAreaSource

Definitions, properties, and rules	
Field definition	The source of "TotalSurfaceArea" value.
Field data type	String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	Indicate "Field" domain value.
Collection rules: Office	Indicate "Design" or "GIS" domain value.
Domain values and definitions: "AreaVolumeSource"	
Design	The "TotalSurfaceArea" value was found in a design document such as as-built plans, the Hydraulic Report, etc.
Field	The "TotalSurfaceArea" value was determined based upon physical measurements and calculations obtained in the field.
GIS	The "TotalSurfaceArea" value was determined using a polygon area calculation function of GIS software.

DITCH

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Polyline
Feature definition	A long, narrow excavation dug in the earth for drainage, having a top width less than 10 feet at design flow. This can include various linear conveyances constructed of rock, gravel, earth, concrete, asphalt, or other material using forms, machinery, etc. It can also include a convergence in gradients of impervious surfaces (e.g., in a parking lot) designed to concentrate and convey stormwater.
Feature subtypes	None
Collection location	The beginning and ending vertices should be placed at the first and last location where the feature collects, concentrates, or conveys stormwater or at the junction point between a ditch and the previous conveyance feature. A minimum of two vertices are collected for a straight line ditch segment, with additional vertices placed at the ditch flow line, adequate in number and spacing to approximate a curved ditch segment.
Collection rules: Field	A ditch line should continue until either it terminates or until the feature's attributes change significantly. For example, the "BottomWidth" changes from 36 inches to 102 inches, or the "BottomMaterial" changes from "Vegetated" to "Rock." The attributes should have a run length of 100 feet or greater to justify ending the current ditch to begin a new one.
Collection rules: Office	The ditch feature should only be digitized over the ditch lines as they appear on the as-built plan sheet. Many ditches are represented by the Roadway Sections and their flow direction is shown by Roadway Profiles. These will not show up as lines on the Drainage Plan sheets.

Feature Type-Specific Fields and Domains

BackSlope/ForeSlope

Definitions, properties, and rules	
Field definition	• The range of the slope, expressed as a ratio, at the back side of the ditch (backslope—farthest from traffic) or front side of the ditch (foreslope—nearest to traffic). The ratio is expressed as **H**orizontal:**V**ertical. •
Field data type	String; Length: 30
Office vs. Field collection	Both
Collection rules: Field	• The slope extents are determined based on the effective volumetric capacity of the ditch. • Measure the horizontal and vertical dimensions of the slope from its top to toe and reduce the ratio to a denominator of 1 (one). • The ditch backslope and foreslope are limited to the cross-sectional extent of the feature that will effectively convey water. For example, a ditch with a steep or vertical foreslope may occur at the base of a long gradual embankment slope. If only the steep sloped portion of the ditch will convey water, then the long gradual embankment slope is ignored in this calculation.
Collection rules: Office	• If a specific ditch section detail is provided in the as-built plans, use the dimensions indicated in the cross section. • If only a "typical" ditch detail is provided in the as-built plans, use these dimensions for all ditches that are drawn in the contract.
Domain values and definitions: "Slope"	
Steeper Than 2 to 1	The slope (expressed as H:V) is steeper than a ratio of 2:1.
In Between 2 to 1 and 4 to 1	The slope (expressed as H:V) is in the range between a ratio of 2:1 and 4:1.
Flatter Than 4 to 1	The slope (expressed as H:V) is flatter than a ratio of 4:1.
Vertical	The slope is vertical.

BidirectionalFlowFlag

Definitions, properties, and rules	
Field definition	Indicates whether flow through the ditch feature is influenced by marine tides or unique conditions such as river flood events that could change the flow direction.
Field data type	Domain; String; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Use of this flag should be limited to ditch features that lie at or below the mean high tide line or in immediate proximity to the banks of a stream segment that is prone to tidal influence or frequent flooding.
Collection rules: Office	Limit the use of this attribute to situations where specific design elements are being called upon to limit reverse flow through the ditch such as flood control gates.
Domain values and definitions: "YNUnk"	
Yes	This ditch appears to be prone to bidirectional flow.
No	Stormwater will flow only one direction through this ditch.
Unknown	At the time of documentation, it is unclear if this ditch is subject to bidirectional flow.

BottomDepth

Definitions, properties, and rules	
Field definition	The vertical depth of the ditch, measured as a function of its maximum conveyance volume, from the ditch bottom to the top of the lowest flow-confining side.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	• After locating the top of the lowest flow-confining side of the ditch, a vertical measurement is taken from this elevation to the lowest point on the ditch bottom. • Do not approximate this value. Use only physical measurements by tape (or range finder where appropriate).
Collection rules: Office	• Oftentimes ditch depth is not recorded in the as-built plans. • If a specific ditch section detail is provided in the as-built plans, use the depth dimension indicated in the cross section. • If only a "typical" ditch detail is provided in the as-built plans, use the depth dimension for all ditches that are drawn in the contract.
Domain values and definitions: None	

BottomMaterial

Definitions, properties, and rules	
Field definition	An approximate description of the physical material that composed a majority of the ditch bottom.
Field data type	Domain; String; Length: 20
Office vs. Field collection	Both
Collection rules: Field	• The assigned value should be a visual estimate of the primary material that comprises the ditch bottom at the time of documentation. • Exceptions might include asphalt, concrete, or rock-lined ditches that appear to have a heavy debris load obscuring the bottom material.
Collection rules: Office	Use the bottom material type as described in the as-built plan sheets.
Domain values and definitions: "DitchMaterial"	
Asphalt	A majority of the ditch bottom is composed of asphalt.
Bare Soil	A majority of the ditch bottom is composed of bare soil.
Concrete	A majority of the ditch bottom is composed of concrete.
Rock	A majority of the ditch bottom is composed of rock such as rip rap. Also use this value for a rock-lined ditch that has become vegetated over time.
Vegetation	A majority of the ditch bottom is vegetated soil.
Other	The ditch bottom is composed of a material that is not included in this list.
Unknown	Due to field conditions (submersion, heavy vegetation) at the time of documentation, the ditch bottom material is unclear.
Other Add Note	The ditch bottom is composed of a material that is not included in this list.

BottomWidth

Definitions, properties, and rules	
Field definition	The bottom width of the ditch is determined by the horizontal distance, measured perpendicular to the primary flow line, between the toe of each side slope.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Determine points where the ditch side slopes meet the ditch bottom, and physically measure the distance between using a tape (or laser range finder where appropriate).
Collection rules: Office	• If a specific ditch section detail is provided in the as-built plans, use the bottom width dimension indicated in the cross section. • If only a "typical" ditch detail is provided in the as-built plans, use this bottom width dimension for all ditches that are drawn in the contract.
Domain values and definitions: None	

DitchShape

Definitions, properties, and rules	
Field definition	The cross-sectional geometry of the ditch (*Hydraulics Manual,* Figure 4-2.2.1).
Field data type	Domain; String; Length: 30
Office vs. Field collection	Both
Collection rules: Field	Using care to achieve a proper perspective, look longitudinally down the ditch line and estimate the cross-sectional geometry of the feature.
Collection rules: Office	• If a specific ditch section detail is provided in the as-built plans, use the geometric shape indicated in the cross section. • If only a "typical" ditch detail is provided in the as-built plans, use this geometric shape for all ditches that are drawn in the contract.
Domain values and definitions: "DitchShape"	
Rectangle	The ditch geometry is defined by a flat bottom and vertical sides.
Trapezoidal Equal Sides	The ditch geometry is defined by a flat bottom and sloped sides, with the foreslope and backslope having the *same* slope range value as defined in "Slope" domain of the "ForeSlope" and "BackSlope" fields defined above.
Trapezoidal Unequal Sides	The ditch geometry is defined by a flat bottom and sloped sides, with the foreslope and backslope having *different* slope range value as defined in the "Slope" domain of the "ForeSlope" and "BackSlope" fields defined above.
Triangle	The ditch geometry is defined by sloped sides and negligible bottom width.
U-Shaped	The ditch geometry is defined by a pronounced curvature near the bottom and has vertical walls.
Other Add Note	The ditch geometry is better characterized by a value that is not included here.
NA	Only used for discharge points, when the associated feature type is not a ditch.

TopWidth

Definitions, properties, and rules	
Field definition	The top width of the ditch is determined by the horizontal distance measured perpendicular to the primary flow line, between the two side slopes, at the highest potential water line.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Determine the points where the highest possible water line would intersect the ditch side slopes, and physically measure the distance between using a tape (or laser range finder where appropriate).
Collection rules: Office	• If a specific ditch section detail is provided in the as-built plans, use the top width dimension indicated in the cross section. • If only a "typical" ditch detail is provided in the as-built plans, use this top width dimension for all ditches drawn in the contract.
Domain values and definitions: None	

UIC_ID

Definitions, properties, and rules	
Field definition	• This is the unique identification number assigned to the feature by the Underground Injection Control (UIC) database, where applicable. • .
Field data type	String; Length: 25
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	•
Domain values and definitions: None	

DRAINAGE AREA

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Polygon
Feature definition	• The land surface area contributing runoff to a specific point in the stormwater system. This is determined as the sum of the total land surface area upstream from the point being analyzed and does not include areas within the polygon that are known to be or seen to be noncontributing to surface runoff. • Determined from local topographic maps and designed perimeter-confining features (e.g., curbs, concrete barriers, roadway crown, designed gradient inflection lines in paved surfaces). May have several different parts, respective to the impervious cover, soil, and vegetative ground cover types within the polygon.
Feature subtypes	None
Collection location	The boundaries of the "Drainage Area" polygon should be collected as closely as possible to the true location of the line that divides drainage basins.
Collection rules: Field	• Closely approximate the +/- slope inflection line that divides runoff flow destination. • Use designed and natural perimeter features whenever possible. • In flat areas, the boundaries of a drainage divide may be impossible to determine with certainty.
Collection rules: Office	Drainage area boundaries should be included in the Hydraulic Report.

Feature Type-Specific Fields and Domains

AssociatedFeatureID

Definitions, properties, and rules	
Field definition	
Field data type	Text; Length: 20
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	

Domain values and definitions: None

ImperviousPct

Definitions, properties, and rules	
Field definition	An estimated percent value of the impervious vs. total surface area within the drainage area.
Field data type	Double; Length: 8
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	An estimate of this value can be calculated using the as-built plan sheets and imagery.
Domain values and definitions: None	

RelatesTo

Definitions, properties, and rules	
Field definition	The "WSDOTFeatureID" for the individual feature or the stormwater system this drainage area relates to.
Field data type	String; Length: 10
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	Determine the "WSDOTFeatureID" of the specific feature that receives flow from the drainage area being documented.
Domain values and definitions: None	

DRAINAGE INLET

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Point
Feature definition	• A chamber or well allowing for the entry of surface runoff to a closed stormwater conveyance system. • Inlet type is chosen based upon its hydraulic and interception capacity as well as depth of flow, grade, superelevation, and placement.
Feature subtypes	Catch Basin; Concrete Inlet; Drop Inlet; Dry Well; Grate Inlet; Manhole; Other; Unknown
Collection location	Place the point as closely as possible to the center of the structure's lid.
Collection rules: Field	NAunder development
Collection rules: Office	• When a drawing says a catch basin (or other drainage inlet) is to be removed, what happens to the associated pipe? The pipe should say if it will be removed. If the drainage inlet is removed and pipes remain, it could be that the drainage inlet was replaced, but that should be noted. Also, the pipe could be abandoned in place and that could be in the Structure Notes. If the drainage inlet is not replaced and there is no note stating what happens to the pipe, snap the pipes that connected to that drainage inlet together and add a note that the drainage inlet was removed to each pipe feature affected.

