[redacted]

MOLZEN-CORBIN & Associates
ENGINEERS/ARCHITECTS/PLANNERS

MASTER DRAINAGE PLAN FOR

ALBUQUERQUE INTERNATIONAL SUNPORT
ALBQUERQUE, NEW MEXICO
FOREIGN TRADE ZONE
TRACT "A" REPLAT

August 2011

City of Albuquerque – Aviation Department
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RECEIVED
AUG 11 2011
HYDROLOGY SECTION

I, Daniel W. Hogan, New Mexico Registered Professional Engineer No. 9094, do hereby certify that the following documents were made under my supervision and direction and that same is true and correct to the best of my knowledge and belief.

Daniel W. Hogan

N.M.P.E. Date

MOLZENCORBIN
ENGINEERS | ARCHITECTS | PLANNERS

Sunport Center- Foreign Trade Zone Drainage Analysis
Albuquerque International Sunport
Albuquerque, New Mexico

PURPOSE AND SITE LOCATION

The site for the Sunport Center- Foreign Trade Zone is located on the south end of University Boulevard between the UNM Golf Course and the Albuquerque International Sunport. It is bordered by Clark Carr Road on the north, University Boulevard on the west and Spirit Drive on the east and south (see location map). The site is approximately 72+ acres of mostly undeveloped land that is planned for development into approximately 20 lease areas. This area has previously been analyzed in the Albuquerque International Sunport Storm Drainage Master Plan (Molzen-Corbin & Associates, May 1995) as well as in the Albuquerque International Sunport Rent-A-Car Facility Drainage Report (Molzen-Corbin & Associates, September 1999). This analysis takes into account drainage information from these two documents.

There currently is an existing storm drain system located on the east side of the site along Spirit Drive as well as on the west in University Boulevard at the intersection of Spirit and Clark Carr as described below. In the Albuquerque International Sunport Storm Drainage Master Plan this site is considered Sub-basins 724, 723, 1201, and a small portion of 1202.

Existing Conditions

The site is located on the sandy slope of the mesa that the Albuquerque International Sunport resides on and is part of the airport property. The site generally slopes from east to west in varying amounts, but at an average of about 3.5 percent slope, with Clark Carr Road located along the north side of the site and University Boulevard located on the west. The two existing developed sites that are adjacent to Spirit Drive have been graded to partially slope toward Spirit Drive but some of the site slopes west with small retention ponds located at the west end of the lot(s). Other than a small portion of the two existing developments and a small strip of land adjacent to Spirit Drive, the runoff from the site presently flows overland toward the west into an unimproved ditch along University Boulevard. During large or high intensity storms this ditch can overflow and run into University Boulevard right-of-way causing sediment and debris to settle on University Boulevard. There is a drainage divide on University Boulevard approximately 1200 feet south of its intersection with Clark Carr Road. Runoff reaching University Boulevard south of this point will flow south toward the existing inlets at the intersection of Spirit Drive and University Boulevard, and runoff north of this point will flow north toward the inlets at the intersection of Clark Carr Road and University Boulevard. This drainage divide splits the existing runoff approximately in half from the center of the site going in each direction.

The existing drainage system consists of three storm drains, one at each apex of the semi-triangular shaped site. These storm drains will be used to drain the proposed developed site, but the development will not require an increase in capacity in the existing system. The existing drainage system(s) are described as follows:

1. The first system is in Spirit Drive and runs along the east side of the site to the intersection of Spirit Drive and Clark Carr Road. From this point a 36 inch line runs west in Clark Carr about 350 feet and then turns north and runs about 325 feet where it ties into a 48 inch storm drain that runs west through the Remote Car Rental Facility. This system eventually outfalls as a 60 inch line into an improved arroyo with gabion drop structures before it enters the South Diversion Channel. Runoff from a portion of the two existing developments located on this site currently drain into this system.
2. The second system is located at the southwest apex of the site in the intersection of Spirit Drive and University Boulevard. This system is limited to a few inlets in the street at the intersection and a couple of median inlets constructed over 6 foot diameter manholes to pick up flows from off the roadway. These inlets all tie into a 48 inch pipe that then outfalls to an arroyo on the west side of University.
3. The third system is located at the northwest apex of the site at the intersection of Clark Carr Road and University Boulevard. This system is limited to a few inlets in the street at the intersection and two median inlets constructed over 6 foot diameter manholes to pick up flows from the site. The system then goes north in University Boulevard and ties into the same system mentioned above (the first system) about 1100 feet downstream of where the Spirit Drive line connects. At the point of connection, the pipe is 60 inches in diameter and it remains that size until it outfalls into the arroyo.

Proposed Conditions

Since this development is following the Albuquerque International Sunport Storm Drainage Master Plan (Molzen Corbin, May 1995) and the Albuquerque International Sunport Rent-A-Car Drainage Report (Molzen Corbin, September 1999), the overall runoff pattern and existing storm drainage system is not proposed to be changed. In order not to exceed the existing capacity of the storm drains, the developed runoff from the site will be ponded in several locations prior to release into the existing storm drainage system. A private storm drain system will be constructed on site to direct developed flows to these private ponds. Although the proposed systems with preliminary pipe sizes are show on Plate 3, the intent is that as a private system it will be allowed to vary in order to accommodate the needs of development and the individual lease holders. Any variance from the proposed storm drain and/or pond layout will be required to meet the overall intent of this document and the Albuquerque International Sunport Storm Drainage Master Plan referenced above plus all the current drainage criteria at the time of development, including probable retention of "First Flush" flows for pollution reduction.

The site will be graded into two major tiers by the proposed construction of a double stepped retaining wall separating the east and west portions of the site. The retaining walls will meander across the site from north to south generally parallel to University Blvd. but offset 400 to 800 feet east of University Blvd. Retaining walls will also be installed along the east side of University Blvd. to allow the collection and detention of onsite developed storm water. The upper tier level consists of drainage basins A and B. The upper tier will be graded to drain toward Spirit Dr. and then into one of the two storm drain systems in Spirit Dr. with the exception of a small portion of the most western edge of the upper tier that contain temporary retention ponds for two existing developments. These temporary retention ponds will drain into the lower tier using storm drains. Basin A will enter the system on Clark Carr Rd. just west of

the intersection of Spirit Dr. and Clark Carr Rd., while Basin B will enter the system located near the intersection of Spirit Dr. and University Blvd. The lower tier level consists of drainage areas C, D, and E. This lower tier is split approximately in half by the entrance road off University Blvd. and will be graded so the entrance road and the area north of the entrance (Basins C and E) will drain toward the intersection of Clark Carr Rd. and University Blvd., while the remainder of the lower tier (Basin D) will drain toward the intersection of Spirit Dr. and University Blvd. An internal roadway traverses the lower tier north to south between Clark Carr Rd. and Spirit Dr. Storm flows from lease areas east (uphill) of the internal north-south roadway will not enter the roadway instead they will enter a series of private storm drains running between lease areas and be directed towards one of the two intersections mentioned above. All of the flow from the lower tier will pass through one of two detention basins located at the northwest and south west apexes of the site prior to being released into the existing systems at a controlled rate that meets downstream capacity and the intent of the Albuquerque International Sunport Storm Drainage Master Plan. Below is a more detailed description of each basin.

Basin A consists of approximately 23.2 acres located in the northeast corner of the site on the upper tier. This area will be developed into approximately 4 lease lots in addition to the existing development. Runoff from a small area along Spirit drive will drain into the storm drain system along Spirit Dr. (the first system) by placing addition inlets on the lease areas that connect to the existing storm drain in Sprit Dr. Most of the new lease area will flow west to a swale along the top of the retaining wall for the upper tier and then north in the swale to a detention pond that will tie into the existing 36 inch pipe located in Clark Carr Rd. about 350 feet west of Spirit Dr. (see Plate 3). The overall required developed flow from this basin is 97.71 cfs with a 100 year 24 hour volume of 3.63 ac-ft. The 36 inch RCP located on the far north end of this basin in Clark Carr Road 350 feet west of Spirit Dr. has a capacity of 150.7 cfs according to the Albuquerque International Sunport Rent-A-Car Facility Drainage Report. Flows from Basin A will be routed to this 36 inch storm drain through the detention pond mentioned above and released at a rate that will be within the constraint of upstream flows and the maximum flow of 150.7 cfs. The existing area that has already been developed will not be changed. Calculations for this area can be seen in the appendix.

Basin B consists of approximately 4.8 acres located in the southeast corner of the site. This area is planned to be developed into 2 lease lots. Runoff from 3.09 acres of this basin (Lease Area 16) will drain east directly into the Spirit Dr. right-of-way and flow in the street to the storm drain system located in the intersection of Spirit Drive and University Boulevard. Spirit Drive appears to have capacity for this flow based on the Albuquerque Development Process Manual Plate 22.3 D-3. The remainder of Basin B will enter a storm drain at the intersection of Spirit Dr. and the proposed north-south roadway and be diverted through the proposed detention pond at the southwest apex of the site.

Basin C consists of approximately 22.8 acres located in the northwest corner of the site. This area is planned to be developed into 6 lease lots including a portion of proposed north-south roadway through the site. Runoff from the lease areas in this basin will enter a series of private storm systems running between the lease areas and directed towards the far northwest corner of the site into a detention pond. The detention pond will be sized so the release rate does not exceed the capacity of the existing storm drain system located at the intersection of Clark Carr

Road and University Blvd. The constraints in this area come from a 60 inch storm drain located just north of the intersection of Clark Carr Road and University Boulevard. There currently are three branches from the existing drainage system that intersect at this location. These is a 54 inch reinforced concrete pipe coming from the east, a 42 inch reinforced concrete pipe coming from the north, and a 24 inch pipe coming from the south. The 24 inch pipe limits the amount of runoff that can be sent from this site into the existing storm drain system. The required developed capacity for this basin is 96.0 cfs and a 100 year 24 hour volume of 1.67 ac-ft. . The capacity allowed to leave this basin is limited by a 24 inch pipe with a capacity of 58.0 cfs which matches the undeveloped flows from this basin. The proposed detention pond will be sized to limit the flows to 58.0 cfs including flow from Clark Carr Rd. west of the Spirit Dr. storm drain system. Calculations for this area can be seen in the appendix.

Basin D consists of approximately 21.2 acres located in the southwest corner of the site. This area is planned to be developed into 8 lease lots including a portion of proposed north-south roadway through the site. Runoff from this area will drain towards the far southwest apex of the site into a detention pond. The detention pond will connect to the existing storm drain system located at the intersection of Spirit Drive and University Boulevard. After reviewing the existing system based on information from the Albuquerque International Sunport Storm Drainage Master Plan it was determined that this area will require a controlled release into the system. The constraints in this area come from an 18 inch reinforced concrete located just east of the intersection of Spirit Drive and University Boulevard. This pipe connects to an existing 24 inch reinforced concrete pipe and this pipe connects to a 48 inch reinforced concrete pipe that outfalls on the west side of University Boulevard. The 48 inch pipe has the capacity to handle flows from this area; however, constraints are created from the 18 inch pipe where the detention pond drainage system will tie into. The required capacity for this basin is 89.29 cfs and a 100 year 24 hour volume of 1.56 ac-ft.The capacity available to leave this basin is limited by a 18 inch RCP with a capacity of 15.51 cfs. The proposed detention pond will be sized to limit the flows to 15.51 cfs capacity leaving the developed site. Calculations for this area can be seen in the appendix.

Basin E is small, consisting of 0.36 acres which serves as the main entry into the site from University Boulevard. Runoff from this basin will drain west into University Boulevard right-of-way and and then flow north to the drainage system located at Clark Carr Road and University Boulevard intersection. The required capacity for this basin is 1.69 cfs. This matches the existing drainage pattern and is proposed to be allowed to have free discharge into University Blvd.

In the appendix are the capacities and volumes required for each Basin under developed conditions as well as capacities for the existing drainage system.

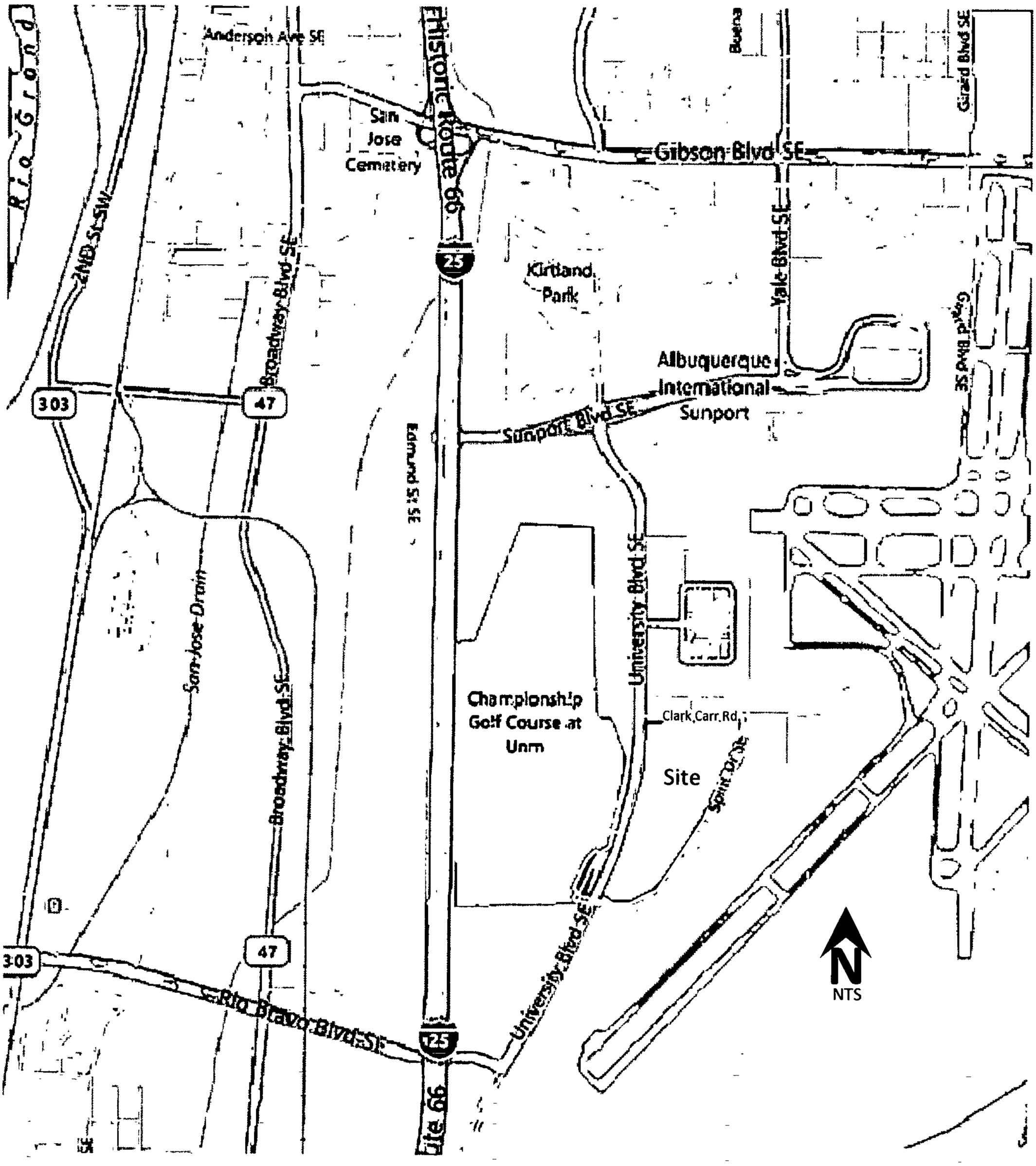
CONCLUSION

The drainage for the proposed development closely follows what has been previously proposed and modeled for future development in the Albuquerque International Sunport Storm Drainage Master Plan and the Albuquerque International Sunport Rent-A-Car Facility Drainage Report. Developed runoff will be controlled on site with detention ponds in order to maintain the same

release flow rates modeled for the existing system and meet the existing downstream system capacity. A private drainage system will be completed as development occurs and allowed to vary in order to accommodate the needs of development and the individual lease holders as long as the release rates and the intent of this and previous reports are met. The pond volumes will be determined at the time of development and are dependent on the phasing of development.

APPENDIX A- LOCATION

Albuquerque Sunport
Foreign Trade Zone
Location



APPENDIX B- SCHEMATIC OF EXISTING STORM DRAIN SYSTEM

LANDS OF UNM

4 PT SIA 46+29.70

8" SAS

11 7/8" 12" 54" W - 219.50'

8" W

18" RCP

15"

8" SAS

48" RCP

8" W

12"

14"

12" SAS

UNIVERSITY BLVD. SE

14" W

TEL

DRAINAGE EASE

STA 48+49.20 ℄ SPIRIT DRIVE
= STA 10+00.00 ℄ UNIVERSITY BLVD

20' TERMINUS
REMOVE EXIST
CURB

8" CAP

NEXT SHEET NO. M-15

Y10

Y9

Y8

Y7

Y6

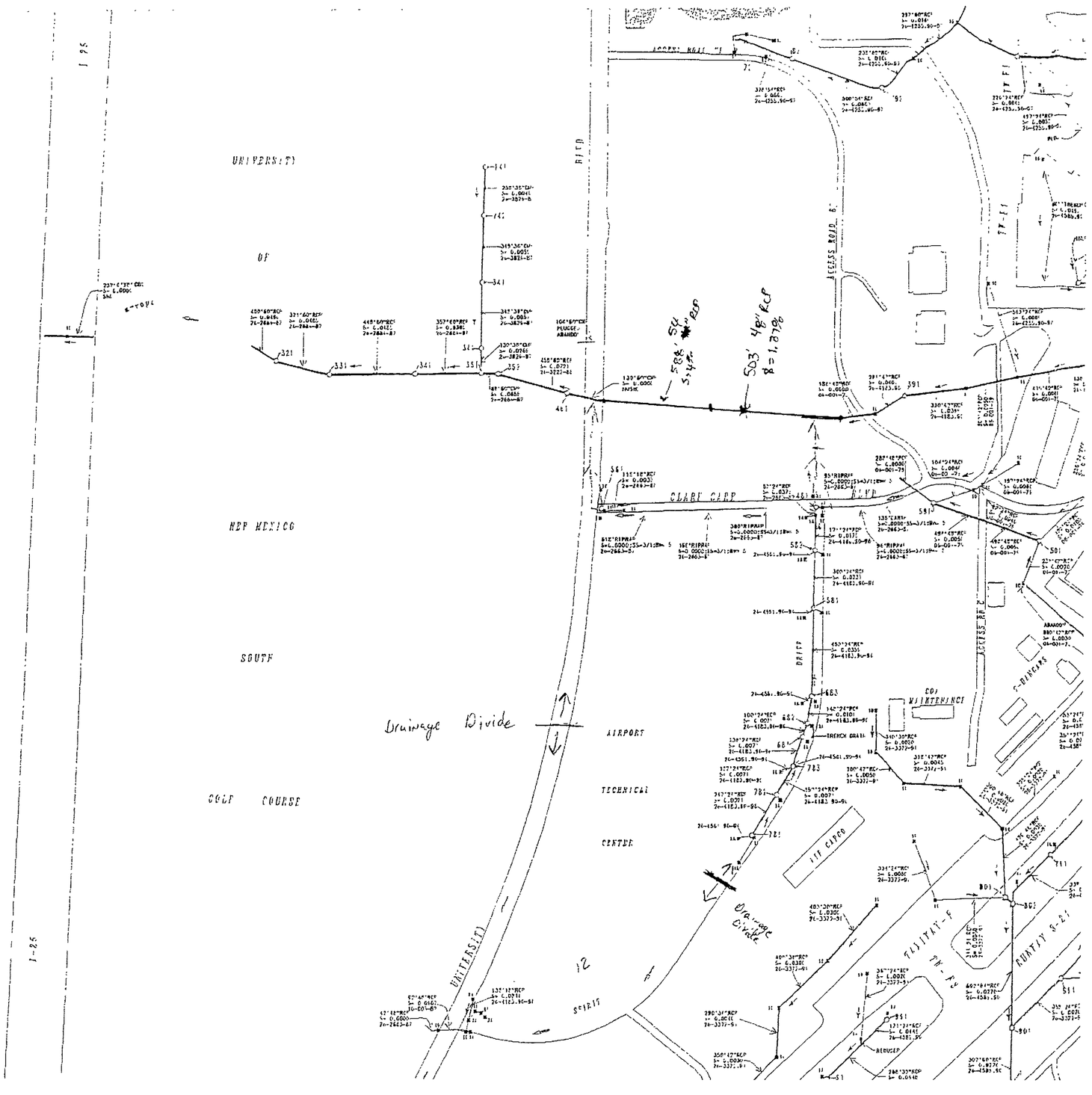
Y5

Y4

Y3

Y2

NEXT SHEET NO. N-14



NEXT SHEET NO. N-18

Storm Legend

- Lateral Stubout Inlet Connector
- Collector
- Reservor Drain Siphon
- Double Pipe
- Force Main
- Abandon Lines
- Manhole
- Inlet Catch Basin
- Junction Box
- Vault
- Standpipe/Riser
- Surface Flow
- Pipe Flow
- Water Course Holding Ponds Dams
- Well
- Reservoir
- Pump Station

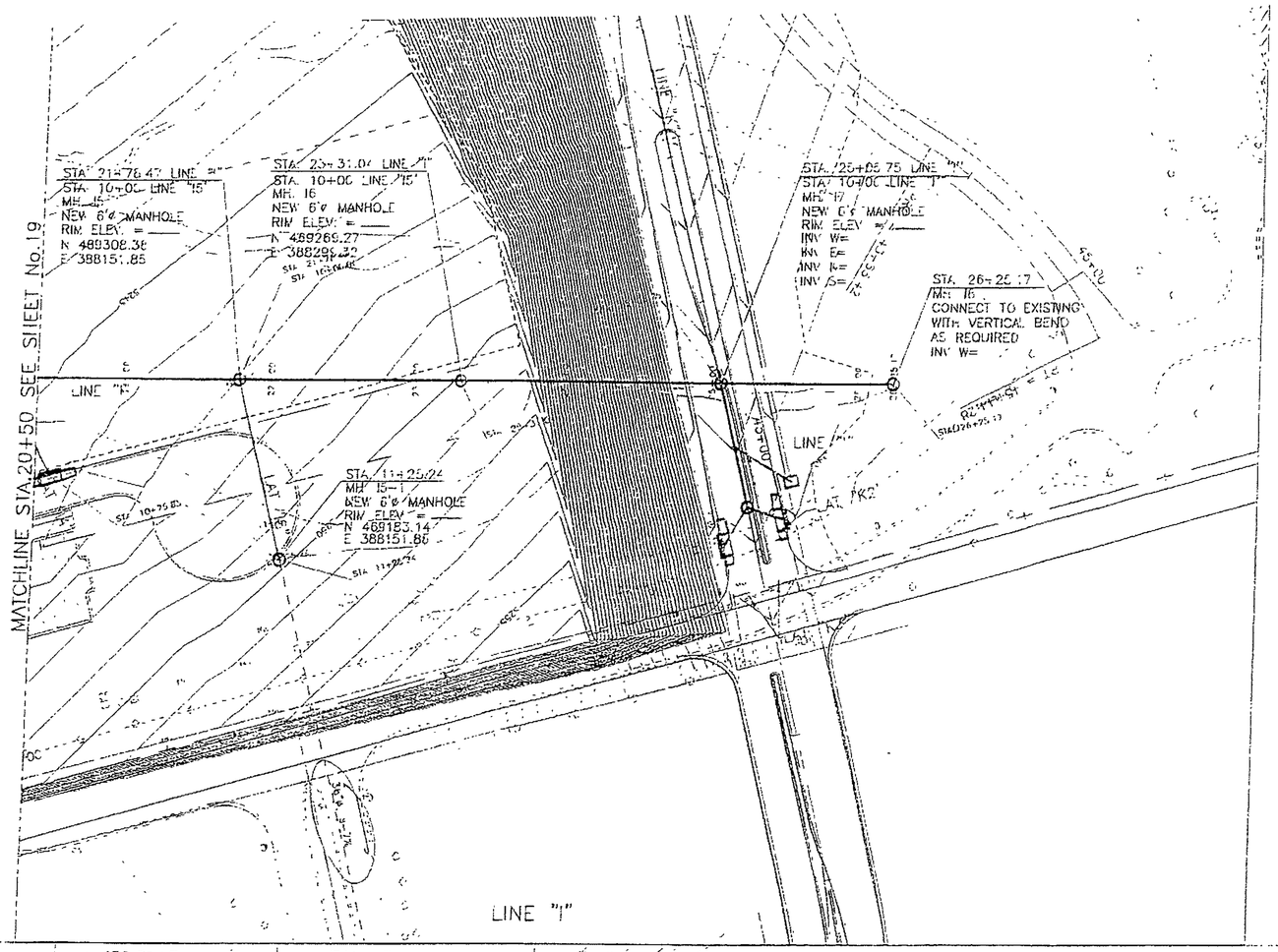
0 100 200 400 600

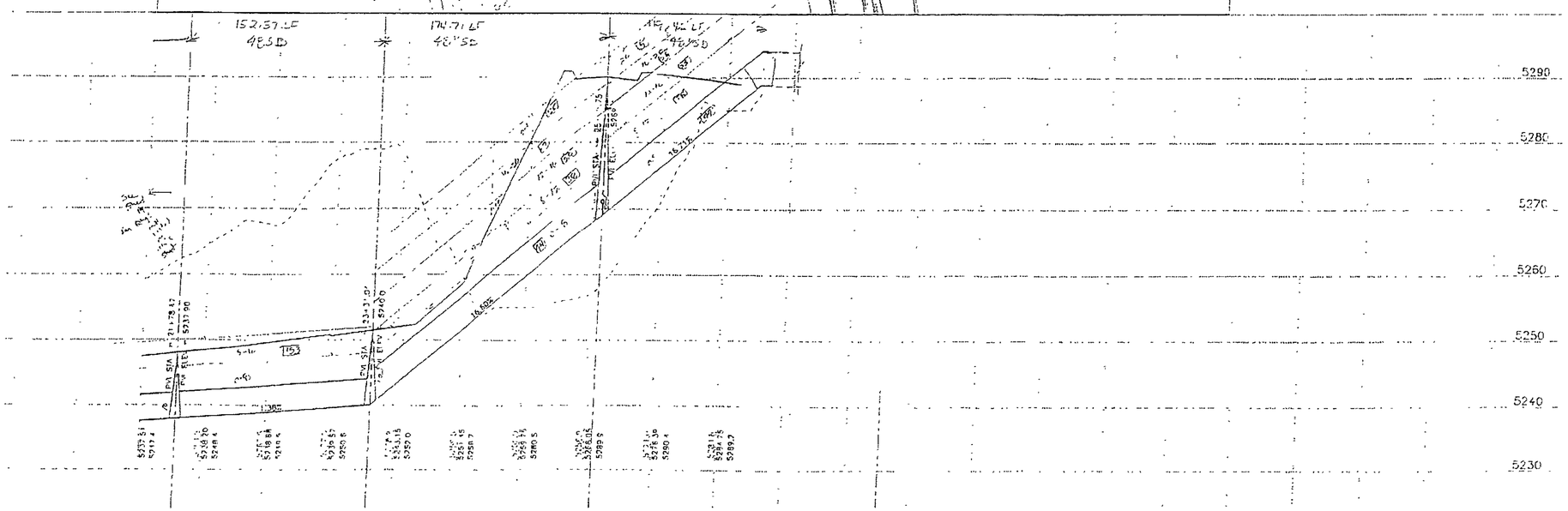
SCALE

MAP GRID

Notes:

