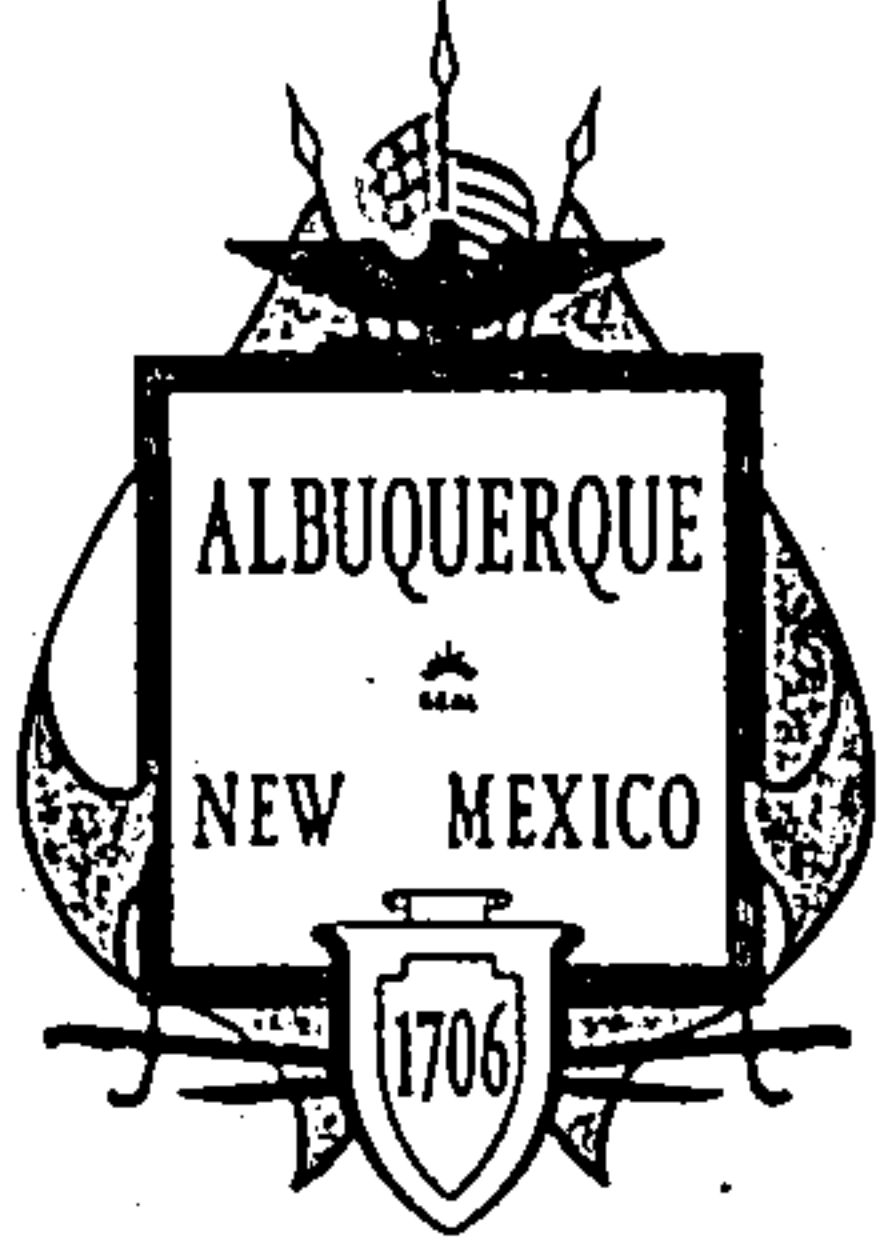




City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

April 13, 1992

Mark Goodwin, P.E.
D. Mark Goodwin & Associates, P.A.
Post Office Box 90606
Albuquerque, New Mexico 87199

RE: DRAINAGE PLAN FOR LOT 4, BLOCK 2, FOUR HILLS VILLAGE
(L-23/D16) ENGINEER'S STAMP DATED APRIL 3, 1992

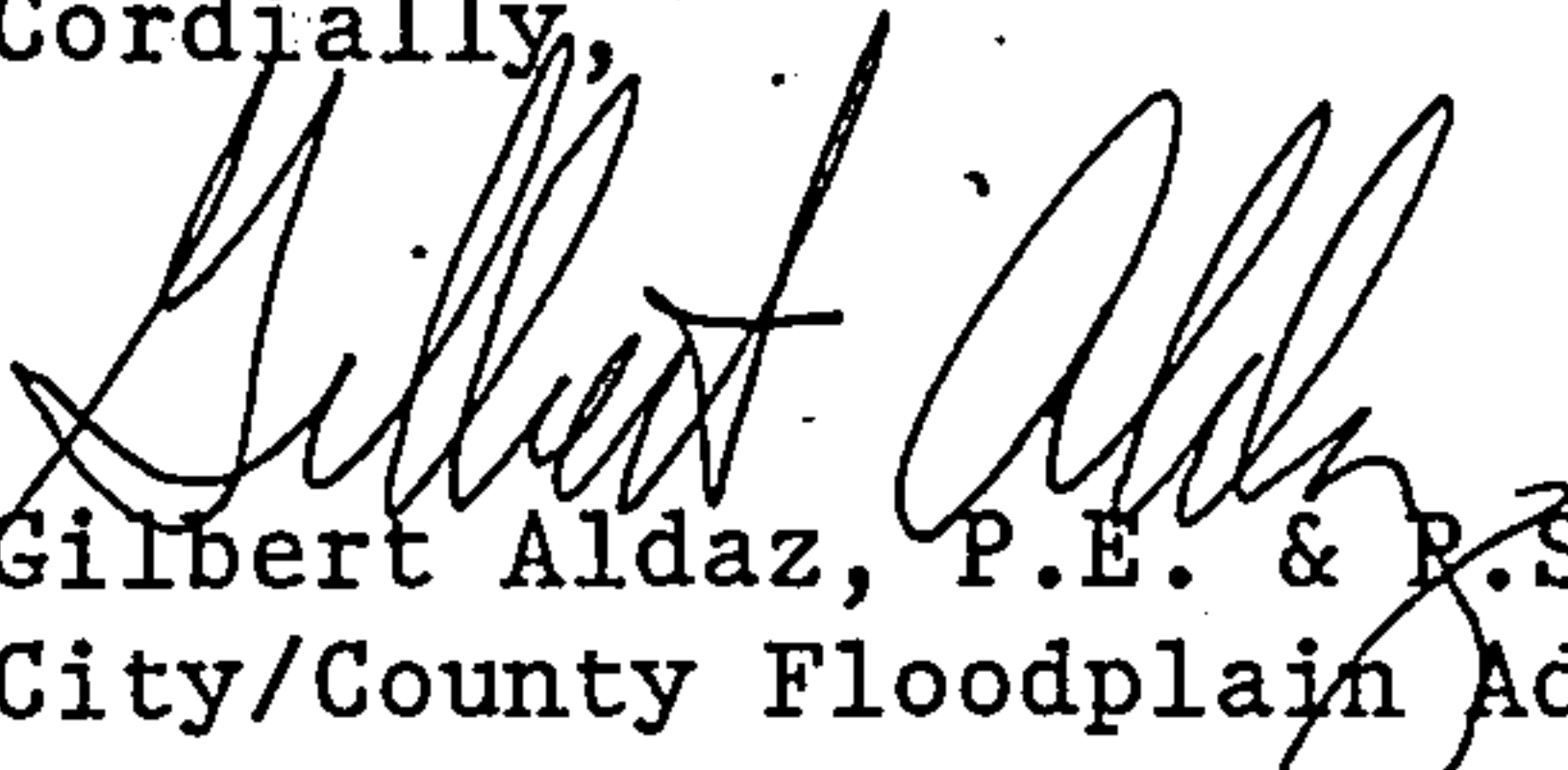
Dear Mr. Goodwin:

Based on the information provided on the referenced submittal received April 3, 1992, the plan is acceptable for Rough Grading and Building Permit release.

Please be advised that an Engineer's Certification stating that the construction is in substantial compliance with this plan is required, once the improvements are constructed.

If you should have any questions, please do not hesitate to call me at 768-2650.

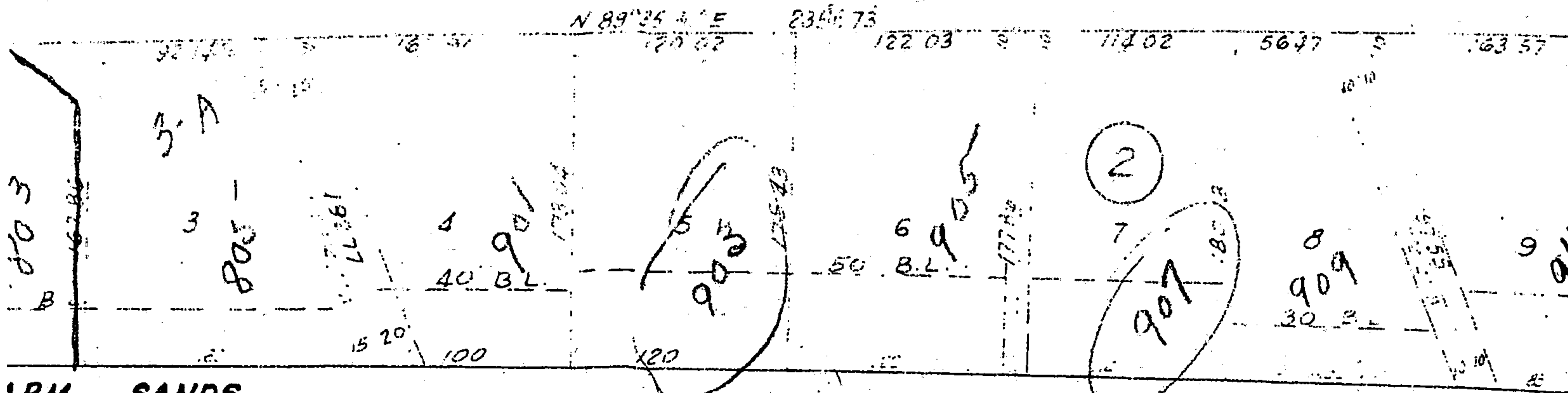
Cordially,


Gilbert Aldaz, P.E. & P.S.
City/County Floodplain Administrator

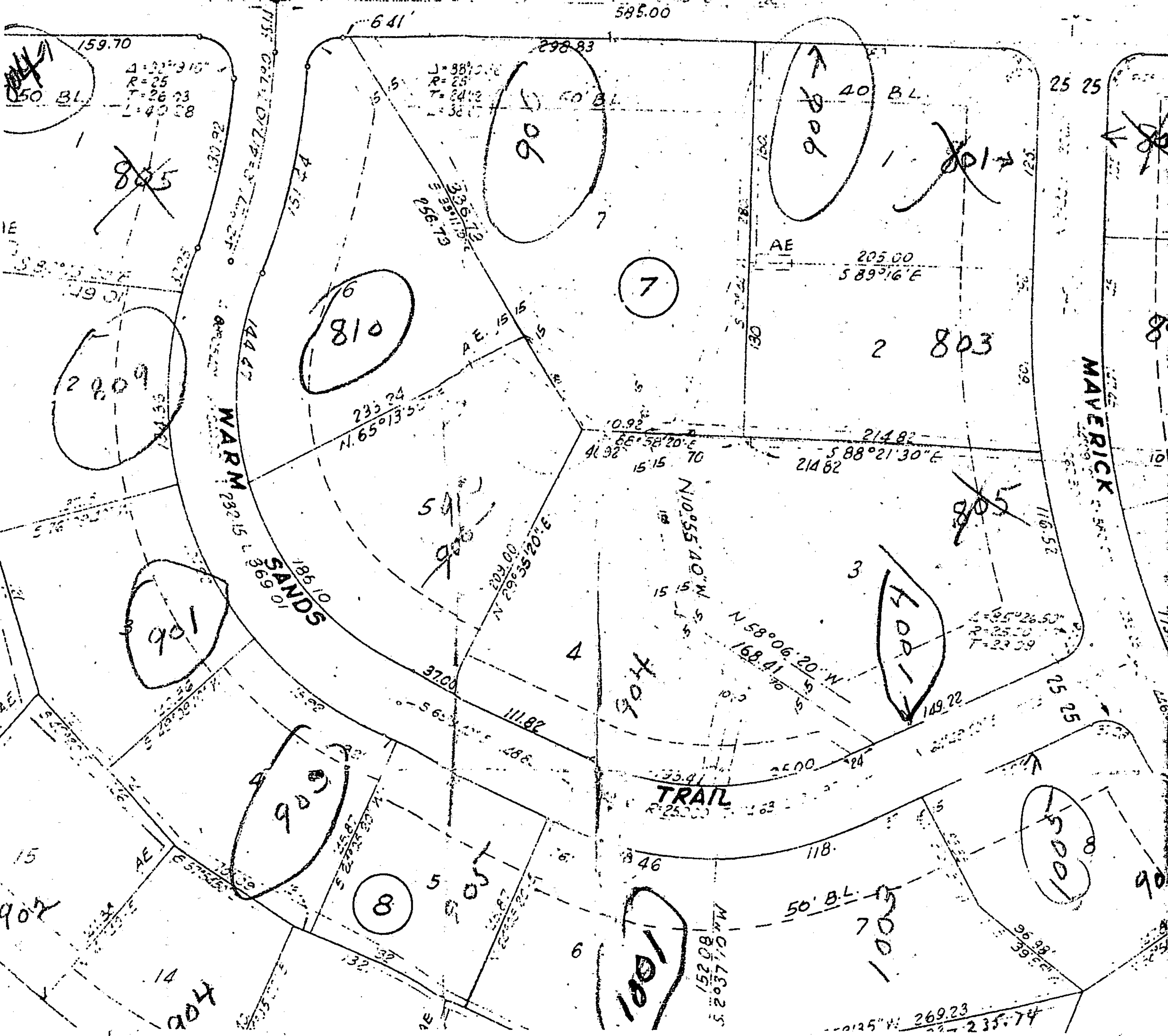
xc: Alan Martinez, Hydrology Inspector

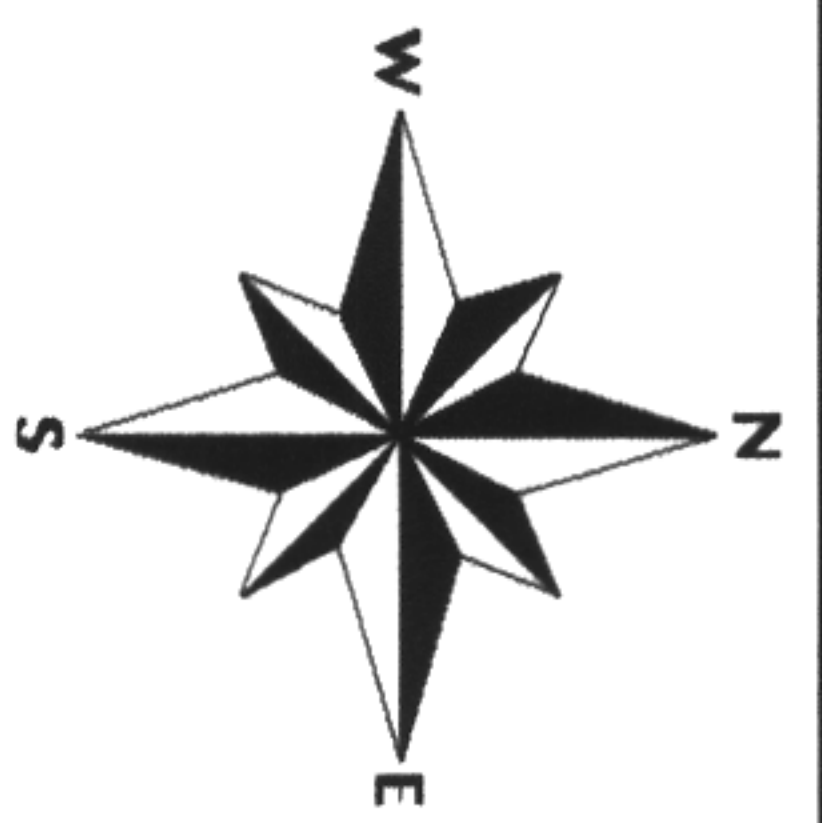
GA
wp+3237

PUBLIC WORKS DEPARTMENT



IRM SANDS





SEP 30 2002
CONSTRUCTION ADDRESS
U.S.C.

901 Wagon Sands Dr SE, Albuquerque NM 871

SECTION

APPLICANT TO PROVIDE ALL INFORMATION BELOW:

TYPE OF APPLICATION

☒ NEW BUILDING ☐ ADDITION ☐ REMODEL ☐ REPAIR ☐ OTHER

RETAIN FOR RE-ISSUE?

☐ YES ☐ NO

SEPTIC TANK REQUIRED?

☐ YES ☒ NO

(IF YES, SHOW LOCATION OF APPROVED SEPTIC TANK ON SITE PLAN.)

CONSTRUCTION DATA:

NUMBER OF STORIES 2

SQUARE FOOTAGE:

HEATED 2,700GARAGE 850CARPORT, PORCH,
& PATIO COVER 200TOTAL 3,820VALUATION OF WORK \$280,000

LEGAL DESCRIPTION

LOT NO. 4 BLOCK NO. 2 UNIT 1SUBDIVISION Four-Hills villageUNIFORM PROPERTY CODE 2-11023-055-109-516-21104

OWNERSHIP

☒ PRIVATE ☐OWNER McGuinness West, Inc PHONE 505-6127ADDRESS 12404 Smiley Mountain Way NE
Albuquerque, NM ZIP 87111

DESCRIPTION OF WORK:

Design / Build Custom 2-yr
Home

ARCHITECT, ENGINEER

OR DESIGNER McGuinness West, Inc PHONE 505-6127ADDRESS 12404 Smiley Mountain Way NE
Albuquerque, NM ZIP 87111☒ SINGLE-FAMILY DWELLING ☐ DUPLEX
☐ TOWNHOUSE ☐ GARAGE
☐ CARPORT ☐ SWIMMING POOL
☐ PATIO COVER ☐ FOUNDATION
☐ PATIO ENCLOSURE

(APPENDIX CHAP. 31, DIV. III)

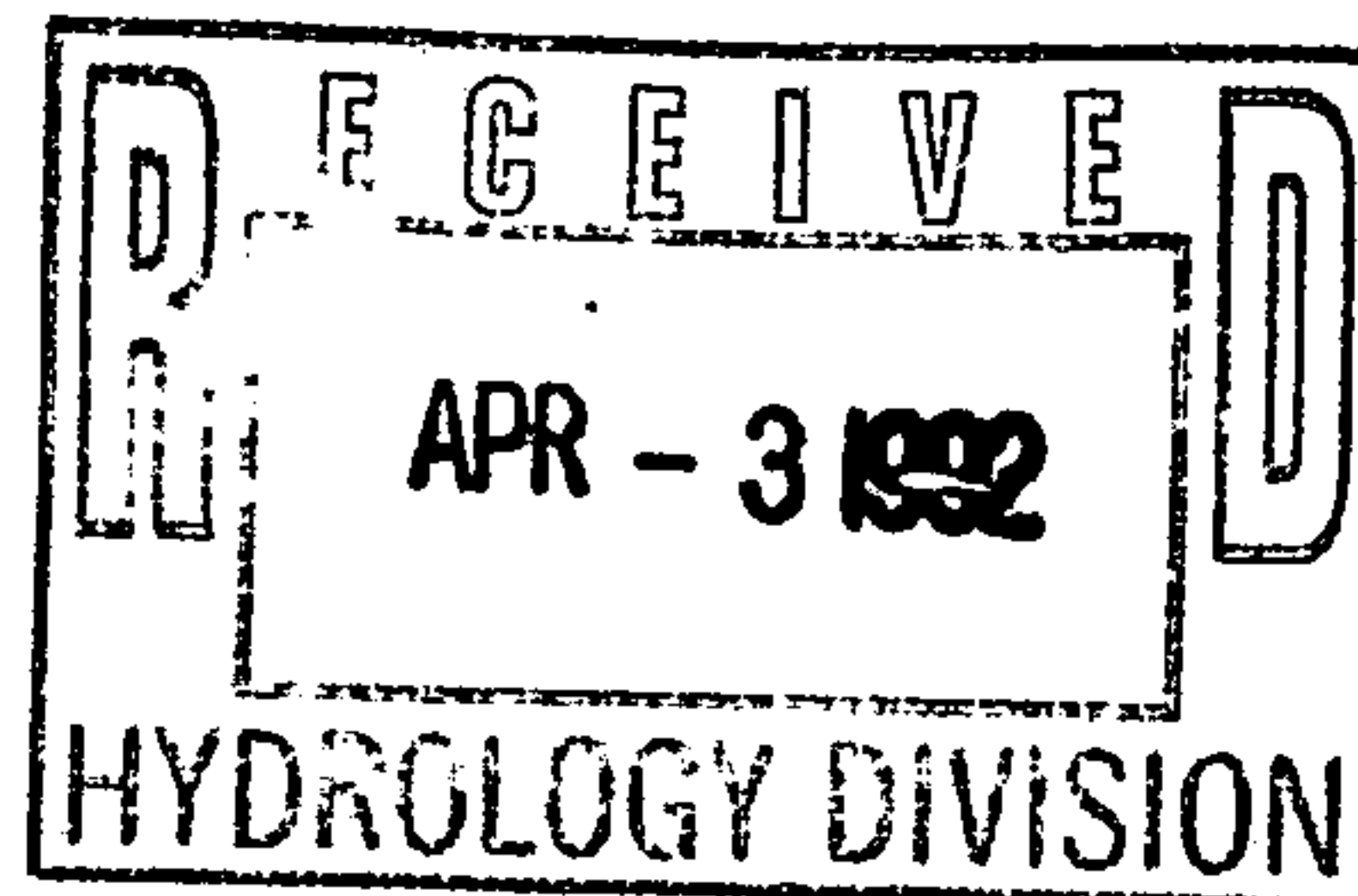
CONTRACTOR McGuinness West, Inc PHONE 505-6127ADDRESS 12404 Smiley Mountain Way NE
Albuquerque, NM ZIP 87111☐ FOUNDATION FOR MOBILE HOME
☐ FOUNDATION FOR MODULAR BUILDING
☐ FOUNDATION FOR MOVED BUILDING
☐ GARDEN WALL, FENCE, RETAINING WALLNM STATE LICENSE NO. 87106NM STATE TAX NO. 72-4185125-41-2



D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors
P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200

April 6, 1992

Mr. Gilbert Aldaz
Hydrology Department
City of Albuquerque
PO Box 1293
Albuquerque, NM 87103



Re: Alikhani Residence

Dear Mr. Aldaz:

Attached, please find revised calculations, drawing and a copy of a lot certification for the referenced project. We offer the following comments concerning this submittal:

- The drainage basin boundary was indeed slightly different than originally shown. We determined the true boundary by an extensive field review. The orthophotos do not accurately define the boundary, but our field review does. All calculations have been revised to reflect this boundary.
- We requested a 20-foot drainage easement from the owner. He produced a lot certification he had acquired with the purchase of the lot that indicates a 20-foot easement already exists. We have revised our drawing accordingly.

We appreciate your consideration of this matter. Hopefully, this resolves your concerns.

Sincerely,

D. MARK GOODWIN AND ASSOCIATES, P.A.

Mark Goodwin, P.E.

