

Chapter 3.5 - Stormwater Management

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3.5.100 – Purpose, Scope and Applicability

- A. **Purpose.** The purpose of this chapter is to provide planning and design standards for stormwater management within the City. The primary intent of this chapter is to provide standards for effective and cost efficient stormwater management. Stormwater management is accomplished through a combination of design standards reflecting a more accurate representation of natural climatic, hydraulic and geologic conditions. Included in this chapter are stormwater detention criteria for development, grading and drainage plan requirements, landscaping criteria, street, curb and sidewalk designs. These are designed to keep all precipitation from each lot contained upon that lot.

Important cross reference to other standards: The following code chapters are to be cross referenced to assess impacts of the provisions of this chapter; Chapter 3.1, Chapter 3.2, Chapter 3.3, Chapter 3.4, Chapter 3.6, Chapter 4.1, Chapter 4.2 and Chapter 5.1.

- B. **Applicability.** Where storm sewer infrastructure is currently available or unless otherwise provided, the standard specifications for construction or reconstruction of stormwater management facilities, utilities and other public improvements within the City shall occur in accordance with the standards of this chapter. This chapter applies to development on or within public properties and rights-of-way and privately owned properties.
- C. **Standard Specifications.** The City Manager or their designee shall establish standard construction specifications consistent with the design standards of this Chapter and application of accepted engineering, landscape architecture, hydraulic and geologic principles. They are incorporated in this code by reference.
- D. **Conditions of Development Approval.** Development may occur when stormwater management criteria are met or guaranteed, in conformance with the provisions of this Code. Improvements required as a condition of development approval shall be roughly proportional to the impact of development. Findings in the development approval shall indicate how the required improvements are roughly proportional to the impact.

3.5.200 – Detention Criteria and Requirements

- A. Purpose.** Detention of stormwater collected from impervious surfaces on a given property, or within a public right-of-way, is essential to the management of stormwater within the City of Boardman. Each lot will retain all precipitation, which falls upon the lot, within the confines of the lot. In the case of public facilities, stormwater will be retained within the public right-of-way. This section of Chapter 3.5 is to identify the detention of stormwater based upon the Oregon Department of Transportation Hydraulic Manual for Zone 13. National Oceanographic and Atmospheric Administration 100 year – 24-hour isopluvial maps and data were reviewed for applicability. Soils permeability rates from National Resource Conservation Service were also reviewed and assessed to determine the most appropriate data to use in the construction detention volumes of Table 3.5.100C. The Zone 13 Intensity, Duration and Frequency curves, which are the most conservative for the 100-year storm event, at 0.93”/hour for 1 hour, were used in development of Table 3.5.100C and the criteria set in this chapter. All detention values are based upon retention of 100% of the precipitation volumes derived from the data contained in the Oregon Department of Transportation Hydraulic Manual curves for Zone 13.
- B. Public Rights-Of-Way.** Detention of all of the minimum stormwater detention volumes listed in Table 3.5.100C shall be applicable to the design and development of stormwater detention from all impervious surfaces within a public right-of-way.
- C. Lot Development.** Detention of all of the minimum stormwater detention volumes listed in Table 3.5.100C shall be applicable to the design and development of stormwater detention from all impervious surfaces located on any lot within the City.

Table 3.5.100C
Detention Volume Criteria

Impervious Surface Square Footage	Detention Volume Cubic Feet	Detention Volume Gallons
1,000	78	580
2,000	155	1,159
3,000	233	1,739
3,500	271	2,027
4,000	310	2,319
5,000	388	2,899
6,000	465	3,478
7,000	543	4,058
8,000	620	4,638
9,000	698	5,217
10,000	775	5,797
11,000	853	6,380
12,000	930	6,956
13,000	1,008	7,540
14,000	1,085	8,116
15,000	1,163	8,699
20,000	1,550	11,594
25,000	1,938	14,496
30,000	2,325	17,931
35,000	2,713	20,428
40,000	3,100	23,188
43,560	3,376	25,252

