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CORRIENTE 80-DR-2004

RICK ENGINEERING JOB NUMBER 3024-B

FINAL DRAINAGE REPORT

APRIL 2005

REVISED AUGUST 2005

RICK ENGINEERING COMPANY

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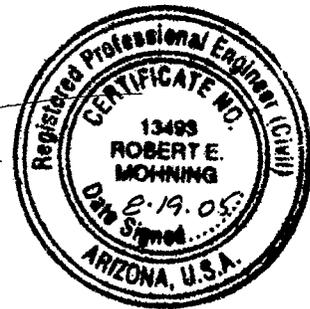
CORRIENTE
80-DR-2004

FINAL DRAINAGE REPORT

PREPARED FOR:

STARPOINTE PROPERTIES
7025 North Scottsdale Road
Scottsdale, Arizona 85253


Robert E. Mohning, P.E., R.L.S.



APRIL 2005
REVISED AUGUST 2005

RICK ENGINEERING COMPANY
6150 North 16TH Street
Phoenix, Arizona 85016-1705

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1.0 INTRODUCTION

The purpose of this report is to address drainage issues associated with the proposed Corriente condominium site.

2.0 SITE LOCATION DESCRIPTION

Corriente is a proposed 9.02-acre condominium site located between Scottsdale Road and Hayden Road on the south side of Indian Bend Road. See vicinity map on appendix A.

3.0 FLOODPLAIN DESIGNATION

The proposed project site lies within Flood Zone "X" as indicated on map number 04013C1695G of the FEMA Flood Insurance Rate Map, dated July 19, 2001. Zone "X" areas are defined by FEMA as areas of 500-year flood; areas of 100-year flood with average depths less than 1 foot or with drainage areas less than 1 square mile and areas protected by levees from 100-year flood. See Appendix B.

4.0 OFF-SITE DRAINAGE

Currently offsite flow from the adjacent property to the west of the Corriente Condominiums is being routed through the southerly panhandle portion of the site. Wall openings were constructed near the southeast corner of the Sienna Condominiums property wall, to allow for flow from the Sienna Condominiums to be routed across the existing parking lot. The routed flow exits the parking lot via wall openings to the east and discharges into an existing drainage channel and 36" pipe provided by the "Paradise View Villas". This condition will remain the same.. See Drainage Exhibit in Map Pocket 1.

Based on the Drainage Report for Paradise View Villas by Morea-Hall Engineering, Inc. dated December 22, 2000, a capacity of 61 cfs was designed for the 36" pipe at the northwest corner of its site. The 36" pipe was designed to have capacity to convey the 100 year storm runoff from the Sienna Condominiums and runoffs from a portion of the proposed Corriente site. Based on the Final Drainage Report for The Courtyards (renamed Sienna Condominiums) by Evans Withycombe, Inc., written by George J. Teply on October 9, 1992, a total of 48.52 cfs is being routed to the 36" pipe from the Sienna Condominiums site. See Appendix D for excerpt from above referenced reports.

The site is well above the 100+ year water surface in Indian Bend Road as demonstrated by the Final Hydraulic Analysis Scottsdale Links at Indian Bend Inlet Golf Course Design, Section I Front Nine Holes, by Amwest Engineering (Appendix E). Proposed finish floor elevations are well above the water surface elevation based on a flow of 30,000 cfs. (100-year flow is 17,000 cfs according to the Indian Bend Floodplain Delineation Study, Salt River to 40th Street, FCD 93-05, Hydraulics, Simons, Li and Associates Inc. (Appendix F). The regulatory flood elevation is the 100-year flood elevation plus 1.0 foot. All lowest floor elevations are more than 2.0 feet above the water surface elevations with 30,000 cfs, nearly double the 100-year flood flow. Accordingly all lowest finish floors have more than 1.0 foot of free board above the regulatory base flood.

5.0 ON-SITE DRAINAGE

No on-site retention will be provided for the proposed development. The drainage pattern for the western portion of the proposed site, basins 1 and 4 pre-development and basins 16 and 17 post development, will remain the same. The existing flow is 26.09 cfs and the post development flow is 18.32 cfs. It will surface drain and discharge into the existing 36" pipe on the Paradise View Villas site via existing wall openings at the southern and western parking lot site walls. The drainage pattern for existing basin 3 will remain the same. It will surface drain to an existing catch basin at the southeast entrance of the site. See map pockets 1 and 2 for Pre and post drainage exhibits. The remainder of the site will be conveyed via surface drain and storm drain system and discharged into the adjoining lake east of buildings 6,7 and 8. (See Appendix J for Hydraulic Calculations). The lake is within the boundary of the project land and has more than 3 feet of freeboard from normal water surface to the overflow at the southeast bank of the lake, with more than 300,000 cf of volume, thereby furnishing more than an adequate storm water retention volume in the 100-year event. Indian Bend Wash will likely flow much later than the flow from the site and fill this lake to overflowing. See Appendix C for hydrology calculations, Appendix G for retention requirements and provisions and Map Pocket 2 for Drainage Exhibit. The redeveloped portion of this site discharges 33.03 cfs to the lake. The site soil type is group B (Appendix I).

6.0 DRAINAGE AND FLOOD CONTROL STIPULATIONS FROM ZONING CASE 23-ZN-2003

DRAINAGE AND FLOOD CONTROL

1. STORM WATER STORAGE EASEMENTS. With the Development Review Board submittal, the developer shall submit a site plan subject to City staff approval. The site plan shall include and identify tracts with easements dedicated for the purposes of storm water storage in conformance with Scottsdale Revised Code and the Design Standards and policies Manual.
Appendix G shows the existing lake which will be utilized for storm water retention.
2. DRAINAGE EASEMENTS.
 - a. Before the issuance of any building permit for the site, the developer shall dedicate to the City, in conformance with the Scottsdale revised Code and the Design Standards and Policies Manual, all drainage easements necessary to serve the site.
Drainage easements are prepared with construction documents.
 - b. With the Development Review Board submittal, the developer shall submit documentation that all drainage and flood control easements for the subject property have been legally described and dedicated in conformance with the Maricopa County Flood Control District's requirements. The developer shall submit a letter from the Flood control District staff indicating that the District is satisfied with the drainage and flood control easements.
Appendix H contains the agreements from the Flood Control District.
 - c. With the Development Review Board submittal, the developer shall submit plans that show only the drainage and flood control easement as approved by the Flood Control District. The applicant shall submit release of easement forms for any existing drainage easements currently in place adjacent to the Indian Bend Wash.
This is part of the agreement by the Flood Control District in Appendix H.) The new easement line is identified on the Drainage Exhibit as the new line along Indian Bend Wash.
3. CONCEPTUAL DRAINAGE REPORT. With the Development Review Board submittal, the developer shall submit a conceptual drainage report and plan subject to City staff approval. The

conceptual report and plan shall conform to the Design Standards and Policies Manual – Drainage Report Preparation. In addition, the conceptual drainage report and plan shall.

a. Identify all major wash corridors entering and exiting the site, and calculate the peak discharge (100-yr, 6-hr storm event) for a pre-verses post-development discharge comparison of ALL washes which exit the property

Pre/post discharges are identified in this report.

b. Determine easement dimensions necessary to accommodate design discharges.

Easements exist or will be provided.

c. Demonstrate how the storm water storage requirement is satisfied, indicating the location, volume and drainage area of all storage.

Shown in Appendix G

d. Include flood zone information to establish the basis for determining lowest floor elevations in conformance with the Scottsdale Revised Code. The lowest floor elevations shall be, at a minimum, the same elevation as the soffit elevation of the existing building.

Flood zone identified in section 3. The soffit elevation does not apply.

e. Include a complete description of requirements relating to project phasing.

There will be no phasing.

f. Demonstrate that adequate flood protection exists along the portions of the site adjacent to the Indian Bend Wash to protect against the 100-year storm event.

Most of the levy exists. The portion where the existing resort building projects into the wash will be constructed to Flood Control District and C.O.E. Standards.

g. Describe and provide details for the construction of the levy in the area around the existing building that extends into the existing lake with the proposed grading plans and the conceptual drainage report. The levy shall be constructed to the Corps of Engineers (COE) standards and specifications and must match the existing work.

The drainage exhibit shows the contouring for said levy construction. Construction will be per C.O.E. standards.

4. FINAL DRAINAGE REPORT. With the improvement plan submittal to the Project Quality/Compliance Division, the developer shall submit a final drainage report and plan subject to City staff approval. The final drainage report and plan shall conform to the Design Standards and Policies Manual – Drainage Report and Preparation. In addition, the final drainage report and plan shall:

a. Provide final calculations and detailed analysis that demonstrate consistency with the accepted conceptual drainage plan and report.

This is the final drainage report.

2. STORM WATER STORAGE REQUIREMENT. The Preliminary Drainage Report dated October 2003, indicated that no storm water storage would be provided. On-site storm water storage is required for the full 100-year, 2-hour storm event, unless City staff approves the developer's Request for Waiver. See Section 2 of the Design Standards and Policies Manual for waiver criteria.

a. if applicable, prior to the Development Review Board submittal, the developer shall submit to the Community Development Division a Request for waiver Review form, which shall:

- i. Include a supportive argument that demonstrates historical flow through the site will be maintained, and that storm water runoff exiting this site has a safe place to flow.
 - ii. Include an estimate for payment in-lieu of on-site water storage, subject to City staff approval.
- b. Before the improvement plan submittal to the Project Quality/Compliance Division, the developer shall have obtained the waiver approval.

Note that storm water retention will be provided in the existing lake within the golf course. See Appendix G.

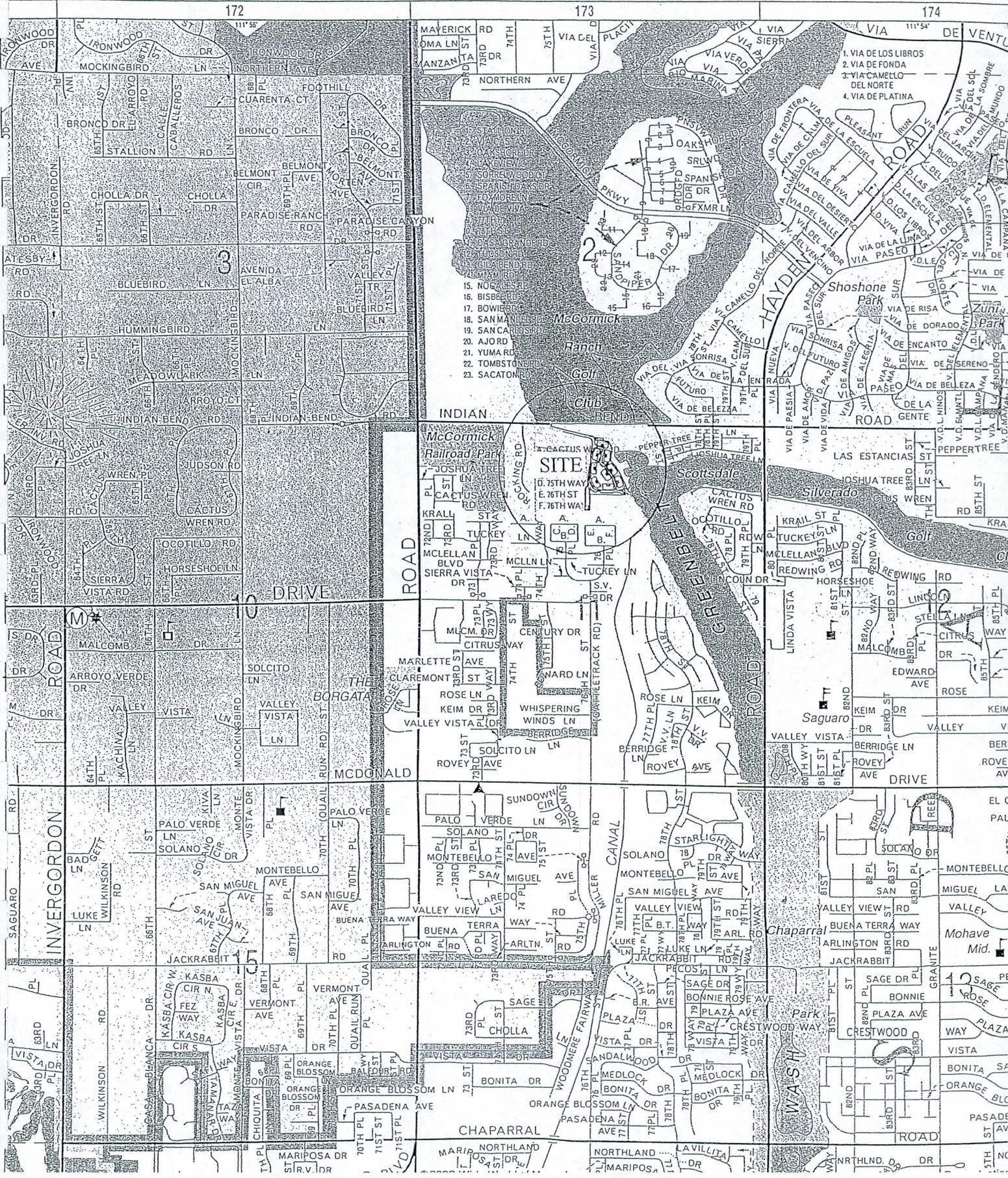
APPENDIX A

INVERGORDON RD
6400E

SCOTTSDALE RD
7200E

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HAYDEN RD
8000E



172

173

174

1. VIA DE LOS LIBROS
2. VIA DE FONDA
3. VIA CAMELO DEL NORTE
4. VIA DE PLATINA

15. NOGAL
16. BISBEER
17. BOWBIRD
18. SAN MANUEL
19. SAN CARLOS
20. AJORD
21. YUMA RD
22. TOMBOSTON
23. SACATON

SITE

10. 75TH WAY
E. 76TH ST
F. 76TH WAY

INVERGORDON RD

THE BORGATA

MCDONALD

CANAL

Chaparral

CHAPARRAL

WASH

APPENDIX B

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY,
ARIZONA AND
INCORPORATED AREAS

PANEL 1695 OF 4350

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:
COMMUNITY

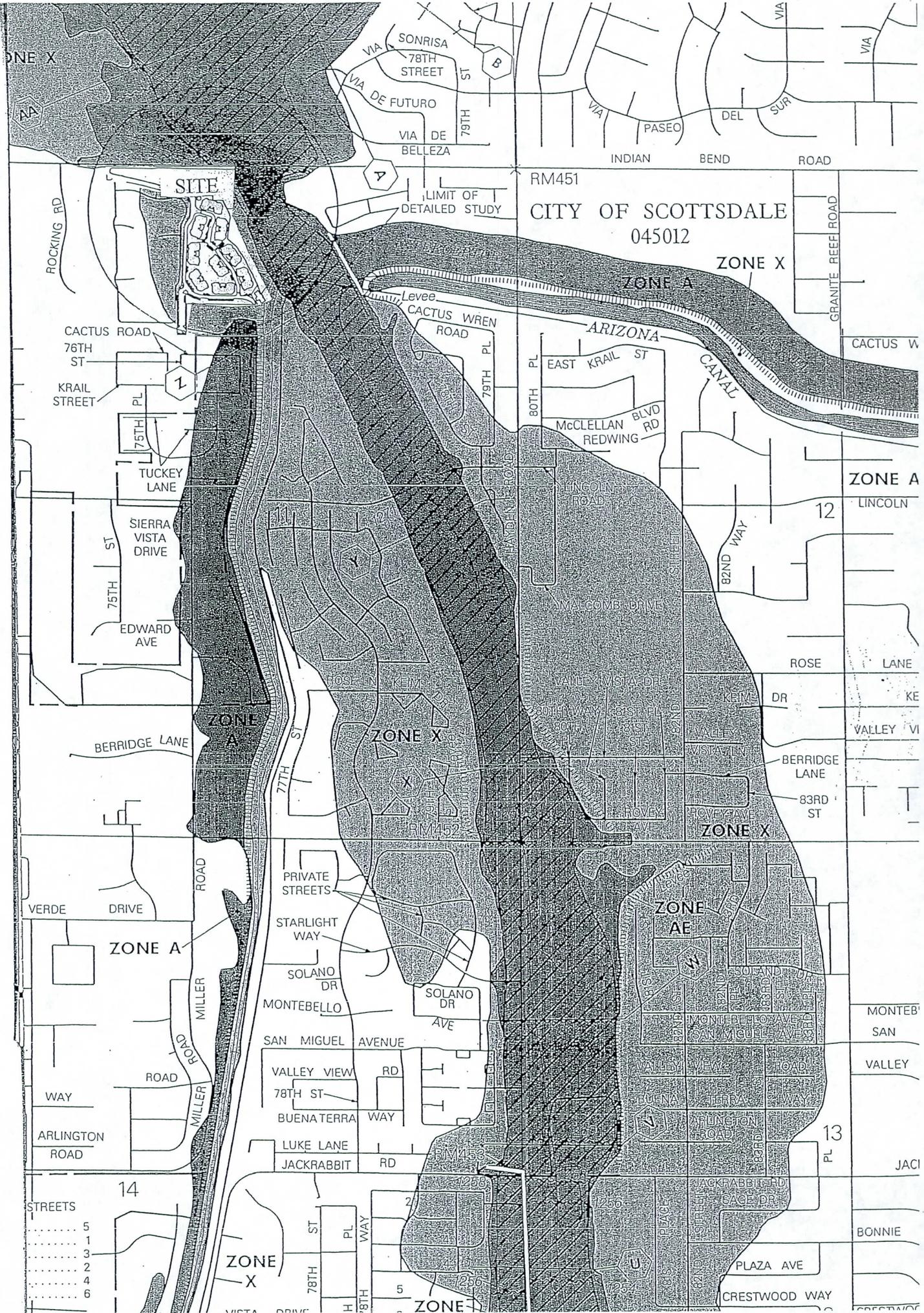
	<u>NUMBER</u>	<u>PANEL</u>	<u>SUFFIX</u>
MARICOPA COUNTY, UNINCORPORATED AREAS	040037	1695	G
PARADISE VALLEY, TOWN OF	040049	1695	G
SCOTTSDALE, CITY OF	045012	1695	G

MAP NUMBER
04013C1695 G

MAP REVISED:
JULY 19, 2001



Federal Emergency Management Agency



RM451
 CITY OF SCOTTSDALE
 045012

- STREETS
- 5
 - 1
 - 3
 - 2
 - 4
 - 6

SITE

LIMIT OF DETAILED STUDY

ZONE X
 ZONE A

ZONE A
 LINCOLN

ZONE X

ZONE X

ZONE AE

ZONE X

ZONE X

12

13

14

2

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APPENDIX C

**PRE-DEVELOPMENT
RATIONAL METHOD CALCULATIONS**

BASIN	Area (acre)	C ₁₀	C ₁₀₀	T _c (min)	i ₁₀ (in/hr)	i ₁₀₀ (in/hr)	Local Q ₁₀ (cfs)	Local Q ₁₀₀ (cfs)
1	3.99	0.75	0.80	10	4.8	7.2	14.37	22.99
2	3.22	0.7	0.75	10	4.8	7.2	10.83	17.40
3	1.27	0.75	0.80	10	4.8	7.2	4.56	7.30
4	0.54	0.75	0.80	10	4.8	7.2	1.94	3.10
Total	9.02							

**POST-DEVELOPMENT
RATIONAL METHOD CALCULATIONS**

Sub-Area	Area (acre)	C ₁₀ (weighted)	C ₁₀₀ (weighted)	T _c (min)	i ₁₀ (in/hr)	i ₁₀₀ (in/hr)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
1	0.92	0.75	0.80	5	5.9	9	4.09	6.65
2	1.26	0.75	0.80	5	5.9	9	5.59	9.09
3	0.13	0.90	0.95	5	5.9	9	0.68	1.10
4	0.16	0.90	0.95	5	5.9	9	0.85	1.38
5	0.13	0.90	0.95	5	5.9	9	0.68	1.10
6	0.16	0.90	0.95	5	5.9	9	0.85	1.38
7	0.13	0.90	0.95	5	5.9	9	0.68	1.10
8	0.16	0.90	0.95	5	5.9	9	0.85	1.38
9	0.13	0.90	0.95	5	5.9	9	0.68	1.10
10	0.16	0.90	0.95	5	5.9	9	0.85	1.38
11	0.13	0.90	0.95	5	5.9	9	0.68	1.10
12	0.16	0.75	0.80	10	4.8	7.2	0.56	0.90
13	0.20	0.75	0.80	10	4.8	7.2	0.73	1.17
14	0.90	0.75	0.80	10	4.8	7.2	3.23	5.17
15	0.98	0.75	0.80	10	4.8	7.2	3.52	5.63
16	2.64	0.75	0.80	10	4.8	7.2	9.51	15.22
17	0.54	0.75	0.80	10	4.8	7.2	1.94	3.10
18	0.05	0.75	0.80	10	4.8	7.2	0.18	0.30
19	0.06	0.75	0.80	10	4.8	7.2	0.23	0.37
Total	9.02						36.41	58.59
1,2,11	2.32	0.75	0.80	5	5.9	9	10.24	16.67
12,13,14	1.26	0.75	0.80	10	4.8	7.2	4.52	7.24
16	2.64	0.75	0.80	10	4.8	7.2	9.51	15.22
17	0.54	0.75	0.80	10	4.8	7.2	1.94	3.10

ON-SITE RETENTION FOR THE 100 YEAR, 2 HOUR STORM

Sub-Area	Area (acre)	C ₁₀₀	P _{100 yr, 2 hr} (in/hr)	Vol. Req. (cf)	Lake Vol. Prov. (cf)
ALL	9.02	0.76	2.82	70,163	352,884

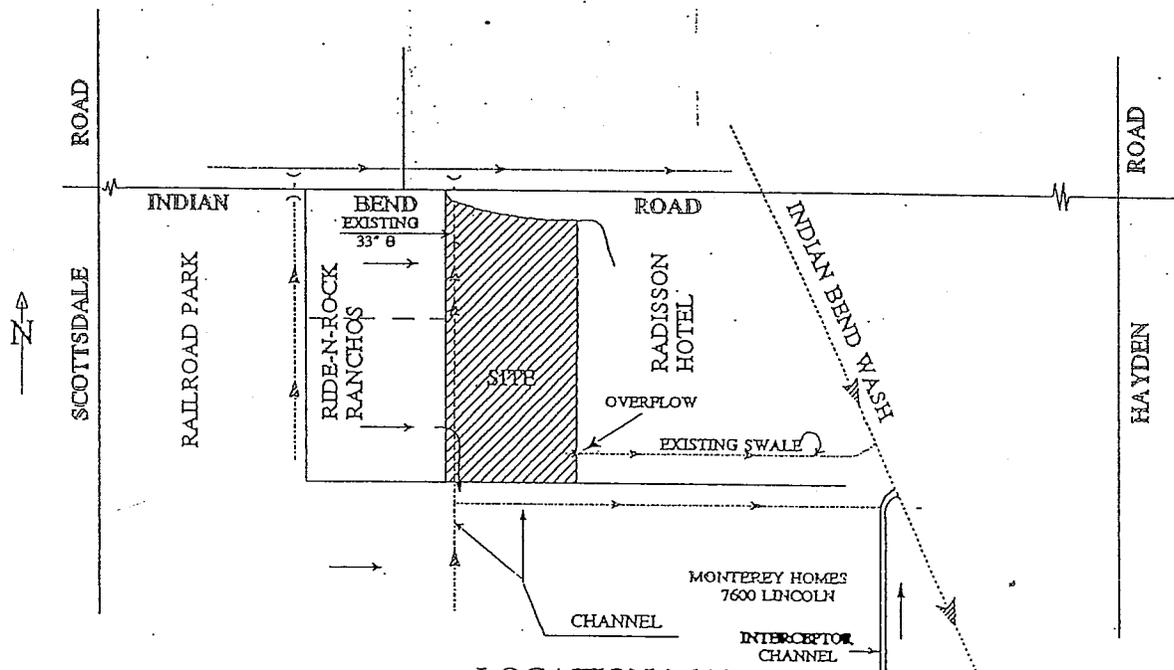
APPENDIX D

THE COURTYARDS

APARTMENTS
BY
EVANS WITHYCOMBE, INC.
6991 E. Camelback Road,
Scottsdale, Arizona 85251



FINAL DRAINAGE REPORT



LOCATION MAP

N.T.S.