DMG:kaw

Attachments

DRAINAGE INFORMATION SHEET

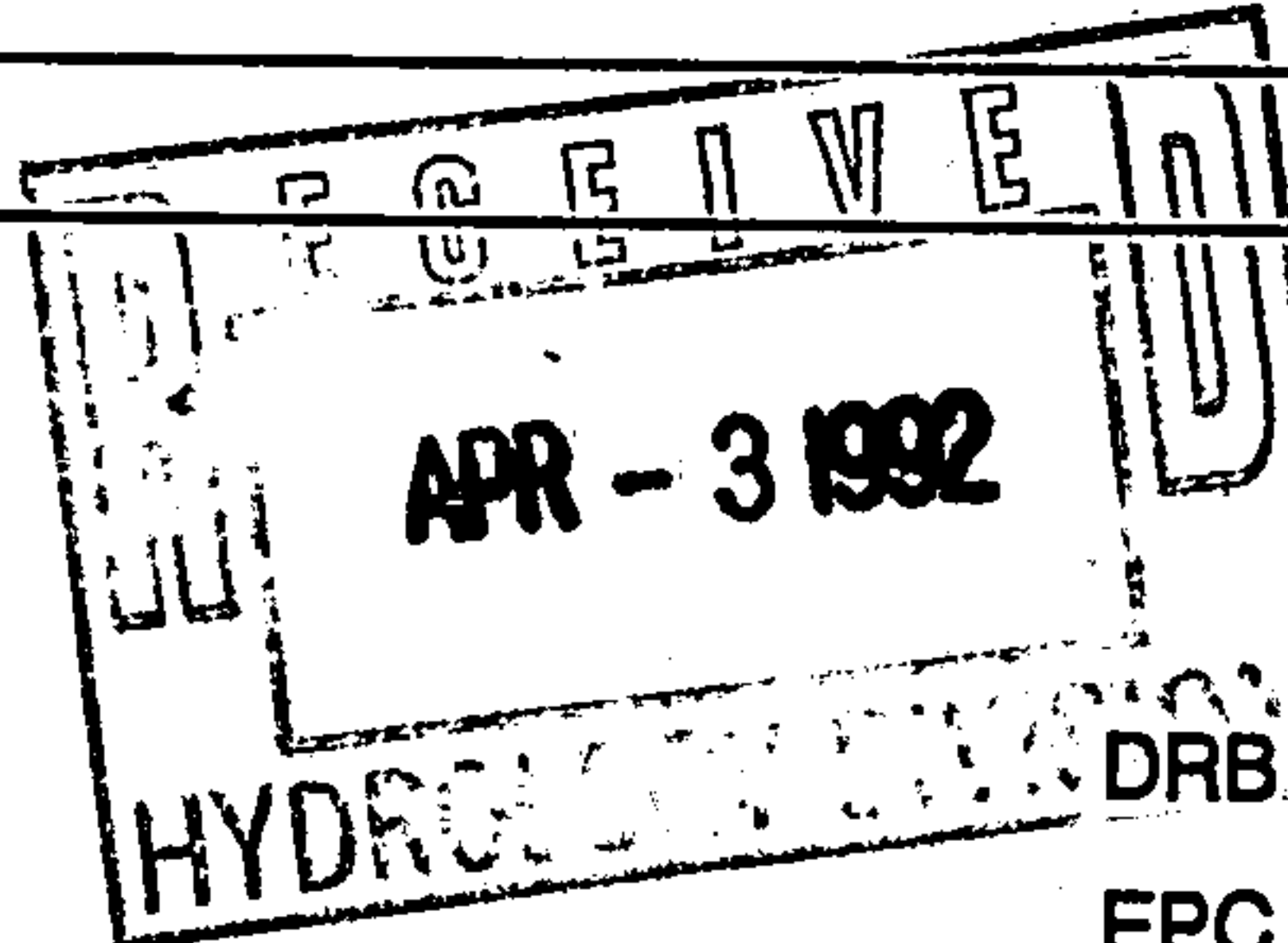
PROJECT TITLE: Alikhani Residence ZONE ATLAS/DRNG. FILE #: L-23 / D16
LEGAL DESCRIPTION: Lot 4, Block 2, Four Hills Village, First Installment
CITY ADDRESS: Warm Sands Drive SE
ENGINEERING FIRM: Mark Goodwin & Associates CONTACT: Mark Goodwin, P.E.
ADDRESS: PO Box 90606 87199 PHONE: 828-2200
OWNER: Naser Alikhani CONTACT: Naser Alikhani
ADDRESS: 13816 Winterwood Way SE 87123 PHONE: 299-1000
ARCHITECT: N/A CONTACT: _____
ADDRESS: _____ PHONE: _____
SURVEYOR: Mark Goodwin & Associates CONTACT: Richard Borgel, P.S.
ADDRESS: PO Box 90606 PHONE: 828-2200
CONTRACTOR: N/A CONTACT: _____
ADDRESS: _____ PHONE: _____

PRE-DESIGN MEETING

☐ YES

☒ NO

☐ COPY OF CONFERENCE RECAP
SHEET PROVIDED



DRB NO. _____

EPC NO. _____

PROJ. NO. _____

TYPE OF SUBMITTAL:

☐ DRAINAGE REPORT

☒ DRAINAGE PLAN

☐ CONCEPTUAL GRADING & DRAINAGE PLAN

☒ GRADING PLAN

☐ EROSION CONTROL PLAN

☐ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

☐ SKETCH PLAT APPROVAL

☐ PRELIMINARY PLAT APPROVAL

☐ SITE DEVELOPMENT PLAN APPROVAL

☐ FINAL PLAT APPROVAL

☒ BUILDING PERMIT APPROVAL

☐ FOUNDATION PERMIT APPROVAL

☐ CERTIFICATE OF OCCUPANCY APPROVAL

☒ ROUGH GRADING PERMIT APPROVAL

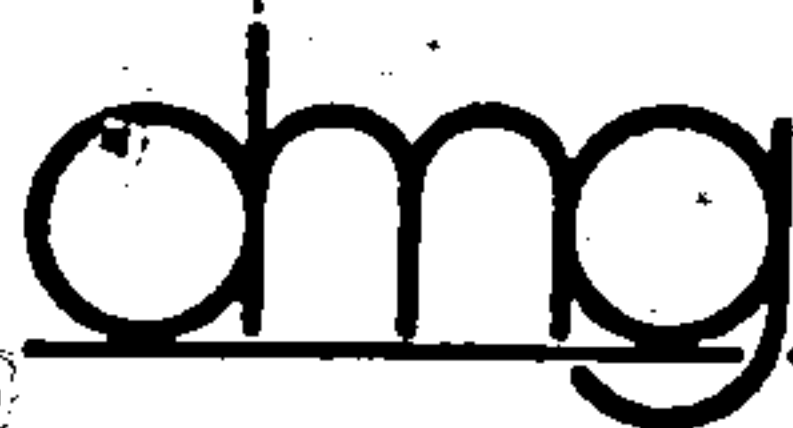
☐ GRADING/PAVING PERMIT APPROVAL

☐ OTHER _____ SPECIFY

DATE SUBMITTED: 4/3/92

BY: Mark Goodwin

Mark Goodwin, P.E.



D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

JOB Alikhani Lot
SUBJECT Drainage
JOB NO. _____ SHEET 1 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____

Per City Orthophoto (attached) up-land drainage basin = 64 Ac.

We will use HMMO to compute the 100 year - 6 Hour storm & to route this storm through our project.

Precipitation Zone = 3

$P(100-6) = 2.60$ in.

$P(1) = 2.14$ in

Land Treatments

Majority of lots = $1/3$ Ac. $\rightarrow N=3$

Percent D = $7(3(3)) + 5(3) = 34\%$

Treatment A = $10\% = 6.4$ Ac.

Treatment B = $40\% = 25.6$ Ac.

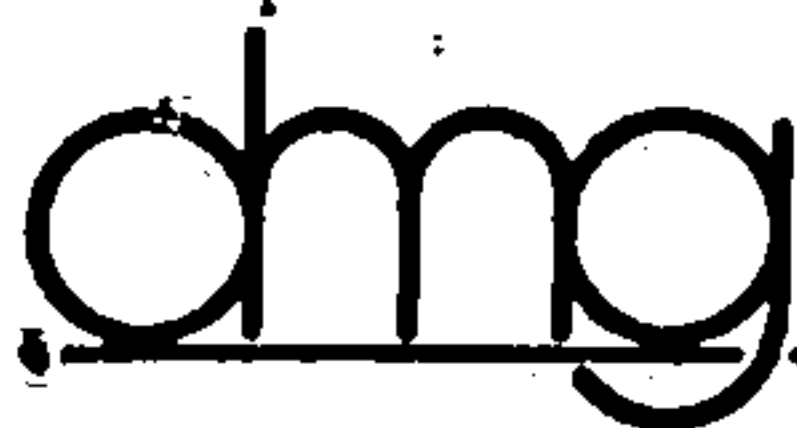
Treatment C = $16\% = 10.24$ Ac.

Treatment D = $34\% = 21.76$ Ac.

Revised Area

Area = 42.24 Ac = 0.060 sq. mi.

Composite $IA = \frac{6.4(0.40) + 25.6(.32) + 10.24(.25)}{42.24} = 0.32$ in.



D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

JOB Alikhani Lot
SUBJECT Drainage
JOB NO. _____ SHEET 2 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____

$$\text{Composite INF} = \frac{6.4(2.10) + 25.6(1.63) + 10.24(1.15)}{42.24} = 1.59 \text{ in/hr.}$$

Travel Path

1. Overland Flow = 1600' @ S = 5%

2. Arroyo Flow = 1900' @ S = 6%

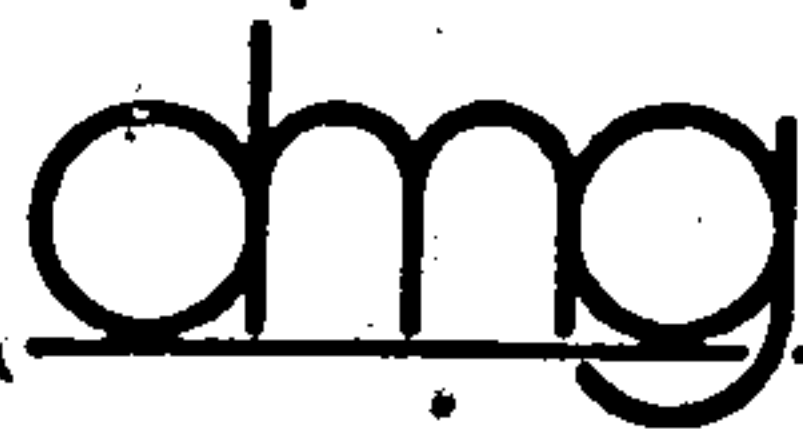
$$T_o = \frac{1600}{.715} + \frac{1900}{3\sqrt{6}} = 1281 \text{ sec.} = 21 \text{ min.} = 0.356 \text{ Hrs.}$$

$$T_p = \frac{2}{3} T_o = 0.237 \text{ Hrs.}$$

$$\begin{aligned} \frac{K}{K_{p30}} &= 1.074538 + (2.14)^{.0354} (5.3) + .836676 + (2.14)^{.02882} (21.2) \\ &+ .636099 + (2.14)^{.0221} (8.4) \\ &= 34.9 \\ &= 0.133 \end{aligned}$$

$$\begin{aligned} \frac{K}{K_{p130}} &= 1.309397 (2.14)^{.130834} (5.3) + 1.051878 (2.14)^{.35546} (21.2) + .921429 (2.14)^{.340438} (8.4) \\ &= 34.9 \\ &= 0.802 \end{aligned}$$

$$\frac{K}{K_p} = 0.133 + \left[\frac{(53-30)(.802-0.133)}{100} \right] = 0.287$$



D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

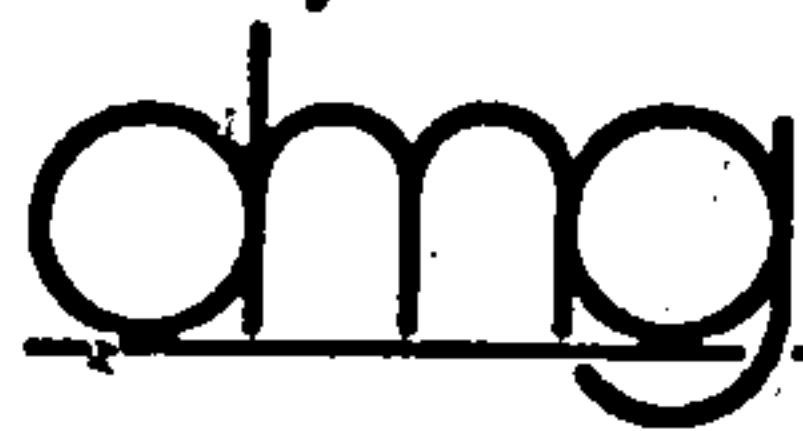
JOB Alikhani Lot
SUBJECT Drainage
JOB NO. _____ SHEET 3 OF _____
BY MG DATE 3/13/92
CHECKED _____ DATE _____

$$K = 0.287 (.237) = 0.068$$

MASS RAINFALL

JNE = 3
P50 = 2.14
P360 = 2.6
P1440 = 3.1

VALUE OF t	VALUE OF Pt	VALUE OF t	VALUE OF Pt	VALUE OF t	VALUE OF Pt	VALUE OF t	VALUE OF Pt
2	0.0011	92	2.2335	182	2.4060	272	2.5181
4	0.0049	94	2.2385	184	2.4090	274	2.5202
6	0.0145	96	2.2434	186	2.4119	276	2.5223
8	0.0336	98	2.2483	188	2.4148	278	2.5244
10	0.0661	100	2.2531	190	2.4177	280	2.5264
12	0.1161	102	2.2578	192	2.4205	282	2.5285
14	0.1880	104	2.2625	194	2.4234	284	2.5305
16	0.2861	106	2.2671	196	2.4262	286	2.5325
18	0.4150	108	2.2716	198	2.4290	288	2.5345
20	0.5793	110	2.2761	200	2.4317	290	2.5365
22	0.7839	112	2.2805	202	2.4345	292	2.5385
24	1.0337	114	2.2848	204	2.4372	294	2.5405
26	1.2492	116	2.2891	206	2.4399	296	2.5425
28	1.3461	118	2.2934	208	2.4425	298	2.5444
30	1.4282	120	2.2975	210	2.4452	300	2.5464
32	1.5015	122	2.3017	212	2.4478	302	2.5483
34	1.5682	124	2.3057	214	2.4504	304	2.5502
36	1.6298	126	2.3098	216	2.4530	306	2.5521
38	1.6871	128	2.3137	218	2.4556	308	2.5540
40	1.7407	130	2.3177	220	2.4581	310	2.5559
42	1.7911	132	2.3215	222	2.4606	312	2.5577
44	1.8386	134	2.3254	224	2.4631	314	2.5596
46	1.8835	136	2.3292	226	2.4656	316	2.5615
48	1.9260	138	2.3329	228	2.4681	318	2.5633
50	1.9664	140	2.3366	230	2.4705	320	2.5651
52	2.0047	142	2.3403	232	2.4730	322	2.5669
54	2.0411	144	2.3439	234	2.4754	324	2.5687
56	2.0757	146	2.3475	236	2.4778	326	2.5705
58	2.1086	148	2.3510	238	2.4802	328	2.5723
60	2.1404	150	2.3545	240	2.4825	330	2.5741
62	2.1471	152	2.3580	242	2.4849	332	2.5759
64	2.1536	154	2.3614	244	2.4872	334	2.5776
66	2.1600	156	2.3648	246	2.4895	336	2.5794
68	2.1663	158	2.3682	248	2.4918	338	2.5811
70	2.1725	160	2.3715	250	2.4941	340	2.5829
72	2.1785	162	2.3748	252	2.4963	342	2.5846
74	2.1844	164	2.3780	254	2.4986	344	2.5863
76	2.1903	166	2.3813	256	2.5008	346	2.5880
78	2.1960	168	2.3845	258	2.5030	348	2.5897
80	2.2016	170	2.3876	260	2.5052	350	2.5914
82	2.2072	172	2.3908	262	2.5074	352	2.5931
84	2.2126	174	2.3939	264	2.5096	354	2.5947
86	2.2179	176	2.3969	266	2.5117	356	2.5964
88	2.2232	178	2.4000	268	2.5139	358	2.5980
90	2.2284	180	2.4030	270	2.5160	360	2.6000



D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

JOB Alikhani Lot
SUBJECT Drainage
JOB NO. _____ SHEET 4 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____

Impervious Area

$$A = 21.76 A_c = 0.030 \text{ sq. mi.}$$

$$I_A = 0.10 \text{ in}$$

$$I_{NF} = 0.04 \text{ in/hr}$$

$$T_P = 0.237 \text{ hrs}$$

$$\frac{K}{k_{p30}} = .42063 + (2.14)(.00656) = 0.435$$

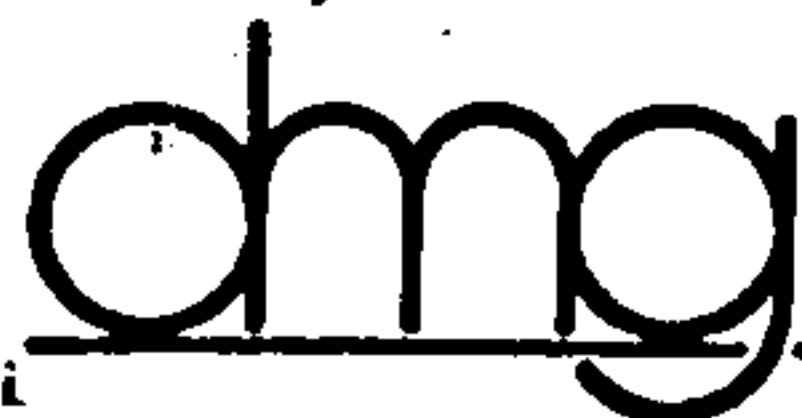
$$\frac{K}{k_{p30}} = .667076 (2.14) \frac{.254788}{.00656} = 0.550$$

$$\frac{K}{k_p} = .435 + \left[(53-30) \left(\frac{.550 - .435}{100} \right) \right] = 0.461$$

$$K = 0.109$$

Per Attached Hydro Run: $Q(100-6) = 229 \text{ cfs}$

Ponding Area upstream of Warm Sands
needs to be accounted for as well as
ponding area upstream of Winterwood.
We will route thru these areas to determine
impact.



D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

JOB Alikhani Lot
SUBJECT Drainage
JOB NO. _____ SHEET 5 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____

Discharge beneath Worm Sands is a
36" CIP that will act as an orifice. Discharge
beneath Winterwood is via 2- 48 RCP that may
act as an orifice.

Worm Sands

$$Q = CA \sqrt{2gH} = 0.8(7.06) \sqrt{2gH} = 5.66 \sqrt{2gH}$$

<u>HEAD</u>	<u>Elev.</u>	<u>Q_{out}</u>	<u>Vol.</u>
0	45.5	0	0
4.5'	50.0	96	0.147
6.5'	52.0	116	.256
8.5'	54.0	132	.420
10.5'	56.0	147	.620
12.5'	58.0	161	.790

Winterwood

<u>HEAD</u>	<u>Elev.</u>	<u>Q_{out}</u>	<u>Vol.</u>
0	33.0	0	0
2'	35.0	228	.161
4'	37.0	322	.468

HYMO PROGRAM (AHYMO490) - AMAFCA VERSION APR., 1990

RUN DATE (MON/DAY/YR) = 04/03/1992

START TIME (HR:MIN:SEC) = 14:32:48

START TIME=0.0

***** COMPUTE HYDROGRAPHS FOR ALIKHANI LOT 4 HILLS

***** March 1992

***** PERVIOUS AREA OF WATERSHED

COMPUTE HYD ID=1 HYD NO=101.1 DT=.03333 HRS DA=.060 SQ MI

IA=-0.32 INF=-1.59 K=-0.068 TP=-0.237 RAIN=

0.0000	0.0011	0.0049	0.0145	0.0336	0.0661	0.1161
0.1880	0.2861	0.4150	0.5793	0.7839	1.0337	1.2492
1.3461	1.4282	1.5015	1.5682	1.6298	1.6871	1.7407
1.7911	1.8386	1.8835	1.9260	1.9664	2.0047	2.0411
2.0757	2.1086	2.1404	2.1471	2.1536	2.1600	2.1663
2.1725	2.1785	2.1844	2.1903	2.1960	2.2016	2.2072
2.2126	2.2179	2.2232	2.2284	2.2335	2.2385	2.2434
2.2483	2.2531	2.2578	2.2625	2.2671	2.2716	2.2761
2.2805	2.2848	2.2891	2.2934	2.2975	2.3017	2.3057
2.3098	2.3137	2.3177	2.3215	2.3254	2.3292	2.3329
2.3366	2.3403	2.3439	2.3475	2.3510	2.3545	2.3580
2.3614	2.3648	2.3682	2.3715	2.3748	2.3780	2.3813
2.3845	2.3876	2.3908	2.3939	2.3969	2.4000	2.4030
2.4060	2.4090	2.4119	2.4148	2.4177	2.4205	2.4234
2.4262	2.4290	2.4317	2.4345	2.4372	2.4399	2.4425
2.4452	2.4478	2.4504	2.4530	2.4556	2.4581	2.4606
2.4631	2.4656	2.4681	2.4705	2.4730	2.4754	2.4778
2.4802	2.4825	2.4849	2.4872	2.4895	2.4918	2.4941
2.4963	2.4986	2.5008	2.5030	2.5052	2.5074	2.5096
2.5117	2.5139	2.5160	2.5181	2.5202	2.5223	2.5244
2.5264	2.5285	2.5305	2.5325	2.5345	2.5365	2.5385
2.5405	2.5425	2.5444	2.5464	2.5483	2.5502	2.5521
2.5540	2.5559	2.5577	2.5596	2.5615	2.5633	2.5651

sh. 7

2.5669 2.5687 2.5705 2.5723 2.5741 2.5759 2.5776
2.5794 2.5811 2.5829 2.5846 2.5863 2.5880 2.5897
2.5914 2.5931 2.5947 2.5964 2.5980 2.6000

K = .068000HR TP = .237000HR SHAPE CONSTANT, N = 17.25913
UNIT PEAK = 225.62 CFS UNIT VOLUME = .9995 B = 891.21

RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.10

RUNOFF VOLUME = .79870 INCHES = 2.5558 ACRE-Feet
PEAK DISCHARGE RATE = 129.02 CFS AT .600 HOURS

***** IMPERVIOUS AREA OF WATERSHED

COMPUTE HYD ID=2 HYD NO=101.2 DT=.03333 HRS DA=0.030 SQ MI
IA=-0.1 INF=-0.04 K=-0.109 TP=-0.237 RAIN=-1

K = .109000HR TP = .237000HR SHAPE CONSTANT, N = 8.87900
UNIT PEAK = 76.500 CFS UNIT VOLUME = .9998 B = 604.35

RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 101.20

RUNOFF VOLUME = 2.26759 INCHES = 3.6281 ACRE-Feet
PEAK DISCHARGE RATE = 76.84 CFS AT .600 HOURS

***** COMBINED HYDROGRAPH WATERSHED A

ADD HYD ID=2 HYD NO=101.3 ID=1 ID=2

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 101.30

RUNOFF VOLUME = 1.28833 INCHES = 6.1839 ACRE-Feet
PEAK DISCHARGE RATE = 205.85 CFS AT .600 HOURS

ROUTE RESERVOIR ID=3 HYD NO=101.4 INFLOW ID=2 CODE=10

OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)

96.00	0.147	50.0
116.00	0.256	52.0
132.00	0.420	54.0
150.00	0.620	56.0
165.00	0.820	58.0
173.00	0.920	60.0

