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

April 13, 2000

Bo K. Johnson, P.E.
Bokay Construction, Inc.
5905 Azuelo Court NW
Albuquerque, New Mexico 87120

RE: Grading and Drainage Certification Plan for the Sandia Glow Subdivision (D21/D3B), Submitted for Release of Financial Guarantees, Engineer's Certification Stamp Dated 4/12/00.

Dear Mr. Johnson:

Based on the information provided, the above referenced plan is adequate to satisfy the Grading and Drainage Certification requirement per the Infrastructure List dated April 14, 1998, and last revised on February 2, 1999, for the release of the Financial Guarantees for the Sandia Glow Subdivision.

If you have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Terri Martin, DRB-97-76, City Project # 603181
Yvonne Scarafiotti, Owner
File

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

January 27, 1999

Bo K. Johnson, P.E.
Bokay Construction, Inc.
5905 Azuelo Court NW
Albuquerque, New Mexico 87120

RE: Revised Grading and Drainage Plan for the Sandia Glow Subdivision (D21/D3B), Submitted for Preliminary and Final Plat Approval and Rough Grading Approval, Engineer's Stamp Dated 1/15/99.

Dear Mr. Johnson:

Based on the information provided with the submittal of January 19, 1999, the above referenced revised plan for Sandia Glow Subdivision is approved for Plat action.

The above referenced plan is also approved for Rough Grading provided it is approved by the DRB. A topsoil disturbance permit is required before any grading may occur on this site.

As you are aware, the SIA must be in place prior to Final Plat sign-off, and the Grading and Drainage Certification is required prior to the release of Financial Guarantees for this subdivision.

If you have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: DRB-97-76
Yvonne Scarafiotti, Owner
File

CITY OF
Albuquerque

October 12, 1998

Bo K. Johnson, P.E.
Bokay Construction, Inc.
5905 Azuelo Court NW
Albuquerque, New Mexico 87120

RE: Addendum to the Drainage Report for the Sandia Glow Subdivision (D21/D3B) Engineer's Stamp Dated 9/21/98.

Dear Mr. Johnson:

City Hydrology has no objection to your proposal to replace the 10' concrete channel with an underground storm drain pipe. It appears that a revised Infrastructure List will have to be approved by the DRB for this change. Please provide a revised grading plan showing this pipe and the proposed swale prior to DRB approval.

The submittal was unclear whether a 24" or 18" pipe is proposed. Although the 18" pipe has the capacity, using a 24" pipe is recommended for maintenance issues. City Hydrology also recommends that a Type "A" inlet be used instead of the Type "C" inlet. These details may be worked out at DRC.

If you have any questions regarding these comments, please call me at 924-3982.

Sincerely,

Susan Calongne

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Yvonne Scarafiotti, Owner
File

DRAINAGE REPORT

FOR

THE SANDIA GLOW SUBDIVISION

PREPARED FOR:

MS. EVONNE SCARAFIOTTI
1573 EAGLE RIDGE CT. NE
ALBUQUERQUE, NEW MEXICO 87122

PREPARED BY:

BOKAY CONSTRUCTION, INC.
5905 AZUELO CT. NW
ALBUQUERQUE, NEW MEXICO 87120

BO K. JOHNSON, P.E.
PROJECT MANAGER

MARCH 30, 1998

BO K. JOHNSON, P.E.

SANDIA GLOW SUBDIVISION

I. PURPOSE AND SCOPE

The purpose of this drainage report is to present a drainage management plan and a comprehensive analysis of the drainage control measures to be implemented with the Sandia Glow subdivision, a 19 lot single-family subdivision proposed on approximately 4 acres of land in the NE heights of Albuquerque, New Mexico. The project is located in the developing part of the city and is contiguous to existing drainage infrastructure. Both onsite and offsite drainage affected by this development will be addressed by this report.

II. SITE DESCRIPTION AND HISTORY

The Sandia Glow subdivision is located in Lots 14, 16, 18 and 20 of North Albuquerque Acres Tract 3 Unit 2 and is situated in the Elena Gallegos Grant projected section 21, T11N, R4E, NMPM, City of Albuquerque, Bernalillo County, New Mexico. The project site is bounded by Coronado Road on the north and Karak Road on the south and can be found in the City of Albuquerque Zone Atlas page D-21.

The site is bounded by Quintessence subdivisions on the east, south and southwest. The property northwest of the site flows to the west, therefore no offsite flows enter the site.

Karak Road runs east/west along the south project boundary. Karak Road is fully improved in front of this project with asphalt, curb and gutter, and all underground utilities, including storm drain facilities.

Coronado Road runs east/west along the north boundary of the site. Coronado Road is not fully improved. An existing water main and storm sewer system has been constructed at a depth proposed to be adequate for future street construction. These facilities are operational and connected to the City systems.

The existing fully improved Coronado Road terminates at the northeast corner of this project. It is the intent of this project to extend the necessary City improvements westward to the north west corner of the subject tract. This would include construction of ½ of the ultimate street section and the necessary utilities.

The project is bounded on the east and west by existing improved subdivisions. On the east the rear lot line and project boundary is defined by improved lots graded away from the project and a retaining wall with a maximum height of 4 feet.

