community sciences corporation

DRAINAGE REPORT

FOR

PARADISE GREENS, UNIT #1 SUBDIVISION (MAP #B-12)

PREPARED FOR

ARGUS DEVELOPMENT COMPANY

6501 AMERICAS PARKWAY, ALBUQUERQUE, NM 87110

PREPARED BY

COMMUNITY SCIENCES CORPORATION
P. O. BOX 1328
CORRALES, NEW MEXICO 87048

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JAMES D. HUGHES

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JAMES D. HUGHES 11674 NEW MEXICO REGISTERED PROFESSIONAL ENGINEER

P.O. Box 1328
Corrales, New Mexico 87048
(505) 897-0000

SURVEYING
LAND PLANNING
CIVIL ENGINEERING
DEVELOPMENT CONSULTANTS

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I. PURPOSE AND SCOPE

Argus Development Company is currently planning for the development of Paradise Greens Unit I. The proposed development consists of approximately 12.2 acres and is to be subdivided into 42 single family residential lots.

This report presents an overall Drainage Management and Conceptual Grading Plan for approval by the City of Albuquerque in order that subsequent subdivision and development may commence.

II. SITE DESCRIPTION AND HISTORY

Paradise Greens Phase I formerly Tract A Lands of Horizon, is located at the southwest corner of the intersection of Irving Blvd. and Golf Course Road. (See Vicinity Map, Plate #1).

The site slopes to the east at 2-4%. No flood plain or arroyos pass through Phase I. The soils are fine silty sands.

The only previous drainage study done for the area is the Leverton-Denny Drainage Master Plan for Paradise Hills completed in 1975. A report was just recently completed by our office that analyzed flows in Irving as they relate to the 38 ac. & 45 ac. tract just across Irving Blvd. The Phase I development of Paradise Greens is in conformance with this drainage plan.

III. DESIGN CRITERIA

A. Flood Control Regulations

The drainage plan presented in this report has been designed to comply with AMAFCA resolution 80-15, which requires that proposed land development projects be designed such that no flooding of private properties will occur during any storm up to and including the 100-year frequency event. Additionally, this drainage plan has been designed to comply with current "City of Albuquerque Drainage Ordinance" and Chapter 22 of the Development Process Manual (DPM), and subsequently adopted general policies of the City of Albuquerque.

1. 100-year storm

   a. Stormwater flow depth not to exceed the top of curb in any street.

   b. Jump depth to be contained within right-of-way.

2. 10-year storm:

   a. Local street - velocity times depth less than 6.5

   b. Arterial streets:

      i. Flow not to exceed a depth of 0.50
      ii. Velocity times depth less than 6.5
      iii. One driving lane in each direction free of stormwater

B. Engineering Parameters

In accordance with AMAFCA criteria, all hydrological analysis is based on the 100-year frequency, 6-hour duration storm, as represented in Section 22.2, Hydrology, of the

"Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, New Mexico, January 1993".

Ten-year, 6-hour values were also used for subcatchments, in accordance with City drainage policies regarding street flow.

The four rainfalls pertinent to the study are as follows:

	10-Year	100-Year
One-Hour	1.27"	1.90"
Six-Hour	1.47"	2.20"

IV. COMPUTATIONAL PROCEDURES

The analysis approach follows standard engineering practice. Key points of confluence were selected and the associated individual and aggregate contributing basins were subsequently defined.

Hydrological computations were accomplished by means of the March 1992 version of AHYMO Computer Program as developed by AMAFCA. The input parameters and resulting flows for the basins are summarized on Table 1. Summary and detailed AHYMO printouts are contained in Appendix A.

Times of concentration were estimated using the Upland Method and then converted to times to peak (Lg), in accordance with the above referenced Section 22.2 which also establishes the minimum time of concentration as 12 minutes.