1. Map is for reference only





Item No 926.150
Furn MH Cover Type E Vane bolt-66.1
Inst MH Cover Type E for L >18G
Item No 926.106

Item No 701.150 Trch.BF 42-66 Swale E Dike
91 LF

Item 701.160 Trch.BF 42-66 Swale 9-15 Dike
209 LF

Item 701.170 Trch.BF 42-66 Swale N-15 Dike
43 LF

Item 701.180 Trch BF 42-66 Swale K-Radius
43 LF

Item 701.190 Trch.BF 42-66 Swale S Dike
6 LF

8-12 = 204
12-16 = 43
16-20 = 93
20 = 61
Total = 447 LF

Storm Drain
Item No 910.021 48" RCP III
447 LF

N

0 50 100
1" = 50'
GRAPHIC SCALE

LEGEND

- PROPOSED S.D. MANHOLE
- PROPOSED TYPE "D" DROP INLET
- PROPOSED TYPE "A" DROP INLET
- PROPOSED FILTER DAM
- PROPOSED RIP-RAP
- 24"ø PROPOSED S.D. LINE AND SIZE

NOTE:
ALL DROP INLETS ARE TYPE "A" OR TYPE "D" UNLESS OTHERWISE NOTED ON THE LAYOUT PLAN

Field Notes
By: URS GREINER WOODWARD CLYDE
Date: 12/98 THRU 2/99
No. 2050

1-M16 RESET AN ACS ALUMINUM CAP APPROX. 5.10' E, 1180 FT FROM THE INTERSECTION OF EXISTING ACCESS ROAD "B" AND CLARK CARR BLVD. AND APPROX. 100 FT SSE OF A CHAIN GATE ALIGNED EAST TO WEST
ELEVATION = 5306.73

JOHN M. PROVINE 10997 NEW MEXICO REGISTERED PROFESSIONAL ENGINEER

MOLZEN-CORBIN & Associates
ENGINEERS/ARCHITECTS/PLANNERS

BPLW
Landscape Architecture
Engineering to Shape the Future

No.	Date	Remarks	By
1.	4/99	11/C STUFF	JWP

Designed By: JWP Date: 4/99
Drawn By: JWP Date: 4/99
Checked By: JWP Date: 4/99

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

Remote Car Rental Facility
StormDrain Line "I"-Sta.20+50 to E.O.L.

Design Review Committee	City Engineer Approval	

STA 5+56.30 LINE "F" =
STA 10+00 LINE "B1"
MH. B1'
NEW 4'ø MANHOLE
RIM ELEV. =
N 470807.96
E 387033.13

STA 10+00 LINE "B" =
STA 10+00 LINE "B1"
J BOX B1'
NEW JUNCTION BOX
RIM ELEV. =
N 469564.72
E 387012.76

STA 12+81.27 LINE "B" =
STA 10+00 LINE "B2"
ME B3
NEW 4'ø MANHOLE
RIM ELEV. =
N 469285.88
E 387020.03

STA 14+90.02
MH. B4'
NEW 4'ø MANHOLE
CONNECTED TO EXISTING
SD ITS SOUTH
REMOVE AND DISPOSE
EXISTING HEADWALL
RIM ELEV. =
N 469074.87
E 387026.43

STA 15+99.30
DI B1
NEW TYPE 'A' DROP INLET
GRADE ELEV. =
N 469[illegible]
E 387[illegible]

Remove and replace
existing 60"ø RCP

LINE "B"

188.45 LF 42" SD @ 0.90%
133.41 LF 42" SD @ 0.90%
121.90 LF 42" SD @ 0.90%
284.24 LF 30" SD @ 6.51%
205.78 LF 24" SD @ 6.56%
309.06 LF 18" SD @ 8.15%

STA 5+56.30
MH B1
INV NW=5192.00
INV S=5192.00
INV E=5192.00

STA 7+44.75
MH B2
INV N=5190.30
INV S=5190.30
INV E=5190.30

STA 8+79.16
DI B1
INV N=5189.10
INV S=5189.10
INV E=5190.10

STA 10+00 LINE "B"
STA 10+00 LINE "B1"
J BOX B1
INV E=5188.0

EXISTING GROUND
FINISH GRADE

5240
5230
5220
5210
5200

1" LINE RESET AT ACS ALUMINUM CAP APPROX 5.10' E, 1180 FT. FROM THE INTERSECTION OF EXISTING ACCESS ROAD "B" AND CLARK CARR BLVD. AND APPROX 100 FT. SE OF A CHAIN LINK GATE ALIGNED EAST TO WEST
ELEVATION = 5108.33

1 ea Junction Box

1 ea Curb Inlet, Type 'A' Single Grate

1 ea Type 'A' Drop Inlet

LEGEND

- PROPOSED S.D MANHOLE
- PROPOSED TYPE "D" DROP INLET
- PROPOSED TYPE "A" DROP INLET
- PROPOSED FILTER DAM
- PROPOSED RIP-RAP
- PROPOSED S.D. LINE AND SIZE (24"ø)

NOTE
ALL DROP INLETS ARE TYPE "A" OR TYPE "D" UNLESS OTHERWISE NOTED ON THE LAYOUT PLAN

N

0 50 100
1"= 50'
GRAPHIC SCALE

JOHN V. PROFFITT
NEW MEXICO
10997
REGISTERED PROFESSIONAL ENGINEER

MOLZEN-CORBIN & Associates

BPLW

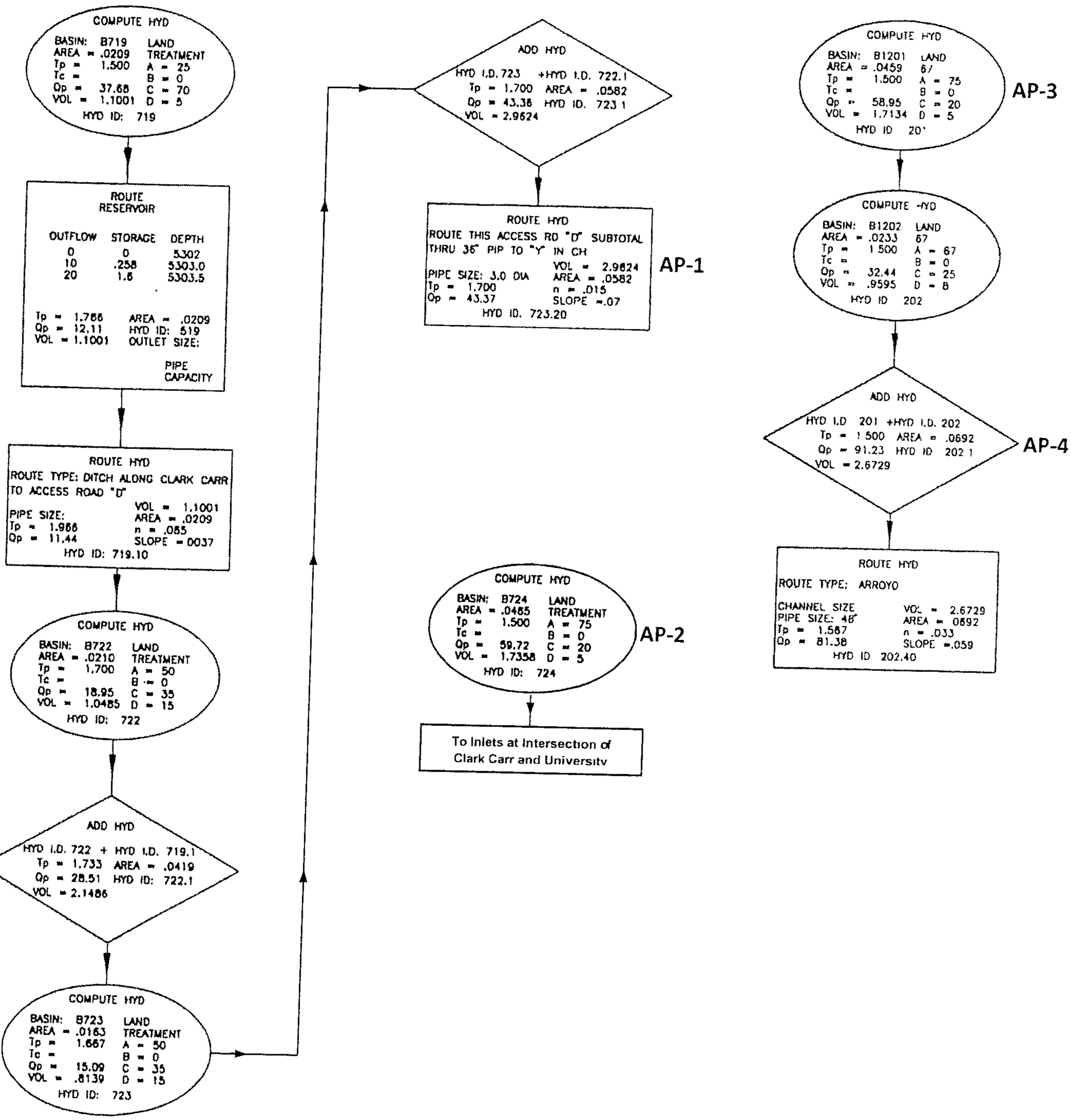
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

APPENDIX C- CALCULATIONS

AHYMO Flow Charts*

Drainage Basin GA, Sub-Basins 719 and 722 thru 724
Drainage Basin UE, Sub-Basins 1201 and 1202

100 Year Existing

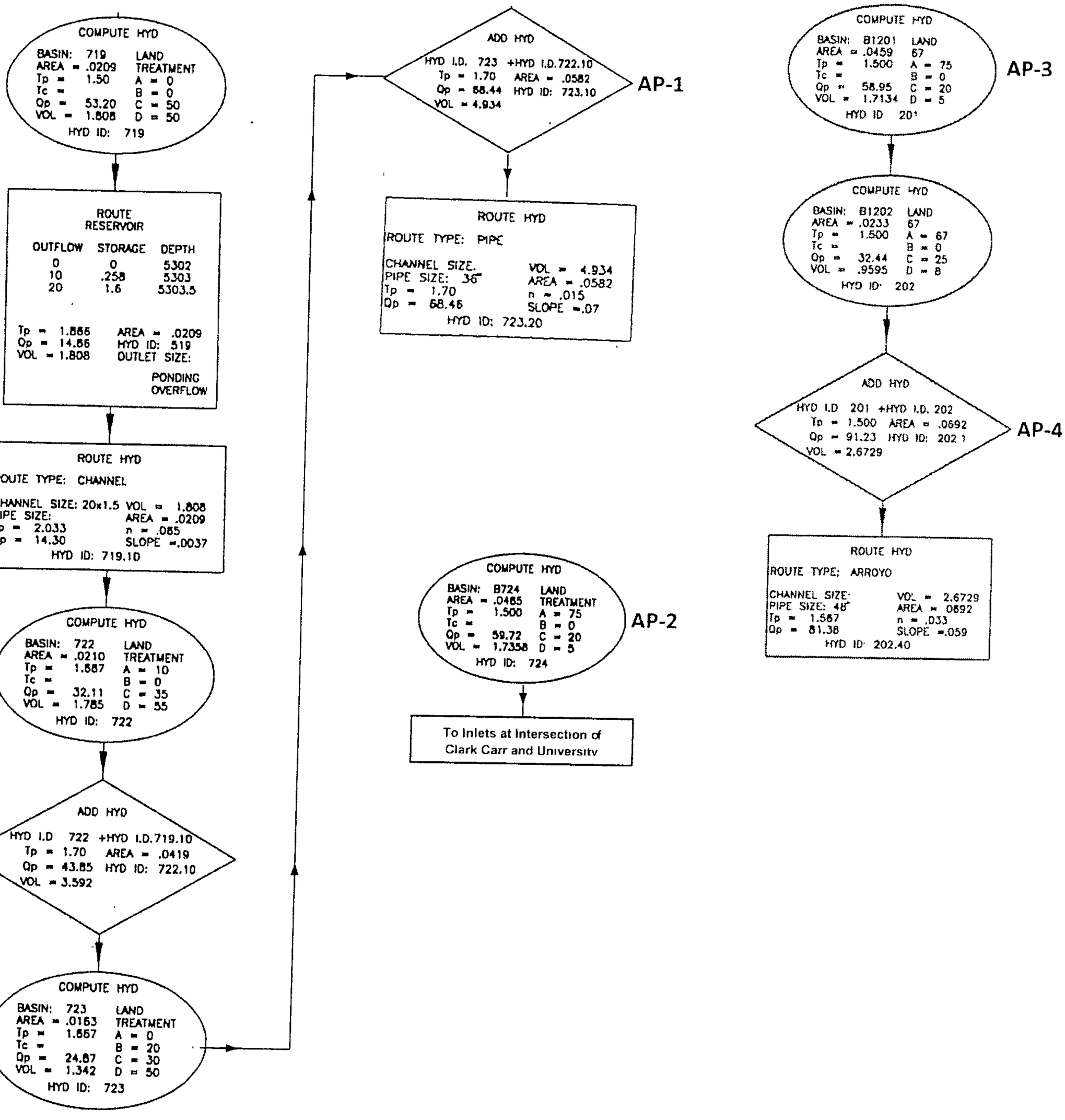


* Flow charts and data from:
Albuquerque International Airport, Albuquerque, New Mexico
Storm Drainage Master Plan, August 1995, by Molzen-Corbin & Associates

AHYMO Flow Charts*

Drainage Basin GA, Sub-Basins 719 and 722 thru 724
Drainage Basin UE, Sub-Basins 1201 and 1202

100 Year Developed



* Flow charts and data from:
Albuquerque International Airport, Albuquerque, New Mexico
Storm Drainage Master Plan, August 1995, by Molzen-Corbin & Associates

FTZ Drainage
Albuquerque, New Mexico

Precipitation Depths$_{100\text{-Year}}$ [inches]:

P_{60}	P_{360}	P_{1440}	P_{4days}	P_{10days}
2 01	2 35	2 75	3 3	3 95

Peak Discharge$_{100Year/6Hour}$ [cfs/acre]:

A	B	C	D
1.56	2.28	3.14	4.7

Tc 0 2 hr
Zone 2 Peak Intensity [in/hr]:
I = 5.05

Existing

BASIN A

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0 00	0 00%	0 53	--	0 0000	--	--	0 0000	0.31	0 00
B		4 64	20 00%	0 78	--	0 6013	--	--	10 5792	0.45	10 54
C		6 96	30 00%	1 13	--	0 9019	--	--	21 8544	0.62	21 79
D		11 60	50 00%	2.12	--	1 5032	--	--	54 5200	0.93	54 48
Totals	**0.0000**	**23.20**	100 00%	--	**1.5550**	**3.0063**	**3.3930**	**4.5530**	**86.9536**	--	**86.82**
					check	3 0063					

BASIN B

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		3 84	80 00%	0 53	--	0 1856	--	--	5 9904	0.31	6 01
B		0 96	20 00%	0 78	--	0 0464	--	--	2 1888	0 45	2 18
C		0 00	0 00%	1 13	--	0 0000	--	--	0 0000	0.62	0.00
D		0 00	0 00%	2 12	--	0 0000	--	--	0 0000	0.93	0 00
Totals	**0.0000**	**4.80**	100 00%	--	**0.5800**	0 2320	**0.2320**	**0.2320**	**8.1792**	--	**8.19**
					check	0 2320					

BASIN C

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		20 52	90 00%	0 53	--	0 9491	--	--	32 0112	0.31	32 12
B		2 28	10 00%	0 78	--	0 1055	--	--	5 1984	0 45	5 18
C		0 00	0 00%	1.13	--	0 0000	--	--	0 0000	0.62	0 00
D		0 00	0 00%	2 12	--	0 0000	--	--	0 0000	0.93	0 00
Totals	**0.0000**	**22.80**	100 00%	--	**0.5550**	**1.0545**	**1.0545**	**1.0545**	**37.2096**	--	**37.31**
					check	1 0545					

BASIN D

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		19 08	90 00%	0.53	--	0 8825	--	--	29 7648	0.31	29 87
B		2 12	10 00%	0.78	--	0 0981	--	--	4 8336	0 45	4 82
C		0 00	0 00%	1.13	--	0 0000	--	--	0 0000	0.62	0 00
D		0 00	0 00%	2.12	--	0 0000	--	--	0 0000	0.93	0 00
Totals	**0.0000**	**21.20**	100 00%	--	**0.5550**	**0.9805**	**0.9805**	**0.9805**	**34.5984**	--	**34.69**
					check	0 9805					

BASIN E

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0 00	0 00%	0.53	--	0 0000	--	--	0 0000	0.31	0 00
B		0 00	0 00%	0.78	--	0 0000	--	--	0 0000	0 45	0 00
C		0 36	100 00%	1.13	--	0 0339	--	--	1 1304	0.62	1 13
D		0 00	0 00%	2.12	--	0 0000	--	--	0 0000	0.93	0 00
Totals	**0.0000**	**0.36**	100 00%	--	**1.1300**	**0.0339**	**0.0339**	**0.0339**	**1.1304**	--	**1.13**
					check	0 0339					

Developed

BASIN A

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0 00	0 00%	0 53	--	0 0000	--	--	0 0000	0 31	0 00
B		4 64	20 00%	0 78	--	0 6013	--	--	10 5792	0.45	10 54
C		0 00	0 00%	1 13	--	0 0000	--	--	0 0000	0 62	0 00
D		18 56	80 00%	2 12	--	2 4051	--	--	87 2320	0 93	87.17
Totals	**0.0000**	**23.20**	100 00%	--	**1.8520**	**3.0063**	**3.6250**	**5.4810**	**97.8112**	--	**97.71**
					check	3 5805					

BASIN B

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0 00	0 00%	0 53	--	0 0000	--	--	0 0000	0.31	0 00
B		0 96	20 00%	0.78	--	0 0464	--	--	0 0000	0.45	2 18
C		0 00	0 00%	1 13	--	0 0000	--	--	0 0000	0 62	0 00
D		3 84	80 00%	2.12	--	0 1856	--	--	18 0480	0.93	18 03
Totals	**0.0000**	**4.80**	100.00%	--	**1.8520**	0 2320	**0.3600**	**0.7440**	**18.0480**	--	**20.22**
					check	0 7408					

BASIN C

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0 00	0 00%	0 53	--	0 0000	--	--	0 0000	0.31	0 00
B		4 56	20 00%	0.78	--	0 2109	--	--	10 3968	0 45	10 36
C		0 00	0 00%	1 13	--	0 0000	--	--	0 0000	0.62	0 00
D		18 24	80 00%	2 12	--	0 8436	--	--	85 7280	0 93	85 66
Totals	**0.0000**	**22.80**	100 00%	--	**1.8520**	**1.0545**	**1.6625**	**3.4865**	**96.1248**	--	**96.03**
					check	3 5188					

BASIN D

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0 00	0 00%	0 53	--	0 0000	--	--	0 0000	0 31	0 00
B		4.24	20.00%	0 78	--	0 1961	--	--	9 6672	0.45	9 64
C		0 00	0 00%	1 13	--	0 0000	--	--	0 0000	0.62	0 00
D		16 96	80 00%	2 12	--	0 7844	--	--	79 7120	0 93	79 65
Totals	**0.0000**	**21.20**	100 00%	--	**1.8520**	**0.9805**	**1.5458**	**3.2418**	**89.3792**	--	**89.29**
					check	3 2719					

BASIN E

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0 00	0 00%	0 53	--	0 0000	--	--	0 0000	0.31	0 00
B		0 00	0 00%	0 78	--	0 0000	--	--	0 0000	0 45	0 00
C		0 00	0 00%	1 13	--	0 0000	--	--	0 0000	0 62	0 00
D		0 36	100 00%	2 12	--	0 0339	--	--	1 6920	0.93	1 69
Totals	**0.0000**	**0.36**	100 00%	--	**2.1200**	**0.0339**	**0.0459**	**0.0819**	**1.6920**	--	**1.69**
					check	0 0636					

24" RCP
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	University & Clark Carr Road
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.065600	ft/ft
Diameter	24.00	in

Results		
Depth	2.00	ft
Discharge	57.94	cfs
Flow Area	3.14	ft^2
Wetted Perimeter	6.28	ft
Top Width	0.00	ft
Critical Depth	1.99	ft
Percent Full	100.00	
Critical Slope	0.061633	ft/ft
Velocity	18.44	ft/s
Velocity Head	5.29	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	62.32	cfs
Full Flow Capacity	57.94	cfs
Full Flow Slope	0.065600	ft/ft

42"
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	FTZ
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.009500	ft/ft
Diameter	42.00	in

Results		
Depth	3.50	ft
Discharge	98.06	cfs
Flow Area	9.62	ft²
Wetted Perimeter	11.00	ft
Top Width	0.00	ft
Critical Depth	3.05	ft
Percent Full	100.00	
Critical Slope	0.008660	ft/ft
Velocity	10.19	ft/s
Velocity Head	1.61	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	105.48	cfs
Full Flow Capacity	98.06	cfs
Full Flow Slope	0.009500	ft/ft

18" UNIVERSITY & SPIRIT DR
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	FTZ
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.021800	ft/ft
Diameter	18.00	in

Results		
Depth	1.50	ft
Discharge	15.51	cfs
Flow Area	1.77	ft^2
Wetted Perimeter	4.71	ft
Top Width	0.00	ft
Critical Depth	1.42	ft
Percent Full	100.00	
Critical Slope	0.018849	ft/ft
Velocity	8.78	ft/s
Velocity Head	1.20	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	16.68	cfs
Full Flow Capacity	15.51	cfs
Full Flow Slope	0.021800	ft/ft

48" UNIVERSITY & SPIRIT DR
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	FTZ
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.016700	ft/ft
Diameter	48.00	in

Results		
Depth	4.00	ft
Discharge	185.62	cfs
Flow Area	12.57	ft²
Wetted Perimeter	12.57	ft
Top Width	0.00	ft
Critical Depth	3.80	ft
Percent Full	100.00	
Critical Slope	0.014462	ft/ft
Velocity	14.77	ft/s
Velocity Head	3.39	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	199.67	cfs
Full Flow Capacity	185.62	cfs
Full Flow Slope	0.016700	ft/ft

54"
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	FTZ
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.040100	ft/ft
Diameter	54.00	in

Results		
Depth	4.50	ft
Discharge	393.77	cfs
Flow Area	15.90	ft^2
Wetted Perimeter	14.14	ft
Top Width	0.00	ft
Critical Depth	4.46	ft
Percent Full	100.00	
Critical Slope	0.037136	ft/ft
Velocity	24.76	ft/s
Velocity Head	9.53	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	423.58	cfs
Full Flow Capacity	393.77	cfs
Full Flow Slope	0.040100	ft/ft

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

February 26, 1993

Kerry Davis
Bohannan Huston, Inc.
7500 Jefferson NE
Albuquerque, N.M. 87109

RE: CONCEPTUAL GRADING & DRAINAGE PLAN FOR UNM BUSINESS PARK (N=15/D6*)
RECEIVED FEBRUARY 4, 1993 FOR SKETCH PLAT & MASTER PLAN APPROVAL
STAMPED & DATED FEB 3, 1993

Dear Mr. Davis:

Based on the information included in the submittal referenced above, City Hydrology has the following comments that must be addressed before the Master Plan can be approved for this project:

1. Downstream conditions must be evaluated all the way to the south diversion channel. Indicate what easements & improvements are required.

