

DRAINAGE REPORT
for
TRAILS WEST SUBDIVISION

Prepared For

*Family Housing Development Corp.
1114 Pennsylvania NE
Albuquerque, NM 87110*

*February 1995
Revised March 1995*





D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

PROJECT Trails West
SUBJECT Drainage
BY MG DATE 2/27/95
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We need to re-calculate hydrology per
COA letter 2/27/95 & add 7-Bar Loop Rd.

D.A. 1 $A = 4.02$ $AC = .0063$

Treatment B = 35%

Treatment C = 10%

Treatment D = 55%

D.A. 2 $A = 12.33 - .69 = 11.64$ $AC = 0.0182$

Treatment B = 35%

Treatment C = 10%

Treatment D = 55%

7-BAR Loop $A = 2.38 + .69 = 3.07$ $AC = 0.0048$

Treatment B = 0.53 $AC = 17\%$

Treatment C = 0.49 $AC = 16\%$

Treatment D = 67%



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RUNOFF SUMMARY

	MASTERPLAN	PROPOSED
D.A. 1 (To Pond)	3.3	13.70
D.A. 2 (To SD)	58.8	39.5
7-Bar Loop incl. Back Yards	9.4	11.4

Masterplan total in 7-Bar Loop to Eastern Pond = 12.7 VS. Proposed 25.1

The only solution is to take SD in subdivision to D.A. 1 & cast on 7-Bar Loop & collect 12.4 cfs

Masterplan total to SD to Blacks Arroyo from this site = 58.8 VS. New Proposal 51.9 cfs

At intersection of Suntrail Rd & Diablo Trail Place $Q = 9.8$ cfs - still need to collect 2.4 cfs in 7-Bar Loop. At 11.4 cfs / 920' we get 0.012 cfs / ft. We need 216 L.F. 18" SD in 7-Bar Loop.

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PURPOSE

The purpose of this report is to present the Drainage Management and Grading Plan for Final Plat and Work Order approvals for Tract N-2A-2, Seven Bar Ranch. All applicable ordinances and the DPM were utilized for this study. The latest version of AHYMO was used to determine applicable peak rates.

EXISTING CONDITIONS

Tract N-2A-2 is currently undeveloped and comprises an area of 16.3480 acres bounded by Cibola High School on the north, by the Coors By-Pass right-of-way on the east, by Seven Bar Loop Road on the south and by Black's Arroyo Diversion Channel on the west. The site is comprised of sandy soils with poor vegetation cover, and slopes ranging from 4% to 6%. Current on-site runoff sheet flows in a southeasterly direction and is collected in an asphalt channel in the Seven Bar Loop right-of-way adjacent to the street improvements. These flows are conveyed to two temporary retention ponds on the south side of Seven Bar Loop Road in the future phases of The Trails at Seven Bar South. No off-site runoff enters or impacts this site.

Tract N-2A-2 was included in the approved Drainage Master Plan for The Trails at Seven Bar South, prepared by Bohannon-Huston, Inc. The Master Plan considered this site in a fully developed condition and made recommendations for handling this site's flows that are still valid. As shown in the following section, this management plan will complete the Master Plan requirements.

PROPOSED MANAGEMENT PLAN

Trails West is to be developed into a 93 lot residential development in a single phase. The interior drainage scheme is to collect runoff in the streets and to convey all flows overland to Seven Bar Loop Road. With only one exception, all of the interior streets have been shown to have adequate capacity using mountable curb and gutter. The first 100 feet of Arroyo Crest Drive will require standard curb and gutter. Completion of the north portion of Seven Bar Loop Road will also require standard curb and gutter.

Due to the topography of Tract N-2A-2, the Master Plan considered this site as being developed into two drainage basins. As shown on the attached Grading and Drainage Plan, this concept has been adhered to.

The Master Plan anticipated that 3.40 acres would drain to the east into a temporary Public Retention Pond adjacent to the Coors By-Pass right-of-way. These flows would be collected in inlets constructed in Phase I of The Trails at Seven Bar for conveyance to the pond. At the time the Coors By-Pass is constructed by SAD 223, the inlets will be tied to that system. The scheme for this project conforms to that plan, and the inlets and pond are in place.

The remainder of this site was planned to drain to a 42 inch storm drain constructed with this site. A 42 inch connection to the Black's Arroyo Diversion Channel was accomplished with Phase I of The Trails at Seven Bar. The Master Plan called for the extension of this storm drain to Tract N-2A-2 at the time of its' development. Per the attached plan, this extension will be accomplished with this project. The Master Plan anticipated a flow rate of 58.8 cfs in this storm drain. A more detailed

analysis performed for this project indicates a peak flow rate of 45.6 cfs. The existing inlets on the south side of Seven Bar Loop, as well as an additional inlet to be placed on the north side, will be connected to the storm drain extension to collect the flow from Seven Bar Loop Road.

