CONCEPTUAL DRAINAGE REPORT FOR SUNRISE TERRACE UNIT 7

INTRODUCTION AND PROJECT DESCRIPTION

This is a drainage report for Sunrise Terrace Unit 7. It consists of 19.3 acres in southwest Albuquerque to be developed as a residential area. The site planning and design are being done in conjunction with an adjacent property under the same ownership called Sunrise Terrace West, which is in Bernalillo County. Both sites make up 62.6 acres. This report addresses only the portion in the City, Unit 7, which will be developed first. However, Sunrise Terrace West is also analyzed for the fully developed condition due to shared drainage features. Figure 1 is a vicinity map.

The development will be phased such that the City portion will be built first along with erosion and drainage control features for the County portion of the land. This phase is referred to as "interim." The interim phase also includes extending one half of Eucariz Avenue west to the City Limit. Drainage features to be installed now will be sized for ultimate build-out of the site, both City and County tracts.

The drainage analysis is based on the "Master Drainage Plan for Sunrise Terrace Units 1 and 6 (Master Drainage Plan)," dated March 1995 by Easterling and Associates, Inc. The analysis is also in compliance with "Master Drainage Plan, Sunrise Terrace Units III, IV & V," Revised June 1994, by Ryals Engineering & Construction Services. This report limited the total developed runoff to 1.29 cfs per acre. This number was computed as the "fair share" that all developing lots can release so the capacity of the downstream drainage structures is not exceeded.

Existing drainage on the property is generally from west to east at roughly a 4 percent slope. It is bounded on the north, west and south by undeveloped land. Residential developments or planned residential areas lie to the east. Runoff will flow through the residential area via streets or storm drains eventually draining to the Snow Vista Channel. Runoff on the site will be controlled by a "surge pond" within Unit 7. The flow will be drained through storm drains and bypass the pond. When the required HGL in the storm drain exceeds the bottom of pond elevation, water will back up into the pond where it will be detained and released at the design rate. A more detailed description can be found in the On-Site Flow section of the report.

The site is not in a flood hazard zone. It is shown on FEMA Floodway Panel 33 which is shown on Figure 2.

METHODOLOGY

Hydrology was determined using the methods described in The City of Albuquerque Development Process Manual(DPM), Section 22.2, Hydrology. The AHYMO, January 1994 version, computer model was used to calculate the flows. The model created previously in the Master Drainage Plan was revised for this project.

Street and storm drain hydraulics are calculated as described in the DPM and meet the City's criteria.

OFF-SITE FLOWS

EXISTING CONDITIONS

Off-site flow drains to the project from the north and west overland or through small existing arroyos to two existing detention and sediment ponds on the project site. Runoff is directed to the ponds via an earthen channel which is also on the site and is directly west of an existing development, Sunrise Terrace Unit 6.

An exception is the City of Albuquerque Westside Satellite Center which now is bermed and has full retention of runoff.

Figure 3 shows the existing and interim condition off-site flow basins.

INTERIM

In this phase runoff from the north and west will drain the same as in the existing condition. However, the earthen channel will be relocated to the west of the project site and drain to the existing pond in the center of Sunrise Terrace Unit 7. The existing pond will require some reconfiguration to allow for lot placement. The other small sedimentation pond on the south side of the site will be eliminated and flows to this pond will be re-routed north to the remaining pond. The drainage features can extend west of the site into Sunrise Terrace West since the owner is the same. See Figure 3 for the contributing basins.

Also, during the interim phase, one half of Eucariz Avenue will be extended west to the City Limit from 106th Street. A 36-inch storm drain will be extended west under a portion of Eucariz Avenue as called for in the Master Drainage Plan. It will extend from the existing 60-inch storm drain at Eucariz Avenue and 106th Street approximately 100 feet. A temporary rundown inlet will be constructed at the upstream end of the storm drain to intercept flow from Basin 402. A ditch will be placed parallel to the new Eucariz Avenue to direct Basin 402 flow to the inlet. The ditch has adequate capacity for the interim flows as shown in Calculation D in the Appendix. The rundown inlet is designed to handle sediment along with the flow.

ULTIMATE

Figure 4 shows off-site drainage basins in the fully developed condition. Flow from the City Maintenance Satellite Center will drain to a controlled discharge and drain a maximum of 1.29 cfs per acre to a proposed storm drain. As shown in Plate 1 the storm drain will intercept flow from the west(Basin 310). Again a controlled discharge of 1.29 cfs/acre will be collected and run through Basin 330 to the pond in Unit 7. Runoff in Basin 330 will also be directed into the storm drain free discharge. The controlled rate from this basin will be taken care of by the Unit 7 pond. See the On-Site Ultimate Section for a description of how the pond functions.

Flow from the north will empty to the storm drain in Eucariz Avenue, which, per the Master Drainage Plan, will be extended west up Eucariz Avenue. As required on all the sites draining ultimately to Snow Vista Channel, a controlled discharge of 1.29 cfs per acre will be necessary.

Table 1 shows flow rates at critical locations. Analysis points are shown on Plate 1

Table 1
OFF-SITE FLOW RATES

Analysis Point	Existing Flow Rate (cfs)		Interim Flow Rate (cfs)		Fully Developed* Flow Rate (cfs)	
	100 year	10 year	100 year	10 year	100 year	10 year
1	124	24	135	26	281.4	218.8
2	62	12	62	12	129.9	129.9
3	0	0	0	0	58.6	58.6
4	N/A - included in AP 5		10	2	35.5**	35.5
5	31	6	22	4	55.9**	55.9

* Discharge limited to 1.29 cfs/acre in accordance with Master Drainage Plan for Sunrise Terrace Units 1 and 6.

