

DEVELOPMENT STANDARDS

City of Ellensburg



STORM STANDARDS

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STORM DRAIN

CITY STORM DRAINAGE DESIGN

Storm Drainage plans, at a minimum, will be required for all plats, commercial property improvements, and parking lots, meeting the following requirements:

1. All storm drainage plans shall be stamped and signed by a Professional Licensed Engineer (PE).
2. Applicants PE shall use the current Stormwater Management Manual for Eastern Washington, <https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMEW/2019SWMMEW.htm> or approved equivalent for reference in the design of stormwater treatment and flow control for post construction requirements for new development and redevelopment. The design shall at a minimum use the following design storms, or as recommended for the proposed BMP, whichever is greater:
 - A. Volume based treatment BMP's shall be designed based on the first ½" rainfall (6-month, 24-hour storm event) for all pollution generating impervious surfaces.
 - B. Flow rate based treatment BMP's shall be designed based on the runoff from the SCS Type II 24-hour storm with a rainfall of 0.59-inches (6-month, 24-hour storm event) for all pollution generating impervious surfaces.
 - C. Flow Control shall be designed based on retaining the full 10-year 24-hour storm event (1.3-inches) on-site and matching the pre-development and post-development 25 year, 24-hour storm events (1.6-inches).
 - D. Where structural BMPs are required, property owners shall operate and maintain the facilities in accordance with an Operation and Maintenance (O&M) plan that is prepared in accordance with the provisions in Chapters 5 and 6 of the Stormwater Management Manual for Eastern Washington (most current version). The O&M plan shall address all proposed stormwater facilities and BMPs, and identify the party (or parties) responsible for maintenance and operation; the O&M plan must also address the long-term funding mechanism that will support proper O&M. At private facilities, a copy of the plan shall be retained onsite or within reasonable access to the site, and shall be transferred with the property to the new owner. Commercial and residential property developers may also develop generic O&M plans, including checklists of actions and procedures for the operators, for BMPs that are commonly used in their projects.
3. Designer shall place catch basins at a maximum spacing of 400', at all changes in direction, and shall be located upstream of handicap accessible ramps (to prevent gutter line flow through handicap ramps areas). Storm drains shall be constructed to the furthest extent of project, unless otherwise approved by the Public Works Director.
4. Permanent stormwater control facilities shall be maintained and operated in compliance with Chapter 9.100 'Storm Drainage and Surface Water Management Utility' of the Ellensburg Municipal Code and the current Stormwater Management Manual for Eastern Washington. Stormwater control facilities include streams, rivers, ponds, lakes, waterways, groundwater, and functionally related natural and manmade stormwater control facilities that combined constitute the city's stormwater control facility.

CONSTRUCTION STORMWATER RUNOFF AND POLLUTION PREVENTION

Construction stormwater runoff shall be in compliance with this chapter of the Development Standards, the current Stormwater Management Manual for Eastern Washington, and Chapter 9.100 of the Ellensburg Municipal Code. Applicant and/or applicant's Engineer shall submit to the City, for approval, a Stormwater Pollution Prevention Plan (SWPPP) for all projects with one-acre or more, and from construction projects of less than one acre that are part of a common plan of development or sale, prior to construction.

Applicant shall also be required to implement the SWPPP, inspect construction stormwater runoff, erosion control, and pollution prevention methods throughout construction and modify/implement the plan, as necessary, using Best Management Practices in compliance with the current Stormwater Management Manual for Eastern Washington. This chapter also includes the requirement to mitigate migrant dust from leaving the site (dust control).

