HYDROLOGY F20/D4 3 PLANS

F20/D4

3 PLANS

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DRAINAGE STUDY
FOR THE DEVELOPMENT OF

CANDLELIGHT HILLS
A SINGLE FAMILY SUBDIVISION

PREPARED FOR

WESTERN DEVELOPMENT COMPANY

5301 JESSIE DRIVE N.E.

ALBUQUERQUE, NEW MEXICO 87110

PREPARED BY

MURRAY-McCORMICK, INC.

ENVIRONMENTAL DESIGN

ENGINEERS, SURVEYORS & PLANNERS

2601-F WYOMING BLVD. N.E.

ALBUQUERQUE, NEW MEXICO 87110

SEPTEMBER 1975

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I GENERAL INTRODUCTION & EXISTING DRAINAGE CONDITIONS

This report will present the data, analysis and calculations resulting from a storm drain study of the proposed single family subdivision, titled "Candlelight Hills". The lands for this development were recently annexed to the City of Albuquerque and generally encompass the northeast one-half of Section 32, a small westerly portion of Section 33, and the southeast one-quarter of Section 29 lying contiguous to the north, all in Township 11 North, Range 4 East, New Mexico Principal Meridian.

The property encloses 90± acres and it is intended to be subdivided into approximately 320 large (70'x115', typical size) single family lots. More precise information can be found by examining the enclosed tract map, Plat No. 3.

The land, covered with the grasses and shrubs native to the Central New Mexico region, slopes gently to the west at an approximate gradient of 3 to 4% and continues up the alluvial fan created by the Sandia Mountains.[1] A visual site inspection indicates a slightly undulating terrain with minor flowlines in the depressions and the well defined, natural channel of the Bear Canyon Arroyo Tributary along the north boundary. It is intended that the cut and fill grading will interrupt the minor flow patterns and allow the runoff to be conveyed in the street to the northerly and southerly arroyo.

The subdivision site is bounded on the north by the Bear

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[1]Topography obtained from A.M.A.F.C.A., reference sheets F-20, F-21 and E-20.

Arroyo, Trib. and on the east by Eubank Blvd. N.E. The west boundary of the property is Estrellita del Norte N.E., a proposed and platted street in Academy Estates Unit 4, draining to the Bear Arroyo.

According to the Rice report, the Bear Tributary to the north has an interpolated 100-year flow of 1450 c.f.s. adjacent to the project. A 150' wide drainage right-of-way will be dedicated to contain this flow. To the south, the Bear Arroyo has a flow of approximately 150 c.f.s. This low flow will be contained in a 75' wide drainage right-of-way.

Offsite flows from the east are expected to be intercepted and diverted away from the property by the future extensions of Eubank Blvd. N.E. and the construction of Layton Avenue. Until such construction takes place, however, drainage ditches along the northeast property lines, sloped to Eubank Blvd. N.E. and the Bear Tributary, will re-route and reduce the offsite flow onto the subdivision.

The offsite area shown on Plat No. 2 is therefore expected to be temporary. Street construction, although not presently started, is expected to commence in the near future.

At the northeastern corner of the property, the Bear Tributary turns northward. The master plan for this area proposes a right-of-way alignment that does not follow the natural flowlines. With proper grading and the use of smooth curves with adequate protection, the alignment can be continued through this higher ground and subsequently join the existing flowline north of Layton Avenue

II DESIGN CRITERIA

In analyzing the storm runoff, the Rational Formula, Q = CIA was used.

Where:

Q = Runoff quantity in cubic feet/second

A = Contributing area in acres

I = Intensity in inches/hour for a duration equal to the time of accumulation (duration) measured in minutes and obtained from Chart 1, Appendix A, the "Master Plan of Drainage, City of Albuquerque, New Mexico" by Herkenhoff and Associates. (Note: Where a Time of Concentration [Tc] is less than ten minutes from the chart, the Intensity value equal to ten minutes was used as shown on the curve for a 100 year storm in Figure V.)

C = Runoff Coefficient (No unit)

Quantities of runoff were computed on a 100 year storm frequency for both the undeveloped and the proposed final development form.

III ESTIMATED RUNOFF - UNDEVELOPED STATE

Drainage within the boundary of the site in the undeveloped state forms the basis fo comparison with the drainage of the site in its developed state.

Offsite drainage is shown on Plat No. 2.

The following table shows runoff in the undeveloped state:

TABLE 1

Runoff in Undeveloped State

Drainage Basin	Elev.Diff. (feet)	Length of Flow (feet)	Tc (min)	I "/hr.	C[2]	Area (Ac)	Q (cfs)
Site	70'	2400'	12	5.11	0.35	87.28	156
A_{50}						19.61	28
A_{51}						36.88	50
A_{52}						2.01	3

[2]Table XII, Master Plan of Drainage, City of Albuquerque, New Mexico and Environs, 1963, G. Herkenhoff & Associates, C for undeveloped areas = 0.35

III ESTIMATED RUNOFF - DEVELOPED STATE

Table 3 shows the results of calculations of runoff in the developed subdivision state.

Because development increases the area of impervious surfaces, runoff rates increase to a point which is greater than that which existed before development. To offset this increase, onsite restrictions of flows must be incorporated into the development of the subdivision. While this can take many forms, the most practical solution for this type of development is to utilize onsite ponding for as many lots as practical. This approach can help satisfy A.M.A.F.C.A.'s requirements concerning developed flows.

In analyzing the runoff which leaves the subdivision, a composite runoff coefficient was developed based upon the percentage of different types of surfaces in the drainage area.

The following is a breakdown for this site:

Total subdivision area = 87.28 ac.

Total ponded area = 16.30 ac.

Total onsite length of street excluding Eubank Blvd. N.E.

32'F-F = 11,000 ft.

44'F-F = 2,400 ft.

Width of asphalt and concrete 32' + 8' sidewalk (both sides) = 40'

44' + 8' sidewalk (both sides) = 52'

1. Asphalt & concrete area (streets and sidewalk)

$\frac{40 \times 11{,}000}{43{,}560} = 10.10$ ac. (32' F-F street)

$\frac{52 \times 2{,}400}{43{,}560} = 2.86$ ac. (44' F-F street)

2. Driveways

$\frac{320 \times 27' \times 15'}{43{,}560} = 2.97$ ac.

Total asphalt and concrete = 15.93 ac.

3. Roofs

$\frac{1900\ ft^2 \times 320}{43{,}560} = 13.96$ ac.

TABLE 2

Composite Runoff Coefficient

Area Description	Area	% of Total Area	Std. "C" Coeff.	Wt. "C" Coeff.
Roofs	13.96	20	0.825	0.17
Asphalt & Concrete	15.93	22	0.825	0.18
Lawns, shrubs and open space	41.09	58	0.30	0.17
Total Area (Not ponded)	70.98ac. 16.3 87.28	100%		= 0.52

Use a coefficient of runoff of 0.50

TABLE 3

Runoff in Developed State

Drainage Basin	Elev.Diff. (feet)	Length of Flow (feet)	Tc (min)	I "/hr.	C	Area (Ac)	Q (cfs)
A_1	68	2050	10	5.4	0.5	11.2	30
A_2	54	1800	10	5.4	0.5	15.5	42
A_3	40	1600	10	5.4	0.5	9.4	25
A_4	34	1200	10	5.4	0.5	7.0	19
A_5	54	2300	12.5	5.04	0.5	14.4	36
A_6	40	1640	10	5.4	0.5	5.8	16
A_7	4	600	10	5.4	0.5	3.0	8
A_8	4	650	10	5.4	0.5	3.0	8
A_9	12	250	10	5.4	0.5	1.1	3
A_{10}	14	1750	10	5.4	0.5	9.0	24
						79.4	

Flows leaving site at concentration points

A_1 thru A_5, plus A_9 & 10	70	4050	22.5	3.98	0.5	67.6	134
A_6	40	1640	10	5.4	0.5	5.8	16
A_7	4	600	10	5.4	0.5	3.0	8
A_8	4	650	10	5.4	0.5	3.0	8
						=	166

V RESULTS AND RECOMMENDATIONS

Summary of results for the site:

1. Runoff before development (within site) = 156 c.f.s.
2. Runoff after development (within site) = 166 c.f.s.

The net result is an increase of 10 c.f.s. over the undeveloped state. This amounts to a 6% increase in the runoff rate. It should be emphasized here that this increase will not have to be born by downstream street systems. All flows leaving this site proceed directly into either the Bear Tributary on the north or the 75' drainage r.o.w. on the south. which cross south

All streets which carry the flows to the exit points can handle the runoff water. The street capacity was based on the city street standard, 4" crown and 0.2' overflow.