** Runoff drains to Eucariz Avenue Storm Drain

ON-SITE FLOW

EXISTING

Drainage is generally from west to east to the on-site earth channel and detention ponds described above. Runoff ponded in the large pond in the center of the site has a standpipe

outlet to a 24-inch storm drain in Connemara [illegible]nue. The storm drain runs east in Connemara to Tanager Drive where it turns to the [illegible]th to the intersection of Tanager and Andalusian Avenue. At this point the 24-inch [illegible]empties to a 48-inch storm drain in Andalusian Avenue.

Runoff ponded in the smaller pond to the south is [illegible]ined and also drained by a standpipe to the 48-inch storm drain in Andalusian Avenue. The 48-inch pipe runs east along Andalusian Avenue to eventually tie to the Snow Vista Channel.

Plate 1, in the map pocket, shows the existing p[illegible]s and storm drain features.

INTERIM

This site will be developed to the City Limit as shown on Plate 1 in the map pocket. Runoff will be directed to the pond shown in the center of the site by way of street drainage and storm drains. The pond is in the same location as the existing, however, it will be reconfigured somewhat to allow for the placement of lots.

Flow from basins 401, 404 and 405 will drain to the pond from the west. A berm/ditch will be built on the west side of the City limit to collect this runoff and direct it to the pond. See Figure 3. The land to the west of the City limit is Sunrise Terrace West and is under the same ownership as Unit 7.

The existing standpipe in the central pond will remain. A new 36-inch storm drain will tie to it as shown in Plate 1, draining Basin 170. This will function as a surge system. Flow up to the capacity of the 24-inch will drain uncontrolled. When the system reaches the design level of 21 cfs, runoff will surcharge into the pond. Another structure will be required in conjunction with the 36-inch pipe to allow flow to surcharge into the pond because the existing standpipe does not have the capacity. The outflow will drain through the 24-inch pipe as described in the above section.

The 24-inch surge system will be supplemented by an outlet to a storm drain to the south along 110th Street. Under fully developed conditions, this outlet will also function as a surge system. In the interim it will function as a standard pipe outlet. Ultimately the pipe in 110th Street will drain 197.5 cfs and will be sized accordingly even though under interim conditions this will be oversized. The pipe will be either a 60-inch or a 54-inch pipe depending on the final grading of 110th Street. A calculation sheet in the appendix of the report shows a comparison of the two sizes and the requirements for each. This pipe will drain from north to south although 110th Street drains in the opposite direction.

The 110th Street storm drain will be extended west in the future to collect flow from the County portion of the project and off-site basins to the west and northwest. Only a stub out will be built as part of this project.

Flow from Basin 320 will free discharge into the 110th Street storm drain in the interim

condition. Basin 321 also drains uncontrolled into the 24-inch storm drain in Tanager Drive and into the Andalusian storm drain. While this basin is not strictly a part of this project, it is included in the Master Drainage Report as part of the area associated with the Unit 7 pond so it is considered in these calculations.

As shown in Table 2, at Analysis Point 10 the 100-year outflow is 85.2 cfs to the Andalusian storm drain. The Master Drainage Report shows an ultimate rate at this point of 191cfs making the interim system well within the capacity of the drainage outfall system.

ULTIMATE

The entire (both City and County) site consists of 68.40 acres. See Plate 1 in the map pocket. Using the "fair share" flow release rate of 1.29 cfs/acre multiplied by 68.40 acres, under fully developed the site can release 88.24 cfs. This area includes the county portion which will drain to the Unit 7 pond and Basin 321 which has already been built with free discharge to the existing Tanager Road storm drain. Basin 321 was not accounted for in the previous AHYMO model so must be accounted for now.

A maximum outflow of 197.5 cfs was computed for the fully developed project site. Calculation sheet A in the appendix shows this calculation in detail.

Previously per the Master Drainage Plan, 23 cfs was to drain to the Eucariz storm drain. Under this plan very little flow will be discharged to the Eucariz Avenue storm drain. All on site flow will be directed to the pond or to the storm drains. Runoff will travel overland in the streets to storm drain systems discharging to the pond.

The Unit 7 pond is to act as a Surge Pond. Flow will empty to the two outflow storm drains up to the design rate. At this point flow will back up into the pond. When the peak flow drops the flow will then drain out of the pond. Benefits of the surge pond include:

→ low flows will drain quickly through the storm drain

→ the pond will only be wet during larger storm events

→ the pond can be smaller since it does not store the entire storm volume -the volume of runoff up to the design outflow when water starts accumulating is drained in the storm drain - the pond only has to store the peak portion of the hydrograph

Basin 320 is downstream of the pond inflow and will drain freely out the 110th Street storm drain in smaller storm events. As noted earlier this storm drain will carry 197.5 cfs. When this flow is reached and flow is surcharging into the pond, the storm drain will be under pressure and runoff from Basin 320 will not be able to drain into the pipe. Since 110th

Street will be graded to drain north, runoff will drain overland in the street to the pond.

