HYDROLOGY K17/D1 1PLAN

K17/D1

1 Plan

CHAMBERS • CAMPBELL • ISAACSON • CHAPLIN, INC.
3500 INDIAN SCHOOL RD., N.E. / ALBUQUERQUE, NEW MEXICO 87106 / PHONE (505) 266-5521

June 4, 1976

RECEIVED
JUN 07 1976
CITY ENGINEERS

Mr. Kelston Laws
City Engineer's Office
P.O. Box 1293
Albuquerque, NM 87103

REFERENCE: Albuquerque Highland Swimming Pool Drainage

Dear Mr. Laws:

The Parks and Recreation Department has requested that the small auxiliary ponds A through D for the above referenced project be removed from the plans for maintenance reasons. Examination of the relative impact of such action reveals that these ponds represent such a small fraction of the required ponding volume as to be insignificant to the overall plan. In fact, the larger ponds "E" and "F" contain at least the required ponding volume of 7590 cubic feet due to rounding of berm and bottom elevations to nearest tenths. We are therefore requesting that you accept this letter as an addendum to the subject drainage report for purposes of removing these smaller ponds from the project.

Please advise us of your decision in this matter. Thank you for your cooperation.

Sincerely yours,

Kent M. Whitman

Kent M. Whitman, for

CHAMBERS, CAMPBELL,
ISAACSON & CHAPLIN, INC.

KMW:dd

dmy

CHAMBERS • CAMPBELL • ISAACSON • CHAPLIN, INC.
3500 INDIAN SCHOOL RD., N.E. / ALBUQUERQUE, NEW MEXICO 87106 / PHONE (505) 266-5521

Fegruary 27, 1976

RECEIVED
MAR 0 3 1976
CITY ENGINEERS

Mr. Kleston Laws
City Engineer's Office
P.O. Box 1293
Albuquerque, New Mexico 87103

REFERENCE: Drainage Report for Albuquerque Highland Swimming Pool

Dear Mr. Laws:

Enclosed please find three copies of subject report. We trust you will find the plan presented therein acceptable. Regarding previous comments by yourself and Mr. Sheppard, I am informed that the City Parks and Recreation Department and the Board of Education will not accept a design using parking lot ponding. We have therefore maintained the infiltration pond concept introduced in our preliminary drawings.

Please contact us should you have any questions.

Sincerely yours,

Kent Whitman

Kent M. Whitman, for
CHAMBERS, CAMPBELL,
ISAACSON, CHAPLIN, INC.

KMW/slf

Mr. Laws

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE February 10, 1976 REF. NO._____

TO: Mr. E. F. Hensch, Director of Public Works

FROM: Mr. C. D. Sheppard, Asst. City Engineer-Field & Mr. K. Laws
Hydrology Engineer

SUBJECT: HIGHLAND HIGH SCHOOL SWIMMING POOL - PRELIMINARY CONCEPT PLANS; REVIEW COMMENTS

Preliminary concept drawings appear suitable.

Recommend 2" minimum asphalt pavement on parking lot with depth of base course as appropriate for soils encountered in subgrade.

The following comments are from Mr. Laws:

Drainage study is forthcoming. It is recommended the consultant examine potential of controlling the runoff rate by using flat parking areas and curbs instead of the ponding areas shown. It seems desirable to eliminate deep infiltration ponds. Those areas that do require infiltration ponding should be shallow and preferably grassed and landscaped.

END OF COMMENTS

cc: Mr. V. M. Kimmick

file

DRAINAGE REPORT

FOR

ALBUQUERQUE HIGHLAND SWIMMING POOL

PREPARED FOR

CITY OF ALBUQUERQUE

BY

CHAMBERS, CAMPBELL, ISAACSON & CHAPLIN, INC.

MARCH 1975

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
3695
NEW MEXICO
THOMAS O. ISAACSON

DRAINAGE REPORT

FOR

ALBUQUERQUE HIGHLAND SWIMMING POOL

PREPARED FOR

CITY OF ALBUQUERQUE

BY

CHAMBERS, CAMPBELL, ISAACSON & CHAPLIN, INC.

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A) PURPOSE AND SCOPE:

The Albuquerque Highland Swimming Pool is a public project being undertaken by the City of Albuquerque in cooperation with the Albuquerque Parks and Recreation Department and the Albuquerque Board of Education. The overall site contains approximately 2.45 acres, and proposed improvements include a large covered swimming pool, a small children's wading pool, peripheral grassed landscaping, and appurtenant parking facilities. The purpose of this report is to present a plan for controlling surface runoff in a manner acceptable to the Albuquerque Metropolitan Arroyo Flood Control Authority and the Albuquerque City Engineer's Office.