Shl. 8

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	45.50	.000	.00
.33	3.51	45.60	.003	2.21
.67	167.46	57.25	.745	159.35
1.00	35.66	47.25	.057	37.26
1.33	11.14	46.07	.019	12.13
1.67	4.68	45.73	.007	4.85
2.00	2.77	45.63	.004	2.84
2.33	1.92	45.59	.003	1.95
2.67	1.47	45.57	.002	1.49
3.00	1.19	45.56	.002	1.20
3.33	.98	45.55	.002	.99
3.67	.83	45.54	.001	.83
4.00	.70	45.53	.001	.71
4.33	.59	45.53	.001	.60
4.67	.50	45.52	.001	.51
5.00	.42	45.52	.001	.42
5.33	.35	45.52	.001	.35
5.67	.29	45.51	.000	.29
6.00	.23	45.51	.000	.23
6.33	.08	45.50	.000	.09
6.67	.02	45.50	.000	.02
7.00	.01	45.50	.000	.01
7.33	.00	45.50	.000	.00

PEAK DISCHARGE = 159.351 CFS - PEAK OCCURS AT HOUR .67

MAXIMUM WATER SURFACE ELEVATION = 57.247

MAXIMUM STORAGE = .7447 AC-FT INCREMENTAL TIME = .033330HR

S

PRINT HYD

ID=3 CODE=0

PARTIAL HYDROGRAPH 101.40

TIME	TIME	FLOW	TIME	TIME	FLOW	TIME	FLOW
HRS	HRS	CFS	HRS	HRS	CFS	HRS	CFS
4.600	.000	.0	6.133	1.533	6.4	3.066	1.2
4.633	.033	.0	6.166	1.567	5.9	3.100	1.1
4.666	.067	.0	6.199	1.600	5.5	3.133	1.1
4.700	.100	.0	6.233	1.633	5.2	3.166	1.1
	.133	.0		1.667	4.9	3.200	1.1

START TIME=0.0
***** COMPUTE HYDROGRAPHS FOR ALIKHANI LOT 4 HILLS
***** March 1992
***** PERVIOUS AREA OF WATERSHED
COMPUTE HYD

ID=1 HYD NO=101.1 DT=.03333 HRS DA=.060 SQ MI
IA=-0.32 INF=-1.59 K=-0.068 TP=-0.237 RAIN=

0.0000	0.0011	0.0049	0.0145	0.0336	0.0661	0.1161
0.1880	0.2861	0.4150	0.5793	0.7839	1.0337	1.2492
1.3461	1.4282	1.5015	1.5682	1.6298	1.6871	1.7407
1.7911	1.8386	1.8835	1.9260	1.9664	2.0047	2.0411
2.0757	2.1086	2.1404	2.1471	2.1536	2.1600	2.1663
2.1725	2.1785	2.1844	2.1903	2.1960	2.2016	2.2072
2.2126	2.2179	2.2232	2.2284	2.2335	2.2385	2.2434
2.2483	2.2531	2.2578	2.2625	2.2671	2.2716	2.2761
2.2805	2.2848	2.2891	2.2934	2.2975	2.3017	2.3057
2.3098	2.3137	2.3177	2.3215	2.3254	2.3292	2.3329
2.3366	2.3403	2.3439	2.3475	2.3510	2.3545	2.3580
2.3614	2.3648	2.3682	2.3715	2.3748	2.3780	2.3813
2.3845	2.3876	2.3908	2.3939	2.3969	2.4000	2.4030
2.4060	2.4090	2.4119	2.4148	2.4177	2.4205	2.4234
2.4262	2.4290	2.4317	2.4345	2.4372	2.4399	2.4425
2.4452	2.4478	2.4504	2.4530	2.4556	2.4581	2.4606
2.4631	2.4656	2.4681	2.4705	2.4730	2.4754	2.4778
2.4802	2.4825	2.4849	2.4872	2.4895	2.4918	2.4941
2.4963	2.4986	2.5008	2.5030	2.5052	2.5074	2.5096
2.5117	2.5139	2.5160	2.5181	2.5202	2.5223	2.5244
2.5264	2.5285	2.5305	2.5325	2.5345	2.5365	2.5385
2.5405	2.5425	2.5444	2.5464	2.5483	2.5502	2.5521
2.5540	2.5559	2.5577	2.5596	2.5615	2.5633	2.5651
2.5669	2.5687	2.5705	2.5723	2.5741	2.5759	2.5776
2.5794	2.5811	2.5829	2.5846	2.5863	2.5880	2.5897
2.5914	2.5931	2.5947	2.5964	2.5980	2.6000	

PRINT HYD ID=1 CODE=1
***** IMPERVIOUS AREA OF WATERSHED
COMPUTE HYD ID=2 HYD NO=101.2 DT=.03333 HRS DA=0.030 SQ MI
IA=-0.1 INF=-0.04 K=-0.109 TP=-0.237 RAIN=-1
PRINT HYD ID=2 CODE=1

***** COMBINED HYDROGRAPH WATERSHED A
ADD HYD ID=2 HYD NO=101.3 ID=1 ID=2
PRINT HYD ID=2 CODE=1
ROUTE RESERVOIR ID=3 HYD NO=101.4 INFLOW ID=2 CODE=10

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEVATION(FT)
0.00	0.00	45.5
96.00	0.147	50.0
116.00	0.256	52.0
132.00	0.420	54.0
150.00	0.620	56.0
165.00	0.820	58.0
173.00	0.920	60.0

PRINT HYD ID=3 CODE=0
FINISH

START TIME=0.0
 ***** COMPUTE HYDROGRAPHS FOR ALIKHANI LOT 4 HILLS
 ***** March 1992
 ***** PERVIOUS AREA OF WATERSHED

COMPUTE HYD ID=1 HYD NO=101.1 DT=.03333 HRS DA=.060 SQ MI
 IA=-0.32 INF=-1.59 K=-0.068 TP=-0.237 RAIN=

0.0000	0.0011	0.0049	0.0145	0.0336	0.0661	0.1161
0.1880	0.2861	0.4150	0.5793	0.7839	1.0337	1.2492
1.3461	1.4282	1.5015	1.5682	1.6298	1.6871	1.7407
1.7911	1.8386	1.8835	1.9260	1.9664	2.0047	2.0411
2.0757	2.1086	2.1404	2.1471	2.1536	2.1600	2.1663
2.1725	2.1785	2.1844	2.1903	2.1960	2.2016	2.2072
2.2126	2.2179	2.2232	2.2284	2.2335	2.2385	2.2434
2.2483	2.2531	2.2578	2.2625	2.2671	2.2716	2.2761
2.2805	2.2848	2.2891	2.2934	2.2975	2.3017	2.3057
2.3098	2.3137	2.3177	2.3215	2.3254	2.3292	2.3329
2.3366	2.3403	2.3439	2.3475	2.3510	2.3545	2.3580
2.3614	2.3648	2.3682	2.3715	2.3748	2.3780	2.3813
2.3845	2.3876	2.3908	2.3939	2.3969	2.4000	2.4030
2.4060	2.4090	2.4119	2.4148	2.4177	2.4205	2.4234
2.4262	2.4290	2.4317	2.4345	2.4372	2.4399	2.4425
2.4452	2.4478	2.4504	2.4530	2.4556	2.4581	2.4606
2.4631	2.4656	2.4681	2.4705	2.4730	2.4754	2.4778
2.4802	2.4825	2.4849	2.4872	2.4895	2.4918	2.4941
2.4963	2.4986	2.5008	2.5030	2.5052	2.5074	2.5096
2.5117	2.5139	2.5160	2.5181	2.5202	2.5223	2.5244
2.5264	2.5285	2.5305	2.5325	2.5345	2.5365	2.5385
2.5405	2.5425	2.5444	2.5464	2.5483	2.5502	2.5521
2.5540	2.5559	2.5577	2.5596	2.5615	2.5633	2.5651
2.5669	2.5687	2.5705	2.5723	2.5741	2.5759	2.5776
2.5794	2.5811	2.5829	2.5846	2.5863	2.5880	2.5897
2.5914	2.5931	2.5947	2.5964	2.5980	2.6000	

PRINT HYD ID=1 CODE=1
 ***** IMPERVIOUS AREA OF WATERSHED
 COMPUTE HYD ID=2 HYD NO=101.2 DT=.03333 HRS DA=0.030 SQ MI
 IA=-0.1 INF=-0.04 K=-0.109 TP=-0.237 RAIN=-1
 PRINT HYD ID=2 CODE=1
 ***** COMBINED HYDROGRAPH WATERSHED A
 ADD HYD ID=2 HYD NO=101.3 ID=1 ID=2
 PRINT HYD ID=2 CODE=1
 ROUTE RESERVOIR ID=3 HYD NO=101.4 INFLOW ID=2 CODE=10

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEVATION(FT)
0.00	0.00	33.0
118.00	0.161	35.0
322.00	0.468	37.0

PRINT HYD ID=3 CODE=0
 FINISH

567.11

HYMO PROGRAM (AHYMO490) - AMAFCA VERSION APR., 1990

RUN DATE (MON/DAY/YR) = 04/03/1992

START TIME (HR:MIN:SEC) = 14:37:48

START TIME=0.0

***** COMPUTE HYDROGRAPHS FOR ALIKHANI LOT 4 HILLS

***** March 1992

***** PERVIOUS AREA OF WATERSHED

COMPUTE HYD ID=1 HYD NO=101.1 DT=.03333 HRS DA=.060 SQ MI

IA=-0.32 INF=-1.59 K=-0.068 TP=-0.237 RAIN=

0.0000	0.0011	0.0049	0.0145	0.0336	0.0661	0.1161
0.1880	0.2861	0.4150	0.5793	0.7839	1.0337	1.2492
1.3461	1.4282	1.5015	1.5682	1.6298	1.6871	1.7407
1.7911	1.8386	1.8835	1.9260	1.9664	2.0047	2.0411
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2.2126	2.2179	2.2232	2.2284	2.2335	2.2385	2.2434
2.2483	2.2531	2.2578	2.2625	2.2671	2.2716	2.2761
2.2805	2.2848	2.2891	2.2934	2.2975	2.3017	2.3057
2.3098	2.3137	2.3177	2.3215	2.3254	2.3292	2.3329
2.3366	2.3403	2.3439	2.3475	2.3510	2.3545	2.3580
2.3614	2.3648	2.3682	2.3715	2.3748	2.3780	2.3813
2.3845	2.3876	2.3908	2.3939	2.3969	2.4000	2.4030
2.4060	2.4090	2.4119	2.4148	2.4177	2.4205	2.4234
2.4262	2.4290	2.4317	2.4345	2.4372	2.4399	2.4425
2.4452	2.4478	2.4504	2.4530	2.4556	2.4581	2.4606
2.4631	2.4656	2.4681	2.4705	2.4730	2.4754	2.4778
2.4802	2.4825	2.4849	2.4872	2.4895	2.4918	2.4941
2.4963	2.4986	2.5008	2.5030	2.5052	2.5074	2.5096
2.5117	2.5139	2.5160	2.5181	2.5202	2.5223	2.5244
2.5264	2.5285	2.5305	2.5325	2.5345	2.5365	2.5385
2.5405	2.5425	2.5444	2.5464	2.5483	2.5502	2.5521
2.5540	2.5559	2.5577	2.5596	2.5615	2.5633	2.5651

sh. 12

2.5669 2.5687 2.5705 2.5723 2.5741 2.5759 2.5776
2.5794 2.5811 2.5829 2.5846 2.5863 2.5880 2.5897
2.5914 2.5931 2.5947 2.5964 2.5980 2.6000

K = .068000HR TP = .237000HR SHAPE CONSTANT, N = 17.25913
UNIT PEAK = 225.62 CFS UNIT VOLUME = .9995 B = 891.21

RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.10

RUNOFF VOLUME = .79870 INCHES = 2.5558 ACRE-Feet
PEAK DISCHARGE RATE = 129.02 CFS AT .600 HOURS

***** IMPERVIOUS AREA OF WATERSHED

COMPUTE HYD ID=2 HYD NO=101.2 DT=.03333 HRS DA=0.030 SQ MI

IA=-0.1 INF=-0.04 K=-0.109 TP=-0.237 RAIN=-1

K = .109000HR TP = .237000HR SHAPE CONSTANT, N = 8.87900
UNIT PEAK = 76.500 CFS UNIT VOLUME = .9998 B = 604.35

RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 101.20

RUNOFF VOLUME = 2.26759 INCHES = 3.6281 ACRE-Feet
PEAK DISCHARGE RATE = 76.84 CFS AT .600 HOURS

***** COMBINED HYDROGRAPH WATERSHED A

ADD HYD ID=2 HYD NO=101.3 ID=1 ID=2

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 101.30

RUNOFF VOLUME = 1.28833 INCHES = 6.1839 ACRE-Feet
PEAK DISCHARGE RATE = 205.85 CFS AT .600 HOURS

ROUTE RESERVOIR ID=3 HYD NO=101.4 INFLOW ID=2 CODE=10

OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)

118.00 0.161 35.0
322.00 0.468 37.0

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	33.00	.000	.00
.33	3.51	33.04	.003	2.30
.67	167.46	35.63	.258	182.44
1.00	35.66	33.63	.051	37.06
1.33	11.14	33.20	.016	12.01
1.67	4.68	33.08	.007	4.83
2.00	2.77	33.05	.004	2.83
2.33	1.92	33.03	.003	1.95
2.67	1.47	33.03	.002	1.49
3.00	1.19	33.02	.002	1.20
3.33	.98	33.02	.001	.99
3.67	.83	33.01	.001	.83
4.00	.70	33.01	.001	.71
4.33	.59	33.01	.001	.60
4.67	.50	33.01	.001	.51
5.00	.42	33.01	.001	.42
5.33	.35	33.01	.000	.35
5.67	.29	33.00	.000	.29
6.00	.23	33.00	.000	.23
6.33	.08	33.00	.000	.09
6.67	.02	33.00	.000	.02
7.00	.01	33.00	.000	.01
7.33	.00	33.00	.000	.00

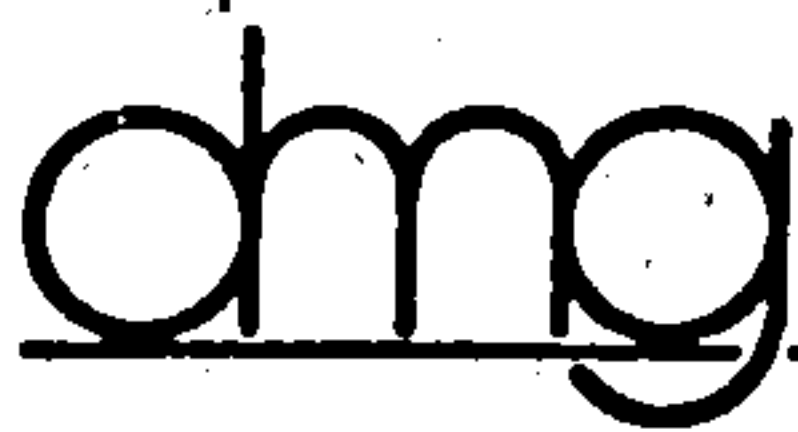
PEAK DISCHARGE = 200.587 CFS - PEAK OCCURS AT HOUR .63
MAXIMUM WATER SURFACE ELEVATION = 35.810
MAXIMUM STORAGE = .2853 AC-FT INCREMENTAL TIME= .033330HR

S

PRINT HYD ID=3 CODE=0

PARTIAL HYDROGRAPH 101.40

TIME	TIME	FLOW	TIME	FLOW	TIME	FLOW
HRS	HRS	CFS	HRS	CFS	HRS	CFS
	.000	.0	1.533	6.3	3.066	1.2
4.600	.5	.0	6.133	.2	3.100	1.1
	.033	.0	1.567	5.9		
4.633	.5	.0	6.166	.2	3.133	1.1
	.067	.0	1.600	5.5		
4.666	.5	.0	6.199	.2	3.166	1.1
	.100	.0	1.633	5.2		
4.700	.5	.0	6.233	.2	3.200	1.1
	.133	.0	1.667	4.8		
4.733	.5	.0	6.266	.1	3.233	1.0
	.167	.0	1.700	4.5		
4.766	.5	.0	6.299	.1	3.266	1.0
	.200	.0	1.733	4.3		
4.800	.5	.0	6.333	.1	3.300	1.0
	.233	.0	1.766	4.0		
4.833	.5	.0	6.366	.1	3.333	1.0
	.267	.1	1.800	3.8		



D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

JOB Alikhani Lot
SUBJECT Drainage
JOB NO. _____ SHEET 14 OF _____
BY MLG DATE 3/18/92
CHECKED _____ DATE _____

SUMMARY OF Flood Plain

Peak $Q(100-6) = 206 \text{ cfs}$

Peak Vol. = 6.18 AC-Ft.

MAX. Pond Depth @ Warm Sands = 57.24

Elev. Warm Sands = 58.00

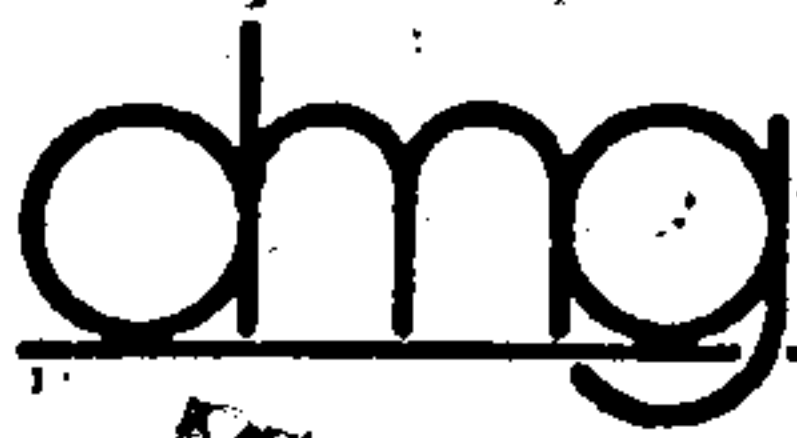
Does not run over Warm Sands

MAX. Pond Depth @ Winterwood = 35.81'
= 2.81' deep

Does not run over Winterwood

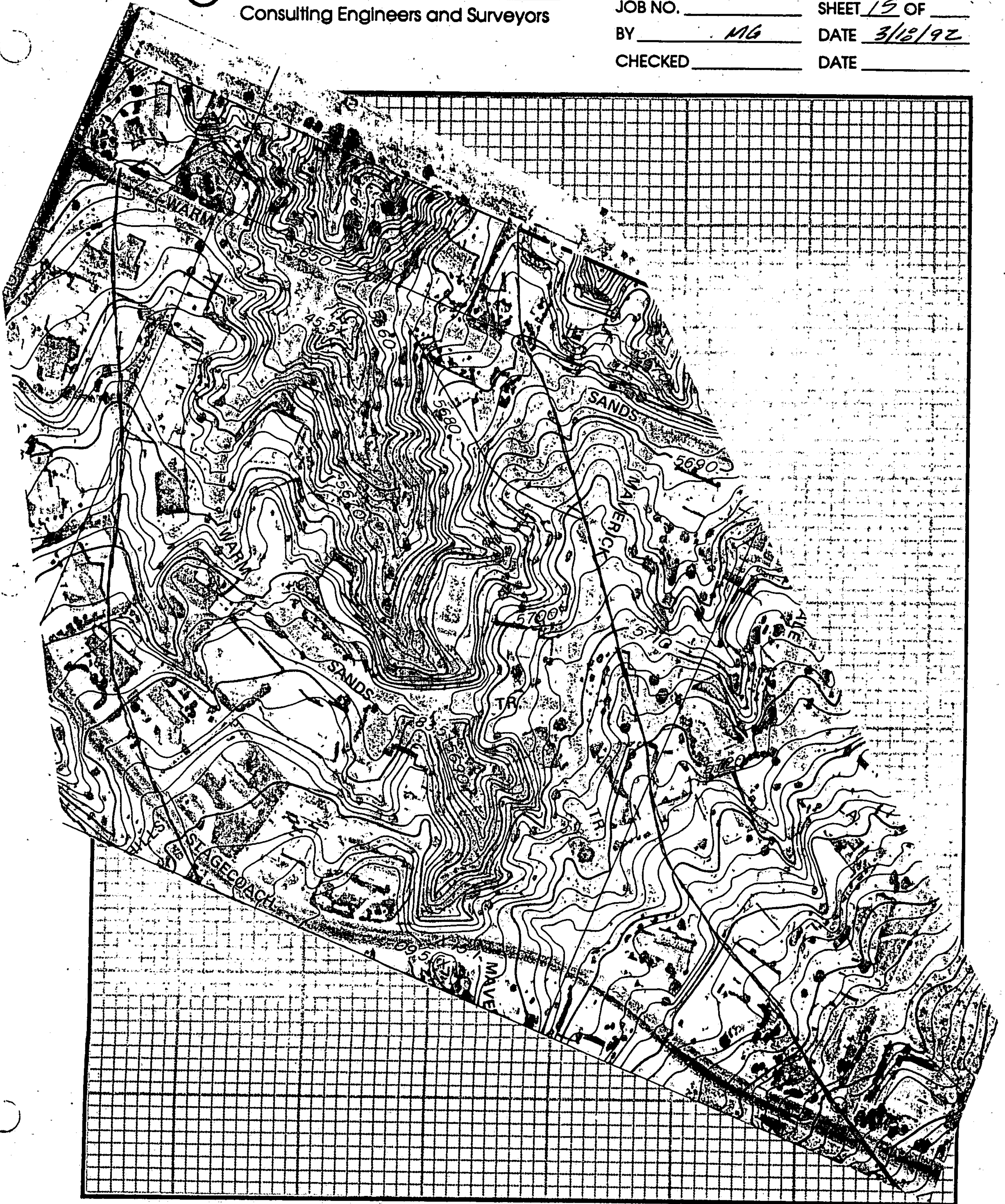
FIRM Panel Shows 1' to 3' depth

Setback requirement = $\frac{205(6)}{100} = 12.30'$



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Consulting Engineers and Surveyors