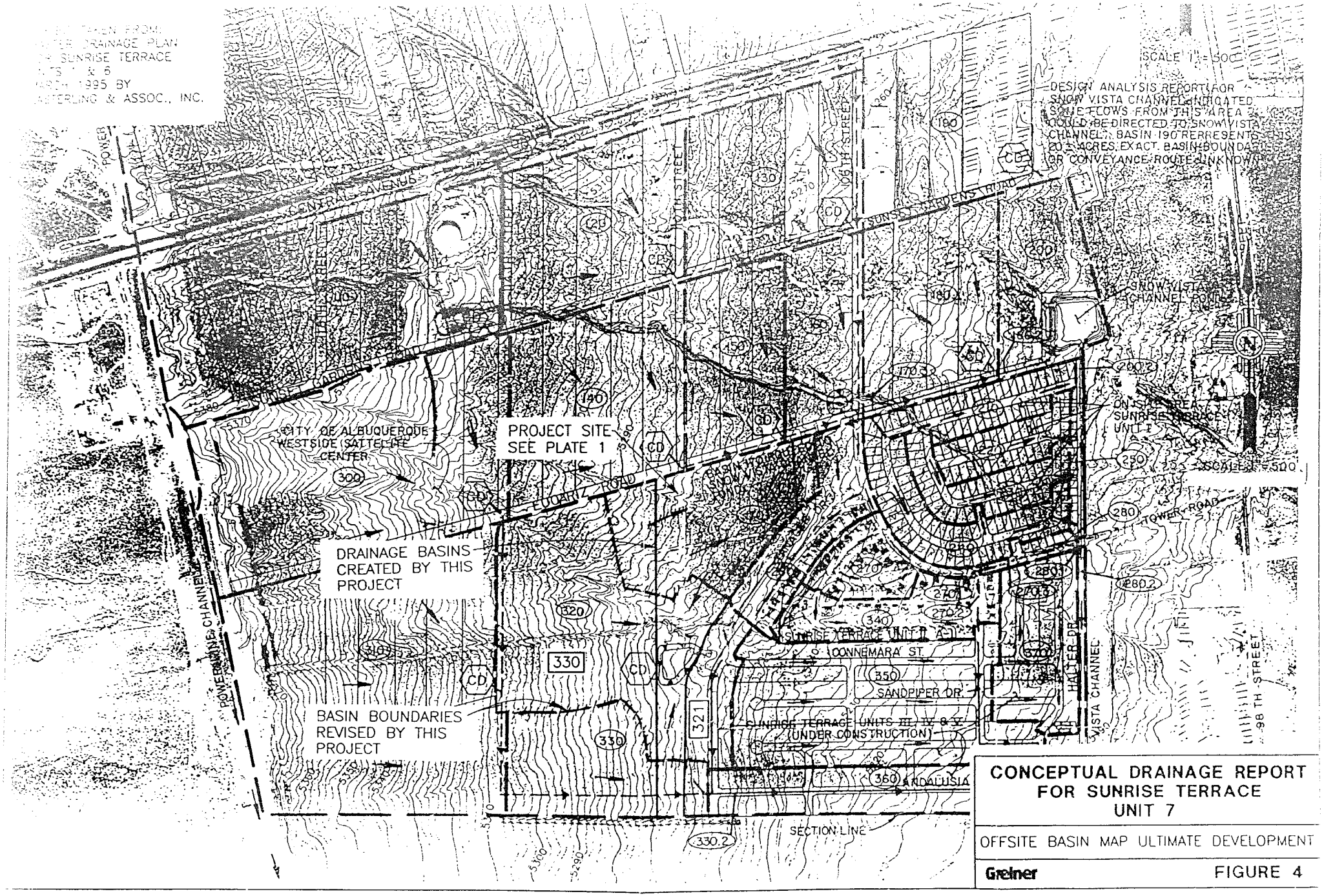
Table 2
ON-SITE FLOW RATES

Analysis Point	Interim Flow Rate (cfs)		Fully Developed * Flow Rate (cfs)	
	100 year	10 year	100 year	10 year
6	0	0	292.3	225.4
7	76.0	24.9	197.2	196.7
8	57.4	34.6	57.4	34.6
9	16.3	16.3	16.3	16.3
10	85.2	32.1	216.9	208.7

* Discharge limited to 1.29 cfs/acre in accordance with Master Drainage Plan for Sunrise Terrace Units 1 and 6.

CONCLUSION

Sunrise Terrace West will be developed with single family homes in a manner that complies with the Master Drainage Plan for the area as well as City criteria. Phased construction will also comply in a logical way that fits with the existing conditions.

