DRAINAGE REPORT
FOR
RANCHO SERENO UNIT 2 SUBDIVION

RIVERVIEW TRACTS H-18A & H-17A-1B2

JUNE 1993

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DRAINAGE REPORT

FOR

RIVERVIEW TRACTS H-18A-1A & H-17A-1B2

NOW COMPRISING

RANCHO SERENO UNIT 2 SUBDIVISION

APRIL, 1993

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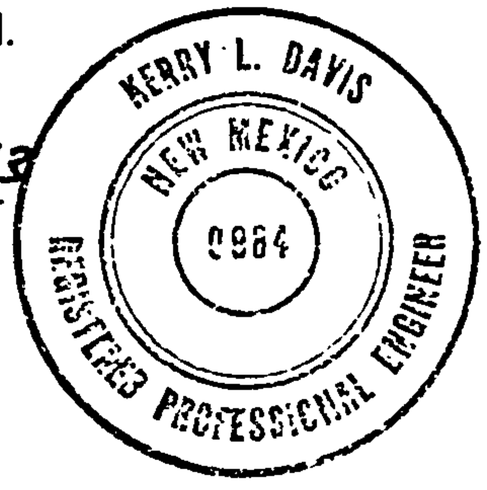
I CERTIFY THAT I AM A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF NEW MEXICO AND THAT THIS REPORT WAS PREPARED BY ME OR UNDER MY SUPERVISION.

6/21/93

KERRY L. DAVIS, P.E. DATE



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PURPOSE AND LEGAL DESCRIPTION

The purpose of this report is to present the Drainage Management Plan for preliminary plat approval for the development of Rancho Sereno Unit 2 Subdivision, which is currently legally described as Riverview Subdivision, Tracts H-18A-1 and H-17A-1B2. This plan has been prepared in accordance with prior drainage reports approved by the City of Albuquerque, and in accordance with the Development Process Manual (DPM) of the City of Albuquerque, including recently promulgated revisions dated January, 1993 (DPM Update). Rancho Sereno Unit 2 is proposed to be developed into a single-family, detached residential subdivision.

SITE LOCATION AND EXISTING CONDITIONS

The subject tracts are located north of the intersection of Butterfield Trail, NW and Calle Nortena, NW, within the Piedras Marcadas middle branch watershed. They lie within the Riverview Sector Development Plan Area of Taylor Ranch on the west mesa and are bounded by Butterfield Trail on the southeast, the AMAFCA Piedras Marcadas dam basin on the northeast, the middle branch of the Piedras Marcadas Arroyo on the north, Golf Course Road on the west, and Calle Nortena on the southwest.

The property is presently undeveloped, and is zoned RLT. Butterfield Trail, which lies along the southeast boundary of this tract, and Calle Nortena on the southwest, are fully developed residential streets with paving, drainage, and utility improvements. Residential subdivisions are in the process of being constructed across these streets to the southwest and southeast. These projects include Riverview Estates to the southwest across Calle Nortena, and Rancho Sereno Unit 1 Subdivision to the southeast across Butterfield Trail. Also bordering the development to the southwest across Calle Nortena is the City's Los Metates Open Space parcel. It is anticipated that the AMAFCA dam basin to the northeast will remain as open space. The tracts on the north and west are presently undeveloped. The property north of the site across the Piedras Marcadas Channel is owned by Centex Homes and is anticipated to be developed as Phase 3 of the Rancho Sereno residential development.

The majority of the site slopes from west to east at approximately 2%, with some steeper property approaching 8% slopes adjacent to Golf Course Road. The site discharges into the middle branch of the Piedras Marcadas Arroyo and AMAFCA's Piedras Marcadas dam basin via sheet flow.

Golf Course Road intercepts runoff from the west and conveys it to the middle branch of the Piedras Marcadas Arroyo, while Calle Nortena intercepts the runoff from the southwest and conveys it to the south branch of the Piedras Marcadas Arroyo. Butterfield Trail and its associated storm drain, along the south perimeter of the site, are the major drainage conveyances of south branch runoff into the dam. The unlined main branch of the Piedras Marcadas borders the site on the north. In their present condition, the existing perimeter streets and arroyo intercept all offsite flows and convey them around the site.

FLOOD HAZARD ZONES

As shown by Plates 1, 2, and 5 (Panel 3500020008 of the National Flood Insurance Program Flood Boundary and Floodway Maps for the City of Albuquerque, dated September 15, 1983), a portion of the subdivision's new residential lots lie within designated Flood Hazard Zones along the Piedras Marcadas middle branch and south branch.

A CLOMR has been requested and approved by the Federal Emergency Management Agency (FEMA) to revise this map along the south branch of the Piedras Marcadas Arroyo (FEMA Case No. (65-DR1-100) 6-91-178). The revised map will show that the 100-year floodplain of the south branch is limited to underground storm sewers and the paved surfaces of Butterfield Trail.

A separate CLOMR is anticipated to be requested for the middle branch upon completion of the design of a proposed concrete-lined channel, which is planned for construction concurrently with this project, within the middle branch of the Piedras Marcadas from Golf Course Road east to the dam basin. This channel lining will remove the floodplain from the lots adjacent to the middle branch channel. The drainage report, design analysis report and CLOMR request for the middle branch will be submitted under separate cover, and the channel will not be addressed by this report.

After the two CLOMRs have been approved and the associated drainage improvements have been constructed, none of the subject properties will lie within a 100-year floodplain. In the meantime, this report will outline the grading and drainage plan for the development of this subdivision. It is understood that lots which lie within the designated flood hazard zones may require flood insurance until such time as the CLOMRs have been approved.