The arroyos which receive these flows are subject to some minor grading. The Bear Canyon Tributary has a flood hazard line which encroaches on a dozen or so lots adjacent to the right-of-wya. This encroachment is for a maximum of 30'. With a small amount of fill in this area, flooding will not be a problem. For the purposes of fill material and as insurance against flooding, a trapazoidal section should be established on the south embankment of the Bear Tributary. This could take the shape of 10' wide embankment on top of the slope for access, a 3:1 side slope with an 80' bottom shaped in the 150' ensement. The north side of the channel should not be graded so as to utilize the flood plain volume already available. The construction on the south

embankment should be gently blended into the flowline of the existing channel. Future drop structures, and a defined cross-section of the channel, as recommended by the Rice Report, will not be constructed until development to the north occurs. why wh would do

The 75' drainage right-of-way shall be graded to handle the existing 149 c.f.s.[3] coming from Eubank Blvd. N.E. plus the 134 c.f.s. departing the site. what about flows from Malaguena A typical cross-section would have 2:1 side slopes, a 10' bottom and depth of flow of 2.0'. Such a section would handle 325 c.f.s. at a 0.0325 slope. This channel will empty into the Bear Canyon Arroyo. cone dwt? velocity Fr- cross-spam

Offsite flows from A_{50} and A_{52} can be diverted to the north and south respectively by simple ditch-dikes paralleling the site boundary. For A_{50}, the relationship between the top of the ditch and the flowline should not be less than 1.25' with a bottom of 10' and side slopes of 2:1 at a minimum slope of 0.0075. For A_{52}, the typical section can be 1.0' between ditch bank? and flowline, bottom of 5', side slopes of 2:1 at a minimum slope of 0.0050. Refer to Plat No. 3 for typical cross-sections of the drainageways within the subdivision.

Ponding areas, where called for in backyards, would be best situated toward the rear of the yard. There should be a minimum of a 5 foot buffer zone between the rear property lines and the edge of the pond. This will protect any walls which might be constructed. In no case should ponded waters be allowed to stand

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[3]Data from "Revised Drainage Study for Academy Estates", Ralph K. Hicks, May 1973. yes

against the wall.

Ponds should average six inches deep and the minimum surface area should not be less than 30%[4] of the total area which is drained into the pond.

[4]Sized for a 100-year - 6 hour storm as per Technical Paper #40

$Q = 58$

$S = .02$

$b = 19$

$$\frac{(58)(.013)}{19^{8/3}(.02)^{1/2}} = .00207$$

$$D/b = (.02)(19) = .38$$

$$(.38)(19) = 7.22 \text{ area}$$

$$V = \frac{58}{7.22} = 8 \text{ ft/sec.}$$

$$\frac{(134)(.013)}{24^{8/3}(.01)} = .00363$$

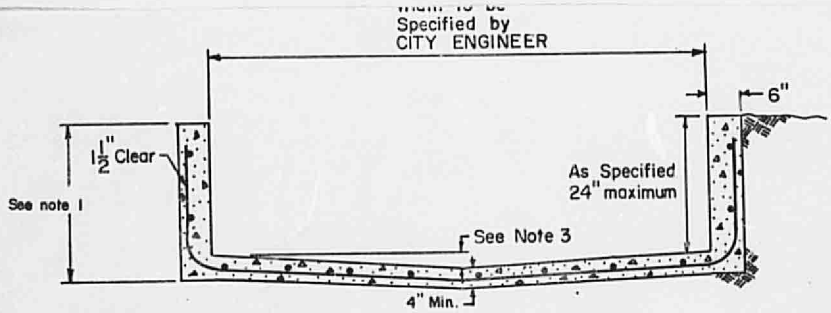
213
150

414
213
201

$$D/b = .027465 = .66$$

$A - 15.84$

$$\frac{134}{15.84} = 8.5$$



All steel to be #4 rebars on 12" centers

TYPE B

CITY OF ALBUQUERQUE

PAVING
TYPICAL LINING
FOR DRAINAGE EASEMENTS
PAGE 317

VI SUMMARY

The following is a summary of the recommendations found in the report which must be incorporated in the construction drawings and field inspections during construction.

1. The critical street, Estrellita del Norte Road, as it slopes south, must be constructed with the minimum slope of 0.75% and with a minimum crown in order to adequately handle the design storm.
2. The lots shown as ponded should be graded to store water in the rear yard.
3. The 75' drainage r.o.w. should be graded as specified in the report and adequate protection established on the banks where flows depart Eubjank Blvd. N.E. & entire length ?
4. The Bear Canyon Tributary should have the south embankment defined by grading construction and adequate embankment protection established along the curve sections of the channel.
5. The 20' storm drain easements should be 19' rectangular channels with 1' high vertical walls. Construction should be of 2,500 psi concrete with filled concrete block walls. Adequate inlet and rundown protection, constructed of concrete, should be provided for all the storm drain easements. check depth & velocity d=.4 v=8
6. The 25' storm drain easement should be a 24' rectangular channel with 2' high vertical walls. Construction should be the same as the above channels with a concrete rundown from the outlet into the channel. check depth & velocity d=.7 v=8.5

7. Ditch-dikes should be constructed as shown on Plat No. ~~3~~ to provide protection from offsite flows from the east. not there

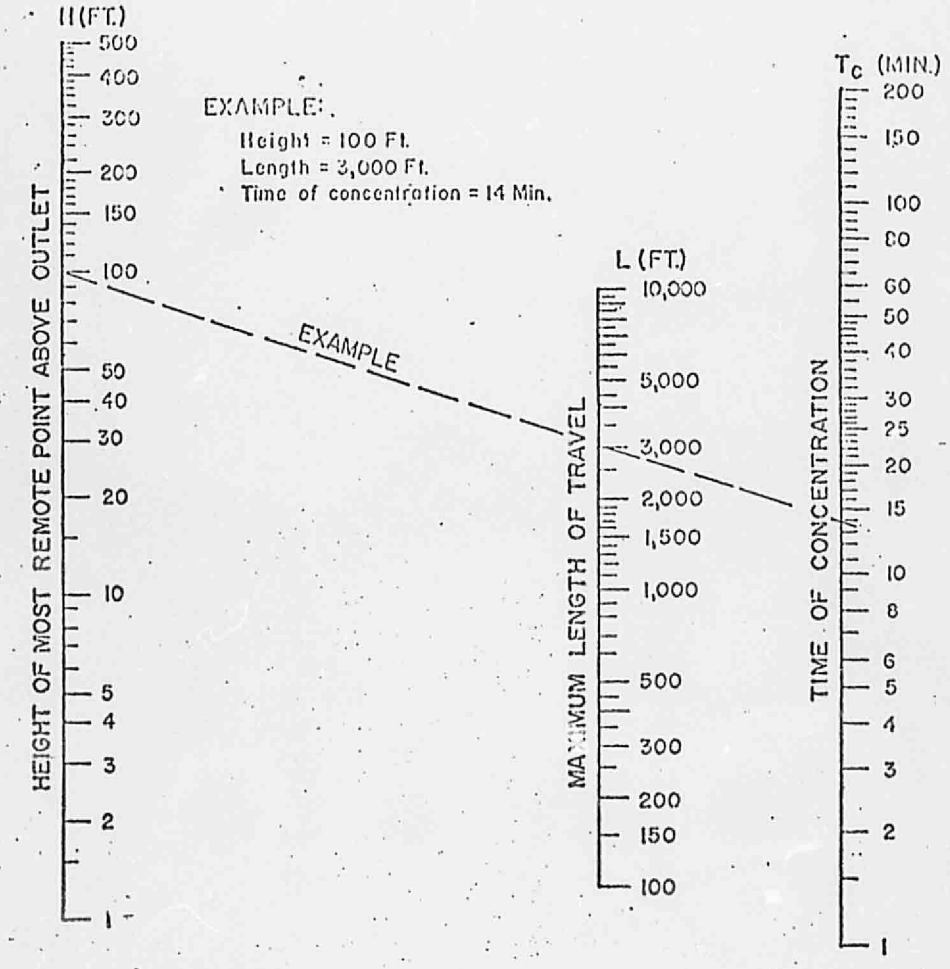
The developer, by following the guidelines set forth in this report, will be able to develop a subdivision whic will have a beneficial effect on the drainage characteristics of not only the immediate site, but the downstream future developments.