The Courtyards is a proposed 276 unit apartment complex located on 15.46 acres formerly occupied by a portion of the Radisson Hotel in the northwest quarter of Section 11, Township 2 North, Range 4 East, Gila and Salt River Base and Meridian, Maricopa County, Arizona.

The existing drainage pattern in the vicinity is sheet flow from west to east toward the Indian Bend Wash. Flow from the Railroad Park is diverted along the east property line to the north and via the culvert underneath Indian Bend Road to the channel along the north of this road to the Indian Bend Wash. The existing subdivision Ride-N-Rock Ranchos consists of 10 units built on 20 acres with dense vegetation and mixed grass and desert surfaces. The general slope is 0.8% from west to east. Runoff from the northerly 10 acres is diverted via a paved road along the east property line to the existing 33" pipe culvert crossing Indian Bend Road to the north. The southerly 10 acres drains as a sheet flow into the investigated site.

The site is protected from the north by an earthen dike constructed south of Indian Bend Road and is located in Zone "B" - see copy of the Flood Plain Map.

EXISTING CONDITIONS:

The former structures on the site have been demolished and cleared, but the existing tennis courts and parking lot along the south property line still remain, also a portion of an existing parking area along the east property line encroaching into the site.

There used to be a retention basin north of the tennis courts, presently silted and not functioning. Therefore the entire runoff outflows from the site into the existing channel along the south edge of the Radisson Hotel terminating in the Indian Bend Wash.

The capacity of this channel is approximately 131 cfs ($W = 18'$, $D = 2'$ $S = 1.66\%$, $n = 0.03$) flowing full. The driveway by the Radisson Hotel over this channel with an 18" pipe culvert causing the flow to spread over the adjacent parking lot.

ESTIMATED EXISTING RUNOFF:

10 ac. Ride-N-Rock Ranchos ($C = 0.3$, $S = 0.8\%$)
15.63 ac. - The Courtyards site

$$L = 1300$$

$$T_c = \frac{0.04593 \times 1300^{.77}}{0.8^{.385}} = 13 \text{ min.}, I_{10} = 4.2 \quad I_{100} = 6.1$$

$$\text{Courtyards } W_c = \frac{4.05 \times 0.95 + 11.58 \times 0.3}{15.63} = 0.47$$

$$\text{Weight}_c = \frac{10 \times 0.3 + 15.63 \times 0.47}{25.63} = 0.40$$

$$Q_{10} = 25.46 \times 0.4 \times 4.2 = 42.7 \text{ cfs}$$
$$Q_{100} = 25.46 \times 0.4 \times 6.1 = 62.1 \text{ cfs} < 131 \text{ cfs in existing channel}$$

PROPOSAL

The Courtyards site consists of 22 buildings, club house, 2 pools and a tennis court. Required parking is located along all four sides of the site surrounding the buildings. Access is provided from the existing drive to the hotel at the north.

Ride-N-Rock Ranchos along the west is accessible via Rocking Road from Indian Bend Road, and only two lots have driveways to the existing paved drive between the subdivision and the Courtyards site. This access will stay intact.

As mentioned, the existing runoff is drained via the existing channel along the south of the Radisson Hotel to the Indian Bend Wash. Due to a proximity of this major wash, the on-site retention for the Courtyards site is not required.

To maintain the described existing drainage pattern with new development proved to be difficult for the following reasons:

- The proposed site must be drained in a north-south direction with the existing elevation at the low point in Radisson Drive at the north (runoff must be intercepted) and at the elevation at the existing outlet at the south, there is only limited available grade for surface drainage.
- Surface drainage would require wide swales through the site and excessive grading. With the given site plan, there is not enough available space for the needed wide swales.

Four different schemes were designed for grading and drainage:

- A) *Grade a detention in every available area with interconnecting pipes and small swales.* This scheme proved to be unacceptable to the developer due to a problem with pedestrian traffic (sidewalks crossing the depressed areas).
- B) *Limit the detention to two locations only and use partially underground storm drains as preliminarily agreed after the first scheme was rejected.* After the plans were drafted, they were rejected again for the same reason.
- C) To satisfy all parties, the scheme without any depressed areas was developed *using a complete system of underground pipes, draining the site with outlet into a channel paralleling the south property line and constructed by Monterey Homes as part of their subdivision 7600 LINCOLN.* The outlet into the above channel shall be provided with an automatic gate to prohibit runoff in the channel backing up into the site when the channel is flowing. In case the automatic gate at the outlet is closed, the runoff from the system at the junction box between Buildings 8 and 9 will overflow to the east over the parking lot at Building 7 and flow into an existing channel along the south of the Radisson Hotel (existing drainage pattern). The Courtyards perimeter wall along the east will be designed with openings for this emergency overflow. The same will be needed along the east wall to intercept the sheet flow from Ride-N-Rock Ranchos.
- D) Scheme C) was incorporated in final design and we have been directed to make a change. *Instead of outflow into the Monterey channel, follow the historical drainage outflow into the existing channel along the south of the Radisson Hotel. The storm drain system is therefore altered as shown on the Exhibit with the last catch basin located just east of the parking area opposite Building 7, from where the runoff will overflow toward the existing channel through the wall openings.* This solution is hydraulically safe (see following calculations), but will require the pump to empty the system after the runoff stops. The pump will be serviced mechanically by complex personnel (see detail of CB7 combined with pump well).

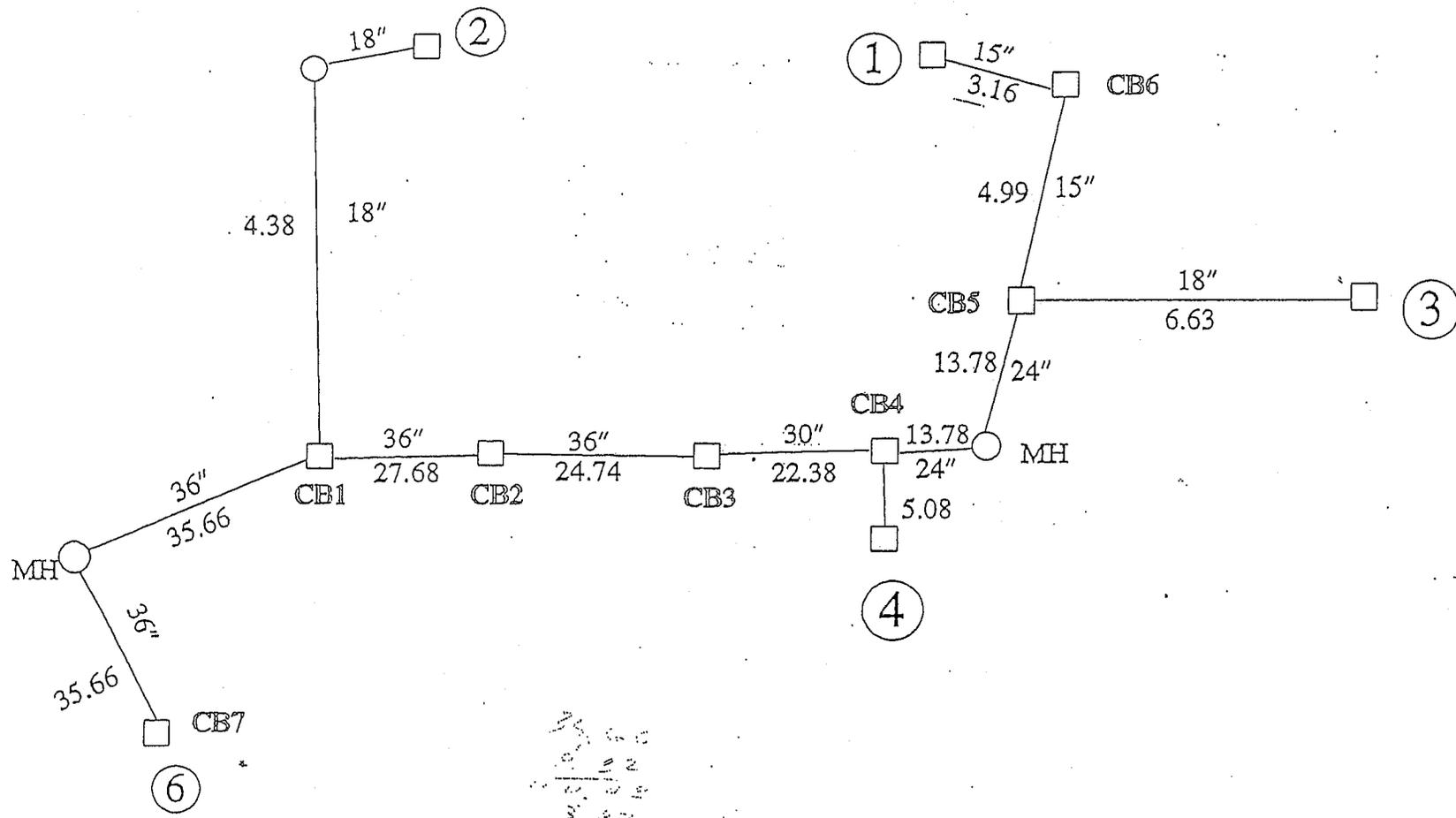
ON SITE CONTRIBUTIONS

LOCATION	A	A _i	A _p	W _c	T _c	I ₁₀	I ₁₀₀	Q ₁₀	Q ₁₀₀
OVER PARKING TO CB 7	1.29	0.40	0.89	0.57	16	3.8	5.5	2.79	4.04
CB1	1.12	0.35	0.77	0.57	15	3.9	5.65	3.48	3.60
CB2	0.65	0.39	0.26	0.73	12	4.3	6.2	2.04	2.94
CB3	0.72	0.25	0.47	0.58	15	3.9	5.65	1.62	2.36
CB4	1.17	0.39	0.78	0.58	18	3.5	5.2	2.37	3.52
CB5	0.66	0.24	0.42	0.58	15	3.9	5.65	1.49	2.16
CB6	0.54	0.20	0.34	0.60	15	3.9	5.65	1.26	1.83

13.8.92

See exhibit for location and areas. Open spaces based on C = 0.4 (mix grass and granite).

CP ①	2.16	3.16
CP ②	3.00	4.38
CP ③	4.62	6.63
CP ④	3.51	5.08
CP ⑥	6.09	8.82



Handwritten notes:
 1. 1.5' x 1.5' x 1.5'
 2. 1.5' x 1.5' x 1.5'
 3. 1.5' x 1.5' x 1.5'
 4. 1.5' x 1.5' x 1.5'
 5. 1.5' x 1.5' x 1.5'
 6. 1.5' x 1.5' x 1.5'

Q_{100} total in pipes used for the following calculations. Hydraulic conditions require pipe oversizing.

CALCULATIONS FOR OVERFLOW IN SYSTEM

FOR CB 7 EL. 81.60

REACH	PIPE	L	HGLS	Q	VEL.	LOSS	HGL EL.
CB7 - MH	36"	148	0.00286	35.66	5.20	0.41	82.43
MH - CB1	36"	126	0.00286	35.66	4.30	0.002	82.79
CB1 - ②	18"	214	0.00169	4.38	3.60	0.10	83.46
CB1 - CB2	36"	148	0.00174	27.68	3.90	0.005	83.05
CB2 - CB3	36"	144	0.00139	24.74	3.30	0.005	83.25
CB5 - ④	15"	24	0.00620	5.08	9.80	0.74	84.5
CB4 - CB5	24"	126	0.00375	13.78	4.40	0.005	83.71
CB5 - CB6	15"	88	0.00600	4.99	4.00	0.005	84.24
CB6 - ①	15"	40	0.00239	3.16	2.60	0.052	84.38
CB5 - ③	18"	204	0.00399	6.63	4.00	0.124	84.64 < 85.91

CB ③ - El. 85.91 > 84.64 - System works.

SUMMARY: Comparing the outflow from the site into the existing channel south of the Radisson Hotel:

Existing Q_{100} = 62.1 cfs
 Developed Q_{100} = 48.52 cfs

FROM MOREA-HALL ENGINEERING INC. (TUE) 9 30 2003 17:49/ST. 17:47/NO. 5110253593-P 1



MOREA-HALL
engineering, inc.

1820 W. Maricopa Freeway
Phoenix, Arizona 85007
TEL (602) 258-4428
FAX (602) 340-9053
morea-hall.civl@att.net

TRANSMITTAL

SEPTEMBER 30, 2003

MOREA-HALL JOB NO: 3466

TO:
Rick Engineering

RE:
PARADISE VIEW VILLAS
SCOTTSDALE

ATTN: BOB MOHNING

WE ARE SENDING YOU:

ATTACHED

UNDER SEPARATE COVER

VIA:

MAIL

HAND

FACSIMILE

EMAIL

OTHER

THE FOLLOWING ITEMS:

COPIES	DATE	NO.	DESCRIPTION
1	12-22-00		Drainage Report

REMARKS:

FOR YOUR USE AS REQUESTED

TRANSMITTED TO FACSIMILE NUMBER : 662-265-2396

TOTAL NUMBER OF FACSIMILE PAGES INCLUDING TRANSMITTAL: 8

COPY TO:

SIGNED:

Claudia
CLAUDIA MOREA, P.E., L.S.

CIVIL • SANITARY • STRUCTURAL • SURVEY

FX TIME 09/30 '03 17:29
LOCATION: 6023409053

(TUE) 9 30 2003 17:49/ST. 17:47/NO. 5110253598 P 2

FROM MOREA-HALL ENGINEERING INC.

DRAINAGE REPORT
for
PARADISE VIEW VILLAS
Scottsdale, Arizona

RX TIME 09/30 '03 17:29

Prepared by:

MOREA-HALL ENGINEERING, INC.
1820 W Maricopa Freeway
Phoenix, Arizona 85007

MH Job #3466
August 1, 2000
December 22, 2000



MOREA-HALL
engineering, inc

LOCATION: 6023409053

(TUE) 9 30 2003 17:49/ST. 17:47/NO. 5110253598 P 3

FROM MOREA-HALL ENGINEERING INC.

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Off-site Flows	3
On-site Flows	3
Vicinity Map	5
Overall Site Plan	6
Site Plan	7



RX TIME 09/30 '03 17:29

LOCATION:6023409053



(TUE) 9:30 2003 17:49/ST. 17:47/NO. 5110253598.P 4

FROM MOREA-HALL ENGINEERING INC.

OFF-SITE FLOWS

This project is the development of a parcel surrounded by other developments or proposed developments. The site presently receives flow from the areas to the west and the north at the northwest corner of the site. These flows are contained in a drainage swale that flows along the north property line and are proposed to be collected and drained through a 36" storm drain pipe at the northeast corner of the project. To complete the on-site development it is proposed to extend the storm drain to the northwest corner of the site. The flow at the inlet to the 36" storm drain is reported to be 61 cfs. This will be the same flow that will be collected at the inlet of the extended 36" storm drain. The flow of 61 cfs in a 36" storm drain requires a minimum slope of 0.80%. A slope of 0.90% is provided by the design.

The site is bounded on the south by an improved Corps of Engineers collector channel. This channel as well as the above mentioned storm drain discharge into a lake on the golf course part of the Indian Bend drainage system.

The scheduling of the development requires the perimeter walls to be completed prior to on-site construction. This will prevent discharge of uncontrolled run-off or sediment discharge to the adjacent properties or drainage systems.

ON-SITE FLOWS

The Corps of Engineers collector channel is reported to have sufficient capacity to receive the flows generated from the proposed site development as well as the lake that will receive the flows. The conceptual drainage report for the Paradise View Villas indicated that the Paradise View Villas would be graded to the south with discharge to the channel. The construction plans accomplish this by surface flow to two collection points on the south side of the development. From there it will be collected in catch basins and discharged to the channel through 12" storm drains. As the point of entrance to the channel is lower than the 100-year storm water elevation the storm drains will include backwater valves.

The site is considered to be that area within the proposed perimeter walls. The run-off within this area is divided into 2 approximately equal drainage areas. The areas comprising 1.57 acres, each. The run-off is calculated using the rational method in Drainage Design Manual for Maricopa County, Arizona (DDM)

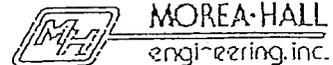
Q = CIA
C = 0.75 for Multi-Unit Residential Areas table 3.2 (DDM)
A = 63,500 / 68,400

i (T_c = 70 min) = 2.1 inches/hr figure 3.2 (DDM)

T_c = 11.4 L^{.05} k_b^{0.52} S^{-0.31} I_r^{2.38} equation 3.2 (DDM)

RX TIME 09:30 '03 17:29

LOCATION: 6023409053



FROM MOREA-HALL ENGINEERING INC.

(TUE) 9 30 2003 17:50/ST. 17:47/NO. 5110253598.P 5

where $L = 0.057$ miles

$K_c = 0.0368$

$S = 1.70 \text{ ft}/0.067 \text{ miles} = 25.37$

$i = 2.1$

$T_c = 68$ minutes

Use $1 = 2.1$ inches/hr

$Q = 0.75 \times 2.1 \times 1.57 = 2.47$ cfs

To carry the 2.47 cfs in a 12" storm drain, the slope must be 0.45%. A slope of 0.50% is provided by the design.



MOREA-HALL
engineering, inc.

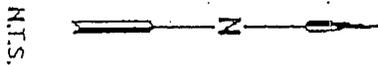
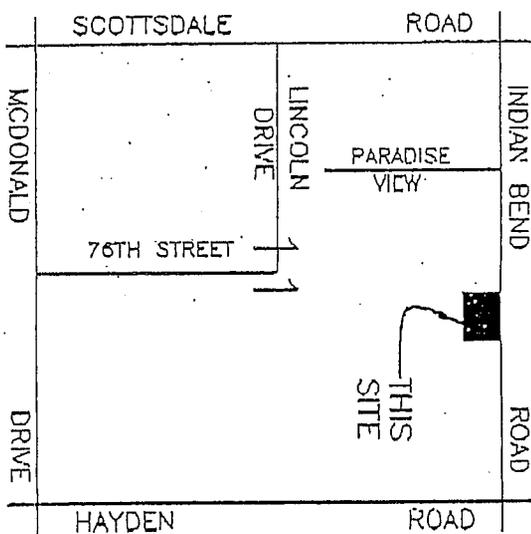
LOCATION: 6023409053

RX TIME 09/30 '03 17:29

FROM MOREA-HALL ENGINEERING INC.