	• In some drawings, two drainage inlets are right next to each other, with no connecting pipe. This could indicate a concrete inlet connected to a catch basin. If the air photo shows a concrete barrier intersecting the symbols, that is most likely what it going on. If it's not clear what is going on from the Structure Notes, put in two adjacent "Unknown" subtypes. • When copying drainage inlets from the Roadside Features Inventory Program, Highway Features (RFIP/HF) into the Stormwater Features Inventory Database, make all the drainage inlets "Unknown" unless you have corroborating information from the drawing (RFIP didn't pop lids).

Feature Subtype Definitions

Catch basin	A drainage structure with a sump that interrupts the flow of rainwater and allows for settling and collection of sediment, debris, detritus, contaminants, etc., prior to transfer to the outlet pipe. The sump should be greater than 12 inches as measured between the flow line of the lowest pipe in the basin and the basin floor. (Standard Plans B-5.20, B-5.40, B-5.60, B-10.20, B-10.40, B-10.60.)
Concrete inlet	A square structure similar to catch basin Type 1 but with no sump. (Standard Plan B-25.60.)
Drop inlet	Intended for use in mountainous areas or portions of highways that have very long continuous grades. High hydraulic capacity, common in medians. Effective in passing large debris. Trapezoidal-shaped structure. (Standard Plans B-45.20, B-45.40; see also *Hydraulics Manual,* Section 5-3.3.)
Dry well	A well completed above the water table so that its bottom and sides are typically dry except when receiving fluids. Dry wells are designed to disperse water below the land surface. Round structures using circular grates. (Standard Plans B-20.20, B-20.40, B-20.60.)
Grate inlet	Similar characteristics to a catch basin but with a larger inlet area. Type 1 cannot support traffic loads. Welded grates on Type 2 can only be subjected to light traffic. Rectangular structure with rectangular inlet. (Standard Plans B-35.20, B-35.40.)
Manhole	A circular structure with circular lid. Pipe embedded in "channel and shelf" at base of structure; no additional pipes at higher elevation. (Standard Plans B-15.20, B-15.40, B-15.60.)
Other	The drainage inlet structure is categorized as something other than what is included in this list. This might include older cast- or constructed-in-place structures formed from concrete, masonry, wood, rock, or other material.
Unknown	Due to conditions at the time of documentation (submersion, heavy sediment load, incomplete documentation), the subtype is unclear.

Feature Type-Specific Fields and Domains

AccessLength

Definitions, properties, and rules	
Field definition	The measure of the long dimension of the drainage inlet access. Used for either rectangular or square access.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Measure the inside long dimension of the access using a tape. Do not estimate this value.
Collection rules: Office	Refer to the WSDOT Standard Plan for the structure type that is called out in the Drainage Sheets of as-built plans.
Domain values and definitions: None	

AccessRoundDiameter

Definitions, properties, and rules	
Field definition	The inside diameter of the drainage inlet access. Used for round (circular) access.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Measure the maximum inside dimension (diameter) of the access using a tape. Do not estimate this value.
Collection rules: Office	Refer to WSDOT's Standard Plan for the structure type that is called out in the Drainage Sheets of the as-built plans.
Domain values and definitions: None	

AccessWidth

Definitions, properties, and rules	
Field definition	The measure of the short dimension of the drainage inlet access. Used for rectangular or square access.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Measure the inside short dimension of the access using a tape. Do not estimate this value.
Collection rules: Office	Refer to WSDOT's Standard Plan for the structure type called out in the Drainage Sheets of the as-built plans.
Domain values and definitions: None	

AtGradeFlag

Definitions, properties, and rules	
Field definition	Indicates the top elevation of the grate frame of the drainage inlet, relative to local grade.
Field data type	Domain; String; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Use a basic visual assessment to determine the drainage inlet grate frame rim elevation relative to the surrounding surface. Will stormwater be able to enter the structure through the grated inlet or will it bypass?
Collection rules: Office	Record the design intent for the drainage inlet elevation relative to the surrounding ground. For example, most drainage inlet grates are designed to be installed at grade in order to readily accept runoff. Dry wells are an exception; they are designed to be installed with frame rims above the local ground surface to allow for ponding and "pretreatment" prior to the entry of stormwater to the structure.
Domain values and definitions: "YesNo"	
Yes	The top of the structure's grate frame matches or is lower than the local ground elevation.
No	The top of the structure's grate frame is higher than the local ground elevation, initially causing flow to pond or bypass the structure.

BottomDepth

Definitions, properties, and rules	
Field definition	The interior vertical dimension of the drainage inlet structure, measured from the top of the grate frame to the base of the interior chamber.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	If possible, the grate should be removed during measurement. In the event of a structure with a sump, take care to account for the total depth of accumulated debris and sediment. Make sure the measurement is based on the actual bottom of the structure.
Collection rules: Office	• Refer to WSDOT's Standard Plan for the structure type that is called out in the Drainage Detail Sheets of the as-built plans. • The "standard" depth value for the structure as specified in the *Standard Plans* should be treated as a minimum that may be adjusted to match local grade elevation using precast riser sections, stacked rectangular or circular adjustment sections, or cast-in-place grout. • If it is not directly recorded on the Drainage Detail plan sheets, local finished grade elevation can be interpolated from the roadway plans and profiles.
Domain values and definitions: None	

CoverLock

Definitions, properties, and rules	
Field definition	The cover/lid of the feature has a locking mechanism on it, commonly a ½-inch Allen bolt or a ½-inch standard bolt.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	Observe if there is a locking mechanism barring access to the inside of the feature.
Collection rules: Office	Refer to office documentation for notes that state the feature has a locking cover/lid.
Domain values and definitions: "YNUnk"	
Yes	Select this option if a locking mechanism is observed in the field or found in the office documentation. Covers/Lids in the traveled lanes should have a locking mechanism.
No	Select this option if there is no observable locking mechanism, or if it is specifically stated in the office documentation not to have one.
Unknown	Select this option if the existence of a locking mechanism on the cover/lid is unknown. This option will be selected for most office collected drainage inlets.

CoverLockType

Definitions, properties, and rules	
Field definition	The description of the locking mechanism on a cover/lid.
Field data type	Domain; String; Length: 25
Office vs. Field collection	Both
Collection rules: Field	Observe and describe the type of locking mechanism barring access to the inside of the feature. Description should infer what tools are required to open the feature.
Collection rules: Office	Refer to office documentation for notes that describes the feature's cover/lid locking mechanism. Description should infer what tools are required to open the feature.
Domain values and definitions: "CoverLockType"	
Half-Inch Hex	Commonly used locking mechanism on drainage inlets, this would take a ½-inch Allen wrench to open.
Half-Inch Bolt	Commonly used locking mechanism on drainage inlets, this would take a ½-inch socket to open.
Other Add Note	Sometimes other sizes of the options in this list are used, or a different mechanism all together. If this option is selected please provide a brief note in the "Notes" field describing what is needed to access the feature.
Unknown	This value is selected if the type of locking mechanism is unknown, or it is unknown if the feature has a locking mechanism.

CoverType

Definitions, properties, and rules	
Field definition	Indicates whether the inlet cover is designed to allow for surface flow to enter the structure.
Field data type	Domain; String; Length: 20
Office vs. Field collection	Both
Collection rules: Field	Based on direct field observation, record the attribute that best describes the inlet grate at the time of documentation.
Collection rules: Office	Record the attribute that best describes the inlet grate intended to be placed during installation of the structure.
Domain values and definitions: "DrainageInletCoverType"	
Solid	The inlet grate is solid or almost solid and is not designed to allow the entry of runoff into the structure (e.g., Standard Plan B-30.20).
Grated	The inlet grate is perforated and is designed to allow the entry of runoff into the structure.
Other Add Note	The character of the inlet grate is best described by something other than what is included here.

DrainageInletCategory

Definitions, properties, and rules	
Field definition	This is a selection list of the Drainage Inlet feature subtypes, as defined above.
Field data type	Subtype list; Short Integer: Length: 2
Office vs. Field collection	Both
Collection rules: Field	The drainage inlet is assessed against the subtype definitions presented above and the appropriate value is selected.
Collection rules: Office	The drainage inlet is assessed against the subtype definitions presented above and the appropriate value is selected.
Domain values and definitions: Drainage Inlet feature subtype list	
1-Catch Basin	The drainage inlet structure meets the criteria for a "Catch basin" as defined above.
4-Concrete Inlet	The drainage inlet structure meets the criteria for a "Concrete inlet" as defined above.
3-Drop Inlet	The drainage inlet structure meets the criteria for a "Drop inlet" as defined above.
6-Dry Well	The drainage inlet structure meets the criteria for a "Dry well" as defined above.
2-Grate Inlet	The drainage inlet structure meets the criteria for a "Grate inlet" as defined above.
5-Manhole	The drainage inlet structure meets the criteria for a "Manhole" as defined above.
7-Other	The drainage inlet structure appears to be better described as something other than what is listed here.
8-Unknown	At the time of documentation, it is unclear what type of drainage inlet is being documented.