B) SITE LOCATION & TOPOGRAPHY:

The Albuquerque Highland Pool site is located at the southeast corner of Jackson Street and Highland Avenue, S.E., in the City of Albuquerque (See Plate I). Ground topography is relatively flat, varying only five to six feet in vertical elevation across the parcel. No distinguishable arroya systems cross the property.

C) DESIGN CRITERIA:

1) Engineering Parameters: For calculation of composite coefficients of runoff, the following values of "C" were taken for the indicated land coverages:

a) Streets, Roofs, Walks - 0.95

b) Lawns - 0.15

c) Southwestern Landscaping - 0.6

d) Natural Ground - 0.35

e) Bare Earth - 0.45

In addition, all runoff volume calculations have been based on a 100 year-6 hour rainfall of 2.2" per AMAFCA requirements. Rate of runoff calculations have been based on the frequency - intensity - duration relationship for a 100 year storm as presented by Gordon Herkenhoff and Associates in their 1963 Master Plan of Drainage for the City of Albuquerque. This relationship is expressed by the following equation: $I = 189/(Tc+25)$.

2) Flood Control Regulations: The drainage plan presented in this report has been designed to comply with the 1972 AMAFCA Resolution in regard to rate and volume of runoff leaving the site. That Resolution has been interpreted to say that the rate and volume of runoff allowed to leave the site after development shall be no greater than the rate and volume running off prior to development.

D) COMPUTATIONAL PROCEDURES:

Appendix A contains samples of the various types of hydraulic calculations performed. Hydrological flow rate calculations are based on the rational runoff method. Estimates were made of percents of area covered by each coverage type described above in section C-1 for each

drainage sub-area. A composite runoff coefficient was then calculated for each sub-area.

Volume calculations for sizing ponding areas and for determination of net volumes of discharge for the entire site in both natural and developed states were performed by multiplication of the applicable C factor times the 100 year - 6 hour rainfall (0.183') times the appropriate area to obtain cubic feet of water.

E) OFF-SITE DRAINAGE:

Runoff from off-site approaches the property as sheet flow along the southern boundary. This drainage is relatively minor in magnitude (2 cfs), and can be directed along the southern boundary line into Jackson Street by means of a small berm as shown on Plate II. on others property!

F) ON-SITE DRAINAGE:

Plate II illustrates the site broken down into nine (9) sub-areas of drainage. Areas 1, 2, 4, and 9 are shown draining uncontrolled into the adjacent street system because there is no practical means of draining them into ponding areas. However, ponds A-E compositely contain a gross ponding volume sufficiently large to comply with AMAFCA regulations as applied to the entire site. In other words, more water than would ordinarily be necessary will be retained from areas 3, 5, 6, 7, and 8 in order to compensate for the release of all runoff from the remaining areas.

Table I contains volume calculations for all drainage sub-areas as well as the overall figures for the entire site. The net ponding requirement for the entire site is 7590 cubic feet, and ponds A-F will provide this amount of storage. Since the ponds will virtually absorb the peaks from any 100 year storm, rates of runoff should remain unchanged from the natural condition. Runoff volumes and rates will actually be reduced for storms of lesser intensity than the 100 year storm.

G) RECOMMENDATIONS:

In conclusion, we make the following recommendations regarding drainage for the Albuquerque Highland Swimming Pool:

1) That the diversion berm shown along the south property line on Plate II be constructed to divert off-site drainage into Jackson Street.

2) That the drainage flow patterns indicated on Plate II be incorporated into the final grading plan.

3) That the ponding facilities shown on Plate II be constructed in order to comply with AMAFCA regulations regarding rate and volume of discharge.

TABLE I

VOLUME CALCULATIONS

AREA DESIGNATION	MAP AREA IN.2	LAND AREA FT.2	% AREA RUNNING OFF @ .95	% AREA RUNNING OFF @ .15	% AREA RUNNING OFF @ 0	% AREA RUNNING OFF @ .35	% AREA RUNNING OFF @ .45	COMPOSITE C	NATURAL VOLUME 100 YEAR 6 HOUR STORM CU. FT.	DEVELOPED VOLUME 100 YEAR 6 HOUR STORM CU. FT.	NET REQUIRED PONDING CU. FT.
1	28.08	1232	93	7	0	0	0	.89	720 C=.35	1830	1110
2	8.74	3496	61	39	0	0	0	.64	220 C=.35	410	190
3	7.0	2800	50	50	0	0	0	.55	180 C=.35	280	100
4	5.34	2136	77	23	0	0	0	.77	140 C=.35	300	160
5	7.29	2916	65	35	0	0	0	.67	190 C=.35	360	170
6	56.91	22764	44	56	0	0	0	.5	1460 C=.35	2090	630
7	108.56	43424	78	0	4	0	18	.82	2790 C=.35	6530	3740
8	39.73	15892	74	0	2	0	24	.81	1020 C=.35	2360	1340
9	4.73	1892	68	0	0	0	32	.79	120 C=.35	270	150
		106552 2.446ac.					SUMMARY		6840	14430	7590

APPENDIX A

SAMPLE CALCULATIONS

1) Required Size Ponds E & F

Bottom area ponds B, C, and D = 1112 $ft.^2$

Volume = 1112 x 0.5 = 556 cu. ft.

