City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

January 19, 1994

James D. Hughes, P.E.
Community Sciences Corp.
P.O. Box 1328
Corrales, N.M. 87048

RE: DRAINAGE REPORT FOR RICHLAND HILLS UNIT 1 (C-12/D6)
ENGINEER'S STAMP DATED 1-10-94; RECEIVED JANUARY 12, 1994
FOR ROUGH GRADING PERMIT APPROVAL

Dear Mr. Hughes:

Based on the information included in the submittal referenced above, City Hydrology approves this project for Rough Grading Permit.

If you will submit the mylars, I will be happy to sign them as approved for Rough Grading.

The Contractor must obtain a "Topsoil Disturbance Permit" from the Environmental Health Department prior to any grading.

If you have any questions about this project, You may contact me at 768-2727.

Sincerely,

John P. Curtin

John P. Curtin, P.E.
Civil Engineer/Hydrology

xc: INSPECTOR

WPHYD/8136/jpc

TABLE OF CONTENTS

I. PURPOSE AND SCOPE

Sivage Thomas Homes, Inc.is currently planning for the development of Richland Hills, Unit 1. The proposed development consists of approximately 18.75 acres and is to be subdivided into 64 single family residences.

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. ULTIMATE DESIGN FOR REMNANTS OF TRACT H-3, H-4, H-5 AND OFF-SITE FLOWS. (SEE ALTA/ACSM SURVEY AND DRAINAGE BASINS PLOT IN THIS REPORT).

Final developed conditions were also considered for remnants of Tract H-3, H-4, and H-5. Water runoff from these Tracts will be conveyed to the Golf Course Rd. storm drain. Leftovers of parcel H-3 and H-5 will be subdivided into single family lots also. Future development of Basin 120 is considered in this study because it will contribute runoff water to proposed Ridgemont Ave. Basin 112 is designated park area and these flows were considered in Richland Hills Road and Extension of Education Place design. Basin 102 is future single family subdivision and its runoff water is to be conveyed through Paseo Del Norte into proposed 42" R.C.P. off-site storm drain sewer located south of Paseo Del Norte within the boundary of Las Terrazas subdivision. Tributary Basin 101 (identified as Parcel H-2) located north of proposed Richland Hills development currently is in raw, undeveloped condition. This parcel is designated by City of Albuquerque Zone Atlas as SU-1, C-2 and IP-special use, neighborhood commercial and industrial park zone. Total runoff from fully developed basin is Q=23.15 cfs and is diverted into Marn Lynn Ave. This flow will be conveyed through Education Place in Richland Hills subdivision into proposed 42" R.C.P. storm drain discharging into the Piedras Marcadas Dam. Capacity of the 42" R.C.P. storm drain will accomodate increased flow.

III. SITE DESCRIPTION AND HISTORY

Richland Hills Unit 1 is a portion of Riverview, Parcel H-3, H-4 and H-5, located north of Paseo Del Norte, east of Golf Course Rd., south of 105.69, U.N.M. easement and Marna Lyn Ave. N.W. and southwesterly of Albuquerque west Unit 1, Tract A, B and F.

The site slopes to the south with an average slope of approximately 4%. No flood plain or arroyo exist through this site. The soil is fine silty sand classified as type "A" hydrolic group soils.

Previous drainage studies for this area were conducted by Community Sciences Corporation for Riverview sector development plan Plate 5. This plate was a base for drainage study of Richland Hills project.

IV. 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. The proposed conditions will improve the drainage so it will also conform with current "City of

Albuquerque Drainage Ordinance". 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"	1.9"
Six-Hour	1.48"	2.22"

V. 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 "B".

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.

VI. OFF-SITE DRAINAGE

Off-site drainage from the north Parcel H-2, designated as Basin 101, will be intercepted by the construction of an extension of Marna Lynn Ave. and will join drainage from Basins 101.11 and 101.2 that drain to the existing Marna Lynn Ave. These flows will be conveyed to Education Place, there joined by drainage from Tract A (Basin 101.3). At the southeasterly corner of Tract A an existing storm drain in Education Place will take 38.4 cfs and pass the balance of flow through Education Place in Richland Hills subdivision and into proposed 42" R.C.P. off-site storm drain.

Off-site drainage from west (Basin 120) will contribute flows into proposed Ridgemont Ave. Off-site drainage from the east (Basin 102) is considerate in full developed condition as single family subdivision and its runoff is to be conveyed directly to proposed 42" R.C.P. off-site storm. Basin 103 (Paseo Del Norte) drains directly to proposed 42" R.C.P. storm drain.