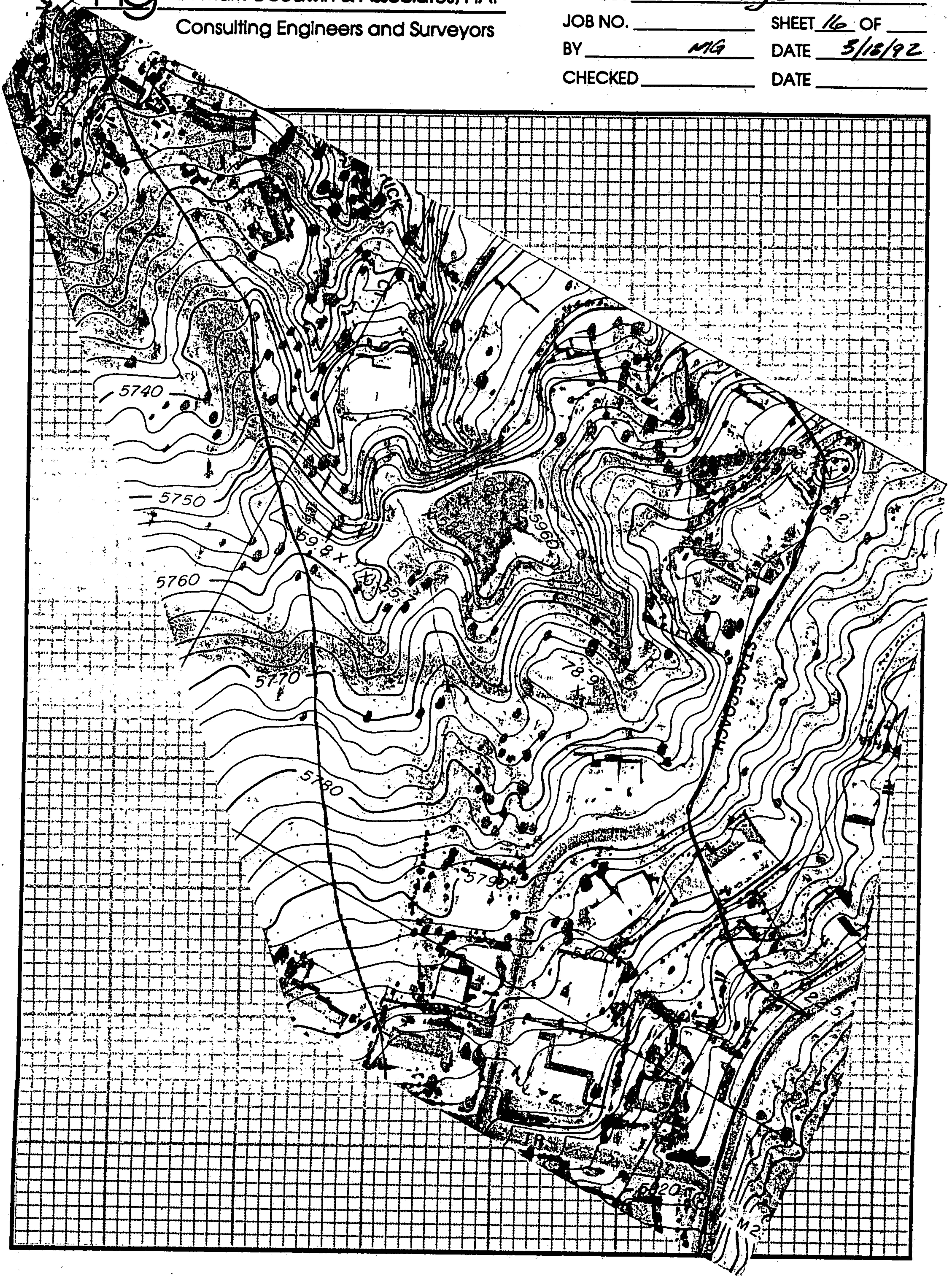
JOB Alikhani
SUBJECT Drainage
JOB NO. _____ SHEET 15 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____

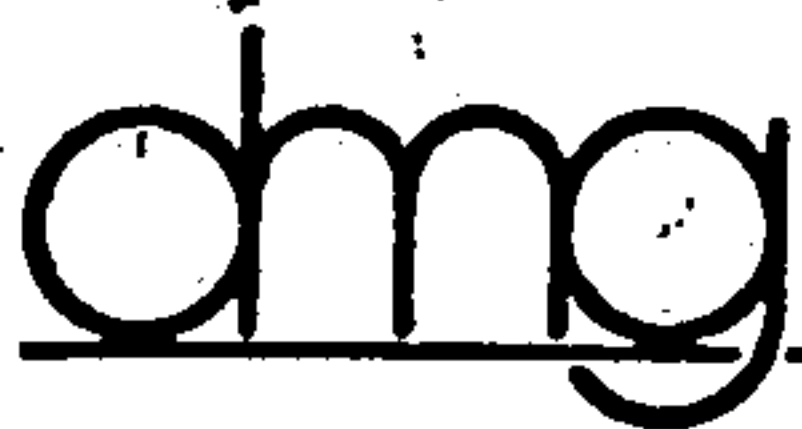




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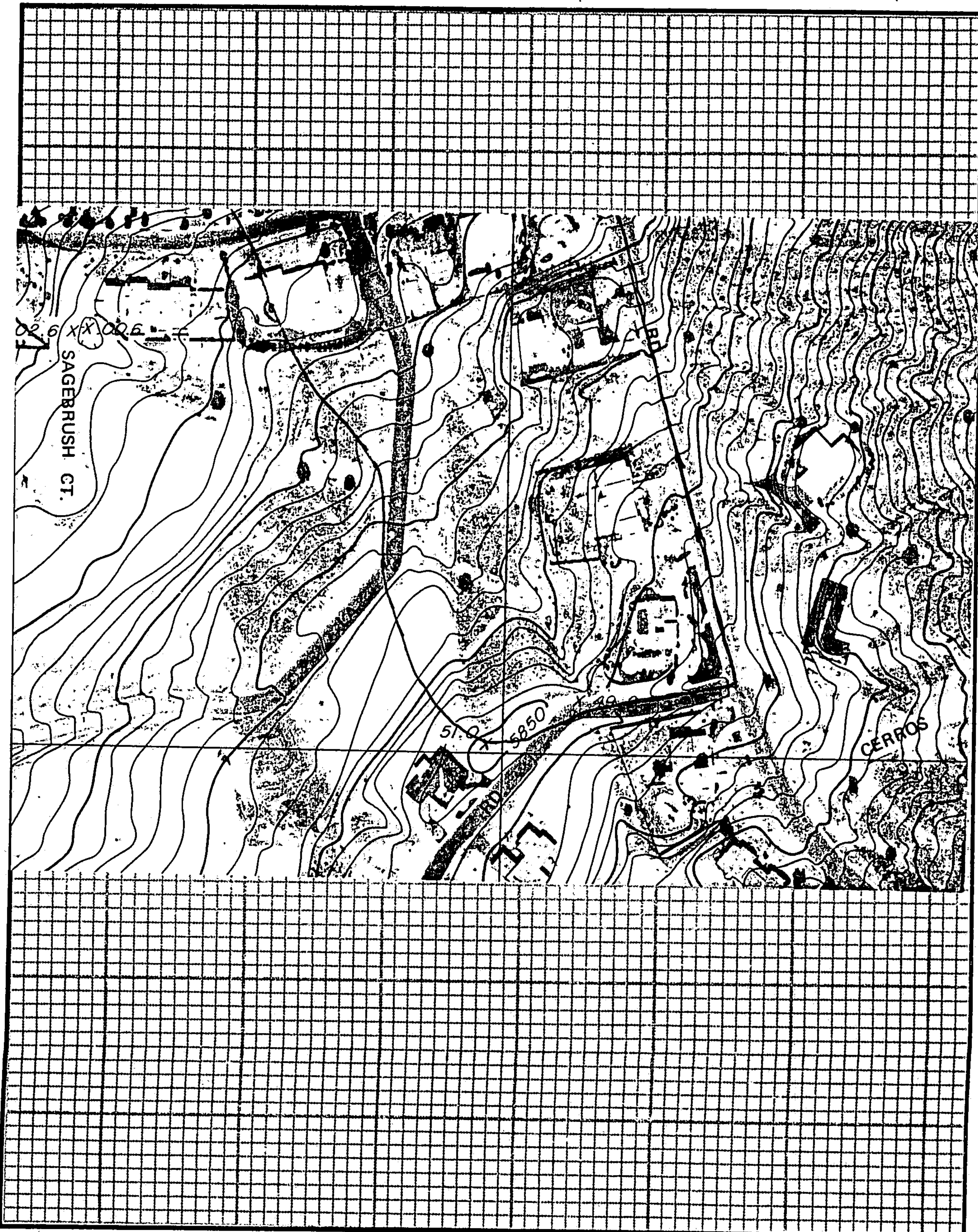
JOB Alikhani
SUBJECT Drainage
JOB NO. _____ SHEET 16 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____

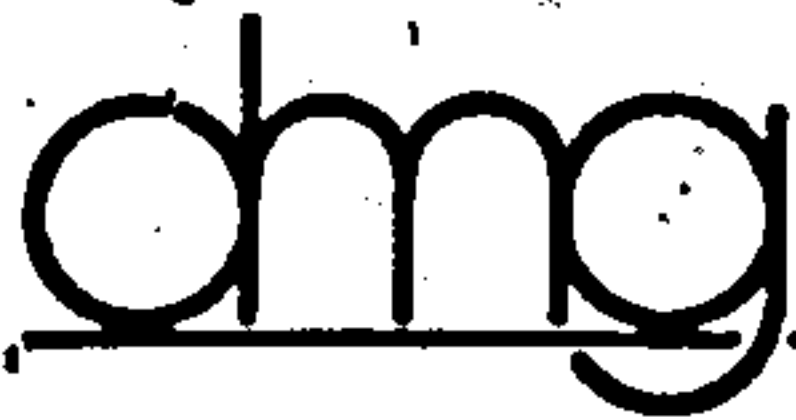




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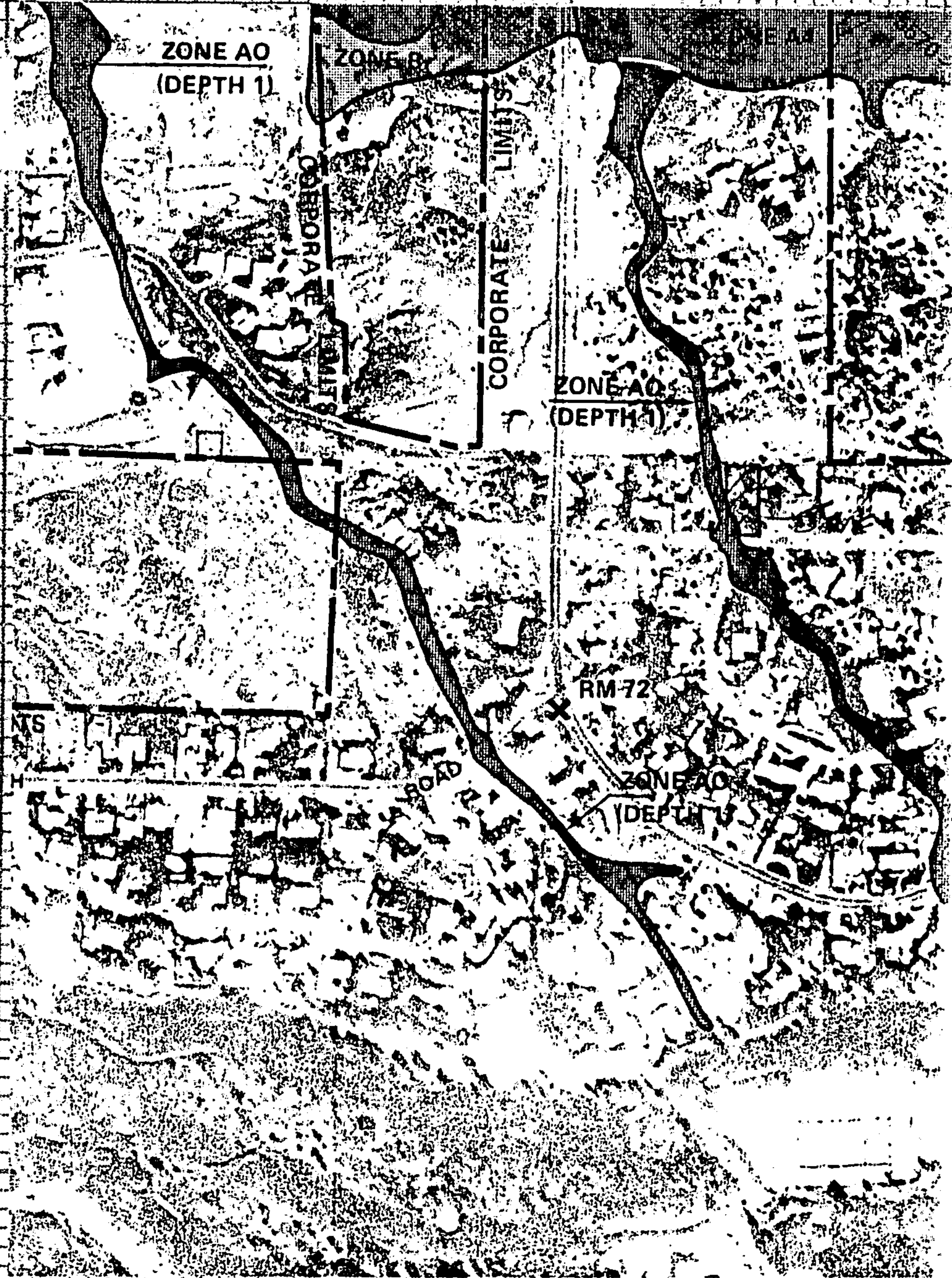
JOB Alikhani
SUBJECT Drainage
JOB NO. _____ SHEET 17 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____





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Consulting Engineers and Surveyors

JOB Alikhani
SUBJECT Drainage
JOB NO. _____ SHEET 18 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____





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Consulting Engineers and Surveyors

JOB Alikhani
SUBJECT Drainage
JOB NO. _____ SHEET 19 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____

We now need to calculate the flow and depth of flow in storm drains.

From Drainage Area Map $\rightarrow$ D.A. = 0.924 Ac.

$$P(100-6) = 2.60 \text{ in.}$$

Travel Path

1. overland = 400' @ 5% 5%

2. Gutter = 250' @ 6%

$$T_c = \frac{400}{.775} + \frac{250}{3.6} = 290 \text{ sec.} = 5 \text{ min. use 10 min.}$$

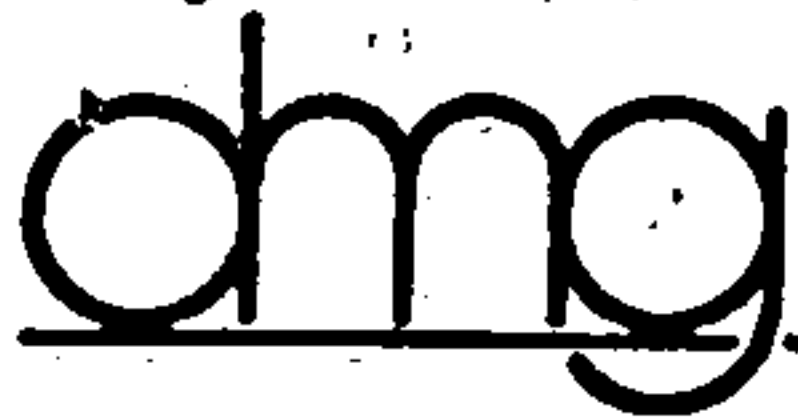
$$I(100-6) = 5.60 \text{ in/hr.}$$

Composite "C"

Roofs	0.90	0.184	0.166
Streets	0.75	0.172	.163
Landscape	0.25	0.568	.112
		.924	.471

$$\text{Composite "C"} = .51$$

$$Q(100-6) = 2.6 \text{ cfs}$$

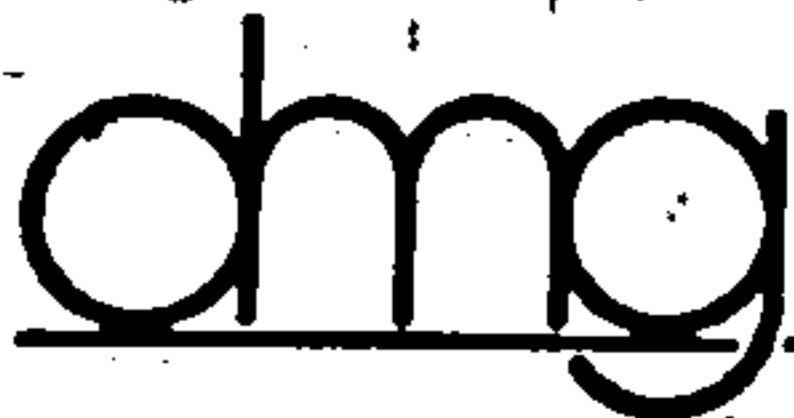


D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

JOB Alikhani
SUBJECT Drainage
JOB NO. _____ SHEET 20 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____

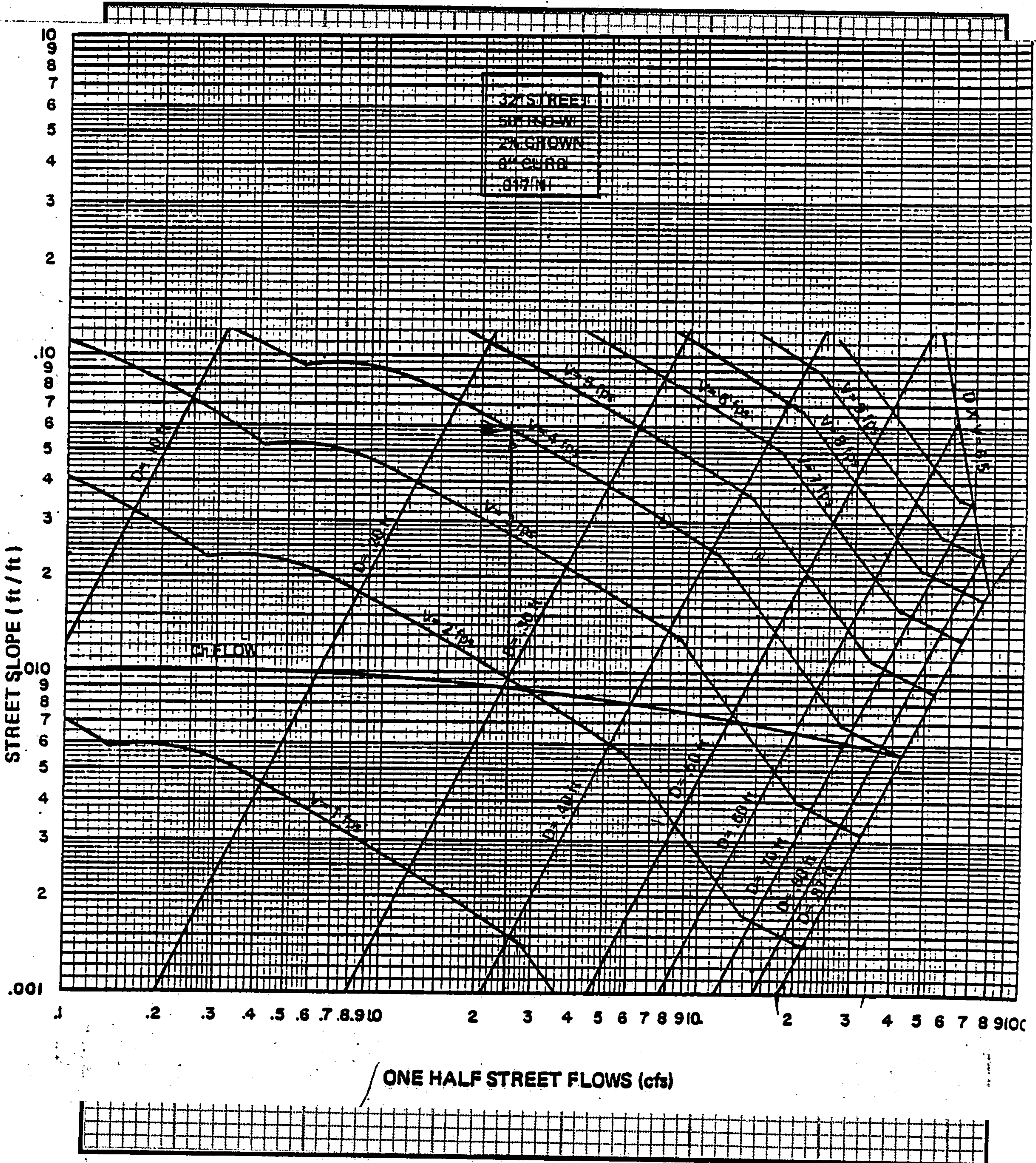
Since street (32') has a REVERSE CROWN
we will assume all flow is on our side
of street as it passes proposed driveway.

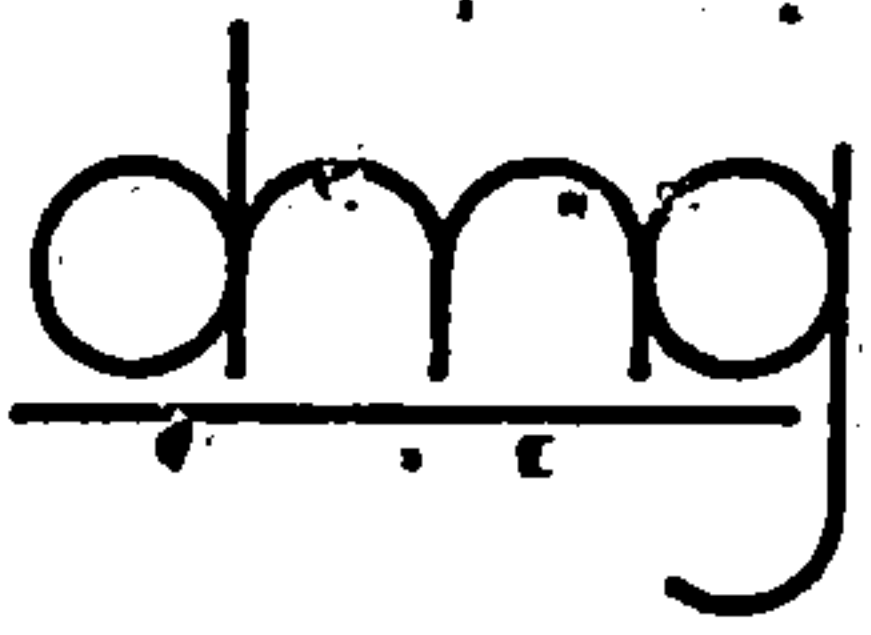
Per the following sht. Max. d = 0.22' we
have provided the std. 1' water block.



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Consulting Engineers and Surveyors

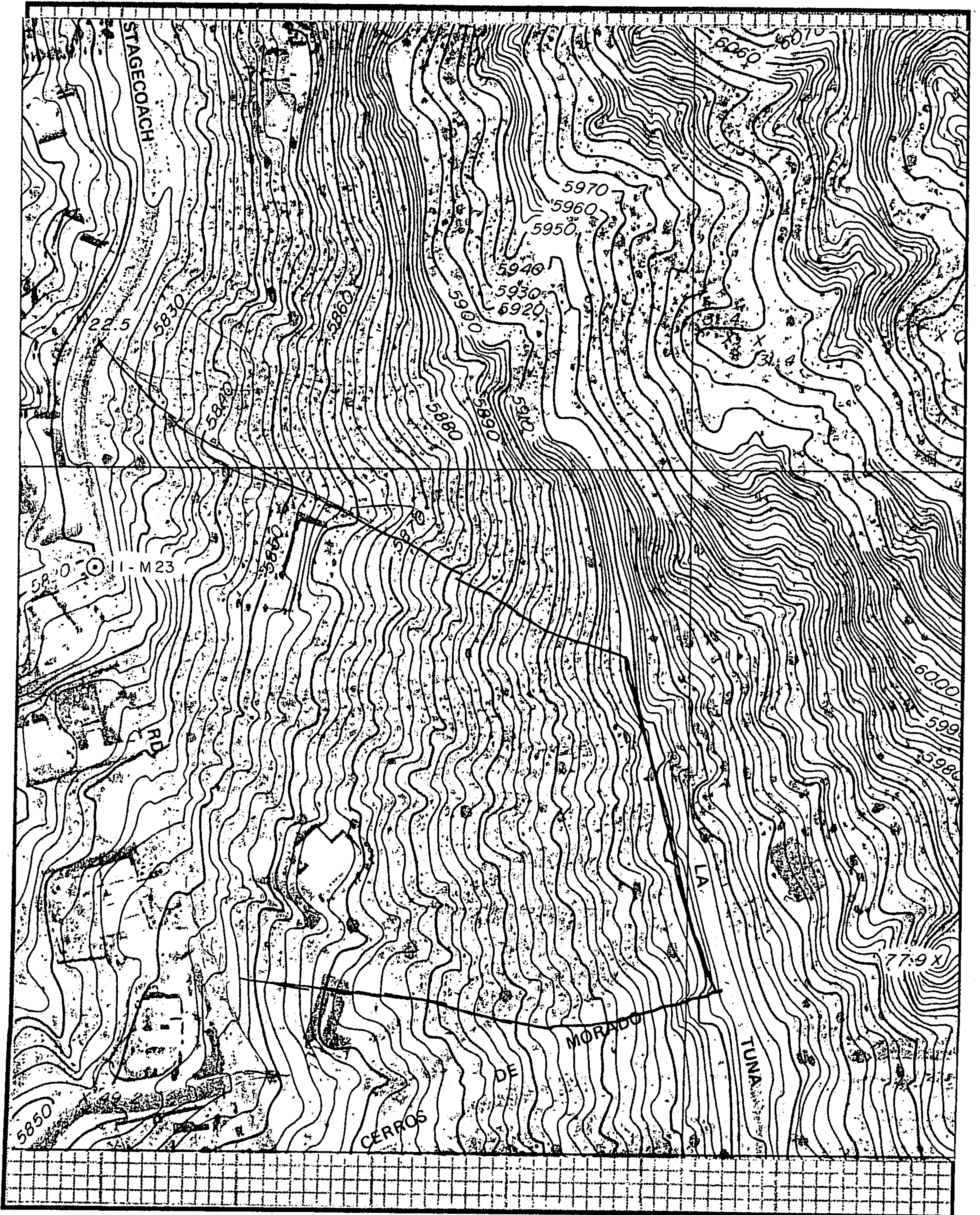
JOB Alikhani
SUBJECT Drainage
JOB NO. _____ SHEET 21 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____





D. MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS & SURVEYORS

PROJECT Alikhani
SUBJECT Drainage
BY MG DATE 4/3/92
CHECKED _____ DATE _____
SHEET 22 OF _____



SOUTHWEST SURVEYING CO., INC.