Respectfully submitted,

MURRAY-McCORMICK, INC.

BO K. JOHNSON, N.M.P.E. #5922
Vice President

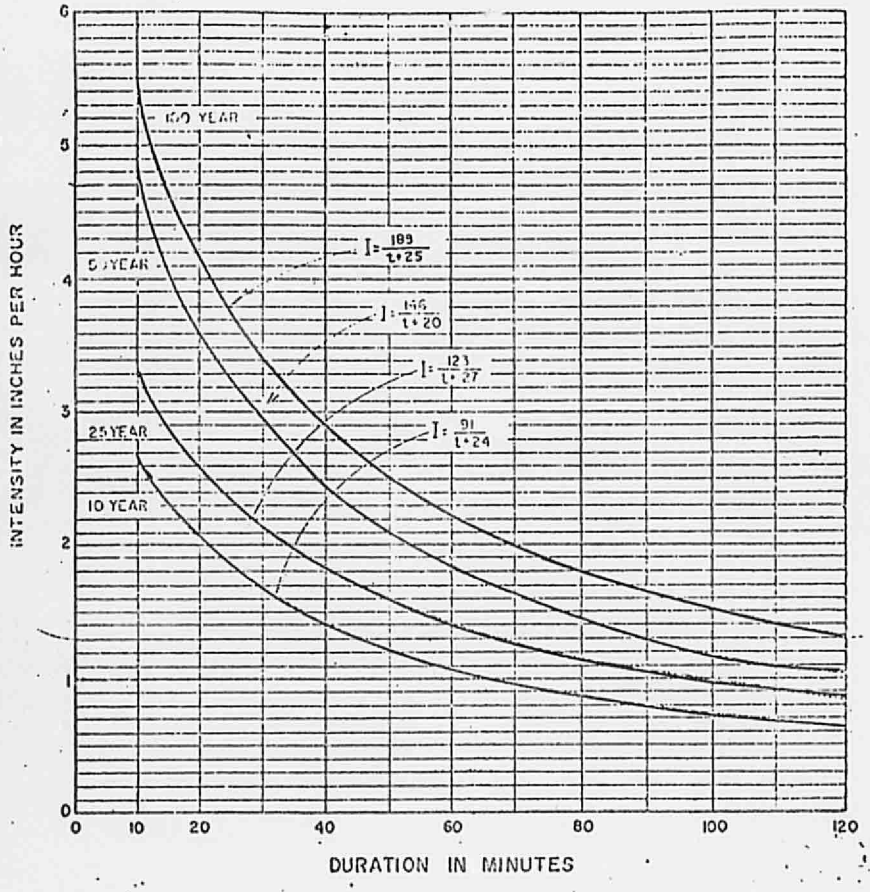
Estellita del Norte Rd will have 36" sewer in it & cannot be permanently paved.



Based on study by P. Z. Kirpich,
Civil Engineering, Vol. 10, No. 6, June 1940, p. 332

TIME OF CONCENTRATION OF SMALL DRAINAGE BASINS

Reprinted from "Design of Roadside Drainage Channels - Hydraulic Engineering Circular No. 6", April 1962, U. S. Dept.



MASTER PLAN OF DRAINAGE
CITY OF ALBUQUERQUE - NEW MEXICO
AND ENVIRONS

INTENSITY DURATION
FREQUENCY CURVES

(ALBUQUERQUE AREA - 1961)

GORDON HERKENHOFF & ASSOC.
CONSULTING ENGINEERS
ALBUQUERQUE, NEW MEXICO

CHART
1

STREET CAPACITY TABLES

50' R.O.W. 32' FACE-FACE 8" CURB 8" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	15.3611	51.3731	.0050	.0707	.2990	.4472	2.8545	43.8477
.0165	15.3611	51.3731	.0100	.1000	.2990	.4472	4.0368	62.0100
.0165	15.3611	51.3731	.0150	.1225	.2990	.4472	4.9441	75.9464
.0165	15.3611	51.3731	.0200	.1414	.2990	.4472	5.7089	87.6954
.0165	15.3611	51.3731	.0250	.1581	.2990	.4472	6.3828	98.0464
.0165	15.3611	51.3731	.0300	.1732	.2990	.4472	6.9920	107.4045
.0165	15.3611	51.3731	.0350	.1871	.2990	.4472	7.5522	116.0101
.0165	15.3611	51.3731	.0400	.2000	.2990	.4472	8.0736	124.0200

50' R.O.W. 32' FACE-FACE 8" CURB 6" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	18.9167	51.3569	.0050	.0707	.3683	.5138	3.2801	62.0482
.0165	18.9167	51.3569	.0100	.1000	.3683	.5138	4.6387	87.7494
.0165	18.9167	51.3569	.0150	.1225	.3683	.5138	5.6813	107.4706
.0165	18.9167	51.3569	.0200	.1414	.3683	.5138	6.5602	124.0964
.0165	18.9167	51.3569	.0250	.1581	.3683	.5138	7.3345	138.7439
.0165	18.9167	51.3569	.0300	.1732	.3683	.5138	8.0345	151.9864
.0165	18.9167	51.3569	.0350	.1871	.3683	.5138	8.6783	164.1640
.0165	18.9167	51.3569	.0400	.2000	.3683	.5138	9.2775	175.4983

50' R.O.W. 32' FACE-FACE 8" CURB 4" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	22.4722	51.3453	.0050	.0707	.4377	.5765	3.6797	82.6933
.0165	22.4722	51.3453	.0100	.1000	.4377	.5765	5.2038	116.9417
.0165	22.4722	51.3453	.0150	.1225	.4377	.5765	6.3734	143.2238
.0165	22.4722	5123453	.0200	.1414	.4377	.5765	7.3593	165.3806
.0165	22.4722	51.3453	.0250	.1581	.4377	.5765	8.2280	184.9011
.0165	22.4722	51.3453	.0300	.1732	.4377	.5765	9.0133	202.5490
.0165	22.4722	51.3453	.0350	.1871	.4377	.5765	9.7355	218.7780
.0165	22.4722	51.3453	.0400	.2000	.4377	.5765	10.4077	233.8835

50' R.O.W. 32' FACE-FACE 8" CURB 2" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0165	26.0278	51.3384	.0050	.0707	.5070	.6358	4.0585	105.6348
.0165	26.0278	51.3384	.0100	.1000	.5070	.6358	5.7396	149.3901
.0165	26.0278	51.3384	.0150	.1225	.5070	.6358	7.0296	182.9648
.0165	26.0278	51.3384	.0200	.1414	.5070	.6358	8.1171	211.2696
.0165	26.0278	51.3384	.0250	.1581	.5070	.6358	9.0752	236.2066
.0165	26.0278	51.3384	.0300	.1732	.5070	.6358	9.9414	258.7513
.0165	26.0278	51.3384	.0350	.1871	.5070	.6358	10.7379	279.4834
.0165	26.0278	51.3384	.0400	.2000	.5070	.6358	11.4793	298.7803