As shown on the attached plan, the storm drain will be extended into Tract N-2A-2 via Arroyo Crest Drive where all flows from Drainage Area 2 will be collected. This solution conforms to the Master Plan.

INTERIM EROSION CONTROL

The erosion control plan centers on the fact that storm waters will not be allowed free discharge during the construction process not off the finished lots prior to home construction. This detail is shown on the plans.

CONCLUSIONS

This report has shown that this project as presented can adequately handle stormwaters while meeting all current City of Albuquerque criteria. It has also been shown how this site fits into the larger scheme off-site, and what off-site improvements will be necessary.



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This project entails construction of a 93 lot residential subdivision on 16.35 Ac. of undeveloped property immediately north of The Trails at Seven Bar.

This site was included in the Master Drainage Plan for The Trails at Seven Bar prepared by Bohannon-Huston. This report established that this site would discharge to Seven Bar Loop Road and be collected in a storm drain constructed with this project for conveyance to Blacks Arroyo to the west. AMNFC SCS and City approvals were gained for this solution and the connection to Blacks Arroyo was made with the construction of the Trails.

This report will :

1. Verify masterplan flow rates
2. Provide detail design of storm drain and inlets necessary to complete the system.
3. Check adequacy of internal streets

DETERMINE DEVELOPED FLOW RATES :

There will be 2 internal drainage areas

Drainage Area 1 :

Flows to Sunset Trail at the northeast end of the project & then to Seven Bar Loop.

Area = 4.02 Ac. = 0.0063 sq. mi.



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Site lies in Precipitation Zone 1:

$$P_1 = 1.87 \text{ in.} \quad P_6 = 2.20 \quad P_{24} = 2.66$$

Land Treatments:

Treatment A = 0%

Treatment B = 40%

Treatment C = 10%

Treatment D = 50%

These treatments are
consistent w/ Masterplan

For small watersheds, $T_c = 8 \text{ min.}$ $T_p = 12 \text{ min.}$

From Attached AHYMO:

$$Q_{100} = 13 \text{ cfs}$$

$$\text{Vol.}_{100} = 19,676 \text{ C.F.}$$

Drainage Area 2:

Collects in Arroyo Crest Drive and then
to Seven Bar Loop.

$$\text{Area} = 12.33 \text{ AC} = 0.0193 \text{ SQ. MI}$$

$$Q_{100} = 40.5 \text{ cfs}$$

$$\text{Vol.}_{100} = 60,113 \text{ C.F.}$$



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Trails West vs. Masterplan

D.A. 1	13 cfs	vs.	1.3 cfs
D.A. 2	40.5 cfs	vs.	58.8 cfs
TOTAL	53.5	vs.	60.1 close enough

Differences are due to basin areas being different once detailed grading was determined.

Street Capacities :

*Typical street is 28' FF, mountable curb
and slope = 4% $n = 0.017$*



$$\text{Area} = 2(1/2)(.28)(14) + 28(.05) = 5.32 \text{ ft}^2$$
$$\text{WP} = 28.66$$

$$V = \frac{1.486}{.017} \left(\frac{5.32}{28.66} \right)^{2/3} (.04)^{1/2} = 5.69 \text{ fps}$$

$$Q = 30.26 \text{ cfs}$$



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Given the street layout and flow distribution, only the entrance of Arroyo Crest Dr. needs standard curb. All other curb can be mountable.

We now need to collect flows in storm drain for conveyance. Since our flows match masterplan, we will not re-analyze storm drain in Seven Bar Loop.

Per the approved masterplan, flows from this site were to be handled in two ways:

1. Southwestern 15 Ac ± is to be collected in a storm drain to be constructed with this project and conveyed to Blacks Arroyo. 42" stub out was constructed @ Arroyo when Trails was built.
2. Northeastern 3 1/2 Ac ± was to be collected in Seven Bar Loop and discharged to a Temporary Public Retention Pond #2 constructed with the Trails. SAD 223 will collect flows in future.

We need to place sufficient inlets in Trails West entrance to collect 40.5 cfs.



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We propose a 36' FF entrance w/ 8" standard
curb @ $S = 1.50\%$.

We will place 2 "A" inlets upstream to
begin

$$Q = 40.5 \text{ cfs} \Rightarrow D = 0.55'$$

$$Q_{\text{intercept}} = 9 \text{ cfs EA.}$$

$$Q = 22.5 \rightarrow D = 0.48'$$

using double "C"

$$Q_{\text{intercept}} = 8 \text{ cfs EA.}$$

$$Q = 6.5 \text{ cfs use single "C" each side}$$