333 Lomas N.E.
Albuquerque, New Mexico 87102
(505) 247-4444
Franklin E. Wilson NM PLS No. 6446

SURVEYOR'S INSPECTION REPORT

THIS IS TO CERTIFY,
TO THE TITLE CO.:

ALBUQUERQUE TITLE COMPANY

TO UNDERWRITER:

COMMONWEALTH LAND TITLE INSURANCE COMPANY

TO LENDER:

NONE PROVIDED

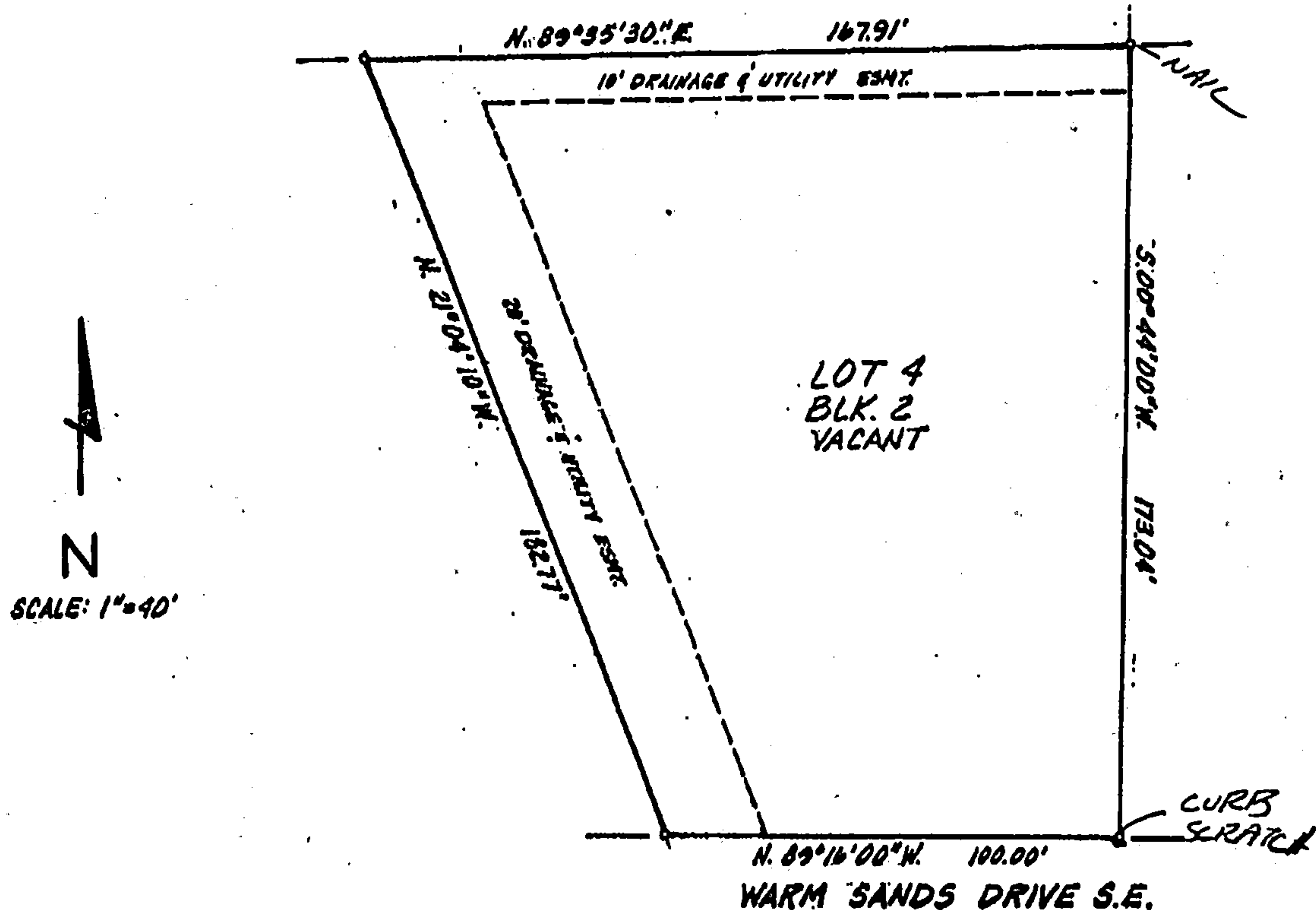
that on JANUARY 23, 1922, I made an inspection of the premises
situated at ALBUQUERQUE, BERNALILLO County,
N.M., briefly described as: WARM SANDS DRIVE SE
(Address, if applicable)

NOTE: The error of closure is one foot of error for every 10,000 OR MORE
feet along the perimeter of the legal description provided.
Easements shown hereon are as listed in Title Commitment No. NONE
provided by Title Company.

PLAT REFERENCE: Bearings, distances and/or curve data are taken from the
following plat.

LEGAL DESCRIPTION

Lot numbered Four (4) in Block numbered Two (2) FOUR HILLS VILLAGE, FIRST
INSTALLMENT, an Addition to the City of Albuquerque, New Mexico, as the same
is shown and designated on the Plat of said Addition filed in the Office of
the County Clerk of Bernalillo County, New Mexico, on September 9, 1958.



Improvement location is based on previous property surveys. No monuments
were set. This tract is subject to all easements, restrictions and
reservations of record which pertain. This report is not to be relied on
for the establishment of fences, buildings or other future improvements.

SURVEYOR'S INSPECTION REPORT
WARMS SANDS DRIVE SE

ADDRESS OR BRIEF LEGAL DESC.

I FURTHER CERTIFY as to the existence of the following at the time of my last inspection:

1. Evidence of rights of way, old highways or abandoned roads, lanes, trails or driveways, sewer, drains, water, gas or oil pipe lines on or crossing said premises (show location, if none visible, so indicate:

NONE

2. Springs, streams, rivers, ponds, or lakes located, bordering on or through said premises:

NONE

3. Evidence of cemeteries or family burial grounds located on said premises (show location):

NONE

4. Overhead utility poles, anchors, pedestals, wires or lines overhanging or crossing said premises and serving other properties (show location):

NONE

5. Joint driveways or walkways, joint garages, party walls or rights of support, steps or roofs used in common or joint garages:

NONE

6. Apparent encroachments. If the buildings, projections or cornices thereof, or signs affixed thereto, fences or other indications of occupancy appear to encroach upon or overhang adjoining property, or the like appear to encroach upon or overhang inspected premises, specify all such (show location):

NONE

7. Specific physical evidence of boundary lines of all sides:

SEE DRAWING

8. Is the property improved? (If structure appears to encroach or appears to violate set back lines, show approximate distances):

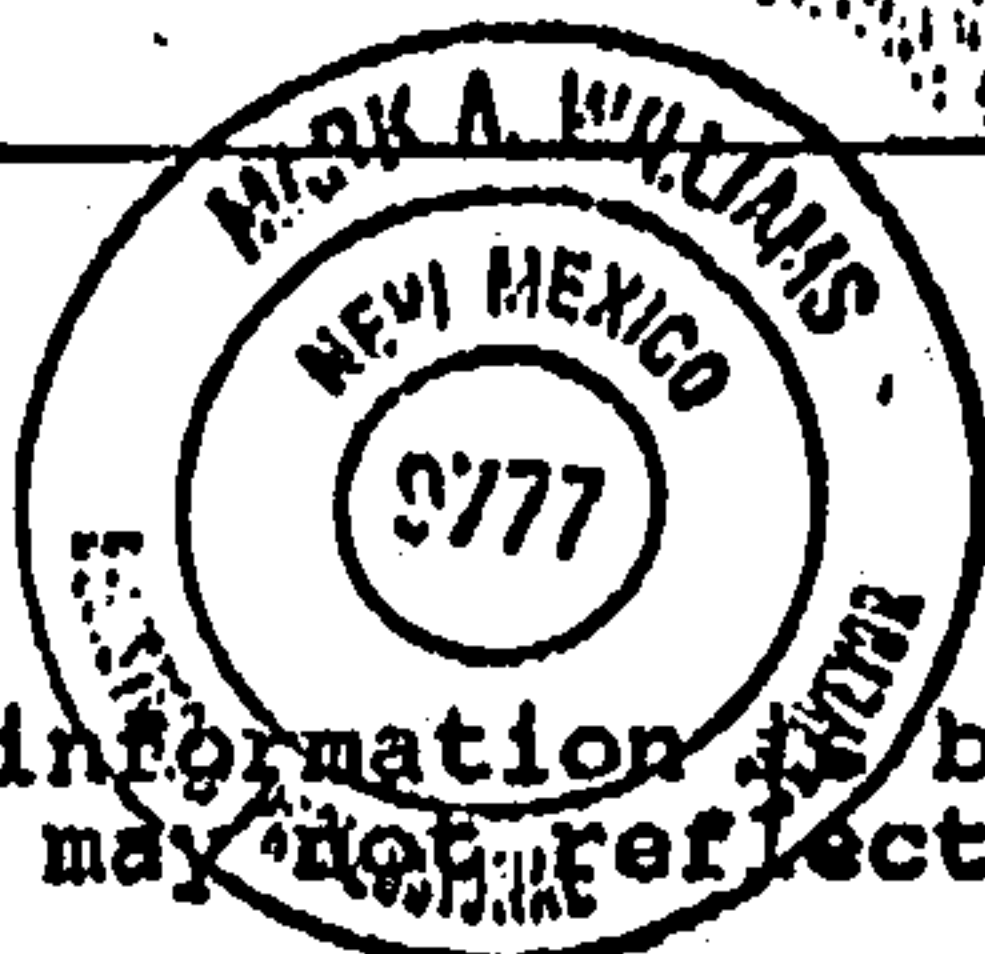
EXISTING RESIDENCE

9. Indications of recent building construction, alterations or repairs:

NONE

10. Approximate distance of structures from at least two lot lines must be shown:

SEE DRAWING



NEW MEXICO PROFESSIONAL SURVEYOR

2/24/92
DATE

The above information is based on boundary information taken from a previous survey and may not reflect that which may be disclosed by a boundary survey.

DRAINAGE INFORMATION SHEET

PROJECT TITLE: Alikhani Residence ZONE ATLAS/DRNG. FILE #: L-23 / 1014
LEGAL DESCRIPTION: Lot 4, Block 2, Four Hills Village, First Installment
CITY ADDRESS: Warm Sands Drive SE
ENGINEERING FIRM: Mark Goodwin & Associates CONTACT: Mark Goodwin, P.E.
ADDRESS: PO Box 90606 87199 PHONE: 828-2200
OWNER: Naser Alikhani CONTACT: Naser Alikhani
ADDRESS: 13816 Winterwood Way SE 87123 PHONE: 299-1000
ARCHITECT: N/A CONTACT: _____
ADDRESS: _____ PHONE: _____
SURVEYOR: Mark Goodwin & Associates CONTACT: Richard Borgel, P.S.
ADDRESS: PO Box 90606 PHONE: 828-2200
CONTRACTOR: N/A CONTACT: _____
ADDRESS: _____ PHONE: _____

PRE-DESIGN MEETING

☐ YES
☒ NO
☐ COPY OF CONFERENCE RECAP
SHEET PROVIDED

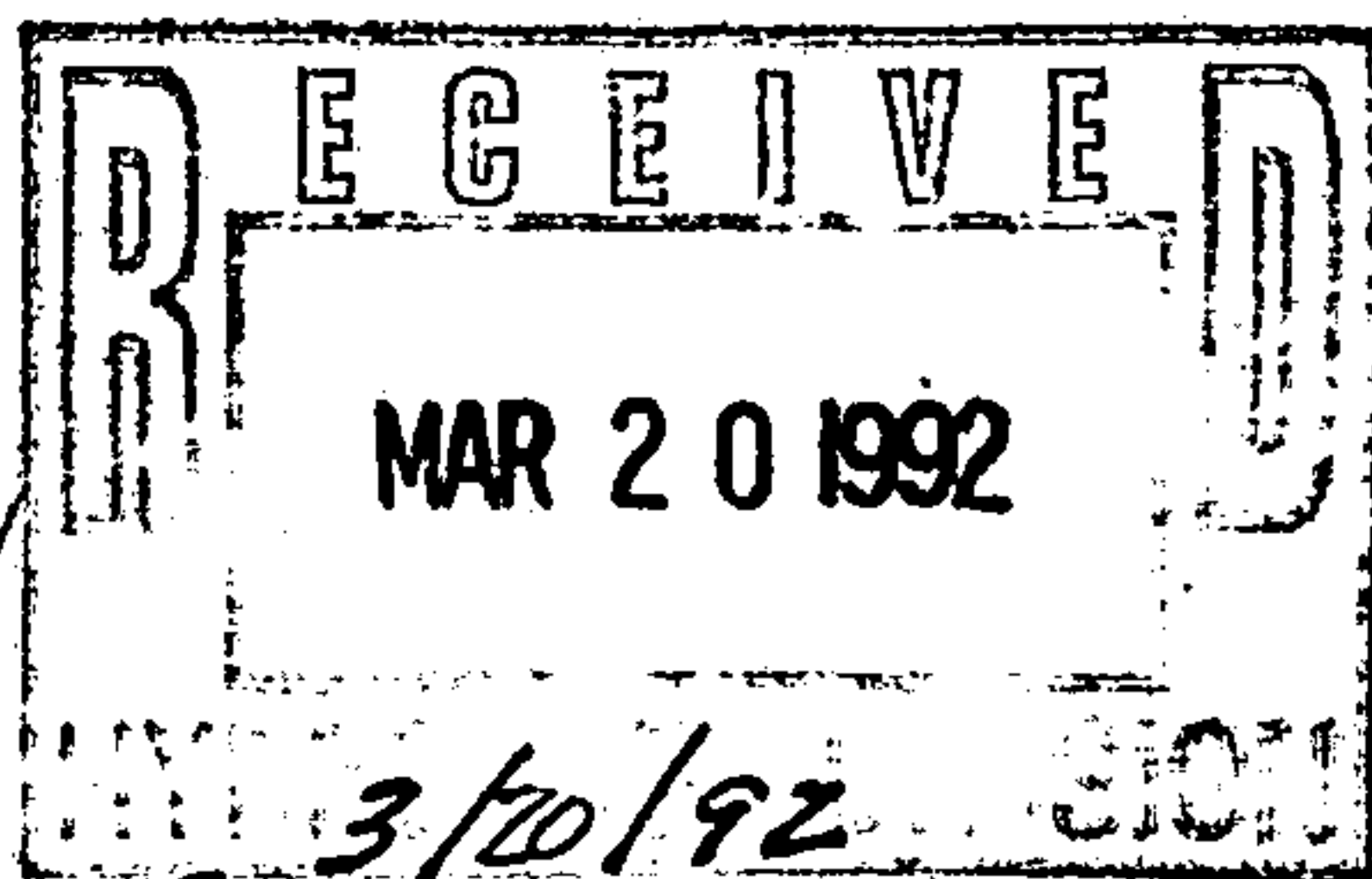
DRB NO. _____
EPC NO. _____
PROJ. NO. _____

TYPE OF SUBMITTAL:

☐ DRAINAGE REPORT
☒ DRAINAGE PLAN
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☒ GRADING PLAN
☐ EROSION CONTROL PLAN
☐ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

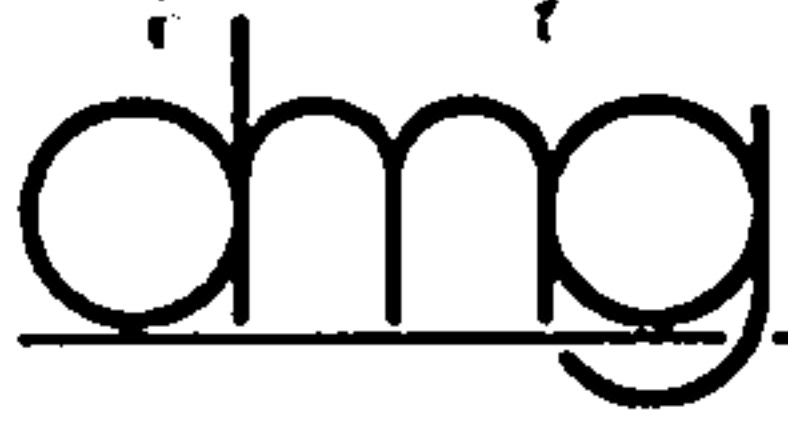
☐ SKETCH PLAT APPROVAL
☐ PRELIMINARY PLAT APPROVAL
☐ SITE DEVELOPMENT PLAN APPROVAL
☐ FINAL PLAT APPROVAL
☒ BUILDING PERMIT APPROVAL
☐ FOUNDATION PERMIT APPROVAL
☐ CERTIFICATE OF OCCUPANCY APPROVAL
☒ ROUGH GRADING PERMIT APPROVAL
☐ GRADING/PAVING PERMIT APPROVAL
☐ OTHER _____ SPECIFY



DATE SUBMITTED: _____

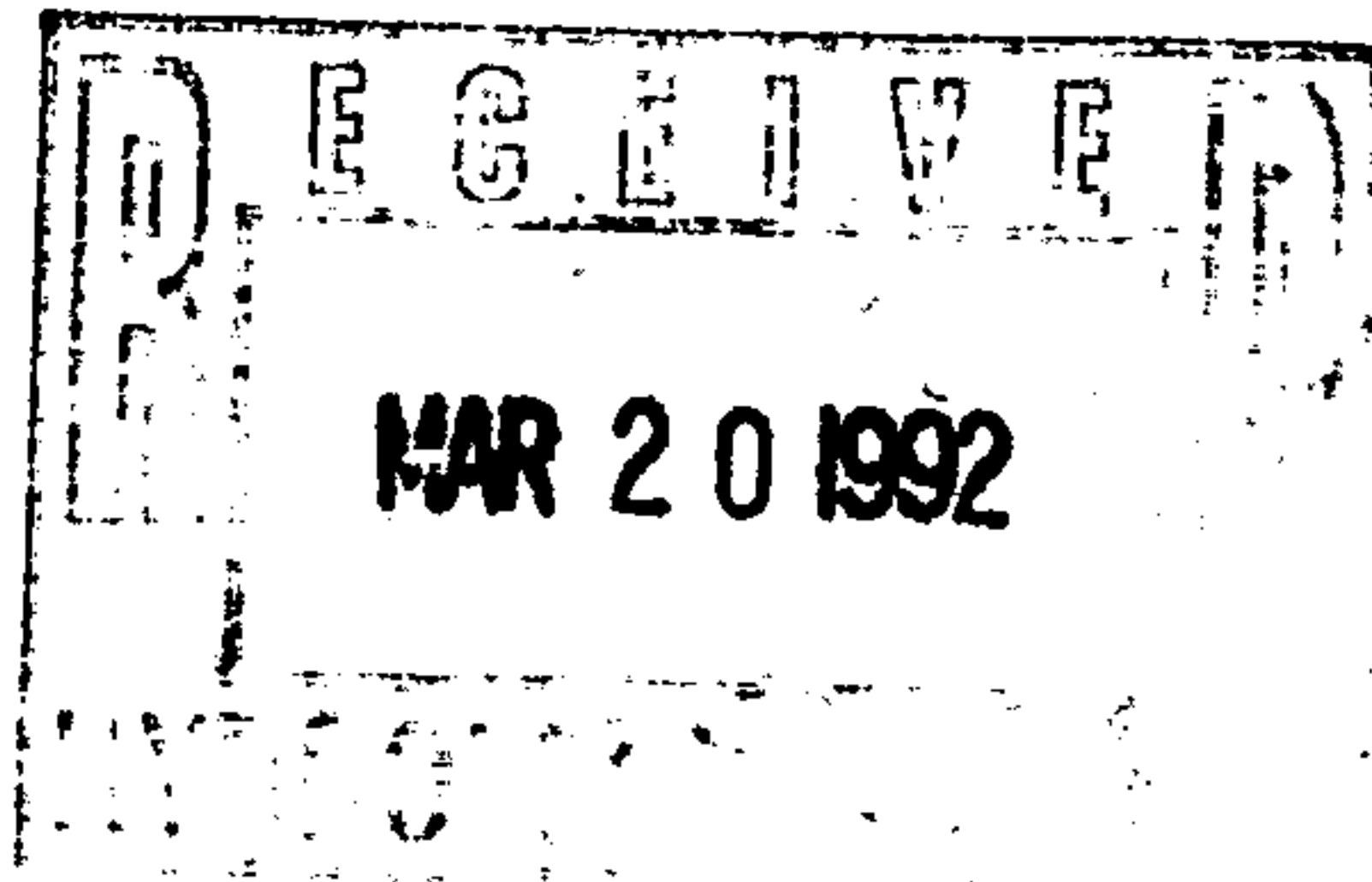
BY: Mark Goodwin

Mark Goodwin, P.E.



D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200



March 19, 1992

Mr. Gilbert Aldaz
Hydrology Department
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Lot 4, Block 2, Four Hills Village

Dear Mr. Aldaz:

Concerning the referenced project and your letter dated 3/13/92, we offer the following:

1. In the enclosed calculations, you will find a copy of the FIRM map with the site shown. ✓
2. We have included the drainage boundary map and lengthy analysis utilizing HYMO. This analysis not only calculates the 100-year storm but also routed this storm through the constrictions at Warm Sands and Winterwood. In neither case does the flow top the road, however, the depth of flow behind Warm Sands will be 11 feet. The City may want to consider this potential problem. ?

what kind of Problem?

off site
map appears
larger consider
street.

In the area of our project, the maximum depth of ponding will be 2.67 feet. Considering that the FIRM map indicates a depth of one to three feet, we feel fairly confident with this analysis.

3. Based upon the setback formula and a peak flow of 190 cfs, 11.4 feet of setback is required. We are well outside this limit as shown on the drawing.
4. Included in the calculations, you will note that the anticipated depth of flow in Warm Sands is 0.2 feet. We have proposed the standard water block height of one foot.
5. We feel that the arroyo is reasonably stable. There is a good vegetative cover and several trees growing in the arroyo. Our plan proposes no work be done in the arroyo other than "dressing" damaged areas.
6. Since a pool will form behind Winterwood, we do not feel the need to provide erosion control within the arroyo. Once again, we feel that disturbing the vegetation would be a mistake.