2. Off-site flows must be evaluated. How does the Airport Master Plan effect this Master Plan. Why does the storm drain at Carr-Clark & Spirit discharge 52.8 cfs when Basin D only contributes 22.1 cfs?

3. Add summary table to summarize what is happening in the sub-basins. Indicate the rate of flow from the sub-basin, from pond if present, in street & in pipe at nodes. Compare runoff at Analysis Points. Current runoff comparison does not compare apples to apples.

If you have any questions about this project you may contact me at 768-2727.

Sincerely,

John P. Curtin

John P. Curtin, P.E.
PWD/Hydrology

xc: Fred Aguirre, DRB

WPHYD+7537;jpc

RECEIVED
FEB 4 1993
HYDROLOGY

DRAINAGE REPORT AND CONCEPTUAL GRADING PLAN FOR UNM BUSINESS PARK

Prepared for:

University of New Mexico
UNM Campus, Scholes Hall
Albuquerque, NM 87131

Prepared by:

BOHANNAN-HUSTON INC.
ENGINEERS ARCHITECTS PHOTOGRAMMETRISTS SURVEYORS
COURTYARD I, 7500 JEFFERSON NE ALBUQUERQUE, NM 87109 TEL (505) 823-1000 FAX (505) 821-0892

DRAINAGE REPORT

AND CONCEPTUAL GRADING PLAN

FOR

UNM BUSINESS PARK

JANUARY, 1993

PREPARED FOR:

UNIVERSITY OF NEW MEXICO
UNM CAMPUS, SCHOLES HALL
ALBUQUERQUE, NM 87131

PREPARED BY:

BOHANNAN-HUSTON, INC.
7500 JEFFERSON NE
COURTYARD 1
ALBUQUERQUE, NM 87109

JOB NO. 92188.24

I CERTIFY THAT I AM A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF NEW MEXICO AND THAT THIS REPORT WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Joe Kelley

JOE P. KELLEY, P.E. DATE

JOE P. KELLEY 1-13-93 NEW MEXICO 9996 REGISTERED PROFESSIONAL ENGINEER

PURPOSE

The purpose of this report is to present the Conceptual Grading and Drainage Plan for the development of UNM Business Park. The plan is prepared in accordance with prior drainage reports approved by the City of Albuquerque, and in accordance with the Development Process Manual (DPM) of the City of Albuquerque, including recently proposed revisions dated August, 1991 (DPM Update).

LEGAL DESCRIPTION

University of New Mexico Business Park.

LOCATION

UNM Business Park is located in southeast Albuquerque, and is bounded by University Boulevard on the west, Clark Carr Boulevard on the north, and Spirit Drive on the east and south. UNM Golf Course is west of this site across University Boulevard. The Albuquerque International Airport Air Freight center is east of the site across Spirit Drive. The land south and north of the site is zoned M-2, but is undeveloped at this time.

FLOOD HAZARD ZONES

As shown by Panel 3500020041 of the National Flood Insurance Program Flood Boundary and Floodway Maps for the City of Albuquerque, dated September 15, 1983, the site does not lie within a designated Flood Hazard Zone.

PRESENT LAND USE

UNM Business Park is zoned M-2, and is an unplatted parcel of the Lands of UNM. Two tracts have been created within the future Business Park: Tract 1 is presently being developed for the UNM Press Warehouse, and Tract 2 is presently being developed for the Southwest Airlines Reservation Center. The balance of the property is undeveloped, and is vegetated with native grasses.

PRESENT DRAINAGE PATTERN

As shown on Plate 1, the site discharges to two watersheds. Basins 722, 723, and 724 discharge to the north, and Basins 1201 and 1202 discharge to the south.

Basin 724 slopes to the north and west at about 10%, and discharges into a 48" RCP storm drain east of University Blvd. that conveys runoff to the north under Clark Carr. The runoff is then conveyed about 500' north via a dirt channel to an existing 60" storm drain under University Blvd. Basins 722 and 723 discharge to a 36" RCP storm drain which conveys runoff under Clark Carr and into an offsite arroyo. This offsite arroyo conveys runoff to the west, where it is discharged under University Blvd. by the same 60" RCP mentioned previously. A small portion of the Basin 722/723 runoff (2.2 cfs) bypasses the storm drain at Clark Carr and is conveyed to the west on Clark Carr paved surfaces. It is then intercepted by Type A inlets on Clark Carr which discharge to the 48" RCP storm drain mentioned above.

Basins 1201 slopes to the west at about 10% and discharges into a bar ditch on the east side of University Blvd. This ditch conveys runoff to the south to Spirit Drive where it enters a storm drain system. Basin 1202 discharges via sheet flow and Spirit Drive paved surfaces to this same system. Runoff from this system is discharged under University Blvd. via a 48" RCP into an unlined channel. This channel conveys the runoff to an existing offsite detention pond west of the Ethicon building on the west side of University Blvd.

Offsite Basin A-1 is on UNM Golf Course property. In its existing state, Basin A-1 discharges only Golf Course runoff under I-25 via a 48" RCP.

RELATED REPORTS

A drainage report by Molzen-Corbin & Associates for the initial construction of Spirit Drive (formerly Access Road "D") was submitted to the City and approved in 1991. Molzen-Corbin is presently modifying this approved report to accompany the construction of the remainder of Spirit Drive. In addition, Molzen-Corbin is updating the Master Drainage Plan for the Airport. This report has been coordinated with prior and ongoing reports prepared by Molzen-Corbin.

D. Mark Goodwin & Associates prepared a drainage plan for University of New Mexico Business Park Tract 2, dated Nov. 2, 1992. This report has been prepared in accordance with that plan.

PROPOSED LAND USE

UNM Business Park will be developed as a medium-to-light industrial area comprised of 2 to 5-acre lots. The perimeter of the Park will be extensively lanscaped, and a walkway/jogging trail will be provided throughout.

DRAINAGE AND GRADING PLAN

As with the existing drainage pattern, half of the site's runoff will discharge to the north, and half to the south. Basins D ans B will discharge to the north, while Basins A and C will discharge to the south.

Developed runoff from Basin D, discharging to the 36" storm drain under Clark Carr Blvd., will be allowed to discharge freely into the street or storm inlets as noted on Plate 2. Detention ponds within future parking lots, or landscaped areas are proposed to be designed and installed in accordance with the detention pond design parameters listed on Plate 2. These detention ponds will attenuate the flows such that the Spirit Drive drainage parameters are not exceeded, and only 7 cfs will bypass the storm drain system and flow west on Clark Carr Blvd.

Developed runoff from Basin B, discharging to the 48" storm drain under Clark Carr Blvd., will be decreased to less than the existing value by the construction of a detention pond in the parking lot of subbasin B-1. Subbasin B-2 will discharge into the existing storm drain system via a new inlet and connector pipe, while subbasin B-3 will be permitted to discharge freely into Clark Carr Blvd. The net result of this plan will be: a reduction in the discharge through the 48" RCP under Clark Carr to less than its present value, and a slight bypass flow of 1.6 cfs onto University Blvd from Clark Carr.

Developed runoff from subbasins A-3 and A-4 will be diverted from its existing drainage pattern, where it is conveyed to the detention pond on Ethicon property. Runoff from these basins is now planned to be conveyed under University Blvd. via a new storm drain and into a proposed detention pond. The detention pond is proposed to be built on golf course property downstream of the parking lot. This detention pond will decrease the developed peak flows runoff under Interstate 25 to less than the existing undeveloped flow rate.

Developed runoff from Basin C will follow its existing pattern, and will discharge through the 48" storm drain under University Blvd. Peak flows in this storm drain will be reduced beneath existing levels by the above-mentioned diversion of runoff through the golf course. Only the runoff from Basins C-1 and C-2 will discharge through this storm drain. It is proposed to construct new inlets in the parking lots in Basin C and connect them to the existing storm drain. This would decrease the amount of runoff in the street.

The Drainage and Grading Plan shows: 1) existing grades indicated by spot elevations and contours at 1'0" intervals; 2) proposed grades indicated by spot elevations and slopes; 3) the limit and character of existing improvements; 4) the limit and character of proposed improvements; and 5) continuity between existing and proposed grades.

ANALYSIS METHODS

The hydrologic calculations which appear herein analyze both the existing and developed discharge for the 100-year, 6-hour rainfall event. In order to determine ponding volumes, the 24-hour event was compared to the 6-hour event, and the greater of the two was used for the pond design. In every case, the 6-hour volume governed.

The peak discharge of runoff has been calculated using the modified computerized hydrologic model AHYMO, which utilizes the initial abstraction/uniform infiltration method as identified within the proposed DPM Update.

The hydraulic calculations which appear herein were computed as follows: Street and channel capacities were computed using Manning's equation with Manning's N values as identified within the latest edition of the DPM. The capacities of streets were computed with the maximum water elevation at top of curb. The computed capacities of storm drains have been noted on the drainage plan, and the Manning's analyses of these sections are included within the Hymo run. Where culvert capcities were limited by inlet hydraulics, culvert capacities were computed from the 1963 Bureau of Public Roads culvert capacity nomographs.

The Spirit Drive storm drain design and hydraulic grade line were computed by Mozen-Corbin and Associates, and have been included in this report for reference.

CONCLUSIONS

As shown by these calculations, the proposed development will result in an increase in runoff generated by the site. This runoff will be reduced to less than the existing values by means of proposed detention ponds. The Basin Development Plan on Plate 2 outlines the development scenario for each of the properties within the UNM Business Park. By following this Plan, the development of this property will not have an adverse impact on downstream properties.

```
**   BOHANNAN-HUSTON INC.   **
**   AHYMO RUN FOR UNM BUSINESS PARK   **
**   FILENAME:_ CDP:[C9218824]HYMO6POND.IN/OUT
**   100-YEAR, 6-HOUR STORM
**   DATE:  JANUARY 18, 1993
**
SUMMARY              1
START                0.00
RAINFALL             TYPE=1  RAIN QUARTER=0.0  RAIN ONE=2.01
                     RAIN SIX=2.34  RAIN DAY=2.70  DT=0.033333

                  COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATL
                  DT =   0.033333 HOURS        END TIME =     5.999940 HOU
                    0.0000  0.0015  0.0031  0.0047  0.0063  0.0079  0.009
                    0.0114  0.0131  0.0149  0.0168  0.0187  0.0207  0.022
                    0.0248  0.0270  0.0292  0.0315  0.0338  0.0363  0.038
                    0.0414  0.0441  0.0470  0.0499  0.0530  0.0562  0.059
                    0.0632  0.0670  0.0709  0.0765  0.0824  0.0888  0.102
                    0.1330  0.1800  0.2475  0.3396  0.4607  0.6150  0.807
                    1.0417  1.2587  1.3494  1.4261  1.4943  1.5563  1.613
                    1.6665  1.7160  1.7625  1.8062  1.8474  1.8864  1.923
                    1.9582  1.9913  2.0228  2.0526  2.0809  2.0873  2.093
                    2.0989  2.1043  2.1095  2.1144  2.1192  2.1237  2.128
                    2.1323  2.1364  2.1404  2.1442  2.1479  2.1516  2.155
                    2.1585  2.1618  2.1651  2.1683  2.1714  2.1744  2.177
                    2.1803  2.1832  2.1860  2.1887  2.1914  2.1940  2.196
                    2.1992  2.2017  2.2041  2.2065  2.2089  2.2113  2.213
                    2.2158  2.2181  2.2203  2.2225  2.2246  2.2267  2.228
                    2.2309  2.2329  2.2349  2.2369  2.2388  2.2408  2.242
                    2.2446  2.2464  2.2483  2.2501  2.2519  2.2537  2.255
                    2.2572  2.2589  2.2606  2.2623  2.2640  2.2657  2.267
                    2.2689  2.2705  2.2721  2.2737  2.2753  2.2768  2.278
                    2.2799  2.2814  2.2829  2.2844  2.2859  2.2873  2.288
                    2.2902  2.2916  2.2931  2.2945  2.2958  2.2972  2.298
                    2.3000  2.3013  2.3026  2.3040  2.3053  2.3066  2.307
                    2.3092  2.3105  2.3118  2.3130  2.3143  2.3155  2.316
                    2.3180  2.3192  2.3204  2.3217  2.3229  2.3240  2.325
                    2.3264  2.3276  2.3287  2.3299  2.3310  2.3322  2.333
                    2.3345  2.3356  2.3367  2.3378  2.3389  2.3400

**  EXISTING CONDITIONS (FROM MOLZEN-CORBIN'S DATA)
*   CALCULATE BASIN 1201 (DISCHARGE TO SPIRIT DR./UNIVERSITY DR.
*   INTERSECTION FROM THE NORTH)
COMPUTE NM HYD       ID=1  HYD=EXST1201  DA=.0459 SQ MI
                     [%A=75] %B=0  %C=20] [%D=5]
                     TP=-0.13  RAIN=-1

 Basin        TP       K      K/TP     N       Unit      B      Area     IA     IF
  Type                                          Peak
              hr       hr                      cfs             sq mi    in     in

mpervious    0.130   0.071   0.545    7.11      9.3   526.28    0.002   0.1    0.04
Pervious     0.130   0.145   1.118    3.16     98.9   294.88    0.044   0.6    1.49
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

PRINT HYD            ID=1  CODE=0

                     HYDROGRAPH NUMBER   EXST1201


      RUNOFF VOLUME =       1.706 ACRE-FT
```

```
        PEAK DISCHARGE RATE =        58.7 CFS
        PEAK OCCURRED AT  1.50 HRS.


    *   CALCULATE BASIN 1202 (DISCHARGE TO SPIRIT DR./UNIVERSITY DR.
    *   INTERSECTION FROM THE EAST)
    COMPUTE NM HYD       ID=2  HYD=EXST1202  DA=.0233 SQ MI
                         %A=67  %B=0  %C=25  %D=8
                         TP=-0.13  RAIN=-1
```

Basin Type	TP	K	K/TP	N	Unit Peak	B	Area	IA	IF
	hr	hr			cfs		sq mi	in	in
mpervious	0.130	0.071	0.545	7.11	7.5	526.28	0.002	0.1	0.04
Pervious	0.130	0.142	1.094	3.23	49.5	300.10	0.021	0.6	1.44

```
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD
PRINT HYD            ID=2  CODE=0

                     HYDROGRAPH NUMBER   EXST1202


        RUNOFF VOLUME =        0.955 ACRE-FT
        PEAK DISCHARGE RATE =         32.3 CFS
        PEAK OCCURRED AT  1.50 HRS.


*   ADD BASINS 1201 AND 1202
ADD HYD              ID=2  HYD=EXST0102  ID I=1  ID II=2
PRINT HYD            ID=2  CODE=0

                     HYDROGRAPH NUMBER   EXST0102


        RUNOFF VOLUME =        2.661 ACRE-FT
        PEAK DISCHARGE RATE =        91.1 CFS
        PEAK OCCURRED AT  1.50 HRS.


*   ROUTE THROUGH 48" RCP UNDER UNIVERSITY DR.
*   THIS 48" RCP DISCHARGES TO A CHANNEL THAT IS ROUTED THROUGH A
*   DETENTION POND BEHIND ETHICON.
COMPUTE RATING CURVE CID=1  VS=1  CODE=-1  SLP=.02
                     DIA=48 IN  N=.013
                          0.00        0.0         0.0         0.0
                          0.21        0.3         1.1         4.3
                          0.42        0.7         4.7         6.7
                          0.63        1.3        10.9         8.6
                          0.84        1.9        19.6        10.2
                          1.05        2.6        30.6        11.6
                          1.26        3.4        43.7        12.9
                          1.47        4.2        58.5        14.0
                          1.68        5.0        74.8        14.9
                          1.89        5.8        92.2        15.8
                          2.11        6.7       111.1        16.5
                          2.32        7.6       129.5        17.1
                          2.53        8.4       147.7        17.6
                          2.74        9.2       165.3        18.0
                          2.95        9.9       181.6        18.3
                          3.16       10.6       196.1        18.4
```

3.37	11.3	207.9	18.4
3.58	11.9	216.0	18.2
3.79	12.3	218.4	17.7
4.00	12.6	218.4	17.4

COMPUTE TRAVEL TIME ID=3 REACH=1 VS=1 L=140 SLP=.02

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.21	1.	0.0091	4.3
0.42	5.	0.0058	6.7
0.63	11.	0.0045	0.0
0.84	20.	0.0038	0.0
1.05	31.	0.0033	0.0
1.26	44.	0.0030	0.0
1.47	59.	0.0028	0.0
1.68	75.	0.0026	0.0
1.89	92.	0.0025	0.0
2.11	111.	0.0024	0.0
2.32	129.	0.0023	0.0
2.53	148.	0.0022	0.0
2.74	165.	0.0022	0.0
2.95	182.	0.0021	0.0
3.16	196.	0.0021	0.0
3.37	208.	0.0021	0.0
3.58	216.	0.0021	0.0
3.79	218.	0.0022	0.0
3.79	218.	0.0022	0.0

ROUTE ID=3 HYD=48OUT INFLOW ID=2 DT=.033333
PRINT HYD ID=3 CODE=0

HYDROGRAPH NUMBER 48OUT

RUNOFF VOLUME = 2.630 ACRE-FT
PEAK DISCHARGE RATE = 90.9 CFS
PEAK OCCURRED AT 1.50 HRS.

* CALCULATE BASIN A-1 RUNOFF.
* BASIN A-1 WAS NOT PART OF MOLZEN-CORBIN'S STUDY. IT IS AN
* EXISTING BASIN ON THE GOLF COURSE. BASIN A-1 DISCHARGES TO
* A 48" RCP CULVERT UNDER I-25.
COMPUTE NM HYD ID=5 HYD=EXISTA1 DA=.04152 SQ MI
%A=88 %B=0 %C=0 %D=12
TP=0.133333 RAIN=-1

Basin Type	TP hr	K hr	K/TP	N	Unit Peak cfs	B	Area sq mi	IA in	IF in
mpervious	0.133	0.073	0.545	7.11	19.7	526.28	0.005	0.1	0.04
Pervious	0.133	0.160	1.201	2.96	76.3	278.37	0.037	0.6	1.67

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

PRINT HYD ID=5 CODE=0

HYDROGRAPH NUMBER EXISTA1

```
      RUNOFF VOLUME =       1.589 ACRE-FT
      PEAK DISCHARGE RATE =        50.5 CFS
      PEAK OCCURRED AT  1.50 HRS.


  * CALCULATE BASIN 722 (DISCHARGE TO CLARK CARR ROAD/SPIRIT DR.
  *  INTERSECTION, EAST SIDE)
  COMPUTE NM HYD       ID=7  HYD=EXIST722  DA=.0210 SQ MI
                       %A=50  %B=0  %C=35  %D=15
                       TP=-0.30  RAIN=-1

Basin        TP       K      K/TP     N       Unit      B      Area     IA     IF
 Type                                          Peak
             hr       hr                      cfs                sq mi    in     in
mpervious    0.300   0.164   0.545    7.11      5.5   526.28    0.003   0.1    0.04
Pervious     0.300   0.312   1.039    3.40     18.6   312.87    0.018   0.5    1.32
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

  PRINT HYD            ID=7  CODE=0

                     HYDROGRAPH NUMBER   EXIST722


      RUNOFF VOLUME =       1.044 ACRE-FT
      PEAK DISCHARGE RATE =        18.9 CFS
      PEAK OCCURRED AT  1.70 HRS.


  *  CALCULATE BASIN 723 (DISCHARGE TO CLARK CARR RD/SPIRIT DR.
  *  INTERSECTION, WEST SIDE)
  COMPUTE NM HYD       ID=2  HYD=EXIST723  DA=.0163 SQ MI
                       %A=50  %B=0  %C=35  %D=15
                       TP=-0.29  RAIN=-1

Basin        TP       K      K/TP     N       Unit      B      Area     IA     IF
 Type                                          Peak
             hr       hr                      cfs                sq mi    in     in
mpervious    0.290   0.158   0.545    7.11      4.4   526.28    0.002   0.1    0.04
Pervious     0.290   0.301   1.039    3.40     14.9   312.87    0.014   0.5    1.32
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

  PRINT HYD            ID=2  CODE=0

                     HYDROGRAPH NUMBER   EXIST723


      RUNOFF VOLUME =       0.810 ACRE-FT
      PEAK DISCHARGE RATE =        15.0 CFS
      PEAK OCCURRED AT  1.67 HRS.


  * ADD BASINS 722 AND 723 FOR TOTAL DISCHARGE TO CLARK CARR/
  *  SPIRIT DR. INTERSECTION
  ADD HYD              ID=2  HYD=EXST2324  ID I=7  ID II=2
  PRINT HYD            ID=2  CODE=0

                     HYDROGRAPH NUMBER   EXST2324
```

```
      RUNOFF VOLUME =       1.855 ACRE-FT
      PEAK DISCHARGE RATE =        33.9 CFS
      PEAK OCCURRED AT  1.70 HRS.


* DIVIDE OUT THE AMOUNT DISCHARGED INTO THE EXISTING 36" STORM DRAIN
*  THAT CROSSES CLARK CARR AT SPIRIT DRIVE.  THIS AMOUNT IS 30.67 CFS
*   AS DERIVED FROM MOLZEN-CORBIN'S ACCESS ROAD "D" DRAINAGE REPORT
*   (ENGINEER'S STAMP DATED 3/26/91).
DIVIDE HYD            ID=2  QMAX=30.67 ID=10  HYD=PIPE  PIPEFLOW
                                       ID=20  HYD=STREET  STREETFLOW

PRINT HYD             ID=20  CODE=0

                    HYDROGRAPH NUMBER     STREET

      RUNOFF VOLUME =       0.032 ACRE-FT
      PEAK DISCHARGE RATE =        3.2 CFS
      PEAK OCCURRED AT  1.70 HRS.


*   ROUTE STREET RUNOFF DOWN TO TWO TYPE "A" INLETS AT CLARK CARR/
*   UNIVERSITY INTERSECTION.
COMPUTE RATING CURVE CID=1  VS=1  SEG=1  MIN EL=0  MAX EL=0.67
                     CH SLP=.0400  FP SLP=.0400  N=.017  DIST=25
                     DIST   EL
                      0     0.67
                      0      0
                     2.00   0.13
                     24.00  0.57
                     25.00  0.57
                     25.00  0.67

                       RATING CURVE VALLEY SECTION  1.0
                      WATER      FLOW       FLOW       FLOW
                     SURFACE     AREA       RATE        VEL
                      ELEV       SQ FT      CFS         FPS
                       0.00        0.0        0.0        0.0
                       0.04        0.0        0.0        1.1
                       0.07        0.0        0.1        1.8
                       0.11        0.1        0.2        2.4
                       0.14        0.2        0.4        2.6
                       0.18        0.3        0.8        2.7
                       0.21        0.5        1.4        3.1
                       0.25        0.7        2.4        3.4
                       0.28        1.0        3.9        3.8
                       0.32        1.4        5.8        4.2
                       0.35        1.8        8.3        4.6
                       0.39        2.3       11.4        5.0
                       0.42        2.9       15.2        5.3
                       0.46        3.5       19.7        5.7
                       0.49        4.2       25.0        6.0
                       0.53        4.9       31.1        6.3
                       0.56        5.7       38.1        6.7
                       0.60        6.6       46.6        7.1
                       0.63        7.5       57.4        7.7
                       0.67        8.4       69.0        8.3
COMPUTE TRAVEL TIME ID=2   REACH=1   VS=1   L=1000   SLP=.0400
```

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.04	0.	0.2449	1.1
0.07	0.	0.1543	1.8
0.11	0.	0.1178	2.4
0.14	0.	0.1066	2.6
0.18	1.	0.1021	2.7
0.21	1.	0.0910	3.1
0.25	2.	0.0809	3.4
0.28	4.	0.0726	3.8
0.32	6.	0.0660	4.2
0.35	8.	0.0605	4.6
0.39	11.	0.0560	5.0
0.42	15.	0.0523	5.3
0.46	20.	0.0490	5.7
0.49	25.	0.0463	6.0
0.53	31.	0.0438	6.3
0.56	38.	0.0417	6.7
0.60	47.	0.0393	7.1
0.63	57.	0.0362	7.7
0.67	69.	0.0336	8.3

ROUTE ID=2 HYD=STREET INFLOW ID=20 DT=.033333
PRINT HYD ID=2 CODE=0

HYDROGRAPH NUMBER STREET

RUNOFF VOLUME = 0.026 ACRE-FT
PEAK DISCHARGE RATE = 2.2 CFS
PEAK OCCURRED AT 1.73 HRS.

* CALCULATE-BASIN 724 (DISCHARGE TO EXISTING OPEN 6' DIA MH
* INLET SOUTHEAST OF CLARK CARR ROAD/UNIVERSITY INTERSECTION)
COMPUTE NM HYD ID=3 HYD=EXIST724 DA=.0465 SQ MI
%A=75 %B=0 %C=20 %D=5
TP=-0.13 RAIN=-1

Basin Type	TP hr	K hr	K/TP	N	Unit Peak cfs	B	Area sq mi	IA in	IF in
mpervious	0.130	0.071	0.545	7.11	9.4	526.28	0.002	0.1	0.04
Pervious	0.130	0.145	1.118	3.16	100.2	294.88	0.044	0.6	1.49

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

PRINT HYD ID=3 CODE=0

HYDROGRAPH NUMBER EXIST724

RUNOFF VOLUME = 1.728 ACRE-FT
PEAK DISCHARGE RATE = 59.5 CFS
PEAK OCCURRED AT 1.50 HRS.

