

Storm Water Specifications and Design Standards

CITY OF MISSOULA
STORM WATER UTILITY DIVISION
PUBLIC WORKS DEPARTMENT
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Section 1 – General Requirements

1.1 Introduction

These specifications are the latest adopted by the Missoula Storm Water Utility Division. The specifications are to be used in conjunction with City of Missoula standard drawings as well as Montana Department of Environmental Quality standards. They are meant to provide minimum standards for site grading and the control of storm water runoff, both quantity and quality. In addition, they create permitting, submittal, and development design standards for erosion and sedimentation control, preservation of natural drainage systems, flood mitigation, site grading, and property protection.

The specifications and detail drawings shall be made a part of the contract documents for construction of development and redevelopment projects.

Any reference to an ordinance, administrative rule, permit, or other directive contained within these specifications implies the latest edition of that document. All contract documents must be completed and signed before any construction may begin.

1.2 Acronyms

BMPs – Best Management Practices

MT DEQ – Montana Department of Environmental Quality

NOI – Notice of Intent

NOT – Notice of Termination

PTN – Permit Transfer Notice

SWPPP – Storm Water Pollution Prevention Plan

U. S. EPA – United States Environmental Protection Agency

Section 2 – Grading, Drainage, and Erosion Control

2.1 Plans

2.1.1 Plans for Grading, Drainage, and Erosion Control shall be approved by the City Engineering Division and the Storm Water Utility Division, prior to any on-site grading. Applicants shall submit the information required in this section for a Building and / or Zoning Compliance Permit for all new construction and / or additions including but not limited to structures, driveways, streets and parking. The site plan and grading plans may be on one sheet.

2.1.2 Plans for Grading, Drainage and Erosion Control shall be in accordance with and include the following:

2.1.2.1 The landscape design shall incorporate berms and / or landscape grading to:

2.1.2.2 slow or direct storm water runoff;

2.1.2.3 provide shallow infiltration and evaporation;

- 2.1.2.4 distribute collection and detention throughout the site to minimize large, ditch like detention ponds; and
- 2.1.2.5 minimize standing water, especially due to the collection of irrigation runoff.
- 2.1.3 Drywells (Sumps) are not allowed within the Missoula Business / Development Park or any other areas / locations with predominately clay soils.
- 2.1.4 Each site will provide for the adequate storage for the difference between the existing (*pre-development*) storm water runoff for the greater amount of either the 24-hour 10-year or 24-hour 100-year storm event and the proposed (*post-development*) storm water runoff for the greater amount of either the 24-hour 10-year or 24-hour 100-year storm event.
 - 2.1.4.1 Drawings that are to scale and do not exceed one inch (1") equals forty feet (40');
 - 2.1.4.2 All proposed and existing structures;
 - 2.1.2.2 All existing and proposed property corners and adjacent right-of-way, including location of curbs, sidewalks, and driveways;
 - 2.1.2.3 All existing and proposed utilities and utility easements and other documented easement locations;
 - 2.1.2.4 Existing and proposed finished floor elevations for primary structures;
 - 2.1.2.5 North arrow and scale;
 - 2.1.2.6 Spot elevations for existing and proposed (a) driveway at the street; (b) finished elevation for garage; and (c) existing and finished grade at building corners;
 - 2.1.2.7 Areas of riparian resource;
 - 2.1.2.8 Existing trees including location and size;
 - 2.1.2.9 Locations of proposed cut and fill;
 - 2.1.2.10 Existing and proposed drainage structures and flow lines;
 - 2.1.2.11 Proposed slopes in excess of 2:1;
 - 2.1.2.12 Existing and proposed retaining walls;
 - 2.1.2.13 Storm Water Pollution Prevention Plan (SWPPP);
 - 2.1.2.14 Drag-on prevention plan;

- 2.1.2.15 For slopes ten (10%) percent or greater, all multi-family, commercial, and industrial parcels with more than four parking spaces require the following additional information:
 - 2.1.2.15.1 A contour map showing two foot (2') existing and proposed contours of the entire lot up to one acre in size.
 - 2.1.2.15.2 A contour map showing two foot (2') existing and proposed contours for the disturbed area on lots exceeding one acre in size.
 - 2.1.2.15.3 The contour maps including the grading and drainage plans shall be prepared, stamped and signed by a licensed professional engineer, surveyor, or architect.
- 2.1.3 Plans and project design submittals shall include the following:
 - 2.1.3.1 Five **(5)** copies of the submitted plans for the proposed grading, drainage, erosion control, and SWPPP shall be submitted to Development Services at the time of the application for zoning compliance permit and / or building permit which requires site grading as described in these Specifications. The submitted plans shall be in conformance with MMC Title 12, Title 15, and Title 20, or as required by any federal, state, and / or local agency.
 - 2.1.3.2 All disturbed slopes shall be graded or have retaining walls constructed according to an approved grading plan. The required grading plans shall be in accordance with the following:

2.1.3.2.1 Cut-and-fill slopes and intersections of manufactured and natural slopes shall have curved configurations that reflect the forms and shapes of surrounding topography.