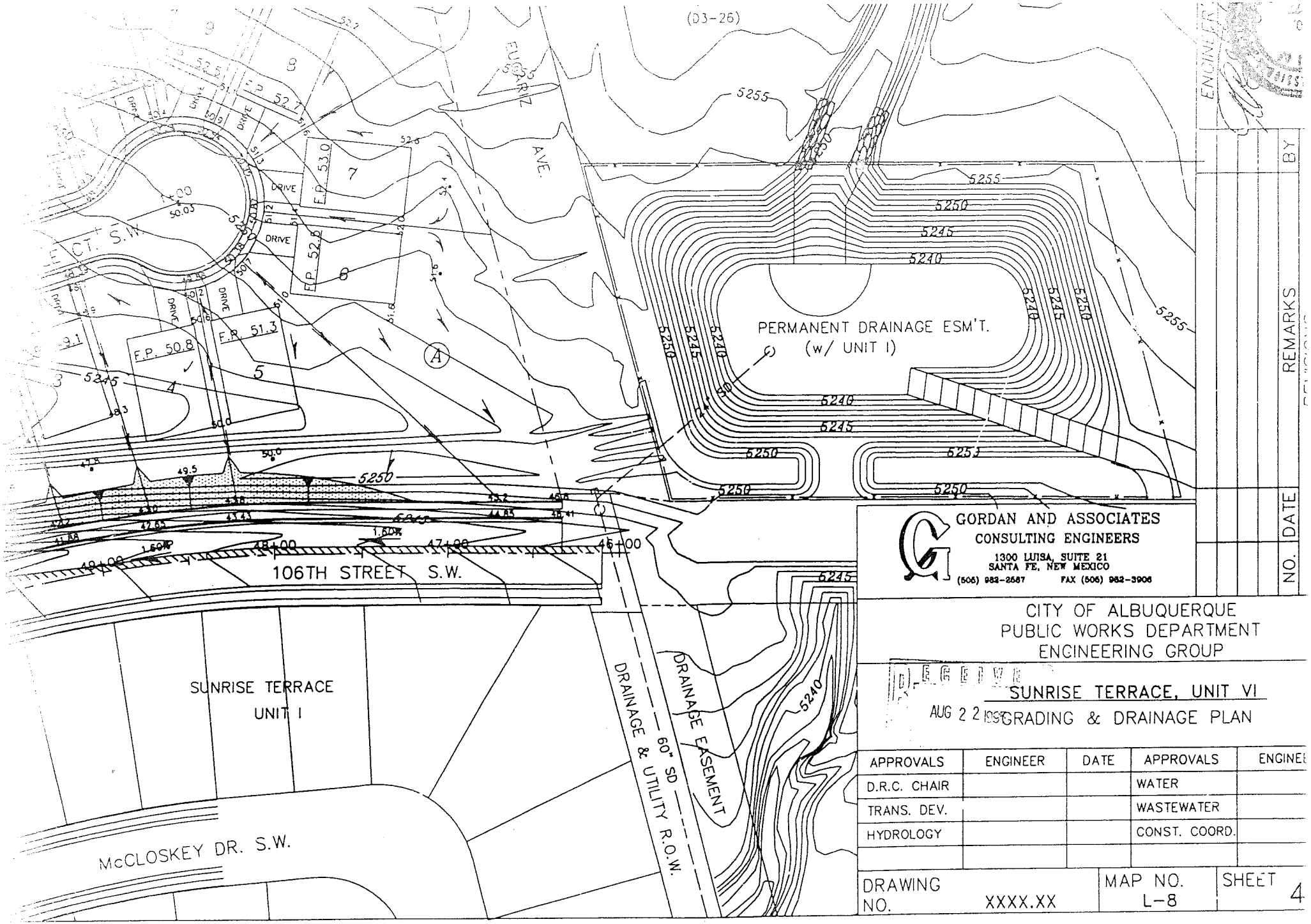


CONCEPTUAL DRAINAGE REPORT FOR SUNRISE TERRACE UNIT 7

OFFSITE BASIN MAP ULTIMATE DEVELOPMENT

Greiner

FIGURE 4



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NO.	DATE	REMARKS	BY

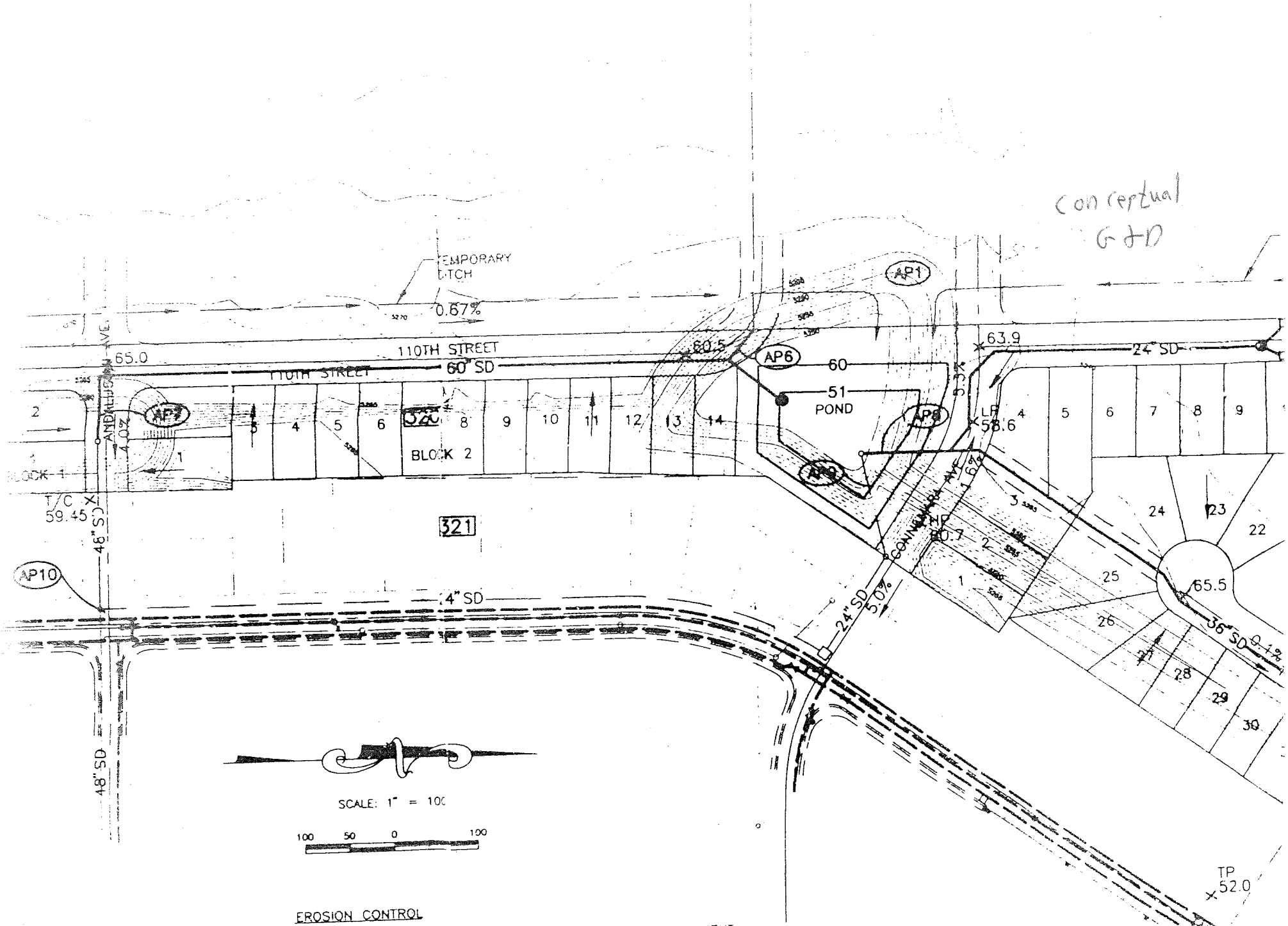
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

RECEIVED
AUG 2 2 1996

SUNRISE TERRACE, UNIT VI
GRADING & DRAINAGE PLAN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER
D.R.C. CHAIR			WATER	
TRANS. DEV.			WASTEWATER	
HYDROLOGY			CONST. COORD.	