EROSIVITY WAIVER

The City of Ellensburg may allow construction site operators to qualify for a waiver from the requirements to submit a SWPPP for local jurisdictional review if the following conditions are met:

1. The site will result in the disturbance of less than 5 acres; and the site is not a portion of a common plan of development or sale that will disturb 5 acres or greater; and
2. The project's rainfall erosivity factor ("R" Factor) is less than 5 during the period of construction activity, as calculated using the Texas A&M University online rainfall erosivity calculator at: <http://ei.tamu.edu/>. The period of construction activity begins at initial earth disturbance and ends with final stabilization; and
3. The entire period of construction activity falls within the following timeframe(s):
 - A. June 15 through October 15 for sites with mean annual precipitation of 12 inches or more; or
 - B. No additional timeframe restrictions apply for sites with mean annual precipitation of less than 12 inches; and
4. The site or facility has not been declared a significant contributor of pollutants; and
5. There are no planned construction activities at the site that will result in non-stormwater discharges; and
6. The waiver is allowed by the local jurisdiction; and
7. The construction site operator notifies the City of Ellensburg of the intention to apply this waiver at least one week prior to commencing land disturbing activities. The notification must include a summary of the project information used in calculating the project's rainfall erosivity factor (see #2 above) and a certified statement that:
 - A. The operator will comply with applicable local stormwater requirements; and
 - B. The operator will implement appropriate erosion and sediment control BMPs to prevent violation of water quality standards.

ENFORCEMENT AND PENALTIES

Per chapter 9.100.020 of the Ellensburg Municipal Code, the Public Works Director, or his or her designee, shall administer and enforce this Storm Drainage Chapter of the Development Standards and Chapter 9.100 of the Ellensburg Municipal Code. Violations to this chapter are subject to penalties as outlined in chapter 9.05.500 of the Ellensburg Municipal Code.

ENTRANCE ONTO PRIVATE PROPERTY

When necessary to perform any duties under this title or to investigate upon reasonable cause or complaint the existence or occurrence of a violation of this title, the Director may enter onto property to inspect the same or to perform any duty imposed or authorized by this title; provided, that if such property is occupied and not a public place, the Director shall first present proper credentials and request permission to enter; and if such property is not occupied, the Director shall first make a reasonable effort to locate the owners or other persons having charge or control and request entry. If such entry is refused, the Director shall have recourse to every remedy provided by law to secure entry. The right of entry authorized under this title extends to any employee, officer or person who accompanies the Director.

GENERAL NOTES

1. All workmanship, materials and testing shall be in accordance with the current edition of the WSDOT/APWA, or City of Ellensburg Development Standards unless otherwise specified.
2. Developer or developer's engineer shall include detailed Storm Drainage plans and calculations with the Development Plans submittals.

3. The underground portion of the storm drain system shall be water tight, by the use of water tight gaskets on all pipe joints and fittings, and by grouting smooth the inside and outside of all seams, joints, pipe inlets and outlets, manhole sections, grade rings, and frames of all storm drain structures (i.e.: catch basins, manholes, etc.).
4. Contractor shall keep pipe clean from debris while laying. Contractor may be required to clean pipes if rock and debris are present.
5. The entire Storm Drain System shall be inspected by the City of Ellensburg Public Works Department. Please contact the Public Works Department at 509-962-7230 for inspections.
6. Piped entrances or exits from the storm drainage system, eight (8) inches in diameter or larger, shall be equipped with a grate.

STAKING

All surveying and staking shall be performed by an engineering or surveying firm capable of performing such work. The engineer or surveyor directing such work shall be licensed by the State of Washington.

TRENCH REQUIREMENTS

Trenching for Storm Drain Pipe shall be in accordance with City of Ellensburg Standard Details located at the end of this section.

MATERIAL

PIPES

Storm Drain Pipe shall be Corrugated Polyethylene Pipe meeting the requirements of WSDOT Standard Spec. 9-05.20, or ASTM 3034 PVC with water tight gaskets. All storm drain pipe shall be a minimum of 8" diameter or meet the requirements of the Storm Drain Comprehensive Plan, whichever is greater, or as approved by the Public Works Department. Minimum cover over pipes shall meet manufacturer's requirements. Ductile Iron Pipe may be substituted in situation where minimum cover over pipe is not feasible, with the approval of the Public Works Department. All pipe terminations not ending in a structure (CB or manhole) shall have a beveled ends. All pipe inlets shall have a trash rack.

STRUCTURES

All structures shall be Type 1 or Type 1L Catch Basins, or Type II Manholes unless otherwise approved by the Public Works Department. If any other structures are to be used, the Developer or Developer's Engineer shall submit shop drawings for approval. All structures set to finish grade shall have a minimum of 6" of adjustment for possible future modifications to finish grade.