(TUE) 9 30 2003 17:50/ST. 17:47/NO. 511025359& P 6

PARADISE VIEW VILLAS
VICINITY MAP



N.T.S.

LOCATION: 6023409053

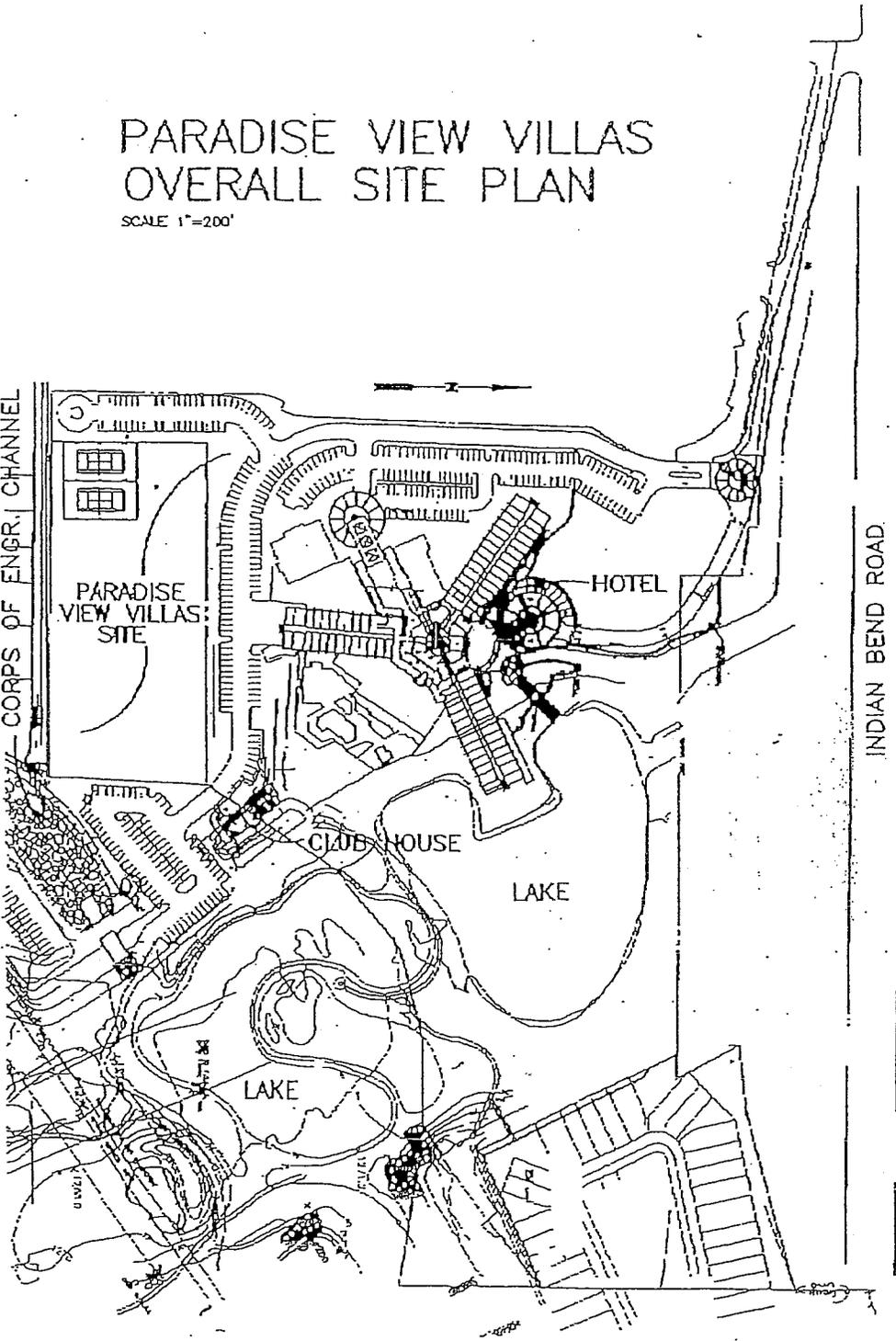
RX TIME 09/30 '03 17:29

FROM MOREA-HALL ENGINEERING INC. (TUE) 9 30 2003 17:50/ST. 17:47/NO. 5110258598 P .7

CORPS OF ENGR. CHANNEL

PARADISE VIEW VILLAS OVERALL SITE PLAN

SCALE 1"=200'



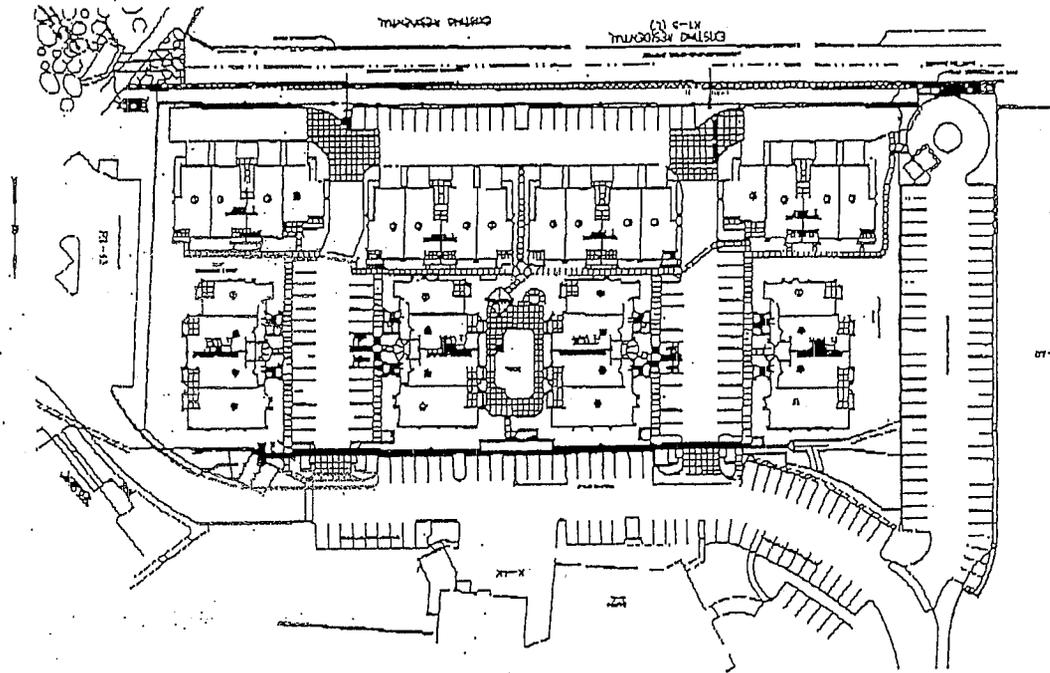
RX TIME 09/30 '03 17:29

LOCATION: 6023409053

FROM MOREA-HALL ENGINEERING INC.

(TUE) 9 30 2003 17:50/ST.17:47/NO. 5110253598 P. 8

PARADISE VIEW VILLAS
SITE PLAN
SCALE 1" = 150'



LOCATION: 6023409053

RX TIME 09/30 '03 17:29

APPENDIX E

**FINAL HYDRAULIC ANALYSIS
SCOTTSDALE LINKS AT INDIAN BEND
INLET GOLF COURSE DESIGN**

AMWEST JOB NO. 96091

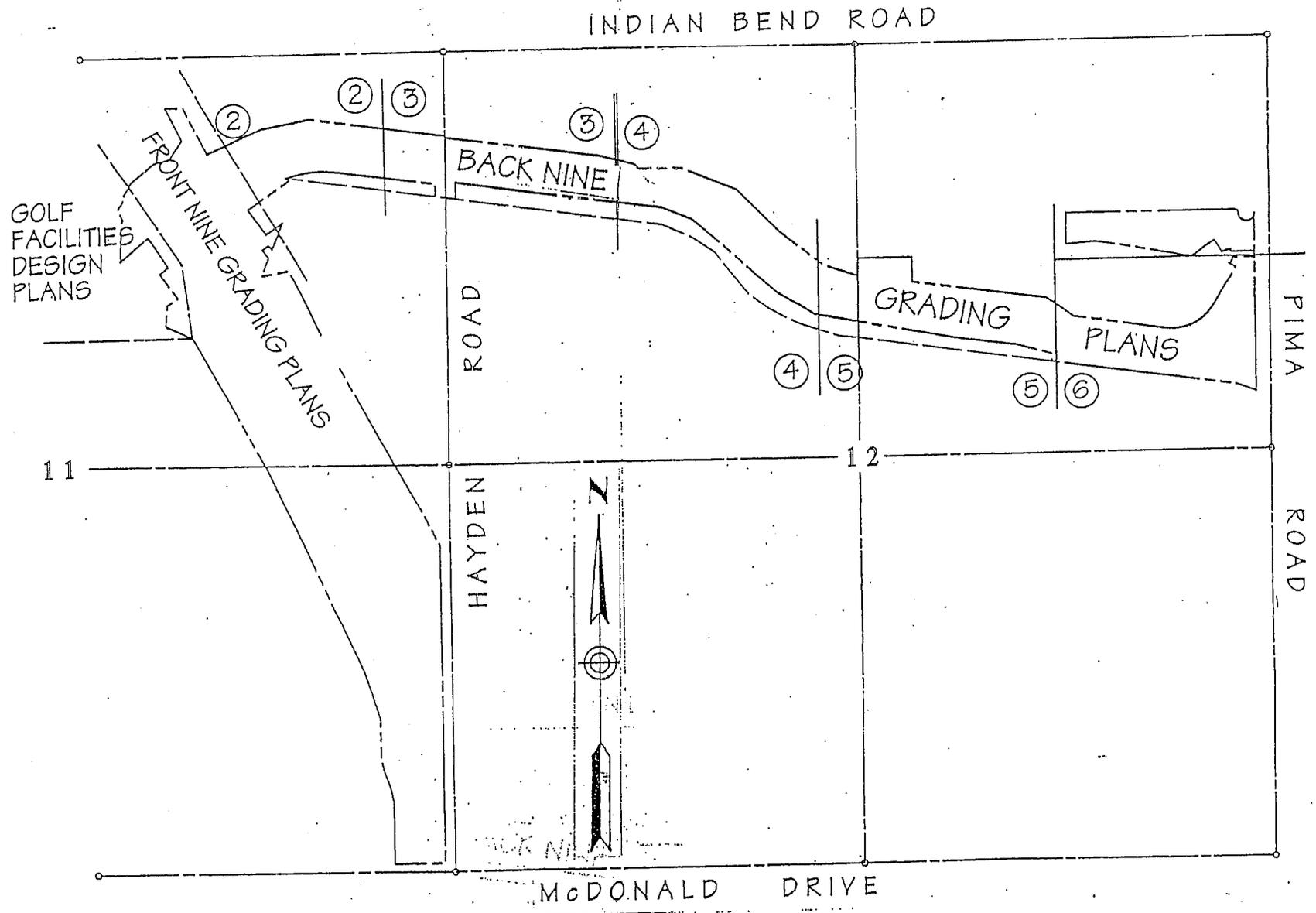
**SECTION I
FRONT NINE HOLES**

PREPARED BY:

**AMWEST ENGINEERING CO., INC.
1710 E. INDIAN SCHOOL RD., #100
PHOENIX, AZ 85016
(602) 264-1427**

OCTOBER 1998

KEY AND VICINITY MAP



INDEX

Page	Description
1	Background (Previous Reports and Supplements)
1	The Problem: Convert HEC-2 Coding to a Grading Plan
3	Data and Criteria Used in Hydraulic Model
3	HEC-2 Coding for Final Analysis
4	HEC-2 Printouts of Final Analysis
4	Results in Final Analysis Report
6, 7	HEC-2 8/3/98 Summary Printout Marked with 10/22/98 WS
8	Notes to Contractor on Cover of Grading Plan
9,10	Hydraulic Profile of FL, WS, Top of Banks

Appendix A

A-1	[1] Abbreviations; [1A] Purpose for HEC-2 Revision 8/3/98
A-2	(Pages 1-6) HEC-2 Printout 3/18/98 Marked at Changes for 8/3/98
A-3	FCD Comments on Review of Coding 8/3/98 and City FAX
A-4	(Pages 1-5) Amwest Reply to FCD Comments
A-5	(Pages 1-5) Data and Criteria Previously Approved

Appendix B

1-5	Final Analysis Changes Marked on HEC-2 8/3/98
6	Notes on HEC-2 Coding Details and Methods
7-10A	City and FCD Letters to Corps LA on Lake Coding
11-26	HEC-2 Printout 10/22/98 at 30,000 cfs
31-46	HEC-2 Printout 10/23/98 at 20,000 cfs

SEPARATE ENVELOPE

1. HEC-2 Coding Maps Using Amwest Grading Plans Marked with GR EL and Stations on Each SECNO Line to Show Changes from HEC-2 August 3, 1998 and HEC-2 Revised 10/22/98

BACKGROUND:

Reference information from previous submittals is at Appendix A. The following text makes reference to Appendix A pages that contain specific details, data and supplementary information.

Abbreviations used in previous submittals are on Appendix A-1, page 1.

Preliminary Report 8/18/97 contained Corps LA data, criteria and decisions related to the Inlet in DM-3 and INTR in DM-4.

Inlet As-Built Analysis (BOOK 1, 9/3/97) used City contour maps of existing conditions in the Inlet channel for HEC-2 results that closely matched original Corps LA DM-3 profile. All Corps GR EL on NGVD 29 datum were converted to Project NAVD 88 datum by adding 1.8' to all Corps EL.

Inlet Golf Course Design Analysis (BOOK 2, 11/3/97) used As-Built coding maps enlarged to 1" = 50' scale. SECNO line locations were selected to cross high GR EL on greens and tees per Architects plans for FRONT NINE holes.

Inlet Golf Course Design Analysis was revised (Supplement 1, 3/27/98) because (1) Architect's layout changes, (2) lake coding lower than bank EL, (3) used $n = 0.03$ for grass, (4) 20,000 cfs WS determined at INTR SECNO 414+05. HEC-2 printout 3/18/98 was in Supplement 1.

Inlet Analysis was revised again (Supplement 2, 8/4/98) to (1) lower fairways and reduce fill import, (2) move green 9 at SRP request, (3) code lake for sediment full FL at bank outfall GREL same as Corps LA DM-3, (4) move some SECNO to revised high EL on green and tee locations. Appendix A-1, page 1A, is a copy of "PURPOSE" for Supplement 2 with more specific explanation. Changes in WS results were insignificant for 30,000 cfs and 20,000 cfs. HEC-2 printout 8/3/98 results were submitted for review and Supplement 1 HEC-2 printout 3/18/98 was marked to show reviewers where (1) GR EL were lower on fairways, (2) green 9 moved, (3) lake coding, (4) SECNO moved to cross greens and tees. (See Appendix A-2, 6 pages.)

THE PROBLEM: CONVERT HEC-2 CODING TO A GRADING PLAN

The HEC-2 input data 8/3/98 (Supplement 2) was given to the CADD specialist to print on the grading plan. Problems discovered immediately were corrected on the grading plan as follows:

1. HEC-2 EL lowered at toe of banks were moved out on grading plan to maintain less than maximum design slope.
2. Architect's concept contours on HEC-2 coding maps did not match GR EL lowered to reduce fill. Decision made to delete concept contours.
3. HEC-2 included coded points where SECNO lines crossed concept contours. Decision made to delete contour points and show cross slope of straight grade across fairway between GR EL points.

4. HEC-2 input data in low flow swale coded FL above bottom of ponds and deeper locations where design EL was over 1'± below the outfall EL 1262 under McDonald bridge. Theoretical flow analysis data was deleted. Grading plan can only show actual FL EL to be staked for construction.
5. HEC-2 input estimated GR EL where SECNO lines crossed cart path and low flow swale. Path and FL EL using calculated slopes were changes of 0.1'± for grading plan exact staking.
6. Architect's concept contour layout used for HEC-2 coding maps did not show Corps CL exactly as CADD plotted on grading plan from geometric control line bearing, distance and curve data in DM-3. Stations for GR coded points on SECNO lines were changed on grading plans for exact construction staking. All coded points on a SECNO where CL station 2,000 moved required station changes but HEC-2 flow area did not change.
7. High points on tees, greens and berms were transferred a short distance to some SECNO lines on HEC-2 8/3/98 to model the upstream obstruction. This is an acceptable HEC-2 coding method frequently used. The grading plan deleted all theoretical coded points not on the SECNO line or moved the SECNO line on the grading plan to cross high points that will be staked for construction.
8. Architect's final design computer disk layout of golf course had some revisions to tees and greens not on the 8/3/98 coding maps. These changes were plotted on the grading plan, ie some long tees were divided for two separate pads, some green shapes were changed.
9. HEC-2 coding of existing contours on banks outside of design GR EL needed on grading plan for construction staking were deleted. Coding of points deleted were same as-built analysis of existing condition contours.

Amwest grading plan preparation focused on design elevations to be staked for control of construction. The grading plan is correct and ready to be used for construction staking. Another HEC-2 analysis was not considered necessary because WS results did not show any significant change after six similar plan modifications during the design process.

Grading plans were submitted for review five weeks after Supplement 2. City and FCD reviewers found many coded points in HEC-2 8/3/98 did not match points on the grading plan. The FCD letter with review comments and City FAX comments are in Appendix A-3 (3 pages). Approval of the golf course requires hydraulic analysis that matches the grading plan.

Amwest marked all changes to match the grading plan on the HEC-2 input data printout 8/3/98. The Amwest reply to FCD comments at Appendix A-4 (5 pages) recognized the difficulty to review HEC-2 data that does not match GR EL on SECNO location maps and agreed that re-coding the HEC-2 model was the only way for City and FCD to insure the hydraulic analysis results are acceptable. Changes are minor (EL 0.5'±, Stations 10'±) but each SECNO has many coding revisions.

DATA AND CRITERIA USED IN HYDRAULIC MODEL

A

Appendix A contains the original information previously submitted for review. The following text makes reference to Appendix A-5 pages that contain specific details, data and supplementary information.

1. Appendix A-5, 1 and 2 HEC-2 coding is orientated looking downstream with SECNO selected at Corps DM-3 CL stations. CL is coded point station 2,000, etc.
2. Appendix A-5, page 3
 - (a) Variable flow n factor 0.05 is used for dense vegetation in low flow swale where ponds or FL is below outfall EL 1262 at McDonald bridge.
 - (b) Tree branches will be pruned. Trees are wide spreads, tree masses (3 or 4 trees) are 20' apart and are not a significant flow obstruction.
 - (c) Path of streamline flows along bank openings (Lincoln Dr. and Interceptor) are shown on coding map and limit coded top width at sideboard.
 - (d) Low flow swale is coded at deeper places with FL 1261 until reaching swale bottom EL 1262 matching outfall EL at MCDONALD Bridge.
3. Appendix A-5, page 4
 - (a) Corps letter with review comment $n = 0.03$ is acceptable.
 - (b) Corps LA expects paving EL on clubhouse parking lot to be higher than existing contours and effectively contain 100 year storm flow within the golf course lease property.
4. Appendix A-5, page 5

Photos to show no erosion before and after golf course development was sent to City, FCD and Corps LA. The velocities in IBW are $10 \pm$ fps at some locations and grass lining adequately prevents erosion.

HEC-2 CODING FOR FINAL ANALYSIS

Reference information in this Final Analysis report is at Appendix B. The following text makes reference to Appendix B pages that contain specific details, data and supplementary information. Perusal of chnges for this report marked on HEC-2 8/3/98 in Appendix B pages 1-5 and Grading Plans in separate envelope marked HEC-2 Revisions 10/22/98 is necessary to understand the following:

1. Appendix B, page 6

HEC-2 coding notes on the coding maps in separate envelope herewith are modified for this report to include additional HEC-2 coding decisions. Notes explain coding of (1) existing contours, (2) data changes encircled, (3) FL table, (4) [S] deleted data, (5) low flow width, (6) existing contour GR EL and (7) SECNO at FCD flow meter head.

2. Appendix B, pages 7-10A

HEC-2 coding of lake at the outfall EL was requested by City and FCD.

3. Appendix A-5

All data and criteria in Appendix A-5 applies to the final analysis.

HEC-2 PRINTOUTS OF FINAL ANALYSIS:

Pages 6 and 7 are the HEC-2 Summary Printout Table 8/3/98. (Supplement 2) with entries in a new column marked "WS 10/22/98". The data is from Final Analysis HEC-2 results. The changes in WS are 0.05'± at most SECNO. The WS at SECNO 397+70 is +0.17' higher because the coding line was moved upstream to cross high berm EL. The WS at SECNO 410+90 is the maximum negative change at -0.10' lower. The WS at INTR is 0.02' lower.

Appendix B, Pages 11-26, are Final Analysis HEC-2 10-22/98. WS results are on pages 6 and 7. Maximum velocity is less than 10 fps.

Appendix B, Pages 31-46, are Final Analysis HEC-2 10/23/98 at 20,000 cfs coincident flow used to determine starting WS at INTR SECNO 414+05. The WS result 1278.02 is 0.03' lower than INTR starting WS 8/3/98.