DRAWING NO.	MAP NO.	SHEET
XXXX.XX	L-8	4



EROSION CONTROL

EROSION CONTROL SHALL BE ADDRESSED IN TWO PHASES: CONSTRUCTION AND PERMANENT PHASE. THE PERMANENT PHASE WOULD CONTROL EROSION WITH IMPERVIOUS SURFACES AND LANDSCAPING. EROSION CONTROL DURING CONSTRUCTION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. DISTURBED TOPSOIL WILL BE REVEGETATED PER THE LANDSCAPING PLAN.

TABLE 1
OFF-SITE FLOWRATES

ANALYSIS POINT	EXISTING FLOWRATE (cfs) 100YEAR	10YEAR	INTERIM FLOWRATE (cfs) 100YEAR	10YEAR	FULLY DEVELOPED* FLOWRATE (cfs) 100YEAR	10YEAR
1	124	24	135	26	281.4	218.3
2	62	12	62	12	129.9	129.9
3	0	0	0	0	58.6	58.6
4	N/A - INCLUDED IN AP5		10	2	35.5**	35.5
5	31	6	22	4	55.9**	55.9

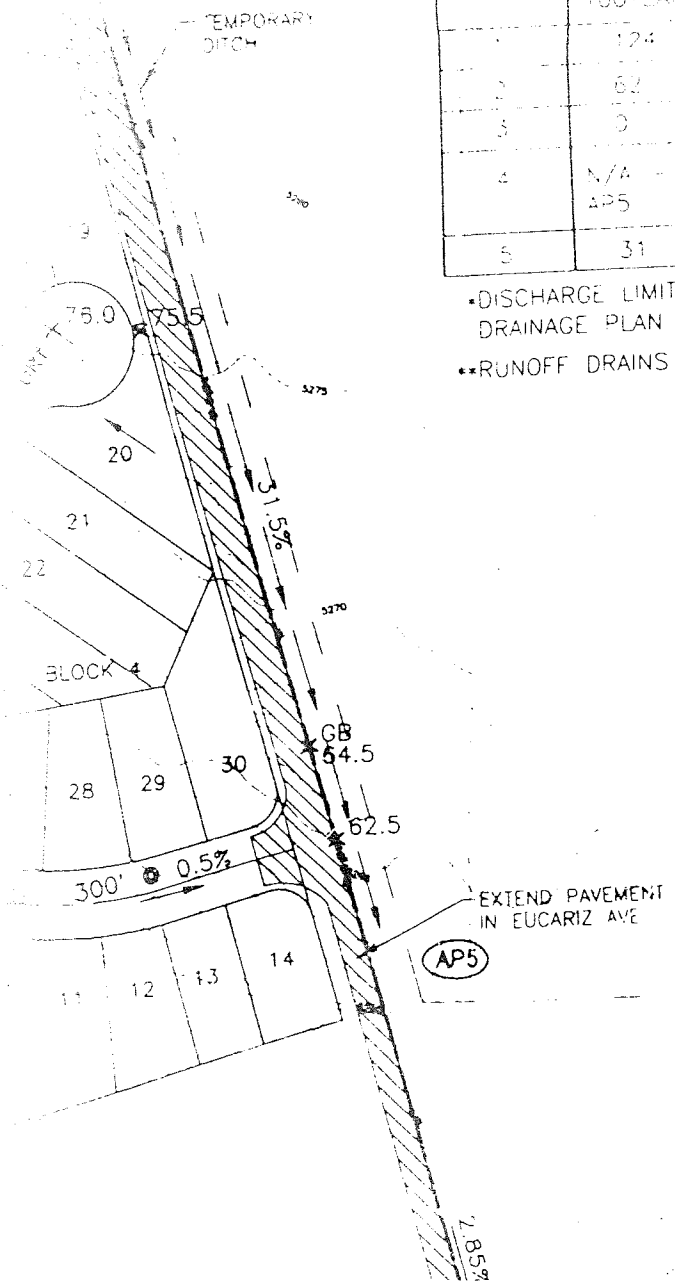
*DISCHARGE LIMITED TO 1.29 CFS/ACRE IN ACCORDANCE WITH MASTER DRAINAGE PLAN FOR SUNRISE TERRACE UNITS 1 AND 6

**RUNOFF DRAINS TO EUCARIZ AVENUE STORM DRAIN

TABLE 2
ON-SITE FLOWRATES

ANALYSIS POINT	INTERIM FLOWRATE (cfs) 100YEAR	10YEAR	FULLY DEVELOPED* FLOWRATE (cfs) 100YEAR	10YEAR
6	0	0	292.3	225.4
7	76.0	24.9	197.2	196.7
8	57.4	34.6	57.4	34.6
9	16.3	16.3	16.3	16.3
10	85.2	32.1	216.9	208.7

