

# **STORM WATER DRAINAGE DESIGN MANUAL AMENDMENT 2023**

*Prepared by*

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# **STORM WATER DRAINAGE DESIGN MANUAL AMENDMENT 2023**

**May 2023**

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## INTRODUCTION

May 12, 2021 the State of Utah issued an updated Municipal Separate Storm Sewer System (MS4) permit (UTR090000) to municipalities. The permit had multiple updates, one of which affects the way storm water is handled within MS4's. Municipalities, by previous permit, were required to retain, infiltrate, evapotranspire, or re-use rainwaters up to and including the 90<sup>th</sup> percentile storm event. This means all storms less than or equal to a size of storm the city receives 90 percent of the time must be retained onsite. The May 12, 2021, permit increased the size of storm that must be retained to the 80<sup>th</sup> percentile storm. This amendment is written to update the Storm Water Drainage Design Manual to be in compliance with the latest MS4 permit requirements.

## AMENDMENTS

### LOW IMPACT DEVELOPMENT

By the previous 2016 Storm Water Drainage Manual amendment, Low Impact Development was added to section 3.2 with reference to the 90<sup>th</sup> percentile storm. That text is hereby removed and replaced as shown below:

Remove previous text:

~~State MS4 Permit UTR090000 Section 4.2.5.3.4 reads:~~

~~“Each Permittee shall develop and define specific hydrologic method or methods for calculating runoff volumes and flow rates to ensure consistent sizing of structural BMPs in their jurisdiction and to facilitate plan review. Within 180 days from the effective date of this Permit, new development or redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale must manage rainfall on-site, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 90<sup>th</sup> percentile rainfall event. This objective must be accomplished by the use of practices that are designed, constructed, and maintained to infiltrate, evapotranspire and/or harvest and reuse rainwater. The 90<sup>th</sup> percentile rainfall event is the event whose precipitation total is greater than or equal to the 90 percent of all storm events over a given period of record. If meeting this retention standard is technically infeasible, a rationale shall be provided on a case by case basis for the use of alternative design criteria. The project must document and quantify that infiltration, evapotranspiration and rainwater harvesting have been used to the maximum extent technically feasible and that full employment of these control are infeasible due to site constraints.”~~

Inset the follow text:

State MS4 Permit UTR090000 Section 4.2.5.1.2 reads:

“Retention Requirement. The Permittee must develop and define a specific hydrologic method or methods for calculating runoff volumes and flow rates to ensure consistent sizing of structural BMPs in their jurisdiction and to facilitate plan review. New development projects

*that disturb land greater than or equal to one acre, including projects that are part of a larger common plan of development or sale which collectively disturbs land greater than or equal to one acre must manage rainfall onsite and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 80th percentile rainfall event or a predevelopment hydrologic condition, whichever is less. This objective must be accomplished by the use of practices that are designed, constructed, and maintained to infiltrate, have evapotranspiration, and/or harvest and reuse rainwater. The 80th percentile rainfall event is the event whose precipitation total is greater than or equal to 80 percent of all storm events over a given period of record. Redevelopment projects that disturb greater than or equal to one acre, including projects less than an acre that are part of a larger common plan of development or sale which collectively disturbs land greater than or equal to one acre must provide a site-specific and project-specific plan aimed at net gain to onsite retention or a reduction to impervious surface to provide similar water quality benefits. If a redevelopment project increases the impervious surface by greater than 10%, the project shall manage rainfall on-site and prevent the off-site discharge of the net increase in the volume associated with the precipitation from all rainfall events less than or equal to the 80th percentile rainfall event. This objective must be accomplished by the use of practices that are designed, constructed, and maintained to infiltrate, have evapotranspiration, and/or harvest and reuse rainwater.”*

Remove the following text:

#### 90TH PERCENTILE STORM

- ~~1. Historical rain data is available for Alpine City dated to the year 1900. Using this data, the 90<sup>th</sup> percentile storm event for Alpine City is 0.55 inches which is shown in Appendix E. This is the amount that must be retained onsite. The applicant must provide calculations and details as to how this will be achieved.~~
- ~~2. Only storm volumes greater than the 90<sup>th</sup> percentile storm can be discharged at the rate described in section 3.3, though it is encouraged LID be maximized on each site. 100-year storage requirements still apply (SWDDM Section 3.1.1).~~

Insert the following text:

#### 80TH PERCENTILE STORM

1. Historical rain data is available for Alpine City dated to the year 1900, however, only the last 30 years worth of data (1990 to 2020) was used to more accurately portray the climate Alpine currently experiences. Using this data, the 80<sup>th</sup> percentile storm event for Alpine City is 0.53 inches which is shown in Appendix E. This is the amount that must be retained onsite. The applicant must provide calculations and details as to how this will be achieved.
2. Only storm volumes greater than the 80<sup>th</sup> percentile storm can be discharged at the rate described in section 3.3, though it is encouraged LID be maximized on each site. 100-year storage requirements still apply (SWDDM Section 3.1.1).

Appendix E is modified as follows:

Remove the following text and chart:

~~**APPENDIX E – 90<sup>th</sup> PERCENTILE EVENT DATA**~~

~~Data to calculate the 90<sup>th</sup> percentile storm for Alpine City Utah was taken from the Utah Climate Center, Utah State University. Daily values were acquired for the years 1900 to 2016. The data was then sorted by precipitation and all non-rainfall values were eliminated. What was left was the rainfall values, they were sorted by amount and charted as shown below. As shown, the 90<sup>th</sup> percentile storm for Alpine City is 0.55 inches are rainfall.~~

Insert the following text and chart:

**APPENDIX E – 80<sup>th</sup> PERCENTILE EVENT DATA**

Data to calculate the 80<sup>th</sup> percentile storm for Alpine City Utah was taken from the Utah Climate Center, Utah State University. Daily values were acquired for the years 1990 to 2020. The data was then sorted by precipitation and all non-rainfall values were eliminated, including values below 0.1 inches. What was left was the rainfall values above 0.1 inches, they were sorted by amount and charted as shown below. As shown, the 80<sup>th</sup> percentile storm for Alpine City is 0.53 inches of rainfall.