RESULTS IN FINAL ANALYSIS REPORT

City and FCD reviewers will:

- (1) Compare changes marked on HEC-2 printout 8/3/98 (Appendix B, pages 1-5) with HEC-2 input data 10/22/98 (Appendix B, pages 11-15) to insure changes were correctly entered into the final analysis computer data.
- (2) Compare the HEC-2 input coding 10/22/98 to the GR EL and stations marked on the grading plan to insure final analysis coding exactly matches the EL and scaled stations to be staked for construction.
- (3) After verification that HEDC-2 model 10/22/98 exactly matches the grading plan, City and FCD reviewers will verify HEC-2 results 10/23/98 for 20,000 cfs coincident flow at SECNO

414+05 in Appendix B, pages 31-46, and approve starting WS 1276.02 for INTR Golf Course Design analysis.

Amwest has made a final check and certifies the HEC-2 data exactly matches the grading plan in this final analysis. City and FCD reviewers need to assure Corps LA that this hydraulic analysis HEC-2 10/22/98 matches the grading plan to be used for Construction Staking. Amwest will change any coding data that the City or FCD requests for a revision that may have a significant effect on results in this report.

This final Analysis verifies that the golf course constructed as shown on the grading plan will comply with all conditions of:

- (1) Lease agreement between the City and FCD
- (2) Corps Design Memorandum
- (3) City public health and welfare requirements to safely convey the 100 year storm flow within the banks of IBW with adequate freeboard.

The hydraulic profile of golf course design FL, WS, top of banks ^{on pages 9 and 10} ~~in the separate envelope~~ graphically verifies the above statements. The Grading Plan Cover Sheet has Amwest Notes to the Contractor to clearly define that construction staking will be the plan EL at computer plotted coordinate points and other grading requirements copied on page 8.

3AUG98

THIS RUN EXECUTED 03AUG98 11:32:29

 HEC-2 WATER SURFACE PROFILES
 Version 4.6.2: Mar 1991

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MC DONALD TO INDIAN BEND

SUMMARY PRINTOUT TABLE 150

WS
10/22/98

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRWS	E6	10*KS	VCH	AREA	.01K
368.220	.00	.00	.00	62.00	30000.00	70.30	.00	71.31	25.09	9.73	4382.07	5989.74
369.220	100.00	.00	.00	61.00	30000.00	71.02	70.97	71.54	11.78	6.79	5737.26	8740.61
370.220	100.00	.00	.00	61.00	30000.00	71.00	71.02	71.71	16.30	7.52	5136.05	7430.93
372.020	100.00	.00	.00	61.00	30000.00	71.24	71.19	72.19	26.54	8.81	4066.31	5823.27
374.350	233.00	.00	.00	61.00	30000.00	71.57	71.59	72.99	33.51	9.90	3285.79	5182.21
375.200	85.00	.00	.00	61.00	30000.00	72.11	72.09	73.26	25.86	8.84	3522.26	5898.03
377.050	105.00	.00	.00	61.00	30000.00	72.76	72.78	73.68	19.06	7.85	3944.94	6872.41
378.550	150.00	.00	.00	61.00	30000.00	72.86	72.87	74.12	24.78	9.15	3419.39	6025.99
380.100	155.00	.00	.00	61.50	30000.00	73.56	73.64	74.43	14.76	7.65	4091.84	7808.66
383.000	250.00	.00	.00	62.00	30000.00	74.17	74.25	74.78	8.56	6.26	4822.60	10251.53
387.000	400.00	.00	.00	62.00	30000.00	74.67	74.75	75.10	6.83	5.27	5690.87	11482.90
397.500	50.00	.00	.00	62.00	30000.00	74.68	74.76	75.15	7.98	5.51	5448.81	10616.60
398.250	255.00	.00	.00	62.00	30000.00	74.79	74.86	75.47	13.12	6.61	4539.92	8283.34
392.400	235.00	.00	.00	62.30	30000.00	74.98	74.97	75.95	22.48	7.88	3807.87	6327.17
394.100	170.00	.00	.00	62.50	30000.00	75.61	75.67	76.25	11.61	6.39	4694.04	8805.82
394.700	60.00	.00	.00	62.50	30000.00	75.62	75.74	76.35	14.08	6.86	4370.50	7994.22
395.300	60.00	.00	.00	62.70	30000.00	75.69	75.77	76.46	16.23	7.04	4261.12	7445.72

03AUG98 11:27:48
 3AUG98

PAGE

WS
 10/22/98

SECNO	XLCH	ELTRD	ELLC	ELMIN	0	CWSEL	CRWS	EG	10*KS	VCH	AREA	.01K
396.050	75.00	.00	.00	62.00	30000.00	75.76	75.81.00	76.61	19.61	7.39	4013.12	6916.76
397.150	110.00	.00	.00	67.00	30000.00	76.24	76.34.00	76.78	9.64	5.93	5058.26	9662.75
* 397.550	40.00	.00	.00	66.00	30000.00	75.72	75.89.00	77.10	35.04	9.44	3179.65	5068.31
* 398.050	50.00	.00	.00	66.10	30000.00	76.41	76.48.00	77.27	17.81	7.47	4017.25	7108.21
400.400	235.00	.00	.00	66.65	30000.00	76.78	76.86.00	77.76	22.56	7.94	3780.22	6616.91
401.300	90.00	.00	.00	66.80	30000.00	77.04	77.11.00	77.94	19.23	7.61	3940.84	6842.05
401.800	50.00	.00	.00	66.90	30000.00	77.09	77.17.00	78.05	16.99	7.89	3885.20	7279.07
404.800	300.00	.00	.00	67.44	30000.00	77.67	77.75.00	78.59	18.28	7.67	3913.16	7017.38
408.300	350.00	.00	.00	67.90	30000.00	78.29	78.28.00	79.31	21.26	8.08	3712.49	6505.94
410.400	170.00	.00	.00	68.40	30000.00	78.55	78.62.00	79.77	26.22	8.06	3387.56	5858.21
410.900	90.00	.00	.00	68.50	30000.00	79.06	78.96.00	79.99	17.08	7.72	3884.36	7257.96
412.700	100.00	.00	.00	68.60	30000.00	79.44	79.53.00	80.28	14.97	7.38	4066.21	7753.86
414.050	135.00	.00	.00	68.70	30000.00	79.80	79.78.00	80.47	10.65	6.58	4568.11	9194.43
415.500	145.00	.00	.00	70.50	30000.00	79.88	79.86.00	80.70	15.44	7.25	4140.85	7634.74
416.250	75.00	.00	.00	70.50	30000.00	79.93	79.88.00	80.94	16.55	7.66	3915.69	7374.90
417.450	120.00	.00	.00	70.50	30000.00	80.32	80.36.00	81.03	11.70	6.75	4443.36	8772.28
418.450	100.00	.00	.00	70.00	30000.00	80.74	80.73.00	81.18	12.71	5.33	5626.08	8415.78
* 422.300	365.00	.00	.00	70.00	30000.00	81.07	81.06.00	82.06	29.78	7.99	3753.23	5504.63

AMWEST NOTES TO THE CONTRACTOR:

Design elevations shown are finished grade. Architects design contours may not match

Engineer's design elevations. Engineer's design elevations are control for grading.

Civil Engineers design elevations and fairway cross slopes are correct as shown at each section line station only. Elevation and cross slopes vary uniformly between section line stations. Fairways cross slopes start at elevation XS and end at low flow swale TB or lower elevation XS.

Construction stakes with elevations will be set as required at computer plotted coordinate points (cp) for (a) low flow swale control line and width, (b) green CP & limit lines, (c) tee CP and surface limits, (d) bunker bottom and bank limits, (e) berm top and toe limits, (f) cart path control line.

Cross reference to Architect's plan contours and details are required for supplemental construction data. Top of tee elevation on plan is average at 3% cross slope.

All fill will be constructed per MAG Spec Section 211 and compacted to 90% with 3:1 side slopes unless shown otherwise.

Excavated material not immediately placed where fill is required will be stockpiled on-site outside the 100 year storm limits at locations designated by the Engineer.

100 year storm limit line is 10'± inside highest bank elevation on both sides of golf course.

Unsuitable soil will be removed from the site.

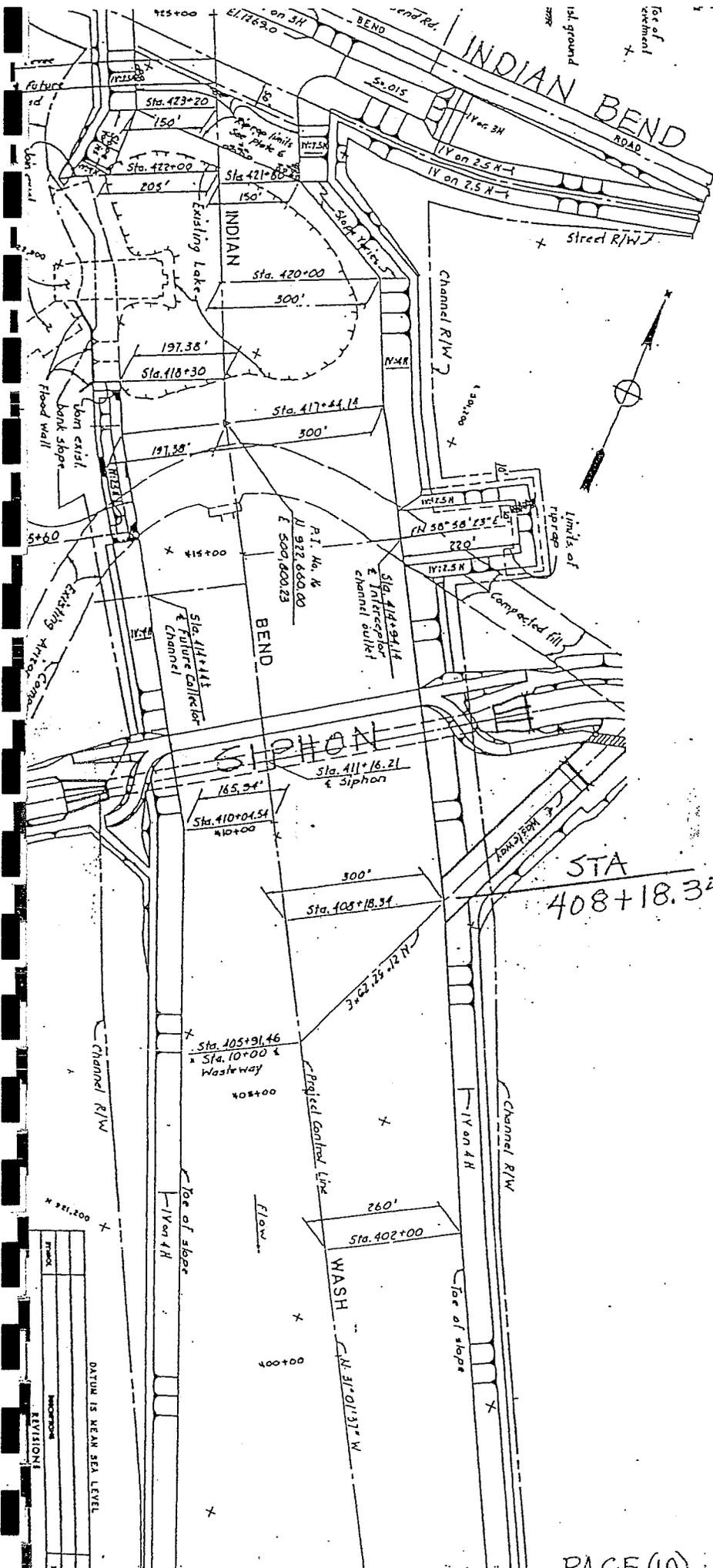
An attempt has been made to show all existing improvements. However, the contractor is responsible for site investigation and final determination prior to bid on all special grading required to avoid conflicts.

Finished grades marked on civil plans are final design in HEC-2 hydraulic analysis.

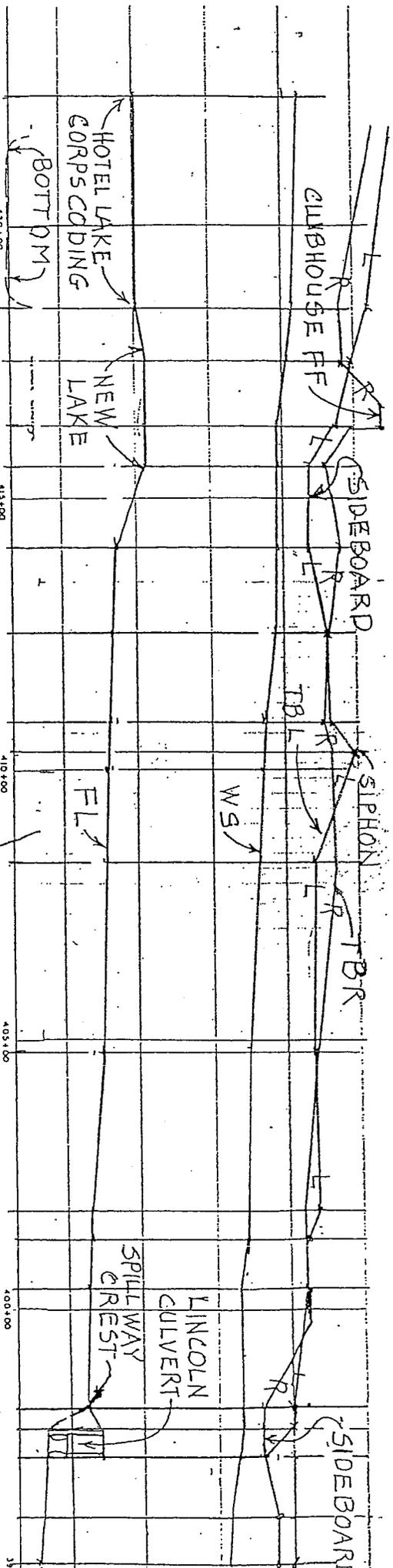
Contractor will get Architect's approval of low flow swale cross section before seed planting.

Contractor will install path to avoid abrupt vertical angle at GB with Architect's approval of subgrade before ~~AG~~ placement.

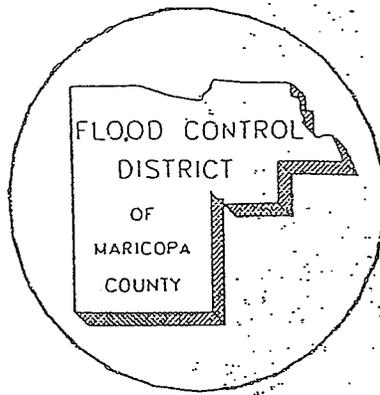
Concrete



- 42230
- 41845
- 41745
- 41625
- 41556
- 41465
- 41263
- 41090
- 41040
- 40830
- 40480
- 40180
- 40130
- 40040
- 39805
- 39770
- 39715
- 39605



APPENDIX F



INDIAN BEND WASH
FLOODPLAIN DELINEATION STUDY

Salt River to 40th Street
FCD 93-05

HYDRAULICS REPORT
VOLUME 1 OF 2

NOVEMBER 1997

sla Simons, Li & Associates, Inc.

2.0 AREA STUDIED

2.1 Scope of Study

The primary element of the scope was to delineate the 100-year floodplain and floodway for the IBW.

SLA project engineers conducted a site reconnaissance of IBW to collect data to be used in the determination of the Manning's "n" values and verification of structures in the wash. Photographs of typical land cover and channel reaches were taken during the field reconnaissance. An "n-Value Determination Report" was prepared using the data gathered from the field trip (1).

The most current topographic mapping available (Baker 1993) was supplied by the City of Scottsdale. The 100-year floodplain and floodway delineations were developed using the HEC-2 computer model.

2.2 Community Description

Figure 1 illustrates the location of IBW relative to the communities of Phoenix, Paradise Valley, Scottsdale, and Tempe. The watershed is highly developed urban and suburban with mixed land uses located entirely within Maricopa County, Arizona. IBW originally had a total drainage area of 206 square miles to its confluence with the Salt River. In 1975, construction of the Central Arizona Project (CAP) Canal and the dikes associated with this project, isolated the upper portion of the watershed. The CAP dikes impound all runoff from the north. This has resulted in a reduction of the total IBW drainage area by 43 percent to approximately 102 square miles (2). The U.S. Army Corps of Engineers has estimated that these dikes will reduce the estimated Standard Project Flood discharge from 62,000 cfs to 39,000 cfs at Indian Bend Road.

Indian Bend Wash was converted to a greenbelt area through the City of Scottsdale in 1985. This multi use project conveys flood flows and provides recreational amenities including open space, grass, golf courses, sports fields, hiking, bicycling, picnic areas, boating and many other quality of life features. The greenbelt project conveys flood flows from its inlet at Indian Bend Road to its outlet near the Salt River. The inlet is an earthen channel from Indian Bend Road south to McDonald Drive. The outlet channel is an earthen excavated channel from McKellips Road south to the Salt River. The inlet channel collects flows above the Arizona Canal, conveys them across the canal, and discharges into the greenbelt floodway. A siphon passes water in the Arizona Canal under Indian Bend Wash. East of the Wash, an interceptor channel collects and disposes of floodwaters that pond behind the north bank of the Arizona Canal. West of the Wash, a series of collectors, side channels, and underground pipes collect floodwaters and prevents ponding and overtopping of the canal bank. In addition to the greenbelt, numerous detention basins have been constructed within the drainage area as development has occurred.

2.3 Principal Flood Problems

The City of Scottsdale expressed a general concern that the currently effective FIS depicts areas adjacent to Indian Bend Wash as being in the floodplain when in fact they are not.

2.4 Flood Protection Measures

None are proposed as part of this study.

3.0 ENGINEERING METHODS

3.1 Hydrologic Analysis

The 100-year discharges used for Indian Bend Wash were taken from the FEMA Flood Insurance Study (FIS) for Maricopa County, Arizona & Incorporated Areas, Volume 1 of 12, revised September 1995. Table 2 summarizes the discharges.

Table 2 Summary of Discharges

100-Year Discharges for Indian Bend Wash	
Reach	Discharge (cfs)
36th Street to Cactus Road	6000
Cactus Road to Scottsdale Road	9000
Scottsdale Road to Indian Bend Road	16000
Indian Bend Road to Indian School Road	17000
Indian School Road to Salt River	20000

3.2 Hydraulic Analysis

3.2.1 Work Map Delineation

Water surface profiles were developed using the U.S. Army Corps' of Engineers HEC-2 computer program (Version 4.6.2) (4). Water surface profiles were determined for the 100-year floodplain and floodway. The hydraulic analysis conducted for this delineation reflects existing conditions of IBW at the time of mapping for the study.

The cross section data and topographic mapping for the study reach of IBW, were developed from a digital terrain model (DTM) prepared by Michael Baker Jr., Inc. The DTM is based on aerial photography taken September, October, and November 1993.

Cross sections were drawn approximately perpendicular to the anticipated flow paths in the channel and overbanks. The cross-sections were labeled using standard engineering stationing with the distance in river miles above the confluence with the Salt River. The station of each cross-section is determined by measuring the distance above the confluence along the IBW channel centerline (thalweg).