DrainageInletType

Definitions, properties, and rules	
Field definition	• This field further defines the drainage inlet feature subtypes through reference to specific WSDOT Standard Plans. • Each domain is feature subtype-specific and displays automatically based on the subtype chosen.
Field data type	String; Length: 50
Office vs. Field collection	Both
Collection rules: Field	Based on direct field observation, record the attribute that best describes the drainage inlet structure at the time of documentation.
Collection rules: Office	The drainage inlet type should be specified in the Drainage Detail Sheets and/or Structure Notes in the as-built plan set.
Subtype "Catch Basin" & "Concrete Inlet" domain values and definitions: "CatchBasinType"	
Type 1	This structure conforms with Standard Plan B-5.20.
Type 1L	This structure conforms with Standard Plan B-5.40.
Type 1P	This structure conforms with Standard Plan B-5.60.
Type 2	This structure conforms with Standard Plan B-10.20.
Type 2 with Flow Restrictor	This structure conforms with Standard Plan B-10.40.
Type 2 with Baffle Type Flow Restrictor	This structure conforms with Standard Plan B-10.60.
Subtype "Drop Inlet" domain values and definitions: "DropInletType"	
Type 1	This structure conforms with Standard Plan B-45.20.
Type 2	This structure conforms with Standard Plan B-45.40.
Subtype "Dry Well" domain values and definitions: "DryWellType"	
Type 1	This structure conforms with Standard Plan B-20.20.
Type 2	This structure conforms with Standard Plan B-20.40.
Type 3	This structure conforms with Standard Plan B-20.60.
Subtype "Grate Inlet" domain values and definitions: "GrateInletType"	
Type 1	This structure conforms with Standard Plan B-35.20.
Type 2	This structure conforms with Standard Plan B-35.40.
Subtype "Manhole" domain values and definitions: "ManholeType"	
Type 1	This structure conforms with Standard Plan B-15.20.
Type 2	This structure conforms with Standard Plan B-15.40.
Type 3	This structure conforms with Standard Plan B-15.60.
Subtype "Other" domain values and definitions: "OtherDrainageInletType"	
Other	Only use this subtype if the drainage inlet structure does not conform to a WSDOT Standard Plan.
Subtype "Unknown" domain values and definitions: "Unknown"	
Unknown	Only use this subtype if the drainage inlet structure type is not able to be determined at the time of documentation.

FrameType

Definitions, properties, and rules	
Field definition	This attribute identifies the shape of the grate frame (opening) at the top of the drainage inlet structure.
Field data type	Domain; String; Length: 20
Office vs. Field collection	Both
Collection rules: Field	Visually verify the geometry of the frame in place at the time of documentation.
Collection rules: Office	Assess the frame geometry recorded in the as-built plan Drainage Detail Sheets.
Domain values and definitions: "DrainageInletFrameType"	
Rectangular	The frame is rectangular or square (e.g., Standard Plan B-30.10).
Round	The frame is circular (e.g., Standard Plan B-30.70).
Other Add Note	The frame shape is something other than is listed here.

GrateType

Definitions, properties, and rules	
Field definition	• This defines the drainage inlet grate type based on a WSDOT Standard Plan. • Grate configuration is chosen based on a combination of design considerations, anticipated flow volume, and drainage structure position (e.g., wheel path, curb, ditch).
Field data type	Domain; String; Length: 50
Office vs. Field collection	Both
Collection rules: Field	• Based on direct field observation, record the attribute that best describes the grate type at the time of documentation. • Many grates installed on older systems or by non-WSDOT parties will need to be listed as "OtherAddNote."
Collection rules: Office	The grate type should be specified in the Drainage Detail Sheets and/or Structure Notes in the as-built plan set.
Domain values and definitions: "DrainageInletGrateType"	
Circular Frame (Ring) and Cover	This grate conforms to Standard Plan B-30.70.
Circular Grate	This grate conforms to Standard Plan B-30.80.
Combination Cover (Inlet)	This grate conforms to Standard Plan B-25.20.
Frame and Dual Vaned Grate	This grate conforms to Standard Plan B-40.40.
Rectangular Bidirectional Vaned Grate	This grate conforms to Standard Plan B-30.40.
Rectangular Herringbone Grate	This grate conforms to Standard Plan B-30.50.
Rectangular Solid Metal Cover	This grate conforms to Standard Plan B-30.20.
Rectangular Vaned Grate	This grate conforms to Standard Plan B-30.30.
Type 1	This grate conforms to Standard Plan B-50.20.
Type 2	This grate conforms to Standard Plan B-50.20.
Type 3	This grate conforms to Standard Plan B-50.20.
Welded Grate	This grate conforms to Standard Plan B-40.20.
Other Add Note	The grate type in place does not meet the design specifications depicted in WSDOT's *Standard Plans*.

ManholeUseFlag

Definitions, properties, and rules	
Field definition	Indicates the primary use intended for the drainage inlet structure.
Field data type	Domain; String; Length: 50
Office vs. Field collection	Both
Collection rules: Field	Assess the structure based on local conditions and adjacent structures.
Collection rules: Office	Record the "use" value as is indicated on the as-built plans.
Domain values and definitions: "ManholeUseFlag"	
Stormwater	The drainage inlet is designed to convey only stormwater flow.
Sewage	The drainage inlet structure is designed to convey only sanitary sewer flow.
Utility	The stricture being documented is designed to serve the purpose of a nonstormwater/nonsewer utility.
Other Add Note	The primary use of the drainage inlet structure is something other than is included here. This would include a combined sanitary/storm sewer.

PreCastFlag

Definitions, properties, and rules	
Field definition	This indicates the construction method of the drainage inlet structure. Was the structure built off-site and transported to the location for installation ("precast")? Or was it formed/constructed in place?
Field data type	Domain; String; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Based on field observations, does it appear as though the structure was precast?
Collection rules: Office	Most new drainage inlet structures will be precast as part of WSDOT contracts. All of the structure types noted here are precast. Check to make sure that no special procedures are called out in the Structure Notes or Drainage Detail Sheets of the as-built plan sets that would indicate a structure is to be built in place.
Domain values and definitions: "YNUnk"	
Yes	The drainage inlet structure is precast.
No	The drainage inlet structure was cast/constructed in place.
Unknown	Due to conditions at the time of documentation, it is unclear whether the drainage inlet structure is precast or cast in place.

SumpFlag

Definitions, properties, and rules	
Field definition	• This flag indicates whether or not a drainage inlet structure has a sump. • A sump is a low-lying place such as a pit that, by design, catches rainwater and allows for settling and collection of sediment, debris, detritus, contaminants, etc., prior to transfer to the outfall, outlet pipe, or outlet structure of a vault/catch basin/pond/detention facility. Distinguished from a vault/basin floor. • Measured depth of a sump in a catch basin is from the bottom of the basin to the invert (flow line) of the lowest pipe into or out of the basin. Sump depths for other structures should be measured from the sump bottom to the surrounding basin floor.
Field data type	Domain; String; Length: 8
Office vs. Field collection	Both

Collection rules: Field	• Most "standard" plans for drainage inlet structures specify minimum dimensions for sump depth. Actual finish dimensions can vary considerably depending on where the pipes are placed in the structure wall "knockouts." The finished depth should always exceed the minimum specified in the plan.
	• When assessing whether or not a structure has a sump, compare the depth to these minimum required depths in the WSDOT Standard Plan for each drainage inlet subtype.
	  ➢ Catch Basin Type 1: 12 inches (Standard Plan B-5.20-01)
	  ➢ Catch Basin Type 2: 24 inches (Standard Plan B-10.20-00)
	  ➢ Grate Inlet Type 1: 18 inches (Standard Plan B-35.20)
	  ➢ No designed sump: Concrete inlet (all types), Drop inlet (all types), Dry well (all types), Grate inlet Type 2, Manhole (all types).
	• If the drainage inlet structure is older, custom made, or otherwise non-conventional, compare the structure geometry and dimensions to those in the *Standard Plans* and make a best guess as to the appropriate minimum sump depth.

Collection rules: Office	Look at the WSDOT Standard Plan for the drainage inlet structure type specified in the as-built plan Structure Notes. Determine whether the structure is designed to include a sump.
Domain values and definitions: "YNUnk"	
Yes	The drainage inlet structure has a sump.
No	The drainage inlet structure does not have sump.
Unknown	Due to conditions at the time of documentation, it could not be determined whether the drainage inlet structure has a sump.

UIC_ID

Definitions, properties, and rules	
Field definition	• This is the unique identification number as assigned to the feature by the Underground Injection Control (UIC) database, where applicable. •
Field data type	String; Length: 25
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	• This field should be filled by the data steward.
Domain values and definitions: None	

ENERGY DISSIPATOR

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Point
Feature definition	• A method to reduce the total energy of flowing water; a mechanism that reduces velocity prior to or at discharge from an outfall in order to prevent erosion (see *Hydraulics Manual*, Section 3-4.7*; see also *FHWA Hydraulic Engineering Circular No. 14*). • The WSDOT Stormwater Features Inventory Database should not document energy dissipators unless they occur at or near the end of a stormwater system, immediately prior to discharge.
Feature subtypes	None
Collection location	Place the point at the closely approximated center of the structure.
Collection rules: Field	Examples of energy dissipators include rock splash pads, drop manholes, concrete stilling basins or baffles, and rock check dams.
Collection rules: Office	• Only map energy dissipators that are associated with discharge points. • Quarry spalls are the most common type of energy dissipators, but there are other types. • If an infiltration pond is the ultimate discharge location, you don't need to map quarry spalls in the pond.

Feature Type-Specific Fields and Domains

EnergyDissipatorType

Definitions, properties, and rules	
Field definition	Indicates whether the energy dissipator is internally mounted within a stormwater conveyance feature or mounted/added to the outside of the feature (see *Hydraulics Manual,* Section 3-4.7*; see also *FHWA Hydraulic Engineering Circular No. 14*).
Field data type	Domain; String; Length: 10

Office vs. Field collection	Both
Collection rules: Field	Assess the physical location of the dissipator relative to the feature that it serves.
Collection rules: Office	Assess the planned location of the dissipator relative to the feature that it serves.
Domain values and definitions: "EnergyDissipatorType"	
External	The dissipator has been mounted to the outside of, or added onto the end of, the stormwater conveyance feature that it serves.
Internal	The dissipator is mounted inside of the conveyance feature that it serves.

Location

Definitions, properties, and rules	
Field definition	Description of the feature containing the energy dissipater, or connected to it, such as "Outlet end of concrete culvert pipe."
Field data type	String; Length: 50
Office vs. Field collection	Both
Collection rules: Field	Assess the feature associated with the dissipator.
Collection rules: Office	Assess the feature associated with the dissipator.
Domain values and definitions: None	

Sumpflag

Definitions, properties, and rules	
Field definition	• This flag indicates whether or not the dissipator has a sump. • A sump is a low-lying place such as a pit that, by design, catches stormwater and allows for settling and collection of sediment, debris, detritus, contaminants, etc., prior to transfer to the outfall, outlet pipe, or outlet structure of a vault/catch basin/pond/detention facility. • Distinguished from a vault/basin floor.
Field data type	Domain; String; Length: 8
Office vs. Field collection	Both
Collection rules: Field	• Assess the energy dissipator and determine whether a designed sump is present. This might be most likely designed as part of a stilling basin. • Make sure that the sump is intended to be a designed component of the energy dissipator and not part of an adjacent drainage structure.
Collection rules: Office	Review the as-built plan detail for the presence of a sump.
Domain values and definitions: "YNUnk"	
Yes	The energy dissipator has a sump.
No	The energy dissipator does not have a sump.
Unknown	Due to conditions at the time of documentation, it could not be determined whether the energy dissipator had a sump.