* ADD BASIN 724 RUNOFF TO OTHER RUNOFF IN STORM DRAIN AT CLARK CARR

```
*  FOR TOTAL RUNOFF IN 48" STORM DRAIN UNDER CLARK CARR JUST EAST
*  OF UNIVERSITY DR.
ADD HYD              ID=3  HYD=SDCARR  ID I=3  ID II=2
PRINT HYD            ID=3  CODE=0

                   HYDROGRAPH NUMBER     SDCARR


     RUNOFF VOLUME =       1.754 ACRE-FT
     PEAK DISCHARGE RATE =       59.5 CFS
     PEAK OCCURRED AT  1.50 HRS.


** DEVELOPED CONDITIONS (12/16/92 PLAN)
*  CALCULATE BASIN A-4 RUNOFF
COMPUTE NM HYD       ID=1  HYD=BASINA4  DA=.01844 SQ MI
                     %A=0  %B=20  %C=0  %D=80
                     TP=0.133333 RAIN=-1
```

Basin Type	TP hr	K hr	K/TP	N	Unit Peak cfs	B	Area sq mi	IA in	IF in
mpervious	0.133	0.073	0.545	7.11	58.2	526.28	0.015	0.1	0.04
Pervious	0.133	0.132	0.991	3.56	9.0	324.91	0.004	0.5	1.25

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

```
PRINT HYD            ID=1  CODE=0

                   HYDROGRAPH NUMBER     BASINA4


     RUNOFF VOLUME =       1.809 ACRE-FT
     PEAK DISCHARGE RATE =       49.7 CFS
     PEAK OCCURRED AT  1.50 HRS.


*  ROUTE BASIN A-4 THROUGH STORM DRAIN TO CONFLUENCE WITH
*  BASIN A-3
COMPUTE RATING CURVE CID=1  VS=1  CODE=-1  SLP=.09
(DIA=24 IN)  N=.013
```

0.00	0.0	0.0	0.0
0.11	0.1	0.4	5.9
0.21	0.2	1.6	8.9
0.32	0.3	3.8	11.6
0.42	0.5	6.6	13.7
0.53	0.7	10.4	15.6
0.63	0.8	14.6	17.2
0.74	1.1	19.8	18.7
0.84	1.3	25.0	20.0
0.95	1.5	31.1	21.1
1.05	1.7	36.8	22.0
1.16	1.9	43.3	22.9
1.26	2.1	49.1	23.5
1.37	2.3	55.2	24.1
1.47	2.5	60.4	24.4
1.58	2.7	65.5	24.6
1.68	2.8	69.3	24.6
1.79	3.0	72.2	24.3
1.89	3.1	73.0	23.7
2.00	3.1	73.0	23.2

COMPUTE TRAVEL TIME ID=2 REACH=1 VS=1 L=275 SLP=.09

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.11	0.	0.0129	5.9
0.21	2.	0.0085	8.9
0.32	4.	0.0066	11.6
0.42	7.	0.0056	13.7
0.53	10.	0.0049	0.0
0.63	15.	0.0044	0.0
0.74	20.	0.0041	0.0
0.84	25.	0.0038	0.0
0.95	31.	0.0036	0.0
1.05	37.	0.0035	0.0
1.16	43.	0.0033	0.0
1.26	49.	0.0032	0.0
1.37	55.	0.0032	0.0
1.47	60.	0.0031	0.0
1.58	66.	0.0031	0.0
1.68	69.	0.0031	0.0
1.79	72.	0.0031	0.0
1.89	73.	0.0032	0.0
1.89	73.	0.0032	0.0

ROUTE ID=2 HYD=BASINA4 INFLOW ID=1 DT=.033333
PRINT HYD ID=2 CODE=0

HYDROGRAPH NUMBER BASINA4

RUNOFF VOLUME = 1.737 ACRE-FT
PEAK DISCHARGE RATE = 49.7 CFS
PEAK OCCURRED AT 1.50 HRS.

COMPUTE RATING CURVE CID=1 VS=1 CODE=-1 SLP=.016
DIA=30 IN N=.013

0.00	0.0	0.0	0.0
0.13	0.1	0.3	2.8
0.26	0.3	1.2	4.3
0.39	0.5	2.7	5.6
0.53	0.8	5.1	6.7
0.66	1.0	7.9	7.6
0.79	1.3	11.2	8.4
0.92	1.6	15.0	9.1
1.05	2.0	19.1	9.8
1.18	2.3	23.5	10.3
1.32	2.6	28.4	10.8
1.45	3.0	33.1	11.2
1.58	3.3	37.7	11.5
1.71	3.6	42.1	11.8
1.84	3.9	46.3	11.9
1.97	4.1	49.9	12.0
2.11	4.4	53.2	12.0
2.24	4.6	55.2	11.9
2.37	4.8	55.8	11.6
2.50	4.9	55.8	11.4

COMPUTE TRAVEL TIME ID=3 REACH=1 VS=1 L=650 SLP=.016

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.13	0.	0.0648	2.8
0.26	1.	0.0415	4.3
0.39	3.	0.0323	5.6
0.53	5.	0.0268	6.7
0.66	8.	0.0236	7.6
0.79	11.	0.0214	8.4
0.92	15.	0.0197	9.1
1.05	19.	0.0185	9.8
1.18	23.	0.0175	10.3
1.32	28.	0.0167	10.8
1.45	33.	0.0161	11.2
1.58	38.	0.0157	11.5
1.71	42.	0.0153	11.8
1.84	46.	0.0151	11.9
1.97	50.	0.0150	12.0
2.11	53.	0.0150	12.0
2.24	55.	0.0152	11.9
2.37	56.	0.0156	11.6
2.37	56.	0.0156	11.6

ROUTE ID=3 HYD=BASINA4 INFLOW ID=2 DT=.033333
PRINT HYD ID=3 CODE=0

HYDROGRAPH NUMBER BASINA4

RUNOFF VOLUME = 1.736 ACRE-FT
PEAK DISCHARGE RATE = 49.0 CFS
PEAK OCCURRED AT 1.53 HRS.

* CALCULATE BASIN A-3 RUNOFF
COMPUTE NM HYD ID=1 HYD=BASINA3 DA=.02129 SQ MI
%A=0 %B=20 %C=0 %D=80
TP=0.133333 RAIN=-1

Basin Type	TP hr	K hr	K/TP	N	Unit Peak cfs	B	Area sq mi	IA in	IF in
mpervious	0.133	0.073	0.545	7.11	67.2	526.28	0.017	0.1	0.04
Pervious	0.133	0.132	0.991	3.56	10.4	324.91	0.004	0.5	1.25

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

PRINT HYD ID=1 CODE=0

HYDROGRAPH NUMBER BASINA3

RUNOFF VOLUME = 2.089 ACRE-FT
PEAK DISCHARGE RATE = 57.4 CFS
PEAK OCCURRED AT 1.50 HRS.

* ADD BASINS A-4 AND A-3 AT CONFLUENCE ON EAST SIDE OF UNIVERSITY.

```
*  THIS DEVELOPED RUNOFF CAN BE COMPARED TO UNDEVELOPED BASIN 1201
*  RUNOFF.
ADD HYD              ID=2  HYD=MANHOLE  ID I=3  ID II=1
PRINT HYD            ID=2  CODE=0

                   HYDROGRAPH NUMBER    MANHOLE


     RUNOFF VOLUME =       3.825 ACRE-FT
     PEAK DISCHARGE RATE =     105.5 CFS
     PEAK OCCURRED AT  1.50 HRS.


*  ROUTE RUNOFF THROUGH STORM DRAIN ACROSS UNIVERSITY DRIVE TO NEW
*  DETENTION POND.
COMPUTE RATING CURVE CID=1  VS=1  CODE=-1  SLP=.025
                    DIA=36 IN  N=.013
                      0.00        0.0         0.0         0.0
                      0.16        0.1         0.6         4.0
                      0.32        0.4         2.5         6.2
                      0.47        0.7         5.6         7.9
                      0.63        1.1        10.2         9.4
                      0.79        1.5        16.0        10.8
                      0.95        1.9        22.9        11.9
                      1.11        2.4        30.8        12.9
                      1.26        2.8        38.8        13.8
                      1.42        3.3        48.0        14.6
                      1.58        3.8        57.5        15.2
                      1.74        4.3        67.2        15.8
                      1.89        4.7        76.2        16.3
                      2.05        5.1        85.5        16.6
                      2.21        5.6        94.1        16.9
                      2.37        6.0       101.8        17.0
                      2.53        6.4       108.0        17.0
                      2.68        6.7       112.0        16.8
                      2.84        6.9       113.4        16.4
                      3.00        7.1       113.4        16.0
COMPUTE TRAVEL TIME ID=3  REACH=1  VS=1  L=400  SLP=.025

                          TRAVEL TIME TABLE
                            REACH  1.0

     WATER          FLOW          TRAVEL          FLOW
     DEPTH          RATE           TIME           VEL
     FEET           CFS            HRS            FPS
      0.16            1.        0.0278           4.0
      0.32            3.        0.0178           6.2
      0.47            6.        0.0140           7.9
      0.63           10.        0.0118           9.4
      0.79           16.        0.0103          10.8
      0.95           23.        0.0093          11.9
      1.11           31.        0.0086          12.9
      1.26           39.        0.0081          13.8
      1.42           48.        0.0076          14.6
      1.58           58.        0.0073          15.2
      1.74           67.        0.0070          15.8
      1.89           76.        0.0068          16.3
      2.05           86.        0.0067          16.6
      2.21           94.        0.0066          16.9
      2.37          102.        0.0065          17.0
      2.53          108.        0.0065          17.0
```

```
                              2.68        112.      0.0066      16.8
                              2.84        113.      0.0068      16.4
                              2.84        113.      0.0068      16.4
ROUTE                   ID=3  HYD=PONDIN  INFLOW ID=2  DT=.033333
PRINT HYD               ID=3  CODE=0

                         HYDROGRAPH NUMBER      PONDIN


     RUNOFF VOLUME =          3.747 ACRE-FT
     PEAK DISCHARGE RATE =        105.0 CFS
     PEAK OCCURRED AT  1.53 HRS.


*  CALCULATE BASIN A-2 RUNOFF.  BASIN A-2 WILL BE CREATED WHENEVER
*  NEW DETENTION POND IS BUILT ON GOLF COURSE.
COMPUTE NM HYD          ID=1  HYD=BASINA2  DA=.01259 SQ MI
                        %A=63  %B=0  %C=0  %D=37
                        TP=0.133333 RAIN=-1
```

Basin Type	TP hr	K hr	K/TP	N	Unit Peak cfs	B	Area sq mi	IA in	IF in
mpervious	0.133	0.073	0.545	7.11	18.4	526.28	0.005	0.1	0.04
Pervious	0.133	0.160	1.201	2.96	16.6	278.37	0.008	0.6	1.67

```
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

PRINT HYD               ID=1  CODE=0

                         HYDROGRAPH NUMBER    BASINA2


     RUNOFF VOLUME =          0.747 ACRE-FT
     PEAK DISCHARGE RATE =        21.7 CFS
     PEAK OCCURRED AT  1.50 HRS.


*  ADD TO RUNOFF CROSSING UNIVERSITY THROUGH NEW STORM DRAIN.
ADD HYD                 ID=3  HYD=PONDIN  ID I=3  ID II=1
PRINT HYD               ID=3  CODE=0

                         HYDROGRAPH NUMBER      PONDIN


     RUNOFF VOLUME =          4.494 ACRE-FT
     PEAK DISCHARGE RATE =        126.1 CFS
     PEAK OCCURRED AT  1.53 HRS.


*  ROUTE RUNOFF THROUGH POND
ROUTE RESERVOIR         ID=6  HYD=PONDOUT  INFLOW ID=3  CODE=10
                        OUTFLOW(CFS)  STORAGE(AC-FT)  EL(FT)
                         0               0             100
                         5.0             4.0           103


* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

TIME (HRS)	INFLOW DISCHARGE (CFS)	WATER ELEV (FT)	WATER VOLUME (A-F)	TOTAL OUTFLOW (CFS)
0.0	0.0	100.0	0.0	
0.3	0.0	100.0	0.0	0.0
0.7	0.0	100.0	0.0	0.0
1.0	0.0	100.0	0.0	0.0
1.3	29.1	100.1	0.1	0.1
1.7	69.5	101.9	2.5	3.2
2.0	29.9	102.7	3.7	4.6
2.3	6.9	103.0	4.0	5.0
2.7	2.9	103.0	4.0	5.0
3.0	1.5	102.9	3.9	4.9
3.3	0.2	102.8	3.8	4.7
3.7	0.1	102.7	3.7	4.6
4.0	0.1	102.7	3.5	4.4
4.3	0.1	102.6	3.4	4.3
4.7	0.1	102.5	3.3	4.1
5.0	0.1	102.4	3.2	4.0
5.3	0.1	102.3	3.1	3.9
5.7	0.1	102.2	3.0	3.7
6.0	0.1	102.2	2.9	3.6
6.3	0.0	102.1	2.8	3.5
6.7	0.0	102.0	2.7	3.4
7.0	0.0	102.0	2.6	3.3
7.3	0.0	101.9	2.5	3.1
7.7	0.0	101.8	2.4	3.0
8.0	0.0	101.8	2.4	2.9
8.3	0.0	101.7	2.3	2.8
8.7	0.0	101.6	2.2	2.7
9.0	0.0	101.6	2.1	2.6
9.3	0.0	101.5	2.0	2.6
9.7	0.0	101.5	2.0	2.5
10.0	0.0	101.4	1.9	2.4
10.3	0.0	101.4	1.8	2.3
10.7	0.0	101.3	1.8	2.2
11.0	0.0	101.3	1.7	2.2
11.3	0.0	101.2	1.7	2.1
11.7	0.0	101.2	1.6	2.0
12.0	0.0	101.2	1.6	1.9
12.3	0.0	101.1	1.5	1.9
12.7	0.0	101.1	1.5	1.8
13.0	0.0	101.1	1.4	1.8
13.3	0.0	101.0	1.4	1.7
13.7	0.0	101.0	1.3	1.6
14.0	0.0	100.9	1.3	1.6
14.3	0.0	100.9	1.2	1.5
14.7	0.0	100.9	1.2	1.5
15.0	0.0	100.9	1.1	1.4
15.3	0.0	100.8	1.1	1.4
15.7	0.0	100.8	1.1	1.3
16.0	0.0	100.8	1.0	1.3
16.3	0.0	100.7	1.0	1.2
16.7	0.0	100.7	1.0	1.2
17.0	0.0	100.7	0.9	1.2
17.3	0.0	100.7	0.9	1.1
17.7	0.0	100.6	0.9	1.1
18.0	0.0	100.6	0.8	1.0
18.3	0.0	100.6	0.8	1.0

PEAK DISCHARGE = 4.99 CFS.
MAXIMUM WATER ELEVATION = 103.0 FT.
MAXIMUM RESERVOIR STORAGE = 3.99 ACRE-FT.

PRINT HYD ID=6 CODE=0

HYDROGRAPH NUMBER PONDOUT

RUNOFF VOLUME = 3.695 ACRE-FT
PEAK DISCHARGE RATE = 5.0 CFS
PEAK OCCURRED AT 2.43 HRS.

* ROUTE TO OUTFALL UNDER I-25

COMPUTE RATING CURVE CID=1 VS=1 SEG=1 MIN EL=0 MAX EL=2
CH_SLP=.10 FP_SLP=.10 N=.030 DIST=20

DIST	EL
0	2
8	0
12	0
20	2

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	FLOW VEL FPS
0.00	0.0	0.0	0.0
0.11	0.5	1.5	3.3
0.21	1.0	5.0	5.0
0.32	1.7	10.4	6.2
0.42	2.4	17.6	7.3
0.53	3.2	26.7	8.3
0.63	4.1	37.8	9.2
0.74	5.1	51.1	10.0
0.84	6.2	66.6	10.7
0.95	7.4	84.5	11.4
1.05	8.6	104.8	12.1
1.16	10.0	127.8	12.8
1.26	11.4	153.5	13.4
1.37	13.0	182.0	14.0
1.47	14.6	213.3	14.6
1.58	16.3	247.8	15.2
1.68	18.1	285.3	15.8
1.79	20.0	326.1	16.3
1.89	21.9	370.2	16.9
2.00	24.0	417.7	17.4

COMPUTE TRAVEL TIME ID=2 REACH=1 VS=1 L=2200 SLP=.10

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.11	2.	0.1866	3.3
0.21	5.	0.1234	5.0
0.32	10.	0.0979	6.2
0.42	18.	0.0833	7.3
0.53	27.	0.0737	8.3
0.63	38.	0.0667	9.2
0.74	51.	0.0613	10.0

```
                              0.84        67.     0.0570      10.7
                              0.95        84.     0.0534      11.4
                              1.05       105.     0.0504      12.1
                              1.16       128.     0.0478      12.8
                              1.26       153.     0.0455      13.4
                              1.37       182.     0.0435      14.0
                              1.47       213.     0.0418      14.6
                              1.58       248.     0.0402      15.2
                              1.68       285.     0.0387      15.8
                              1.79       326.     0.0374      16.3
                              1.89       370.     0.0362      16.9
                              2.00       418.     0.0351      17.4
ROUTE                 ID=2   HYD=I25   INFLOW ID=6   DT=.033333
PRINT HYD             ID=2   CODE=0

                          HYDROGRAPH NUMBER          I25

          RUNOFF VOLUME =       3.707 ACRE-FT
          PEAK DISCHARGE RATE =         5.0 CFS
          PEAK OCCURRED AT  2.50 HRS.


     *  CALCULATE RUNOFF FROM NEW (SMALLER) BASIN A-1 ON GOLF COURSE.
     COMPUTE NM HYD       ID=1  HYD=DEVA1  DA=.02893 SQ MI
                          %A=100  %B=0  %C=0  %D=0
                          TP=0.133333 RAIN=-1

 Basin        TP       K      K/TP     N       Unit       B      Area     IA      IF
  Type                                          Peak
              hr       hr                       cfs                sq mi    in      in

mpervious    0.133   0.160   1.201    2.96      60.4   278.37    0.029   0.6     1.67
     PRINT HYD            ID=1  CODE=0

                          HYDROGRAPH NUMBER       DEVA1

          RUNOFF VOLUME =       0.815 ACRE-FT
          PEAK DISCHARGE RATE =        28.7 CFS
          PEAK OCCURRED AT  1.53 HRS.


     *  ADD BASIN A-1 RUNOFF AT I-25 CULVERT FOR TOTAL RUNOFF UNDER I-25.
     *  THIS CAN BE COMPARED TO EXISTING RUNOFF UNDER I-25.
     ADD HYD              ID=3  HYD=I25DEV  ID I=1  ID II=2
     PRINT HYD            ID=3  CODE=0

                          HYDROGRAPH NUMBER      I25DEV


          RUNOFF VOLUME =       4.522 ACRE-FT
          PEAK DISCHARGE RATE =        29.3 CFS
          PEAK OCCURRED AT  1.53 HRS.


     *  CALCULATE BASIN C-2 RUNOFF.
     COMPUTE NM HYD       ID=2  HYD=DEVELC2  DA=.01192 SQ MI
                          %A=0  %B=20  %C=0  %D=80
                          TP=0.133333 RAIN=-1
```

Basin Type	TP	K	K/TP	N	Unit Peak	B	Area	IA	IF
	hr	hr			cfs		sq mi	in	in
mpervious	0.133	0.073	0.545	7.11	37.6	526.28	0.010	0.1	0.04
Pervious	0.133	0.132	0.991	3.56	5.8	324.91	0.002	0.5	1.25

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

PRINT HYD ID=2 CODE=0

HYDROGRAPH NUMBER DEVELC2

RUNOFF VOLUME = 1.170 ACRE-FT
PEAK DISCHARGE RATE = 32.1 CFS
PEAK OCCURRED AT 1.50 HRS.

* CALCULATE [BASIN C-1] RUNOFF
COMPUTE NM HYD ID=1 HYD=DEVELC1 DA=.0239 SQ MI
%A=0 [%B=40] [%C=5] [%D=55]
TP=0.133333 RAIN=-1

Basin Type	TP	K	K/TP	N	Unit Peak	B	Area	IA	IF
	hr	hr			cfs		sq mi	in	in
mpervious	0.133	0.073	0.545	7.11	51.9	526.28	0.013	0.1	0.04
Pervious	0.133	0.129	0.970	3.64	26.7	330.42	0.011	0.5	1.20

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

PRINT HYD ID=1 CODE=0

HYDROGRAPH NUMBER DEVELC1

RUNOFF VOLUME = 1.940 ACRE-FT
PEAK DISCHARGE RATE = [55.8 CFS]
PEAK OCCURRED AT 1.50 HRS.

* [ADD BASINS C-2 AND C-1 FOR TOTAL DISCHARGE INTO STORM DRAIN
* UNDER UNIVERSITY DR.
* THIS CAN BE COMPARED TO BASIN 1201/1202 DISCHARGE ABOVE.
ADD HYD ID=2 HYD=DEVC2C1 ID I=1 ID II=2
PRINT HYD ID=2 CODE=0

HYDROGRAPH NUMBER DEVC2C1

RUNOFF VOLUME = 3.109 ACRE-FT
PEAK DISCHARGE RATE = [87.9 CFS]
PEAK OCCURRED AT 1.50 HRS.

* [ROUTE THROUGH 48"] RCP UNDER UNIVERSITY
COMPUTE RATING CURVE CID=1 VS=1 CODE=-1 SLP=.02
DIA=48 IN N=.013

0.00	0.0	0.0	0.0
0.21	0.3	1.1	4.3
0.42	0.7	4.7	6.7

0.63	1.3	10.9	8.6
0.84	1.9	19.6	10.2
1.05	2.6	30.6	11.6
1.26	3.4	43.7	12.9
1.47	4.2	58.5	14.0
1.68	5.0	74.8	14.9
[1.89]	[5.8]	[92.2]	[15.8]
2.11	6.7	111.1	16.5
2.32	7.6	129.5	17.1
2.53	8.4	147.7	17.6
2.74	9.2	165.3	18.0
2.95	9.9	181.6	18.3
3.16	10.6	196.1	18.4
3.37	11.3	207.9	18.4
3.58	11.9	216.0	18.2
3.79	12.3	218.4	17.7
4.00	12.6	218.4	17.4

COMPUTE TRAVEL TIME ID=4 REACH=1 VS=1 L=140 SLP=.02

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.21	1.	0.0091	4.3
0.42	5.	0.0058	6.7
0.63	11.	0.0045	0.0
0.84	20.	0.0038	0.0
1.05	31.	0.0033	0.0
1.26	44.	0.0030	0.0
1.47	59.	0.0028	0.0
1.68	75.	0.0026	0.0
[1.89]	[92.]	[0.0025]	[0.0]
2.11	111.	0.0024	0.0
2.32	129.	0.0023	0.0
2.53	148.	0.0022	0.0
2.74	165.	0.0022	0.0
2.95	182.	0.0021	0.0
3.16	196.	0.0021	0.0
3.37	208.	0.0021	0.0
3.58	216.	0.0021	0.0
3.79	218.	0.0022	0.0
3.79	218.	0.0022	0.0

ROUTE ID=4 HYD=DEV48OUT INFLOW ID=2 DT=.033333
PRINT HYD ID=4 CODE=0

HYDROGRAPH NUMBER DEV48OUT

RUNOFF VOLUME = 3.020 ACRE-FT
PEAK DISCHARGE RATE = [87.9 CFS]
PEAK OCCURRED AT 1.50 HRS.

* CALCULATE BASIN D RUNOFF. BASIN D WILL BE INPUT INTO THE NEW
* SPIRIT DRIVE STORM DRAIN EXTENSIONS PLANNED BY MOLZEN-CORBIN.
* THIS HYMO RUN IS CONSISTENT WITH MOLZEN-CORBIN'S DESIGN.
* CALCULATE BASIN D=9?
COMPUTE NM HYD ID=1 HYD=BASIND9 DA=.002707 SQ MI
%A=0 [%B=20] %C=0 [%D=80]

TP=0.133333 RAIN=-1

Basin Type	TP hr	K hr	K/TP	N	Unit Peak cfs	B	Area sq mi	IA in	IF in
mpervious	0.133	0.073	0.545	7.11	8.5	526.28	0.002	0.1	0.04
Pervious	0.133	0.132	0.991	3.56	1.3	324.91	0.001	0.5	1.25

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

PRINT HYD ID=1 CODE=0

HYDROGRAPH NUMBER BASIND9

RUNOFF VOLUME = 0.266 ACRE-FT
PEAK DISCHARGE RATE = 7.3 CFS
PEAK OCCURRED AT 1.50 HRS.

* DIVIDE 2.47 CFS INTO INLET BASED ON MOLZEN'S DESIGN.
DIVIDE HYD ID=1 QMAX=2.47 ID=10 HYD=NODE1PIP PIPEFLOW
ID=20 HYD=NODE1STR STREETFLOW

PRINT HYD ID=20 CODE=0

HYDROGRAPH NUMBER NODE1STR

RUNOFF VOLUME = 0.082 ACRE-FT
PEAK DISCHARGE RATE = 4.8 CFS
PEAK OCCURRED AT 1.50 HRS.

* ROUTE STREET FLOW TO NEXT INLET (NODE 3)
COMPUTE RATING CURVE CID=1 VS=1 SEG=1 MIN EL=0 MAX EL=0.67
CH SLP=.0061 FP SLP=.0061 N=.017 DIST=25

DIST	EL
0	0.67
0	0
2.00	0.13
24.00	0.57
25.00	0.57
25.00	0.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	FLOW VEL FPS
0.00	0.0	0.0	0.0
0.04	0.0	0.0	0.4
0.07	0.0	0.0	0.7
0.11	0.1	0.1	0.9
0.14	0.2	0.2	1.0
0.18	0.3	0.3	1.1
0.21	0.5	0.5	1.2
0.25	0.7	0.9	1.3
0.28	1.0	1.5	1.5
0.32	1.4	2.3	1.6
0.35	1.8	3.3	1.8
0.39	2.3	4.5	1.9
0.42	2.9	5.9	2.1

0.46	3.5	7.7	2.2
0.49	4.2	9.8	2.3
0.53	4.9	12.1	2.5
0.56	5.7	14.9	2.6
0.60	6.6	18.2	2.8
0.63	7.5	22.4	3.0
0.67	8.4	27.0	3.2

COMPUTE TRAVEL TIME ID=21 REACH=1 VS=1 L=350 SLP=.0061

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.04	0.	0.2195	0.4
0.07	0.	0.1383	0.7
0.11	0.	0.1055	0.9
0.14	0.	0.0956	1.0
0.18	0.	0.0915	1.1
0.21	1.	0.0815	1.2
0.25	1.	0.0725	1.3
0.28	2.	0.0651	1.5
0.32	2.	0.0591	1.6
0.35	3.	0.0543	1.8
0.39	4.7	0.0502	1.9
0.42	6.	0.0468	2.1
0.46	8.	0.0440	2.2
0.49	10.	0.0415	2.3
0.53	12.	0.0393	2.5
0.56	15.	0.0374	2.6
0.60	18.	0.0352	2.8
0.63	22.	0.0324	3.0
0.67	27.	0.0301	3.2

ROUTE ID=21 HYD=NODE3STR INFLOW ID=20 DT=.033333
PRINT HYD ID=21 CODE=0

HYDROGRAPH NUMBER NODE3STR

RUNOFF VOLUME = 0.079 ACRE-FT
PEAK DISCHARGE RATE = 4.3 CFS
PEAK OCCURRED AT 1.53 HRS.

* ROUTE PIPE FLOW TO NEXT INLET
COMPUTE RATING CURVE CID=1 VS=1 CODE=-1 SLP=.0035
DIA=24 IN N=.013

0.00	0.0	0.0	0.0
0.11	0.1	0.1	1.2
0.21	0.2	0.3	1.8
0.32	0.3	0.7	2.3
0.42	0.5	1.3	2.7
0.53	0.7	2.1	3.1
0.63	0.8	2.9	3.4
0.74	1.1	3.9	3.7
0.84	1.3	4.9	3.9
0.95	1.5	6.1	4.2
1.05	1.7	7.3	4.3
1.16	1.9	8.5	4.5
1.26	2.1	9.7	4.6