*DISCHARGE LIMITED TO 1.29 CFS/ACRE IN ACCORDANCE WITH MASTER DRAINAGE PLAN FOR SUNRISE TERRACE UNITS 1 AND 6



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Design
Drawn
Check
Scale

CONCEPTUAL GRADING &
DRAINAGE PLAN

Conceptual

JAN - 2

Slide 5 of 9
Plate 1

slide 5 of 9

Plate I Drainage Plan Sheet

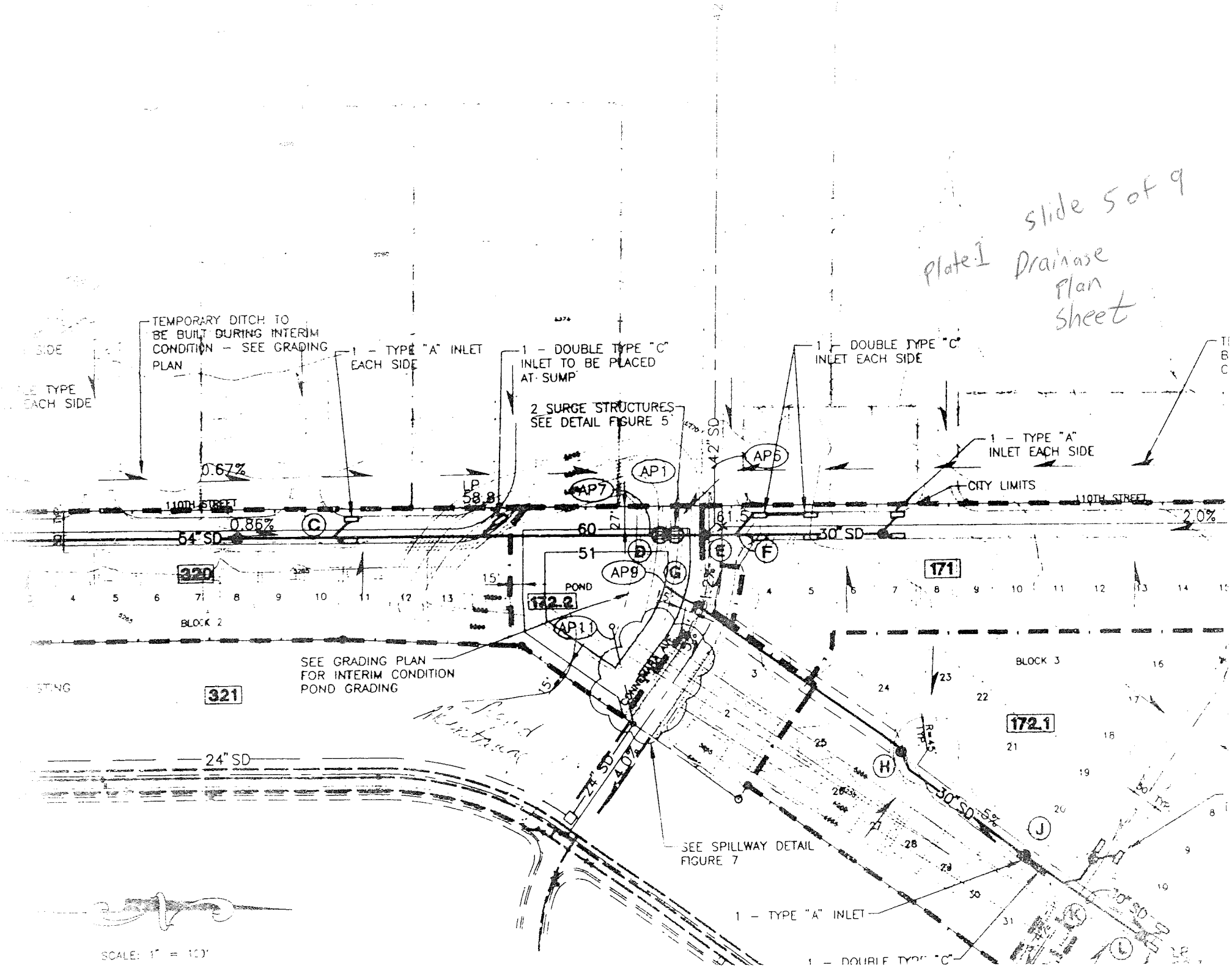

TABLE 1

OFF-SITE FLOWRATES

ANALYSIS POINT	EXISTING FLOWRATE (cfs) 100YEAR	10YEAR	INTERIM FLOWRATE (cfs) 100YEAR	10YEAR	FULLY DEVELOPED* FLOWRATE (cfs) 100YEAR	10YEAR
1	124	24	108.8	17.9	NA	NA
2	61	12	61.8	11.7	129.9	129.9
3	0	0	0	0	58.6	58.6
4	N/A - INCLUDED IN AP5		9.6	1.8	35.5**	35.5**
5	31	6	21.5**	4.1**	55.9**	55.9**

TABLE 2

ON-SITE FLOWRATES

ANALYSIS POINT	INTERIM FLOWRATE (cfs) 100YEAR	10YEAR	FULLY DEVELOPED* FLOWRATE (cfs) 100YEAR	10YEAR
6	0	0	177.5	157.6
7	11.1	6.7	234.7	192.1
8	22.0	13.3	171.0	171.0
9	34.5	20.8	34.5	20.8
10	44.0	26.2	193.8	184.2
11	6.5	1.9	7.0	2.9
12**	34.3	12.3	67.3	62.6