The project contours are such that a large natural swale encompasses the center of the project. Grading criteria dictates that this projects' natural low point be maintained. This feature was also recognized in the westerly completed subdivision which has an existing 10 foot wide concrete rundown constructed up to and contiguous to its' east tract line which is the subject sites' west property line. The projects' plan is to continue this rundown eastward to the west curb and gutter of the new Sandia Glow street.

Onsite soils consist of Embudo and Tijeras Complexes. Embudo soils are typically found in drainage ways and depressions and the Tijeras soil is found on low ridges and narrow undulations. On both soils the runoff is medium and the hazard of water erosion is moderate. Both soils are classified as hydrologic soil group B by the USDA Soil Conservation Service. As shown on Plate 5, FEMA panels 35001C0141D and 35001C0142, dated 9-20-96, none of this site is located in a 100 year floodplain.

III. COMPUTATIONAL PROCEDURES

Hydrologic analysis was performed utilizing the AHYMO computer model (version 1993), and the design criteria found in the COA-DPM Section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria, January 1993.

Drainage for the fully developed conditions was analyzed for the 100-year 6-hour storm event using the AHYMO hydrologic model. Time of Concentrations were estimated using the Upland Method and then were converted to Time to Peak (Lg) in accordance with section 22.2 of the COA-DPM which also establishes the minimum Time of Concentration to be 12 minutes.

IV. DRAINAGE AND FLOOD CONTROL DESIGN CRITERIA

The following rainfall amount was used in the AHYMO model (version 1993) for the hydrologic analysis:

Return Period	1-hour (inches)	6-hour (inches)	24-hour (inches)
100-year	2.20	2.70	2.60

A TYPE 1-6 hour rainfall distribution based on NOAA Atlas 2 with peak intensity at 1.4 hours was used in the AHYMO analysis.

In accordance with AMAFCA's design criteria for determination of percent land treatment D, the following equation was used for "single family residential" classification based on the maximum possible density of 5 dwelling units per acre: 7x(((NxN)+(5xN))) ½ which results in a Land Treatment D = 50%. It was assumed the other 50% would be split between Land Treatment B = 25% and Land Treatment C = 25%.

For street capacity design, streets were assumed to have a 2% cross slope from lip of gutter to crown.

V. EXISTING DRAINAGE CONDITIONS OVERVIEW

As stated previously, this development is located between two existing phases of the Quintessence subdivision. The phase to the east effectively cuts off all drainage coming on the site from that direction, while the phase to the west is downhill from the site. The site is shaped like a bowl with its' discharge to the west into a concrete lined channel constructed by the development which backs on to it to the west. This channel was sized to take the developed flows from the Sandia Glow subdivision.

Coronado Road is on the northern boundary of the development. There is an existing 24" RCP in Coronado Road designed to carry the flows from the north and east.

VI. DRAINAGE MANAGEMENT PLAN

A. Overview

The drainage management plan for this site is covered in the previously approved drainage report for the Quintessence Subdivision prepared by Community Sciences Corporation. The plan allows for a discharge of the calculated 15 cfs into the concrete lined channel, which in turn discharges into the Quintessence storm drain system before discharge into the Heritage Hills subdivision.

With the logical grading and construction of a rundown extension onto the Sandia Glow project, the drainage generated by this development will be fully controlled. As stated before, no offsite runoff can reach the project lots due to its' unique location and terrain. Also, all walls on the periphery of the site will be of masonry construction.

Only a small quantity of runoff will drain on to Karak Road as only the adjacent 2 lots partially drain to this road. The new cul-de-sac will be graded to drain north away from Karak Road.

Due to the construction of a solid masonry fence along the right-of-way line, no flows from Coronado Road reach this subdivision. This project will install a catch basin on the south side of Coronado Road, at the west end of the project, to minimize downstream surface runoff caused by the new reach of asphalt.

B. Onsite Drainage

Hydrologic analysis was done for the developed conditions utilizing the AHYMO computer model. The basin numbers used are the same as those used by Community Sciences Corporation as their study included the Sandia Glow development. As can be seen in the attached AHYMO summary, the conclusions reached are the same, therefore, this report should be used as a supplement to the other approved report in this area only.

The street capacity was calculated using Mannings' formula with mountable curb and gutter for the street section. The ½ street capacity was calculated to be 4.45 cubic feet per second; therefore, the full street capacity is 8.9 cubic feet per second. Mountable curb and gutter was shown to be sufficient to carry the flow of water to the rundown. Sufficient standard curb and gutter will be installed at the entrance to the rundown to accommodate the confluence of onsite flows into the entrance of the rundown. Calculations for the street stormwater carrying capacity are shown in Appendix A.

Calculations demonstrating the adequate stormwater carrying capacity of the proposed 10' wide channel are shown in Appendix B.

C. Offsite Drainage

As outlined previously, Coronado Road is one of two offsite drainage areas directly involved with this site. Based on the ultimate development of Coronado Road along the northern boundary being 30' face of curb to face of curb and with the existing storm drain system in the right-of-way, all drainage generated in the road can be accepted by the existing storm drain system. This project allows for the installation of an inlet on the south side of Coronado Road at the west end of the project to tie into the existing storm drain system in Coronado Road. The calculations for the Q entering this catch basin are shown in Appendix B. Karak Road, which is on the southern boundary, also has an existing storm drain system which will accept flows generated within its' right-of-way.