Lot 4, Block 2, Four Hills Village

March 19, 1992

Page 2

7. We mistakenly labeled the culvert beneath Warm Sands as a 24-inch CMP. Based upon our field surveys, it is 36-inch. Based upon our routing computations, flows will not top Warm Sands. As to the condition of the slope blanket/rundown, it is over 30 years old and is indeed showing signs of wear. It could fail prior to the 100-year event. Give us some direction in this matter.
8. You will note that the majority of the Flood Plain is on adjacent property. We can grant an easement for that portion on Lot 4 as you desire. If you will provide the forms, we will take it from there.
9. As to the dumping, we are requiring, by our plan, that the owner clean up and remove debris that was pushed into the arroyo. There is no way of knowing what the topography was like before our survey. We will certify to a stable slope when the project is completed. You can note that our analysis took into account the existing condition and that there appear to be no adverse impacts. However, we were not content with this, so our plan calls for the owner to clean it up. We do not know what else can be done.

*If failure
could structure
be damaged?*

*Provide
Easement.*

We hope that this analysis and response clear up any of the concerns you may have; but if not, please contact us.

Sincerely,

D. MARK GOODWIN AND ASSOCIATES, P.A.

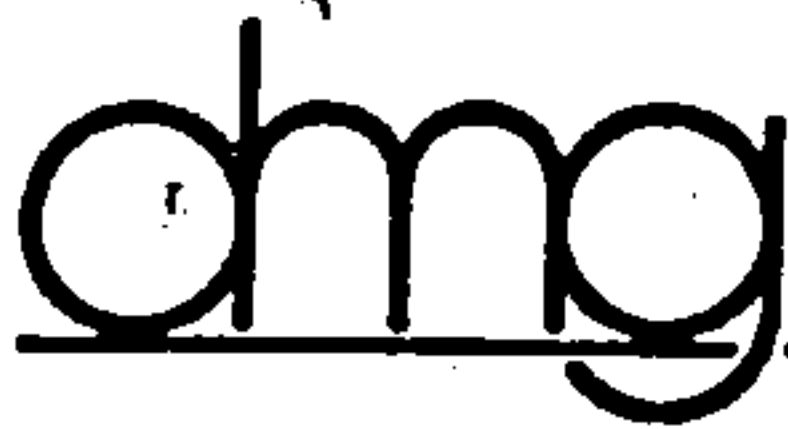


Mark Goodwin, P.E.

DMG:kaw

Enclosures

*Where is
clean-up note
certification reqd?*



D. Mark Goodwin & Associates, P.A.

Consulting Engineers and Surveyors

MAR 20 1992

JOB Alikhani Lot

SUBJECT Drainage

JOB NO. _____

SHEET 1 OF _____

BY _____

MG

DATE 3/18/92

CHECKED _____

DATE _____

Per City Orthophoto (attached) up-land drainage basin = 53 Ac.

We will use H&M to compute the 100 year - 6 hour storm & to route this storm through our project.

Precipitation Conc = 3

$P(100-6) = 2.60$ in.

$P(1) = 2.14$ in

Land Treatments

Majority of lots $\approx 1/3$ Ac. $\rightarrow N=3$

Percent D = $7(3(3) + 5(3)) = 34\%$

Treatment A = 10% = 5.3 Ac.

Treatment B = 40% = 21.2 Ac.

Treatment C = 16% = 8.4 Ac.

Treatment D = 34% = 18.1 Ac.

Pervious Area

Area = 34.9 Ac = 0.055 sq. mi.

Composite $I_A = \frac{5.3(0.40) + 21.2(.32) + 8.4(.25)}{34.9} = 0.32$ in.



D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

JOB Alikhani Lot

SUBJECT Drainage

JOB NO. _____ SHEET 2 OF _____

BY MG DATE 3/18/92

CHECKED _____ DATE _____

$$\text{Composite INF} = \frac{5.3(2.10) + 21.2(1.63) + 8.4(1.15)}{34.9} = 1.59 \text{ in/hr.}$$

Travel Path

1. Overland Flow = 1600' @ 5% = 5%

2. Arroyo Flow = 1900' @ 5% = 6%

$$T_o = \frac{1600}{.7\sqrt{5}} + \frac{1900}{3\sqrt{6}} = 1281 \text{ sec.} = 21 \text{ min.} = 0.356 \text{ hrs.}$$

$$T_p = \frac{2}{3} T_o = 0.237 \text{ hrs.}$$

$$\frac{K}{C_{p30}} = \frac{1.074538}{.636099} + \frac{(2.14)^{.0354}}{1} (5.3) + \frac{.836676}{1} + \frac{(2.14)^{.02882}}{1} (21.2) + \frac{(2.14)^{.0221}}{1} (8.4)$$

$$= 0.133$$

$$\frac{K}{C_{p130}} = \frac{1.309397}{.349} (2.14)^{.130834} (5.3) + \frac{1.051876}{.35546} (2.14)^{.130834} (21.2) + \frac{.921429}{.340428} (2.14)^{.130834} (8.4)$$

$$= 0.802$$

$$\frac{K}{C_p} = 0.133 + \left[\frac{(53-30)(.802-0.133)}{100} \right] = 0.287$$



D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

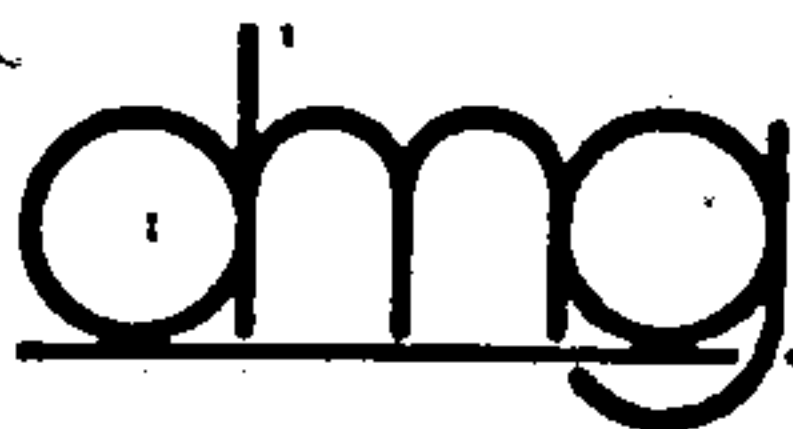
JOB Alikhani Lot
SUBJECT Drainage
JOB NO. _____ SHEET 3 OF _____
BY MG DATE 3/13/92
CHECKED _____ DATE _____

$$K = 0.787 (.237) = 0.186$$

MASS RAINFALL

JNE = 3
P60 = 2.14
P360 = 2.6
P1440 = 3.1

VALUE OF t	VALUE OF Pt	VALUE OF t	VALUE OF Pt	VALUE OF t	VALUE OF Pt	VALUE OF t	VALUE OF Pt
2	0.0011	92	2.2335	182	2.4060	272	2.5181
4	0.0049	94	2.2385	184	2.4090	274	2.5202
6	0.0145	96	2.2434	186	2.4119	276	2.5223
8	0.0336	98	2.2483	188	2.4148	278	2.5244
10	0.0661	100	2.2531	190	2.4177	280	2.5264
12	0.1161	102	2.2578	192	2.4205	282	2.5285
14	0.1880	104	2.2625	194	2.4234	284	2.5305
16	0.2861	106	2.2671	196	2.4262	286	2.5325
18	0.4150	108	2.2716	198	2.4290	288	2.5345
20	0.5793	110	2.2761	200	2.4317	290	2.5365
22	0.7839	112	2.2805	202	2.4345	292	2.5385
24	1.0337	114	2.2848	204	2.4372	294	2.5405
26	1.2492	116	2.2891	206	2.4399	296	2.5425
28	1.3461	118	2.2934	208	2.4425	298	2.5444
30	1.4282	120	2.2975	210	2.4452	300	2.5464
32	1.5015	122	2.3017	212	2.4478	302	2.5483
34	1.5682	124	2.3057	214	2.4504	304	2.5502
36	1.6298	126	2.3098	216	2.4530	306	2.5521
38	1.6871	128	2.3137	218	2.4556	308	2.5540
40	1.7407	130	2.3177	220	2.4581	310	2.5559
42	1.7911	132	2.3215	222	2.4606	312	2.5577
44	1.8386	134	2.3254	224	2.4631	314	2.5596
46	1.8835	136	2.3292	226	2.4656	316	2.5615
48	1.9260	138	2.3329	228	2.4681	318	2.5633
50	1.9664	140	2.3366	230	2.4705	320	2.5651
52	2.0047	142	2.3403	232	2.4730	322	2.5669
54	2.0411	144	2.3439	234	2.4754	324	2.5687
56	2.0757	146	2.3475	236	2.4778	326	2.5705
58	2.1086	148	2.3510	238	2.4802	328	2.5723
60	2.1404	150	2.3545	240	2.4825	330	2.5741
62	2.1471	152	2.3580	242	2.4849	332	2.5759
64	2.1536	154	2.3614	244	2.4872	334	2.5776
66	2.1600	156	2.3648	246	2.4895	336	2.5794
68	2.1663	158	2.3682	248	2.4918	338	2.5811
70	2.1725	160	2.3715	250	2.4941	340	2.5829
72	2.1785	162	2.3748	252	2.4963	342	2.5846
74	2.1844	164	2.3780	254	2.4986	344	2.5863
76	2.1903	166	2.3813	256	2.5008	346	2.5880
78	2.1960	168	2.3845	258	2.5030	348	2.5897
80	2.2016	170	2.3876	260	2.5052	350	2.5914
82	2.2072	172	2.3908	262	2.5074	352	2.5931
84	2.2126	174	2.3939	264	2.5096	354	2.5947
86	2.2179	176	2.3969	266	2.5117	356	2.5964
88	2.2232	178	2.4000	268	2.5139	358	2.5980
90	2.2284	180	2.4030	270	2.5160	360	2.6000



D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

JOB Alikhani Lot
SUBJECT Drainage
JOB NO. _____ SHEET 4 OF _____
BY MIG DATE 3/18/92
CHECKED _____ DATE _____

Impervious Area

$$A = 18.1 \text{ AC} = .0285 \text{ sq. mi.}$$

$$I_A = 0.10 \text{ in}$$

$$I_{NF} = 0.04 \text{ in/hr}$$

$$T_P = 0.237 \text{ hrs}$$

$$K = .42063 + (2.14)(.00656) = 0.435$$

K_{P30}

$$K = .667076 (2.14) = 0.550$$

K_{P130}

$$K = .435 + \left[(53 - 30) \left(\frac{.550 - .435}{100} \right) \right] = 0.461$$

K_P

$$K = 0.109$$

Per Attached Hyne Run: $Q(100-6) = 190 \text{ cfs}$

Ponding Area upstream of Warm Sands
needs to be accounted for as well as
ponding area upstream of Winterwood.

We will route thru these areas to determine
impact.



D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

JOB Alikhani Lot
SUBJECT Drainage
JOB NO. _____ SHEET 5 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____

Discharge beneath Wurm Sands is a
36" culvert that will act as an orifice. Discharge
beneath Winterwood is via 2-48 RCP that may
act as an orifice.

Wurm Sands

$$Q = CA \sqrt{2gH} = 0.8(7.06) \sqrt{2gH} = 5.66 \sqrt{2gH}$$

<u>HEAD</u>	<u>Elev.</u>	<u>Q_{out}</u>	<u>Vol.</u>
0	45.5	0	0
4.5'	50.0	96	.147
6.5'	52.0	116	.256
8.5'	54.0	132	.420
10.5'	56.0	147	.620
12.5'	58.0	161	.790

Winterwood

<u>HEAD</u>	<u>Elev.</u>	<u>Q_{out}</u>	<u>Vol.</u>
0	33.0	0	0
2'	35.0	228	.161
4'	37.0	322	.468

START TIME=0.0
***** COMPUTE HYDROGRAPHS FOR ALIKHANI LOT 4 HILLS
***** March 1992
***** PERVIOUS AREA OF WATERSHED

COMPUTE HYD ID=1 HYD NO=101.1 DT=.03333 HRS DA=.055 SQ MI
IA=-0.32 INF=-1.59 K=-0.068 TP=-0.237 RAIN=

0.0000	0.0011	0.0049	0.0145	0.0336	0.0661	0.1161
0.1880	0.2861	0.4150	0.5793	0.7839	1.0337	1.2492
1.3461	1.4282	1.5015	1.5682	1.6298	1.6871	1.7407
1.7911	1.8386	1.8835	1.9260	1.9664	2.0047	2.0411
2.0757	2.1086	2.1404	2.1471	2.1536	2.1600	2.1663
2.1725	2.1785	2.1844	2.1903	2.1960	2.2016	2.2072
2.2126	2.2179	2.2232	2.2284	2.2335	2.2385	2.2434
2.2483	2.2531	2.2578	2.2625	2.2671	2.2716	2.2761
2.2805	2.2848	2.2891	2.2934	2.2975	2.3017	2.3057
2.3098	2.3137	2.3177	2.3215	2.3254	2.3292	2.3329
2.3366	2.3403	2.3439	2.3475	2.3510	2.3545	2.3580
2.3614	2.3648	2.3682	2.3715	2.3748	2.3780	2.3813
2.3845	2.3876	2.3908	2.3939	2.3969	2.4000	2.4030
2.4060	2.4090	2.4119	2.4148	2.4177	2.4205	2.4234
2.4262	2.4290	2.4317	2.4345	2.4372	2.4399	2.4425
2.4452	2.4478	2.4504	2.4530	2.4556	2.4581	2.4606
2.4631	2.4656	2.4681	2.4705	2.4730	2.4754	2.4778
2.4802	2.4825	2.4849	2.4872	2.4895	2.4918	2.4941
2.4963	2.4986	2.5008	2.5030	2.5052	2.5074	2.5096
2.5117	2.5139	2.5160	2.5181	2.5202	2.5223	2.5244
2.5264	2.5285	2.5305	2.5325	2.5345	2.5365	2.5385
2.5405	2.5425	2.5444	2.5464	2.5483	2.5502	2.5521
2.5540	2.5559	2.5577	2.5596	2.5615	2.5633	2.5651
2.5669	2.5687	2.5705	2.5723	2.5741	2.5759	2.5776
2.5794	2.5811	2.5829	2.5846	2.5863	2.5880	2.5897
2.5914	2.5931	2.5947	2.5964	2.5980	2.6000	

PRINT HYD ID=1 CODE=1
***** IMPERVIOUS AREA OF WATERSHED
COMPUTE HYD ID=2 HYD NO=101.2 DT=.03333 HRS DA=0.028 SQ MI
IA=-0.1 INF=-0.04 K=-0.109 TP=-0.237 RAIN=-1
PRINT HYD ID=2 CODE=1
***** COMBINED HYDROGRAPH WATERSHED A
ADD HYD ID=2 HYD NO=101.3 ID=1 ID=2
PRINT HYD ID=2 CODE=1
ROUTE RESERVOIR ID=3 HYD NO=101.4 INFLOW ID=2 CODE=10
OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
0.00 0.00 45.5
96.00 0.147 50.0
116.00 0.256 52.0
132.00 0.420 54.0
147.00 0.620 56.0
161.00 0.790 58.0
173.00 0.920 60.0
PRINT HYD ID=3 CODE=0
FINISH

HYMO PROGRAM (AHYMO490) - AMAFCA VERSION APR., 1990
RUN DATE (MON/DAY/YR) = 03/18/1992
START TIME (HR:MIN:SEC) = 01:11:28

START TIME=0.0

***** COMPUTE HYDROGRAPHS FOR ALIKHANI LOT 4 HILLS

***** March 1992

***** PERVIOUS AREA OF WATERSHED

COMPUTE HYD ID=1 HYD NO=101.1 DT=.03333 HRS DA=.055 SQ MI

IA=-0.32 INF=-1.59 K=-0.068 TP=-0.237 RAIN=

0.0000	0.0011	0.0049	0.0145	0.0336	0.0661	0.1161
0.1880	0.2861	0.4150	0.5793	0.7839	1.0337	1.2492
1.3461	1.4282	1.5015	1.5682	1.6298	1.6871	1.7407
1.7911	1.8386	1.8835	1.9260	1.9664	2.0047	2.0411
2.0757	2.1086	2.1404	2.1471	2.1536	2.1600	2.1663
2.1725	2.1785	2.1844	2.1903	2.1960	2.2016	2.2072
2.2126	2.2179	2.2232	2.2284	2.2335	2.2385	2.2434
2.2483	2.2531	2.2578	2.2625	2.2671	2.2716	2.2761
2.2805	2.2848	2.2891	2.2934	2.2975	2.3017	2.3057
2.3098	2.3137	2.3177	2.3215	2.3254	2.3292	2.3329
2.3366	2.3403	2.3439	2.3475	2.3510	2.3545	2.3580
2.3614	2.3648	2.3682	2.3715	2.3748	2.3780	2.3813
2.3845	2.3876	2.3908	2.3939	2.3969	2.4000	2.4030
2.4060	2.4090	2.4119	2.4148	2.4177	2.4205	2.4234
2.4262	2.4290	2.4317	2.4345	2.4372	2.4399	2.4425
2.4452	2.4478	2.4504	2.4530	2.4556	2.4581	2.4606
2.4631	2.4656	2.4681	2.4705	2.4730	2.4754	2.4778
2.4802	2.4825	2.4849	2.4872	2.4895	2.4918	2.4941
2.4963	2.4986	2.5008	2.5030	2.5052	2.5074	2.5096
2.5117	2.5139	2.5160	2.5181	2.5202	2.5223	2.5244
2.5264	2.5285	2.5305	2.5325	2.5345	2.5365	2.5385
2.5405	2.5425	2.5444	2.5464	2.5483	2.5502	2.5521
2.5540	2.5559	2.5577	2.5596	2.5615	2.5633	2.5651

5ht. 8

2.5669 2.5687 2.5705 2.5723 2.5741 2.5759 2.5776
2.5794 2.5811 2.5829 2.5846 2.5863 2.5880 2.5897
2.5914 2.5931 2.5947 2.5964 2.5980 2.6000

K = .068000HR TP = .237000HR SHAPE CONSTANT, N = 17.25913
UNIT PEAK = 206.82 CFS UNIT VOLUME = .9995 B = 891.21

RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.10

RUNOFF VOLUME = .79870 INCHES = 2.3428 ACRE-FEET
PEAK DISCHARGE RATE = 118.27 CFS AT .600 HOURS

***** IMPERVIOUS AREA OF WATERSHED

COMPUTE HYD ID=2 HYD NO=101.2 DT=.03333 HRS DA=0.028 SQ MI
IA=-0.1 INF=-0.04 K=-0.109 TP=-0.237 RAIN=-1

K = .109000HR TP = .237000HR SHAPE CONSTANT, N = 8.87900
UNIT PEAK = 71.400 CFS UNIT VOLUME = .9997 B = 604.35

RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 101.20

RUNOFF VOLUME = 2.26759 INCHES = 3.3863 ACRE-FEET
PEAK DISCHARGE RATE = 71.72 CFS AT .600 HOURS

***** COMBINED HYDROGRAPH WATERSHED A

ADD HYD ID=2 HYD NO=101.3 ID=1 ID=2

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 101.30

RUNOFF VOLUME = 1.29422 INCHES = 5.7291 ACRE-FEET
PEAK DISCHARGE RATE = 189.98 CFS AT .600 HOURS

ROUTE RESERVOIR ID=3 HYD NO=101.4 INFLOW ID=2 CODE=10

OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)

96.00	0.147	50.0	5ht 9
116.00	0.256	52.0	
132.00	0.420	54.0	
147.00	0.620	56.0	
161.00	0.790	58.0	
173.00	0.920	60.0	

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
---------------	-----------------	----------------	-------------------	------------------

.00	.00	45.50	.000	.00
.33	3.28	45.60	.003	2.06
.67	154.67	56.27	.643	148.90
1.00	33.17	47.12	.053	34.66
1.33	10.37	46.03	.017	11.30
1.67	4.37	45.71	.007	4.53
2.00	2.58	45.62	.004	2.65
2.33	1.79	45.59	.003	1.82
2.67	1.37	45.57	.002	1.39
3.00	1.11	45.55	.002	1.12
3.33	.92	45.54	.001	.92
3.67	.77	45.54	.001	.78
4.00	.66	45.53	.001	.66
4.33	.55	45.53	.001	.56
4.67	.47	45.52	.001	.47
5.00	.39	45.52	.001	.39
5.33	.32	45.52	.001	.33
5.67	.27	45.51	.000	.27
6.00	.21	45.51	.000	.22
6.33	.07	45.50	.000	.08
6.67	.02	45.50	.000	.02
7.00	.01	45.50	.000	.01
7.33	.00	45.50	.000	.00

PEAK DISCHARGE = 148.904 CFS - PEAK OCCURS AT HOUR .67

MAXIMUM WATER SURFACE ELEVATION = 56.272

MAXIMUM STORAGE = .6431 AC-FT INCREMENTAL TIME= .033330HR

S

PRINT HYD

ID=3 CODE=0

PARTIAL HYDROGRAPH 101.40

TIME	TIME	FLOW	TIME	TIME	FLOW	TIME	FLOW
HRS	HRS	CFS	HRS	HRS	CFS	HRS	CFS
4.600	.000	.0	6.133	1.533	5.9	3.066	1.1
4.633	.033	.0	6.166	1.567	5.5	3.100	1.1
4.666	.067	.0	6.199	1.600	5.2	3.133	1.0
4.700	.100	.0	6.233	1.633	4.8	3.166	1.0
4.733	.133	.0	6.266	1.667	4.5	3.200	1.0

START TIME=0.0
 ***** COMPUTE HYDROGRAPHS FOR ALIKHANI LOT 4 HILLS
 ***** March 1992
 ***** PERVIOUS AREA OF WATERSHED
 COMPUTE HYD

ID=1 HYD NO=101.1 DT=.03333 HRS DA=.055 SQ MI
 IA=-0.32 INF=-1.59 K=-0.068 TP=-0.237 RAIN=

0.0000	0.0011	0.0049	0.0145	0.0336	0.0661	0.1161
0.1880	0.2861	0.4150	0.5793	0.7839	1.0337	1.2492
1.3461	1.4282	1.5015	1.5682	1.6298	1.6871	1.7407
1.7911	1.8386	1.8835	1.9260	1.9664	2.0047	2.0411
2.0757	2.1086	2.1404	2.1471	2.1536	2.1600	2.1663
2.1725	2.1785	2.1844	2.1903	2.1960	2.2016	2.2072
2.2126	2.2179	2.2232	2.2284	2.2335	2.2385	2.2434
2.2483	2.2531	2.2578	2.2625	2.2671	2.2716	2.2761
2.2805	2.2848	2.2891	2.2934	2.2975	2.3017	2.3057
2.3098	2.3137	2.3177	2.3215	2.3254	2.3292	2.3329
2.3366	2.3403	2.3439	2.3475	2.3510	2.3545	2.3580
2.3614	2.3648	2.3682	2.3715	2.3748	2.3780	2.3813
2.3845	2.3876	2.3908	2.3939	2.3969	2.4000	2.4030
2.4060	2.4090	2.4119	2.4148	2.4177	2.4205	2.4234
2.4262	2.4290	2.4317	2.4345	2.4372	2.4399	2.4425
2.4452	2.4478	2.4504	2.4530	2.4556	2.4581	2.4606
2.4631	2.4656	2.4681	2.4705	2.4730	2.4754	2.4778
2.4802	2.4825	2.4849	2.4872	2.4895	2.4918	2.4941
2.4963	2.4986	2.5008	2.5030	2.5052	2.5074	2.5096
2.5117	2.5139	2.5160	2.5181	2.5202	2.5223	2.5244
2.5264	2.5285	2.5305	2.5325	2.5345	2.5365	2.5385
2.5405	2.5425	2.5444	2.5464	2.5483	2.5502	2.5521
2.5540	2.5559	2.5577	2.5596	2.5615	2.5633	2.5651
2.5669	2.5687	2.5705	2.5723	2.5741	2.5759	2.5776
2.5794	2.5811	2.5829	2.5846	2.5863	2.5880	2.5897
2.5914	2.5931	2.5947	2.5964	2.5980	2.6000	