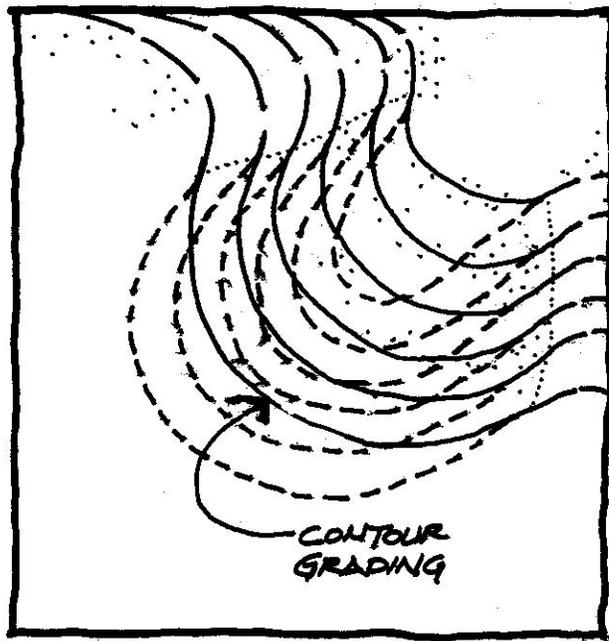


Figure 2.1—Contour Grading Illustration

2.1.3.2.2 Grading shall incorporate elements to protect drainage systems. Natural drainage ways shall be preserved. Drainage ways shall remain clear and open and shall not be obstructed with fences, structures, etc. Streets and roads which cross a drainage way shall preserve the capacity of the drainage.

2.1.3.2.3 Grading shall integrate landscaping design to provide erosion protection and prevent weed infestation to the site. Landowners shall replant areas of disturbance no later than the first growing season in consultation with the County Extension Office.

2.1.3.2.4 Where site grading is necessary, topsoil shall be salvaged or imported to redistribute on areas to be re-vegetated.

2.1.3.2.5 Where drainage swales are used to divert surface waters, they shall be constructed, vegetated and protected to minimize potential erosion.

2.1.3.2.6 Manufactured slopes may not exceed a slope ratio of 2:1 unless all of the following requirements are met and satisfied:

- 2.1.3.2.6.1 The soils are suitable.
- 2.1.3.2.6.2 Only if it is necessary so that significant environmental characteristics of a site are preserved or the need for extensive cut and fill slopes is substantially reduced.
- 2.1.3.2.6.3 Shall have certification by a licensed professional geotechnical or soils engineer.
- 2.1.3.2.7 Within public rights-of-way, private use of retaining structures shall be allowed only if approved by the Development Services Director. Slope ratios within the public right-of-way require approval by Development Services.
- 2.1.3.2.8 Use of retaining structures outside of the right-of-way may be allowed, if approved by Development Services, as part of the grading plan.
- 2.1.3.2.9 Provisions for the collection of storm water runoff and prevention of soil erosion shall be the first improvements constructed on the development site. Such improvements shall be designed to divert surface water away from cut faces or sloping surfaces of a fill.
- 2.1.3.2.10 Unless an adequate storm sewer exists or is provided, all surface run-off in addition to that normally present before development shall be retained on-site or released from the site in a manner which shall not substantially increase the peak run-off normally present before development. Restrictive covenants may be required to mitigate adverse effects of property drainage. Mitigation may involve the installation of drainage structures or the connection to an existing storm drainage system. Drainage easements across adjoining land to the nearest drainage way may be required.
- 2.1.3.2.11 Design of such drainage facilities shall be based upon local soil factors, topography, natural drainages, gullies and swales, aesthetics, and capacity for proper disposal of excess water. Drainage facilities shall be designed to handle both the post-development and the existing adjacent storm water runoff / drainage.
- 2.1.3.2.12 Any trees to be saved shall be noted on the site plan and grading shall not take place inside the “drip line” of the tree canopy.
- 2.1.3.2.13 All cut and fill shall be confined to stated right-of-way widths or roadway easement widths.

- 2.1.3.2.14 In residential developments with lot sizes one (1) acre or smaller in size, if the total percentage of the impervious surface exceeds thirty-five (35%) percent of the total lot size, additional drainage and / or erosion control measures may be required.