D. Rear Yard Swales On Lots 1-8

Due to the relatively steep slope of Karak Road, the lots on the west side of the project numbered 1 through 8 will be graded to slope to the rear property line. Along the rear property line, a 2' wide concrete swale will be constructed which will carry the flows from the rear yard across the adjacent lots. This swale will run along the rear property line of lots 1-8 and will discharge through the side yard fence of lots 5 and 6, into the channel which drains the site. The side yard fences will have 2 CMU blocks turned on side, at the flowline, to allow the flows to pass through the fences. This will prevent the need for major retaining walls to be constructed on the west property line of the project.

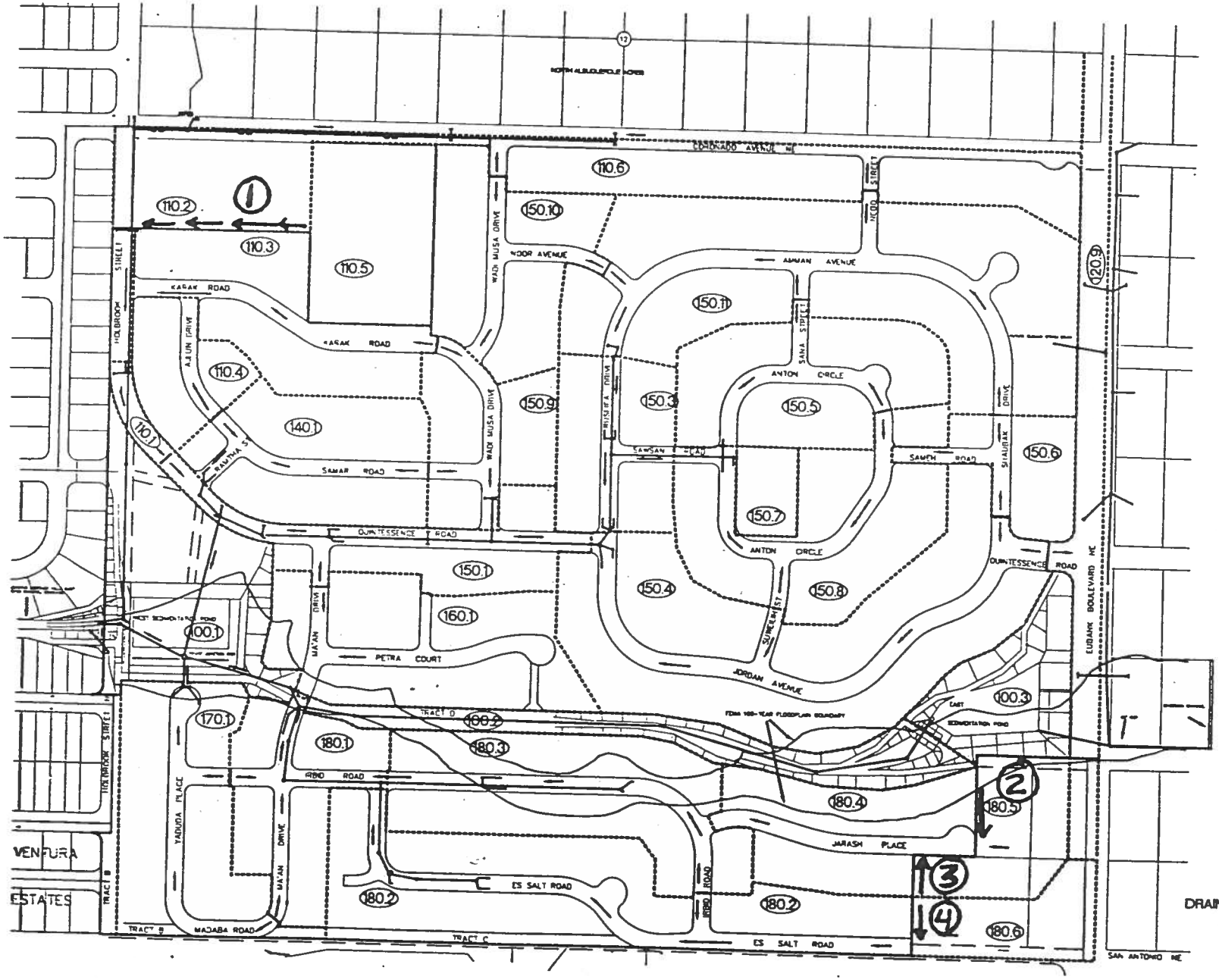
Only the water falling onto the rear yard of lots 1-8 will be allowed to run into the swale. All roof water will drain to the street. The long depth of the lots makes this a very practical solution.