FLOW RESTRICTOR

Feature type definitions, properties, and rules	
Type	Simple Feature Class

Geometry	Point
Feature definition	• A device such as an orifice or weir that restricts the volume of stormwater flow through or at the outlet of a structure. • This may be associated with a "control structure" as part of a "flow restrictor system" (see Standard Plans B-10.40, B-10.60).
Feature subtypes	None
Collection location	• In the case of a flow restrictor, which is mounted internally to a drainage inlet structure, place the point at the approximate center of the inlet grate. • In the case of a flow restrictor, such as a weir (that is accessible), place the point over the approximate center of the structure.
Collection rules: Field	Many stormwater ponds have a flow restrictor or control structure at their outlet.
Collection rules: Office	Digitize at the center of the symbol representing, or containing, the feature.

Feature Type-Specific Fields and Domains

OrificeDiameter

Definitions, properties, and rules	
Field definition	The maximum inside diameter of the flow restrictor orifice plate. Distinct from the "PipeDiameter" as defined below.
Field data type	Short Integer; Length: 2
Office vs. Field collection	Both
Collection rules: Field	Physically measure this dimension using a tape, if possible. Use care when assessing orifice diameters. Orifice pipes used to convey flow may have an "orifice plate" mounted to the pipe inlet that is of smaller diameter than the pipe itself (e.g., Standard Plan B-10.60).
Collection rules: Office	Examine the as-built Drainage Detail Sheets for the design dimensions of the orifice diameter or a reference to a WSDOT Standard Plan.
Domain values and definitions: None	

PipeDiameter

Definitions, properties, and rules	
Field definition	The inside diameter of the narrowest pipe that will convey flow. Distinct from the "OrificeDiameter" as defined above.
Field data type	Short Integer; Length: 2
Office vs. Field collection	Both
Collection rules: Field	Identify the narrowest pipe included in the restrictor/control structure that will convey flow. Physically measure the inside diameter with a tape, if possible.
Collection rules: Office	Examine as-built Drainage Detail Sheets for the design dimensions of the pipe diameter or a reference to a WSDOT Standard Plan.
Domain values and definitions: None	

LINEAR DRAIN

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Polyline
Feature definition	
Feature subtypes	None
Collection location	The beginning and ending vertices should be placed at the first and last location where the feature collects, concentrates, or conveys runoff or at the junction point between a linear drain and the previous conveyance feature. A minimum of two vertices are collected for a straight line linear drain segment, with additional vertices placed at the drain flow line, adequate in number and spacing to approximate a curved drain segment.
Collection rules: Field	
Collection rules: Office	The linear drain feature should only be digitized over the lines as they appear on the as-built plan sheet.

Feature Type-Specific Fields and Domains

BackSlope/ForeSlope

Definitions, properties, and rules	
Field definition	• The range of the slope, expressed as a ratio, at the back side of the drain (backslope—farthest from traffic) or front side of the drain (foreslope—nearest to traffic). The ratio is expressed as **H**orizontal:**V**ertical. • The drain backslope and foreslope are limited to the cross-sectional extent of the feature that will effectively convey water.
Field data type	String; Length: 30
Office vs. Field collection	Both
Collection rules: Field	• The slope extents are determined based on the effective volumetric capacity of the drain. • Measure the horizontal and vertical dimensions of the slope from its top to toe and reduce the ratio to a denominator of 1 (one).
Collection rules: Office	• If a specific ditch section detail is provided in the as-built plans, use the dimensions indicated in the cross section. • If only a "typical" ditch detail is provided in the as-built plans, use these dimensions for all ditches that are drawn in the contract.
Domain values and definitions: "Slope"	
Steeper Than 2 to 1	The slope (expressed as H:V) is steeper than a ratio of 2:1.
In Between 2 to 1 and 4 to 1	The slope (expressed as H:V) is in the range between a ratio of 2:1 and 4:1.
Flatter Than 4 to 1	The slope (expressed as H:V) is flatter than a ratio of 4:1.
Vertical	The slope is vertical.

BidirectionalFlowFlag

Definitions, properties, and rules	
Field definition	Indicates whether flow through the drain feature is influenced by marine tides or unique conditions such as river flood events that could change the flow direction.
Field data type	Domain; String; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Use of this flag should be limited to ditch features that lie at or below the mean high tide line or in immediate proximity to the banks of a stream segment that is prone to tidal influence or frequent flooding.
Collection rules: Office	Limit the use of this attribute to situations where specific design elements are being called upon to limit reverse flow through the drain such as flood control gates.
Domain values and definitions: "YNUnk"	
Yes	This drain appears to be prone to bidirectional flow.
No	Stormwater will flow only one direction through this drain.
Unknown	At the time of documentation, it is unclear if this drain is subject to bidirectional flow.

BottomDepth

Definitions, properties, and rules	
Field definition	The vertical depth of the drain, measured as a function of its maximum conveyance volume, from the drain bottom to the top of the lowest flow-confining side.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	• After locating the top of the lowest flow-confining side of the drain, a vertical measurement is taken from this elevation to the lowest point on the drain bottom. • Do not approximate this value. Use only physical measurements by tape (or range finder where appropriate).
Collection rules: Office	• Oftentimes drain depth is not recorded in the as-built plans. • If a specific drain section detail is provided in the as-built plans, use the depth dimension indicated in the cross section. • If only a "typical" ditch detail is provided in the as-built plans, use the depth dimension for all drains that are drawn in the contract.
Domain values and definitions: None	

BottomMaterial

Definitions, properties, and rules	
Field definition	An approximate description of the physical material that composed a majority of the drain bottom.
Field data type	Domain; String; Length: 20
Office vs. Field collection	Both
Collection rules: Field	• The assigned value should be a visual estimate of the primary material that comprises the drain bottom at the time of documentation. • Exceptions might include asphalt, concrete, or rock-lined drain that appear to have a heavy debris load obscuring the bottom material.
Collection rules: Office	Use the bottom material type as described in the as-built plan sheets.
Domain values and definitions: "DitchMaterial"	
Asphalt	A majority of the drain bottom is composed of asphalt.
Bare Soil	A majority of the drain bottom is composed of bare soil.
Concrete	A majority of the drain bottom is composed of concrete.
Rock	A majority of the drain bottom is composed of rock such as rip rap. Also use this value for a rock-lined ditch that has become vegetated over time.
Vegetation	A majority of the drain bottom is vegetated soil.
Other	The drain bottom is composed of a material that is not included in this list.
Unknown	Due to field conditions (submersion, heavy vegetation) at the time of documentation, the drain bottom material is unclear.
Other Add Note	The drain bottom is composed of a material that is not included in this list.

BottomWidth

Definitions, properties, and rules	
Field definition	The bottom width of the drain is determined by the horizontal distance, measured perpendicular to the primary flow line, between the toe of each side slope.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Determine points where the drain side slopes meet the ditch bottom, and physically measure the distance between using a tape (or laser range finder where appropriate).
Collection rules: Office	• If a specific ditch section detail is provided in the as-built plans, use the bottom width dimension indicated in the cross section. • If only a "typical" drain detail is provided in the as-built plans, use this bottom width dimension for all ditches that are drawn in the contract.
Domain values and definitions: None	

CollectionShape

Definitions, properties, and rules	
Field definition	The cross-sectional geometry of the drain (
Field data type	Domain; String; Length: 30
Office vs. Field collection	Both
Collection rules: Field	Taking care for proper perspective, look longitudinally down the ditch line and estimate the cross-sectional geometry of the feature.
Collection rules: Office	• If a specific ditch section detail is provided in the as-built plans, use the geometric shape indicated in the cross section. • If only a "typical" ditch detail is provided in the as-built plans, use this geometric shape for all ditches that are drawn in the contract.
Domain values and definitions: "DitchShape"	
Rectangle	The ditch geometry is defined by a flat bottom and vertical sides.
Trapezoidal Equal Sides	The ditch geometry is defined by a flat bottom and sloped sides, with the foreslope and backslope having the *same* slope range value as defined in "Slope" domain of the "ForeSlope" and "BackSlope" fields defined above.
Trapezoidal Unequal Sides	The ditch geometry is defined by a flat bottom and sloped sides, with the foreslope and backslope having *different* slope range value as defined in the "Slope" domain of the "ForeSlope" and "BackSlope" fields defined above.
Triangle	The ditch geometry is defined by sloped sides and negligible bottom width.
U-Shaped	The ditch geometry is defined by a pronounced curvature near the bottom and has vertical walls.
Other Add Note	The ditch geometry is better characterized by a value that is not included here.
NA	Only used for discharge points, when the associated feature type is not a ditch.

TopWidth

Definitions, properties, and rules	
Field definition	The top width of the ditch is determined by the horizontal distance measured perpendicular to the primary flow line, between the two side slopes, at the highest potential water line.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Determine the points where the highest possible water line would intersect the ditch side slopes, and physically measure the distance between using a tape (or laser range finder where appropriate).
Collection rules: Office	• If a specific ditch section detail is provided in the as-built plans, use the top width dimension indicated in the cross section. • If only a "typical" ditch detail is provided in the as-built plans, use this top width dimension for all ditches drawn in the contract.
Domain values and definitions: None	

MONITORING SITE

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Polygon
Feature definition	A polygon feature that indicates the location and general boundaries of a site that has been selected for monitoring and is defined by WSDOT Environmental Services Office's stormwater monitoring group.
Feature subtypes	None
Collection location	Place vertices on the approximate boundary of the site that has been identified for monitoring.
Collection rules: Field	This feature is not documented during usual activities for stormwater features inventory field data collection.
Collection rules: Office	The polygon boundaries should correspond to the monitoring site as estimated based upon air photos.

Feature Type-Specific Fields and Domains

AnticipatedRetireDate

Definitions, properties, and rules	
Field definition	
Field data type	Date
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	•
Domain values and definitions: None	

MonitoringSiteName

Definitions, properties, and rules	
Field definition	The name of the monitoring site as determined by the WSDOT Environmental Services Office's (ESO's) stormwater monitoring group. This value also acts as a link between the Stormwater Monitoring EQuIS database and the Stormwater Features Inventory Database.
Field data type	String; Length: 22
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	• This is equivalent to the formal (long) name for the monitoring site as indicated in the Quality Assurance Project Plan. • For monitoring projects using ESO's EQuIS database, use the EQuIS subfacility code, a Text (20) linking field.
Domain values and definitions: None	

QAPPlink

Definitions, properties, and rules	
Field definition	A link to the Quality Assurance Project Plans (QAPPs) applicable to this monitoring station as determined by WSDOT Environmental Services Office's stormwater monitoring group.