Flow characteristics for conveyance swales, channels, and streets were analyzed based on the Manning equation for uniform flow. Streets are assumed to have a 2% cross slope from lip of gutter to crown and a curb and gutter per City of Albuquerque Standard details. Finished grade at the right-of-way is 0.33' above top of curb.

V. OFF-SITE DRAINAGE

There is no off-site drainage to Unit I of Paradise Greens. The Paradise Hills Golf Course immediately to the south drains onto itself. Adjacent development to the west drains north to Irving Blvd.

VI. ON-SITE DRAINAGE

On-site basin #100 drains to Alta Mesa Ct.. and then north on Woodburne Dr. Basin #101 drains to Alta Mesa Rd. and proceeds west. Basin #102 drains to Sandhurst Dr. and then north to Woodburne Dr. All flows converge at Green Meadow Drive where a series of inlets pick up all surface flows and deliver them to a storm drain that proceeds north to the Calabacillas Arroyo. Please see the following tables and AHYMO summary for the quantified flows generated by this development.

VII. EROSION CONTROL

Control of excessive soil erosion into City streets and drainage improvements during construction will be accomplished by use of temporary lot line, water-trap berms. These will be windrowed into place following mass grading operations and left in place until each home is constructed and sold. Plate 1 illustrates the dimensions of these berms, and they will be located along those boundaries of each lot which are common to City rights-of-way or public easements.

TABLE I

DEVELOPED CONDITIONS

					LAND TREATMENT				INCREMENTAL		TOTAL	
Basin I.D.	Area (Sq.Mi.)	Contr. Basin	Sum Area (Sq.Mi.)	T_c (Min.)	A	B	C	D	Q_{100} (cfs)	Q_{10} (cfs)	Q_{100} (cfs)	Q_{10} (cfs)
100	0.00182	100	0.00182	12	0	32.5	32.5	35	3.70	2.04	3.70	2.04
101	0.00387	100	0.00569	12	0	32.5	32.5	35	7.84	4.32	11.54	6.36
102	0.00762	102	0.00762	12	0	32.5	32.5	35	15.42	8.50	15.42	8.50
103	0.00574	101,102	0.0191	12	0	32.5	32.5	35	11.62	6.41	38.58	21.27

TABLE 2

STREET CAPACITY CALCULATIONS

Street	Location	Q_{100}	Street Width	Slope	D_N	V_N	F	** EGL	Remarks
Alta Mesa Ct.	Alta Mesa Rd.	3.7	26'	0.5%	0.26	1.32	0.73	0.29	Std. C & G
Alta Mesa Rd.	Woodburne Rd.	11.5	28'	0.5%	0.36	2.08	0.82	0.43	Std. C & G
Alta Mesa Rd.	Sandhurst Dr.	15.4	28'	0.5%	0.40	2.35	0.84	0.49	Std. C & G
Woodburne Rd.	Green Meadow Dr.	23.2	28'	0.5%	0.47	2.78	0.88	0.59	Std. C & G
Sandhurst Dr.	Green Meadow Dr.	15.4	28'	0.5%	0.40	2.35	0.84	0.49	Std. C & G
* Green Meadow Dr.		38.6	32'	0.5%	0.54	3.18	0.91	0.69	Std. C & G

*** Just North of intersection**

**** EGL (Energy Grade Line) = $D_n + V^2_n/2g$**

Select inlets for 38 cfs for 32' F-F street @ s=0.5%.

Normal depth in street = 0.54'

Velocity = 3.18 fps

H = 0.91

From nomograph 22.3 D-5,

Single Type 'A' → Capacity = 8 cfs

Use 2- Type A inlets @ each curb return on Green Meadow Dr.

$Q_{remaining} = 38 - 2(8) = 22$ cfs

From nomograph 22.3 D-6

Double Type C → Capacity = 10 cfs

Use 2 - Type C inlets, Double grate, 20' north of 'A' inlets on Green Meadow Dr.

$Q_{remaining} = 22 - 2(10) = 2$ cfs

OK