*DISCHARGE LIMITED TO 1.29 CFS/ACRE IN ACCORDANCE WITH MASTER DRAINAGE PLAN FOR SUNRISE TERRACE UNITS 1 AND 6

**RUNOFF DRAINS TO EUCARIZ AVENUE STORM DRAIN

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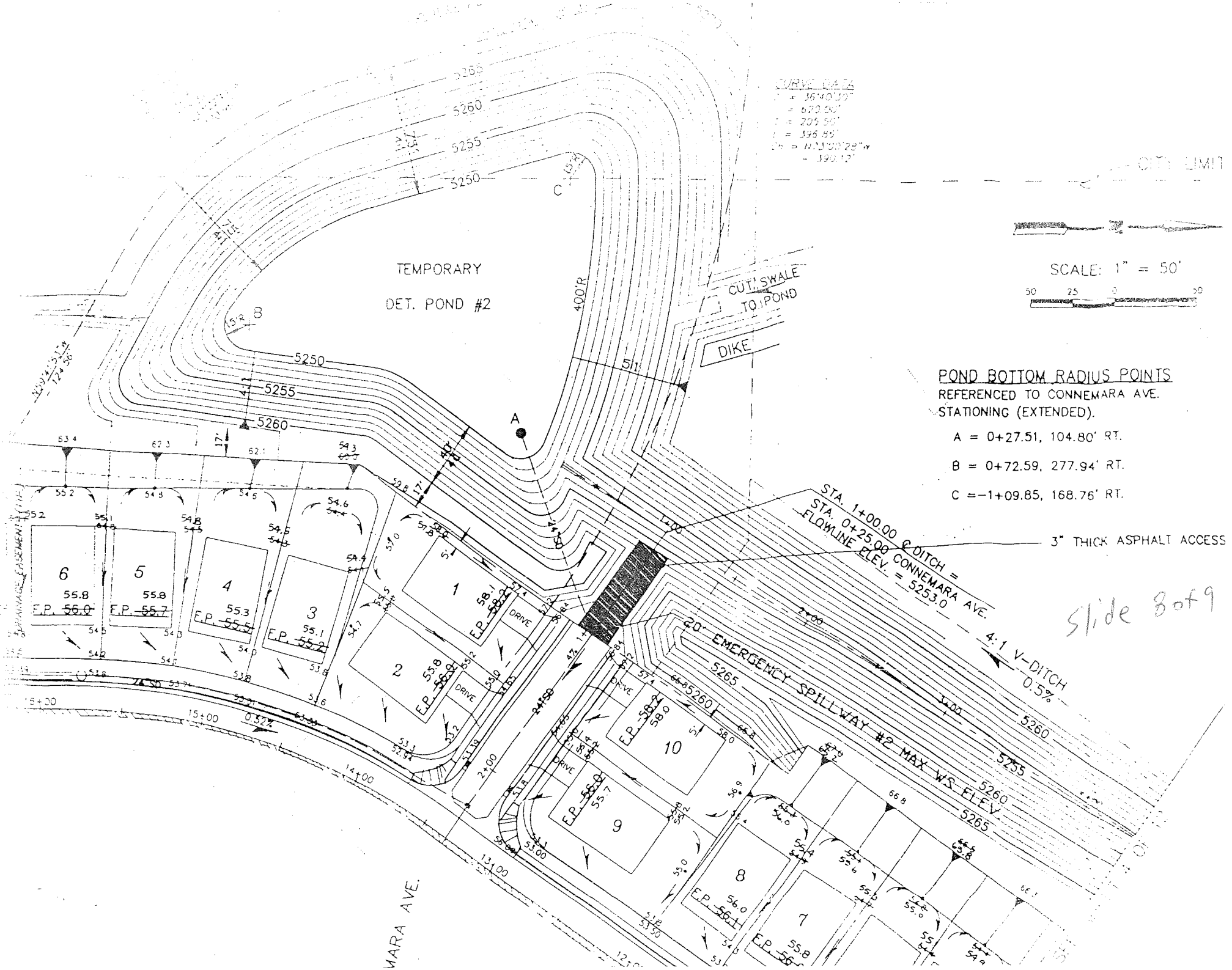
Design	SKJ
Drawn	JAK
Check	MSH
Scale	1" = 100'

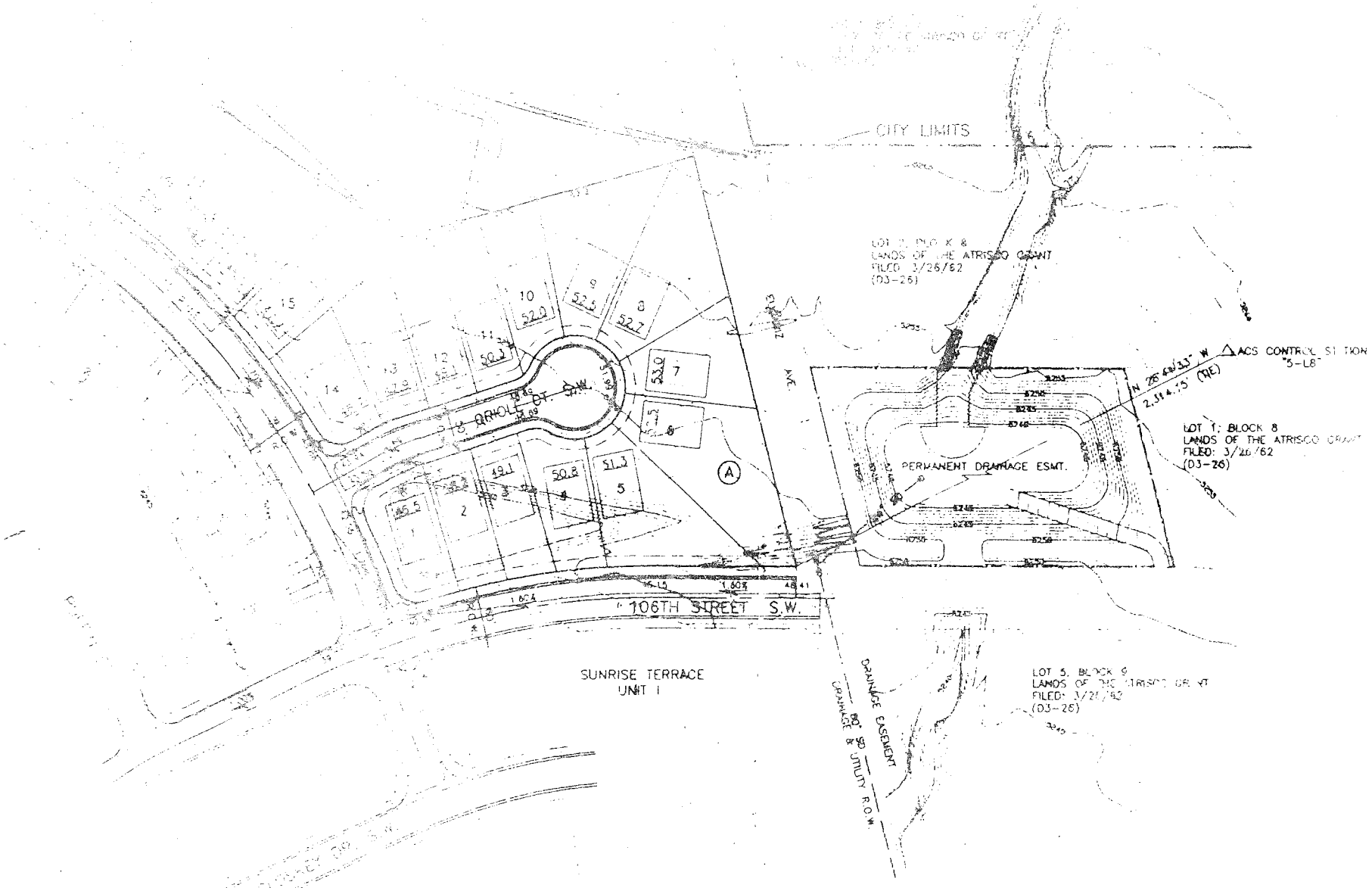
0 100'