VII. ON-SITE DRAINAGE

Basins 110, 111, will drain to the Richland Hills Rd. Basins 113, 114 and 115 will drain to the Ridgemont Ave., which conveys these flows from the west site into Richland Hills Rd. Basin 112 designated as future park area, drains into an extension of Education Pl. Basin 112 will join with off-site flows at easterly end of the extension of Education Place, and all flows will be conveyed to Richland Hills Rd. from the east. Basin 116 drains to Beacon Knoll Court and then flows from the west into Richland Hills Rd. On-site and off-site flows in Richland Hills Rd. will be conveyed to proposed off-site 42" storm drain. All flows will be intercepted before Paseo Del Norte intersection.

VIII. 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 3 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.

CHANGES TO THE AHYMO AND PIPE SIZING CALCULATIONS:

Please note that sheets 1/7, 2/7 3/7 and 5/7 of pipe sizing, 4/7, 6/7 and 7/7 have been deleted and replaced by a table calculating the hydraulic grade line and 3 sheets of Plan and Profile showing the plotted H.G.L. Hydraulic Grade Line Calculation Table is located at the end of Hydraulic Sections.

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

May 16, 1995

CERTIFICATE OF COMPLETION AND ACCEPTANCE

Sivage Thomas Homes, Inc.
5141 Masthead N.E.
Albuquerque, NM 87109

RE: PROJECT NO. 4878.80 RICHLAND HILLS PHASE I
Map No. (C-12) / D6

Dear Sir:

This is to certify that the City of Albuquerque accepts Project No. 4878.80 as being completed according to approved plans and construction specifications. Please be advised this certificate of completion and acceptance shall only become effective upon final plat approval and filing in the office of the Bernalillo County Clerk's Office.

The project is described as follows:

- The project included curb & gutter, and paving, waterlines, on-site and off-site sanitary and storm sewer facilities. The water and sanitary sewer facilities are maintained by New Mexico Utilities. The roadway improvements and storm sewer facilities are maintained by the City of Albuquerque.

The contractor's correction period began the date of this letter, and was effective for a period of one (1) year.

MAY 2 5 1995

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

April 26, 1995

Ellery A. Biathrow, Jr., PE
Sivage Thomas Homes, Inc.
5141 Masthead NE
Albuquerque, NM 87109

RE: ENGINEER'S CERTIFICATION FOR RICHLAND HILLS UNIT 1 (C-12/D6)
RECEIVED APRIL 24, 1995 FOR FINANCIAL GUARANTY RELEASE
ENGINEER'S STAMP DATED 11-11-94

Dear Mr. Biathrow:

Based on the information included in the submittal referenced above, City Hydrology accepts the Engineer's Certification and releases the Financial Guaranty for City Project Number 4878.90, Richland Hills Unit 1.

Contact the DRC Chairman, Billy Goolsby, to obtain the actual Financial Guaranty release document.

If I can be of further assistance, You may contact me at 768-2727.

Sincerely,

John P. Curtin, P.E.
Civil Engineer/Hydrology

c: Andrew Garcia
Billy Goolsby, CPN 4878.90
Doug Hughes, CSC, P.O. Box 1328, Corrales, NM 87048

143-11-033	Z. J. R.	10-13-1993	1/7

AHTMO COMPUTATIONS FOR "RICHLAND HILLS"

ZONE C-12

FROM D.P.M. VOLUME 2 "HYDROLOGY" MANUAL

$P_{60} = 1.90"$ $P_{360} = 2.22"$ $P_{1440} = 2.68"$

FROM FIGURE "D", "E" and "F", ISOPLUVIALS OF 100 YR. - 24 HR. PRECIPITATION.

OFFSITE AREA

(101) $0.711 \times 10^6 : 2.516 = 282,591\ F^2 = 6.1874\ AC.$
(102) $1.324 \times 10^6 : 2.516 = 526,232\ F^2 = 15.2266\ AC.$
$1\ MI. = 5280\ L.F.$ $1\ MI^2 = 27,878,400\ F^2 = 640\ AC.$

ONSITE AREA :

DRAIN.

(110) $0.391 \times 10^6 : 2.516 = 155,405\ F^2 = 3.5676\ AC$
(1111) $0.338 \times 10^6 : 2.516 = 134,340\ F^2 = 3.0840\ AC$
(112) $0.312 \times 10^6 : 2.516 = 124,006\ F^2 = 2.8468\ AC$
(113) $0.278 \times 10^6 : 2.516 = 110,493\ F^2 = 2.5366\ AC$
(114) $0.478 \times 10^6 : 2.516 = 189,734\ F^2 = 4.3614\ AC$
(115) $0.088 \times 10^6 : 2.516 = 34,976\ F^2 = 0.8029\ AC$
(116) $0.315 \times 10^6 : 2.516 = 125,199\ F^2 = 2.8742\ AC$
(117) $0.099 \times 10^6 : 2.516 = 39,343\ F^2 = 0.9033\ AC.$
(118) $0.082 \times 10^6 : 2.516 = 32,591\ F^2 = 0.7482\ AC$

FUTURE ONSITE AREA:

(120) $0.534 \times 10^6 : 2.516 = 212,242\ F^2 = 4.8724\ AC.$

LAND TREATMENTS

(101) - B = 25% D = 75%
(102) - A = 0% B = 35% C = 30% D = 40%

ONSITE

AREA $6.302 \times 10^6 : 2.516 = 2,504,769\ F^2 = 57.5016\ AC.$

DV. = 210 N = 210/57.5016 = 3.6521 DU/AC.