```
                    1.37          2.3          10.9          4.7
                    1.47          2.5          11.9          4.8
                    1.58          2.7          12.9          4.9
                    1.68          2.8          13.7          4.9
                    1.79          3.0          14.2          4.8
                    1.89          3.1          14.4          4.7
                    2.00          3.1          14.4          4.6
COMPUTE TRAVEL TIME ID=11  REACH=1  VS=1  L=350  SLP=.0035

                              TRAVEL TIME TABLE
                                  REACH  1.0

                    WATER         FLOW         TRAVEL        FLOW
                    DEPTH         RATE          TIME         VEL
                    FEET          CFS           HRS          FPS
                     0.11            0.       0.0835          1.2
                     0.21            0.       0.0552          1.8
                     0.32            1.       0.0424          2.3
                     0.42            1.       0.0360          2.7
                     0.53            2.       0.0315          3.1
                     0.63            3.       0.0286          3.4
                     0.74            4.       0.0263          3.7
                     0.84            5.       0.0247          3.9
                     0.95            6.       0.0233          4.2
                     1.05            7.       0.0224          4.3
                     1.16            9.       0.0215          4.5
                     1.26           10.       0.0210          4.6
                     1.37           11.       0.0205          4.7
                     1.47           12.       0.0202          4.8
                     1.58           13.       0.0200          4.9
                     1.68           14.       0.0200          4.9
                     1.79           14.       0.0203          4.8
                     1.89           14.       0.0208          4.7
                     1.89           14.       0.0208          4.7
ROUTE                    ID=11  HYD=NODE3IN  INFLOW ID=10  DT=.033333
PRINT HYD                ID=11  CODE=0

                         HYDROGRAPH NUMBER    NODE3IN

                    RUNOFF VOLUME =       0.161 ACRE-FT
                    PEAK DISCHARGE RATE =          2.5 CFS
                    PEAK OCCURRED AT  1.73 HRS.


*  CALCULATE BASIN D-8
COMPUTE NM HYD           ID=1  HYD=BASIND8  DA=.001649 SQ MI
                         %A=0  %B=20  %C=0  %D=80
                         TP=0.133333 RAIN=-1

 Basin          TP         K        K/TP       N        Unit          B        Area       IA       IF
  Type                                                  Peak
                 hr         hr                           cfs                  sq mi       in       in

mpervious      0.133      0.073      0.545     7.11        5.2    526.28      0.001      0.1     0.04
Pervious       0.133      0.132      0.991     3.56        0.8    324.91      0.000      0.5     1.25
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

PRINT HYD                ID=1  CODE=0

                         HYDROGRAPH NUMBER    BASIND8
```

```
      RUNOFF VOLUME =        0.162 ACRE-FT
      PEAK DISCHARGE RATE =        4.5 CFS
      PEAK OCCURRED AT  1.50 HRS.


 *  ROUTE BASIN D-8 THROUGH ON-SITE DETENTION POND IN PARKING LOT.
ROUTE RESERVOIR       ID=2  HYD=D8OUT  INFLOW ID=1  CODE=10
                      OUTFLOW(CFS)  STORAGE(AC-FT)  ELEV(FT)
                        0              0              100
                        0.12           0.5            101
```

* *

TIME (HRS)	INFLOW DISCHARGE (CFS)	WATER ELEV (FT)	WATER VOLUME (A-F)	TOTAL OUTFLOW (CFS)
0.0	0.0	100.0	0.0	
0.3	0.0	100.0	0.0	0.0
0.7	0.0	100.0	0.0	0.0
1.0	0.0	100.0	0.0	0.0
1.3	1.2	100.0	0.0	0.0
1.7	2.3	100.2	0.1	0.0
2.0	1.0	100.3	0.1	0.0
2.3	0.2	100.3	0.1	0.0
2.7	0.1	100.3	0.2	0.0
3.0	0.0	100.3	0.2	0.0

```
PEAK DISCHARGE =            0.04 CFS
MAXIMUM WATER ELEVATION =   100.3 FT.
MAXIMUM RESERVOIR STORAGE =     0.15 ACRE-FT.
    PRINT HYD                ID=2  CODE=0

                       HYDROGRAPH NUMBER      D8OUT


      RUNOFF VOLUME =        0.004 ACRE-FT
      PEAK DISCHARGE RATE =        1.0 CFS
      PEAK OCCURRED AT  1.50 HRS.


 *  ADD TO MAIN PIPE RUNOFF (INPUT BASIN D-8 INTO BACK OF INLET)
ADD HYD                 ID=10  HYD=NODE1PIP ID I=11  ID II=2
PRINT HYD               ID=10  CODE=0

                       HYDROGRAPH NUMBER   NODE1PIP


      RUNOFF VOLUME =        0.166 ACRE-FT
      PEAK DISCHARGE RATE =        2.5 CFS
      PEAK OCCURRED AT  1.80 HRS.


 *  CALCULATE BASIN D-7
COMPUTE NM HYD          ID=1  HYD=BASIND7  DA=.002518 SQ MI
                        %A=0  %B=20  %C=0  %D=80
```

TP=0.133333 RAIN=-1

Basin Type	TP hr	K hr	K/TP	N	Unit Peak cfs	B	Area sq mi	IA in	IF in
mpervious	0.133	0.073	0.545	7.11	8.0	526.28	0.002	0.1	0.04
Pervious	0.133	0.132	0.991	3.56	1.2	324.91	0.001	0.5	1.25

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

PRINT HYD ID=1 CODE=0

HYDROGRAPH NUMBER BASIND7

RUNOFF VOLUME = 0.247 ACRE-FT
PEAK DISCHARGE RATE = 6.8 CFS
PEAK OCCURRED AT 1.50 HRS.

* ADD TO STREET FLOW BYPASS FROM PREVIOUS INLET.
ADD HYD ID=21 HYD=NODE3STR ID I=21 ID II=1
PRINT HYD ID=21 CODE=0

HYDROGRAPH NUMBER NODE3STR

RUNOFF VOLUME = 0.326 ACRE-FT
PEAK DISCHARGE RATE = 10.8 CFS
PEAK OCCURRED AT 1.53 HRS.

* DIVIDE 3.72 CFS INTO INLET BASED ON MOLZEN'S DESIGN.
DIVIDE HYD ID=21 QMAX=3.72 ID=11 HYD=NODE3PIP PIPEFLOW
ID=20 HYD=NODE3STR STREETFLOW
PRINT HYD ID=20 CODE=0

HYDROGRAPH NUMBER NODE3STR

RUNOFF VOLUME = 0.105 ACRE-FT
PEAK DISCHARGE RATE = 7.0 CFS
PEAK OCCURRED AT 1.53 HRS.

* ADD PIPE FLOW AT NODE 3
ADD HYD ID=11 HYD=NODE3PIP ID I=10 ID II=11
PRINT HYD ID=11 CODE=0

HYDROGRAPH NUMBER NODE3PIP

RUNOFF VOLUME = 0.387 ACRE-FT
PEAK DISCHARGE RATE = 6.2 CFS
PEAK OCCURRED AT 1.73 HRS.

* ROUTE PIPE FLOW TO NEXT INLET (NODE 6)
COMPUTE RATING CURVE CID=1 VS=1 CODE=-1 SLP=.0169
DIA=24 IN. N=.013
0.00 0.0 0.0 0.0

```
                0.11        0.1         0.2         2.6
                0.21        0.2         0.7         3.9
                0.32        0.3         1.6         5.0
                0.42        0.5         2.8         5.9
                0.53        0.7         4.5         6.8
                0.63        0.8         6.3         7.5
                0.74        1.1         8.6         8.1
                0.84        1.3        10.8         8.6
                0.95        1.5        13.5         9.2
                1.05        1.7        16.0         9.6
                1.16        1.9        18.7         9.9
                1.26        2.1        21.3        10.2
                1.37        2.3        23.9        10.4
                1.47        2.5        26.2        10.6
                1.58        2.7        28.4        10.7
                1.68        2.8        30.0        10.7
                1.79        3.0        31.3        10.5
                1.89        3.1        31.6        10.3
                2.00        3.1        31.6        10.1
COMPUTE TRAVEL TIME ID=10  REACH=1  VS=1  L=425  SLP=.0169

                    TRAVEL TIME TABLE
                        REACH  1.0

          WATER        FLOW        TRAVEL        FLOW
          DEPTH        RATE         TIME         VEL
          FEET         CFS          HRS          FPS
           0.11          0.       0.0461         2.6
           0.21          1.       0.0305         3.9
           0.32          2.       0.0235         5.0
           0.42          3.       0.0199         5.9
           0.53          5.       0.0174         6.8
           0.63          6.       0.0158         7.5
           0.74          9.       0.0145         8.1
           0.84         11.       0.0137         8.6
           0.95         13.       0.0129         9.2
           1.05         16.       0.0124         9.6
           1.16         19.       0.0119         9.9
           1.26         21.       0.0116        10.2
           1.37         24.       0.0113        10.4
           1.47         26.       0.0112        10.6
           1.58         28.       0.0111        10.7
           1.68         30.       0.0111        10.7
           1.79         31.       0.0112        10.5
           1.89         32.       0.0115        10.3
           1.89         32.       0.0115        10.3
ROUTE                ID=10  HYD=NODE6IN  INFLOW ID=11  DT=.033333
PRINT HYD            ID=10  CODE=0

                    HYDROGRAPH NUMBER    NODE6IN


     RUNOFF VOLUME =       0.366 ACRE-FT
     PEAK DISCHARGE RATE =         6.3 CFS
     PEAK OCCURRED AT  1.43 HRS.


*  ROUTE STREET FLOW TO NEXT INLET (NODE 6)
COMPUTE RATING CURVE CID=1  VS=1  SEG=1  MIN EL=0  MAX EL=0.67
                     CH SLP=.0061  FP SLP=.0061  N=.017  DIST=25
                     DIST   EL
```

```
 0     0.67
 0      0
2.00   0.13
24.00  0.57
25.00  0.57
25.00  0.67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	FLOW VEL FPS
0.00	0.0	0.0	0.0
0.04	0.0	0.0	0.4
0.07	0.0	0.0	0.7
0.11	0.1	0.1	0.9
0.14	0.2	0.2	1.0
0.18	0.3	0.3	1.1
0.21	0.5	0.5	1.2
0.25	0.7	0.9	1.3
0.28	1.0	1.5	1.5
0.32	1.4	2.3	1.6
0.35	1.8	3.3	1.8
0.39	2.3	4.5	1.9
0.42	2.9	5.9	2.1
0.46	3.5	7.7	2.2
0.49	4.2	9.8	2.3
0.53	4.9	12.1	2.5
0.56	5.7	14.9	2.6
0.60	6.6	18.2	2.8
0.63	7.5	22.4	3.0
0.67	8.4	27.0	3.2

COMPUTE TRAVEL TIME ID=21 REACH=1 VS=1 L=425 SLP=.0061

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.04	0.	0.2666	0.4
0.07	0.	0.1679	0.7
0.11	0.	0.1282	0.9
0.14	0.	0.1161	1.0
0.18	0.	0.1111	1.1
0.21	1.	0.0990	1.2
0.25	1.	0.0880	1.3
0.28	2.	0.0790	1.5
0.32	2.	0.0718	1.6
0.35	3.	0.0659	1.8
0.39	4.	0.0610	1.9
0.42	6.	0.0569	2.1
0.46	8.	0.0534	2.2
0.49	10.	0.0503	2.3
0.53	12.	0.0477	2.5
0.56	15.	0.0454	2.6
0.60	18.	0.0428	2.8
0.63	22.	0.0394	3.0
0.67	27.	0.0366	3.2

```
ROUTE                ID=21   HYD=NODE6STR   INFLOW ID=20   DT=.033333
PRINT HYD            ID=21   CODE=0
```

HYDROGRAPH NUMBER NODE6STR

RUNOFF VOLUME = 0.099 ACRE-FT
PEAK DISCHARGE RATE = 6.0 CFS
PEAK OCCURRED AT 1.57 HRS.

* CALCULATE BASIN-D-6
COMPUTE NM HYD ID=1 HYD=BASIND6 DA=.004954 SQ MI
%A=0 %B=20 %C=0 %D=80
TP=0.133333 RAIN=-1

Basin Type	TP	K	K/TP	N	Unit Peak	B	Area	IA	IF
	hr	hr			cfs		sq mi	in	in
mpervious	0.133	0.073	0.545	7.11	15.6	526.28	0.004	0.1	0.04
Pervious	0.133	0.132	0.991	3.56	2.4	324.91	0.001	0.5	1.25

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

PRINT HYD ID=1 CODE=0

HYDROGRAPH NUMBER BASIND6

RUNOFF VOLUME = 0.486 ACRE-FT
PEAK DISCHARGE RATE = 13.4 CFS
PEAK OCCURRED AT 1.50 HRS.

* ADD TO STREET FLOW BYPASS FROM PREVIOUS INLET.
ADD HYD ID=21 HYD=NODE6STR ID I=21 ID II=1
PRINT HYD ID=21 CODE=0

HYDROGRAPH NUMBER NODE6STR

RUNOFF VOLUME = 0.585 ACRE-FT
PEAK DISCHARGE RATE = 18.2 CFS
PEAK OCCURRED AT 1.53 HRS.

* DIVIDE 4.00 CFS INTO INLET BASED ON MOLZEN'S DESIGN.
DIVIDE HYD ID=21 QMAX=4.00 ID=11 HYD=NODE6PIP PIPEFLOW
ID=20 HYD=NODE6STR STREETFLOW
PRINT HYD ID=20 CODE=0

HYDROGRAPH NUMBER NODE6STR

RUNOFF VOLUME = 0.269 ACRE-FT
PEAK DISCHARGE RATE = 14.2 CFS
PEAK OCCURRED AT 1.53 HRS.

* ADD PIPE FLOW AT NODE 6
ADD HYD ID=11 HYD=NODE3PIP ID I=10 ID II=11
PRINT HYD ID=11 CODE=0

HYDROGRAPH NUMBER NODE3PIP

```
      RUNOFF VOLUME =       0.682 ACRE-FT
      PEAK DISCHARGE RATE =       10.3 CFS
      PEAK OCCURRED AT  1.43 HRS.


* ROUTE_PIPE_FLOW TO NEXT INLET (NODE 7)
COMPUTE RATING CURVE CID=1  VS=1  CODE=-1  SLP=.0356
                    DIA=24 IN  N=.013
                          0.00        0.0         0.0         0.0
                          0.11        0.1         0.3         3.7
                          0.21        0.2         1.0         5.6
                          0.32        0.3         2.4         7.3
                          0.42        0.5         4.1         8.6
                          0.53        0.7         6.6         9.8
                          0.63        0.8         9.2        10.8
                          0.74        1.1        12.5        11.8
                          0.84        1.3        15.7        12.6
                          0.95        1.5        19.5        13.3
                          1.05        1.7        23.2        13.9
                          1.16        1.9        27.2        14.4
                          1.26        2.1        30.9        14.8
                          1.37        2.3        34.7        15.1
                          1.47        2.5        38.0        15.4
                          1.58        2.7        41.2        15.5
                          1.68        2.8        43.6        15.5
                          1.79        3.0        45.4        15.3
                          1.89        3.1        45.9        14.9
                          2.00        3.1        45.9        14.6
COMPUTE TRAVEL TIME ID=10  REACH=1  VS=1  L=450  SLP=.0356

                        TRAVEL TIME TABLE
                            REACH  1.0

                    WATER       FLOW       TRAVEL       FLOW
                    DEPTH       RATE        TIME        VEL
                    FEET        CFS         HRS         FPS
                     0.11          0.     0.0337         3.7
                     0.21          1.     0.0222         5.6
                     0.32          2.     0.0171         7.3
                     0.42          4.     0.0145         8.6
                     0.53          7.     0.0127         9.8
                     0.63          9.     0.0115        10.8
                     0.74         12.     0.0106        11.8
                     0.84         16.     0.0100        12.6
                     0.95         20.     0.0094        13.3
                     1.05         23.     0.0090        13.9
                     1.16         27.     0.0087        14.4
                     1.26         31.     0.0084        14.8
                     1.37         35.     0.0083        15.1
                     1.47         38.     0.0081        15.4
                     1.58         41.     0.0081        15.5
                     1.68         44.     0.0081        15.5
                     1.79         45.     0.0082        15.3
                     1.89         46.     0.0084        14.9
                     1.89         46.     0.0084        14.9
ROUTE                    ID=10  HYD=NODE7IN  INFLOW ID=11  DT=.033333
PRINT HYD                ID=10  CODE=0

                    HYDROGRAPH NUMBER     NODE7IN
```

RUNOFF VOLUME = 0.650 ACRE-FT
PEAK DISCHARGE RATE = 10.3 CFS
PEAK OCCURRED AT 1.47 HRS.

* ROUTE STREET FLOW TO NEXT INLET (NODE 7)
COMPUTE RATING CURVE CID=1 VS=1 SEG=1 MIN EL=0 MAX EL=0.67
CH SLP=.06 FP SLP=.06 N=.017 DIST=25
DIST EL
0 0.67
0 0
2.00 0.13
24.00 0.57
25.00 0.57
25.00 0.67

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	FLOW VEL FPS
0.00	0.0	0.0	0.0
0.04	0.0	0.0	1.4
0.07	0.0	0.1	2.2
0.11	0.1	0.2	2.9
0.14	0.2	0.5	3.2
0.18	0.3	0.9	3.3
0.21	0.5	1.7	3.7
0.25	0.7	3.0	4.2
0.28	1.0	4.7	4.7
0.32	1.4	7.1	5.2
0.35	1.8	10.2	5.6
0.39	2.3	14.0	6.1
0.42	2.9	18.7	6.5
0.46	3.5	24.2	6.9
0.49	4.2	30.6	7.4
0.53	4.9	38.1	7.8
0.56	5.7	46.6	8.2
0.60	6.6	57.0	8.7
0.63	7.5	70.3	9.4
0.67	8.4	84.5	10.1

COMPUTE TRAVEL TIME ID=21 REACH=1 VS=1 L=425 SLP=.0061

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.04	0.	0.0850	1.4
0.07	0.	0.0535	2.2
0.11	0.	0.0409	2.9
0.14	0.	0.0370	3.2
0.18	1.	0.0354	3.3
0.21	2.	0.0316	3.7
0.25	3.	0.0281	4.2
0.28	5.	0.0252	4.7
0.32	7.	0.0229	5.2
0.35	10.	0.0210	5.6
0.39	14.	0.0194	6.1

```
                                0.42        19.     0.0181       6.5
                                0.46        24.     0.0170       6.9
                                0.49        31.     0.0161       7.4
                                0.53        38.     0.0152       7.8
                                0.56        47.     0.0145       8.2
                                0.60        57.     0.0136       8.7
                                0.63        70.     0.0125       9.4
                                0.67        85.     0.0117      10.1
ROUTE                 ID=21  HYD=NODE3STR  INFLOW ID=20  DT=.033333
PRINT HYD             ID=21  CODE=0

                          HYDROGRAPH NUMBER   NODE3STR


      RUNOFF VOLUME =       0.268 ACRE-FT
      PEAK DISCHARGE RATE =       13.9 CFS
      PEAK OCCURRED AT  1.53 HRS.

    *  CALCULATE BASIN D-5
    COMPUTE NM HYD        ID=1  HYD=BASIND5  DA=.000676 SQ MI
                          %A=0  %B=20  %C=0  %D=80
                          TP=0.133333 RAIN=-1

 Basin        TP       K      K/TP     N       Unit      B      Area     IA     IF
  Type                                          Peak
              hr       hr                      cfs             sq mi     in     in

mpervious    0.133  0.073   0.545    7.11       2.1   526.28    0.001  0.1    0.04
Pervious     0.133  0.132   0.991    3.56       0.3   324.91    0.000  0.5    1.25
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

    PRINT HYD             ID=1  CODE=0

                          HYDROGRAPH NUMBER    BASIND5


      RUNOFF VOLUME =       0.066 ACRE-FT
      PEAK DISCHARGE RATE =       1.8 CFS
      PEAK OCCURRED AT  1.50 HRS.

* ADD TO STREET FLOW BYPASS FROM PREVIOUS INLET.
ADD HYD               ID=21  HYD=NODE6STR  ID I=21  ID II=1
PRINT HYD             ID=21  CODE=0

                          HYDROGRAPH NUMBER   NODE6STR


      RUNOFF VOLUME =       0.334 ACRE-FT
      PEAK DISCHARGE RATE =      15.6 CFS
      PEAK OCCURRED AT  1.53 HRS.


* DIVIDE 3.08-CFS INTO INLET BASED ON MOLZEN'S DESIGN.
DIVIDE HYD            ID=21  QMAX=3.08 ID=11  HYD=NODE7PIP  PIPEFLOW
                                       ID=20  HYD=NODE7STR  STREETFLOW
PRINT HYD             ID=20  CODE=0

                          HYDROGRAPH NUMBER   NODE7STR
```

```
      RUNOFF VOLUME =        0.199 ACRE-FT
      PEAK DISCHARGE RATE =        12.5 CFS
      PEAK OCCURRED AT  1.53 HRS.


   *  ADD PIPE FLOW AT NODE 7
   ADD HYD                  ID=11   HYD=NODE7PIP ID I=10   ID II=11
   PRINT HYD                ID=11   CODE=0

                            HYDROGRAPH NUMBER   NODE7PIP


      RUNOFF VOLUME =        0.786 ACRE-FT
      PEAK DISCHARGE RATE =        13.4 CFS
      PEAK OCCURRED AT  1.47 HRS.


   *  CALCULATE BASIN D-4
   COMPUTE NM HYD           ID=1  HYD=BASIND4  DA=.004113 SQ MI
                            %A=0  %B=20  %C=0  %D=80
                            TP=0.133333 RAIN=-1
```

Basin Type	TP hr	K hr	K/TP	N	Unit Peak cfs	B	Area sq mi	IA in	IF in
mpervious	0.133	0.073	0.545	7.11	13.0	526.28	0.003	0.1	0.04
Pervious	0.133	0.132	0.991	3.56	2.0	324.91	0.001	0.5	1.25

```
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

   PRINT HYD                ID=1  CODE=0

                            HYDROGRAPH NUMBER   BASIND4


      RUNOFF VOLUME =        0.404 ACRE-FT
      PEAK DISCHARGE RATE =        11.1 CFS
      PEAK OCCURRED AT  1.50 HRS.


   *  ROUTE BASIN D-4 THROUGH ON-SITE DETENTION POND IN PARKING LOT.
   ROUTE RESERVOIR          ID=2  HYD=D4OUT  INFLOW ID=1  CODE=10
                            OUTFLOW(CFS)  STORAGE(AC-FT)  EL(FT)
                             0              0               0
                             0.12           0.4             1


 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

TIME (HRS)	INFLOW DISCHARGE (CFS)	WATER ELEV (FT)	WATER VOLUME (A-F)	TOTAL OUTFLOW (CFS)
0.0	0.0	0.0	0.0	
0.3	0.0	0.0	0.0	0.0
0.7	0.0	0.0	0.0	0.0
1.0	0.0	0.0	0.0	0.0

```
     1.3          3.1          0.0          0.0          0.0
     1.7          5.7          0.6          0.2          0.1
     2.0          2.6          0.8          0.3          0.1
     2.3          0.6          0.9          0.4          0.1
     2.7          0.2          0.9          0.4          0.1
     3.0          0.1          0.9          0.4          0.1
PEAK DISCHARGE =        0.11 CFS.
MAXIMUM WATER ELEVATION =     0.9 FT.
MAXIMUM RESERVOIR STORAGE =     0.37 ACRE-FT.
    PRINT HYD              ID=2  CODE=0

                          HYDROGRAPH NUMBER       D4OUT


          RUNOFF VOLUME =        0.013 ACRE-FT
          PEAK DISCHARGE RATE =          1.0 CFS
          PEAK OCCURRED AT  1.50 HRS.