The cross sections are defined by data points oriented left to right looking downstream. Each data point consists of an elevation and corresponding station number with the hydraulic baseline assigned a station number of 10,000 feet at each cross section. Each cross section station number is defined

INDIAN BEND WASH
FLOODPLAIN/FLOODWAY

FCD 93-05

EXHIBIT 1: FLOOD PROFILES

CONFLUENCE WITH THE SALT RIVER

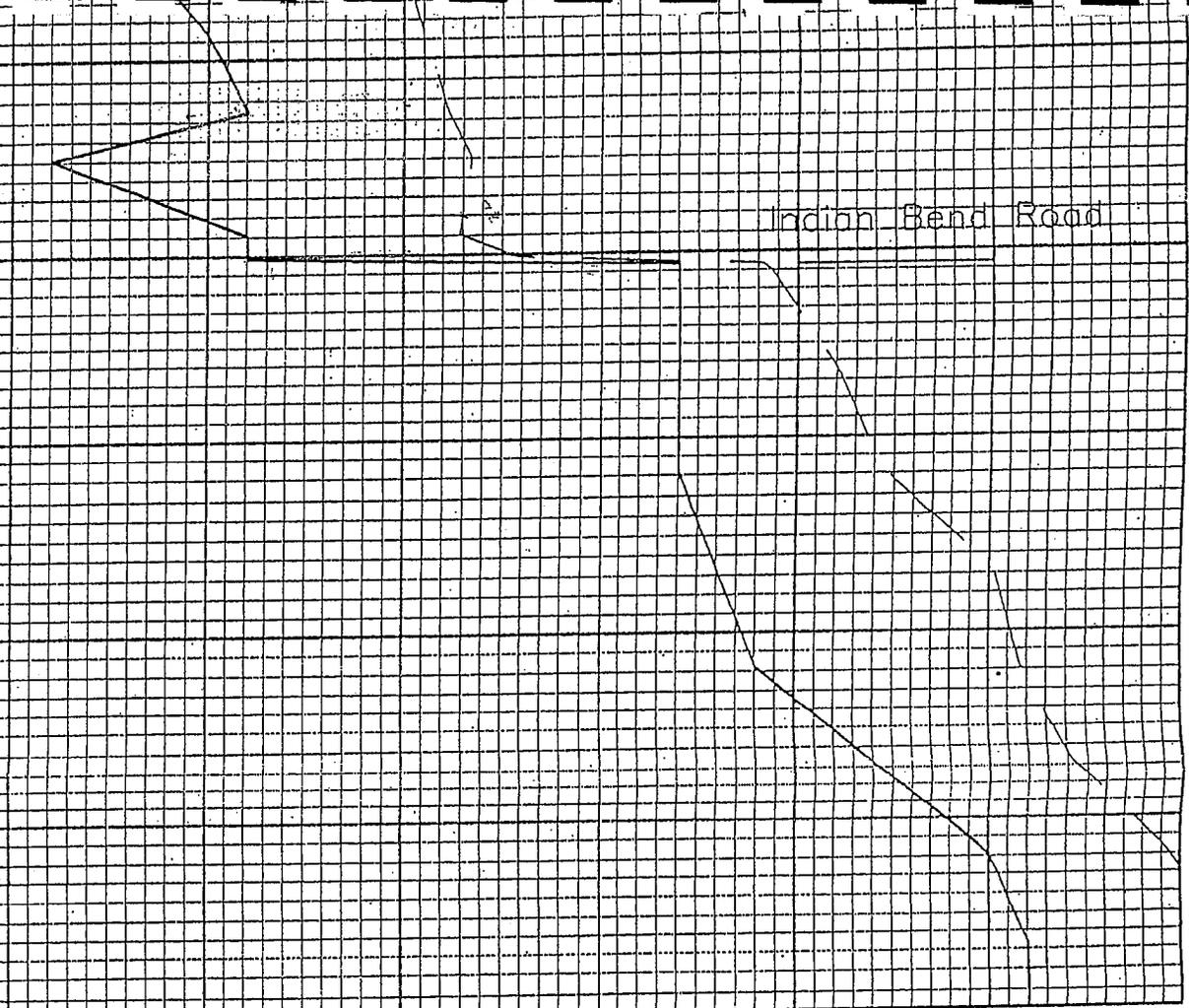
41,000
42,000
43,000
44,000
45,000
46,000

LEGEND

100-YEAR FLOOD

STREAM BED

CROSS SECTION LOCATION



SHEET 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
 MARICOPA COUNTY, AZ
 (FLOOD CONTROL DISTRICT)

FLOOD PROFILES

INDIAN BEND WASH

APPENDIX G

RETENTION VOLUME REQUIRED

Site Area 9.02 Acre = 392,848 s.f.

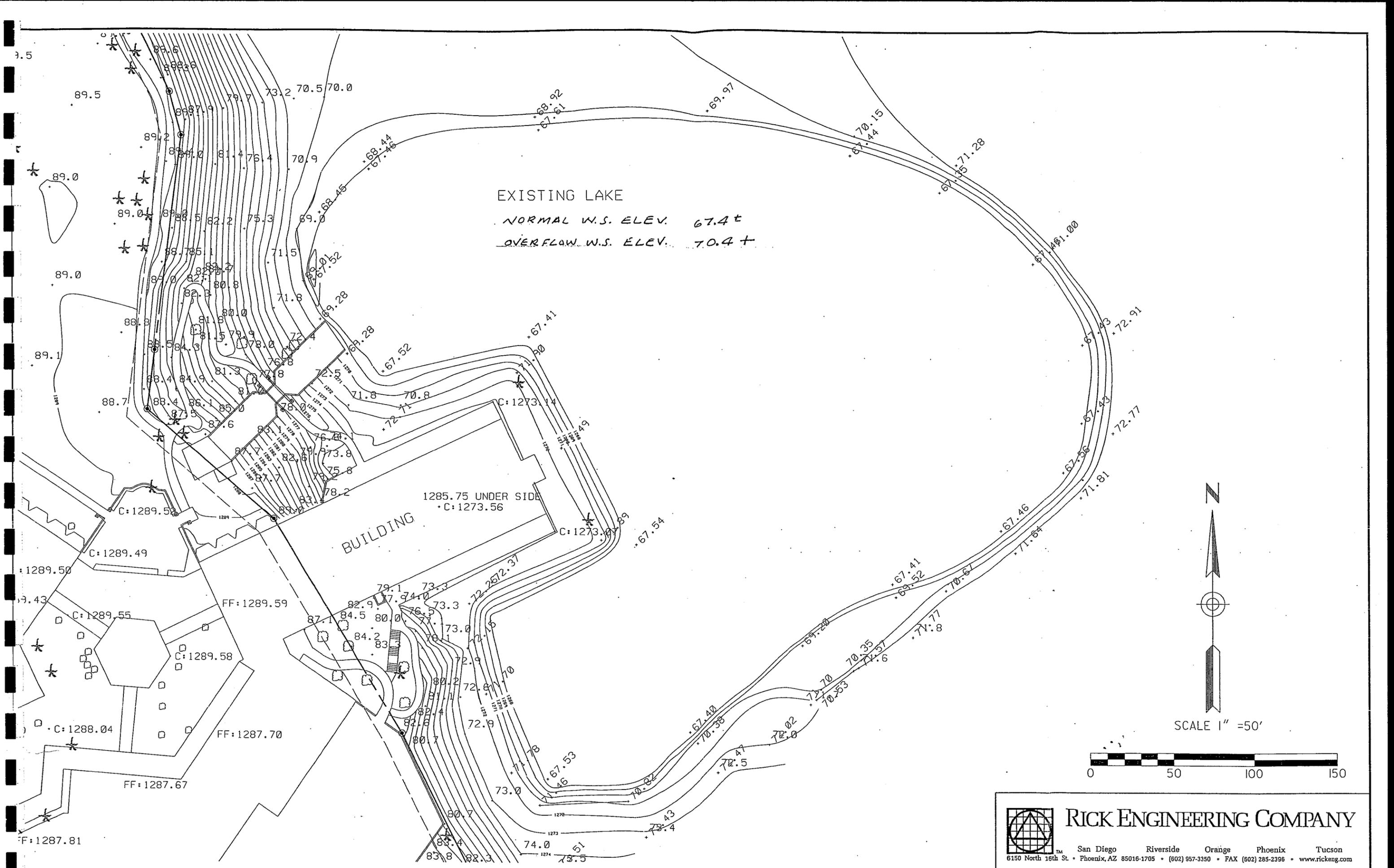
$$V_r = \frac{2.82}{12} \times 392,848 \times 0.76 = 70,163 \text{ cu. ft.}$$

RETENTION VOLUME PROVIDED

Lake surface area (elevation 67.4) = 107,205 s.f.
(See following sheet)

Lake surface area (Elevation 70.4) = 128,051 s.f.

$$\text{Retention Volume} = \frac{107,205 + 128,051}{2} \times 3.0 = 352,884 \text{ cu. ft.} > 70,163 \text{ cu. ft.}$$



 RICK ENGINEERING COMPANY	
San Diego Riverside Orange Phoenix Tucson 6150 North 16th St. • Phoenix, AZ 85016-1705 • (602) 957-3350 • FAX (602) 285-2396 • www.rickeng.com	
JOB NUMBER	3024
PREPARED BY:	D.G.M.
DATE PREPARED:	FEB.-05

APPENDIX H

OFFICIAL RECORDS OF
MARICOPA COUNTY RECORDER
HELEN PURCELL
20041370248 11/22/2004 03:45
ELECTRONIC RECORDING

22041&2FE-19-1-1--
Hoyp

When Recorded, Interoffice Mail To:
Flood Control District of Maricopa County (LLA)

Exempt per ARS 11-1134, A3
Resolution FCD 1999 R-16

**PARTIAL RELEASE OF PERPETUAL EASEMENT AND
GRANT OF PERPETUAL ACCESS EASEMENT**

Project: IBW Interceptor
FCD Parcel: S-2204-1FE, S-2204-2FE
Assessor Parcel No: 174-20-012X

THIS PARTIAL RELEASE OF PERPETUAL EASEMENT AND GRANT OF PERPETUAL ACCESS EASEMENT is made by **THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY**, a municipal corporation and political subdivision of the State of Arizona (the "District"), and **STARPOINTE CORRIENTE CONDOMINIUMS, LIMITED PARTNERSHIP**, a Delaware corporation ("Owner"), as follows:

A. PARTIAL RELEASE OF PERPETUAL EASEMENT

The District has flowage easements along the real property boundary described on Exhibit A attached hereto, which real property is owned by Owner. As set forth in that certain Final Order of Condemnation, dated December 23, 1981 and recorded in Maricopa County, State of Arizona, in Docket 15741, page 461 on January 4, 1982, and in that certain Drainage and Flood Control Easement and Provision for Maintenance dated June 18, 1974 and recorded in Maricopa County, State of Arizona in Docket 10706, page 1458 on June 20, 1974 as assigned in Docket 12717, page 953 on February 8, 1978, the District relinquishes certain portions of its easements.

20041370248

For One and no/100 Dollars (\$1.00) and other valuable consideration, **THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY** hereby releases and disclaims any and all interest in and rights to the flowage easement over the real property described on Exhibit B attached hereto ("Released Property").

This Partial Release of Perpetual Easement is effective solely for the real property as described above and for no other interests of **THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY**.

The District will continue to have a drainage easement over the property described on Exhibit C attached hereto ("Retained Property").

This Partial Release of Perpetual Easement is executed by **THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY**, with the sole and express intent of effecting an extinguishment of the District's rights and obligations over that portion of the flowage easement described in the Final Order of Condemnation dated December 23, 1981, granted to the Flood Control District of Maricopa County and as recorded in Maricopa County, State of Arizona, in Docket 15741, page 461 on January 4, 1982; and the Drainage and Flood Control Easement and Provision for Maintenance dated June 18, 1974 and recorded in Maricopa County, State of Arizona in Docket 10706, page 1458 on June 20, 1974 as assigned in Docket 12717, page 953 on February 8, 1978.

B. GRANT OF PERPETUAL ACCESS EASEMENT

Owner hereby grants to **THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY** a perpetual, nonexclusive easement for vehicular and pedestrian access over and across that real property described on Exhibit D attached hereto ("Access Property"). Owner shall improve the Access Property with reasonable

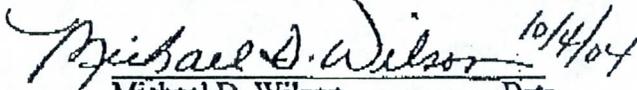
improvements for **THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY'S** access as reasonably approved by **THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY** ("Access Improvements") and the easement rights of **THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY** shall commence upon completion of the Access Improvements. The sole purpose of this easement is to provide access for **THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY** to its flood control improvements. Owner shall be solely responsible to maintain the Access Improvements in a good and safe condition at its sole cost, except to the extent the Access Improvements are damaged by **THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY** or its agents or contractors, in which case **THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY** shall be responsible for necessary repairs at its sole cost. Owner hereby represents and warrants that it is lawfully seized with fee title to the Access Property and that the Access Property is free of any liens or encumbrances that prevent or impair the granting of this easement and right of entry. Owner further warrants and represents that it will defend the District's rights under this easement against any and all adverse interests which may affect the purposes of this easement. **THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY** shall be responsible for all claims, losses, damages or injuries to persons or property resulting from use of the Access Property and Access Improvements by **THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY** or its agents or contractors. This easement shall run with the land and shall be binding upon the parties and their respective heirs, successors and assigns.

RECOMMENDED FOR APPROVAL:

**FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
DISTRICT**



Timothy S. Phillips Date
Acting Chief Engineer and General Manager



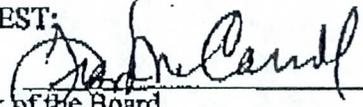
Michael D. Wilson Date
Manager, Land Management Division

ACCEPTED AND APPROVED:

**BOARD OF DIRECTORS OF
FLOOD CONTROL
OF MARICOPA COUNTY**



Chairman of the Board

ATTEST:


Clerk of the Board

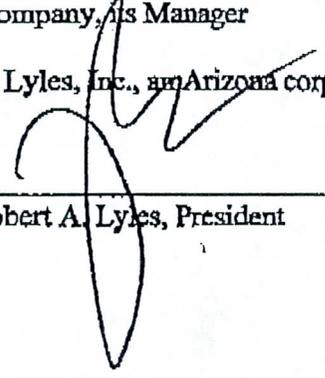
Date: NOV 03 2006

**STARPOINTE CORRIENTE CONDOMINIUMS
LIMITED PARTNERSHIP, a Delaware limited partnership**

By: SP Corriente General Partner, LLC, an Arizona
limited liability company, its general partner

By: Starpointe Communities III, LLC, an Arizona limited
liability company, its Manager

By: R.A. Lyles, Inc., an Arizona corporation, Member

By 

Robert A. Lyles, President

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

On this 29th day of September, 2004, before me, the undersigned officer, personally appeared Robert A. Lyles, who acknowledged himself to be the President of R.A. LYLES, INC., an Arizona corporation, a Member of STARPOINTE COMMUNITIES III, LLC, an Arizona limited liability company, the Manager of SP CORRIENTE GENERAL PARTNER, LLC, an Arizona limited liability company, the General Partner of STARPOINTE CORRIENTE CONDOMINIUM LIMITED PARTNERSHIP, a Delaware limited partnership:

_____ whom I know personally;
_____ whose identity was proven to me on the oath of _____ a

credible witness by me duly sworn;
✓ _____ whose identity I verified on the basis of his Arizona Driver's License #B12735571 (8/4/12);

and he, in such capacity, being authorized so to do, executed the foregoing instrument for the purposes therein contained on behalf of that entity.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

NOTARY SEAL:

Linda T. Hambleton
Notary Public



LINDA T. HAMBLETON
Notary Public - Arizona
Maricopa County
Expires 09/01/08

Exhibit A

Boundary Line for Property under Current Easement

EXHIBIT 'A'

That portion of the North half of Section Eleven, Township Two North, Range Four East of the Gila and Salt River Meridian, Maricopa County, Arizona, described as follows:

COMMENCING at the North quarter corner of said Section 11;

THENCE North 88 degrees 59 minutes 30 seconds West along the North line of said Section 11 a distance of 641.13 feet;

THENCE departing said North line South 00 degrees 25 minutes 00 seconds East a distance of 80.00 feet;

THENCE South 81 degrees 49 minutes 28 seconds East 240.04 feet;

THENCE South 71 degrees 00 minutes 30 seconds East a distance of 210.84 feet;

THENCE South 81 degrees 56 minutes 50 seconds East a distance of 203.92 feet;

THENCE South 82 degrees 46 minutes 34 seconds East a distance of 198.17 feet;

THENCE South 00 degrees 26 minutes 59 seconds West a distance of 34.86 feet to the POINT OF BEGINNING;

THENCE South 00 degrees 26 minutes 59 seconds West a distance of 65.15 feet;

THENCE South 00 degrees 26 minutes 18 seconds West a distance of 130.00 feet;

THENCE South 45 degrees 21 minutes 16 seconds East a distance of 238.80 feet;

THENCE South 25 degrees 46 minutes 53 seconds East a distance of 160.00 feet;

THENCE South 09 degrees 04 minutes 56 seconds East a distance of 104.40 feet;

THENCE South 35 degrees 13 minutes 07 seconds West a distance of 9.00 feet;

THENCE South 25 degrees 46 minutes 53 seconds East a distance of 26.00 feet;

THENCE South 35 degrees 13 minutes 07 seconds West a distance of 42.00 feet;

THENCE North 80 degrees 46 minutes 53 seconds West a distance of 116.00 feet;

THENCE South 09 degrees 13 minutes 07 seconds West a distance of 14.00 feet;

THENCE South 80 degrees 46 minutes 53 seconds East a distance of 9.00 feet;

THENCE South 09 degrees 13 minutes 07 seconds West a distance of 24.00 feet;

THENCE South 20 degrees 46 minutes 53 seconds East a distance of 20.00 feet;

THENCE South 83 degrees 46 minutes 53 seconds East a distance of 123.00 feet;

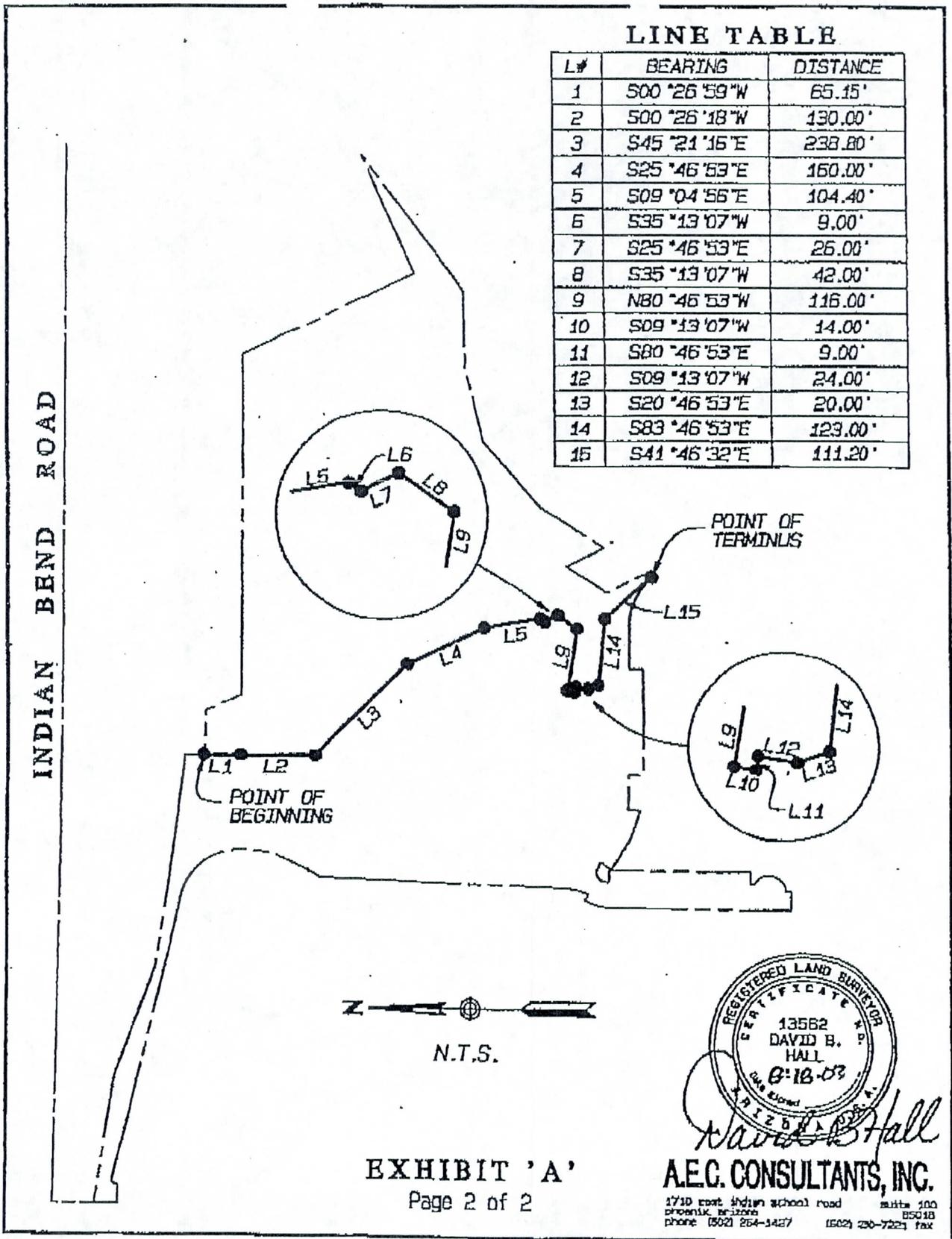
THENCE South 41 degrees 46 minutes 32 seconds East a distance of 111.20 feet to the POINT OF TERMINUS.