3.5.200 – Detention Criteria and Requirements

- D. Building Drains.** Impervious surface drainage from building roofs shall be diverted to detention area(s) on the ground surface by use of downspouts, or other method of vertical conveyance, to a splash pad or other method of horizontal conveyance preventing sub-surface injection of water, which would require registry as an Underground Injection Control well as defined in Oregon Administrative Rule Chapter 340 Division 44.
- E. Methods of Detention.** Collected stormwater can be stored in a detention method capable of holding the entire volume, for the corresponding impervious surface area, listed in Table 3.5.100C. These detention facilities may be constructed ponds, may be lined, may be constructed bio-swales or may be accomplished through grading, drainage and landscaping techniques set forth in Section 3.5.200. Detention facilities shall have no outlet or receiving stream discharge and must be open to allow for evaporative and permeability losses of the detained stormwater. In the case of constructed decorative ponds, permeability loss requirement may be waived; however evaporative loss must be maintained. Methods of detention, other than mentioned in this section, may be considered for approval.
- F. Variance from Table 3.5.100C.** Variance from Table 3.5.100C will be considered with the following information submitted for review and approval as a Class A Variance defined in 5.1.300 (F). all variance requests must submit;
- 1) Site specific permeability data credibly indicating permeability rates higher than those used in the development of Table 3.5.100C;
 - 2) Site specific data of more exact build out impervious area square footages less than the 1,000 square foot increments provided in the tables, and which are calculated in the methods used in the development of Table 3.5.100C;
 - 3) Specific data on permeability rates of alternate paving methods allowing for full or partial permeability of the paving method to be credited as non-impervious surface;
 - 4) Evidence the methods proposed are not classified as a Class V injection system by Oregon Administrative Rule Chapter 340 Division 44;

3.5.300 – Grading and Drainage

- A. Purpose.** The Grading and Drainage for any particular development is an essential function for review and approval. The method of grading to provide drainage, which meets the intent of the stormwater management strategy and wind erosion abatement requirements of the City, will require significant cooperation between City staff and the developer. Minimal grading and surface disturbance from existing topography is generally the best strategic approach to stormwater management and wind erosion concerns within the City of Boardman. However, to accommodate other provisions within the zoning and development codes, to allow for placement of utility and transportation infrastructure, and to allow for effective stormwater management, grading and drainage must be assessed and a plan to manage stormwater and wind erosion shall be developed. This plan shall be developed to negate or minimize impacts from the development during construction and long term operation and occupancy of the development.
- B. Public Infrastructure and Rights-Of-Way.** Grading plans for public and utility infrastructure shall include topographical information of existing property and a planned topographical profile at the completion of the development. The plan shall address how the provisions of section 3.5.100 will be included in the final topographical profile, as these provisions may require altering existing topography to meet the criteria. Creating the maximum drainage areas of 3,500 square feet impervious surface, may require grading to meet a “rolling topography” or some level of “terracing” to maintain the maximum areas of drainage.

3.5.300 – Grading and Drainage (continued)

- C. Lot Development.** Lot development shall submit a grading and drainage plan that meets the provisions of Section 3.5.100 based upon the projected total of impervious surface of the lot at build out. This grading and drainage can be incorporated into the landscape plans required in Section 4.2.500 (5). Stormwater detention areas and sizes shall be identified in this plan. The total detention area on a lot shall be equal to or greater than the requirements in Table 3.5.100C. The detention area(s) can be singular in nature or numerous smaller areas can be created to meet the total detention volume requirements. The grading and drainage plans shall indicate how storm water shall be conveyed to the areas of detention and the areas of detention shall be located to accommodate the proportional amount of impervious surface which is drained to any detention area.
- D. Changes in Impervious Surface Areas.** Whenever there is a proposed increase in the amount of impervious surface area, a plan for grading, drainage and detention shall be submitted for review and approval. This review is to assure the provisions for detention volumes contained in Table 3.5.100C are met.
- E. Changes In Grading or Drainage.** When there is a proposed change to the grading and drainage of an existing development, a plan shall be submitted for review and approval to assure compliance with the detention provisions contained with Table 3.5.100C. Graded depressions for the detention of stormwater shall not be filled or altered without submission of a plan for approval.
- F. Variance From Grading and Drainage Requirements.** Variance from the grading and drainage requirements will be considered when conditions prevent meeting the criteria set forth in this section. The following conditions will be cause for consideration of alternatives from the standards in this section as a Class A Variance;
- 1) Topographical constraints do not allow for the requirements of this section to met; or
 - 2) Geological conditions prevent meeting the criteria in this section; or
 - 3) Other physical constraints preventing the adherence to the criteria of this section.