Drainage Plan

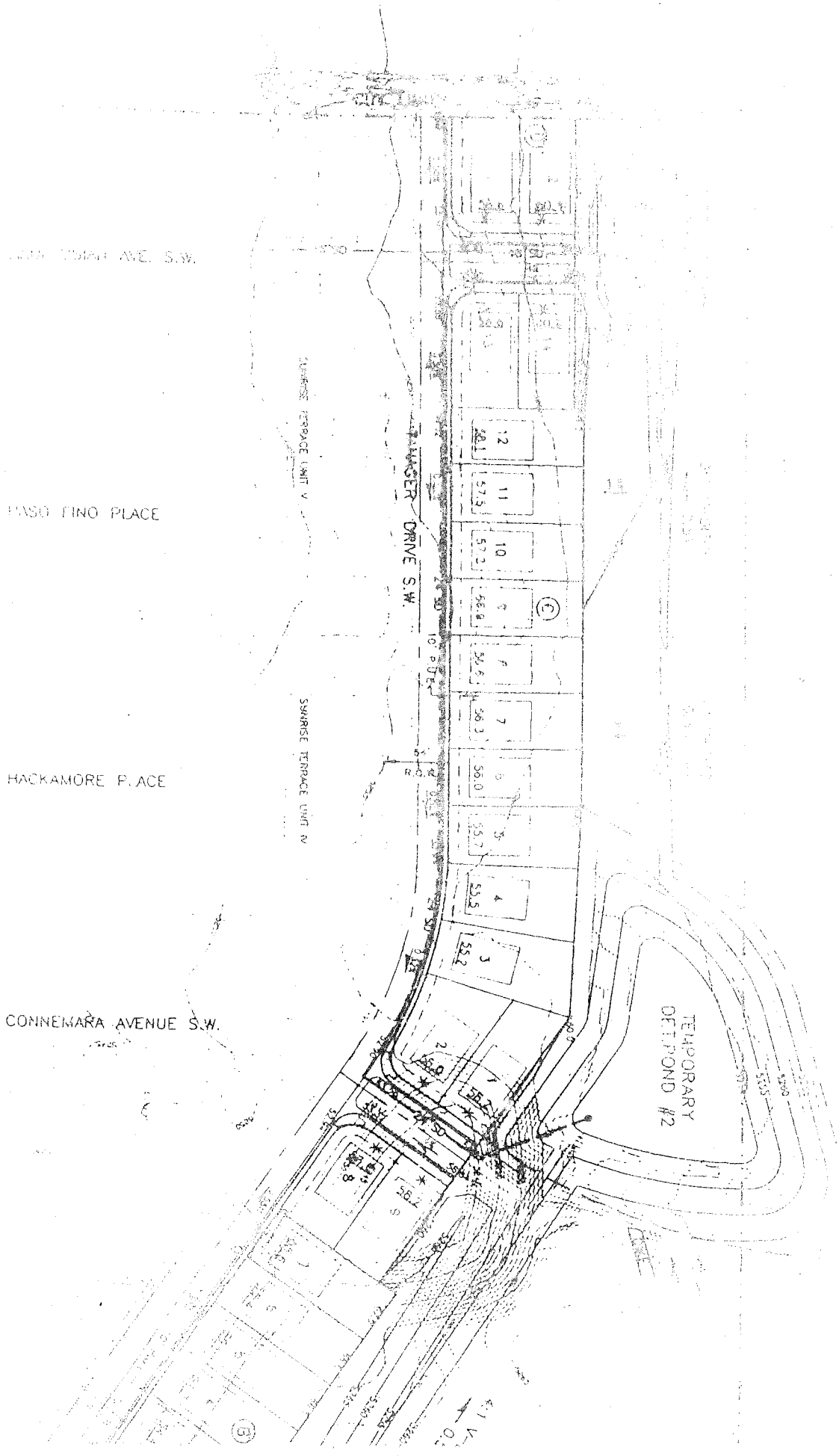
GE PLAN

Slide 5 of 9
plate 1


TEMPORARY
DET. POND #2
CUT, SWALE TO POND
DIKE
SCALE: 1" = 50'
50 25 0 50
POND BOTTOM RADIUS POINTS
REFERENCED TO CONNEMARA AVE.
STATIONING (EXTENDED).
A = 0+27.51, 104.80' RT.
B = 0+72.59, 277.94' RT.
C = -1+09.85, 168.76' RT.
3" THICK ASPHALT ACCESS
STA. 1+00.00 ℄ DITCH = STA. 0+25.00 CONNEMARA AVE.
FLOWLINE ELEV. = 5253.0
4:1 V-DITCH
0.5%
20' EMERGENCY SPILLWAY #2 MAX W.S. ELEV. 5265
CONNEMARA AVE.
DRIVE
5250
5255
5260
5265
400'R
511'
Slide 8 of 9



Easterling & Associates, Inc.


PASO FINO PLACE
HACKAMORE PLACE
CONNEMARA AVENUE S.W.
SUNRISE TERRACE UNIT IV
SUNRISE TERRACE UNIT V
MAGER DRIVE S.W.
TEMPORARY DETPOND #2