2.2 Permits

2.2.1 Grading, Drainage, and Erosion Control Permits are required in accordance with the following:

- 2.2.1.1 Applicants shall obtain a Grading Permit from Development Services before beginning any grading associated with a building permit or zoning compliance permit on public or private property.
- 2.2.1.2 Any new building that requires a building permit where grades are altered more than three (3) feet, except single-family residences located on slopes less than five (5%) percent, require a Grading Permit.
- 2.2.1.3 Any construction activities related to grading that meet the requirements outlined in these Specifications require a Grading Permit.
- 2.2.1.4 Permit applicants shall provide plans of the proposed site development in accordance with these Specifications and receive approval for such plans before beginning any construction.
- 2.2.1.5 Grading, Drainage, and Erosion Control Permits expire by limitation and become null and void if work authorized in the permit does not begin within one hundred-eighty (180) calendar days after date of issuance. Also, permits expire by limitation and become null and void if work authorized by the permit is suspended for more than thirty (30) calendar days, except for weather related delays. Issued Grading, Drainage, and Erosion Control Permits expire one (1) year from date of issuance. Before work begins following an interruption, applicants must pay the full permit fee and must have applied for and been issued a new permit. The Development Services Director may grant a time extension on certain permits and a case-by-case basis. Applicants shall give Development Services staff at least two (2) hours' notice before beginning grading operations, and they shall notify Development Services that work under the permit has been completed.
- 2.2.1.6 Storm Water Pollution Prevention Plan (SWPPP) Permits expire by limitation and become null and void if work authorized by the permit does not begin within one hundred-eighty (180) calendar days after date of issuance. Also, permits expire by limitation and become null and void if work authorized by the permit is suspended for more than thirty (30) calendar days, except for weather related delays. Issued SWPPP Permits expire one (1) year from date of issuance. Before work begins following an interruption, applicants must pay the full permit fee and must have applied for and been issued a new permit. The Development Services Director or a designated agent may grant extension of time on permits.

Applicants shall give the Development Services staff two (2) hours' notice prior to beginning grading operations, and provide notice of completion of work under the permit.

2.3 General Requirements for Single Family and Duplex Residential Parcels

- 2.3.1 The finished grade of the ground shall slope away from the house.
- 2.3.2 Roof drainage structures shall be installed so as to divert storm water away from the foundation of the structure. Roof drainage shall not be constructed to concentrate storm water runoff on to an adjacent parcel.
- 2.3.3 The finished grade shall be contoured to move storm water away from any structures, this includes:
 - 2.3.3.1 Storm water runoff from impermeable surfaces such as roofs, driveways, and sidewalks on the subject property; and
 - 2.3.3.2 Runoff from adjacent properties and undeveloped lands.
- 2.3.4 The finished grade shall be contoured such that:
 - 2.3.4.1 Storm water runoff shall not impact structures on adjacent parcels but shall be configured to direct storm water runoff to landscaped and / or undevelopable areas, or when and where available capacity exists, to drainage facilities on adjacent properties, if reviewed and when approved by the City Engineer and the Storm Water Utility.
 - 2.3.4.2 That natural drainage patterns shall be unaltered or if approved by the City Engineer and the Storm Water Utility, may be redirected.
 - 2.3.4.3 Post-development drainage patterns shall be unaltered or if approved by the City Engineer and the Storm Water Utility, may be redirected.
- 2.3.5 Irrigation shall be installed and used in a manner that does not impact adjacent properties.

2.4 General Requirements for Multi-family, Commercial, and Industrial Parcels

- 2.4.1 All storm water runoff shall be retained on site.
- 2.4.2 Drainage and grading plans shall be prepared, stamped and signed by a by a Montana licensed professional engineer, surveyor or architect.
- 2.4.3 A minimum of one (1) eight-foot (8') dry well (sump) shall be installed per every ten thousand (10,000) square feet of impervious area, including but not limited to paved areas, sidewalks, roofs, etc. Additional drainage facilities may be required if soil permeability indicates a slow percolation rate, dry wells (sumps) are not permitted in clay soils.

- 2.4.4 Alternative drainage systems may be considered with approval from the City Engineer and the Storm Water Utility.
- 2.4.5 Multifamily, commercial, and industrial parcels that have four (4) or fewer parking spaces shall meet the requirements set forth in these Specifications.

2.5 Storm Water Pollution Prevention Plan (SWPPP) Requirements

- 2.5.1 All areas of construction where earthwork / grading (soil movement) occurs shall take measures to prevent all dirt, soil, sand, gravel, mud, rock, concrete, and / or any other debris from being spilled, tracked, and / or dragged onto streets, alleys, or rights-of-way.
- 2.5.2 A MT DEQ and a City of Missoula SWPPP is required for all grading, drainage and erosion control work on parcels one (1) acre or greater in size, including access points and routes to and from the parcel.
 - 2.5.2.1 SWPPPs shall comply with current U.S. EPA and MT DEQ requirements.
 - 2.5.2.2 SWPPPs shall identify storm water pollution prevention measures or Best Management Practices (BMPs) to be used and shall identify where on the parcel which BMPs will be applied.
- 2.5.3 Before work may begin, applicants shall include a copy of their Notice of Intent (NOI), issued by MT DEQ, with their SWPPP submittal.
- 2.5.4 Copy of SWPPP Notice of Termination (NOT) issued by MT DEQ is required prior to release from approved SWPPP requirements and final approval of permit.
- 2.5.5 Copy of SWPPP Permit Transfer Notice (PTN) issued by MT DEQ is required prior to release of current NOI permit holder from approved SWPPP and/or assumption by new NOI permit holder.