Field data type	String; Length: 255
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	A hyperlink should be established to the appropriate QAPP.
Domain values and definitions: None	

StudyCategory

Definitions, properties, and rules	
Field definition	The purpose of monitoring being conducted at this site, as determined by the WSDOT Environmental Services Office's stormwater monitoring group.
Field data type	Domain; String; Length: 50
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	The appropriate domain value is selected based upon internal documents for the site being monitored at this location.
Domain values and definitions: "MonitoringSiteStudyCategory"	
NPDES-Municipal	Fulfill National Pollution Discharge Elimination System Municipal Permit requirements.
TAPE	Technology Assessment Protocol – Ecology (TAPE) approval.
TMDL	Fulfill Total Maximum Daily Load requirements.
Research	Investigation to answer a question.
HRM Emerging Technologies	Required for projects that do not follow the *Highway Runoff Manual* (HRM)-approved best management practices (BMPs), but the method has some preliminary data for controlling stormwater. Monitoring required for compliance with federal and state water quality regulations (HRM 5-3.5.2).
HRM Demonstrative	Required for projects that do not follow the HRM-approved best management practices for controlling stormwater, and that need to monitor for compliance with federal and state water quality regulations (HRM 5-3.5.3).

WSDOTProjectManager

Definitions, properties, and rules	
Field definition	The name of the WSDOT project manager who is overseeing work for the study conducted at this monitoring site as determined by the WSDOT Environmental Services Office's stormwater monitoring group.
Field data type	String; Length: 50
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	The appropriate project manager's name is entered, based upon internal documents for the study being conducted at this location.
Domain values and definitions: None	

WSDOTProjectProgram

Definitions, properties, and rules	
Field definition	The name of the WSDOT program or office that is sponsoring work for the study conducted at this monitoring site as determined by WSDOT Environmental Services Office's stormwater monitoring group.
Field data type	Domain; String; Length: 50
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	The appropriate WSDOT program or project office name is entered, based upon internal documents for the study being conducted at this location.
Domain values and definitions: None	

PIPE and PIPE END

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Polyline (Pipe), Point (Pipe End)
Feature definition	The "Pipe" line feature and the "Pipe End" point feature are combined here because their feature definitions and attributes are similar. *Pipe:* A sub-linear enclosed conveyance designed and constructed to convey flow; it has a clear opening of less than 20 feet (see *Hydraulics Manual, Chapter 8*). *Pipe End:* The end point of a pipe as defined above.
Feature subtypes	Culvert Pipe; Drain Pipe; Sanitary Sewer Pipe; Storm Sewer Pipe; Underdrain Pipe; Other; Unknown
Collection location	*Pipe:* Place the beginning and ending vertices at the center of the pipe flow line at the inlet/outlet lip of the pipe invert. Place additional vertices at the center of the pipe flow line.

	• In the case of a closed system, place the beginning and end vertices as closely as possible to their inlet or outlet location on the drainage structure. These end points will be snapped to the drainage inlet feature during editing. *Pipe End:* Place the point at the center of the pipe flow line at the lip of the pipe invert.
Collection rules: Field	• A pipe should be collected as a "Pipe" line feature whenever two ends can be verified to be the same physical feature. • Do not collect a "Pipe End" feature at the pipe's end location if that pipe is already represented by a "Pipe" line feature. • A pipe should be documented as a "Pipe End" point feature only if the location of the corresponding pipe end cannot be located or if the corresponding pipe is not a WSDOT-owned or -operated conveyance. • A conveyance with a clear opening of greater than 20 feet is considered by WSDOT to be a bridge and is therefore not documented as a "Pipe" or "Pipe End" feature.

Collection rules: Office	*Pipes:*
	• Pipes are probably the most common line feature class, and individual pipes typically run from drainage inlet to drainage inlet.
	• Pipe can be referred to as CMP (CMP = corrugated metal pipe).
	• When copying over Roadside Features Inventory Program (RFIP) culverts to the Stormwater Features Inventory Database (SFID), make sure the beginning and end diameter, height, width, material, etc., match. If they don't, and you can't figure out which is correct from the Structure Notes, use the information for the beginning of the culvert, but make a note of the conflicting information in "Notes."
	• Good rules of thumb:
	  ➤ Culverts: Daylight at both ends.
	  ➤ If pipes are connected by catch basins or other drainage inlets, they are most likely storm sewer pipes.
	  ➤ If pipes are from a drainage inlet to the open, they're most likely drain pipes.
	  ➤ If confused, use "Unknown."
	• Fill in only PipeDiameter or PipeWidth/PipeHeight. Don't fill in all three. Leave the field(s) unfilled <Null>. In 99.9% of the cases, you will be filling in only PipeDiameter.
	• RFIP culverts would be a culvert pipe in SFID.
	• Inlet/outlet information is found primarily on drainage profile sheets.
	
	Pipe Ends:
	• Pipe ends from as-builts will not be added as part of the regular office workflow. They will be calculated from the end vertices of the pipes after the pipes have received their WSDOTFeatureNumber. This will be a separate workflow.
	• RFIP doesn't have a "PipeType" field. When RFIP pipe ends are copied over to SFID, the pipe end subtype "Unknown" should be used.
	• RFIP just has pipe ends, no pipes.
	• RFIP culvert ends are what we consider PipeEnds. Anything conveying

	stormwater was called a culvert end. We will have to determine the PipeType from what the culvert end is connected to.

Feature Subtype Definitions

Culvert Pipe	A culvert is a conduit under a roadway or embankment used to maintain flow from a natural channel or drainage ditch to a natural channel or drainage ditch. Culvert shapes, sizes, and applications can vary substantially from one location to another. This category includes circular; arch; structural plate; road approach and driveway; and box and three-sided box culverts (*Hydraulics Manual*, Section 8-1.3; *Standard Specifications,* Section 7-02).
Drain Pipe	Drain pipe is small-diameter pipe (usually less than 24-inch [600 mm]) and is used to convey roadway runoff or groundwater away from the roadway profile. This term will also be used specifically for pipes whose inlet is tied to a drainage inlet structure and outlet is not. Drain pipe is not allowed to cross under the roadway profile (*Hydraulics Manual*, Section 8-1.1; *Standard Specifications*, Section 7-01).
Sanitary Sewer Pipe	Sanitary sewer pipe is intended to carry either domestic or industrial sanitary wastewater (*Hydraulics Manual,* Section 8-1.5).
Storm Sewer Pipe	Storm sewer pipe is a pipe that connects two drainage inlet structures (*Hydraulics Manual,* Section 8-1.4; *Standard Specifications,* Section 7-04).
Underdrain Pipe	Underdrain pipe is small-diameter perforated pipe intended to intercept groundwater and convey it away from areas such as roadbeds or from behind retaining walls (*Hydraulics Manual,* Section 8-1.2; *Standard Specifications,* Section 7-01).
Unknown	Due to conditions at the time of documentation, the pipe subtype is not able to be determined.

Feature Type-Specific Fields and Domains

BidirectionalFlowFlag

Definitions, properties, and rules	
Field definition	• Indicates whether flow through the pipe or pipe end features are influenced by marine tides or unique conditions such as flood events that could change the flow direction. • Use of this flag should be limited to "pipe" or "pipe end" features that lie at or below the mean high tide line or in immediate proximity to the banks of a stream segment that is prone to tidal influence or frequent flooding.
Field data type	Domain; String; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Take note of local conditions at the time of visit. If possible, verify your assessment by observing conditions again during an opposing stage of the cycle (ebb vs. flow).
Collection rules: Office	Limit the use of this attribute to situations where specific design elements are being called upon to limit reverse flow through the pipe,

	such as a flood control gates or pipe end treatments that allow only unidirectional flow.
Domain values and definitions: "YNUnk"	
Yes	This pipe appears to be prone to bidirectional flow as defined above.
No	Stormwater will flow only one direction through this pipe.
Unknown	At the time of documentation, it is unclear whether this pipe may be subject to bidirectional flow.

InletDepth

Definitions, properties, and rules	
Field definition	Refers to the pipe end in the wall of a drainage structure. Each pipe line will have an inlet to the pipe and an outlet from the pipe. This should not be confused with the inlet or outlet from the drainage structure. Measured from the top of the drainage structure frame to the inlet pipe invert.
Field data type	Short Integer; Length: 2
Office vs. Field collection	Both
Collection rules: Field	Physically measure this dimension with a tape.
Collection rules: Office	Record the value that best fits the inlet pipe end treatment as called out in the as-built Structure Notes or Drainage Detail Sheets.
Domain values and definitions: None	

InletEndType/OutletEndType

Definitions, properties, and rules	
Field definition	This indicates the end treatment for an open-ended pipe.
Field data type	Domain; String; Length: 16
Office vs. Field collection	Both
Collection rules: Field	Select the domain value that best fits the pipe end treatment as observed in the field.
Collection rules: Office	Select the domain value that best fits the pipe end treatment as called out in the as-built Structure Notes or Drainage Detail Sheets.
Domain values and definitions: "PipeEndType"	
Barred	The pipe end is barred (e.g., Standard Plan B-80.20).
Beveled	The pipe end is beveled (*Hydraulics Manual*, Section 3-4.2).
Headwall	The pipe end includes a headwall (*Hydraulics Manual*, Section 3-4.4).
Projecting	The pipe end is projecting (*Hydraulics Manual*, Section 3-4.1).
Other Add Note	A pipe end treatment that is not included on the list above.

OutletDepth

Definitions, properties, and rules	
Field definition	Refers to the pipe end in the wall of a drainage structure. Each pipe line will have an inlet to the pipe and an outlet from the pipe. This should not be confused with the inlet or outlet from the drainage structure. Measured from the top of the drainage structure frame to the outlet pipe invert.
Field data type	Short Integer; Length: 2
Office vs. Field collection	Both
Collection rules: Field	Physically measure this dimension with a tape.
Collection rules: Office	Record the value that best fits the outlet pipe end treatment as called out in the as-built Structure Notes or Drainage Detail Sheets.
Domain values and definitions: None	

PipeDiameter

Definitions, properties, and rules	
Field definition	The pipe's interior diameter, measured between smooth interior surfaces or the inside peak of corrugations (*Hydraulics Manual,* Figures 3-2.1 and 3-3.1). **Note:** This dimension is recorded for cylindrical pipes only.
Field data type	Single; Length: 4
Office vs. Field collection	Both
Collection rules: Field	Physically measure the pipe diameter using a tape.
Collection rules: Office	Search the as-built Drainage Detail Sheets for pipe diameter information.
Domain values and definitions: None	

PipeHeight

Definitions, properties, and rules	
Field definition	The height of the pipe, as measured between the interior surfaces of the pipe, from invert to crown or channel bottom to crown, typically at the midpoint of the span (*Hydraulics Manual,* Figures 3-2.1 and 3-3.1). **Note:** This dimension is recorded for box, three-sided box, or pipe arch pipes.
Field data type	Single; Length: 4
Office vs. Field collection	Both
Collection rules: Field	Physically measure the pipe height using a tape.
Collection rules: Office	Search the as-built Drainage Detail Sheets for pipe diameter information.
Domain values and definitions: None	

PipeInteriorTexture

Definitions, properties, and rules	
Field definition	This is a reference to the texture of the pipe interior surface as originally constructed.
Field data type	Domain; String; Length: 20
Office vs. Field collection	Both
Collection rules: Field	Use care to directly visually assess the interior of the pipe. The texture of the inside of a pipe is not necessarily indicated by the exterior texture.
Collection rules: Office	Search the as-built Drainage Detail Sheets for pipe attribute information.
Domain values and definitions: "PipeInteriorTexture"	
Corrugated	The original design of the interior surface of the pipe has corrugations; includes single-wall PE tubing, metal helical/annular corrugations, etc. (*Hydraulics Manual,* Figure 8-2.2.1).
Smooth	The original design of the interior surface of the pipe is smooth.
Other Add Note	The interior texture of the pipe is best described by a term that is not included in this list.