Spillover = 630 - 556 = 74 cu. ft.

Required volume ponds E & F = 6860 cu. ft.
(from areas 1, 2, 4, 5, 7, 8, 9) and 74 cu. ft. spillover from area 6 = 6934 cu. ft.

Available area - 7538 $ft.^2$

Ponds must be 6934/7538 = 0.9 feet deep at crest of overflow.

2) Outlet Pond E

a) Tc at Pond E < 10 min., therefore I = 5.4 in/hr.
Natural runoff rate at Pond E = CIA = 0.35(5.4)(1.06) = 2 cfs.

b) $Q_{weir} = C_W L H^{3/2}$

Assume H = 0.3 feet

$$L = \frac{2}{3(0.3)^{3/2}} = 4 \text{ feet}$$

c) Critical Depth = $\left(\frac{q^2}{32.2}\right)^{1/3}$ = 0.2 feet

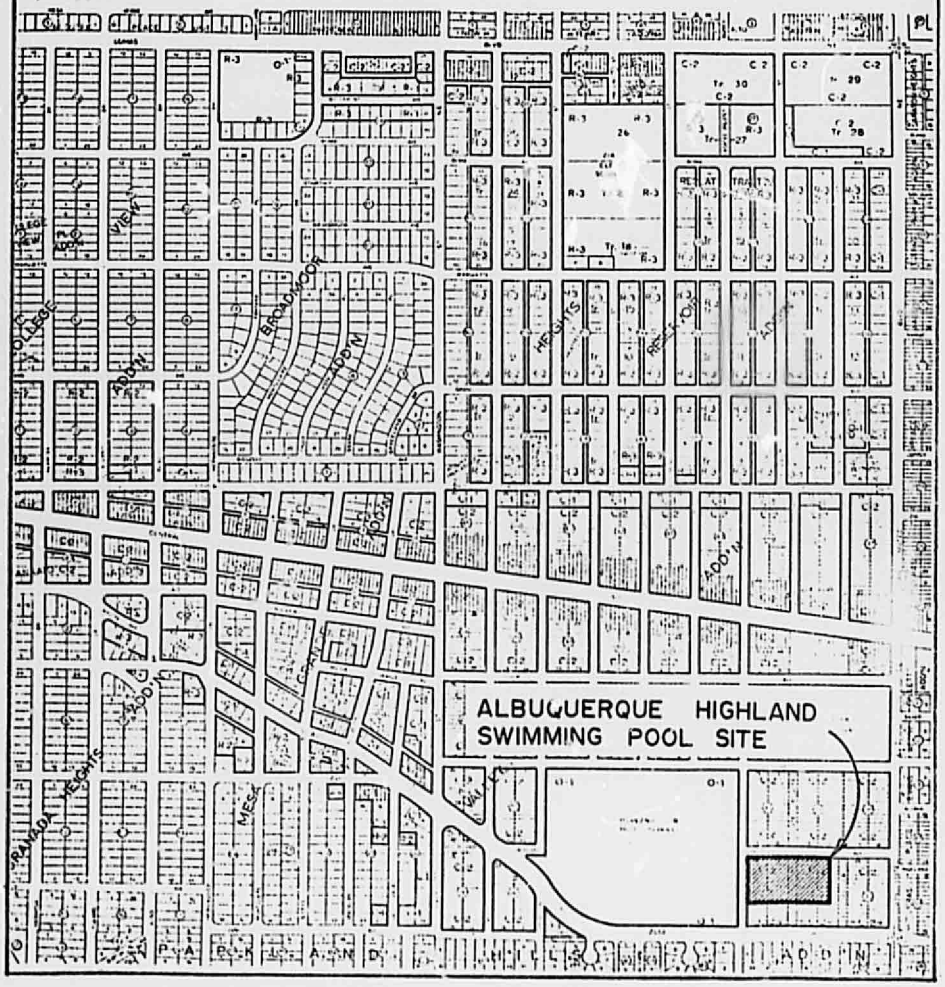
from Manning equation

$$Q = \frac{A\,(1.49)(R^{2/3})\,S^{1/2}}{n}$$

Solving for slope, S_c = .0062, therefore, overflow trough must have a slope steeper than .0062.

PLATE I

LOCATION MAP



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