SUMMARY

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =09/13/1997
INPUT FILE = SUB1_100.DAT USER NO.=

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 1 NOTATION
START										TIME= .00
*S*** PROPOSED SUB-DIVISION DESIGN DRAINAGE CONDITIONS										
*S*** LAND TREATMENT VALUES DEVELOPED RESIDENTIAL AREAS:A=0,B=25,C=25,D=50										
*S*** LTV BASED ON TYPICAL SINGLE FAMILY RES. WHERE %D=7*(((N*N)+(5*N))^.5)										
*S*** 100-YEAR 6-HOUR STORM EVENT										
RAINFALL TYPE= 1										RAIN6= 2.700
*S*** SUB-DRAINAGE AREA 110 *****										
COMPUTE NM HYD	110.60	-	1	.00794	21.23	.764	1.80502	1.517	4.178	PER IMP= 50.00
DIVIDE HYD	102.00	1	2	.00637	10.00	.613	1.80499	1.400	2.454	
	103.00	AND	3	.00157	11.23	.151	1.80499	1.517	11.151	
*S*** ROUTE DA 110.6 1000 FT WEST ON CORONADO STREET *****										
ROUTE	310.60	2	4	.00637	9.99	.613	1.80503	1.700	2.452	
*S DA# 110.8 (OFFSITE AREA - FUTURE CONDITIONS)										
*S (NE OF CORONADO STREET)										
COMPUTE NM HYD	110.80	-	1	.01070	20.08	.655	1.14769	1.517	2.932	PER IMP= 18.00
*S FLOW FROM DA 110.8 AND FLOW CROSSING OVER SOUTH CORONADO TO										
*S NORTH SIDE ROADWAY DITCH										
ADD HYD	110.80	1& 3	2	.01227	31.31	.806	1.23195	1.517	3.986	
*S*** ROUTE DA 110.8 2000 FT WEST IN DITCH ON NORTH SIDE *****										
ROUTE	310.80	2	3	.01227	24.37	.806	1.23196	1.567	3.103	
*S DA# 110.7 (OFFSITE AREA - FUTURE CONDITIONS)										
*S (NORTH OF CORONADO STREET)										
COMPUTE NM HYD	110.70	-	1	.07030	108.12	4.303	1.14769	1.567	2.403	PER IMP= 18.00
*S TOTAL DISCHARGE INTO CORONADO CULVERT AT "A" STREET										
ADD HYD	110.70	1& 3	5	.08257	132.49	5.109	1.16021	1.567	2.507	
ROUTE	110.70	5	3	.08257	132.46	5.109	1.16021	1.567	2.507	
*S COMBINED FLOW FROM CORONADO CULVERT AND DA 110.6										
ADD HYD	110.70	3& 4	1	.08894	142.31	5.722	1.20636	1.567	2.500	
*S*** ROUTE DA 110.6,110.7,110.8, 350 FT SOUTH ON "A" STREET *****										
ROUTE	310.70	1	2	.08894	139.91	5.722	1.20636	1.600	2.458	
COMPUTE NM HYD	110.50	-	1	.00561	15.01	.540	1.80502	1.517	4.179	PER IMP= 50.00
*S*** ROUTE DA 110.5 470 FT WEST IN OPEN CHANNEL *****										
*S*** BTWN DA 110.3 & DA 110.2 *****										
ROUTE	310.50	1	3	.00561	14.59	.540	1.80502	1.533	4.063	
*S*** COMBINE DA 110.5 - .8 *****										
ADD HYD	110.50	2& 3	1	.09455	152.59	6.262	1.24187	1.583	2.522	
COMPUTE NM HYD	110.20	-	2	.00564	13.99	.505	1.68013	1.517	3.875	PER IMP= 50.00
*S COMBINE FLOW FROM DA 110.2, 100.5-.8										
ADD HYD	110.20	1& 2	3	.10019	163.96	6.768	1.26654	1.583	2.557	
COMPUTE NM HYD	110.40	-	1	.00428	11.45	.412	1.80502	1.517	4.181	PER IMP= 50.00
COMPUTE NM HYD	110.30	-	2	.00672	17.97	.647	1.80502	1.517	4.179	PER IMP= 50.00
*S COMBINE DA 110.4 AND 110.3										
ADD HYD	110.30	1& 2	4	.01100	29.42	1.059	1.80498	1.517	4.180	
*S COMBINE FLOW DA 110.2 - 110.8										
ADD HYD	110.30	3& 4	1	.11119	188.38	7.827	1.31981	1.567	2.647	
*S*** ROUTE DA 110.2 - 110.8 SOUTH 270 FT ON "A" STREET *****										
ROUTE	310.20	1	2	.11119	186.50	7.827	1.31981	1.583	2.621	
COMPUTE NM HYD	110.10	-	1	.00118	3.92	.154	2.45175	1.517	5.193	PER IMP= 100.00

*S*** TOTAL DISCHARGE AT WEST LOW POINT IN "A" STREET *****
*S*** DISCHARGES DIRECTLY INTO WEST CHANNEL, BY-PASS POND *****



QUINTESSENCE

DRB NO. 94-552

SEPTEMBER 1995

EAST SEDIMENTATION \ DETENTION POND

PEAK Qin = 492cfs
PEAK Qout = 260cfs
PEAK STORAGE VOLUME = 7.7 AC.FT.
PEAK ELEVATION = 5698.5 FT.
EMERGENCY SPILLWAY ELEV = 5697.0 FT.
SPILLWAY WIDTH = 70 FT.
DEPTH = 1.9 FT. @ Q = 492cfs

WEST SEDIMENTATION \ DETENTION POND

PEAK Qin = 545cfs
PEAK Qout = 378cfs
PEAK STORAGE VOLUME = 3.7 AC.FT.
PEAK ELEVATION = 5632.8 FT.
EMERGENCY SPILLWAY ELEV = 5633.0 FT.
SPILLWAY WIDTH = 100 FT.
DEPTH = 2.2 FT. @ Q = 812cfs