PRINT HYD ID=1 CODE=1
 ***** IMPERVIOUS AREA OF WATERSHED

COMPUTE HYD ID=2 HYD NO=101.2 DT=.03333 HRS DA=0.028 SQ MI
 IA=-0.1 INF=-0.04 K=-0.109 TP=-0.237 RAIN=-1

PRINT HYD ID=2 CODE=1
 ***** COMBINED HYDROGRAPH WATERSHED A

ADD HYD ID=2 HYD NO=101.3 ID=1 ID=2

PRINT HYD ID=2 CODE=1

ROUTE RESERVOIR ID=3 HYD NO=101.4 INFLOW ID=2 CODE=10

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEVATION(FT)
0.00	0.00	33.0
118.00	0.161	35.0
322.00	0.468	37.0

PRINT HYD ID=3 CODE=0
 FINISH

HYMO PROGRAM (AHYMO490) - AMAFCA VERSION APR., 1990
 RUN DATE (MON/DAY/YR) = 03/18/1992
 START TIME (HR:MIN:SEC) = 01:23:31

START TIME=0.0

***** COMPUTE HYDROGRAPHS FOR ALIKHANI LOT 4 HILLS

***** March 1992

***** PERVIOUS AREA OF WATERSHED

COMPUTE HYD ID=1 HYD NO=101.1 DT=.03333 HRS DA=.055 SQ MI

IA=-0.32 INF=-1.59 K=-0.068 TP=-0.237 RAIN=

0.0000	0.0011	0.0049	0.0145	0.0336	0.0661	0.1161
0.1880	0.2861	0.4150	0.5793	0.7839	1.0337	1.2492
1.3461	1.4282	1.5015	1.5682	1.6298	1.6871	1.7407
1.7911	1.8386	1.8835	1.9260	1.9664	2.0047	2.0411
2.0757	2.1086	2.1404	2.1471	2.1536	2.1600	2.1663
2.1725	2.1785	2.1844	2.1903	2.1960	2.2016	2.2072
2.2126	2.2179	2.2232	2.2284	2.2335	2.2385	2.2434
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2.3614	2.3648	2.3682	2.3715	2.3748	2.3780	2.3813
2.3845	2.3876	2.3908	2.3939	2.3969	2.4000	2.4030
2.4060	2.4090	2.4119	2.4148	2.4177	2.4205	2.4234
2.4262	2.4290	2.4317	2.4345	2.4372	2.4399	2.4425
2.4452	2.4478	2.4504	2.4530	2.4556	2.4581	2.4606
2.4631	2.4656	2.4681	2.4705	2.4730	2.4754	2.4778
2.4802	2.4825	2.4849	2.4872	2.4895	2.4918	2.4941
2.4963	2.4986	2.5008	2.5030	2.5052	2.5074	2.5096
2.5117	2.5139	2.5160	2.5181	2.5202	2.5223	2.5244
2.5264	2.5285	2.5305	2.5325	2.5345	2.5365	2.5385
2.5405	2.5425	2.5444	2.5464	2.5483	2.5502	2.5521
2.5540	2.5559	2.5577	2.5596	2.5615	2.5633	2.5651

Sh. 12

2.5669 2.5687 2.5705 2.5723 2.5741 2.5759 2.5776
2.5794 2.5811 2.5829 2.5846 2.5863 2.5880 2.5897
2.5914 2.5931 2.5947 2.5964 2.5980 2.6000

K = .068000HR TP = .237000HR SHAPE CONSTANT, N = 17.25913
UNIT PEAK = 206.82 CFS UNIT VOLUME = .9995 B = 891.21

RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD ID=1 CODE=1

PARTIAL HYDROGRAPH 101.10

RUNOFF VOLUME = .79870 INCHES = 2.3428 ACRE-FEET
PEAK DISCHARGE RATE = 118.27 CFS AT .600 HOURS

***** IMPERVIOUS AREA OF WATERSHED

COMPUTE HYD ID=2 HYD NO=101.2 DT=.03333 HRS DA=0.028 SQ MI

IA=-0.1 INF=-0.04 K=-0.109 TP=-0.237 RAIN=-1

K = .109000HR TP = .237000HR SHAPE CONSTANT, N = 8.87900
UNIT PEAK = 71.400 CFS UNIT VOLUME = .9997 B = 604.35

RUNOFF COMPUTED BY INITIAL ABSTRACTION - INFILTRATION METHOD

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 101.20

RUNOFF VOLUME = 2.26759 INCHES = 3.3863 ACRE-FEET
PEAK DISCHARGE RATE = 71.72 CFS AT .600 HOURS

***** COMBINED HYDROGRAPH WATERSHED A

ADD HYD ID=2 HYD NO=101.3 ID=1 ID=2

PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 101.30

RUNOFF VOLUME = 1.29422 INCHES = 5.7291 ACRE-FEET
PEAK DISCHARGE RATE = 189.98 CFS AT .600 HOURS

ROUTE RESERVOIR ID=3 HYD NO=101.4 INFLOW ID=2 CODE=10

OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)

118.00

0.161

35.0

Sht. 13

322.00

0.468

37.0

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
---------------	-----------------	----------------	-------------------	------------------

.00	.00	33.00	.000	.00
.33	3.28	33.04	.003	2.15
.67	154.67	35.49	.237	168.45
1.00	33.17	33.58	.047	34.48
1.33	10.37	33.19	.015	11.18
1.67	4.37	33.08	.006	4.51
2.00	2.58	33.04	.004	2.64
2.33	1.79	33.03	.002	1.82
2.67	1.37	33.02	.002	1.39
3.00	1.11	33.02	.002	1.12
3.33	.92	33.02	.001	.92
3.67	.77	33.01	.001	.78
4.00	.66	33.01	.001	.66
4.33	.55	33.01	.001	.56
4.67	.47	33.01	.001	.47
5.00	.39	33.01	.001	.39
5.33	.32	33.01	.000	.33
5.67	.27	33.00	.000	.27
6.00	.21	33.00	.000	.22
6.33	.07	33.00	.000	.08
6.67	.02	33.00	.000	.02
7.00	.01	33.00	.000	.01
7.33	.00	33.00	.000	.00

PEAK DISCHARGE = 185.140 CFS - PEAK OCCURS AT HOUR .63

MAXIMUM WATER SURFACE ELEVATION = 35.658

MAXIMUM STORAGE = .2620 AC-FT INCREMENTAL TIME = .033330HR

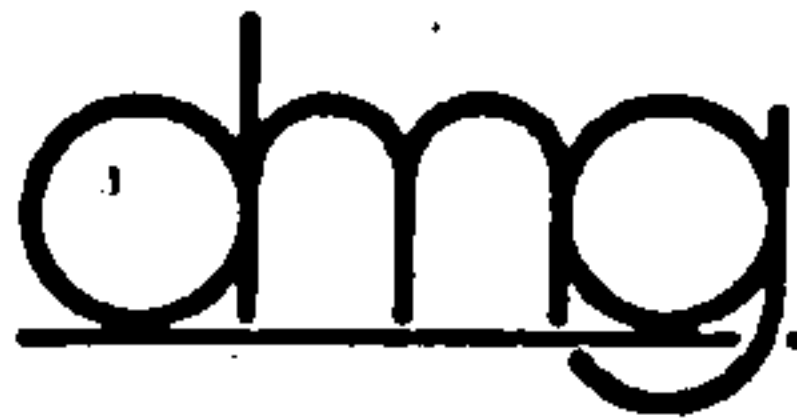
S.

PRINT HYD

ID=3 CODE=0

PARTIAL HYDROGRAPH 101.40

TIME HRS	TIME HRS	FLOW CFS	TIME HRS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
4.600	.000	.0	6.133	1.533	5.9	3.066	1.1
4.633	.033	.0	6.166	1.567	5.5	3.100	1.1
4.666	.067	.0	6.199	1.600	5.1	3.133	1.0
4.700	.100	.0	6.233	1.633	4.8	3.166	1.0
4.733	.133	.0	6.266	1.667	4.5	3.200	1.0
4.766	.167	.0	6.299	1.700	4.2	3.233	1.0
4.800	.200	.0	6.333	1.733	4.0	3.266	1.0
4.833	.233	.0	6.366	1.766	3.8	3.300	.9
	.267	.1	1.800		3.6	3.333	.9



D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

JOB Alikhani Lot
SUBJECT Drainage
JOB NO. _____ SHEET 14 OF _____
BY NIG DATE 3/18/92
CHECKED _____ DATE _____

SUMMARY OF FLOOD PLAIN

Peak $Q(100-6) = 190$ cfs

Peak Vol. = 5.73 AC-Ft.

MAX. Pond Depth @ Warm Sands = 56.27

Elev. Warm Sands = 58.00

= 11.27' deep

Does not run over Warm Sands

MAX. Pond Depth @ Winterwood = 35.67

= 2.67' deep

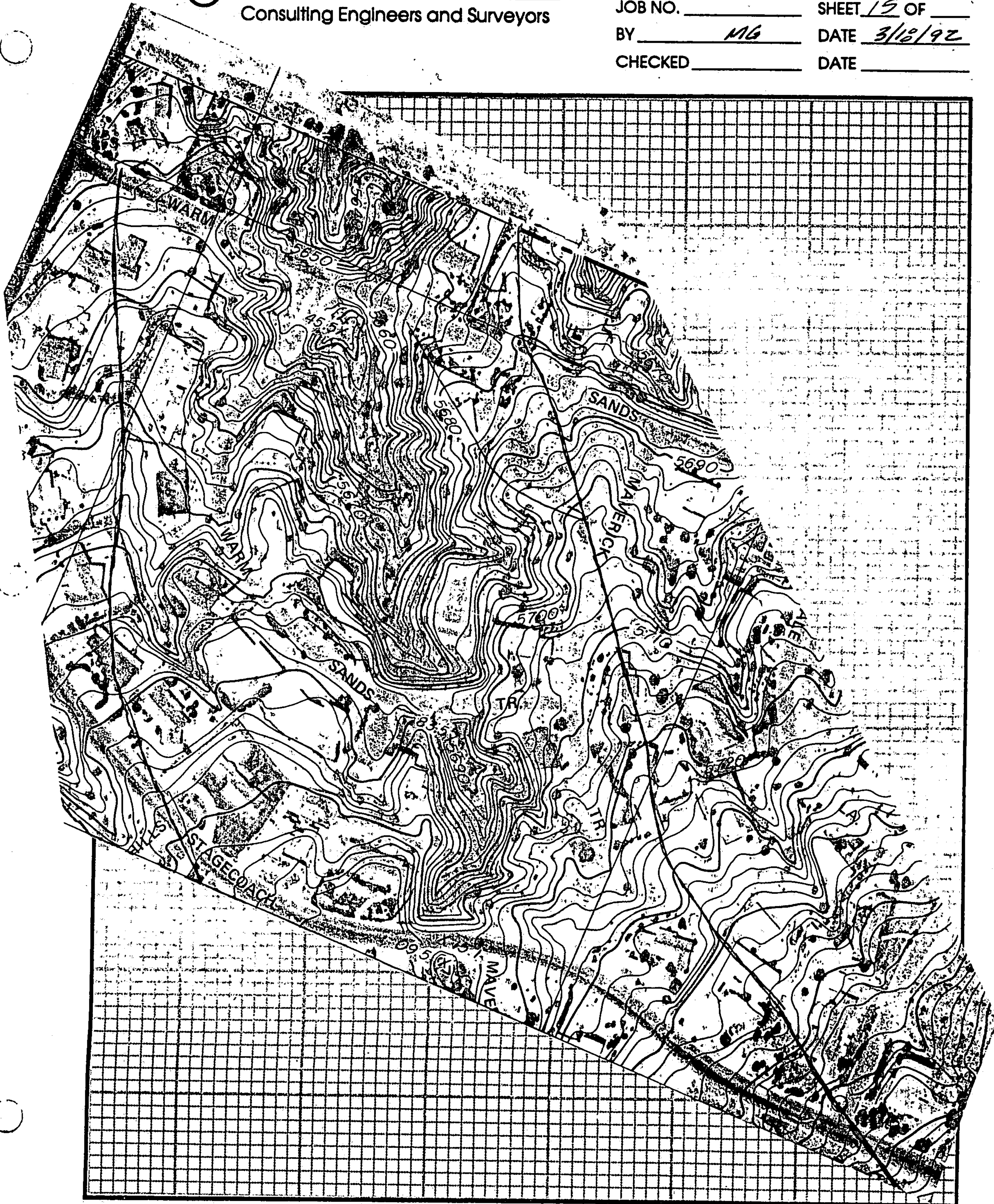
Does not run over Winterwood

FIRM Panel Shows 1' to 3' depth

Setback requirement = $\frac{190(6)}{100} = 11.4'$



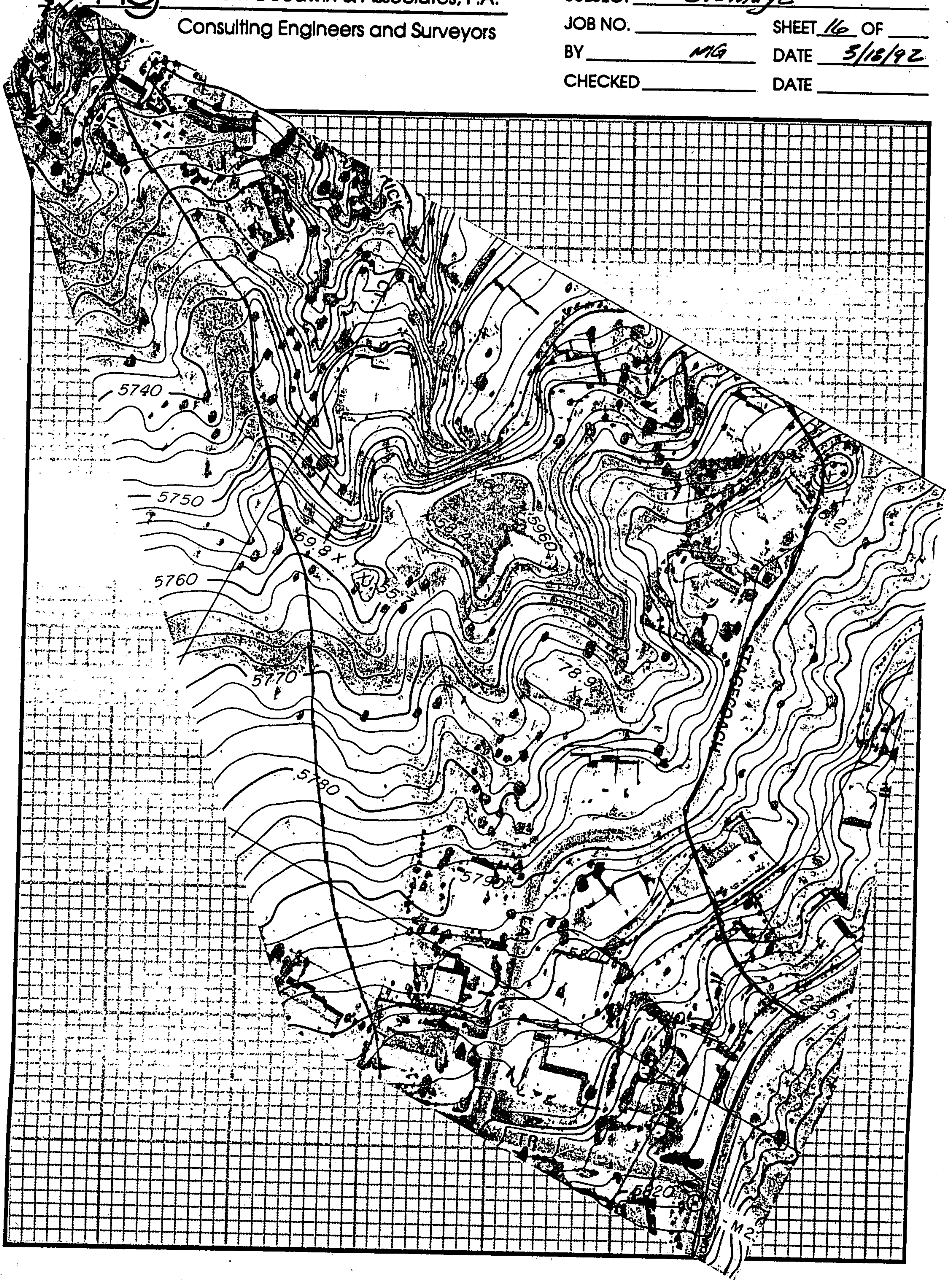
JOB Alikhani
SUBJECT Drainage
JOB NO. _____ SHEET 15 OF _____
BY MG DATE 3/12/92
CHECKED _____ DATE _____

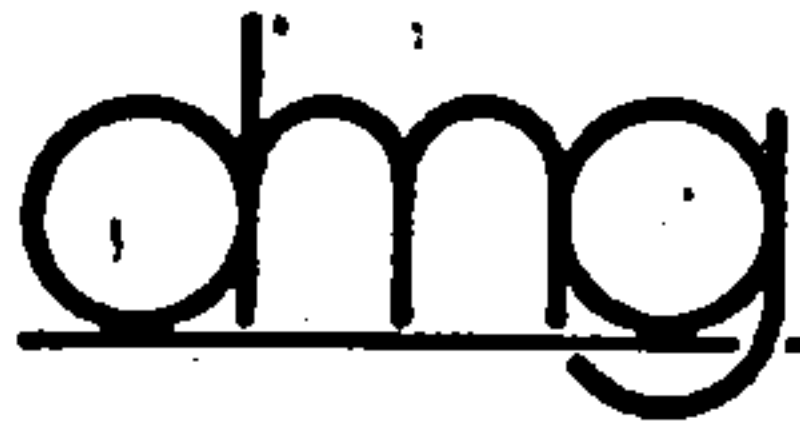




D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

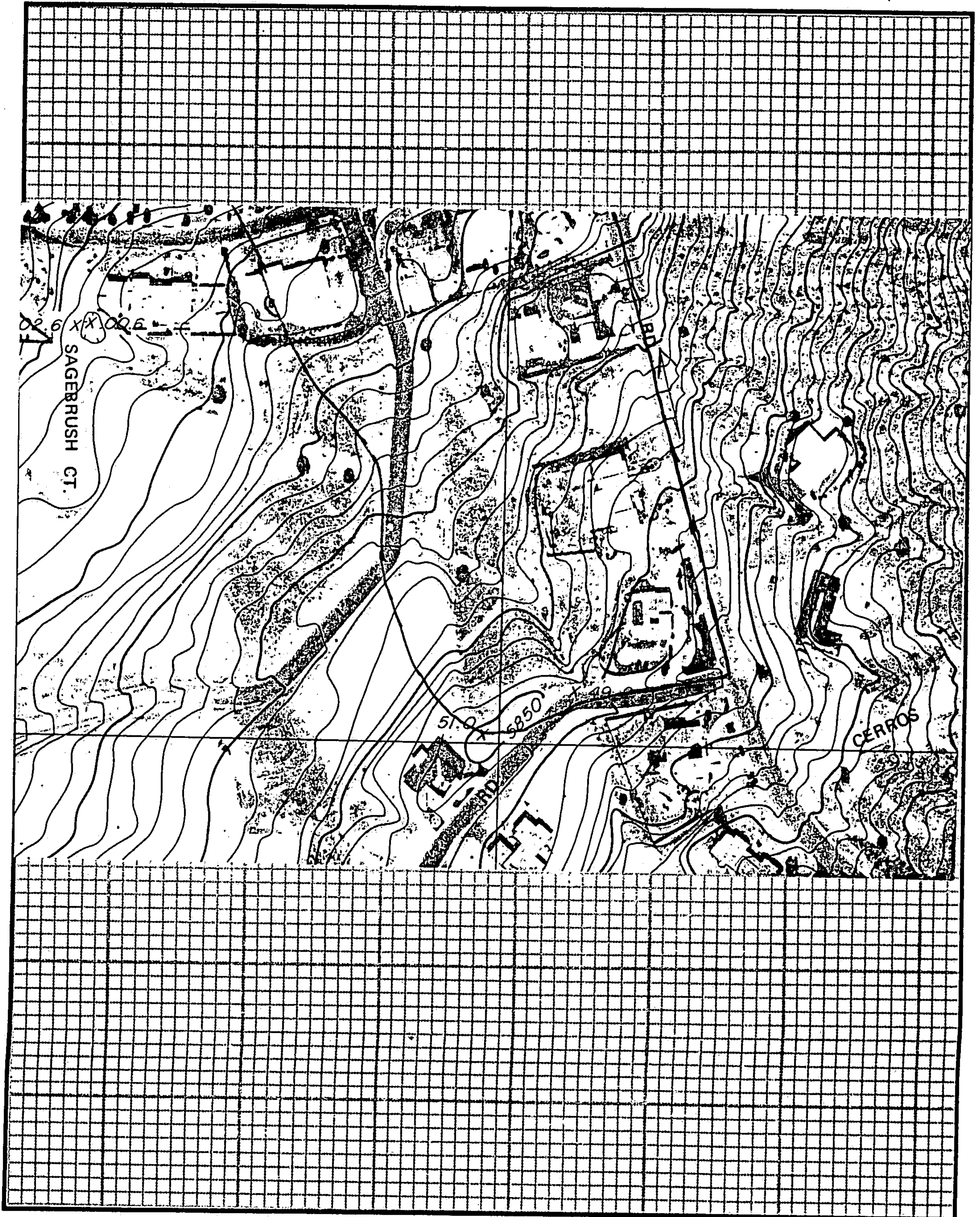
JOB Alikhani
SUBJECT Drainage
JOB NO. _____ SHEET 16 OF _____
BY MIG DATE 5/18/92
CHECKED _____ DATE _____