* ADD TO MAIN PIPE RUNOFF (INPUT BASIN D-4 INTO BACK OF INLET)
ADD HYD                ID=11  HYD=NODE7PIP ID I=11  ID II=2
PRINT HYD              ID=11  CODE=0

                        HYDROGRAPH NUMBER    NODE7PIP


          RUNOFF VOLUME =        0.799 ACRE-FT
          PEAK DISCHARGE RATE =         13.4 CFS
          PEAK OCCURRED AT  1.47 HRS.


* ROUTE PIPE FLOW TO NEXT INLET (NODE 8)
COMPUTE RATING CURVE CID=1  VS=1  CODE=-1  SLP=.0333
                     DIA=24 IN  N=.013
                          0.00         0.0          0.0          0.0
                          0.11         0.1          0.2          3.6
                          0.21         0.2          1.0          5.4
                          0.32         0.3          2.3          7.1
                          0.42         0.5          4.0          8.3
                          0.53         0.7          6.3          9.5
                          0.63         0.8          8.9         10.5
                          0.74         1.1         12.0         11.4
                          0.84         1.3         15.2         12.1
                          0.95         1.5         18.9         12.9
                          1.05         1.7         22.4         13.4
                          1.16         1.9         26.3         13.9
                          1.26         2.1         29.8         14.3
                          1.37         2.3         33.6         14.6
                          1.47         2.5         36.8         14.9
                          1.58         2.7         39.8         15.0
                          1.68         2.8         42.2         15.0
                          1.79         3.0         43.9         14.8
                          1.89         3.1         44.4         14.4
                          2.00         3.1         44.4         14.1
COMPUTE TRAVEL TIME ID=10  REACH=1  VS=1  L=290  SLP=.0333

                          TRAVEL TIME TABLE
                              REACH  1.0

                WATER        FLOW        TRAVEL        FLOW
                DEPTH        RATE         TIME         VEL
```

FEET	CFS	HRS	FPS
0.11	0.	0.0224	3.6
0.21	1.	0.0148	5.4
0.32	2.	0.0114	7.1
0.42	4.	0.0097	8.3
0.53	6.	0.0085	9.5
0.63	9.	0.0077	10.5
0.74	12.	0.0071	11.4
0.84	15.	0.0066	12.1
0.95	19.	0.0063	12.9
1.05	22.	0.0060	13.4
1.16	26.	0.0058	13.9
1.26	30.	0.0056	14.3
1.37	34.	0.0055	14.6
1.47	37.	0.0054	14.9
1.58	40.	0.0054	15.0
1.68	42.	0.0054	15.0
1.79	44.	0.0054	14.8
1.89	44.	0.0056	14.4
1.89	44.	0.0056	14.4

```
ROUTE                ID=10  HYD=NODE8IN  INFLOW ID=11  DT=.033333
PRINT HYD            ID=10  CODE=0

                   HYDROGRAPH NUMBER    NODE8IN

     RUNOFF VOLUME =       0.790 ACRE-FT
     PEAK DISCHARGE RATE =      13.5 CFS
     PEAK OCCURRED AT  1.43 HRS.

*  ROUTE STREET FLOW TO NEXT INLET (NODE 8)
COMPUTE RATING CURVE CID=1  VS=1  SEG=1  MIN EL=0  MAX EL=0.67
                     CH SLP=.02  FP SLP=.02  N=.017  DIST=25
                     DIST   EL
                      0    0.67
                      0     0
                     2.00  0.13
                     24.00 0.57
                     25.00 0.57
                     25.00 0.67
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	FLOW VEL FPS
0.00	0.0	0.0	0.0
0.04	0.0	0.0	0.8
0.07	0.0	0.0	1.3
0.11	0.1	0.1	1.7
0.14	0.2	0.3	1.8
0.18	0.3	0.5	1.9
0.21	0.5	1.0	2.2
0.25	0.7	1.7	2.4
0.28	1.0	2.7	2.7
0.32	1.4	4.1	3.0
0.35	1.8	5.9	3.2
0.39	2.3	8.1	3.5
0.42	2.9	10.8	3.8
0.46	3.5	14.0	4.0
0.49	4.2	17.7	4.2

0.53	4.9	22.0	4.5
0.56	5.7	26.9	4.7
0.60	6.6	32.9	5.0
0.63	7.5	40.6	5.4
0.67	8.4	48.8	5.8

COMPUTE TRAVEL TIME ID=21 REACH=1 VS=1 L=290 SLP=.02

TRAVEL TIME TABLE
REACH 1.0

WATER DEPTH FEET	FLOW RATE CFS	TRAVEL TIME HRS	FLOW VEL FPS
0.04	0.	0.1005	0.8
0.07	0.	0.0633	1.3
0.11	0.	0.0483	1.7
0.14	0.	0.0437	1.8
0.18	1.	0.0419	1.9
0.21	1.	0.0373	2.2
0.25	2.	0.0332	2.4
0.28	3.	0.0298	2.7
0.32	4.	0.0271	3.0
0.35	6.	0.0248	3.2
0.39	8.	0.0230	3.5
0.42	11.	0.0214	3.8
0.46	14.	0.0201	4.0
0.49	18.	0.0190	4.2
0.53	22.	0.0180	4.5
0.56	27.	0.0171	4.7
0.60	33.	0.0161	5.0
0.63	41.	0.0148	5.4
0.67	49.	0.0138	5.8

ROUTE ID=21 HYD=NODE8STR INFLOW ID=20 DT=.033333
PRINT HYD ID=21 CODE=0

HYDROGRAPH NUMBER NODE8STR

RUNOFF VOLUME = 0.198 ACRE-FT
PEAK DISCHARGE RATE = [12.5 CFS]
PEAK OCCURRED AT 1.57 HRS.

* CALCULATE BASIN D-3
COMPUTE NM HYD ID=1 HYD=BASIND3 DA=.000924 SQ MI
%A=0 %B=20 %C=0 %D=80
TP=0.133333 RAIN=-1

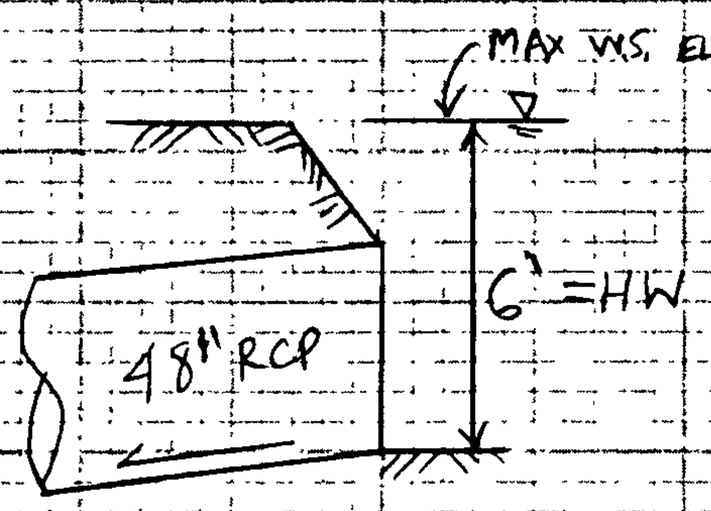
Basin Type	TP	K	K/TP	N	Unit Peak	B	Area	IA	IF
	hr	hr			cfs		sq mi	in	in
mpervious	0.133	0.073	0.545	7.11	2.9	526.28	0.001	0.1	0.04
Pervious	0.133	0.132	0.991	3.56	0.5	324.91	0.000	0.5	1.25

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD

PRINT HYD ID=1 CODE=0

HYDROGRAPH NUMBER BASIND3

1. EXISTING CULVERT UNDER I-25 AT BASIN A-1 OUTFALL.



THE PIPE IS STEEP, SO INLET CONTROL WILL GOVERN

$$\frac{HW}{D} = \frac{6}{4} = 1.5$$

ATTACHED CHART 2 SHOWS: $Q_{CAP} = 124$ CFS

$Q_{EXIST} = 50.5$ CFS

$Q_{DEV} = 29.3$ CFS

$Q_{CAP} > Q_{DEV}, Q_{EXIST}$

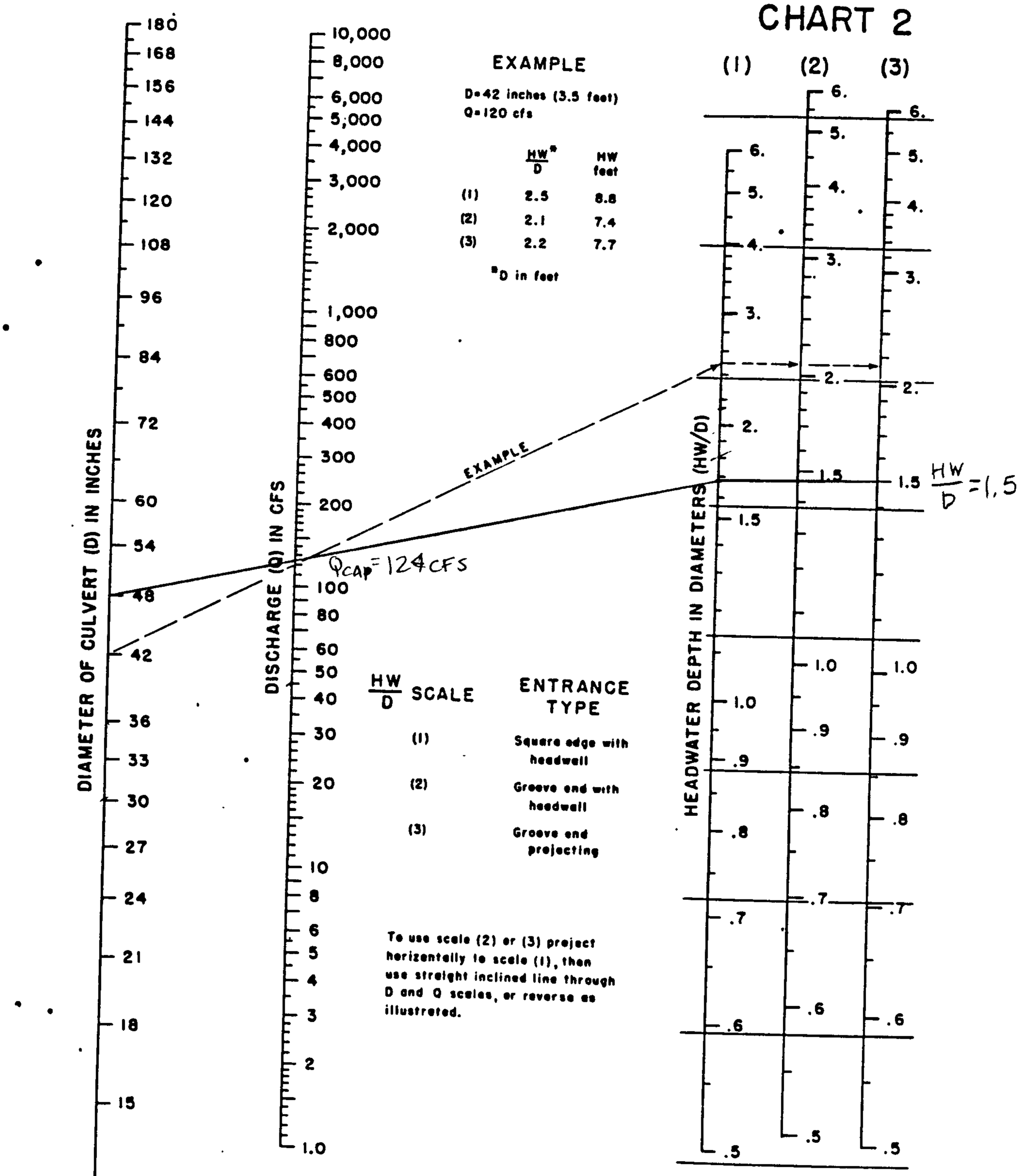
BOHANNAN-HUSTON INC.

PROJECT NAME Univ Bus. Park SHEET 1 OF 2

PROJECT NO. 9218824 BY JPK DATE 12/21/92

SUBJECT CULVERT CAPACITY CH'D _____ DATE _____

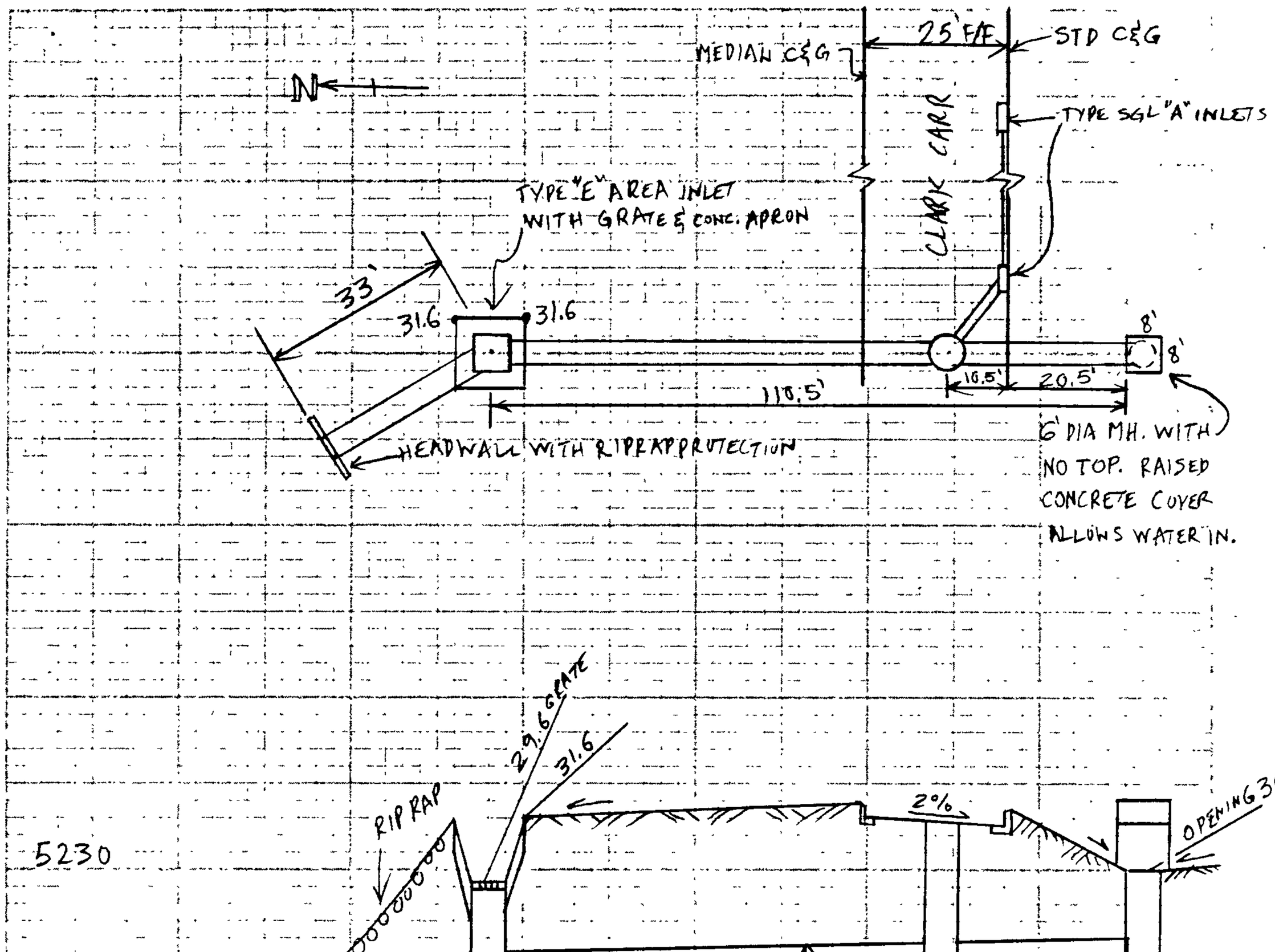
CHART 2



HEADWATER SCALES 283
REVISED MAY 1964

BUREAU OF PUBLIC ROADS JAN. 1963

HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL



SCALE: 1" = 30' (H)
1" = 5' (V)

BOHANNAN-HUSTON INC.

PROJECT NAME UNM BUS. PARK SHEET 1 OF 1

PROJECT NO. _____ BY JPK DATE 12/22

SUBJECT AS-BUILT OF 48" SD CH'D _____ DATE _____

RATING CURVE FOR EXISTING CLARK CARR ROADWAY

MANNING'S N = .0170 SLOPE = .0400

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.67	3	2.00	0.13	5	25.00	0.57
2	0.00	0.00	4	24.00	0.57	6	25.00	1.07

WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
0.1	0.1	0.0	0.0	0.8	1.4	0.8
0.1	0.1	0.1	0.2	1.6	2.3	1.5
0.2	0.2	0.2	0.5	3.2	2.6	3.0
0.2	0.2	0.4	1.2	5.7	2.9	5.5
0.3	0.3	0.7	2.5	8.3	3.5	8.0
0.3	0.3	1.2	4.8	10.8	4.0	10.5
0.4	0.4	1.8	8.1	13.4	4.6	13.0
0.4	0.4	2.5	12.7	15.9	5.1	15.5
0.5	0.5	3.3	18.6	18.5	5.6	18.0
0.5	0.5	4.3	26.0	21.0	6.1	20.5
0.6	0.6	5.4	35.1	23.6	6.5	24.0
0.6	0.6	6.6	46.7	25.6	7.1	25.0
0.7	0.7	7.9	62.2	25.7	7.9	25.0
0.7	0.7	8.4	68.9	25.8	8.2	25.0

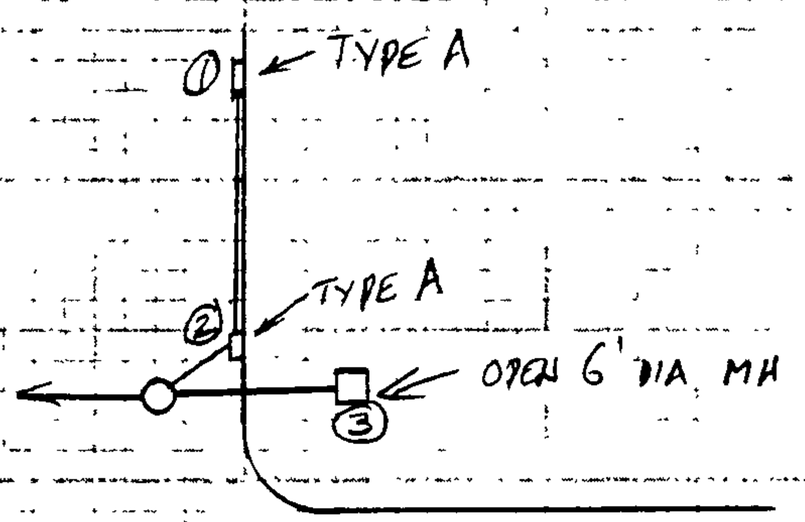
RATING CURVE FOR SPIRIT DRIVE PAVED ROADWAY (ONE SIDE) AT UN

MANNING'S N = .0170 SLOPE = .0700

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.67	3	2.00	0.13	5	25.00	0.57
2	0.00	0.00	4	24.00	0.57	6	25.00	1.07

WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
0.1	0.1	0.0	0.0	0.8	1.9	0.8
0.1	0.1	0.1	0.2	1.6	3.0	1.5
0.2	0.2	0.2	0.6	3.2	3.4	3.0
0.2	0.2	0.4	1.5	5.7	3.9	5.5
0.3	0.3	0.7	3.4	8.3	4.6	8.0
0.3	0.3	1.2	6.3	10.8	5.3	10.5
0.4	0.4	1.8	10.7	13.4	6.0	13.0
0.4	0.4	2.5	16.8	15.9	6.7	15.5
0.5	0.5	3.3	24.6	18.5	7.4	18.0
0.5	0.5	4.3	34.4	21.0	8.0	20.5
0.6	0.6	5.4	46.5	23.6	8.6	24.0
0.6	0.6	6.6	61.8	25.6	9.4	25.0
0.7	0.7	7.9	82.3	25.7	10.5	25.0
0.7	0.7	8.4	91.1	25.8	10.9	25.0

INLET CAPACITIES AT CLARK CARR / UNIVERSITY



1. EXISTING

INLET ①:

DEPTH OF FLOW: Q_{EXIST} = 2.2 CFS; FLOW DEPTH = 0.25' PER HYMO RUN.

PLATE 22.3 D-5:

INLET CAPACITY = 2 CFS

INLET ②:

BY-PASS FLOW (0.2 CFS) IS PICKED UP BY SECOND INLET.

INLET ③

OPEN 6' DIA MH ACTS LIKE A WEIR TO PICK UP Q_{EXIST} = 59.5 CFS

THIS FLOW WOULD REQUIRE A DEPTH OF:

$Q = 3.0\ P\ D^{1.5}$ PERIMETER, $P = 2\pi(3') = 18.85'$

$59.5 = 3.0(18.85')\ D^{1.5}$

$\rightarrow D = 1.03'$

THIS DEPTH IS PRESENTLY PROVIDED BY THE EXISTING TOPOGRAPHY AROUND THE INLET.

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET 1 OF 3

PROJECT NO. _____ BY JPK DATE 1/20/93

SUBJECT _____ CH'D _____ DATE _____

2. PROPOSED

INLET ①:

Q_{PROP} = 8.4 CFS ; D = 0.35' PER HYMO RUN.

PLATE 22.3 D-5:

INLET CAPACITY = 4.0 CFS

BYPASS = 4.4 CFS

INLET ②:

Q_{PROP} = 4.4 CFS, D = 0.29' PER HYMO RUN.