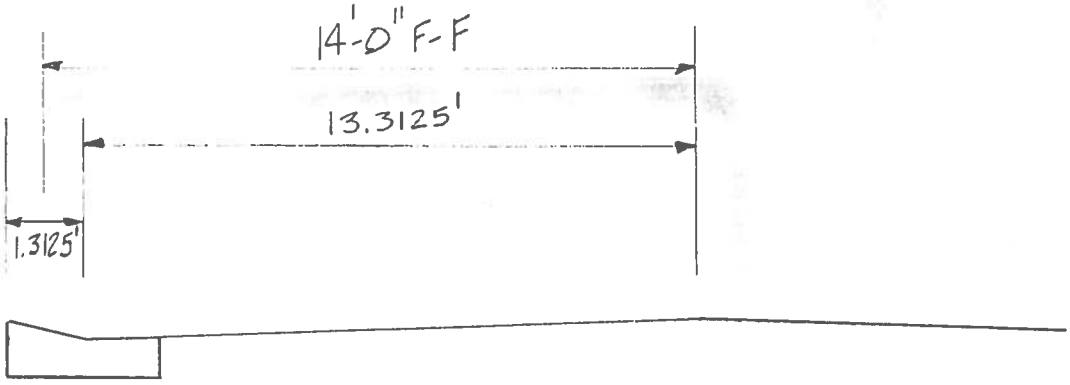
EMERGENCY OVERFLOW SPILLWAY

TYPICAL 80 FT. R/W, 17 FT B/W
3:1 SIDE SLOPES
Q = 485cfs DEPTH = 2.08 FT.

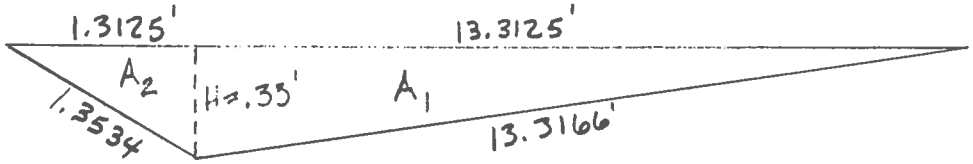
EXHIBIT 3

DRAINAGE CONDITIONS AT KEY LOCATIONS
FOR 100 YEAR STORM EVENT

SANDIA GLOW DR.
½ STREET SECTION



AREA CALCHLATIONS



$A_1 = \frac{1}{2}(.33)(13.3125)$

$A_1 = 2.1966$ S.F.

$A_2 = \frac{1}{2}(.33)(1.3125)$

$A_2 = 0.2166$ SF.

$A_{TOTAL} = A_1 + A_2$

$A_T = 2.1966 + 0.2166$

$A_T = 2.4132$ S.F.

APPENDIX "A"

CALCULATIONS FOR STORMWATER CARRYING CAPACITY OF SANDIA GLOW DR.:

$$V = \frac{1.486}{N}(R)^{\frac{2}{3}}(S)^{\frac{1}{2}}$$

$N = 0.017$

$R = \frac{A}{P}$ $\quad A = 2.4132$ S.F. $\quad P = 14.67$ $\quad S = 0.005$

$\therefore R = \frac{2.4132}{14.67}$

$R = 0.16452$

$\therefore V = \frac{1.486}{0.017}(0.16449)^{2/3}(0.005)^{1/2}$

$V = 87.4112(0.2984)(0.07071)$

$V = 1.8445$

$Q = V \cdot A$

$Q = (1.845)(2.413)$

$Q = 4.45$ C.F.S. FOR ½ SECTION OF STREET

$\therefore Q = 2(4.45) = 8.9$ CFS FOR FULL STREET SECTION

$Q_{BASIN\ A} = 4.5$ CFS

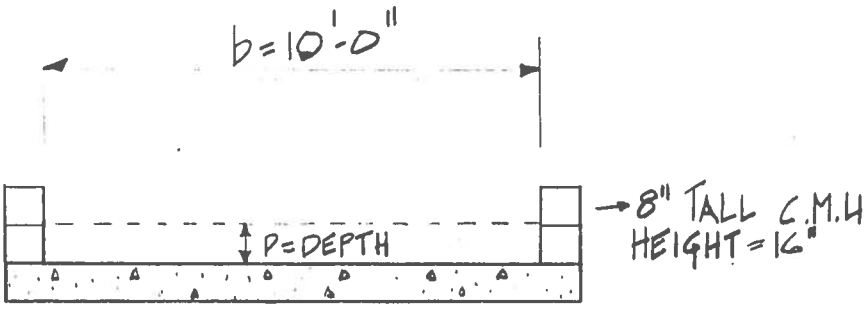
$Q_{BASIN\ B} = 3.9$ CFS

$Q_{BASIN\ C} = 2.7$ CFS

$Q_{BASIN\ D} = 3.9$ CFS

APPENDIX "A" (CON'T)

RUNDOWN CAPACITY CALCULATIONS



$$Q = \frac{K}{N} D^{8/3} S^{1/2}$$

$S = 1\%$

$N = 0.017$

$$K = \frac{Q_N}{D^{8/3} S^{1/2}}$$

TRY $D = 0.5'$

$b = 10'$

$\therefore K = 27.9$

$$\therefore Q = \frac{27.9}{0.017} (.5)^{8/3} (.01)^{1/2}$$

$Q = 25.85$ CFS > 15.0 CFS

APPENDIX "B"