Prepared by: AEC Consultants, Inc.
 1710 E. Indian School Rd., #100
 Phoenix, Arizona 85016
 (602) 264-1427

Date: August 15, 2003

AEC Job No. 98018





LINE TABLE

L#	BEARING	DISTANCE
1	S00°26'59"W	65.15'
2	S00°26'18"W	130.00'
3	S45°21'15"E	238.80'
4	S25°46'53"E	160.00'
5	S09°04'56"E	104.40'
6	S35°13'07"W	9.00'
7	S25°46'53"E	25.00'
8	S35°13'07"W	42.00'
9	N80°46'53"W	116.00'
10	S09°13'07"W	14.00'
11	S80°46'53"E	9.00'
12	S09°13'07"W	24.00'
13	S20°46'53"E	20.00'
14	S83°46'53"E	123.00'
15	S41°46'32"E	111.20'

EXHIBIT 'A'
Page 2 of 2

REGISTERED LAND SURVEYOR
CERTIFICATE NO. 13562
DAVID B. HALL
8-18-03
A.E.C. CONSULTANTS, INC.
1710 East Indian School Road Suite 100
Phoenix, Arizona 85018
phone (602) 254-1427 (602) 230-7221 fax

Exhibit B

Legal Description for Released Property

EXHIBIT 'B'

That portion of the North half of Section Eleven, Township Two North, Range Four East of the Gila and Salt River Meridian, Maricopa County, Arizona, described as follows:

Commencing at the North quarter corner of said Section 11;

Thence North 88 degrees 59 minutes 30 seconds West along the North line of said Section 11 a distance of 641.13 feet;

Thence departing said North line South 00 degrees 25 minutes 00 seconds East a distance of 80.00 feet;

Thence South 81 degrees 49 minutes 28 seconds East 240.04 feet;

Thence South 71 degrees 00 minutes 30 seconds East a distance of 210.84 feet;

Thence South 81 degrees 56 minutes 50 seconds East a distance of 203.92 feet;

Thence South 82 degrees 46 minutes 34 seconds East a distance of 198.17 feet;

Thence South 00 degrees 26 minutes 59 seconds West a distance of 34.86 feet to a point of intersection with a non-tangent curve, the center of which bears North 04 degrees 04 minutes 20 seconds East, 1250.88 feet, said point also being the TRUE POINT OF BEGINNING;

Thence Easterly along the arc of said curve to the left, through a central angle of 03 degrees 27 minutes 45 seconds for an arc distance of 75.69 feet;

Thence South 89 degrees 23 minutes 30 seconds East a distance of 5.18 feet;

Thence South 25 degrees 20 minutes 43 seconds East a distance of 112.91 feet;

Thence South 14 degrees 56 minutes 28 seconds East a distance of 27.43 feet;

Thence South 07 degrees 14 minutes 35 seconds West a distance of 130.41 feet;

Thence South 07 degrees 14 minutes 41 seconds West a distance of 36.08 feet;

Thence South 49 degrees 32 minutes 55 seconds East a distance of 101.76 feet;

Thence South 31 degrees 14 minutes 37 seconds East a distance of 150.53 feet;

Thence South 25 degrees 59 minutes 46 seconds East a distance of 183.31 feet;

Thence South 32 degrees 22 minutes 34 seconds West a distance of 88.64 feet;
Thence South 25 degrees 26 minutes 49 seconds East a distance of 79.58 feet;
Thence South 32 degrees 17 minutes 27 seconds West a distance of 11.42 feet;
Thence North 41 degrees 46 minutes 32 seconds West a distance of 111.20 feet;
Thence North 83 degrees 46 minutes 53 seconds West a distance of 123.00 feet;
Thence North 20 degrees 46 minutes 53 seconds West a distance of 20.00 feet;
Thence North 09 degrees 13 minutes 07 seconds East a distance of 24.00 feet;
Thence North 80 degrees 46 minutes 53 seconds West a distance of 9.00 feet;
Thence North 09 degrees 13 minutes 07 seconds East a distance of 14.00 feet;
Thence South 80 degrees 46 minutes 53 seconds East a distance of 116.00 feet;
Thence North 35 degrees 13 minutes 07 seconds East a distance of 42.00 feet;
Thence North 25 degrees 46 minutes 53 seconds West a distance of 26.00 feet;
Thence North 35 degrees 13 minutes 07 seconds East a distance of 9.00 feet;
Thence North 09 degrees 04 minutes 56 seconds West a distance of 104.40 feet;
Thence North 25 degrees 46 minutes 53 seconds West a distance of 160.00 feet;
Thence North 45 degrees 21 minutes 16 seconds West a distance of 238.80 feet;
Thence North 00 degrees 26 minutes 18 seconds East a distance of 130.00 feet;
Thence North 00 degrees 26 minutes 59 seconds East a distance of 65.15 feet to the
TRUE POINT OF BEGINNING,

Prepared by: AEC Consultants, Inc.
1710 E. Indian School Rd., #100
Phoenix, Arizona 85016
(602) 264-1427

Date: August 15, 2003
Revised: June 17, 2004

AEC Job No. 98018

Page 2 of 3



David B. Hall

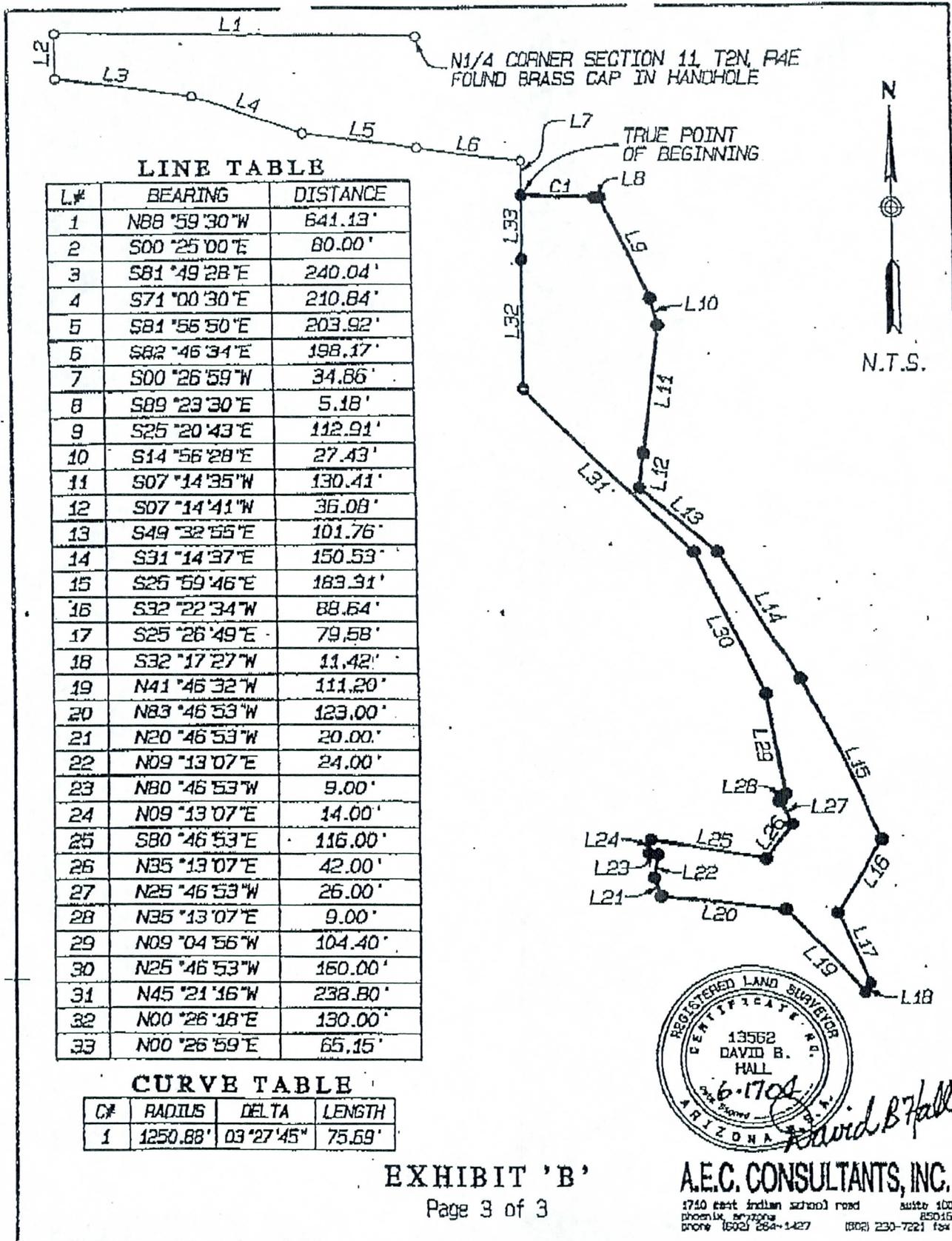


Exhibit C

Boundary Line for Retained Property

EXHIBIT 'C'

That portion of the North half of Section Eleven, Township Two North, Range Four East of the Gila and Salt River Meridian, Maricopa County, Arizona, described as follows:

COMMENCING at the North quarter corner of said Section 11;

THENCE North 88 degrees 59 minutes 30 seconds West along the North line of said Section 11 a distance of 641.13 feet;

THENCE departing said North line South 00 degrees 25 minutes 00 seconds East a distance of 80.00 feet;

THENCE South 81 degrees 49 minutes 28 seconds East 240.04 feet;

THENCE South 71 degrees 00 minutes 30 seconds East a distance of 210.84 feet;

THENCE South 81 degrees 56 minutes 50 seconds East a distance of 203.92 feet;

THENCE South 82 degrees 46 minutes 34 seconds East a distance of 198.17 feet;

THENCE South 00 degrees 26 minutes 59 seconds West a distance of 34.86 feet to a point of intersection with a non-tangent curve, the center of which bears North 04 degrees 04 minutes 20 seconds East, 1250.88 feet, said point also being the POINT OF BEGINNING;

THENCE Easterly along the arc of said curve to the left, through a central angle of 03 degrees 27 minutes 45 seconds for an arc distance of 75.69 feet;

THENCE South 89 degrees 23 minutes 30 seconds East a distance of 5.18 feet;

THENCE South 25 degrees 20 minutes 43 seconds East a distance of 69.91 feet;

THENCE South 25 degrees 20 minutes 41 seconds East a distance of 43.00 feet;

THENCE South 14 degrees 56 minutes 28 seconds East a distance of 27.43 feet;

THENCE South 07 degrees 14 minutes 35 seconds West a distance of 130.41 feet;

THENCE South 07 degrees 14 minutes 41 seconds West a distance of 36.08 feet;

THENCE South 49 degrees 32 minutes 55 seconds East a distance of 101.76 feet;

THENCE South 31 degrees 14 minutes 37 seconds East a distance of 150.53 feet;

THENCE South 25 degrees 59 minutes 46 seconds East a distance of 183.31 feet;

THENCE South 32 degrees 22 minutes 34 seconds West a distance of 88.64 feet;

THENCE South 25 degrees 26 minutes 49 seconds East a distance of 79.58 feet;

THENCE South 32 degrees 16 minutes 51 seconds West a distance of 13.00 feet to the POINT OF TERMINUS.

Prepared by: AEC Consultants, Inc.
1710 E. Indian School Rd., #100
Phoenix, Arizona 85016
(602) 264-1427

Date: August 15, 2003
Revised: June 17, 2004

AEC Job No. 98018



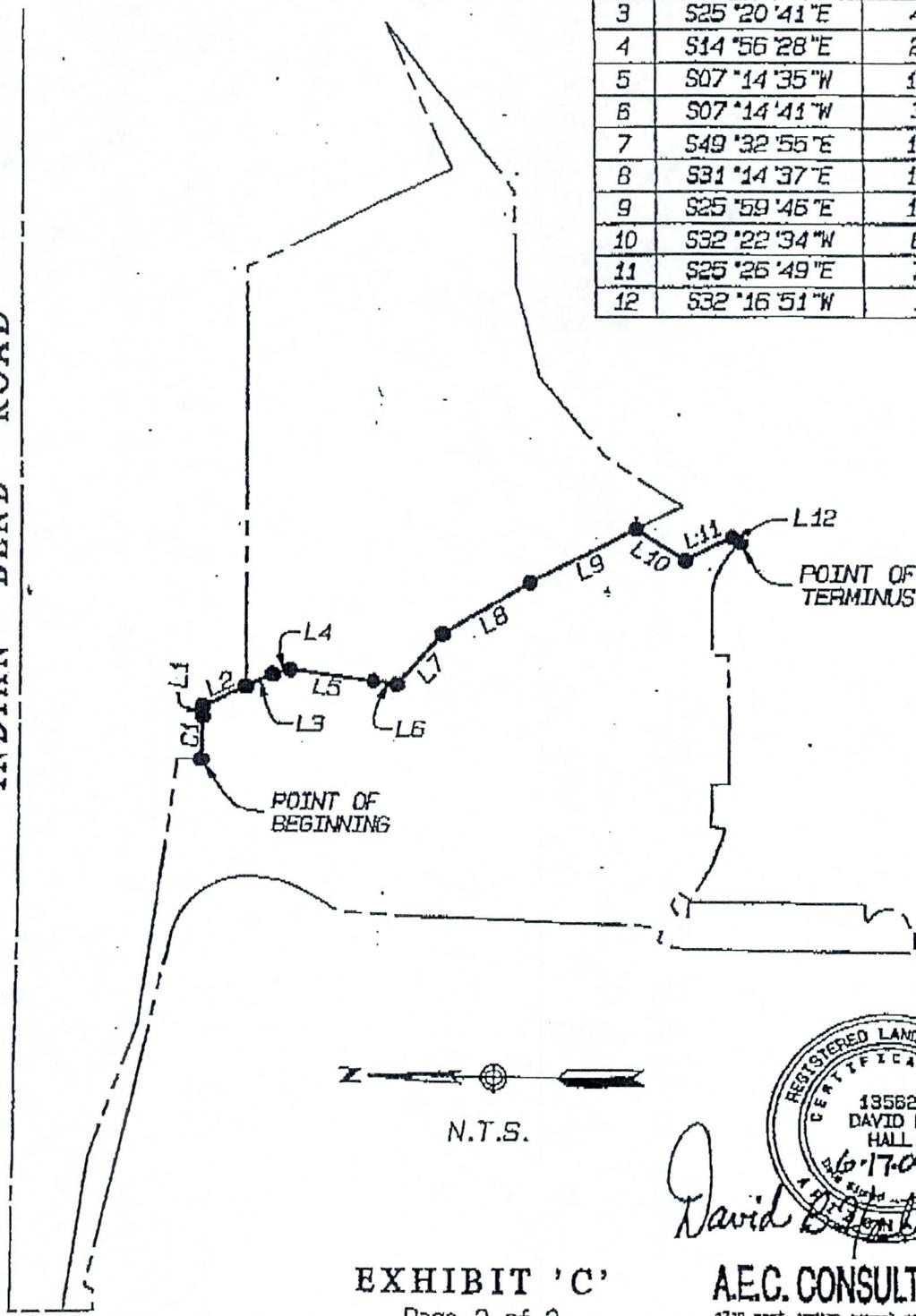
CURVE TABLE

C#	RADIUS	DELTA	LENGTH
1	1250.88'	03°27'45"	75.69'

LINE TABLE

L#	BEARING	DISTANCE
1	N89°23'30"W	5.18'
2	N25°20'43"W	69.91'
3	S25°20'41"E	43.00'
4	S14°56'28"E	27.43'
5	S07°14'35"W	130.41'
6	S07°14'41"W	36.08'
7	S49°32'55"E	101.76'
8	S31°14'37"E	150.53'
9	S25°59'45"E	183.31'
10	S32°22'34"W	88.64'
11	S25°26'49"E	79.58'
12	S32°16'51"W	13.00'

INDIAN BEND ROAD



N.T.S.



David B. Hall

EXHIBIT 'C'

Page 2 of 2

A.E.C. CONSULTANTS, INC.

1730 West Indian School Road Suite 100
Phoenix, Arizona 85018
Phone (602) 264-1427 (502) 230-7231 Fax

12/01/2004 05:34

602-506-8780

LANDS DIVISION
20041370248

PAGE 16

Exhibit D.

Access Property

EXHIBIT 'D'

That portion of the North half of Section Eleven, Township Two North, Range Four East of the Gila and Salt River Meridian, Maricopa County, Arizona, described as follows:

Commencing at the North quarter corner of said Section 11;

Thence North 88 degrees 59 minutes 30 seconds West along the North line of said Section 11 a distance of 641.13 feet;

Thence departing said North line South 00 degrees 25 minutes 00 seconds East a distance of 80.00 feet;

Thence South 81 degrees 49 minutes 28 seconds East 240.04 feet;

Thence South 71 degrees 00 minutes 30 seconds East a distance of 210.84 feet;

Thence South 81 degrees 56 minutes 50 seconds East a distance of 203.92 feet;

Thence South 82 degrees 46 minutes 34 seconds East a distance of 198.17 feet;

Thence South 00 degrees 26 minutes 59 seconds West a distance of 34.86 feet to a point of intersection with a non-tangent curve, the center of which bears North 04 degrees 04 minutes 20 seconds East, 1250.88 feet;

Thence Easterly along the arc of said curve to the left, through a central angle of 03 degrees 05 minutes 16 seconds for an arc distance of 67.41 feet to a point, said point also being the TRUE POINT OF BEGINNING;

Thence continuing along the arc of said curve to the left, through a central angle of 00 degrees 22 minutes 29 seconds for an arc distance of 8.18 feet;

Thence South 89 degrees 23 minutes 30 seconds East a distance of 5.18 feet;

Thence South 25 degrees 20 minutes 43 seconds East a distance of 112.91 feet;

Thence South 14 degrees 56 minutes 28 seconds East a distance of 27.43 feet;

Thence South 07 degrees 14 minutes 35 seconds West a distance of 130.41 feet;

Thence South 07 degrees 14 minutes 41 seconds West a distance of 36.08 feet;

Thence South 49 degrees 32 minutes 55 seconds East a distance of 101.76 feet;

Thence South 31 degrees 14 minutes 37 seconds East a distance of 150.53 feet;
 Thence South 25 degrees 59 minutes 46 seconds East a distance of 183.31 feet;
 Thence South 32 degrees 22 minutes 34 seconds West a distance of 112.13 feet;
 Thence North 57 degrees 37 minutes 26 seconds West a distance of 12.00 feet;
 Thence North 32 degrees 22 minutes 34 seconds East a distance of 105.43 feet;
 Thence North 25 degrees 59 minutes 46 seconds West a distance of 176.06 feet;
 Thence North 31 degrees 14 minutes 37 seconds West a distance of 148.05 feet;
 Thence North 49 degrees 32 minutes 55 seconds West a distance of 106.31 feet;
 Thence North 07 degrees 14 minutes 41 seconds East a distance of 42.57 feet;
 Thence North 07 degrees 14 minutes 35 seconds East a distance of 128.06 feet;
 Thence North 14 degrees 56 minutes 28 seconds West a distance of 23.98 feet;
 Thence North 25 degrees 20 minutes 43 seconds West a distance of 117.69 feet to the
 TRUE POINT OF BEGINNING.

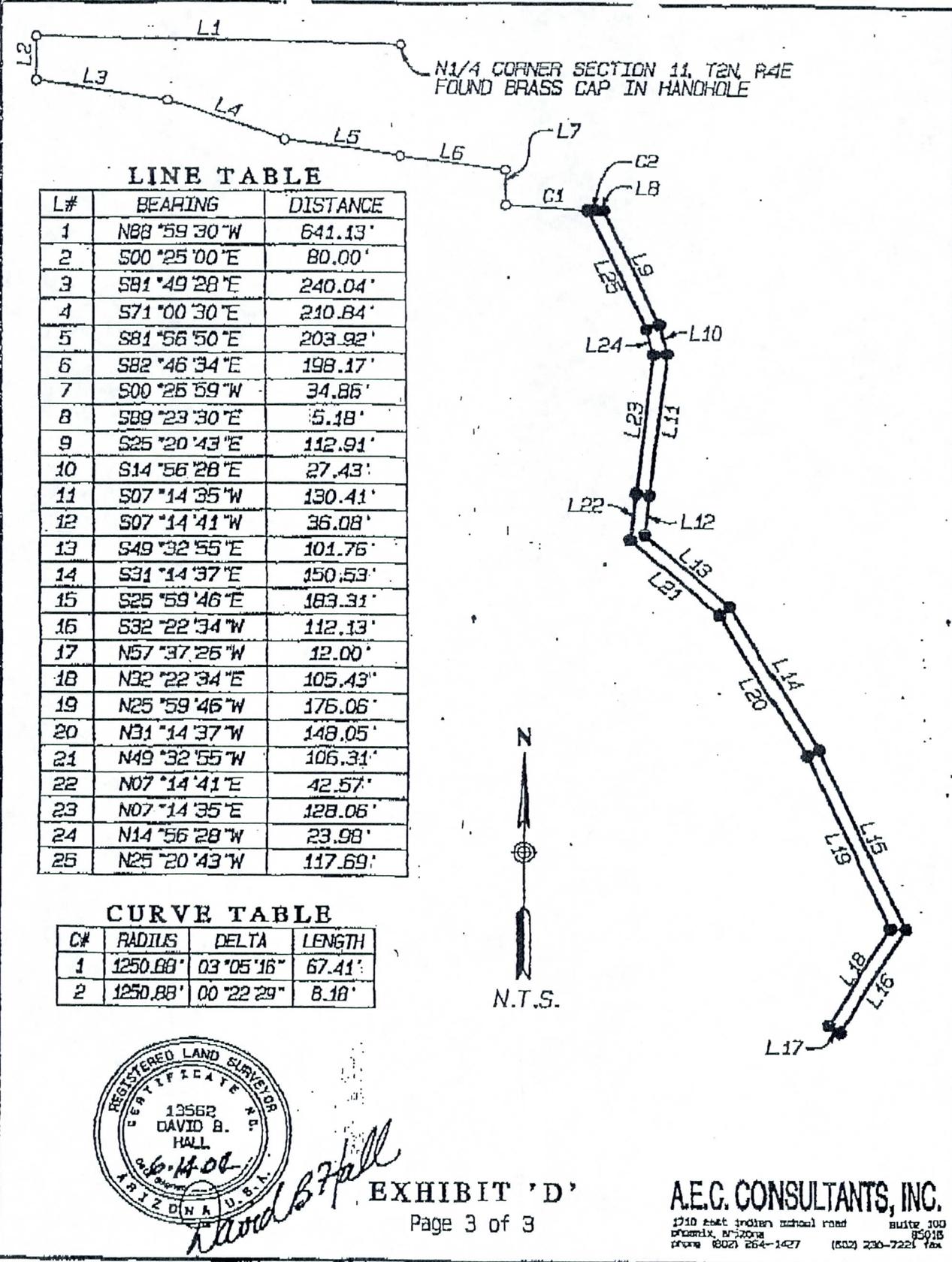
Prepared by: AEC Consultants, Inc.
 1710 E. Indian School Rd., #100
 Phoenix, Arizona 85016
 (602) 264-1427

Date: June 17, 2004

AEC Job No. 98018



David B. Hall



LINE TABLE

L#	BEARING	DISTANCE
1	N88°59'30"W	641.13'
2	S00°25'00"E	80.00'
3	S81°49'28"E	240.04'
4	S71°00'30"E	210.84'
5	S81°56'50"E	203.92'
6	S82°46'34"E	198.17'
7	S00°26'59"W	34.86'
8	S89°23'30"E	5.18'
9	S25°20'43"E	112.91'
10	S14°56'28"E	27.43'
11	S07°14'35"W	130.41'
12	S07°14'41"W	36.08'
13	S49°32'55"E	101.76'
14	S31°14'37"E	150.53'
15	S25°59'46"E	183.31'
16	S32°22'34"W	112.13'
17	N57°37'26"W	12.00'
18	N32°22'34"E	105.43'
19	N25°59'46"W	176.06'
20	N31°14'37"W	148.05'
21	N49°32'55"W	106.31'
22	N07°14'41"E	42.57'
23	N07°14'35"E	128.06'
24	N14°56'28"W	23.98'
25	N25°20'43"W	117.69'

CURVE TABLE

CH	RADIUS	DELTA	LENGTH
1	1250.88'	03°05'16"	67.41'
2	1250.88'	00°22'29"	8.18'



David B. Hall

EXHIBIT 'D'
Page 3 of 3

A.E.C. CONSULTANTS, INC.
1710 East Indian School Road Suite 100
Phoenix, Arizona 85015
Phone (602) 264-1427 (602) 230-7221 Fax

OFFICIAL RECORDS OF
MARICOPA COUNTY RECORDER
HELEN PURCELL

20041370268 11/22/2004 03:47
ELECTRONIC RECORDING

When recorded, return by
Interoffice Mail to:
Flood Control District
of Maricopa County (LLA)

S22041-9-1-1--
HOVP

EASEMENT AND AGREEMENT

Project: IBW Interceptor portion of

FCD Parcel: S-2204-1

Assessor's Parcel No.: portion of 141-21-006-C

This Easement and Agreement ("Easement") is entered into this ____ day of _____, 2004 by and between the following parties, and shall become effective upon acceptance by the Board of Directors of the Flood Control District.

