Received 2/12/07

FINAL DRAINAGE REPORT

FOR

Steele Minor Subdivision

January 9, 2007

Prepared for:

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485 N MAPLE ST
FRUITA, CO 81521-2347

Prepared by:

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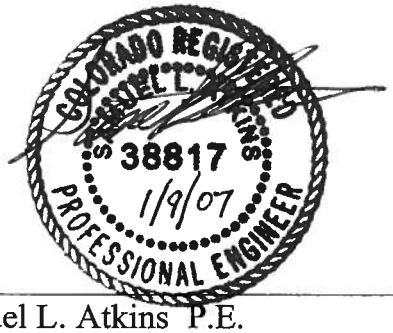
I hereby certify that this Final Drainage Report was completed under my direct supervision.



Reviewed by: _____

Samuel L. Atkins P.E.
State of Colorado, #38817

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I. General Location and Description

Site and Major Basin Location

Steele Minor Subdivision is located at 485 North Maple Street, in the City of Fruita, State of Colorado, more particularly being part of Section 8, Township 1 North, Range 2 West of the Ute Meridian.

Existing streets within the area of the property include North Maple Street to the east and North Peach Way to the west.

The property is bounded to the north by a 3.87-acre single-family parcel used for agricultural/farming purposes, to the south by a 3.37-acre church site, to the east by Maple Grove Subdivision and to the west by Orchard Subdivision. Land-use in the vicinity of the project is best described as residential and agricultural. A concrete-lined irrigation ditch (1-ft wide) runs the entire north property line.

Site and Major Basin Description

Steele Minor Subdivision contains approximately 0.978 acres and is planned for 3 single-family residential lots.

The site currently has a single residential structure with outbuildings used for agricultural needs. The existing residential structure will remain and become lot 1, 0.608 acres. The western 115.50 feet of the property will be divided equally into two (2) lots (Lots 2 and 3), each 0.185 acres. The existing vegetative cover is closely described as orchard grasses.

Topography of the site is considered flat, draining from the northeast to the southwest with slopes ranging from near flat to 1.0%.

This site is a portion of Little Salt Wash Drainage Basin and consists of 36.48 square miles according to the "Drainage Basins" section of the Mesa County GIS. The Little Salt Wash drainage basin originates on the on the Bookcliffs (T 8S R100W) and terminates at the Colorado River about ½ mile west of the I-70 SH 340 intersection. The basin length is approximately 18.9 miles and varies in elevation from 7100 at the basin origin to 4465 ft at the outfall into the Colorado River.

The site soils on the site, based on information from the Mesa County Soils Map, area classified as Re-Sagrlite loam with a typical profile of around 13 inches of loam over 47 inches of silt loam. The slowest permeability is about 0.60 in/hr. Based on the soil makeup and permeability, the site soils are generally classified as soil type B.

II. Existing Drainage Conditions

Site Drainage Description

Topography of the site is considered flat, draining from the northeast to the southwest with slopes ranging from near flat to 1.0%. The existing structures are located near the east end of the property and runoff mostly sheet-flows to the south and southwest. Most likely portions of the runoff cross onto the property to the south. Currently this is not causing any noticeable harm because there is an open field directly south of the proposed subdivision owned by the church directly south of the open field. Ultimately the drainage makes its way to North Peach Way which is an unimproved gravel road running north and south along the western edge of the site. At the northern end of N. Peach Way is Paulson Drive which consists of curb and gutter and approximately 31-feet of asphalt paving. At the southern end of N. Peach Way, the road turns to the west and consists of curb and gutter and 32-feet of asphalt paving. Along the frontage of the proposed subdivision, N. Peach Way drains from north to south. Ultimately, the drainage enters the gutter of that portion of N. Peach Way running east and west and drains to the west. The drainage ultimately reaches a curb inlet on Ottley Avenue at the intersection of Ottley Avenue and Peach Street.

Drainage to the site is limited to only onsite runoff. Offsite drainage remains offsite and does not enter the property. To the north, a 1-foot wide irrigation ditch prevents runoff from entering the property. To the east runoff is directed down Maple Street to Ottley Avenue. The southern and western boundaries of the property drain away from the site.

III. Proposed Drainage Conditions

Changes in Drainage Patterns

The developed property will still generally drain from northeast to southwest, with runoff directed to proposed drainage swales and to the proposed gutter in N. Peach Street. No detention is being proposed as part of this design.

Based on the proposed land use plan, significant change to the existing drainage patterns are not anticipated. The proposed drainage pattern shall continue to direct runoff from the northeast to the southwest. Because most off-site flows are directed away from the project site by existing barriers, compliance with off-site drainage considerations is mitigated.

Maintenance Issues

Access to lots 2 and 3 to the west will be from the improved North Peach Way and access to lot 1 will be from North Maple Street. These area existing streets maintained by the city of Fruita. There is no anticipated open space areas for Steele Minor Subdivision.

IV. Design Criteria and Approach

A. General Considerations

We are not aware of any previous drainage studies performed in this area specific to this site. The development of the proposed site will not impose any constraints to future development in this area.

B. Hydrology

The joint City of Grand Junction-Mesa County Stormwater Management Manual was used as the basis for drainage facility analysis.

Since the project site is less than an acre in size, the "Rational Method" was used to calculate historic and developed flow rates. The 2-year frequency rainfall event was considered the minor storm and the 100-year frequency rainfall event the major storm.

From Table B-1 of the SWMM, a composite C value was established for the 2-year and 100-year event for both the historic and developed discharges. For the historic discharge, a composite C of 0.269 and 0.328 were determined for the 2-year and 100-year events. For the developed discharges, a composite C of 0.367 and 0.420 were determined for the 2-year and 100-year events. For this particular site and proposed development, we believe these to be reasonable assumptions.

Times of Concentration were calculated based on the Average Velocities for Overland Flow and Manning's equation to calculate gutter flow velocities.

Peak Discharge flow rates were computed for historic and developed values using the "Rational Method".

Hydraulics

Calculations were performed to analyze the historic and developed 2-year and 100-year storm event. Calculations were also performed to ensure that the proposed streets have the capacity to handle the 100-year event.

Historic drainage calculations determined the 2-year and 100-year historic discharges from the site are 0.18 c.f.s. and 0.92 c.f.s., respectively.

Street Capacity

Once developed 100-year event flows were calculated, they were compared with capacities of the street. Based on a drive-over curb and having the 2-year event contained within the curbs, the maximum half-street flow for 0.50% street slope is 3.35 cfs. Based on a drive-over curb and having the 100-year event having a maximum water surface of 1-ich above the center of the roadway, the maximum half-street flow for 0.50% street slope is 9.37 cfs. Given this information, the streets are in conformance with the City standards.

V. Results and Conclusion

Following is a table showing historic and developed peak flows. Values for the developed peak runoff represent what will be discharged offsite during that particular event.

	DISCHARGE (cfs)	
	2-Year	100-Year
Historic Conditions	0.18	0.92
Developed Conditions	0.26	1.22

This Final Drainage Study has been prepared to address site-specific drainage concerns in accordance with the requirements of the city of Fruita, Colorado.