TRY $D = 0.33'$

$\therefore K = 43.5$

$$Q = \frac{43.5}{0.017}(.33)^{8/3}(.01)^{1/2}$$

$$Q = 2558.8(0.052)(.1)$$

$Q = 13.3$ CFS < 15.0 CFS

$\therefore D \approx 0.35' - 0.4'$

$\therefore$ CHANNEL WITH 16' BOTTOM WIDTH AND 16" VERTICAL SIDES MINIMUM AT ENTRANCE OK

CALCULATIONS FOR Q ENTERING PROPOSED CATCH BASIN IN CORONADO ROAD

AREA $= 25' \times 330' = 8{,}250$ S.F. $= .1894$ AC.

$I = 1.8"$

$C = .95$

$Q = CIA$

$Q = (.95)(1.8)(.1894)$

$Q = .32$ CFS

APPENDIX "B" (CON'T)

ADDENDUM TO:

DRAINAGE REPORT

FOR

THE SANDIA GLOW SUBDIVISION

PREPARED FOR:

MS. EVONNE SCARAFIOTTI
1573 EAGLE RIDGE CT. NE
ALBUQUERQUE, NEW MEXICO 87122

PREPARED BY:

BOKAY CONSTRUCTION, INC.
5905 AZUELO CT. NW
ALBUQUERQUE, NEW MEXICO 87120

BO K. JOHNSON, P.E.
PROJECT MANAGER

SEPTEMBER 21, 1998

BO K. JOHNSON, P.E.

BO K. JOHNSON
NEW MEXICO
5922
REGISTERED PROFESSIONAL ENGINEER

RECEIVED
SEP 24 1998
HYDROLOGY SECTION

SANDIA GLOW SUBDIVISION

I. PURPOSE AND SCOPE

The purpose of this minor addendum to the original drainage report for the Sandia Glow subdivision is to present and request approval for a revised storm drainage management plan.

The original approved management plan showed a 10' wide concrete rundown draining the proposed subdivision into an existing concrete lined channel and discharging flows to the west.

As the original report shows, 15.0 cfs is the maximum flow in this channel for the Sandia Glow subdivision. It is requested to carry this flow in a 24" diameter, reinforced concrete pipe and catch basin as shown on the enclosed diagram.

II. DESIGN CONSIDERATIONS

As required, in case of a complete stoppage of the catch basin, overflow protection will be provided by a shallow swale that is away from any structure, of sufficient depth to carry the 15.0 cfs and is allowed to discharge into the existing concrete lined channel through an opening in a masonry wall. The swale will be maintained by the lot owner and will be kept free of any structure or other impediment to the flows.

It is proposed to use a double "C" catch basin in the street and an 18" RCP to collect and discharge the flows into the existing concrete lined channel.

III. COMPUTATIONAL PROCEDURES

Using table 22-108 in the City of Albuquerque Development Process Manual, assuming full flow in the pipe, the following calculations are relevant:

The required friction slope is:

$$S = (Q/K)^2$$

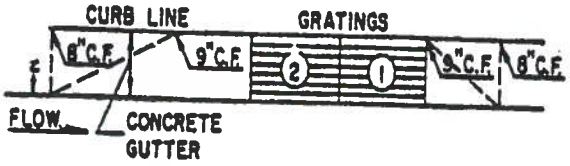
For an 18" RCP:

$$S = (15/105.0)^2$$

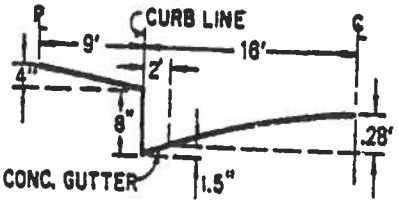
$$S = 0.02041 \text{ ft/ft}$$

An 18" RCP is sufficient to carry flows collected in the proposed double "C" catch basin.