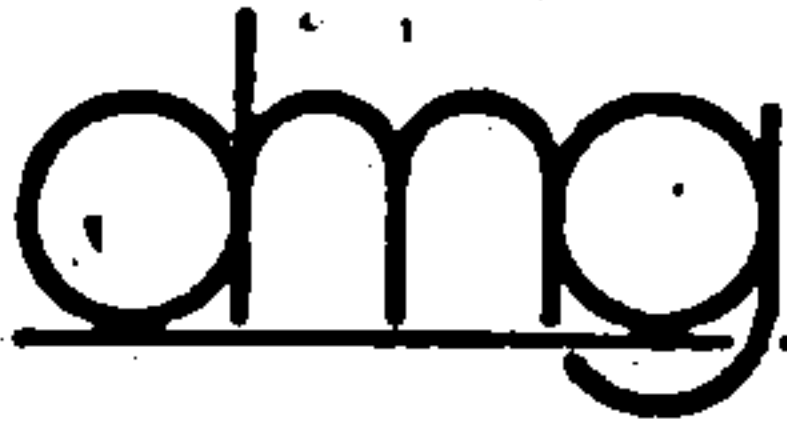




D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

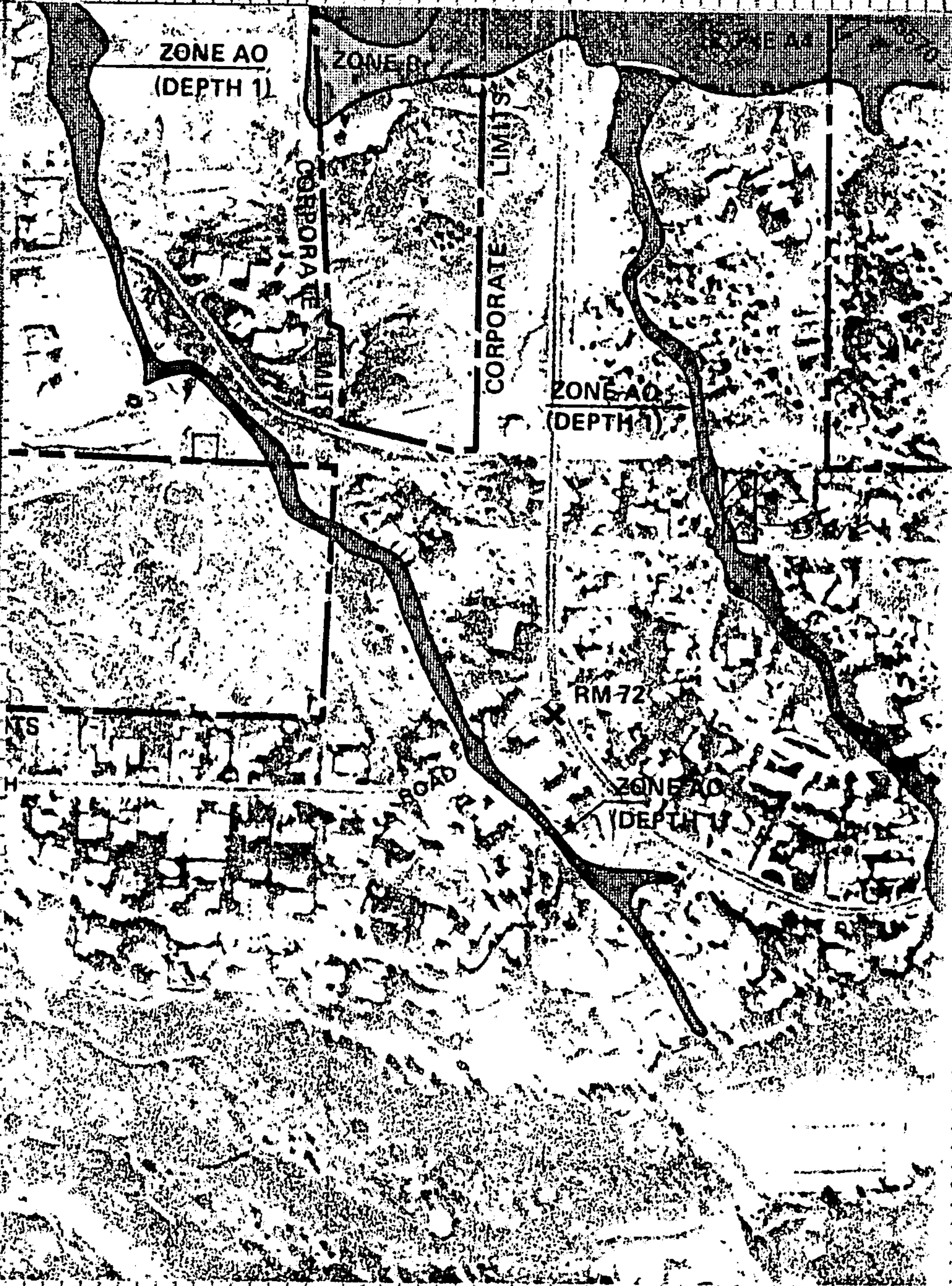
JOB Alikhani
SUBJECT Drainage
JOB NO. _____ SHEET 17 OF _____
BY MG DATE 5/18/92
CHECKED _____ DATE _____

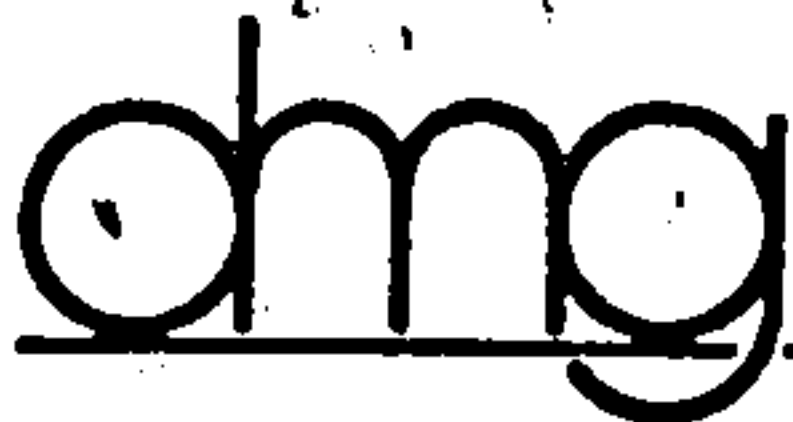




D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

JOB Alikhani
SUBJECT Drainage
JOB NO. _____ SHEET 18 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____





D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

JOB Alikhani
SUBJECT Drainage
JOB NO. _____ SHEET 19 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____

We now need to calculate the flow and depth of flow in storm drains.

From Drainage Area Map $\rightarrow$ D.A. = 0.924 Ac.

$$P(100-6) = 2.60 \text{ in.}$$

Travel Path

1. overland = 400' @ 5% = 5%

2. Gutter = 250' @ 6%

$$T_c = \frac{400}{1.48} + \frac{250}{3.16} = 290 \text{ sec.} = 5 \text{ min. use 10 min.}$$

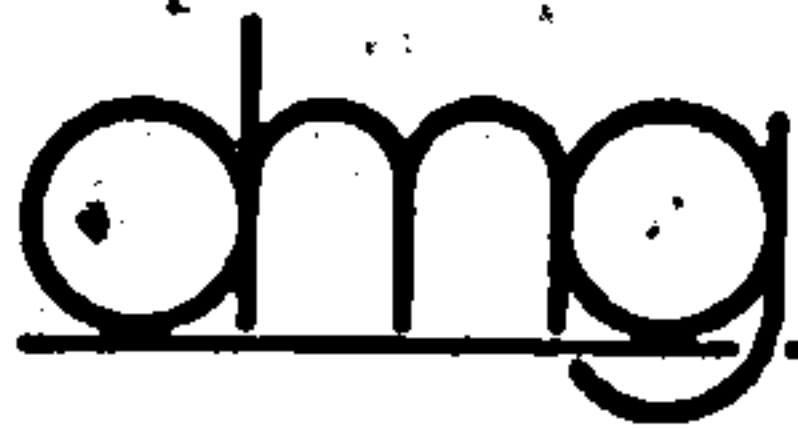
$$I(100-6) = 5.50 \text{ in/hr.}$$

Composite "C"

Roofs	0.90	0.184	0.166
Streets	0.75	0.172	.163
Landscape	0.25	0.568	.112
		.924	.441

$$\text{Composite "C"} = .51$$

$$Q(100-6) = 2.6 \text{ cfs}$$



D. Mark Goodwin & Associates, P.A.
Consulting Engineers and Surveyors

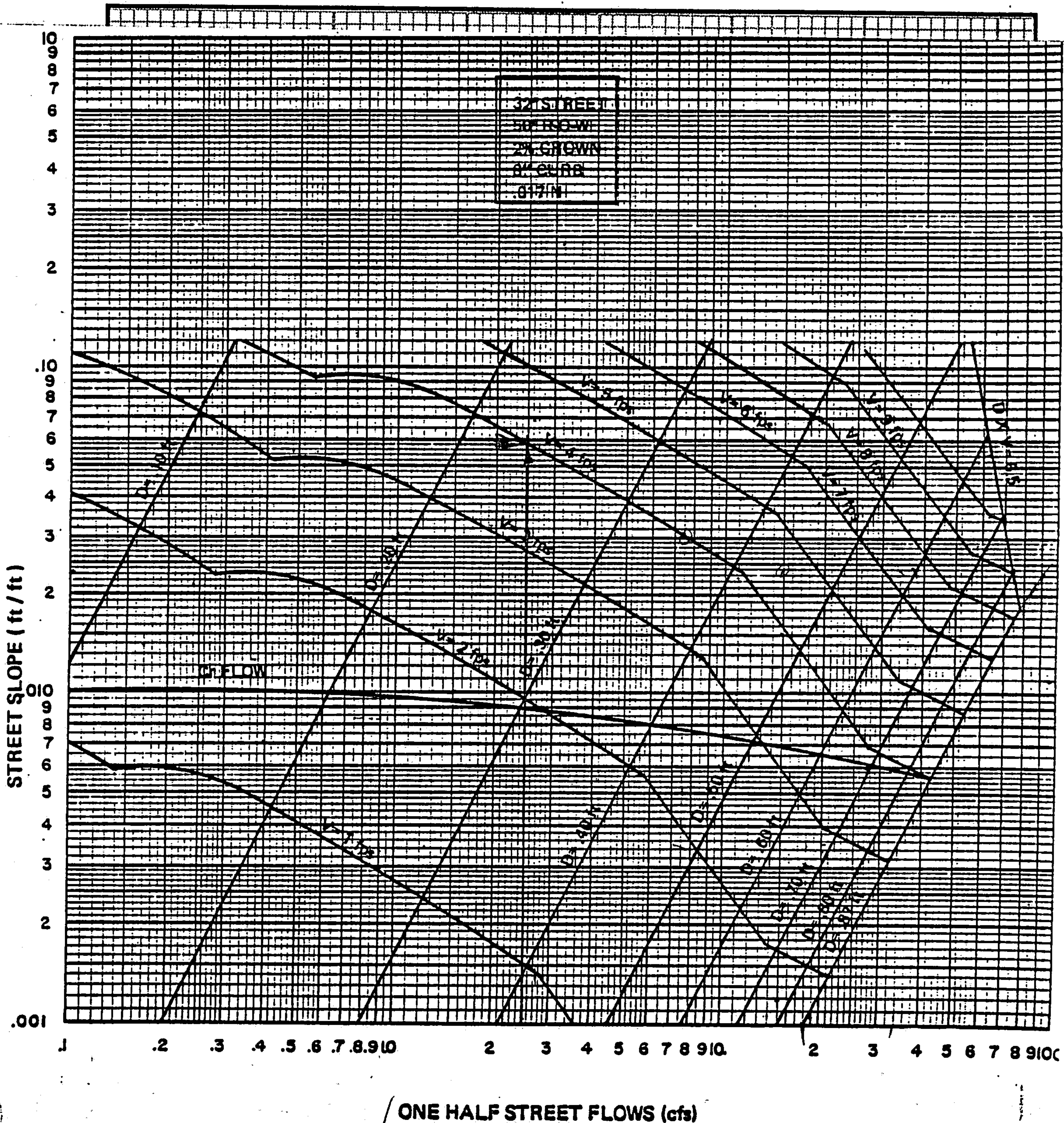
JOB Alikhani
SUBJECT Drainage
JOB NO. _____ SHEET 20 OF _____
BY MG DATE 3/18/92
CHECKED _____ DATE _____

Since street (32') has a reverse crown
we will assume all flow is on our side
of street as it passes proposed driveway.

Per the following skt. Max. d = 0.22' we
have provided the std. 1' water block.



DATE _____





City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 13, 1992

Mark Goodwin, P.E.
D. Mark Goodwin & Associates, P.A.
Post Office Box 90606
Albuquerque, New Mexico 87199

RE: DRAINAGE PLAN FOR LOT 4, BLOCK 2, FOUR HILLS VILLAGE
RECEIVED MARCH 4, 1992 FOR ROUGH GRADING & BUILDING PERMIT
APPROVAL (L-23/D16)

Dear Mr. Goodwin:

Based on the information provided on the referenced submittal received March 4, 1992, the following comments should be addressed prior to Rough Grading or Building Permit approval:

1. Show a copy of the official FIRM map on this plan, and locate the site relative to the official 100-year floodplain.
2. What is the 100-year flow rate through the arroyo? Show the off-site drainage basin boundary. Show the edge of the 100-year water surface on the arroyo based on this flow rate.
3. What is the 100-year flow rate on Warm Sands Drive S.E.? Show the off-site drainage basin boundary. The water block should be based on this depth.
4. Does the existing topography reflect the topography prior to the contractor commencing unauthorized dumping in this floodplain? Please submit evidence that the official floodplain was not relocated due to this unauthorized dumping.
5. What is the headwater depth on Winterwood Way? This could affect the floodplain identified in item No. 2, mentioned above.

PUBLIC WORKS DEPARTMENT

Mark Goodwin, P.E.

March 13, 1992

Page 2

6. Is the retaining wall and building setback for every 6 feet/100cfs of the arroyo? Is the bank stable enough that the retaining wall will not be affected during a 100-year storm?
7. Is the 24" storm drain adequately sized for the 100-year flow rate, or do flows overtop Warm Sands Drive? It appears seepage has taken place at the concrete blanket for the outlet of this 24" culvert. Could failure be experienced during a 100-year storm?
8. Is erosion required at the outlet of the 24 inch pipe on Warm Sands Drive?
9. A drainage easement will need to be dedicated for the floodplain reflected per item No. 2 and 5 mentioned above.

If you should have any questions, please do not hesitate to call me at 768-2650.

Cordially,

Gilbert Aldaz, P.E. & P.S.
City/County Floodplain Administrator

wp+3237



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

March 13, 1992

Mark Goodwin, P.E.
D. Mark Goodwin & Associates, P.A.
Post Office Box 90606
Albuquerque, New Mexico 87199

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4. Does the existing topography reflect the topography prior to the contractor commencing unauthorized dumping in this floodplain? Please submit evidence that the official floodplain was not relocated due to this unauthorized dumping.
5. What is the headwater depth on Winterwood Way? This could affect the floodplain identified in item No. 2, mentioned above.

PUBLIC WORKS DEPARTMENT

Walter H. Nickerson, Jr., P.E.
Assistant Director Public Works

ENGINEERING GROUP

Telephone (505) 768-2500

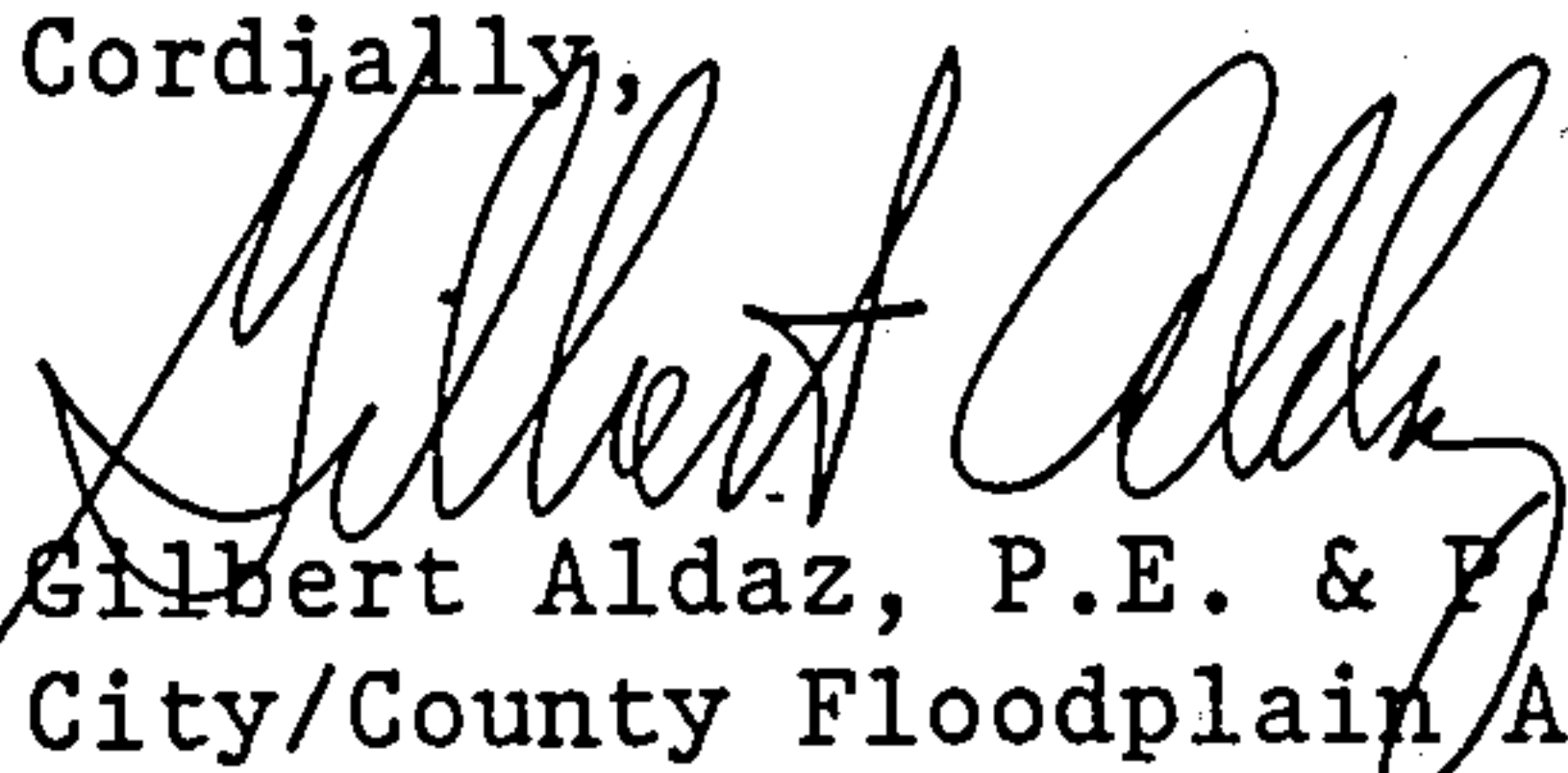
AN EQUAL OPPORTUNITY EMPLOYER

Mark Goodwin, P.E.
March 13, 1992
Page 2

6. Is the retaining wall and building setback for every 6 feet/100cfs of the arroyo? Is the bank stable enough that the retaining wall will not be affected during a 100-year storm?
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If you should have any questions, please do not hesitate to call me at 768-2650.

Cordially,


Gilbert Aldaz, P.E. & P.S.
City/County Floodplain Administrator

wp+3237

DRAINAGE INFORMATION SHEET

PROJECT TITLE: Alikhani Residence ZONE ATLAS/DRNG. FILE #: L-23 / D16
LEGAL DESCRIPTION: Lot 4, Block 2, Four Hills Village, First Installment
CITY ADDRESS: Warm Sands Drive SE
ENGINEERING FIRM: Mark Goodwin & Associates CONTACT: Mark Goodwin, P.E.
ADDRESS: PO Box 90606 87199 PHONE: 828-2200
OWNER: Naser Alikhani CONTACT: Naser Alikhani
ADDRESS: 13816 Winterwood Way SE 87123 PHONE: 299-1000
ARCHITECT: N/A CONTACT: _____
ADDRESS: _____ PHONE: _____
SURVEYOR: Mark Goodwin & Associates CONTACT: Richard Borgel, P.S.
ADDRESS: PO Box 90606 PHONE: 828-2200
CONTRACTOR: N/A CONTACT: _____
ADDRESS: _____ PHONE: _____

PRE-DESIGN MEETING

☐ YES
☒ NO
☐ COPY OF CONFERENCE RECAP
SHEET PROVIDED

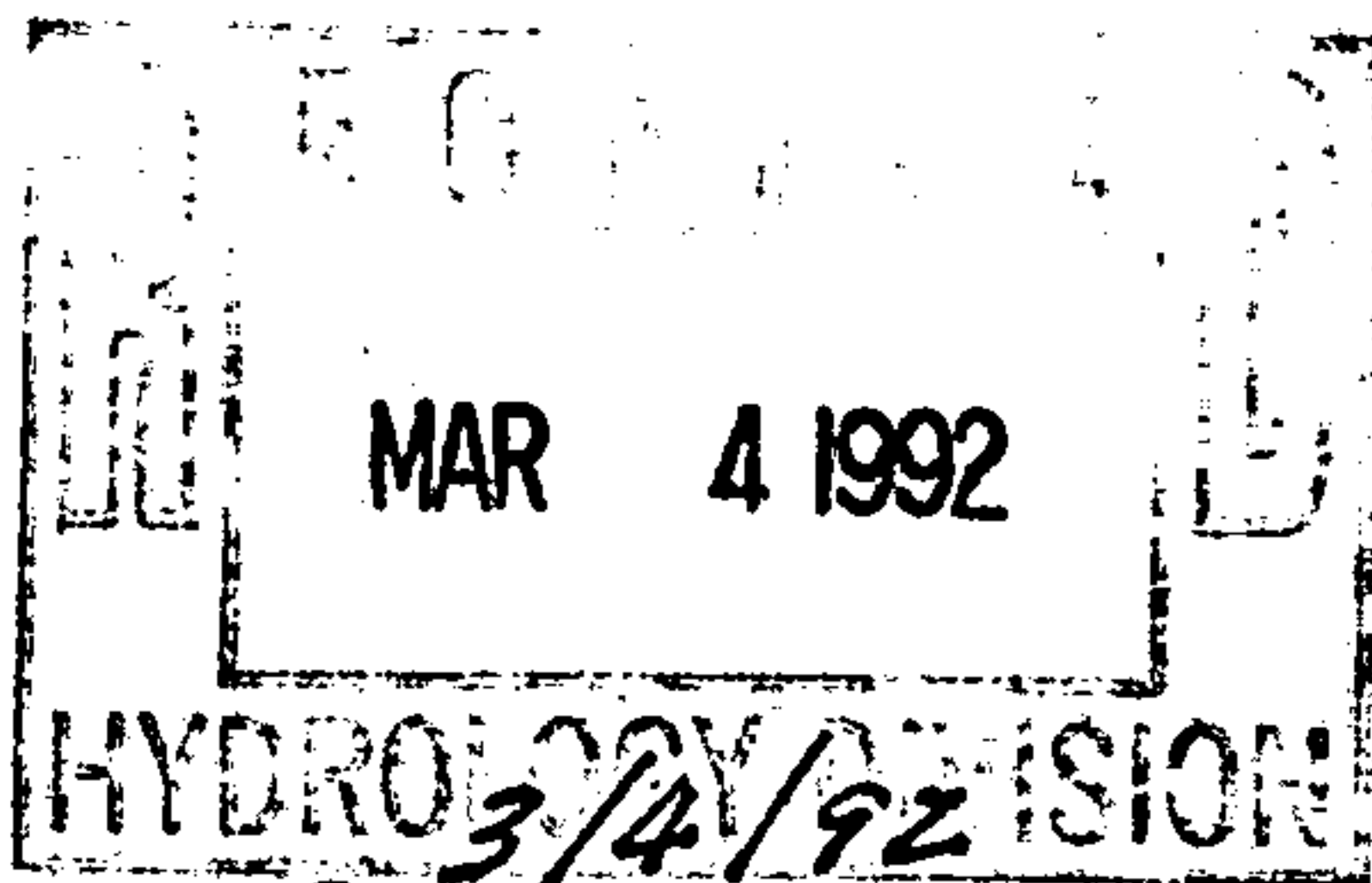
DRB NO. _____
EPC NO. _____
PROJ. NO. _____

TYPE OF SUBMITTAL:

☐ DRAINAGE REPORT
☒ DRAINAGE PLAN
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☒ GRADING PLAN
☐ EROSION CONTROL PLAN
☐ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

☐ SKETCH PLAT APPROVAL
☐ PRELIMINARY PLAT APPROVAL
☐ SITE DEVELOPMENT PLAN APPROVAL
☐ FINAL PLAT APPROVAL
☒ BUILDING PERMIT APPROVAL
☐ FOUNDATION PERMIT APPROVAL
☐ CERTIFICATE OF OCCUPANCY APPROVAL
☒ ROUGH GRADING PERMIT APPROVAL
☐ GRADING/PAVING PERMIT APPROVAL
☐ OTHER _____ SPECIFY



DATE SUBMITTED: _____
BY: Mark Goodwin

Mark Goodwin, P.E.

wp 13231