STREET CAPACITY TABLES

60' R.O.W. 44' FACE-FACE 8" CURB 8" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0160	20.3111	61.3637	.0050	.0707	.3310	.4785	3.1467	63.9133
.0160	20.3111	61.3637	.0100	.1000	.3310	.4785	4.4501	90.3871
.0160	20.3111	61.3637	.0150	.1225	.3310	.4785	5.4503	110.7011
.0160	20.3111	61.3637	.0200	.1414	.3310	.4785	6.2934	127.8267
.0160	20.3111	61.3637	.0250	.1581	.3310	.4785	7.0363	142.9146
.0160	20.3111	61.3637	.0300	.1732	.3310	.4785	7.7079	156.5551
.0160	20.3111	61.3637	.0350	.1871	.3310	.4785	8.3254	169.0988
.0160	20.3111	61.3637	.0400	.2000	.3310	.4785	8.9003	180.7742

60' R.O.W. 44' FACE-FACE. 6" CURB 6" CROWN .2' OVERFLOW

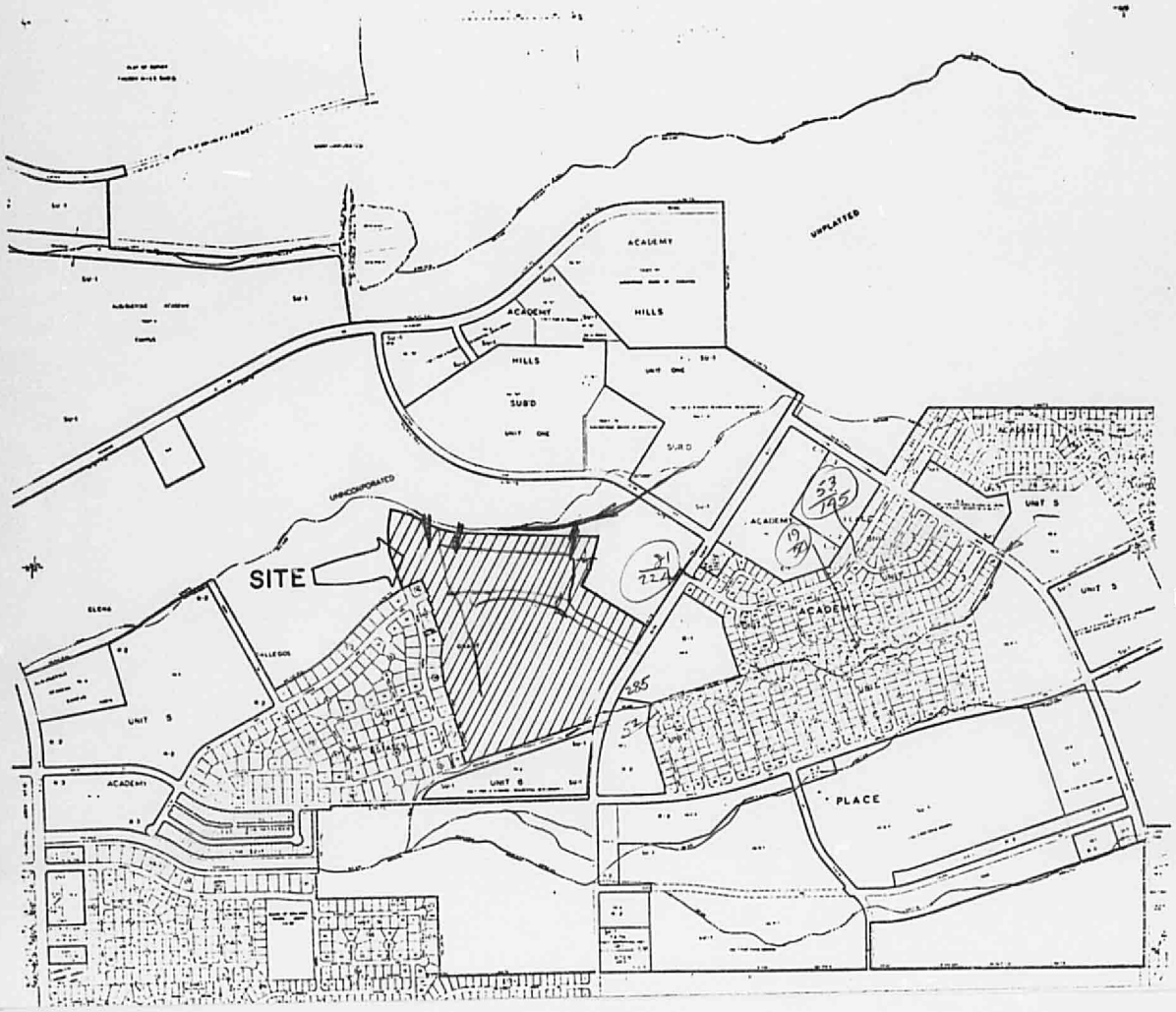
N	A	P	S	S1/2	R	R2/3	V	Q
.0160	25.2000	61.3519	.0050	.0707	.4107	.5526	3.6337	91.5700
.0160	25.2000	61.3519	.0100	.1000	.4107	.5526	5.1389	129.4996
.0160	25.2000	61.3519	.0150	.1225	.4107	.5526	6.2938	158.6039
.0160	25.2000	61.3519	.0200	.1414	.4107	.5526	7.2675	183.1401
.0160	25.2000	61.3519	.0250	.1581	.4107	.5526	8.1253	204.7568
.0160	25.2000	61.3519	.0300	.1732	.4107	.5526	8.9008	224.2998
.0160	25.2000	61.3519	.0350	.1871	.4107	.5526	9.6139	242.2715
.0160	25.2000	61.3519	.0400	.2000	.4107	.5526	10.2777	258.9992

60' R.O.W. 44' FACE-FACE 8" CURB 4" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0160	30.0889	61.3435	.0050	.0707	.4905	.6220	4.0900	123.0643
.0160	30.0889	61.3435	.0100	.1000	.4905	.6220	5.7842	174.0392
.0160	30.0889	61.3435	.0150	.1225	.4905	.6220	7.0841	213.1536
.0160	30.0889	61.3435	.0200	.1414	.4905	.6220	8.1800	246.1286
.0160	30.0889	61.3435	.0250	.1581	.4905	.6220	9.1456	275.1301
.0160	30.0889	61.3435	.0300	.1732	.4905	.6220	10.0185	301.4447
.0160	30.0889	61.3435	.0350	.1871	.4905	.6220	10.8212	325.5975
.0160	30.0889	61.3435	.0400	.2000	.4905	.6220	11.5683	348.0784

60' R.O.W. 44' FACE-FACE 8" CURB 2" CROWN .2' OVERFLOW

N	A	P	S	S1/2	R	R2/3	V	Q
.0160	34.9778	61.3384	.0050	.0707	.5702	.6877	4.5221	158.1723
.0160	34.9778	61.3384	.0100	.1000	.5702	.6877	6.3952	223.6895
.0160	34.9778	61.3384	.0150	.1225	.5702	.6877	7.8325	273.9625
.0160	34.9778	61.3384	.0200	.1414	.5702	.6877	9.0442	316.3447
.0160	34.9778	61.3384	.0250	.1581	.5702	.6877	10.1117	353.6841
.0160	34.9778	61.3384	.0300	.1732	.5702	.6877	11.0768	387.4415
.0160	34.9778	61.3384	.0350	.1871	.5702	.6877	11.9643	418.4846
.0160	34.9778	61.3384	.0400	.2000	.5702	.6877	12.7904	447.3789


SITE
ACADEMY
HILLS
SUBD
UNIT ONE
UNPLATTED
UNINCORPORATED
UNIT 5
UNIT 6
PLACE

E-21-Z

PLAT 1

CITY

OF

ALBUQUERQUE, NEW MEXICO

SPECIAL ASSESSMENT DISTRICT NO. 184

ENGINEER'S REPORT

DEPARTMENT OF PUBLIC WORKS

E. F. HENSCH, DIRECTOR

Scanlon & Associates, Inc.
7911 Mountain Road, N.E.
Albuquerque, New Mexico 87110

City of Albuquerque
Special Assessment District No. 184
Engineer's Report

Analysis of Design

Street Improvements

Street improvements will consist of grading and the construction of sidewalk, standard curb and gutter and asphaltic concrete pavement. The pavement thickness for residential will be 6 inches of compacted subgrade, 3 inches of asphaltic concrete base course, and one inch of asphaltic concrete surface course. The streets in areas zoned for residential will vary from 20.00' to 45.25' wide, back of curb to back of curb. The pavement thickness for arterial will be 12 inches of compacted subgrade, 6 inches cement-treated base course, 3 inches of asphaltic concrete base course, and one inch of asphaltic concrete surface course. The arterial streets will vary from 67.25' to 87.25' wide, back of curb to back of curb. The 67.25' width will have a 16-foot median, the 87.25' width will have a 36-foot median. Sidewalks will be constructed between the property line and the back of curb and will be 4' wide on residential or collector streets and 6' wide on arterial streets.