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

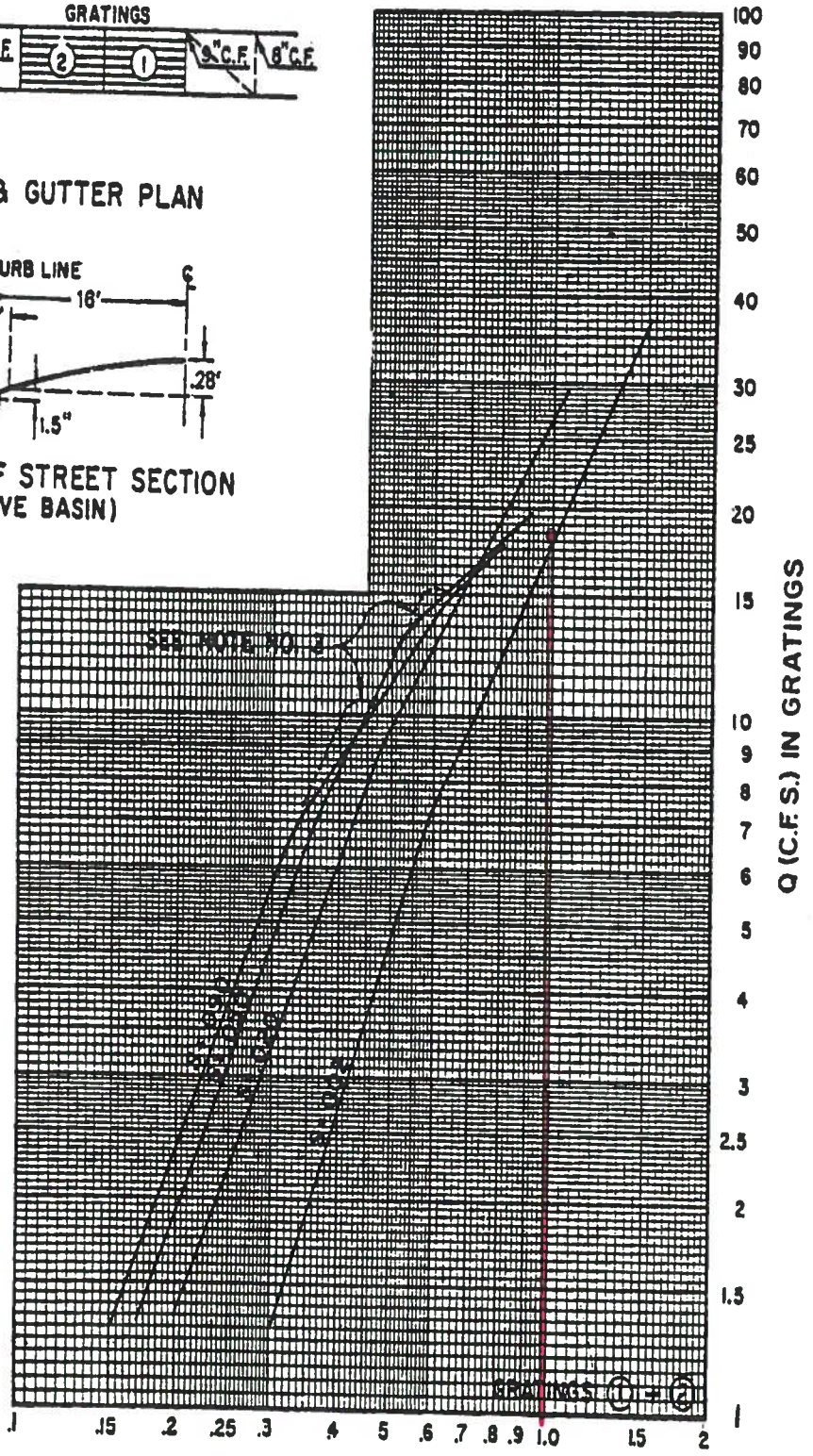
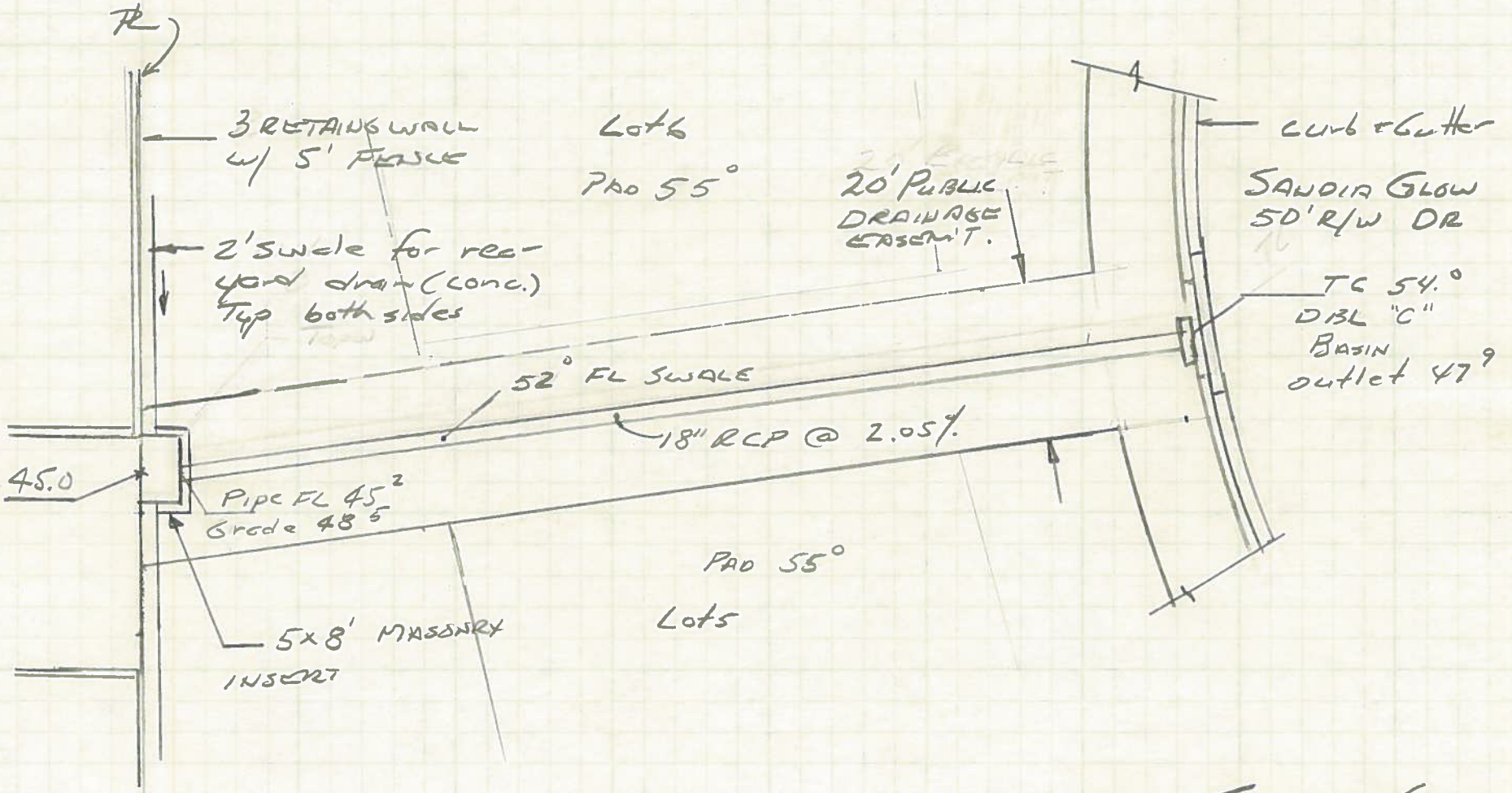