PipeMaterialGroup

Definitions, properties, and rules	
Field definition	The generalized material type used to manufacture the pipe.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	• The pipe material should be directly assessed visually for each pipe that is collected. • Use care to notice material changes between the two ends of the pipe. In cases where a lane was added or the highway shoulder widened, the project may also have included connecting dissimilar pipe types to extend the existing conveyance to the new location (see WSDOT Standard Plan B-60.20).
Collection rules: Office	Review the as-built Drainage Detail Sheets and Structure Notes for indication of the pipe material group.
Domain values and definitions: "PipeMaterialGroup"	
Clay	Historical; no longer used by WSDOT as a standard pipe material but may be found in older systems or private connections.
Concrete	The pipe is constructed of concrete (*Hydraulics Manual,* Section 8-2.1).
Metal	The pipe is constructed of metal (*Hydraulics Manual,* Section 8-2.2).
Plastic	The pipe is constructed of plastic (*Hydraulics Manual,* Section 8-2.3).
Other	The pipe is constructed of a material group that is not included in this list.
Unknown	Due to conditions (burial, submersion, vegetative cover, obstruction of view, etc.) at the time of documentation, the pipe material type is not identifiable.

PipeMaterialType

Definitions, properties, and rules	
Field definition	A more specific and detailed description of the "PipeMaterialGroup" used to manufacture the pipe.
Field data type	Domain; String; Length: 35
Office vs. Field collection	Both
Collection rules: Field	• Field personnel should be familiar with the identification criteria for each material type. • If the field personnel are unclear as to the "PipeMaterialType," photographs should be taken and discussed in the office.
Collection rules: Office	Review the as-built Drainage Detail Sheets and Structure Notes for indication of the pipe material type.
Domain values and definitions: "PipeMaterialType"	
Clay	Historical; no longer used as a standard pipe material but may be found in older systems or private connections.
Concrete	The pipe is constructed of concrete (*Hydraulics Manual,* Section 8-2.1).
Other Add Note	The pipe is constructed of a material type that is not included in this list. Add note to "Notes" field and briefly describe the material.
Polyvinyl Chloride – PVC	The pipe is constructed of PVC plastic (*Hydraulics Manual,* Sections 8-2.3.2, 8-2.3.4).
Polyethylene – PE	The pipe is constructed of PE plastic (*Hydraulics Manual,* Section 8-2.3.1, 8-2.3.3).
High-Density Polyethylene – HDPE	The pipe is constructed of HDPE plastic (*Hydraulics Manual,* Section 8-2.5).
Galvanized Steel	The pipe is constructed of galvanized steel metal (*Hydraulics Manual,* Section 8-2.2.4).
Aluminum Alloy	The pipe is constructed of aluminum alloy metal (*Hydraulics Manual,* Section 8-2.2.6).
Aluminized Steel	The pipe is constructed of aluminized steel metal (*Hydraulics Manual,* Section 8-2.2.5).
Ductile Iron	The pipe is constructed of ductile iron metal (*Hydraulics Manual,* Section 8-2.4).
Unknown	Due to conditions (burial, submersion, vegetative cover, obstruction of view, etc.) at the time of documentation, the pipe material type is not identifiable.

PipeOrientation

Definitions, properties, and rules	
Field definition	The orientation of the pipe feature relative to the state highway.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	• Assess the position of the pipe relative to the state highway. • A pipe that is in a "cross" orientation relative to a local road or driveway would be in an "approach" orientation relative to the highway.

Collection rules: Office	See "Collection Rules: Field" above.
Domain values and definitions: "PipeOrientation"	
Approach	Used for pipes that convey flow across a private or municipal road approach or driveway that connects to the WSDOT highway.
Cross	Used for pipes that convey flow across the main line of the WSDOT highway.
NA	Includes pipes in all other configurations not described above (e.g., highway-parallel pipes that do not cross a road approach or driveway).

PipeSchedule

Definitions, properties, and rules	
Field definition	• Pipe schedule refers to the thickness of the pipe wall and directly indicates the structural integrity of the pipe under a load. Circular culvert pipe and storm sewer pipe from 12 to 48 inches in diameter is designated as "schedule pipe." • Each domain is feature subtype-specific and displays automatically based on the subtype chosen.
Field data type	Domain; String; Length: 5
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	Review the as-built Drainage Detail Sheets and Structure Notes for indication of the pipe schedule.
Subtype "Drain Pipe," "Sanitary Sewer Pipe," "Underdrain Pipe": "PipeSchedule1"	
NA	Not applicable – Pipe schedule is not used to classify this type of pipe.
Subtype "Storm Sewer Pipe": "PipeSchedule2"	
A	Supports fill height of 2'–15' (*Standard Specifications*, Section 7-04, Storm Sewer Pipe Schedules Table).
B	Supports fill height of 15'–25' (*Standard Specifications*, Section 7-04, Storm Sewer Pipe Schedules Table).
Subtype "Culvert Pipe": "PipeSchedule3"	
A	Supports fill height of 2'–15' (*Standard Specifications*, Section 7-02, Culvert Pipe Schedules Table).
B	Supports fill height of 15'–25' (*Standard Specifications*, Section 7-02, Culvert Pipe Schedules Table).
C	Supports fill height of 25'–40' (*Standard Specifications*, Section 7-02, Culvert Pipe Schedules Table).
D	Supports fill height of 40'–60' (*Standard Specifications*, Section 7-02, Culvert Pipe Schedules Table).
NA	Can be used when" PipeSchedule" is unknown.

PipeType

Definitions, properties, and rules	
Field definition	This is a selection list of the "Pipe" and "Pipe End" feature subtypes as defined above.
Field data type	Domain; Short Integer; Length:2
Office vs. Field collection	Both
Collection rules: Field	The pipe or pipe end is assessed against the subtype definitions presented above and the appropriate value is selected.
Collection rules: Office	The pipe or pipe end is assessed against the subtype definitions presented above and the appropriate value is selected.
Domain values and definitions: "Pipe" and "Pipe End" feature subtype list	
3-Culvert Pipe	The pipe or pipe end meets the WSDOT definition of a "Culvert Pipe."
1-Drain Pipe	The pipe or pipe end meets the WSDOT definition of a "Drain Pipe."
5-Sanitary Sewer Pipe	The pipe or pipe end meets the WSDOT definition of a "Sanitary Sewer Pipe."
4-Storm Sewer Pipe	The pipe or pipe end meets the WSDOT definition of a "Storm Sewer Pipe."
2-Underdrain Pipe	The pipe or pipe end meets the WSDOT definition of an "Underdrain Pipe."
6-Unknown	Due to conditions at the time of documentation, the pipe or pipe end subtype is unclear.

PipeWidth

Definitions, properties, and rules	
Field definition	• The width of the pipe, as measured between the interior sides of the pipe, across the pipe span, usually parallel to the ground surface (see *Hydraulics Manual,* Figure 3-2.1). • This dimension is recorded for box, three-sided box, or pipe arch pipes.
Field data type	Single; Length: 4
Office vs. Field collection	Both
Collection rules: Field	Physically measure the pipe width with a tape.
Collection rules: Office	Search the as-built Drainage Detail Sheets for pipe diameter information.
Domain values and definitions: None	

Slope

Definitions, properties, and rules	
Field definition	The slope gradient as expressed in percent. Distinct from "SlopeDescrip" value noted below.
Field data type	Double; Length: 8
Office vs. Field collection	Office (for Now)
Collection rules: Field	NA
Collection rules: Office	Search the as-built profile sheets.
Domain values and definitions: None	

ROADSIDE SLOPE (LINE AND POLYGON)

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Polyline, Polygon
Feature definition	• The "Roadside Slope" line feature and the "Roadside Slope" polygon feature are combined here because their feature definitions and attributes are similar. • Slopes that are documented by the Stormwater Features Inventory Group are limited to those that are designed and/or approved for use as a stormwater best management practice (BMP), such as vegetated filter strips.
Feature subtypes	None
Collection location	*Line:* Place the vertices at the top portion of the slope that is designed to act as a "dispersion" BMP. Begin and end vertices are placed at the longitudinal extents of the BMP. *Polygon:* Place the vertices to closely approximate the boundaries of the area designated to act as a BMP.
Collection rules: Field	This feature should not be documented during field data collection.
Collection rules: Office	• For every roadside slope polygon, identify an artificial discharge point. • Roadside slopes should be mapped only from as-built plans.

Feature Type-Specific Fields and Domains

Height

Definitions, properties, and rules	
Field definition	The vertical height of the slope as measured from the roadway shoulder to the slope toe, expressed as a range in 5-foot increments.
Field data type	String; Length: 30
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	Find this value in the as-built plan Drainage Detail Sheets.
Domain values and definitions: "RoadsideSlopeHeight"	
0 to 5 Feet	The vertical height of the slope is in the range of 0 to 5 feet.
5 to 10 Feet	The vertical height of the slope is in the range of 5 to 10 feet.
10 to 15 Feet	The vertical height of the slope is in the range of 10 to 15 feet.
15 to 20 Feet	The vertical height of the slope is in the range of 15 to 20 feet.
20 to 25 Feet	The vertical height of the slope is in the range of 20 to 25 feet.
Greater Than 25 Feet	The vertical height of the slope is greater than 25 feet.

Slope

Definitions, properties, and rules	
Field definition	The slope gradient as expressed in percent. Distinct from the "SlopeDescrip" value noted below.
Field data type	Double; Length: 8
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	Find this value in the as-built plan Drainage Detail Sheets.
Domain values and definitions: None	

SlopeDescrip

Definitions, properties, and rules	
Field definition	The range of the slope, expressed as a ratio, **H**orizontal:**V**ertical.
Field data type	Domain; String; Length: 40
Office vs. Field collection	Both
Collection rules: Field	Calculate the slope ratio using the "horizontal" and "vertical" distance functions of a laser range finder.
Collection rules: Office	Find this value in the as-built plan Drainage Detail Sheets.
Domain values and definitions: "Slope"	
Steeper Than 2 to 1	The slope (expressed as H:V) is steeper than a ratio of 2:1.
In Between 2 to 1 and 4 to 1	The slope (expressed as H:V) is in the range between a ratio of 2:1 and 4:1.
Flatter Than 4 to 1	The slope (expressed as H:V) is flatter than a ratio of 4:1.
Vertical	The slope is vertical.

