

**THE CHALETS PHASE 6, 7, 8  
QUAIL LANE  
HUNTSVILLE, UTAH  
STORM WATER STUDY**

Project No. 11N222  
3-7-2012

**Revised 12-20-12**  
**Revised 8-13-15**

**General Site Information:**

The proposed Phases 6, 7, and 8 of the Chalets Subdivision are located south of Quail Lane and west of Snow Basin Road in Huntsville, Utah. Construction will consist of an addition to Quail Lane and a road that will be named Hawks Lane as well as a new cul-de-sac called Hummingbird Point in Phase 8 and an emergency access drive. Construction will also include sidewalks, curb and gutter, underground utilities, and several lots prepared for development when completed. Storm water from the site will be detained at a detention pond located just north of the emergency access drive adjacent to an existing drainage. The portion of the Chalets Subdivision that will contribute flows to this detention facility has an area of about 38.7 acres. Storm water from site will be collected in inlet boxes or swales and continue via storm drain pipe or drainage swale to the detention pond and be released at 0.1 cfs per acre for the 10-year storm into the existing unnamed drainage tributary. A small portion of this subdivision area will be retained on lots as they are developed. Also a 264 acre watershed will flow along this drainage tributary as a pass-through flow through the detention pond. Storm water will then continue to the north in this system in a historical fashion to Pine View Reservoir. The attached figure shows the project site and location of storm water outfall. Detention calculations have been provided for the site. (See attached figure and calculations).

The proposed site is considered one drainage area (labeled A-1). Included in the calculations for the detention facility and flows from upstream of the site is an area labeled as "Drainage Watershed". A runoff coefficient of 0.15 was used for natural ground and landscaped areas. A runoff coefficient of 0.90 was used for asphalt, concrete, buildings, and other hard surfaced areas. An average runoff coefficient of 0.34 was calculated for the area within the Chalets contributing to the needed volume in the detention pond.

Rainfall intensities were found on the NOAA website. The values obtained were interpolated as necessary. A copy of this data is attached. As mentioned previously, the allowable release rate from the site is 0.1 cubic feet per second per acre.

Data showing area information, runoff coefficient, time of concentration, peak flow, and required detention for the site is also provided and can be found in the attached calculations.

**Pipe Sizes:**

Storm water pipes in the project are proposed to be concrete pipe (CP). All pipes in the project are sloped to provide the design capacity while maintaining a minimum scour velocity of 2 feet per second when the pipes are flowing full. The pipes and inlet boxes have sufficient capacity to convey the 10-year storm without surcharging. The 100 year storm will be conveyed with minimal surcharging in the inlet boxes and catch basins. The 30" pipe proposed for under the Emergency Access Road is to handle 93.4% of the 10-year flows from the area labeled "Drainage Watershed" on the attached figure. This is equivalent to 47.64 cfs. The capacity of this 30" RCP at  $S=6.93\%$  is 108.0 cfs. The remaining 6.6% of the 10-yr storm plus approx. half of the flows from A-1 contribute to the proposed 18" pipe extending underneath Hawks Lane. This is 16.44 cfs. The capacity of this 18" RCP at  $S=4.70\%$  is 22.8 cfs. Therefore, these two pipes are able to handle these required flows at the proposed slopes.

**Orifice Plate:**

An orifice plate has been sized for this site. It will be used to control the rate that storm water flows from the project. It will be located at the detention pond (See attached figure). The orifice plate will be 24.0 inches in diameter for the pond to fill completely during a 10-yr storm. The orifice is sized to accommodate pass through flows from the drainage watershed. Since the watershed is 264 acres, the pass through flow is 26.4 cfs at 0.1 cfs/acre. The orifice plate will allow 3.873 cfs (0.1 cfs/acre) from the development, as well as the 26.4 cfs from the drainage watershed to pass through without detention. As the rate of storm water into the pipes and above ground detention basins increases, the orifice plate will restrict the flow. The maximum flow through the plate will come when the detention basin reaches the maximum design depth. A detail of the orifice plate is attached.