GRANTOR: **FLOOD CONTROL DISTRICT OF MARICOPA COUNTY**, a municipal corporation and political subdivision of the State of Arizona, its agents, contractors, successors, and assigns.

GRANTEE: **STARPOINTE CORRIENTE CONDOMINIUMS LIMITED PARTNERSHIP**, a Delaware corporation.

FOR AND IN CONSIDERATION of the sum of Fifty five thousand eight hundred and no/100 Dollars (\$55,800.00), and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged, **GRANTOR** does hereby grant and convey to **STARPOINTE CORRIENTE CONDOMINIUMS, LP.**, a Delaware corporation, **GRANTEE**, an exclusive Easement and Right-of-Way for the following purposes, namely: The right to construct, operate, occupy, inhabit, repair, replace, reconstruct and maintain a resort and/or condominium project, including all incidental purposes consistent therewith, including but not limited to utilities and condominium housing, on, over, under, and across the real property embraced within the right-of-way situated in the County of Maricopa, State of Arizona, and described as follows:

See Exhibit "A"

Attached hereto and incorporated herein

To have and to hold the said Easement unto **GRANTEE**, together with the right of ingress and egress to permit the economical operation and maintenance of said resort/condominium development, including all incidental purposes consistent therewith, and together with the right to authorize, permit, and license the use thereof only for utilities or other public purposes not inconsistent with its use as a resort/condominium development as solely determined by the **GRANTEE**. The Easement is perpetual subject to the provisions of the paragraph below entitled "Sale of Property".

GRANTOR hereby covenants that it is granting this Easement only to the extent of any interest it may have in the property.

RESERVING, however, to **GRANTOR**, its successors and assigns, such rights and privileges as may be used and enjoyed without interfering with or abridging the rights and Easement hereby granted; provided that any use of the land by **GRANTOR**, shall be subject to all federal, state and local laws and ordinances with respect to environmental issues and land use, including, but not limited to floodplain regulations.

In the event the right, privilege and Easement herein granted shall be abandoned and permanently cease to be used for the purposes herein granted, all rights herein granted shall cease and revert to **GRANTOR**.

A. **GRANTEE** agrees to indemnify, defend and hold harmless **GRANTOR** for all direct damages to the real property, personal property, or physical injury to persons on the property of **GRANTOR**, as described in Exhibit "A", caused by or arising from the activities of **GRANTEE**, its officers, employees, agents, invitees, guests, or contractors in the exercise of **GRANTEE'S** rights pursuant to the terms of this Easement.

B. To the extent permitted by law, **GRANTEE** agrees to indemnify, defend and hold harmless **GRANTOR**, from and against loss, expense, damage, or claim of any nature whatsoever which is caused by any activity, condition, or event arising out of the non-performance by **GRANTEE** of any of its obligations under the provisions of the Easement. **GRANTOR** shall in all instances be indemnified against liability, losses, and damages of any nature for or on account of injuries to or death of persons or damages to or destruction of property arising out of **GRANTEE'S** performance or non-performance of this Easement, except such injury or damages as shall have been occasioned by the sole negligence of **GRANTOR**. The above cost of damages incurred by **GRANTOR**, shall include, in the event of action, court costs, expenses for litigation, and reasonable attorney's fees.

This Easement shall run with the land and shall be binding upon the parties. This Easement may not be transferred without the written permission of the **GRANTOR**, except for a transfer to any of the following entities, which transfer is hereby expressly permitted: (1) Starpointe Acquisitions II, LLC, an Arizona limited liability company; (2) any and all other entities related to or affiliated with the Starpointe entities described in (1) above; and (3) any condominium or homeowners association which has jurisdiction over the resort/ condominium built on the property described on Exhibit "A" and attached hereto and incorporated herein.

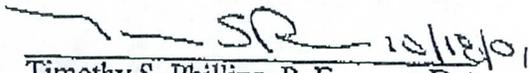
SALE OF PROPERTY: **GRANTEE** understands and agrees that the continuing validity of this Easement is contingent on the following requirement: The underlying fee held interest for the property outlined as "Exhibit A" is being prepared for sale, via public auction (pursuant to ARS 9-402), an auction to occur in absolutely no longer than one year from the date of this Easement. The sale of the property will be subject to this Easement and all rights of Grantee under this Easement, and this Easement shall continue after and notwithstanding the sale. It is a condition of this Easement, that the **GRANTEE** must be willing to meet all criteria necessary to become a bidder at said public auction, and in the event at auction, that no other bidder makes the opening bid at the appraised fair market value, **GRANTEE** will make that opening bid and

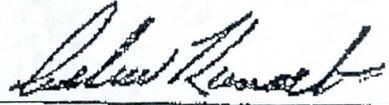
RECOMMENDED FOR APPROVAL:

ACCEPTED AND APPROVED:

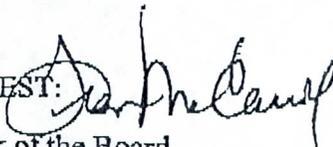
FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

BOARD OF DIRECTORS OF
FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY


Timothy S. Phillips, P. E. Date
Acting Chief Engineer and General Manager


Chairman of the Board


Michael D. Wilson Date
Manager, Land Management Division

ATTEST: 
Clerk of the Board

Date: NOV 03 2004

ZU041370268

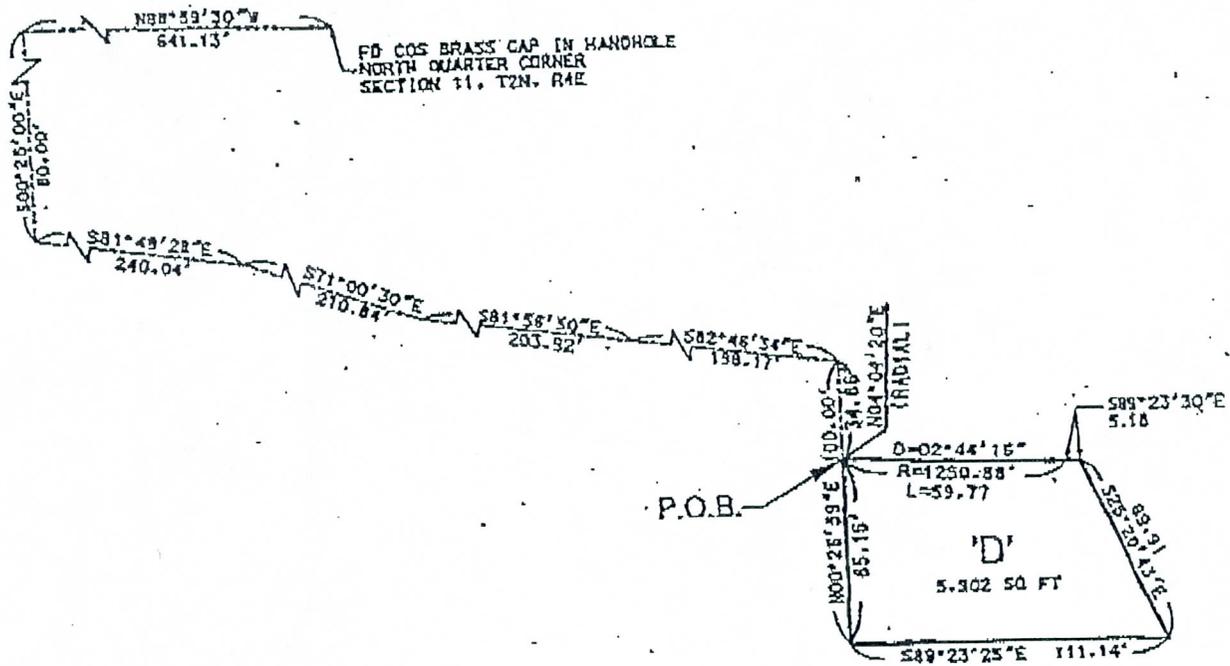
Exhibit A

"Parcel D"

EXHIBIT FOR PARCEL 'D'



SCALE: 1" = 60'



LEGAL DESCRIPTION

For purposes of conveying ownership or rights of certain real property by quit-claim deed to the benefit of the adjacent hotel property ownership.

PARCEL D

That portion of the North half of Section Eleven (11), Township Two (2) North, Range Four (4) East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona, described as follows:

Commencing at the North quarter corner of said Section 11; thence North 88 degrees 59 minutes 30 seconds West along the North line of said Section 11 a distance of 641.13 feet; thence departing said North line South 00 degrees 25 minutes 00 seconds East 80.00 feet; thence South 81 degrees 49 minutes 28 seconds East 240.04 feet; thence South 71 degrees 00 minutes 30 seconds East 210.84 feet; thence South 81 degrees 56 minutes 50 seconds East 203.92 feet; thence South 82 degrees 46 minutes 34 seconds East 198.17 feet; thence South 00 degrees 26 minutes 59 seconds West 34.85 feet, more or less, to a point on the Southerly line of the Roadway Right-of-Way as described in Docket 10706, Page 1469, records of said County, said point on Right-of-Way also being on a non-tangent curve to the North with its center lying North 04 degrees 04 minutes 20 seconds East 1250.88 feet and the TRUE POINT OF BEGINNING of the herein described property; thence Easterly along said curve through a central angle of 03 degrees 27 minutes 45 seconds a distance of 75.59 feet; thence continuing along said Right-of-Way South 89 degrees 23 minutes 30 seconds East 5.18 feet to the West top of bank of the Indian Bend Wash as it appeared on the twenty-sixth day of April, 1996; thence departing said Right-of-Way South 25 degrees 20 minutes 43 seconds East along said top of bank 69.91 feet; thence departing said top of bank North 89 degrees 23 minutes 25 seconds West 111.14 feet; thence North 00 degrees 26 minutes 58 seconds East 65.15 feet to the TRUE POINT OF BEGINNING.

[Handwritten signature]



004

APPENDIX I

SOIL SURVEY

Eastern Maricopa and Northern Pinal Counties Area, Arizona



UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
ARIZONA AGRICULTURAL EXPERIMENT STATION
Issued November 1974

TABLE 5.—*Estimates of soil properties.*

Soil series, land types, and map symbols	Hydrologic soil group	Depth to hardpan or bedrock	Depth from surface	Classification		
				USDA texture	Unified	AASHTO
Cashion: Cc.....	C	Ft. >5	In. 0-28 28-60	Clay..... Fine sandy loam.....	CH SM	A-7 A-4
Cavelt: GeC.....	D	½-1½	0-10 10	Gravelly loam..... Indurated lime hardpan.....	ML or SM	A-4
Contine: Co.....	C	>5	0-12 12-38 38-66	Clay loam..... Clay..... Clay loam and loam.....	CL CH CL	A-6 A-7 A-6 or A-7
Estrella: Es.....	B	>5	0-26 26-60	Loam..... Clay loam.....	ML CL	A-4 A-6
Gilman: Gf, Gm.....	B	>5	0-60	Loam; fine sandy loam in places.....	ML or CL	A-4 or A-6
Glenbar: Gn.....	B	>5	0-60	Clay loam and heavy silt loam.....	CL	A-6
Gravelly alluvial land: Gr.....	A	>5	0-60	Very gravelly sandy loam or loamy sand.....	GP-GM or GP	A-1
Laveent: LaA, LaB, LeA.....	B	>5	0-60	Loam; clay loam in LeA.....	ML, CL or CH	A-7, A-6 or A-4
Mohall: Mo, Mv.....	B	>5	0-60	Loam and clay loam.....	ML or CL	A-4 or A-6
Pimer: Pm.....	B	>5	0-60	Clay loam and loam.....	CL	A-6
Pinal: PnA, PnC.....	D	½-1½	0-18 18	Gravelly loam..... Indurated lime-silica hardpan.....	ML or SM	A-4
Pinal, moderately deep variant: Po.	C	2¼-3½	0-38 38	Loam..... Indurated lime-silica hardpan.....	ML	A-4
Pinant: PvA, PvC.....	B	>5	0-60	Very gravelly sandy clay loam and very gravelly loam.....	GC or GM	A-1
Rillito: RIA, RIB.....	B	>5	0-60	Gravelly loam.....	SM	A-2 or A-4
Rock land: Ro. Variable, not estimated.						
Rough broken land: Ru. Variable, not estimated.						
Tremant: TrB.....	B	>5	0-16 16-60	Gravelly sandy clay loam..... Gravelly loam and gravelly sandy loam.....	SC SM	A-4 A-2
Trix: Tx.....	B	>5	0-60	Clay loam.....	CL	A-6
Valencia: Va.....	B	>5	0-26 26-45 45-60	Sandy loam..... Sandy clay loam..... Sandy loam.....	SM SC SM	A-2 or A-4 A-4 A-2 or A-4
Vecont: Ve.....	C	>5	0-64	Clay and clay loam.....	CH	A-7
Vint: Vf.....	B	>5	0-60	Loamy fine sand.....	SM	A-2

(Joins inset B, sheet 6)

505 000 FEET

2

N

1 Mile

5 000 Feet

Scale 1:20 000

(Joins sheet 1)

0 1 000

2 000

3 000

4 000

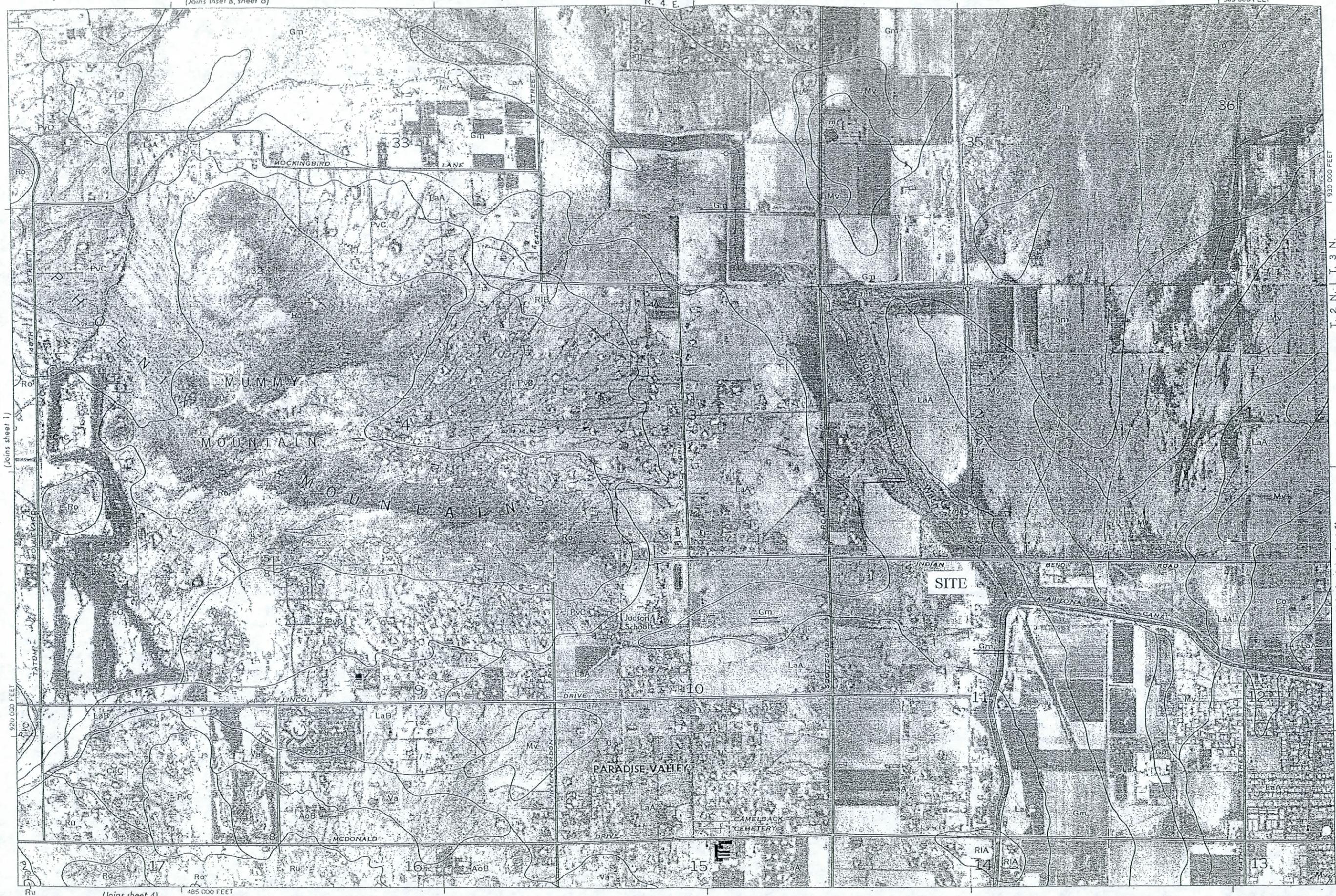
5 000

1/4

1/2

3/4

1



T. 2 N. | T. 3 N.

(Joins inset A, sheet 5)

Lead division corners are approximately positioned on this map. Photobase from 1967 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Arizona coordinate system, central zone. This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the Arizona Agricultural Experiment Station.