D% = 7 $\sqrt{(3.6521)^2 + (5 \times 3.6521)}$ = 39.35 % TAKE 40%

100 − 39.35 = 60.65 %

60.65 : 2 = 30 %

BASINS: 117, 118

TREATMENT:

D = 70 %

B = 30 %

BASINS: 110, 111, 112, 113, 114, 115, 116, 120.

TREATMENT.

B = 30 %

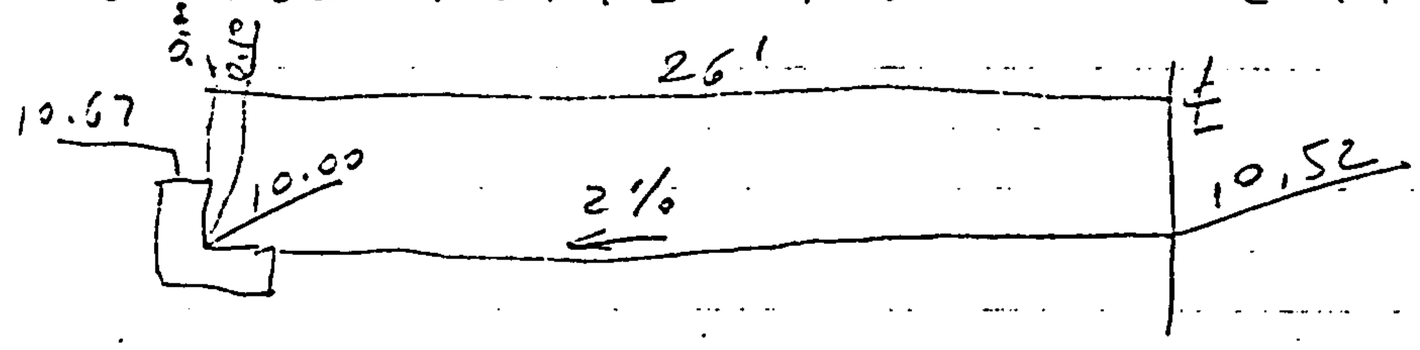
C = 30 %

D = 40 %

AREA IN MI.^{2}

101	— 6.9379	AC	= 0.0094	MI^2
102	— 15.2266	AC	= 0.0238	"
110	— 3.5676	AC	= 0.0056	"
111	— 3.0840	AC	= 0.0048	"
112	— 2.8463	AC	= 0.0044	"
113	— 2.5366	AC	= 0.0040	"
114	— 4.3614	AC	= 0.0058	"
115	— 0.8029	AC	= 0.0013	"
116	— 2.8742	AC	= 0.0045	"
117	— 0.9033	AC	= 0.0014	"
118	— 0.7482	AC	= 0.0012	"
120	— 4.8729	AC	= 0.0076	"

PASEO DEL NORTE N.W. - SECTION (TYP.)



L = 660' SLOPE = 0.0089

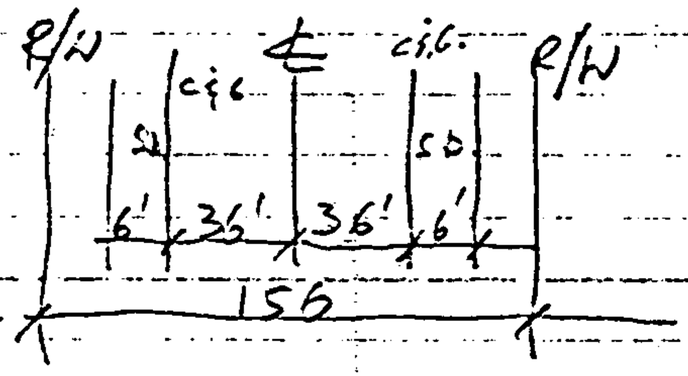
OFFSIDE ARE (103) "PASEO DEL NORTE"

AREA.

1900' x 156' = 296,400 F^2 = 6.8044 AC. = 0.0106 MI^2

LAND TREATMENT.

D % = 84 : 156 x 100 = 53.85 %



B = 23.08 %

C = 23.07 %

D = 53.85 %

LAND TREATMENT FOR BASIN (112)

IT IS FUTURE PARK. B = 80 % D = 20 %