FRAME AND GRATES

The frame and grate for Type 1 and Type 1L catch basins shall be Inland Foundry Style #312-1 and Grate Style #C2 or approved equivalent meeting the requirements of City of Ellensburg Standard Details located at the end of this section. The frame and grate for Type II manholes shall be Olympic Foundry, Seattle, WA, MH 30 or approved equivalent meeting the requirements of City of Ellensburg Standard Details located at the end of this section. On new construction, frames and grates shall be located outside of wheel paths. Round frames and covers should be in traveled area of roadway when appropriate.

DRIVEWAY CULVERTS

Driveway culverts shall be HDPE meeting the requirements of WSDOT Standard Spec. 9-05.23, Solid Wall PVC meeting the requirements of WSDOT Standard Spec. 9-05.12(1), or Corrugated Metal Pipe meeting the requirements of WSDOT Standard Spec. 9-05.4 and shall be a minimum 12" diameter. The pipe size shall typically be sized to meet or exceed the size of adjacent upstream culvert sizes, or as approved by the Public Works Department.

The minimum cover over driveway culverts shall meet manufacturers' requirements.

DOMESTIC SEWER, STORM SEWER, AND WATER MAIN EXTENSIONS - RECORD DRAWINGS

Record drawings of all improvements deeded or conveyed to the City of Ellensburg shall be provided. Record drawings shall show all modifications made during construction. They shall also show precisely the location of all buried utilities, including the measured distance to all tees, bends, wyes, and the distance from valves or structures to fittings. The location of water, sanitary sewer, and storm sewer facilities shall be indicated by showing measured distances to monuments or other approved permanent reference.

Record drawings for water improvements shall include a copy of the Engineer's Certificate of Completion form, as required by Washington State Department of Health.

Record drawings turned over to the City upon acceptance of the utilities shall meet the requirements of the Drafting Section of these Development Standards.

SITE DESIGN AND LOW IMPACT DEVELOPMENT

NOTE: This material is from the most current version of the Eastern Washington Stormwater Manual. The current Storm Manual incorporated LID guidance throughout the chapters and eliminated the old Low Impact Development Manual for Eastern Washington.

<https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMEW/2019SWMMEW.htm>

PURPOSE

This chapter of the City of Ellensburg Stormwater Standards concentrates on site design techniques for improving the quality and reducing the quantity of stormwater runoff from new developments and redevelopment. This was developed to assist projects in better managing stormwater by designing features and practices that mimic the natural hydrologic cycle.

Low Impact Development (LID) is a relatively new approach to developing land and managing stormwater runoff. LID reduces reliance on pipes and ponds. LID represents a new set of tools to improve how we develop land and manage runoff and can reduce the need for costly permanent controls that require maintenance over the life of the project.

APPLICABILITY

LID is encouraged to be used during the planning and design phase of new development and redevelopment projects. The most current version of the Eastern Washington Stormwater Management Manual should be used as a guidance document to assist planners, design engineers, architects, and landscape professionals with the general selection, design and maintenance of LID practices. Applicants are strongly encouraged to utilize the strategies when planning and designing new projects. Using LID techniques can lower both short and long term project cost by:

Reducing the quantity of runoff requiring treatment and flow control can:

- Reduce required conveyance capacity in pipes and channels.
- Reduce long term maintenance costs.
- Improve overall water quality, which could avoid retrofit requirements in the future.

LID practices can be applied to areas of residential, commercial, industrial, and municipal development. The strategies work for both new developments and redevelopment projects and in both urban centers and rural communities, though the specific techniques used will vary based on individual site conditions. Detailed design guidance and application considerations for a number of LID techniques are presented in the Stormwater Management Manual for Eastern Washington.

LOW IMPACT DEVELOPMENT OVERVIEW

Typical land development involves clearing vegetation, grading, and installing roads, parking, utilities, buildings and landscaping. In the process, heavy equipment compacts soils, and the site layout often disrupts natural drainage patterns. After development, less vegetation and more impervious surfaces cause runoff to increase dramatically (up to 20 to 30 times as much as undeveloped land). Stormwater swales and drywells help to prevent flooding, remove pollutants, slow storm flows and recharge aquifers.