(Joins sheet 4)

485 000 FEET

APPENDIX J

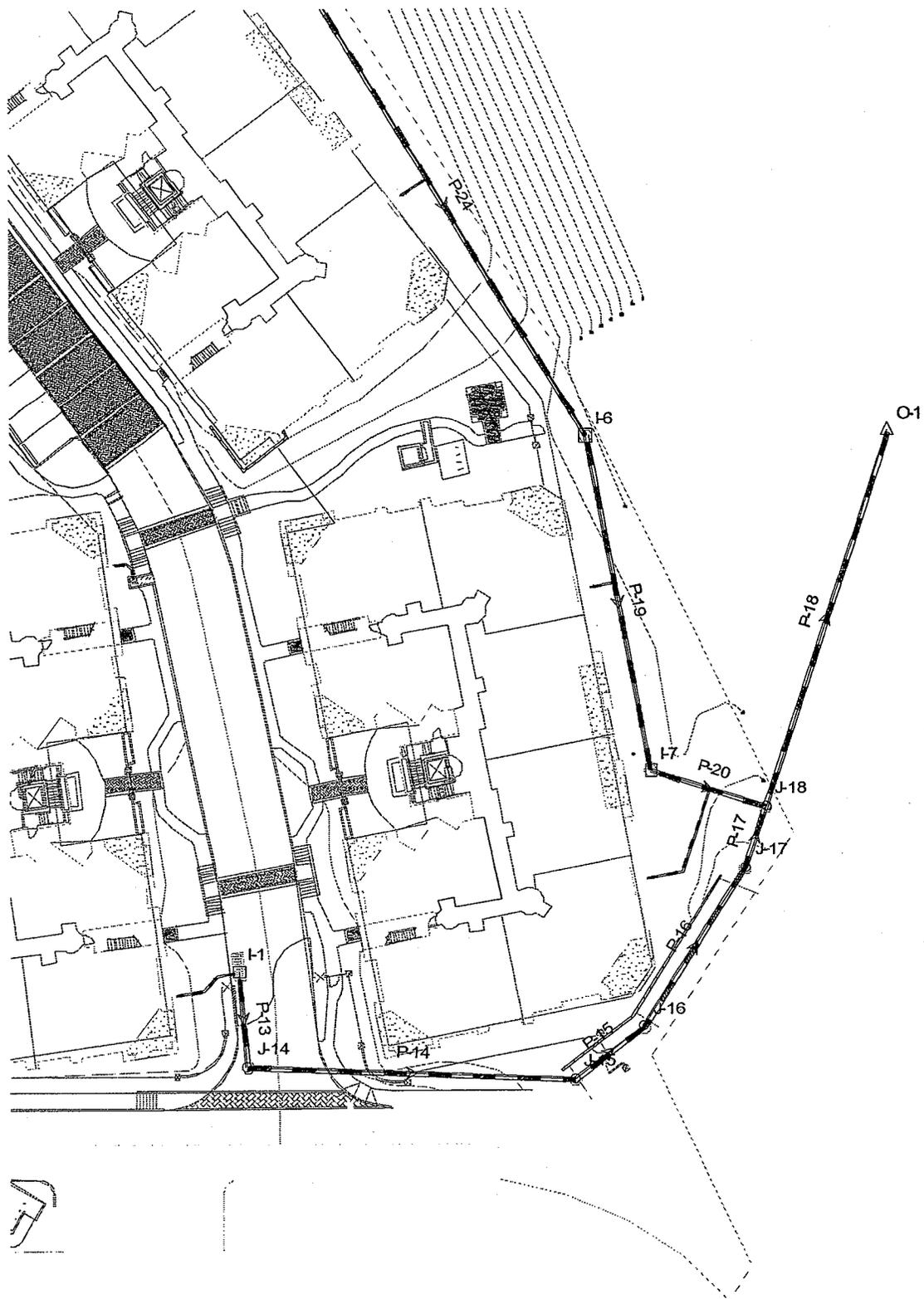
Grated Inlet Capacity - weir condition

$Q=Cw*P*d^{1.5}$

Cw= 3.0 weir coefficient
 Q = discharge capacity
 P = inlet perimeter
 d = flow depth

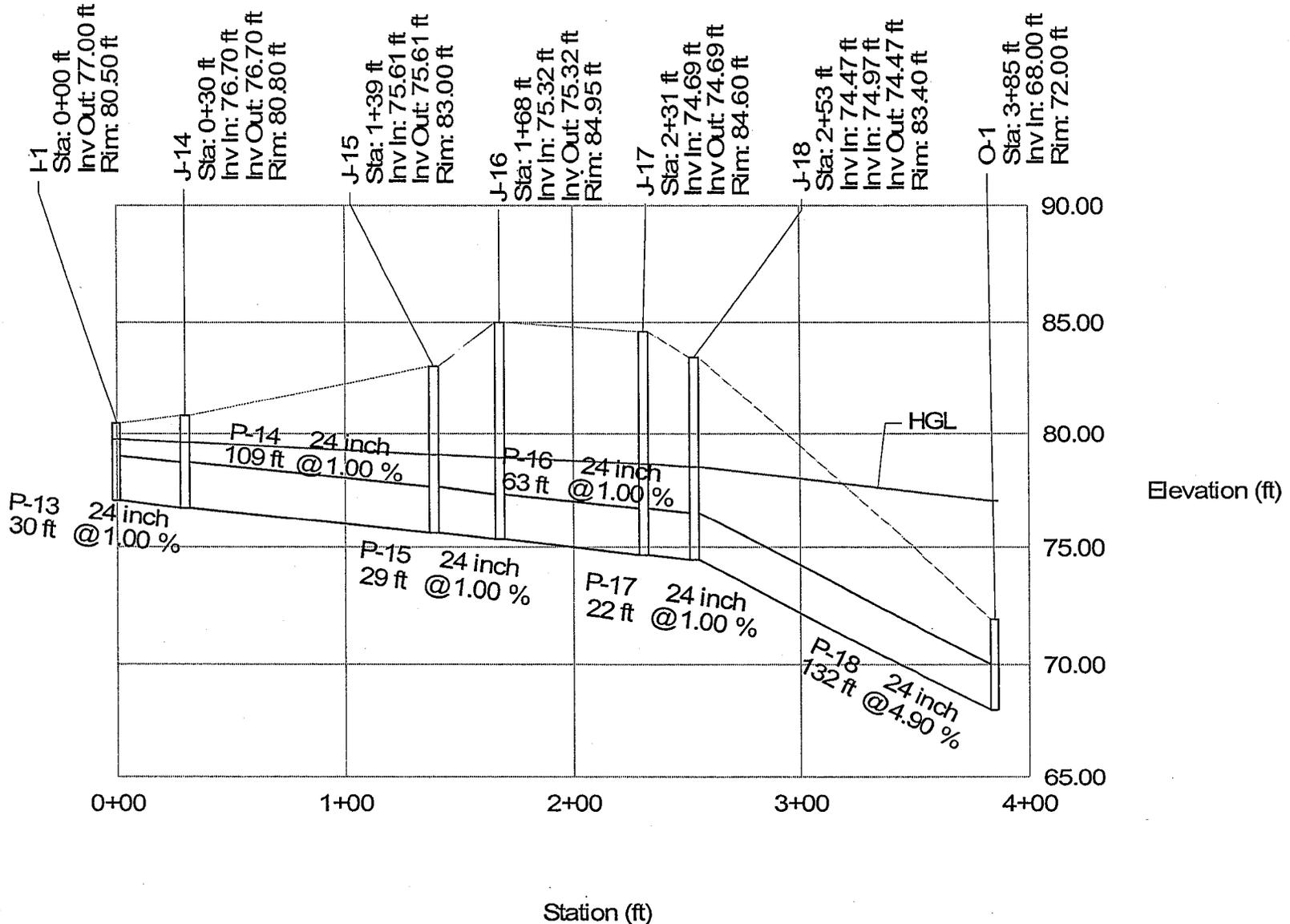
Inlet Type	Inlet	Q ₁₀₀ (cfs)	Inlet Capacity (cfs)	d (ft)	Cw	P (ft)	Inlet Capacity w/ 80% clogging factor (cfs)
2-M.A.G. type "F"	2	16.67	25.10	0.50	3	23.66	20.08

Scenario: Base

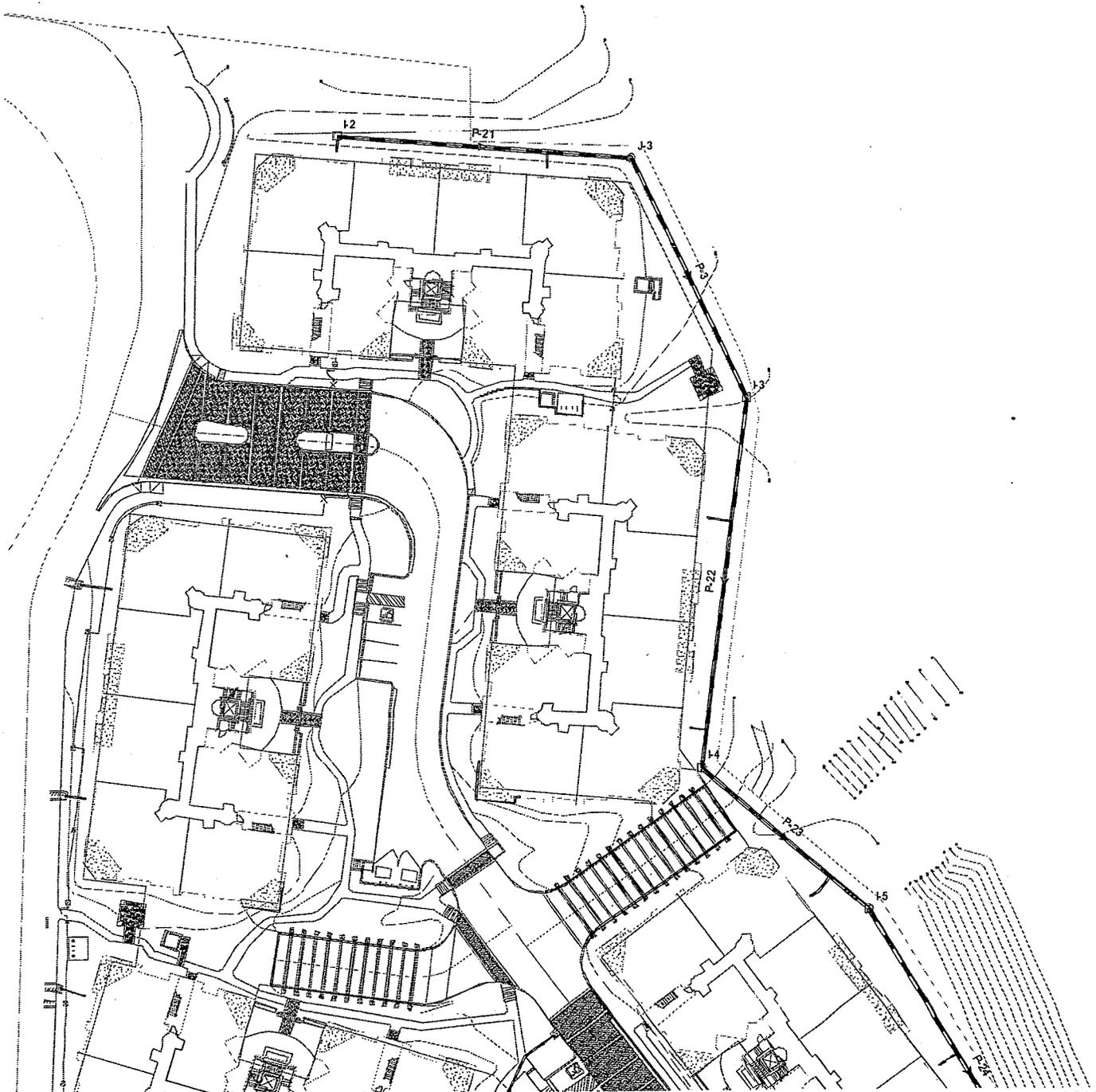


Profile
Scenario: Base

Profile: Profile - 2

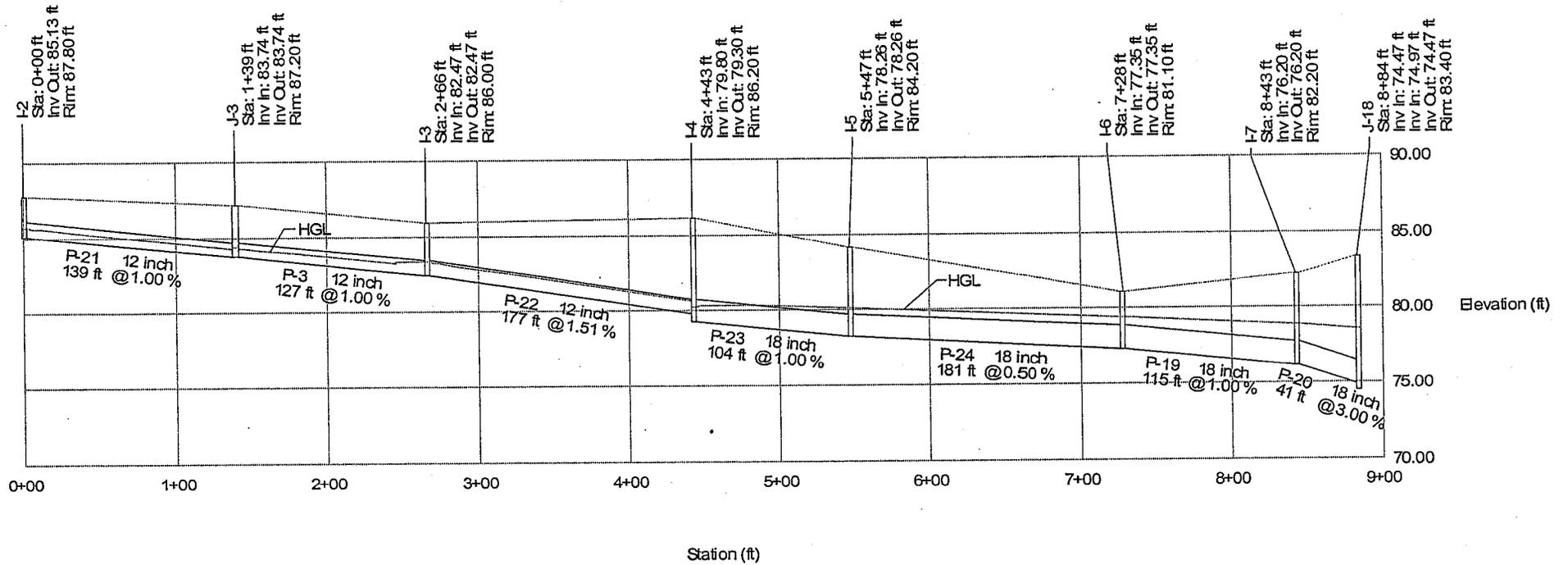


Scenario: Base



Profile
Scenario: Base

Profile: Profile - 1



Scenario: Base

Pipe Report

Label	Upstream Node	Downstream Node	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Length (ft)	Slope (%)	Mannings n	Section Size	Full Capacity (cfs)	Total System Flow (cfs)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Velocity Out (ft/s)
P-21	I-2	J-3	85.13	83.74	139	1.00	0.012	12 inch	3.86	2.41	85.79	84.31	5.18
P-3	J-3	I-3	83.74	82.47	127	1.00	0.012	12 inch	3.86	2.41	84.40	83.38	3.22
P-22	I-3	I-4	82.47	79.80	177	1.51	0.012	12 inch	4.74	4.82	83.38	80.64	6.87
P-23	I-4	I-5	79.30	78.26	104	1.00	0.012	18 inch	11.38	5.91	80.27	80.18	3.34
P-24	I-5	I-6	78.26	77.35	181	0.50	0.012	18 inch	8.07	7.23	80.18	79.45	4.09
P-19	I-6	I-7	77.35	76.20	115	1.00	0.012	18 inch	11.38	8.32	79.45	78.83	4.71
P-20	I-7	J-18	76.20	74.97	41	3.00	0.012	18 inch	19.71	9.64	78.83	78.54	5.46
P-13	I-1	J-14	77.00	76.70	30	1.00	0.012	24 inch	24.51	16.83	79.73	79.59	5.36
P-14	J-14	J-15	76.70	75.61	109	1.00	0.012	24 inch	24.51	16.83	79.59	79.08	5.36
P-15	J-15	J-16	75.61	75.32	29	1.00	0.012	24 inch	24.51	16.83	79.08	78.94	5.36
P-16	J-16	J-17	75.32	74.69	63	1.00	0.012	24 inch	24.51	16.83	78.94	78.64	5.36
P-17	J-17	J-18	74.69	74.47	22	1.00	0.012	24 inch	24.51	16.83	78.64	78.54	5.36
P-18	J-18	O-1	74.47	68.00	132	4.90	0.012	24 inch	54.26	26.47	78.54	77.00	8.43

SEE BELOW

WATER SURFACE=67.4±
OVERFLOW ELEV.=70.4±
(RETENTION)

LAKE

EXISTING LAKE

EXISTING
CATCH BASIN

PARADISE VIEW VILLAS

2

3

EXISTING
36" PIPE

EXISTING
WALL OPENING

4

EXISTING
WALL OPENING
ALONG WALL

EXISTING 36" PIPE AND
OVERFLOW STRUCTURE

Q₁₀₀=23 c.f.s.

Q₁₀₀=51.6 c.f.s.

Q₁₀₀=48.5 c.f.s.

SIENNA CONDOMINIUMS

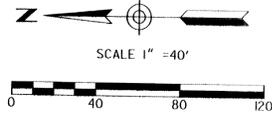
LEGEND

— PRE-DEVELOPMENT DRAINAGE BASIN BOUNDARY

2 DRAINAGE BASIN NUMBER

→ FLOW ARROW

SEE ABOVE



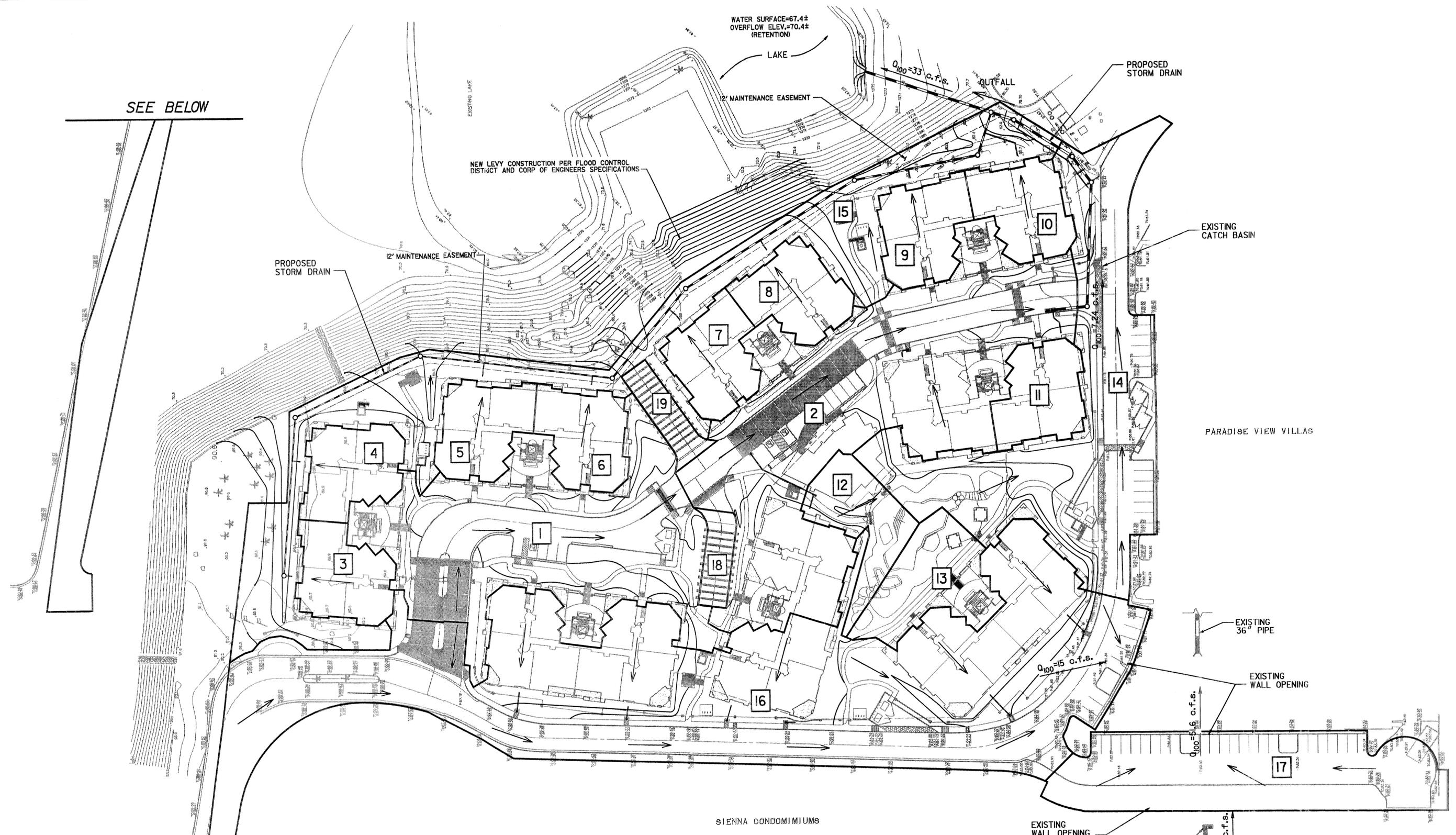
PRE-DEVELOPMENT
DRAINAGE EXHIBIT

CALL TWO MORNING HOURS
BEFORE YOU GO
(602) 263-1100
1-800-STAKE-IT
MARICOPA COUNTY

RICK
ENGINEERING COMPANY
6150 NORTH 16TH STREET
PHOENIX, AZ 85016
602.957.3350
(FAX) 602.285.2396
rickengineering.com

Phoenix Tucson San Diego Riverside Orange Sacramento

DATE: APRIL 2005	PROJECT NO. 3024-B
------------------	-----------------------



SEE BELOW

SEE ABOVE

LEGEND

- POST-DEVELOPMENT DRAINAGE BASIN BOUNDARY
- 2 DRAINAGE BASIN NUMBER
- FLOW ARROW



POST-DEVELOPMENT DRAINAGE EXHIBIT

CALL TWO WORKING DAYS BEFORE YOU DIG!
(602) 263-1100
1-800-STAKE-IT
OUTSIDE MARICOPA COUNTY

RICK ENGINEERING COMPANY
 6150 NORTH 16TH STREET
 PHOENIX, AZ 85016
 602.957.3350
 (FAX) 602.285.2396
 rickengineering.com

Phoenix	Tucson	San Diego	Riverside	Orange	Sacramento
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DATE: APRIL 2005
 PROJECT NO. 3024-B

PRELIMINARY-NOT FOR CONSTRUCTION OR RECORDING