SlopeRatio

Definitions, properties, and rules	
Field definition	
Field data type	Domain; String; Length: 40
Office vs. Field collection	Both
Collection rules: Field	Calculate the slope ratio using the "horizontal" and "vertical" distance functions of a laser range finder.
Collection rules: Office	Find this value in the as-built plan Drainage Detail Sheets.
Domain values and definitions: "Slope"	
Steeper Than 2 to 1	The slope (expressed as H:V) is steeper than a ratio of 2:1.
In Between 2 to 1 and 4 to 1	The slope (expressed as H:V) is in the range between a ratio of 2:1 and 4:1.
Flatter Than 4 to 1	The slope (expressed as H:V) is flatter than a ratio of 4:1.
Vertical	The slope is vertical.

TotalSurfaceArea

Definitions, properties, and rules	
Field definition	Total surface area of the roadside slope best management practice.
Field data type	Double; Length: 8
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	This value should be distinguished from plan-view surface area whenever possible (i.e., a sloped surface will have a greater surface area than is represented on a plan view). Use a GIS-calculated value only when you cannot find another source.
Domain values and definitions: None	

TotalSurfaceAreaSource

Definitions, properties, and rules	
Field definition	Source of total surface area value: Design, Field, GIS.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	Indicates the source of the "TotalSurfaceArea" value.
Domain values and definitions: "AreaVolumeSource"	
Design	The value was located in a design document such as as-built plans.
Field	The value was calculated based upon field measurements.
GIS	The value was calculated using a Geographic Information System algorithm.

Type

Definitions, properties, and rules	
Field definition	This indicates the slope aspect relative to the highway.
Field data type	Domain; String; Length: 10

Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	Indicate the slope "Type" based on information in the as-built plans.
Domain values and definitions: "RoadsideSlopeType"	
Cut	The slope is "facing" toward the highway.
Fill	The slope is "facing" away from the highway.
Horizontal	The slope is flat.

STORMWATER POND (POINT AND POLYGON)

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Point, Polygon
Feature definition	• Various types of stormwater treatment ponds provide treatment and flow control by containing excess runoff for a considerable length of time and then releasing it by evaporation, plant transpiration, or infiltration; or holding surface and stormwater runoff for a short period of time and then releasing it to a surface or stormwater management system. • The "Stormwater Pond" point feature and the "Stormwater Pond" polygon feature are combined here because their feature definitions and attributes are similar.
Feature subtypes	None
Collection location	*Point:* Place the point at the midpoint of the pond edge closest to the highway. *Polygon:* Place the vertices to closely approximate the pond boundaries at maximum water level.
Collection rules: Field	Take at the midpoint of the edge nearest the roadway.
Collection rules: Office	*Point:* • All stormwater ponds in an as-built will first be mapped as points. Once a stormwater pond point has a WSDOTFeatureNumber, the polygon feature class will be edited. This will be a separate workflow. • Infiltration basin = infiltration pond = stormwater pond. *Polygon:* • All stormwater pond polygons will have an associated stormwater pond point. • All stormwater ponds in an as-built will first be mapped as points. Once a stormwater pond point has a WSDOTFeatureNumber, the polygon feature class will be edited. • Stormwater pond polygons will have the same WSDOTFeatureNumber as their associated stormwater pond point. • Stormwater ponds will be mapped as points in the field and then converted to polygons in the office using a drawing, an air photo, or a Hydraulics Report. • Use air photos to define the edges of ponds in as-builts. If there is tree cover or you can't distinguish the edges of the pond from the photo, use what you can from the drawing. • Infiltration basin = infiltration pond = stormwater pond. • In multi-cell ponds, keep information for each individual cell (length, width, depth, etc.). Each cell will have the same WSDOTFeatureNumber.

Feature Type-Specific Fields and Domains

Area Source

Definitions, properties, and rules	
Field definition	The source of the measurement entry.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	NA
Collection rules: Office	NA
Domain values and definitions: "AreaVolumeSource"	
Design	This value was obtained from design documents.
Field	This value was calculated from field measurements.
GIS	This value was calculated from GIS measurements.

AreaDocumented (polygon only)

Definitions, properties, and rules	
Field definition	The area of the pond as documented per "AreaVolumeSource."
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	NA
Collection rules: Office	NA
Domain values and definitions: None	

BottomDepth

Definitions, properties, and rules	
Field definition	The depth of the stormwater pond as measured from the flow line of the overflow spillway (or the lowest point of the pond berm) to the lowest point of the pond.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Determine the vertical distance using a laser range finder.
Collection rules: Office	Determine from the Hydraulic Report or pond details if possible.
Domain values and definitions: None	

BottomDepthSource

Definitions, properties, and rules	
Field definition	The source of the measurement entry.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	Select the "Field" domain value.
Collection rules: Office	Select either the "Design" or "GIS" domain value.
Domain values and definitions: "AreaVolumeSource"	
Design	This value was obtained from design documents.
Field	This value was calculated from field measurements.
GIS	This value was calculated from GIS measurements.

DeadStorageDepth

Definitions, properties, and rules	
Field definition	Maximum depth to which the pond is designed to hold sediment and debris.
Field data type	Double; Length: 8
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	Determine from the Hydraulic Report or pond details if possible.
Domain values and definitions: None	

DeadStorageDepthSource

Definitions, properties, and rules	
Field definition	The source of the measurement entry.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	Select the "Field" domain value.
Collection rules: Office	Select either the "Design" or "GIS" domain value.
Domain values and definitions: "AreaVolumeSource"	
Design	This value was obtained from design documents.
Field	This value was calculated from field measurements.
GIS	This value was calculated from GIS measurements.

DesignDocumentNumberName (point only)

Definitions, properties, and rules	
Field definition	
Field data type	Text; Length: 50
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	
Domain values and definitions: None	

DocumentedArea (point only)

Definitions, properties, and rules	
Field definition	The area of the pond as documented per "AreaVolumeSource."
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	NA
Collection rules: Office	Determine from the Hydraulic Report or pond details, if possible, or calculate using GIS measurement tools.
Domain values and definitions: None	

Length

Definitions, properties, and rules	
Field definition	The plan-view measure of the long dimension of the stormwater pond as defined by the high water line.
Field data type	Double; Length: 8

Office vs. Field collection	Both
Collection rules: Field	Use a laser range finder.
Collection rules: Office	Determine from the Hydraulic Report or pond details, if possible, or calculate using GIS measurement tools.
Domain values and definitions: None	

LengthSource

Definitions, properties, and rules	
Field definition	The source of the measurement entry.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	Select the "Field" domain value.
Collection rules: Office	Select either the "Design" or "GIS" domain value.
Domain values and definitions: "AreaVolumeSource"	
Design	This value was obtained from design documents.
Field	This value was calculated from field measurements.
GIS	This value was calculated from GIS measurements.

LinerFlag

Definitions, properties, and rules	
Field definition	Indicates whether the pond design includes a liner.
Field data type	Domain; String; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Visually assess the pond for the presence of a liner.
Collection rules: Office	Liner will be called out on the drainage plan sheets or detail sheets.
Domain values and definitions: "YNUnk"	
Yes	The pond does have a liner.
No	The pond does not have a liner.
Unknown	Due to conditions at the time of documentation, it is unclear whether the pond has a liner.

LinerType

Definitions, properties, and rules	
Field definition	Indicates the type of pond liner used.
Field data type	String; Length: 50
Office vs. Field collection	Both
Collection rules: Field	Observed liner type such as concrete, plastic, and clay.
Collection rules: Office	Record type of liner if called out in the drainage plan sheets, or detail sheets.
Domain values and definitions: None	

Location

Definitions, properties, and rules	
Field definition	A general description of where the pond is and how WSDOT personnel can easily access it.
Field data type	String; Length: 50
Office vs. Field collection	Both
Collection rules: Field	Use this field only if there are unique or difficult circumstances involved in accessing this pond.
Collection rules: Office	NA
Domain values and definitions: None	

NumberOfInlets

Definitions, properties, and rules	
Field definition	Number of discrete conveyances discharging to the pond. These might include pipes, ditches, curbs, etc.
Field data type	Short Integer; Length: 2
Office vs. Field collection	Both
Collection rules: Field	Use care to investigate the pond perimeter and adjacent stormwater systems to identify their discharge location.
Collection rules: Office	Document the number of stormwater systems indicated on the as-built plan sheet(s) that are shown to discharge to the pond.
Domain values and definitions: None	

NumerOfOutlets

Definitions, properties, and rules	
Field definition	Number of outlets from the pond, including the overflow spillway.
Field data type	Short Integer; Length: 2
Office vs. Field collection	Both
Collection rules: Field	Use care to investigate the pond perimeter and to identify and assess the overflow structures and outlet control structure/flow restrictor.
Collection rules: Office	Document the number of overflow structures and outlet control structures indicated on the as-built plan sheet(s).
Domain values and definitions: None	

SpecialMaintNeeds

Definitions, properties, and rules	
Field definition	Special maintenance and care requirements for this pond as noted in the design documentation. Distinct from "MaintenanceConcerns."
Field data type	String; Length: 100
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	Note here if the documentation calls out special maintenance requirements.
Domain values and definitions: None	

SwPondType

Definitions, properties, and rules	
Field definition	Type of stormwater pond as indicated in the as-built plans, Hydraulic Report, or Verified in the field.
Field data type	Domain; String; Length: 40
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	Determine from design documentation.
Domain values and definitions: "SWPondType"	
Bioinfiltration Pond *(also biofiltration basin, bioinfiltration swale, grass percolation areas)*	A type of pond in which grasses (and/or other vegetation) and soil remove pollutants from stormwater by percolation into the ground (*Highway Runoff Manual* [HRM], 5-4.2.1).
Infiltration Pond *(also infiltration basin)*	Earthen structures used for the collection, temporary storage, and infiltration of stormwater (HRM, 5-4.2.1, IN.02).
Detention Pond *(also sediment pond, retention pond)*	Open basins that provide live storage volume to enable reduction of stormwater runoff flow rates and matching of predeveloped flow durations discharged from a project site (HRM, 5-4.2.3, FC.03).
Wet Pond	Stormwater ponds that retain a permanent pool of water (HRM, 5-4.1.4, RT.12).
Evaporation Pond	Pond designed to evaporate water.
Constructed Treatment Wetland	Shallow constructed wetlands designed to treat stormwater through settling, filtering, and the biological processes associated with emergent aquatic plants (HRM 5-4.1.4, AT.13).
Unknown Other Pond	Use this value if the pond type cannot be determined or if the pond type is not on the list. If the pond type is not on the list, add a brief description to the "Notes" field describing the pond type.
Sand Filter Basin	A sand filter basin is constructed so its surface is at grade and open to the elements, much as an infiltration basin. However, instead of infiltrating into native soils, stormwater filters through a constructed sand bed with an underdrain system.
Combined Wet/Detention	Has the appearance of a detention facility but contains a permanent pool of water (HRM, 5-4.1.4, CO.01).
Combined Treat Wet/Det Pond	Wetland system that provides for the extended detention of runoff during and following storm events (HRM, 5-4.1.4, CO.02).