LID goals are to mimic a site's predevelopment hydrology by using design practices and techniques that capture, filter, store, evaporate, and infiltrate runoff close to its source.

KEY STRATEGIES

Three key strategies of Low Impact Development are summarized below.

DESIGN SITE TO MINIMIZE IMPERVIOUS SURFACES

Site designers, planners, engineers, landscape architects, and architects work together to assess and design the site to:

- Minimize impervious surfaces such as roads, parking lots, and rooftops by reducing the building or parking footprint. Eliminate as much impervious surface as possible by installing using pervious pavements and bio retention facilities (swales).
- Locate homes, other buildings, roads and parking away from natural resource areas and soils that infiltrate well.

CONSERVE AND RESTORE VEGETATION AND SOILS

- Retain native vegetation and trees on undeveloped sites and restore vegetation on previously cleared land. Vegetation captures, infiltrates, and evaporates runoff.
- Preserve well-draining native soil. Healthy soils store and infiltrate stormwater. Use the existing topographic features of a site to slow, store and infiltrate stormwater.
- Protect and incorporate natural drainage features and patterns into site design.
- Protect areas to be used for stormwater infiltration from compaction during construction.
- Use small-scale, integrated management practices such as bioretention and permeable pavements, rather than one large pond (swale).
- Create a landscape that slows storm flows and increases the amount of time runoff is retained on the site. LID tries to mimic the slow movement of water typical in a native landscape.
- Integrated stormwater facilities into the site design to create an attractive landscape that protects the environment. For example, a bioretention area can be a grassy swale that beautifies the neighborhood while managing stormwater. Swales and infiltration areas can be incorporated into community open space areas and can be rock lined to mimic the surrounding landscape.
- Reduce reliance on traditional storm sewers, pipes and ponds.

PROVIDE MAINTENANCE AND EDUCATION

- Develop reliable and long-term maintenance programs with clear and enforceable guidelines.
- Educate homeowners, building owners and landscapers on the proper maintenance requirements for LID facilities.
- Involve neighborhoods in caring for their systems and protecting their natural resources.

LID TECHNIQUES AND STRATEGIES

There are numerous variations of LID practices that can be incorporated into development and redevelopment projects. Some common LID practices include:

Preserving Vegetation and Dispersing Runoff

Protection or replanting a significant portion of a development site's vegetation; locating development on a smaller part of the site; directing runoff to vegetation areas. In many cases, this is the most efficient and cost-effective way to manage stormwater.

Bioretention

Shallow, landscaped areas (swales) composed of soil and native grasses that are integrated into the overall landscaping scheme of a site. Bioretention cells are stand-alone features, while bioretention swales are part of the conveyance system.

Soil Amendments

Compost added to soils disturbed during the construction process. Restores the health of site soils and increases the ability to infiltrate runoff.

Pervious Pavements, Porous Pavers, Porous Concrete

Allows water to infiltrate and may remove some pollutants. Includes porous concrete, porous asphalt, permeable pavers, and grid systems filled with grass or gravel.

All flow control facilities must have pre-treatment. Down turn elbows in catch basins, grassy filter strips and sand filters work. They are required to treat the first half inch of rainfall in a 24 hour storm. The flow control LID facilities must store the 10 year 24 hour storm event and if detention is required, the facility must retain the 25 year/24 hour storm for Central Washington.

SPECIFIC DESIGN GUIDANCE

Specific LID design criteria are outlined in the most current version of the Eastern Washington Stormwater Management Manual. Where design storms are required for sizing these LID techniques, the water quality criteria and the peak storm event should be used. Appropriate design documentation and calculations should be included in the drainage submittal. As is the case with all stormwater management facilities, regular inspection and maintenance of LID installations is required for long term operation.

When referencing LID information it is important to choose information that is appropriate for the soil types and semi-arid and cold climate and soil types in Central Washington.

RESOURCES

The most current version of the Stormwater Management Manual for Eastern Washington

<https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMEW/2019SWMMEW.htm>