PLATE 22.3 D-5:

INLET CAPACITY = 2.8 CFS

BY-PASS = 1.6 CFS

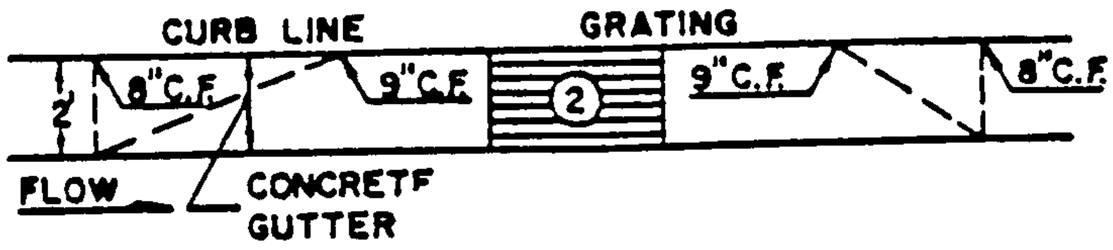
BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET 2 OF 3

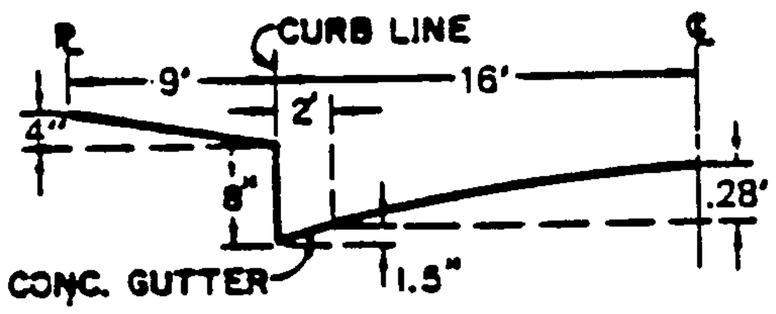
PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

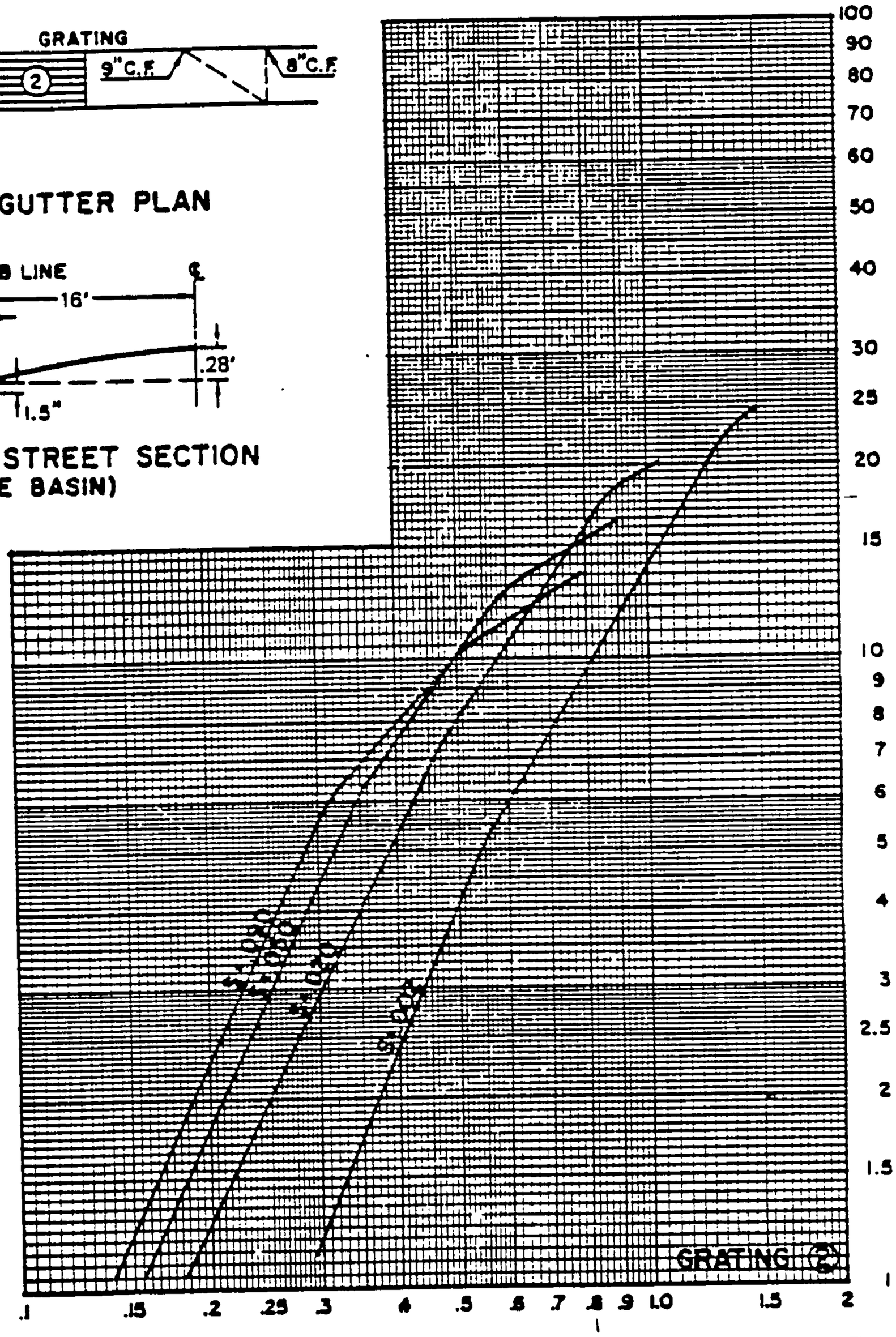
GRATING CAPACITIES FOR TYPE "A" , "C" and "D"



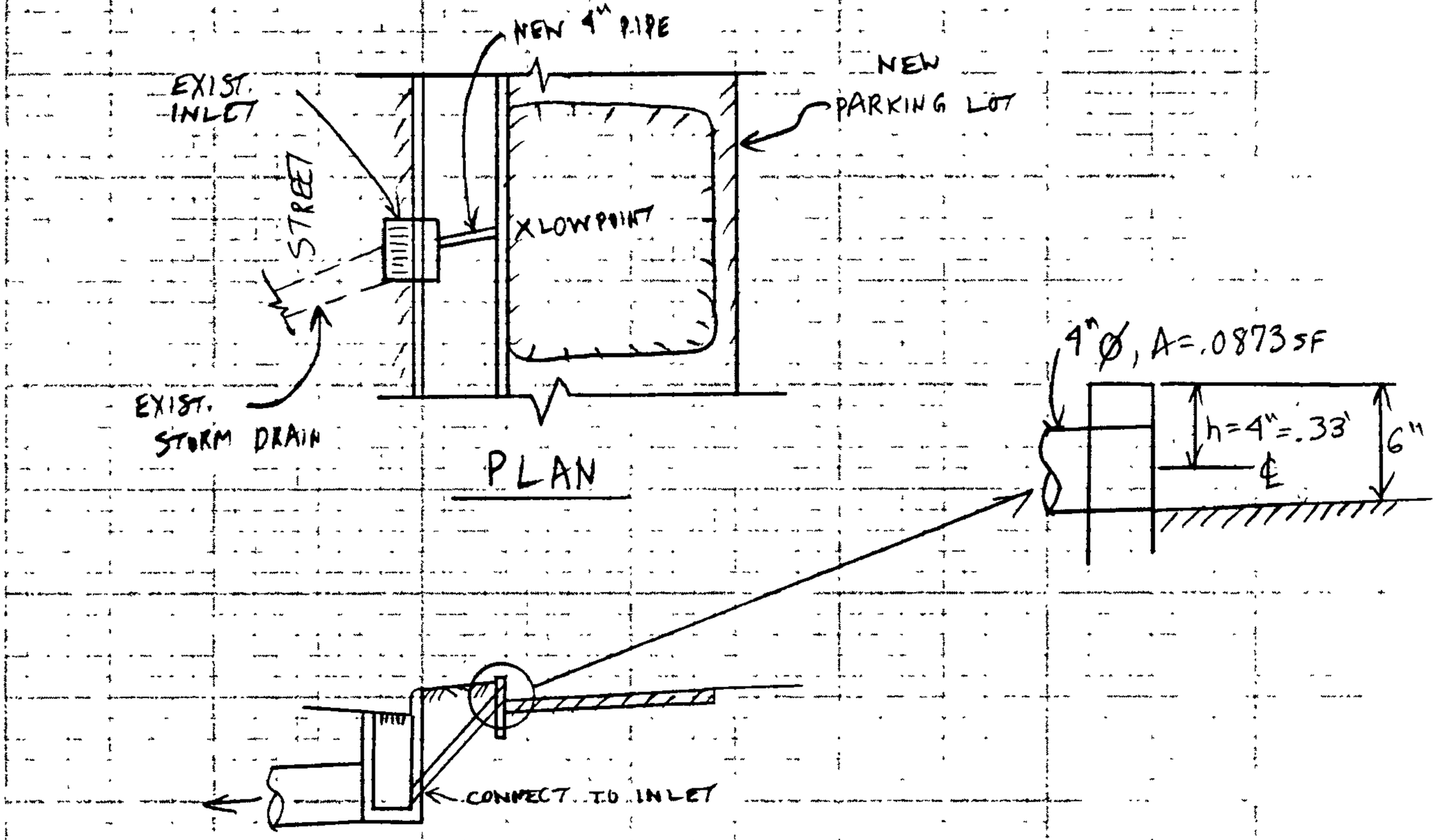
GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



TYPICAL DETENTION POND DESIGN



35% CLOGGING FACTOR

ORIFICE EQN: $Q_{CAP} = 0.65(0.6)\,A\sqrt{2gh}$

$= 0.65(0.6)(.0873)\sqrt{2(32.2)(.33)}$

$= 0.157$ CFS

SO A 4" PIPE AT THE LOW POINT OF EACH PARKING LOT DETENTION POND WOULD DISCHARGE 0.16 CFS AT FULL POND DEPTH. 0.12 CFS WAS CONSERVATIVELY USED IN THE HYMO RUN.

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET 1 OF 1

PROJECT NO. _____ BY JPK DATE 1/21/93

SUBJECT _____ CH'D _____ DATE _____

COMPARISON OF RUNOFF

EXISTING		PROPOSED		CULVERT	
BASIN	DISCHARGE	BASIN	DISCHARGE	CAPACITY	
1201	58.7	A-3/A-4	105.5	----	
1202	32.3	C-1/C-2	87.9	----	
Exist. 48" under University	91.9	Exist. 48" under University	87.9	218	← Pond 5
A-1	50.5	A-1	28.7	----	
Exist. 48" under I-25	50.5	Exist. 48" under I-25	29.3	124	
723	15.0	D	29.1	----	Ponds 1, 2, 3
Exist. 36" under Clark Carr	30.67	Exist. 36" under Clark Carr	52.77	52.6*	
724	59.5	B	98.8	----	← Pond 4
Exist. 48" under Clark Carr	59.5	Exist. 48" under Clark Carr	58.0	86	

*Per Molzen-Corbin's Spirit Drive hydraulic grade line analysis.

CALCULATED BY GDB DATE 12/22/92
CHECKED BY _____ DATE _____
SHEET NO. 1 OF 5

CLIENT _____ PROJECT NO. _____
PROJECT _____
SUBJECT SPIRIT DRIVE HYDRAULIC ANALYSIS

ANALYSIS FOR BASIN D AS DESCRIBED BY PRELIMINARY GRADING PLAN FROM BOHANNAN-HOUSTON INC. 12/17/92

TOTAL AREA = .0217 SQ MI = 607,470 SF = 13.95 ACRES
20% LAND TREATMENT B
80% LAND TREATMENT D
TOTAL RUNOFF = 59 CFS

BASIN D WILL BE BROKEN INTO SUB BASINS FOR ANALYSIS. EACH SUBBASIN WILL BE A PERCENTAGE OF THE TOTAL RUNOFF BASED ON PERCENTAGE OF AREA. FLOW WILL ALSO BE DIVIDED INTO STREET FLOW AND OVERLAND FLOWS THAT WILL BE DIRECTED INTO THE STORM DRAIN SYSTEM.

37.1 - 2.61 - 0.66 = 33.83

BASIN D TOTAL RUNOFF = ~~59~~ CFS

BASIN	% OF TOTAL	STREET FLOW	OVER LAND FLOW	SUB-BASIN TOTAL
D_1	8%	40% 1.08 ~~1.84~~	60% 1.63 ~~2.93~~	2.71 ~~4.72 CFS~~
D_2	8%	40% 1.08 ~~1.84~~	60% 1.63 ~~2.93~~	2.71 ~~4.72 CFS~~
D_3	14%	30% 1.42 ~~2.48~~	70% 3.32 ~~5.78~~	4.74 ~~8.26~~ CFS
D_4	30%	10% 1.02 ~~1.77~~	90% 9.13 ~~15.93~~	10.15 ~~17.7~~ CFS
D_5	20%	20% 1.35 ~~2.36~~	80% 5.92 ~~9.44~~	6.77 ~~11.8~~ CFS
D_6	20%	20% 1.35 ~~2.36~~	80% 5.92 ~~9.44~~	6.77 ~~11.8~~ CFS
	100%	~~12.75~~ ~~10.30~~ 7.30 CFS	~~46.25~~ 26.55	~~59 CFS~~ 33.85

CALCULATED BY GDB DATE 12/22/92

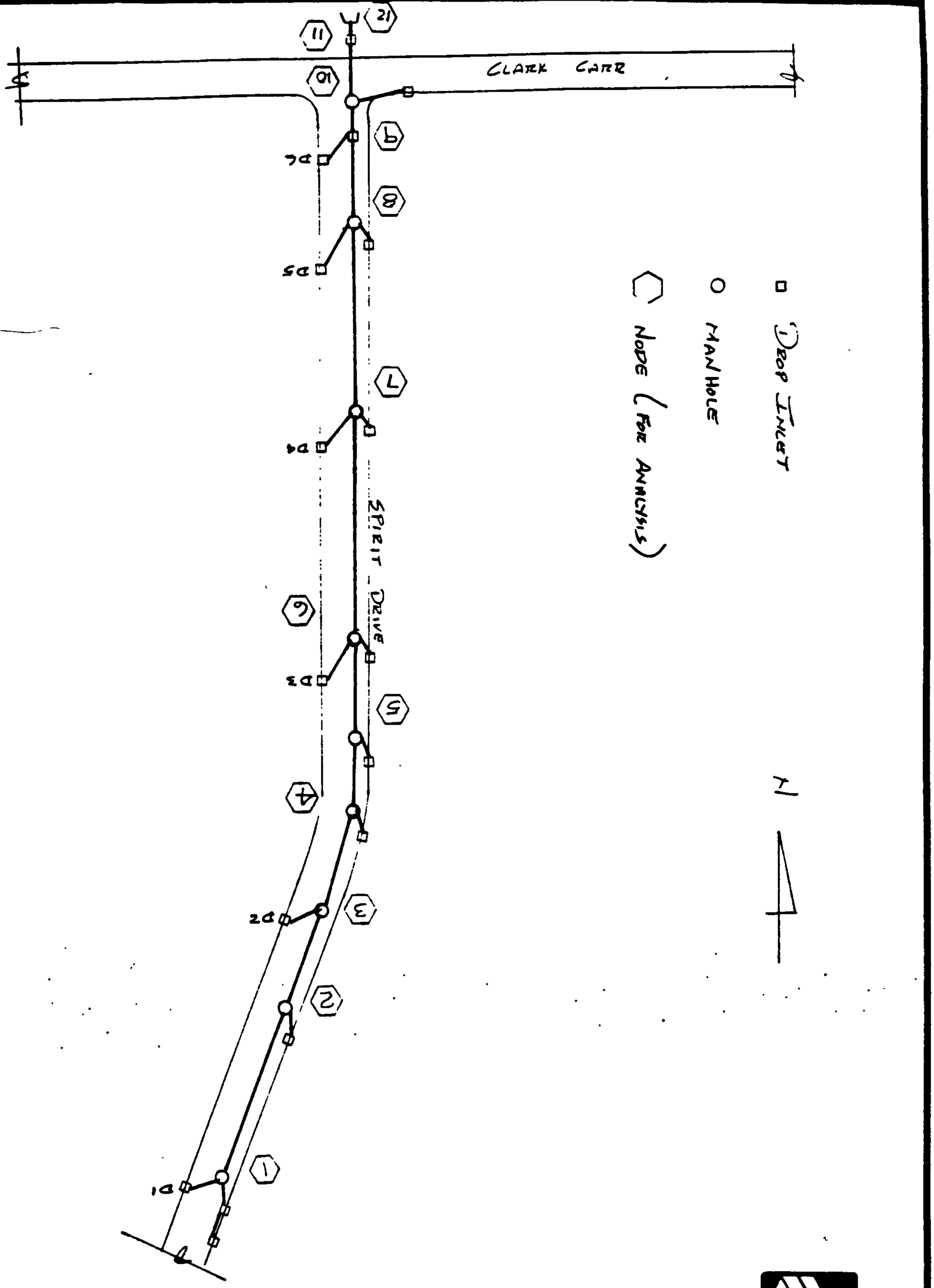
CHECKED BY _____ DATE _____

SHEET NO. 32 OF 35

CLIENT _____ PROJECT NO. _____

PROJECT _____

SUBJECT _____



CALCULATED BY _____ DATE _____	CLIENT _____ PROJECT NO. _____
CHECKED BY _____ DATE _____	PROJECT _____
SHEET NO. 3 OF 5	SUBJECT _____

Q APPROACHING INLET (STREET FLOW)

DI 1 BASINS $D_1 + D_2 + .4(D3) = 2.71 + 2.71 + .4(4.74) = 7.316$

DI 2 BASINS $.6(D3) + .5(D4) = .6(4.74) + .5(10.15) = 7.919$

DI 3 BASINS $.5(D4) = .5(10.15) = 5.075$

DI 4 BASINS $.6(D5) = .6(6.77) = 4.062$

DI 5 BASINS $.5(D6 \text{ STREET FLOW}) + .4(D5) = .5(1.35) + .4(6.77) = 3.383$

DI 6 BASINS $.5(D6 \text{ STREET FLOW}) + D6 \text{ PIPE} = .5(1.35) + 5.42 = 6.095$

4/5

SPIRIT DRIVE

CURB OPENING INLET CAPACITY AND BYPASS ON CONTINUOUS GRADES

MANNIN 0.017 DESIGN BASED ON FLOWS PROVIDED BY BOHANNAN-HUSTON

INLET NO.	Q(p) cfs	Q(ba) cfs	Q(t) cfs	S(o) %	S(x) %	L(c) ft	L(g) ft	L(t) ft	L(c)/L(t) ft	Ec cfs	Q(i) cfs	Q(b) cfs	T ft	W/T	d ft	Eo	V ft/sec	Rf	Rs	E	Qi cfs	Qt cfs	Qb cfs
DI-1	7.32	0.00	7.32	2.00	0.61	3.50	6.50	36.13	0.10	0.17	1.23	6.09	12.77	0.16	0.34	0.20	2.79	1.00	0.99	0.21	1.25	2.47	4.84
DI-2	7.92	4.84	12.76	2.00	0.61	3.50	3.20	45.64	0.08	0.13	1.71	11.05	15.96	0.13	0.42	0.17	3.29	1.00	0.96	0.18	2.01	3.72	9.04
DI-3	5.08	9.04	14.12	2.00	0.61	3.50	3.20	47.62	0.07	0.13	1.81	12.30	16.62	0.12	0.44	0.17	3.39	1.00	0.96	0.18	2.19	4.00	10.12
DI-4	4.06	10.12	14.18	2.00	6.00	3.50	3.20	94.71	0.04	0.07	0.93	13.25	17.09	0.12	0.28	0.15	5.44	1.00	0.98	0.16	2.15	3.08	11.10
DI-5	3.38	11.10	14.48	2.00	1.92	3.50	6.50	67.89	0.05	0.09	1.32	13.17	17.04	0.12	0.36	0.16	4.34	1.00	0.99	0.17	2.26	3.58	10.91
DI-6	6.10	10.91	17.00	2.00	1.92	3.50	3.20	72.62	0.05	0.09	1.45	15.56	18.14	0.11	0.38	0.16	4.54	1.00	0.93	0.24	3.66	5.11	11.89

5/5

ALBUQUERQUER INTERNATIONAL AIRPORT, SPIRIT DRIVE

STORM DRAIN LINE No MAINLINE
BRANCH No 1
BASIN No. D

ELEV OF WATER SURFACE AT FIRST NODE 5257.7
ROUGHNESS COEFFICIENT FOR PIPE 0.013
STATION AT START OF BRANCH: 0

NOD	STRUCT DESC	STA	Qm (cfs)	Qt (cfs)	n	PIPE SIZE (IN)	PIPE SLOPE (FT/FT)	VEL (FT/SEC)	PIPE LENGT (FT)	BEN ANG (DEG	Sf (FT/FT)	Hf (FT)	Ho (FT)	Hj (FT)	Hm (FT)	Ht (FT)	TOTAL HEAD LOSS	ENERGY GRADE LINE	hv (FT)	HYD. GRADE ELEV	INV. ELEV	GRATE ELEV	STRCT DEPTH (FT)
12	ES	0	0.0															5258.5	0.8599	5257.7	5256.52	5259.52	3.00
				82.6	0.013	36	0.0091	7.44	56		0.0082	0.36											
																	0.36	5262.6	0.8599	5261.8			
11	DI	56	0.0							0			0.00		0.04	0.00					5260.53	5265.50	4.97
																	0.04	5263.8	0.8599	5262.9			
				52.6	0.013	36	0.0076	7.44	66		0.0062	0.41											
																	0.41	5264.0	0.8599	5263.2			
10	MH	124	0.0										0.00		0.19	0.31					5261.03	5266.50	5.47
																	0.50	5264.5	3.8038	5260.7			
				48.2	0.013	24	0.0378	15.66	53		0.0472	2.50											
																	2.50	5267.0	3.8038	5263.2			
9	DI	177	0.0							0			0.00		0.13	0.00					5263.02	5267.20	4.18
																	0.13	5667.8	2.5756	5664.6			
				40.5	0.013	24	0.0178	12.88	171		0.0320	5.46											
																	5.46	5272.6	2.5756	5270.0			
8	MH	348	0.0										0.00		0.10	0.00					5268.01	5271.00	4.99
																	0.10	5272.7	2.0549	5270.7			
				36.1	0.013	24	0.0333	11.50	300		0.0255	7.65											
																	7.65	5280.4	2.0549	5278.3			
7	MH	648	0.0										0.00	1.24	0.08	0.00					5276.00	5283.00	7.00
																	1.32	5281.7	1.6479	5280.0			
				32.4	0.013	24	0.0356	10.30	450		0.0304	8.20											
																	8.20	5280.9	1.6479	5288.2			
6	MH	1098	0.0										0.00		0.09	0.00					5286.02	5288.00	6.98
																	0.09	5284.5	1.1798	5283.3			
				27.4	0.013	24	0.0101	8.71	148		0.0148	2.16											
																	2.16	5286.7	1.1798	5286.5			
5	MH	1246	0.0										0.00		0.02	0.00					5283.52	5300.00	6.48
																	0.02	5286.7	0.4451	5286.2			
				16.8	0.013	24	0.0071	5.35	100		0.0055	0.55											
																	0.55	5287.2	0.4451	5286.6			
4	MH	1346	0.0										0.00		0.02	0.00					5284.23	5300.80	6.57
																	0.02	5287.3	0.3409	5286.9			
				14.7	0.013	24	0.0071	4.69	144		0.0042	0.61											
																	0.61	5287.9	0.3409	5287.6			
3	MH	1490	0.0										0.00		0.01	0.00					5286.28	5302.50	7.26
																	0.01	5287.9	0.1904	5287.7			
				11.0	0.013	24	0.0071	3.50	148		0.0024	0.34											
																	0.34	5288.2	0.1904	5288.0			
2	MH	1638	0.0										0.00		0.00	0.00					5286.29	5303.50	7.22
																	0.00	5288.2	0.094	5288.1			
				7.7	0.013	24	0.0071	2.46	347		0.0012	0.29											
																	0.29	5288.5	0.094	5288.4			
1	MH	1882	0.0										0.00		0.08	-0.07					5289.04	5304.09	8.99

CITY OF ALBUQUERQUE

November 5, 2010

Daniel W. Hogan, P.E.
Molzen-Corbin & Associates
2701 Miles Rd SE
Albuquerque, NM 87106

Re: Sunport Foreign Trade Zone Tract A Replat Drainage Analysis
Engineer's Stamp 11-2-10 (N15/D006)

Dear Mr. Hogan,

Based upon the information provided in your submittal received 11-2-10, the above referenced plan cannot be approved as the Drainage Analysis until the following comments are addressed:

- Provide a full size (24" x 36") Existing Conditions Basin Map, Proposed Conditions Basin Map and Conceptual Grading Plan. Plans should include storm drain and the Conceptual Grading Plan should include approximate finished floors for buildings in lease areas.
- Provide an Analysis Point at the intersections of University Blvd with Clark Carr and Spirit Dr with existing and proposed flows. This could be shown on the basin maps.
- The submittal should be a Master Drainage Plan for the benefit of future site design.
- The Work Order, 4183, shows the capacity of the 36" storm drain at the north end of Spirit Dr to be 58.15 cfs (0.76%). The proposed conditions for Basin A state the capacity of this storm drain to be 176.46 cfs.
    - In addition, the Work Order, 4183, does not seem to take into account the flows from the Sate Aviation Office (approx 15 cfs).
    - Provide existing piped and overland flows into the Spirit Dr storm drain.
- In the existing condition it appears that about 1 to 2 acres in proposed Basin A drain to Spirit Dr. with a Land Treatment of "B". The proposed condition should not exceed this flow into Spirit Dr.
- Basin B is near the high point in Spirit Dr. It would appear that flows from Basin B would reach the storm drain at the same time as the rest of the basin.
- Will storm drain be required in the north-south access road? It seems this road would be a basin divide.
- Is there enough grade for flows from Lease areas 7 and 9 to get into the pond at the southwest corner?

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

CITY OF ALBUQUERQUE

If you have any questions, you can contact me at 924-3695.