In order to properly dispose of surface drainage, it will be necessary to install storm sewers and construct drainage control works for the following streets:

Juan Tabo Boulevard N.E. from Baja Drive N.E. to the Bear Arroyo. A storm sewer is necessary at this location to take storm water from the existing subdivision East of Juan Tabo, North to the Bear Arroyo. If this storm sewer were not built, this storm water would flow South to Montgomery Blvd.

The culvert pipe which discharges the 100 year storm from the Juan Tabo Dam passes under Juan Tabo Blvd. The cost of this culvert from right-of-way to right-of-way has been included in the storm sewer costs for this project.

Storm water at the intersection of Eubank Boulevard and Juan Tabo Boulevard. Storm water will flow north on Juan Tabo and will collect in inlets before it goes onto Eubank. Enclosed drainage will outflow just West of Eubank. A surface rundown on Eubank will also be necessary to discharge large flows. The Bear Arroyo Tributary crosses Eubank Blvd. just North of this intersection; however, there is not sufficient grade to discharge the storm water from Juan Tabo into the arroyo where it crosses Eubank Blvd. We recommend that an easement be acquired from this intersection North-west to the Bear Arroyo Tributary and a ditch constructed to carry the storm flow. The cost of a ditch has been included in this estimate.

Malaguena discharges the storm flow of a fairly large area onto Eubank Blvd. This water then drains South on Eubank approximately 1,650 feet to a drainage easement. When the West side of Eubank is constructed a storm sewer system should be installed in Eubank to carry this and other flows South to the drainageway just North of Spain Road.

Bear Canyon Arroyo and Eubank Blvd., a temporary dip section will be constructed with two 27" x 42" arch culverts to carry low flows.

On Indian School Rd. from Wyoming Blvd. to Eubank Blvd., concrete valley gutters will be constructed on the North and South side of all intersections.

At the intersection of Benavides Road and Del Rey Road S.W., there is a drainage easement that discharges into this intersection. This water flows from other streets upstream and a short concrete lined section is necessary just upstream of the intersection.

A drop inlet and short section of storm drain is required to drain the San Venito Place cul-de-sac into the Alameda Drain.

The estimated construction cost for storm sewer improvements is $250,126.85.

Water Improvements

Water mains are to be 6", 10", 12", 16" diameter pipe. The pipe will be cast-iron pipe or asbestos cement pipe and concrete cylinder pipe. The 10", 12" and 16" diameter pipe will be used on Eubank Blvd.

N.E. and Juan Tabo Blvd. N.E. Fire hydrants will be installed as required by City Code. Water services are to be installed from the main line to the property line or as directed by the engineer. This will eliminate the necessity of making water service connections in streets which have been improved.

Sanitary Sewer Improvements

Sanitary sewers are to be 8" diameter pipe. The pipe will be vitrified-clay pipe or ductile-iron pipe. Ductile-iron pipe will be used when the sanitary sewer is very shallow, and also where a sewer line crossing is less than 3' below a water line.

Sanitary sewer service connections will be constructed from the main to the property line at the low point of the property at the right-of-way line or as directed by the engineer. This will eliminate the necessity of making service connections in streets which have been improved.

Sidewalks and Curb and Gutter Improvements

The sidewalk and curb and gutter improvements encompass an area bounded by Carlisle Boulevard N.E. on the West and Juan Tabo Boulevard N.E. on the East; Montgomery Boulevard N.E. on the North and Indian School Road N.E. on the South.

Sidewalks are being constructed where there is no sidewalk or where existing sidewalk does not meet the City of Albuquerque standards. Sidewalks will vary in width from 48" to 72" and will be constructed of portland cement concrete 4" in depth. Drivepads will be 6" in depth. Curb and gutter will be replaced where sidewalks are to be constructed, if the existing curb and gutter is broken or out of alignment. The work will also consist of adjusting existing water meters to grade or relocating water meters so they will be in the sidewalk area.

Outline of Specifications

The "Uniform Standard Specifications for Public Works Construction for Use of Municipalities and Counties in New Mexico",

Interim Edition, and the current "City of Albuquerque, New Mexico, Special Provisions to the Uniform Standard Specifications for Public Works Construction For Use of Muricipalities and Counties in New Mexico" will be used as a part of the contract documents for this project.

Determination of Benefits

General

In connection with Special Assessment District No. 184, Pete Test of Scanlon & Associates, Inc., Engineers, went to the site of the proposed improvements, and inspected the area to be improved and to be assessed. Consideration was given to the relative situation and topography of each parcel to be assessed. It was concluded that the front-foot method would be the most equitable method for determining benfits for the streets, sewer, water, and sidewalk and curb and gutter improvements. If literal compliance to the front-foot method would result in an unfair and inequitable apportionment of estimated maximum benefit and/or assessment against particular parcels, an equitable adjustment in those benefits and/or assessments would be made to more nearly conform to actual benefits.

Street Improvements

The estimated maximum benefits for the areas to be improved were determined by the front-foot method. The benefits derived from intersection improvements were distributed one-half block from the intersection or in the case of cul-de-sacs against each lot abutting the cul-de-sac.

Water Improvements

The estimated maximum benefits for the area to be improved were determined by the front-foot method. Certain properties have been exempted and others have partial exemptions, as outlined by City policies. The applicable policy numbers are shown on the Estimated Maximum Benefits roll.

Water service connection benefits were assessed directly to each property to receive such services and were not considered as a part of the front-foot estimated maximum benefit.

Sewer Improvements

The estimated maximum benefits for areas to be improved were determined by the front-foot method. Certain properties have been exempted and others have partial exemptions, as outlined by City policies. The applicable policy numbers are shown on the Estimated Maximum Benefits roll.

Sewer service connection benefits were assessed directly to each property to receive such services and were not considered as a part of the front-foot estimated maximum benefit.

Sidewalk and Curb and Gutter Improvements

The estimated maximum benefits for areas to be improved were determined by the front-foot method.

Certification

It is the engineer's opinion, after viewing the properties involved, that the proposed street, sewer, water improvements and sidewalk improvements will increase the value of any given parcel of land set forth in the Estimated Maximum Benefit roll by the estimated maximum benefit amount listed for that parcel.

It is also the engineer's opinion after due consideration of the facts, that the methods of assessment used are the fairest and most equitable for the area being assessed.

Estimated Maximum Benefits

Street Improvements (front-foot method)	$1,137,260.94
Water Improvements (front-foot method)	178,065.71
Water Improvements (Service connections)	30,720.00
Sanitary Sewer Improvements (front-foot method)	196,906.71
Sanitary Sewer Improvements (service connections)	49,535.00
Sidewalk Improvements (front-foot method)	312,213.13
Total Estimated Maximum Benefit:	$1,904,701.49

Signed: Pete Test

Pete Test, Professional Engineer
Scanlon & Associates, Inc.