RELATED REPORTS

The Piedras Marcadas Watershed Analysis Report being prepared for AMAFCA by Molzen-Corbin & Associates has shown that the capacity of the Piedras Marcadas dam basin needs to be increased. In order to accomplish this, AMAFCA is in the process of purchasing additional land for dam pool expansion. This property is contained within a portion of Tract H-11B, adjacent to the dam on the north side of the middle branch channel. A portion of the excess dirt required to be excavated from the dam is proposed to be used for fill within the development of Rancho Sereno Unit 2.

The Master Drainage Plan for the south branch of the Piedras Marcadas, prepared by Bohannan-Huston, Inc., identifies the perimeter flows in Butterfield Trail and on Calle Nortena. A portion of the runoff that was previously included in the south branch analysis is proposed to be diverted into the middle branch channel along Rancho Sereno Drive.

PROPOSED DEVELOPMENT

Rancho Sereno Unit 2 is proposed to be developed as a single family detached residential subdivision, consisting of 112 lots on approximately 26 acres, resulting in a residential density of about 4.3 dwelling units/acre. A concrete-lined channel is proposed to be constructed within the middle branch of the Piedras Marcadas along the northern boundary of the site. Rancho Sereno Drive, which bisects the site, is planned to cross the arroyo via a bridge or trapezoidal box culvert. The channel and bridge will be constructed under separate work order, although financial guarantees for these improvements will be provided with the development of Rancho Sereno Unit 2. The construction of a recreational trail within the existing trail and open space easement along the south side of the channel may be constructed concurrently with the channel, or may be deferred.

HYDROLOGIC AND HYDRAULIC ANALYSIS

The hydrologic calculations which appear herein analyze both the existing and developed discharges for the 100-year, 6-hour rainfall event. The peak discharge of runoff has been calculated using the modified computerized hydrologic model AHYMO, which utilizes the initial abstraction/uniform infiltration method as identified within the DPM Update.

The hydraulic calculations which appear herein were computed as follows: Street and channel capacities were computed using Manning's equation with Manning's N values as identified within the latest edition of the DPM. The capacities of streets were computed with the maximum water elevation at top of curb. Street capacity rating curves have been included in the AHYMO run. Computations of inlet capacities in sump conditions were made using charts based on the orifice equation and the weir equation. Computation of inlet capacities on grade were made in accordance with DPM charts and procedures. Storm drain

capacities were based on the Manning's equation, and were computed in the AHYMO run.

DRAINAGE MANAGEMENT PLAN

Developed runoff will be collected by the streets of the subdivision and discharged into the Piedras Marcadas Arroyo system via storm drains at two outfall locations. One storm drain will discharge into the proposed concrete-lined channel at the location of the Rancho Sereno Drive bridge crossing of the arroyo. The other outfall storm sewer will discharge into the dam basin from the easterly end of the Rancho Largo Cul-de-sac through a baffled outlet structure. Design computations for the hydraulic analyses of these storm sewer improvements are provided in Appendix II, and have been coordinated with the design of the channel.

The Drainage and Grading Plan shows: 1) existing grades indicated by spot elevations and contours at 1'0" intervals; 2) proposed grades indicated by spot elevations and slopes; 3) the limit and character of existing improvements; 4) the limit and character of proposed improvements; and 5) continuity between existing and proposed grades. As shown by this Plan, the proposed improvements consist of a 112-lot detached residential subdivision, complete with paving, drainage, and utility improvements.

CONCLUSIONS

As shown by these calculations, the proposed development will result in an increase in runoff generated by the site. Construction of the infrastructure improvements identified herein, including residential street pavement, underground storm sewers, and the Piedras Marcadas Channel improvements (which are described and analyzed within a separate submittal) is anticipated to safely convey the increased on-site runoff to the Piedras Marcadas Dam without damage to public or private property. Because this runoff is being discharged directly into a flood-control facility (AMAFCA's Piedras Marcadas Dam), no on-site ponding is required.

The paved surfaces and landscaping within this development will decrease the sediment load on the Piedras Marcadas dam. After development, no appreciable sediment will be produced by this site, therefore no on-site desedimentation facilities are required.

SUMMARY OF STREET SECTION HYDRAULICS

X-SECT	LOCATION	TYPE OF CURB	WIDTH F-F/ROW	Q_{100} (CFS)	NORMAL DEPTH	ENERGY
A-A	RANCHO LARGO	ROLL	27'/46'	14.7	0.31'	0.53' ≤ 0.53'-- OK
B-B	RANCHO LARGO	STD	28'/46'	17.1	0.37'	0.65' ≤ 0.87'-- OK
C-C	RANCHO DORADO	ROLL	25'/44'	3.9	0.26'	0.30' ≤ 0.53'-- OK
D-D	RANCHO LARGO	STD	28'/46'	23.5	0.38'	0.84' ≤ 0.87'-- OK
E-E	RANCHO QUIETO	ROLL	25'/44'	6.2	0.30'	0.34' ≤ 0.53'-- OK
F-F	RANCHO LARGO	STD	32'/50'	35.5	0.60'	0.75' ≤ 0.87'-- OK
G-G	RANCHO SERENO	STD	32'/50'	11.5	0.40'	0.48' ≤ 0.87'-- OK
H-H	RANCHO ALEGRE	ROLL	27'/46'	7.8	0.32'	0.38' ≤ 0.53'-- OK
I-I	RANCHO LARGO	STD	28'/46'	16.1	0.46'	0.55' ≤ 0.87'-- OK
J-J	RANCHO ENCANTO	STD	28'/46'	20.9	0.50'	0.61' ≤ 0.87'-- OK
K-K	RANCHO LARGO	STD	28'/46'	37.0	0.62'	0.79' ≤ 0.87'-- OK