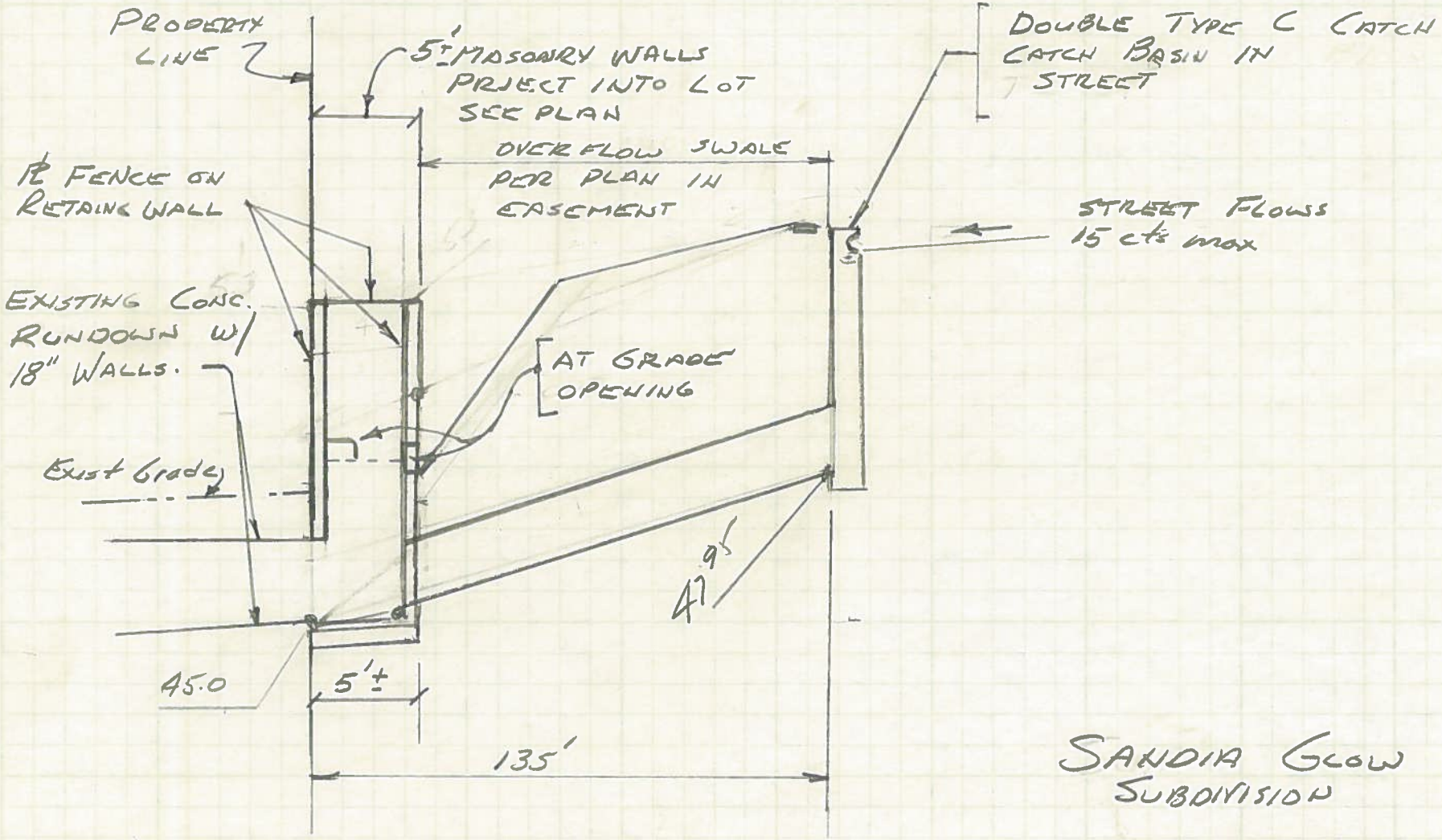
PLATE 22.3 D-6



SANDIA GLOW SUBDIVISION

9/21/98

SANDIA GLOW



SANDIA GLOW
SUBDIVISION

9/21/98