Street Improvements

	Description	Est. Quantity	Unit	Unit Prices	Total Amount
1	12" Arterial Subgrade preparation	48,000	SY	$ 1.25	$ 60,000.00
2.	6" Residential Subgrade preparation	40,294	SY	.55	$ 22,161.70
3.	6" Cement Treated Base	48,000	SY	3.00	144,000.00
4.	3" Asphaltic Concrete Base Course	88,294	SY	2.70	238,393.80
5.	1" Asphaltic Concrete Surface Course	88,294	SY	1.20	105,952.80
6.	Tack Coat	88,294	SY	.15	13,244.10
7.	Standard Concrete Curb and Gutter & 12" Subgrade preparation	34,200	LF	4.50	153,900.00
8.	Standard Concrete Median Curb and Gutter & 12" Subgrade preparation	13,510	LF	3.50	47,285.00
9.	Extruded Asphalt Curb	2,100	LF	2.50	5,250.00
10.	Sidewalk 4" with 2" Sand Cushion and 6" sub-grade preparation	139,305	SF	.90	125,374.50
11.	Driveway pads 6" with 2" Sand Cushion & 6" Subgrade preparation	58,795	SF	1.25	73,493.75
12.	Concrete Alley Gutter	4,825	LF	4.00	19,300.00
13.	Adjust M.H. to Grade	10	ea	100.00	1,000.00
14.	Adjust Water Valve to Grade	7	ea	60.00	420.00
15.	Reconstruct M.H. Cones	6	ea	160.00	960.00
16.	Remove & Dispose of Existing pavement	1,250	SY	2.50	3,125.00
17.	Remove & Dispose of Existing curb and gutter	925	LF	1.50	1,387.50
18.	Remove & Dispose of Existing Asphalt Curb	1,400	LF	1.00	1,400.00
19.	Remove & Dispose of Existing sidewalk & drive pads	70	SY	1.80	126.00
20.	Remove & Dispose of Existing double-C inlets	4	ea	350.00	1,400.00

	Description	Est. Quantity	Unit	Unit Prices	Total Amount
21.	Double-grate Type-C inlets	4	ea	1,500.00	6,000.00
22.	Standard Concrete Valley Gutter	640	SY	11.25	7,200.00
23.	Earth Work Cut & Fill	98,500	CY	.50	49,250.00
24.	Earth Work Cut to be hauled ½ mile	38,000	CY	.25	9,500.00

TOTAL ESTIMATED CONSTRUCTION COST	$1,090,124.15
Plus 20% for Legal & Engineering & Adminis.	218,024.83
TOTAL ESTIMATED COST (Street Improvements)	$1,308,148.98

Storm Sewer Improvements

	Description	Est. Quantity	Unit	Unit Prices	Total Amount
1.	Furnish & Install 18" RCP	950	LF	$ 12.00	$ 11,400.00
2.	Furnish & Install 24" RCP	80	LF	16.00	1,280.00
3.	Furnish & Install 36" RCP	600	LF	18.00	10,800.00
4.	Furnish & Install 42" RCP	388	LF	25.00	9,700.00
5.	Furnish & Install 48" RCP	130	LF	30.00	3,900.00
6.	Furnish & Install 96" RCP	86	LF	150.00	12,900.00
7.	Trenching & backfilling for 36" RCP & smaller 0'-8' depth	1,630	LF	5.50	8,965.00
8.	Trenching & backfilling for 42" - 48", 8'-10' depth	388	LF	10.00	3,880.00
9.	Trenching & backfilling for 42"-48", 12'-14' depth	130	LF	15.00	1,950.00
10.	Trenching & backfilling 96" RCP 0'-8' depth	86	LF	14.00	1,204.00
11.	Type-C manhole 6'dia. 0'-6' depth	2	ea	650.00	1,300.00
12.	Type-E manhole 6'dia. 0'-6' depth	11	ea	800.00	8,800.00
13.	Extra depth for 6' dia.MH	80	LF	45.00	3,600.00
14.	Double grate Type C inlet	12	ea	1,500.00	18,000.00
15.	Headwall at outlet end of SD (Bear Arroyo) & Eubank & Juan Tabo	3	LS	2,000.00	6,000.00
16.	Cattle Guard inlets Manitoba & Juan Tabo Baja Dr. & Juan Tabo	2	LS	10,000.00	20,000.00
17.	Overflow Benavides & DelRey	1	LS	3,000.00	3,000.00

	Description	Est. Quantity	Unit	Unit Prices	Total Amount
18.	Removal & Disposal of Existing Pavement	1,200	SY	2.00	2,400.00
19.	Removal & Disposal of Existing Conc. Cb. & Gtr.	360	LF	1.80	648.00
20.	Concrete Curb & Gutter	360	LF	4.50	1,620.00
21.	Concrete Valley Gutter	330	SY	13.50	4,455.00
22.	Art.Asph.Pvmt incl 12" compact subgrade, 6" CTB prime coat, 3" ABC, tack coat, 1" ASC	600	SY	10.50	6,300.00
23.	Res. Asph. Pvmt. incl 6" compact subgrade, prime coat, 3" ABC, Tack Coat, 1" ASC	275	SY	8.00	2,200.00
24.	Dip Section @ Eubank & Bear Arroyo East ½-2-27" x 42" Arch Pipe with Rip Rap & Retaining walls	1	LS	50,000.00	50,000.00
25.	Grading Ditch from Eubank to the Tribute Bear Arroyo	1	LS	8,000.00	8,000.00
26.	Permits and Fees	1	LS	1,000.00	1,000.00
27.	Testing Allowance	1	LS	4,087.04	4,087.04
	TOTAL ESTIMATED CONSTRUCTION COST				$208,439.04
	Plus 20% for Legal Engineering & Adminis.				41,687.81
	TOTAL ESTIMATED COST (Storm Sewer Improvements)				$250,126.85

Water Improvements

	Description	Est. Quantity	Unit	Unit Prices	Total Amount
1.	6" Cast-Iron or Asbestos Cement Pipe, Incl Trenching & Backfill	16,058	LF	$ 5.75	$ 92,333.50
2.	10" Cast-Iron or Asbestos Cement Pipe, Incl. Trenching & Backfill	1,395	LF	14.00	19,530.50
3.	12" Cast-Iron or Asbestos Cement Pipe, Incl. Trenching & Backfill	100	LF	14.00	1,400.00
4.	16" Cast Iron or Asbestos Cement Pipe, Incl. Trenching & Backfill	1,075	LF	18.00	19,350.00
5.	6" Water Valve & Valve box w/bearing Flange	30	ea	275.00	8,250.00

	Description	Est. Quantity	Unit	Unit Prices	Total Amount
6.	10' Water Valve & Valve box w/bearing Flange	2	ea	550.00	1,100.00
7.	12" Water Valve & Valve box w/bearing Flange	1	ea	700.00	700.00
8.	16" Water Valve & Valve box w/bearing Flange	1	ea	2,500.00	2,500.00
9.	F.H. 4' Bury Completed in place	28	ea	600.00	16,800.00
10.	6" x 6" Tapping Tee	7	ea	240.00	1,680.00
11.	16" x 6" Tapping Tee	4	ea	750.00	3,000.00
12.	36" x 6" Tapping Tee	2	ea	1,500.00	3,000.00
13.	16" Cap Remove	1	ea	35.00	35.00
14.	16" x 16" x 16" x 16" Cross	1	ea	1,100.00	1,100.00
15.	16" x 6" Tee	2	ea	600.00	1,200.00
16.	16" x 6" Reducer	1	ea	345.00	345.00
17.	16" x 10" Reducer	1	ea	420.00	420.00
18.	8" x 6" Tapping Tee	1	ea	300.00	300.00
19.	Wet Connections	6	ea	75.00	450.00
20.	Fittings under 14" & under	6,650	LBS	1.25	8,312.50
21.	1¼" Serviceline-Connection w/sidewalk meterbox & plate	128	ea	200.00	25,600.00
22.	Permits & fees	1	LS	500.00	500.00
23.	Testing allowance	1	LS	3,657.19	3,657.19
	TOTAL WATER IMPROVEMENTS				$211,563.19
	Plus 20% Legal, Engineering & Adminis.				42,312.64
	TOTAL ESTIMATE COST (Water Improvements)				$253,875.83