At a minimum, variance from the grading and drainage plan will be conditioned upon the total amount of detention area being increased to the corresponding impervious surface area detention requirements set in Table 3.5.100C.

3.5.400 – Landscaping Requirements

- A. Purpose.** The purpose of these landscaping requirements is to provide an effective treatment barrier for protection of groundwater in areas of stormwater detention. This treatment barrier is comprised of vegetative materials to act as a bio-filter for the purpose of filtering stormwater contaminants.
- B. Landscape Area Standards.** The landscape area percentages in Section 3.2.200 (C) and 3.2.200 (E) (2) of this code shall be in effect unless the following conditions are experienced; in which case the detention area criteria contained in Table 3.5.100C will be followed;
- 1) The percentage of landscape area is not sufficient to provide adequate detention of stormwater “on-site,”
 - 2) Site specific permeability rates are not adequate to allow for detention and drainage of collected stormwater;
 - 3) Impervious surface area creates detention volumes greater than the 5% requirement for parking lot landscaping.

3.5.400 – Landscaping Requirements *(continued)*

- C. **Landscape Materials.** Landscape materials in detention areas shall be turf grasses or drought tolerant grasses providing a root system to act as a bio filter for any water, which percolates into the soils. Shallow rooting shrubbery, shade trees, groundcover plants and decorative plants, which do not interfere with utilities, may also be used on individual lot development. Shade trees with turf grass cover between them may be used in large detention areas on individual lot developments. Landscaping within the right-of-way shall be turf and drought tolerant grasses, shallow rooting shrubbery, ground cover plants and decorative plants with shallow rooting to prevent damage to utilities routed within the right-of-way.
- D. **Landscape Maintenance.** The grasses in the detention areas shall be mowed periodically and shall be irrigated to maintain plant health. Landscaping shall be maintained in accordance with the landscaping requirements outlined in Section 3.2.200.
- E. **Detention Area Landscape Fertilization.** The detention areas shall not be fertilized.
- F. **Variance To Landscape Requirements.** Variance from the landscape requirements will be considered, as a Class A Variance, when conditions prevent meeting the criteria set forth in this section. A variance request shall be accompanied by the following information for review and subsequent action;
- 1) The physical reason the criteria can not be met;
 - 2) A description of the alternate method being proposed; and
 - 3) How the alternate method meets the purpose of Section 3.5.300, stormwater management strategies of the City;
 - 4) Other information pertinent to the allowance of variance from the standards set in this section.

3.5.500 – Curb and Sidewalk Design

- A. **Purpose.** In order to facilitate the stormwater management strategies being defined within this chapter of the zoning codes the design of streets, curbs and sidewalks have been designed, approved and included in construction standards. The design standards being identified in this section show the design characteristics to allow for the standards defined in this chapter.
- B. **Curb Standards.** The curb designs outlined in this section are consistent with the street design standards of the Transportation System Plan for Local Streets, Neighborhood Collectors, Collectors and Arterial streets. These curb designs will apply to all new construction or reconstruction of streets as classified in the Transportation System Plan.
- 1) **Residential Zones.** Curbs within the residential areas on streets classified as Local or Neighborhood Collector shall be a mountable face curb constructed of concrete as set in City construction standards.
 - 2) **All Other Zones.** Curbs will be a square face curb and will be constructed of concrete as set in City construction standards.
 - 3) **Curb Openings.** Curb openings will be constructed in accordance with City construction standards and will be spaced at the frequencies listed in Table 3.5.400B. This table is to indicate the distance between curb openings while maintaining the maximum impervious area of 3,500 square feet and a minimum spacing for aesthetics and safety when following prescribed street standards.