Volume

Definitions, properties, and rules	
Field definition	The volume of the stormwater pond as calculated based on the high water line.
Field data type	Double; Length: 8
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	Determine from the Hydraulic Report or pond details if possible.
Domain values and definitions: None	

VolumeSource

Definitions, properties, and rules	
Field definition	The source of the measurement entry.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	Select the "Field" domain value.
Collection rules: Office	Select either the "Design" or "GIS" domain value.
Domain values and definitions: "AreaVolumeSource"	
Design	This value was obtained from design documents.
Field	This value was calculated from field measurements.
GIS	This value was calculated from GIS measurements.

Width

Definitions, properties, and rules	
Field definition	The plan-view measure of the short dimension of the stormwater pond as defined by the high water line.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Use a laser range finder.
Collection rules: Office	Determine from the Hydraulic Report or pond details, if possible, or calculate using GIS measurement tools.
Domain values and definitions: None	

WidthSource

Definitions, properties, and rules	
Field definition	The source of the measurement entry.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	Select the "Field" domain value.
Collection rules: Office	Select either the "Design" or "GIS" domain value.
Domain values and definitions: "AreaVolumeSource"	
Design	This value was obtained from design documents.
Field	This value was calculated from field measurements.
GIS	This value was calculated from GIS measurements.

STORMWATER SYSTEM

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Polygon
Feature definition	The complete network of stormwater conveyance elements that convey flow to a primary discharge point.
Feature subtypes	None
Collection location	To be determined.
Collection rules: Field	This feature is not documented during field data collection.
Collection rules: Office	• Everything that drains to a discharge point is a stormwater system. • ConveyanceMode = open or closed, based on the majority of features in the system. This is a manual process.

Feature Type-Specific Fields and Domains

Category

Definitions, properties, and rules	
Field definition	Characterization assigned to the system that indicates whether, upon discharge, the stormwater has been treated to current *Highway Runoff Manual* standards.
Field data type	Domain; String; Length: 50
Office vs. Field collection	Office
Collection rules: Field	NA
Collection rules: Office	Determine from dates associated with the design of the best management practice (BMP) feature if applicable.
Domain values and definitions: "StormWaterSystemCategory"	
Treated to Current Standard	Use this value if the system ends in a stormwater treatment or flow control facility built to current *Highway Runoff Manual* standards.
Treated Not to Current Standard	Use this value if the system ends in a stormwater treatment or flow control facility built to past *Highway Runoff Manual* standards but does not meet the current standards.
Untreated	No stormwater treatment or flow control BMPs in place.

ConveyanceMode

Definitions, properties, and rules	
Field definition	A description of the primary mode of conveyance for the system.
Field data type	Domain; String; Length: 8
Office vs. Field collection	Both
Collection rules: Field	NA
Collection rules: Office	The majority of the summed lengths for all linear features within each "ConveyanceMode" category in the system.
Domain values and definitions: "ConveyanceMode"	
Open Pervious	The majority of the system's linear features are an "Open Pervious" conveyance, a permeable channel in which water flows with a free surface open to the atmosphere. Open pervious conveyances typically include roadside ditches and swales that have a general geometric cross section.

Open Impervious	The majority of the system's linear features are an "Open Impervious" conveyance, an impermeable channel in which water flows with a free surface open to the atmosphere. Open impervious conveyances typically include roadside channels, curbs, gutters, and asphalt-lined ditches that usually have a general geometric cross section.
Closed Pervious	The majority of the system's linear features are "Closed Pervious" conveyances, a permeable conduit in which water flows with no surface open to the atmosphere. Closed pervious stormwater system conveyances typically include box culverts and covered roadside ditches.
Closed Impervious	A "Closed Impervious" conveyance is an impermeable conduit in which water flows with no surface open to the atmosphere. Closed impervious stormwater system conveyances typically include concrete, plastic, and metal pipe series as well as culverts, storm drains, and catch basins.
NA	The discharge is not being received by a stormwater system; for example, natural dispersion and infiltration in a forest.
Open	An "Open" conveyance is designated when the associated feature is known to be open, such as a ditch, but the material type is unknown to make the determination of permeability.
Closed	A "Closed" conveyance is designated when the associated feature is known to be closed, such as a pipe, but the material type is unknown to make the determination of permeability.

STORMWATER VAULT

Feature type definitions, properties, and rules	
Type	Simple Feature Class
Geometry	Point
Feature definition	This includes various best management practices with underground storage facilities that treat stormwater for water quality and quantity control. These processes occur by detaining runoff, allowing pollutants to settle out in underground storage units, and then releasing reduced flows at established rate standards.
Feature subtypes	None
Collection location	The center of the vault lid (first lid relative to the system flow direction).
Collection rules: Field	See collection location.
Collection rules: Office	See collection location.

Feature Type-Specific Fields and Domains

BottomDepth

Definitions, properties, and rules	
Field definition	The depth of the stormwater vault as measured from the top of the access rim to the floor of the vault (distinguished from the sump floor).
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	NA
Collection rules: Office	Document from as-built plan sheets or the Hydraulic Report.
Domain values and definitions: None	

BottomDepthSource

Definitions, properties, and rules	
Field definition	Source of this measurement value.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	Indicate the "Field" domain value.
Collection rules: Office	Indicate either the "Design" or "GIS" domain value.
Domain values and definitions: "AreaVolumeSource"	
Design	This value was obtained from design documents.
Field	This value was calculated from field measurements.
GIS	This value was calculated from GIS measurements.

Diameter

Definitions, properties, and rules	
Field definition	The inside diameter of a cylinder-shaped stormwater vault (e.g., detention pipes).
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Use a tape measure.
Collection rules: Office	Document from as-built plan sheets or the Hydraulic Report
Domain values and definitions: None	

DiameterSource

Definitions, properties, and rules	
Field definition	Source of this measurement value.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	Indicate the "Field" domain value.
Collection rules: Office	Indicate either the "Design" or "GIS" domain value.
Domain values and definitions: "AreaVolumeSource"	
Design	This value was obtained from design documents.
Field	This value was calculated from field measurements.
GIS	This value was calculated from GIS measurements.

Length

Definitions, properties, and rules	
Field definition	The long dimension of the inside of the vault.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Although this attribute is usually collected in the office, a laser range finder can be used to estimate length if it is the best available information.
Collection rules: Office	Collect from as-built plan sheets or the Hydraulic Report; or using GIS measurement tools and the geo-referenced vault plan sheet.
Domain values and definitions: None	

LengthSource

Definitions, properties, and rules	
Field definition	Source of this measurement value.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	Indicate the "Field" domain value.
Collection rules: Office	Indicate either the "Design" or "GIS" domain value.
Domain values and definitions: "AreaVolumeSource"	
Design	This value was obtained from design documents.
Field	This value was calculated from field measurements.
GIS	This value was calculated from GIS measurements.

Location

Definitions, properties, and rules	
Field definition	Location information for Maintenance.
Field data type	String; Length: 50
Office vs. Field collection	Both
Collection rules: Field	NA
Collection rules: Office	NA
Domain values and definitions: None	

Manufacturer

Definitions, properties, and rules	
Field definition	The manufacturer of the stormwater vault, if known.
Field data type	String; Length: 100
Office vs. Field collection	Both
Collection rules: Field	May be stamped on the vault lid.
Collection rules: Office	Document from as-built plan sheets or the Hydraulic Report if available.
Domain values and definitions: None	

StormwaterVaultType

Definitions, properties, and rules	
Field definition	Type of stormwater vault in terms of its best management practice function.
Field data type	Domain; String; Length: 50
Office vs. Field collection	Both
Collection rules: Field	Determine based on "SWVaultType" definitions.
Collection rules: Office	Document from as-built plan sheets or the Hydraulic Report if available.
Domain values and definitions: "SWVaultType"	
Baffle-Type (API) Oil/Water Separator	Device designed to separate gross amounts of oil and suspended solids from stormwater.
Coalescing Plate Separator	Incorporates incline channels, which allow oil drops to collect on the underside of the plates and form larger globules, which then rise toward the surface of the water.
Combined Wet/ Detention Vault	A vault with a wet and detention cell. Maintains a permanent pool of water in the wet cell and manages excess stormwater runoff in the detention cell.
Detention Tank	A detention tank delays the flow of rainwater and stormwater to municipal stormwater pipes.
Detention Vault	A stormwater detention vault is an underground structure designed to manage excess stormwater runoff on a developed site, often in an urban setting.
Infiltration Vault	Bottomless underground structures used for temporary storage and infiltration of stormwater runoff (*Highway Runoff Manual,* 5-4.2.1, IN.04).
Sand Filter Vault	A sand filter vault incorporates a sand layer and underdrains that are installed below grade in the vault. It consists of presettling and sand filtration cells.
Wet Vault	Wet vaults maintain a permanent pool of water, regulated by baffles and tee pipes.
Vortex Tank	A vortex tank generally consists of a cylindrical vessel where the inlet flow spirals around the perimeter causing the heavier particles to settle out of the stormwater. It uses a vortex-enhanced settling mechanism (swirl-concentration) to capture settleable solids, floatables, and oil and grease.
Unknown Other Vault	This should be chosen if the "StormwaterVaultType" cannot be determined from available information; or if the type is not on the list. If the type is not on the list, add a brief description in the "Notes" field to document the actual type.

Width

Definitions, properties, and rules	
Field definition	The short dimension of the inside of the vault.
Field data type	Double; Length: 8
Office vs. Field collection	Both
Collection rules: Field	Although this attribute is mostly collected in the office, a laser range finder can be used to estimate length if it is the best available information.
Collection rules: Office	Collect from as-built plan sheets or the Hydraulic Report; or using GIS measurement tools and the geo-referenced vault plan sheet.
Domain values and definitions: None	

WidthSource

Definitions, properties, and rules	
Field definition	Source of this measurement value.
Field data type	Domain; String; Length: 10
Office vs. Field collection	Both
Collection rules: Field	Indicate the "Field" domain value.
Collection rules: Office	Indicate either the "Design" or "GIS" domain value.
Domain values and definitions: "AreaVolumeSource"	
Design	This value was obtained from design documents.
Field	This value was calculated from field measurements.
GIS	This value was calculated from GIS measurements.

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