Sanitary Sewer Improvements

	Description	Est. Quantity	Unit	Unit Prices	Total Amount
1.	8" Ductile Iron Pipe	625	LF	$ 7.15	$ 4,468.75
2.	8" VCP Extra Strength Pipe	12,630	LF	4.40	55,572.00
3.	Trenching & Backfilling 0'-8'	4,022	LF	3.30	13,272.60
4.	Trenching & Backfilling 8'-14'	8,875	LF	4.95	43,931.25
5.	Trenching & Backfilling 14'-20'	358	LF	15.40	5,513.20
6.	Type B manhole 4' dia. 0'-8'	10	ea	415.00	4,150.00
7.	Type B manhole 4' dia. 8'-14'	22	ea	590.00	12,980.00
8.	Type B manhole 4' dia. 14'-20'	8	ea	850.00	6,800.00
9.	Converting Type B Manhole to Type C Manhole	4	ea	100.00	400.00
10.	Converting Type B Manhole to Type E Manhole	27	ea	90.00	2,430.00
11.	Pavement Removal & replacement	60	SY	12.00	720.00
12.	4" Service Connection on streets w/ROW of 50' & 60'	99	ea	220.00	21,780.00
13.	4" Service Connection on streets w/ROW of 86'	63	ea	285.00	17,955.00
14.	4" Service Connection on streets w/ROW of 106'	28	ea	350.00	9,800.00
15.	Connect to exist. MH	9	ea	75.00	675.00
16.	Permits and fees	1	LS	1,900.00	1,900.00
17.	Testing allowance	1	LS	3,151.92	3,151.92
	SANITARY SEWER ESTIMATED COST				$205,368.09
	Plus 20% Legal, Engineering & Adminis.				41,073.62
	TOTAL ESTIMATED COST (Sanitary Sewer Improvement)				$246,441.71

Sidewalk and Curb and Gutter Improvements

	Description	Est. Quantity	Unit	Unit Prices	Total Amount
1.	4" Sidewalk with 2" sand cushion & 6" Subgrade	260,245	SF	$ .90	$234,220.50
2.	6" Driveway Pads with 2" sand Cushion & 6" Subgrade	13,899	SF	1.25	17,373.75
3.	Remove Concrete Curb & Gutter & Disposal	130	LF	1.00	130.00
4.	Standard Curb & Gutter	130	LF	3.00	390.00
5.	Permits & Fees	1	LS	2,223.73	2,223.73
6.	Testing Allowance	1	LS	5,839.63	5,839.63
	TOTAL ESTIMATED CONSTRUCTION COST				$260,177.61
	Plus 20% for Legal, Engineering & Administration				52,035.52
	TOTAL ESTIMATED COST (Sidewalk & Curb & Gutter Imp.)				$312,213.13

Summary of Estimated Cost

		Construction	Legal, Engrg. & Adminis.	Total
1.	Street Improvements	$1,090,124.15	$218,024.83	$1,308,148.98
2.	Storm Sewer Improvements	208,439.04	41,687.81	250,126.85
3.	Water Improvements	211,563.19	42,312.64	253,875.83
4.	Sanitary Sewer Improvements	205,368.09	41,073.62	246,441.71
5.	Sidewalk, Curb, Gutter Improvements	260,177.61	52,035.52	312,213.13
	TOTALS	$1,975,672.08	$395,134.42	$2,370,806.50

Explanation of Defrayed Cost

It is estimated that $446,105.01 will be defrayed from sources other than Special Assessments and that $1,904,701.49 will be assessed against the tracts or parcels of land in the assessment area that are to be improved. The estimated $466,105.01 defrayed cost shall be funded as follows:

From storm sewer funds	$250,126.85
From street funds	$170,888.04
From water funds	$ 45,090.12
Total:	$466,105.01

From street funds, the $170,888.04 is the additional cost for concrete median on Juan Tabo Boulevard left turn bays and excess pavement on intersections on Juan Tabo Boulevard N.E.

From water funds, the $45,090.12 is the additional cost for 16"-12" & 10" on Juan Tabo Boulevard & Eubank Boulevard.

The City will be assessed for improvement placed on and/or along City-owned property and are listed as follows:

Street Improvements	$ 6,272.64
Water Improvements	$ 1,584.00
Sidewalk, Curb & Gutter Improvements	$ 14,200.00
Subtotal	$ 22,056.64
Defrayed Cost as Listed Above	$466,105.01
Total Cost to the City	$488,161.65

SPECIAL ASSESSMENT DISTRICT NO. 184

Typical Estimated Cost

I. STREET IMPROVEMENTS

	Estimated Assessed Cost Front Foot
32' flowline to flowline residential pavement including sidewalks	$ 18.59
40' flowline to flowline residential pavement including sidewalks	21.12
44' flowline to flowline residential pavement including sidewalk	22.39
66' flowline to flowline arterial pavement including sidewalk	36.23
86' flowline to flowline arterial pavement including sidewalk	36.23

Above prices include 4' sidewalk on residential streets and 6' sidewalk on arterial streets.

Cost Factors:	Assessed Cost
Arterial pavement	$ 9.96
Residential pavement	5.70
Curb and gutter	5.40
Sidewalk	1.08
Driveway pads	1.50
Cutting or filling over 2' on arterial streets	0.60 CY

II. SANITARY SEWER IMPROVEMENTS

	Estimated Assessed Cost Front Foot
All 8" V.C.P. sewer line	$ 8.05
Service connection residential: standard 4' cast-iron pipe including tee and permit for a 60' ROW	264.00
Service connection arterial: standard 4" cast-iron pipe including tee and permit for an 86' ROW	342.00
Service connection arterial: standard 4" cast-iron pipe including tee and permit for an 106' ROW	420.00

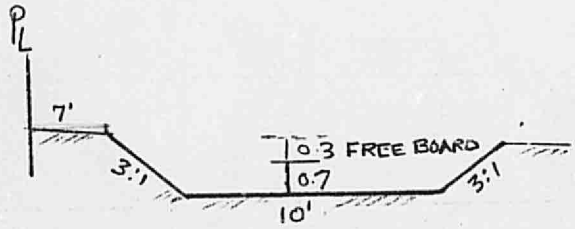
III. WATER IMPROVEMENTS

6" water line, residential street service connection, standard 1-¼" copper	$ 6.00
tubing, corp. stop, curb stop, meter box & lid,	240.00
6" water line, arterial street	10.56

IV. SIDEWALK IMPROVEMENTS

4" sidewalk	$ 1.08 SF
6" driveway pad	1.50 SF

CANDLELIGHT HILLS
DRAINAGE DITCH



Earth Channel

$$Q = A \times V$$
$$= A \times \frac{1.486}{n} \cdot R^{2/3} S^{1/2}$$
$$= 8.47 \times \frac{1.486}{0.025} \times 0.7 \times 0.105$$
$$= 37 \text{ C.f.s.}$$

A = 8.47 SQ. FT.
P = 14.43 FT.
R = 0.59
$R^{2/3}$ = 0.7
S = 1.1 %
$S^{1/2}$ = 0.104
n = 0.025

MURRAY-McCORMICK, INC.
ENVIRONMENTAL DESIGN
ENGINEERING·PLANNING·SURVEYING
2601 WYOMING BLVD., NE SUITE F / ALBUQUERQUE, NEW MEXICO 87110 / 505-292-1936

JOB NO. _____ DATE _____
PROJECT _____
SCALE _____

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

October 17, 1975

Mr. Bo Johnson
Murray-McCormick, Inc.
2601 Wyoming N.E. Suite F
Albuquerque, N.M. 87110

RE: DRAINAGE STUDY CANDLELIGHT HILLS

Dear Mr. Johnson:

The subject drainage study is approved subject to the following conditions:

1. Submitting a grading plan prior to any grading.

2. Approval of all construction plans by the City Engineer. These plans shall show all drainage improvements and details as well as water, sewer, and street improvements.

3. Construction of a stabilized arroyo on the south of the property to handle a flow we agree upon prior to receiving water and sewer service.

4. Assurance that the Bear Arroyo Tributary will be constructed without public funds in accordance with the Northeast Heights Drainage Management Plan.