**Table 3.5.400B
Curb Opening Spacing**

Street Classification	Area Drained Including Sidewalk (Square feet)	Maximum Spacing (feet)	Minimum Spacing (feet)	Area Drained Including Sidewalk (Square feet)
Local Street	3,500	156	65'	1,138
Neighborhood Collector	3,500	143	65'	1,560
Collector	3,500	135	65'	1,690
Arterial	3,500	135	65'	1,690

C. Sidewalk Standards. Sidewalks will be constructed of concrete or brick/masonry pavers in accordance with City construction standards and will meet all American with Disabilities Act requirements. Sidewalk construction will be consistent with Table 7 of the Transportation System Plan Technical appendix A for each street classification;

- 1) **Local Street.** Sidewalks will be sloped at 2% grade away from the curb in accordance with City construction standards.
- 2) **Local Street (Optional/Conditional).** Sidewalks will be sloped at 2% towards the planter strip.
- 3) **Neighborhood Collector Street.** Sidewalks will be sloped at 2% grade away from the curb in accordance with City construction standards.
- 4) **Minor Collector Street.** Sidewalks will be sloped at 2% grade towards the median strip in accordance with City construction standards.
- 5) **N. Main Arterial.** Sidewalks will be sloped at 2% towards the street in accordance with City construction standards.
- 6) **Arterial Street.** Sidewalks will be sloped at 2% grade towards the median strip in accordance with City construction standards.
- 7) **E. Columbia Ave., Wilson Rd., and S. Main St.** Sidewalk will be sloped at 2% towards the planter strips, in accordance with City construction standards.
- 8) **Exemptions.** Sidewalks in existing sub-divisions may match the existing sidewalk widths and construction methods to maintain aesthetic uniformity. Use of the standards above is highly preferable to this exemption.

D. Variance from Curb and Sidewalk Design Standards. Variance from the standards set in this section will be considered by technical staff as a Class A Variance for action, when adherence to these standards is not feasible for physical or practical reasons which include but may not be limited to the following;

- 1) Topographical constraints;
- 2) Provision of utilities can not be accomplished;
- 3) Existing utilities prevent use of the design standards;
- 4) Other physical constraints preventing the use of the design standards.

3.5.600 – Water Quality Easements

Purpose of Water Quality Easements. There may be times where physical or other constraints prevent meeting the detention criteria set forth in Section 3.5.100 of this chapter. In those instances, larger areas of detention than can be accomplished either on-lot or within the right-of-way may be required to meet the stormwater management provisions of this chapter. This may require the developer to obtain and dedicate water quality easements to allow for necessary detention volumes outlined in section 3.5.100. These water quality easements will be for locations such as but not limited to;

3.5.600 – Water Quality Easements *(continued)*

- 1) Topographical constraints do not allow development of smaller detention areas in accordance with Section 3.5.200 – Grading and Drainage; or
 - 2) Geologic constraints which do not allow for soils permeability which is prescribed in section 3.5.100 – Detention Criteria and Requirements; or
 - 3) Sensitive lands, i.e. wetlands, do not allow for the use of this type of detention; or
 - 4) Other physical or practical constraints which preclude the smaller detention areas.
- A. Sizing the Water Quality Easement.** Easements shall be sized to be proportional with the amount of impervious surface area drained in accordance with the methods set in section 3.5.100 and Table 3.5.100C. Additional requirements of meeting all applicable federal, state, local laws and rules will be applied and reviewed for compliance prior to approval of water quality easements as an acceptable alternative to the provisions set in this chapter. All water quality easements shall be recorded with property platting in accordance with Chapter 4.3 of this code.
- B. Maintenance Agreement for Water Quality Easements.** A signed maintenance agreement shall be submitted for review and approval for the use of water quality easements. The agreement will detail the party or entity responsible for the maintenance, care and assurance of compliance with the provisions of this chapter for the water quality easement.

3.5.700 – Plans Submission and Approval

Stormwater plans shall be submitted in accordance with the provisions for development review and site design review established in 4.2.300 – 4.3.600. These plans shall include the areas of detention defined in 3.5.200, the grading and drainage plan defined in 3.5.300, the landscaping plans defined in 3.5.400 and any potential water quality easements as defined in 3.5.500.

3.5.800 – Variances and Exceptions

Variances for this chapter shall be classified as a Class A variance in accordance with 5.1.300 (F) of this code. All procedures for applicability of any requested variance will be in accordance with the provisions of Chapter 4.1, Chapter 4.2 and Chapter 5.1 of this code.