

Existing Code: 10-15D-3-I-2

2. Surface Water Disposal:

a. To the maximum extent possible, surface water produced from the subdivision development shall be properly disposed of within the limits of the subdivision. If not possible within the limits of the development, alternative disposal methods off site may be considered as approved by the city engineer.

b. Pipes, manholes, sumps and other facilities for the collection, transport and disposal of surface water shall be installed where required by the city. The location, size and design of said facilities and any easements relating thereto, shall be in accordance with the city stormwater disposal plans and standards or as directed by the city engineer.

c. The location of all facilities and easements shall be shown on the plans, plats and engineering drawings, as applicable.

d. All plans for subdivision or development shall identify the location of all existing natural drainage channels and final plats of subdivision, and similar land development projects shall provide a drainage easement which includes the natural channel.

e. No structure shall be located less than thirty feet (30') from the boundary of any designated drainage channel and the layout of any subdivision or similar development project which contains a natural drainage channel shall be so arranged to ensure that all required building setbacks can be maintained.

f. Facilities for stormwater runoff shall be required to be constructed on development sites and according to the following design standards:

(1) Such facilities shall be the first improvement of facilities on the property. Phasing of drainage facilities may be allowed as approved by the city engineer.

(2) All storm drain catch basins, pipes and manholes shall be designed to collect and convey stormwater runoff from the 25-year, 24-hour storm.

(3) In the event that a documented downstream discharge or storage with available capacity is present, detention basins shall be designed to detain runoff from the 25-year, 24-hour storm with a maximum discharge rate equal to the predevelopment discharge rate. In addition, the stormwater plan shall make provisions for the accommodation of flows during a 100-year storm event in a manner that will minimize damage to personal property.

(4) Retention facilities such as sumps and retention ponds shall be designed to retain runoff from the 100-year, 24-hour storm.

(5) The design storm criteria shall be as follows:

TABLE 1

ELK RIDGE CITY 25- AND 100-year

STORM DEPTH AND INTENSITY

| <b>Duration</b> | <b>25-year Depth<br/>(Inches)</b>     | <b>25-year Intensity<br/>(Inches/Hour)</b> | <b>100-year Depth<br/>(Inches)</b>     | <b>100-year Intensity<br/>(Inches/Hour)</b> |
|-----------------|---------------------------------------|--|--|---|
| <b>Duration</b> | <b>25-year<br/>Depth<br/>(Inches)</b> | <b>25-year Intensity<br/>(Inches/Hour)</b> | <b>100-year<br/>Depth<br/>(Inches)</b> | <b>100-year Intensity<br/>(Inches/Hour)</b> |
| 5 minutes       | 0.372                                 | 4.46                                       | 0.540                                  | 6.48  |
| 10 minutes      | 0.566                                 | 3.40                                       | 0.822                                  | 4.93  |
| 15 minutes      | 0.701                                 | 2.80                                       | 1.02                                   | 4.08  |
| 30 minutes      | 0.944                                 | 1.89                                       | 1.37                                   | 2.74  |
| 60 minutes      | 1.17                                  | 1.17                                       | 1.70                                   | 1.70  |
| 2 hours         | 1.34                                  | 0.669                                      | 1.91                                   | 0.953                                       |
| 3 hours         | 1.43                                  | 0.475                                      | 1.98                                   | 0.658                                       |
| 6 hours         | 1.63                                  | 0.273                                      | 2.15                                   | 0.358                                       |
| 12 hours        | 2.01                                  | 0.167                                      | 2.51                                   | 0.209                                       |
| 24 hours        | 2.42                                  | 0.101                                      | 2.94                                   | 0.123                                       |

g. Multipurpose stormwater storage facilities or ponds which incorporate recreational facilities such as sport fields, playgrounds and gathering areas are encouraged. Such facilities must incorporate underground rock galleries or connected sumps which disperse nuisance waters under the surface of the pond or recreation facility. The pond must also be tiered in such a way that water from a 25-year storm event is contained in a lower tier. Only major storms larger than a 25-year event should reach the upper tier where recreational

facilities may be located. All storage facilities whether they incorporate recreational facilities or not must be designed to the following criteria:

(1) Maximum side slope on the inside of a pond to be three horizontal to one vertical (3:1) for ponds up to two feet (2') deep, four horizontal to one vertical (4:1) for ponds three (3) to four feet (4') deep and five horizontal to one vertical (5:1) for ponds over four feet (4') deep.

(2) Ponds over two feet (2') deep must be approved by the city engineer. Safety measures such as fencing may be required as well as additional landscaping.

(3) Maximum slope on the outside of a pond to be two horizontal to one vertical (2:1).

(4) Vehicular access for maintenance shall be provided.

(5) A landscape plan shall be submitted to the city for review and approval. All stormwater facilities are to be landscaped appropriate to the design criteria and surrounding properties.

(6) In case of detention ponds, an emergency overflow spillway shall be incorporated into the design assuming the outlet is inoperable and the inflow exceeds the outlet capacity.

(7) Percolation tests used for design shall be certified by a geotechnical engineer.

(8) All detention and retention basins to be designed to drain within a twenty four (24) hour period.

(9) All ponds to be designed with a minimum of one foot (1') of freeboard or fifty percent (50%) capacity increase, whichever is less.

(10) Each development is unique with varying surfaces and areas. The runoff coefficient for the rational method shall be estimated based on the following values listed in table 2 of this section.

TABLE 2

RATIONAL METHOD RUNOFF COEFFICIENTS

| Type Of Drainage Areas | Coefficient |
|------------------------|-------------|
| Type Of Drainage Areas | Coefficient |
| Forested               | 0.059 - 0.2 |

|                                   |             |
|-----------------------------------|-------------|
| Asphalt                           | 0.7 - 0.95  |
| Brick                             | 0.7 - 0.85  |
| Concrete                          | 0.8 - 0.95  |
| Shingle roof                      | 0.75 - 0.95 |
| Lawns, well drained (sandy soil): |             |
| Up to 2% slope                    | 0.05 - 0.1  |
| 2% to 7% slope                    | 0.1 - 0.15  |
| Over 7% slope                     | 0.15 - 0.2  |
| Lawns, poor drainage (clay soil): |             |
| Up to 2% slope                    | 0.13 - 0.17 |
| 2% to 7% slope                    | 0.18 - 0.22 |
| Over 7% slope                     | 0.25 - 0.35 |
| Driveways and walkways            | 0.5 - 0.85  |

h. Ownership and maintenance of storage facilities will be determined on a case by case basis by the city council. If ponds are proposed to be owned and maintained by the city, they must incorporate recreational facilities and be a minimum of one acre in size. Landowners are encouraged to work with adjacent landowners in a cooperative effort to provide regional ponds which service multiple properties. If a pond is proposed to be privately owned and maintained, a perpetual maintenance plan outlining requirements, responsible party and funding sources must be submitted as part of the approval process.

i. All stormwater facilities shall incorporate oil and sediment separators in the system prior to release into a pond or infiltration facility.

j. Storm drain pipelines shall be located within the public right of way or a minimum fifteen foot (15') wide dedicated easement. Pipelines outside of public rights of way may also require access and maintenance easements as directed by the city engineer. The minimum pipe size shall be twelve inches (12"). Acceptable pipe materials include HDPE, reinforced concrete and nonreinforced concrete.

k. All proposed development shall submit storm drainage calculations prepared by a licensed engineer in the state of Utah. Acceptable analysis methods include the rational method, TR-55 and HEC HMS.

l. All drainage facilities shall be designed to divert surface water away from cut surfaces or sloping surfaces of a fill. (Ord. 12-7, 11-27-2012)