Very truly yours,

Kleston H. Laws

Kleston H. Laws
Assistant City Engineer-Hydrology

KHL/fs

cc - Mr. John Robert

October 24, 1975

This Agreement binds Western Development Company, its heirs or assignees, and Academy Development Company, its heirs or assignees, to improve, to the City of Albuquerque Standards, the Bear Tributary Arroyo, that portion platted under the title of Candlelight Hills (Book #D6 , Page #185). This improvement will be required in conjunction with the approval of any improvement plans for the development of the adjacent tract of land described as Tract "A" & "B" of Academy Estates, Unit 7, (Book #D6 , Page #157) when such improvement interrupts the established 100-year Flood Plain.

In the event said Tracts "A" & "B" of Academy Estates, Unit 7 are sold, this Agreement is binding on the purchaser .

APPROVED:

Gerhard Muller, President
Western Development Company

Gary Swearingen, President
Academy Development Company

WITNESS

CITY OF ALBUQUERQUE, NEW MEXICO
CITY ENGINEER'S OFFICE

MEMORANDUM - March 31, 1976

TO: Mr. Wes Trask, Design Engineer
FROM: K. H. Laws, Assist. City Engineer-Hydrology
SUBJECT: CANDLELIGHT HILLS PHASE II REVIEW

I believe a few more lines ~~or~~ and notes on sheet 16 would provide an excellent layout sheet for water, sewer and paving and eliminate the need for sheet 10, 11 and 15. It will allow everyone, designers, surveyors, inspectors, administrators and etc. to evaluate overall system, find conflicts and understand how the entire project fits together. If that sheet is number one with a sheet index, it could serve as the first sheet of each separate estimate.

Sheet one needs north arrow, Sheet 5 on typical street grading should have "unless otherwise shown", removed and a reference to P-1. 3:1 MAX means the steepest or the flatest. i.e. is 2:1 greater or less than 3:1?

Sheet 6. No street dimensions are given. What about erosion control at end of street? Where is the section on the cut off wall detail?

Sheet 7. Same comments as Sheet 6.

Sheet 8. Slope from the curb return to the valley gutter flow line is twice the street grade. In some cases that causes a severe grade break at the curb return.

Sheets 7 & 8. Are valley gutters to be changed to fit new standard with ~~greater~~ quarter points shown?

Sheet 9. I don't believe enough information exists to stake cul-de-sacs. No stations, elevations or grades. Imperial Ct. has no street dimensions. Return elevations do not totally agree with Sheet 8. On Imperial Ct. the 60.55 flowline does not provide adequate slope to the 59.53 flowline property line.

Sheets 12,13 & 14. These sheets have no construction information on water lines or fire hydrants. Do not give manhole types or location of sewer and water stubs. What about manhole elevation so they can be set to grade and avoid adjustment. These sheets seem a long way from construction drawings. The layout sheets give more information.

KHL/fs

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

February 1, 1977

Mr. Carl A. Tebbens, P.E.
Murray-McCormick, Inc.
2601 Wyoming Blvd. N.E., Suite F
Albuquerque, New Mexico 87110

SUBJECT: CANDLELIGHT HILLS - PHASE III AND IV, DRAINAGE STUDY ADDENDUM.

Dear Mr. Tebbens:

The addendum to the Candlelight Hills, Phases III and IV submitted by your letter of January 21, 1977 has been reviewed and is approved. Please furnish an additional copy of the plan at your convenience.

Sincerely,

V. M. Kimmick, P.E.
City Engineer

VMK/fs

cc: Jim Smith
Bob Kielich
Dwayne Sheppard

Public Works Department

Director — Erwin F. Hensch, P. E. 766-7467
Engineering 766-7441 — V. M. Kimmick, P. E.
Street Maint. 766-7755 — G. E. Paul, P. E.
Ass't. Director — Harold R. Orr, Jr. P. E.
Liquid Waste 766-7535 — R. P. Lowe, P. E.
Water 766-7437 — W. H. Otto, P. E.

MURRAY-McCORMICK, INC.
ENVIRONMENTAL DESIGN
ARCHITECTURE · ENGINEERING · PLANNING · SURVEYING

January 21, 1977

RECEIVED
JAN 24 1977
CITY ENGINEERS

Mr. V. M. Kimmick, City Engineer
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Re: Candlelight Hills - Phases III and IV

Dear Mr. Kimmick:

This addendum to the Drainage Study for Candlelight Hills prepared by this office in September, 1975, is being transmitted for your review and approval.

Minor drainage modifications have been made in order to better facilitate the final grading plan for Phases III and IV. The water block shown on the original study on Avenida del Sol just south of Camino del Sol has been removed to allow a uniform grade on Avenida del Sol and to eliminate a potential 7% grade which would have been required with the installation of the water block. Runoff in a portion of Camino del Sol will be diverted to Avenida del Sol. In addition, the water block in Regal Ridge Road (Road "A") near Estrellita Del Norte has been eliminated in order to remove the "roller-coaster" effect in the road. The runoff quantity is not of sufficient magnitude to create a drainage problem at the intersection with Estrellita Del Norte. The total quantity of flow will not differ from that shown on the original plan at Estrellita del Norte Road. The flows are shown on the attached drainage plan.

Offsite Areas 50 and 51 have been reduced in size due to the construction of Layton Avenue N.E., to the east of this development; therefore the offsite flows have been reduced accordingly. This flow will be handled in the same manner as it was proposed in the original study.

In conclusion, the above changes have altered the drainage characteristics only very slightly and in the one instance the flow was reduced due to a reduction in the size of the offsite area.

2601 WYOMING BLVD., NE. SUITE F/ALBUQUERQUE, NEW MEXICO 87110/505-292-1936
CALIFORNIA ALASKA OREGON WASHINGTON TEXAS GEORGIA FLORIDA COLORADO

I would appreciate your approval of this addendum at your earliest convenience.

Very truly yours,

Carl A. Tebbens

Carl A. Tebbens, P.E.
Vice President

CAT:dw

Encl.

cc: Bo Johnson w/encl.

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

drainage file

June 10, 1977

Mr. Bo Johnson
Western Development Company
9821 Lona Lane N.E.
Albuquerque, New Mexico 87111

Re: Candlelight Hills Subdivision, Eubank Blvd.
Drainage Crossing

Dear Mr. Johnson:

In reply to your letter dated June 1, 1977, be advised that the design section is currently preparing the plans for the Eubank Blvd. drainage crossing.

If you have any further questions, please contact Mr. Bob Kielich.

Very truly yours,

Bruno Conegliano
Assistant City Engineer-Hydrology

BC/kr

cc: V. M. Kimmick
Bob Kielich
Drainage File

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

June 8, 1977

F20-D4

Western Development Co.
9821 Lona Lane N.E.
Albuquerque, NM

Gentlemen:

We have received a complaint regarding the completion of the grading and construction on Lot 22, Block 14, Candlelight Hills, on Candle Lane N.E.

The grading plan shows that the lots will be independently drained into the street which implies that a retaining structure needs to be provided at the property line. I understand that the owner of the said Lot 22, Block 14, has tried to secure such construction from your company but has not received satisfaction.

Please advise what procedure you intend to follow.

Very truly yours,

Bruno Conegliano

Bruno Conegliano
Assistant City Engineer-Hydrology

BC/kr

cc-Evelyn Christie
Drainage File
V. M. Kimmick

Western Development Company

F20-04

June 1, 1977

RECEIVED
JUN 02 1977
CITY ENGINEERS

Mr. Bruno Conegliano
Drainage Engineer
P.O. Box 1293
Albuquerque, New Mexico 87103

Re: Candlelight Hills Subdivision
Eubank Blvd. drainage crossing

Dear Bruno:

Please advise me of the status of the above referenced drainage problem as you know, construction has been suspended.

Very truly yours,

WESTERN DEVELOPMENT COMPANY

Bo Johnson

Bo Johnson P.E.

BJ:cp

cc: V.M. Kimmick
City Engineer

9821 Lona Lane, N.E. • Albuquerque, New Mexico 87111 • 821-6800

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