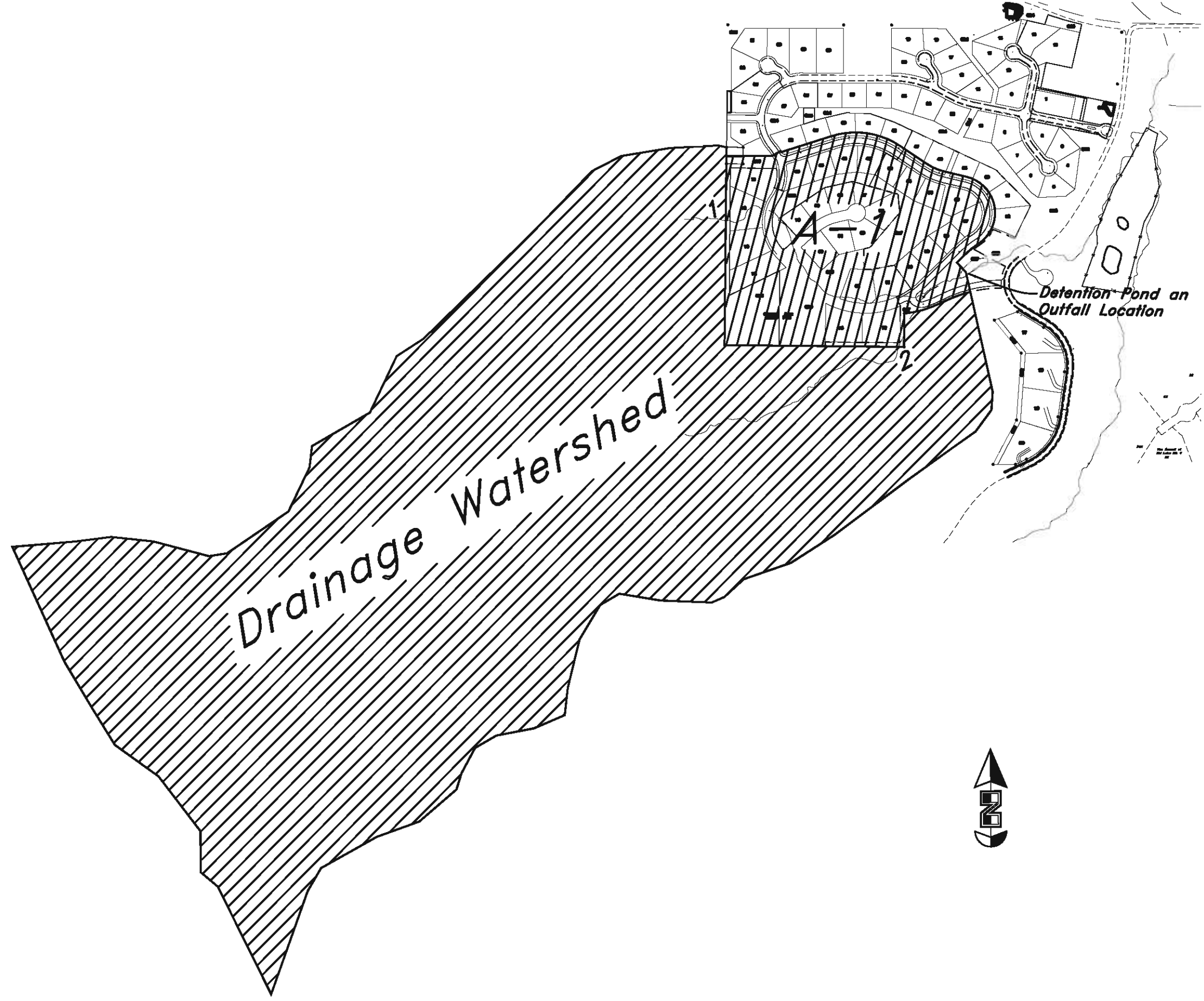
**Required Detention:**

The available volume in the detention pond is 37,935 cubic feet. In addition, the pond has an extra volume of 3,641 that is below the outlet elevation, so the pond will have this extra as a constant volume. The required detention for the 10-year storm with a release rate of 0.1 cfs/acre is 35,928 cubic feet for the pond. In the event the pond experiences a storm larger than the design storm water will then spill out over a proposed overflow structure and continue to the north toward Pine View Reservoir in a historical fashion.

Great Basin Engineering, Inc.

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Jan, 2012

SHEET NO.

**SWS**

SBM120 Waterline

**Storm Water Study**

**Chalets at Ski Lake # 6, 7, 8**

*A part of the Southwest 1/4 of Section 13, a part of the Northeast 1/4 of Section 23, and a part of the Northwest 1/4 of Section 24, T8N, R1E, S16&M, U.S. Survey*



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REV.	DATE	DESCRIPTION