Sincerely,

Curtis A. Cherne, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

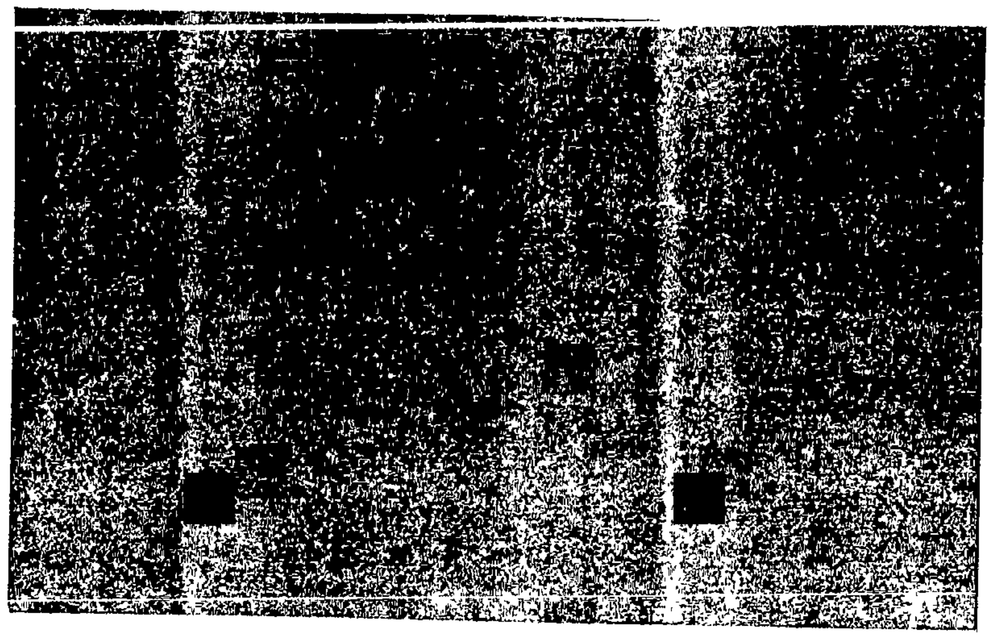
PO Box 1293

Copy: file

Albuquerque

NM 87103

www.cabq.gov



MOLZEN-CORBIN & Associates

ENGINEERS/ARCHITECTS/PLANNERS

DRAINAGE ANALYSIS FOR

ALBUQUERQUE INTERNATIONAL SUNPORT
ALBQUERQUE, NEW MEXICO
FOREIGN TRADE ZONE
TRACT "A" REPLAT

City of Albuquerque – Aviation Department
2200 Sunport Blvd. SE
P.O. Box 9948
Albuquerque, New Mexico 87106
(505) 244-7805

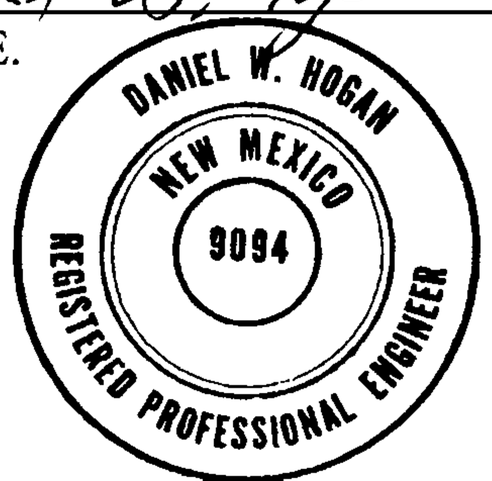
CONSULTING ENGINEER

Molzen Corbin
2701 Miles Road, SE
Albuquerque, New Mexico 87106
(505) 242-5700

I, Daniel W. Hogan, New Mexico Registered Professional Engineer No. 9094, do hereby certify that the following documents were made under my supervision and direction and that same is true and correct to the best of my knowledge and belief.

Daniel W. Hogan 11/2/10

N.M.P.E. Date



MOLZENCORBIN
ENGINEERS | ARCHITECTS | PLANNERS

Sunport Center- Foreign Trade Zone Drainage Analysis
Albuquerque International Sunport
Albuquerque, New Mexico

PURPOSE AND SITE LOCATION

The site for the Sunport Center- Foreign Trade Zone is located on the south end of University Boulevard between the UNM Golf Course and the Albuquerque International Sunport. It is bordered by Clark Carr Road on the north, University Boulevard on the west and Spirit Drive on the east and south (see location map). The site is approximately 72+ acres of mostly undeveloped land that is planned for development into approximately 20 lease areas. This area has previously been analyzed in the Albuquerque International Sunport Storm Drainage Master Plan (Molzen-Corbin & Associates, May 1995) as well as in the Albuquerque International Sunport Rent-A-Car Facility Drainage Report (Molzen-Corbin & Associates, September 1999). This analysis takes into account drainage information from these two documents.

There currently is an existing storm drain system located on the east side of the site along Spirit Drive as well as on the west along University Boulevard. In the Albuquerque International Sunport Storm Drainage Master Plan this site is considered Sub-basins 724, 723.1, and 1201.

Existing Conditions

The site is located on the sandy slope of the mesa that the Albuquerque International Sunport resides on and is part of the airport property. The site generally slopes from east to west in varying amounts, but at an average of about 3.5 percent slope, with Clark Carr Road being at the north of the site and University Boulevard being at the west. The two existing developed sites that are adjacent to Spirit Drive have been graded to partially slope toward Spirit Drive but some of the site slopes west with small retention ponds located at the west end of the lot(s). Other than a small portion of the two existing developments and a small strip of land adjacent to Spirit Drive, the runoff from the site presently flows overland toward the west into an unimproved ditch along University Boulevard. During large or high intensity storms this ditch can overflow and run into University Boulevard right-of-way causing sediment and debris to settle on University Boulevard. There is a drainage divide on University Boulevard approximately 1200 feet south of its intersection with Clark Carr Road. Runoff reaching University Boulevard south of this point will flow south toward the existing inlets at the intersection of Spirit Drive and University Boulevard, and runoff north of this point will flow north toward the inlets at the intersection of Clark Carr Road and University Boulevard. This drainage divide splits the existing runoff in half from the center of the site going in each direction.

The existing drainage system consists of three storm drains, one at each apex of the semi-triangular shaped site. These storm drains will be used to drain the proposed developed site, but the development will not require an increase in capacity in the existing system. The existing drainage system(s) are described as follows:

1. The first system is in Spirit Drive and runs along the east side of the site to the intersection of Spirit Drive and Clark Carr Road. From this point the 24 inch line runs north about 150 feet and ties into a 48 inch storm drain that runs west and outfalls to an improved arroyo with gabion drop structures. Runoff from a portion of the two existing developments located on this site currently drain into this system.
2. The second system is located at the southwest apex of the site in the intersection of Spirit Drive and University Boulevard. This system is limited to a few inlets in the street at the intersection and a couple of median inlets constructed over 6 foot diameter manholes to pick up flows off the roadway. These inlets all tie into a 48 inch pipe that then outfalls to an arroyo on the west side of University.
3. The third system is located at the northwest apex of the site at the intersection of Clark Carr Road and University Boulevard. This system is limited to a few inlets in the street at the intersection and two median inlets constructed over 6 foot diameter manholes to pick up flows from the site. The system then goes north in University Boulevard and ties into the same system mentioned above (the first system) about 1100 feet downstream of where the Spirit Drive line connects. At the point of connection, the pipe is 60 inches in diameter and it remains that size until it outfalls into the arroyo.

Proposed Conditions

Since this development is following the Albuquerque International Sunport Storm Drainage Master Plan (Molzen Corbin, May 1995) and the Albuquerque International Sunport Rent-A-Car Drainage Report (Molzen Corbin, September 1999), the overall runoff pattern and storm drainage system is not proposed to be changed. The developed runoff from the site will be ponded in several locations prior to release into the existing storm drainage system in order not to exceed the existing capacity of the storm drains.

The site will be graded so that about a third of it (23.2 acres, Basin A) will flow northeast toward the intersection of Clark Carr and Spirit Drive, where it will be released into the existing storm drain (the first system) at a controlled rate using detention ponds. About 4.8 acres (Basin B) will be released directly into Spirit Drive right-of-way where it will flow southwest to the existing storm drain at the intersection of Spirit Drive and University Boulevard (the second system). The 21.2 acres at the southwest corner of the site (Basin D) will flow toward the intersection of Spirit Drive and University Boulevard into a proposed detention pond and then be released into the existing storm drain (the second system). The northwest 22.9 acres (Basin C) of the site will flow toward the intersection of Clark Carr Road and University Boulevard into a proposed detention pond and then be released into the existing storm drain at that intersection (the third system). The smallest basin (Basin E) consists of a small portion of the entrance to the site. It will drain onto University Boulevard where it will then flow north to the intersection of Clark Carr Road and University Boulevard into the existing storm drain (the third system). Below is a more detailed description of each basin.

Basin A consists of approximately 23.2 acres located in the northeast corner of the site. This area will be developed into approximately 4 lease lots. Runoff from this area will drain north into the storm drain system along Spirit Drive (the first system). The required capacity for this basin is 97.71 cfs. The capacity available for this basin is controlled by a 36 inch RCP located on the far north end of this basin coming across Clark Carr Road with a capacity of 176.46 cfs. Flows from

Basin A will be routed to this 36 inch RCP, which has enough capacity to handle the developed flows and will flow into the existing storm drain system. There is not a need for detention ponds for this basin because of the available capacity within the 36 inch RCP. Calculations for this area can be seen in the appendix.

Basin B consists of approximately 4.8 acres located in the southeast corner of the site. This area will be developed into approximately 2 lease lots. Runoff from this area will drain east into the Spirit Drive right-of-way eventually making its way to the storm drain system located in the intersection of Spirit Drive and University Boulevard. The required capacity for this basin is 20.22 cfs. It is assumed that the flows from this site will reach the existing storm drain system and exit prior to the peak flow reaching this area. The Spirit Drive right-of-way appears to have capacity based on the Albuquerque Development Process Manual Plate 22.3 D-3.

Basin C consists of approximately 22.8 acres located in the northwest corner of the site. This area will be developed into approximately 6 lease lots including a portion of a new roadway that will be built through the middle of the site. Runoff from this area will drain to the far northwest corner of the site into a detention pond. The detention pond will connect to the existing storm drain system located at the intersection of Clark Carr Road and University Boulevard. After analyzing the existing system based on information from the Albuquerque International Sunport Storm Drainage Master Plan and the Albuquerque International Sunport Rent-A-Car Facility Drainage Report it is determined that this area will require a controlled release into the system. The constraints in this area come from a 60 inch reinforced concrete located just north of the intersection of Clark Carr Road and University Boulevard. There currently are three branches from the existing drainage system that intersect at this area. These are a 54 inch reinforced concrete pipe coming from the east, a 42 inch reinforced concrete pipe coming from the north, and a 24 inch reinforced concrete pipe coming from the south. The 24 inch pipe limits the amount of runoff that can be sent from this site into the existing storm drain system. The required capacity for this basin is 96.03 cfs. The capacity available to leave this basin is limited by a 24 inch RCP with a capacity of 57.94 cfs. Detention ponds to be sized prior to construction will be put in place to ensure that the 57.94 cfs capacity will be maintained as flows leave the developed site. Calculations for this area can be seen in the appendix.

Basin D consists of approximately 21.2 acres located in the southwest corner of the site. This area will be developed into 8 lease lots including a portion of a new roadway that will be built through the middle of the site. Runoff from this area will drain towards the far southwest corner of the site into a detention pond. The detention pond will connect to the existing storm drain system located at the intersection of Spirit Drive and University Boulevard. After analyzing the existing system based on information from the Albuquerque International Sunport Storm Drainage Master Plan it was determined that this area will require a controlled release into the system. The constraints in this area come from an 18 inch reinforced concrete located just east of the intersection of Spirit Drive and University Boulevard. This pipe connects to an existing 24 inch reinforced concrete pipe and this pipe connects to a 48 inch reinforced concrete pipe that outfalls on the west side of University Boulevard. The 48 inch pipe has the capacity to be able to handle flows from this area; however, constraints are created from the 18 inch pipe where the detention pond drainage system will tie into. The required capacity for this basin is 89.29 cfs, The capacity available to leave this basin is limited by a 18 inch RCP with a capacity of 15.51

cfs. Detention ponds to be sized prior to construction will be put in place to ensure that the 15.51 cfs capacity will be maintained as flows leave the developed site. Calculations for this area can be seen in the appendix.

Basin E consists of approximately 0.36 acres located parallel to University Boulevard in the middle of the site on the far west side. This area will serve as the main entrance into the site. Runoff from this site will drain west into University Boulevard right-of-way and will eventually make its way to the drainage system located at Clark Carr Road and University Boulevard intersection. The required capacity for this basin is 1.69 cfs. This follows the existing drainage pattern and is currently developed, no changes will be made.

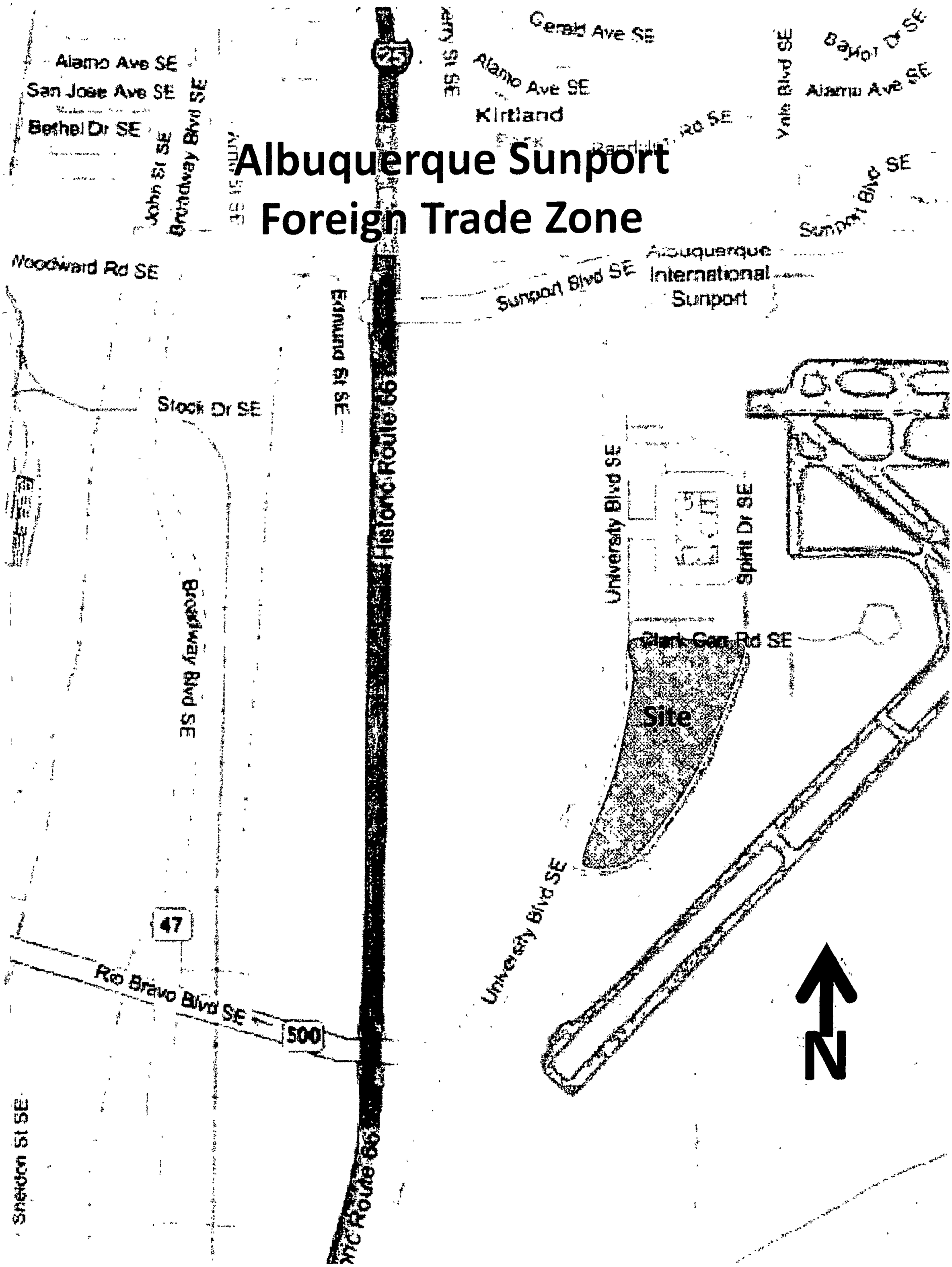
In the appendix are the capacities and volumes required for each Basin under developed conditions as well as capacities for the existing drainage system.

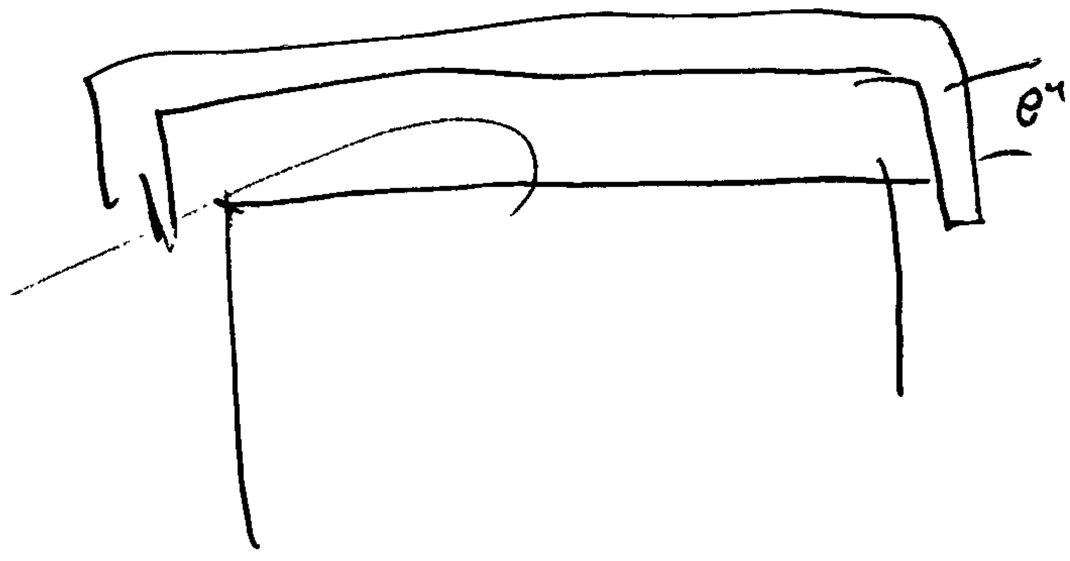
CONCLUSION

The drainage for this developed area closely follows what has already been created previously for future development models located in Albuquerque International Sunport Storm Drainage Master Plan and the Albuquerque International Sunport Rent-A-Car Facility Drainage Report. Developed flows increase the flow reaching the existing storm drain system, but will be controlled on site in order to maintain the same flows as this system was previously designed for. The existing system has adequate capacity to drain the existing site, provided that ponding is completed to regulate the allowable flow level entering into the existing downstream drainage system. The pond volumes will be determined prior to construction and are dependent on the phasing of development for this area.

APPENDIX A- LOCATION

Albuquerque Sunport Foreign Trade Zone

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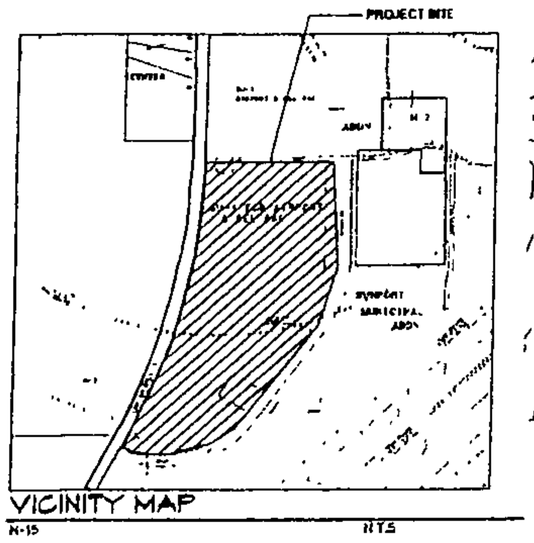
3 basin map



PROJECT DESCRIPTION:
THE PROJECT SITE IS THE 65 ACRE MOSTLY UNDEVELOPED SITE BOUNDED BY UNIVERSITY BLVD. TO THE WEST, CLARK CARR RD TO THE NORTH AND SPIRIT DRIVE TO THE EAST AND SOUTH. CURRENTLY THERE IS A SW AIRLINES CALL CENTER AND A INSTALLATION MANUFACTURING FACILITY LOCATED ON THE SITE WITH ACCOMPANYING SITE FEATURES ALONG THE WEST FRONTAGE OF SPIRIT DR. AS SHOWN ON THE ACCOMPANYING SITE PLAN FOR SUBDIVISION, THERE WILL BE AN ADDITION OF 20 LEASE AREAS TO BE DEVELOPED IN ACCORDANCE WITH THE DESIGN STANDARDS ACCOMPANYING THIS SUBMITTAL.

EXISTING CONDITIONS:
THE EXISTING HYDROLOGY FILE NUMBER IS H-18/DAA, WHICH CONTAINS THE 1993 CONCEPTUAL GRADING & DRAINAGE PLAN FOR THE UNM BUSINESS PARK PREPARED BY BOHANNAN-HUSTON, INC. THE ALBUQUERQUE INTERNATIONAL AIRPORT DRAINAGE MASTER PLAN, UPDATED IN MAY 1995 BY MOLZEN-CORBIN & ASSOCIATES ALSO GOVERNS THE HYDROLOGY FOR THE EXISTING AND FUTURE DEVELOPMENT. RECENTLY THE NORTHEAST OF THE SITE HAS BEEN MODIFIED BY THE REALIGNMENT OF SPIRIT DRIVE TO ALIGN WITH THE FORMER "STREET B" WITH ITS INTERSECTION WITH CLARK CARR ROAD. THIS CONSTRUCTION WAS PERFORMED UNDER THE SPIRIT DR. /CLARK CARR BLVD. RELOCATION AND SUNPORT JET-A FUEL FARM.

CURRENTLY, MOST OF THE EASTERN SITE CURRENTLY DRAINS FROM THE WEST TO THE EAST INTO THE SPIRIT DRIVE RIGHT-OF-WAY WHILE THE NORTHERN PORTION OF THE WESTERN SIDE OF THE SITE DRAINS WEST AND NORTHWEST INTO UNIVERSITY BLVD. AND THEN NORTH TO THE EXISTING STORM DRAIN IN THE UNIVERSITY/CLARK CARR INTERSECTION, WHILE THE SOUTHERN PORTION OF THE WESTERN SIDE OF THE SITE DRAINS TO THE WEST INTO UNIVERSITY BLVD. AND THEN SOUTH TO THE EXISTING STORM DRAIN IN THE UNIVERSITY/SPIRIT DRIVE INTERSECTION. ALSO, THE SOUTHEAST PORTION OF THE SITE DRAINS INTO SPIRIT DRIVE AND DRAINS SOUTHWEST AND DRAINS INTO THE EXISTING STORM DRAIN SYSTEM IN THE UNIVERSITY BLVD / SPIRIT DR. INTERSECTION.

THE SITE CURRENTLY EXPERIENCES NO OFFSITE FLOWS. THE SITE IS LOCATED IN A FLOOD ZONE X AS INDICATED ON THE FIRM MAP.

PROPOSED CONDITIONS:
THE SUNPORT BUSINESS CENTER WILL BE DEVELOPED IN ACCORDANCE WITH THE GUIDELINES LISTED IN THE ACCOMPANYING GUIDELINES AND IN ACCORDANCE WITH THE ALBUQUERQUE INTERNATIONAL AIRPORT DRAINAGE MASTER PLAN UPDATED IN MAY 1995 BY MOLZEN-CORBIN & ASSOCIATES.

THE 65 ACRE SITE WILL BE DIVIDED INTO TWO MAJOR TIERS BY THE PROPOSED CONSTRUCTION OF A DOUBLE TIERED RETAINING WALL SEPERATING THE EAST AND WEST PORTIONS OF THE SITE. THE RETAINING WALL WILL TRAVERSE THE SITE FROM THE NORTH TO SOUTH. THE WALL WILL BE LOCATED AT THE REAR OF THE LEASE AREAS FACING THE SPIRIT DRIVE RIGHT-OF-WAY. THE LOWER LEASE AREAS WILL BE LOCATED AT THE REAR OF THE PROPOSED RETAINING WALL AND THERE WILL BE AN INTERNAL ROADWAY ALSO TRAVERSING THE LOWER LEASE AREAS FROM THE NORTH TO THE SOUTH (CLARK CARR TO SPIRIT DR.) A SINGLE ENTRANCE WILL CONNECT THE INTERNAL ROAD TO THE UNIVERSITY BLVD. RIGHT-OF-WAY. RETAINING WALLS WILL ALSO BE INSTALLED ALONG THE EAST SIDE OF THE UNIVERSITY BLVD. ROW TO ALLOW THE COLLECTION AND DETENTION OF ONSITE DEVELOPED STORM WATER. BASIN A CONSISTS OF 23.2 ACRES AND WILL DRAIN EAST INTO THE UNDERGROUND STORM SYSTEM IN SPIRIT DRIVE AND THEN SOUTH TO COMBINE WITH THE EXISTING STORM SYSTEM AT THE SPIRIT DR. CLARK CARR INTERSECTION. BASIN B'S STORM WATER WILL BE DETAINED BY A SERIES OF DETENTION PONDS AT THE EAST SIDES OF THE LEASE PARCELS FACING SPIRIT DRIVE PRIOR TO RELEASE INTO THE SPIRIT DRIVE RIGHT-OF-WAY. BASIN B CONSISTS OF APPROX. 4.8 ACRES AND WILL DISCHARGE DIRECTLY INTO THE SPIRIT DR. ROW AND DRAIN INTO THE EXISTING STORM DRAIN LOCATED AT THE INTERSECTION OF UNIVERSITY BLVD & SPIRIT DR. BASIN C CONSISTS OF APPROX. 22.8 AC AND WILL DRAIN TO THE NORTHWEST CORNER OF THE SITE TO A LARGE DETENTION POND WITH CONTROLLED RELEASE INTO THE TO THE EXISTING STORM DRAIN SYSTEM LOCATED AT THE UNIVERSITY BLVD /CLARK CARR BLVD. INTERSECTION. BASIN D CONSISTS OF APPROX. 21.7 AC AND WILL DRAIN TO THE SOUTHWEST CORNER OF THE SITE TO A LARGE DETENTION POND WITH CONTROLLED RELEASE INTO THE EXISTING STORM DRAIN SYSTEM LOCATED AT THE UNIVERSITY BLVD./SPIRIT DR. INTERSECTION. BASIN E IS A SMALL BASIN OF APPROX. 2 AC WHICH IS SERVES AS THE MAIN ENTRY INTO THE SITE FROM UNIVERSITY BLVD. THIS BASIN WILL DRAIN INTO WEST INTO THE UNIVERSITY BLVD RIGHT OF WAY AND FLOW NORTH ALONG UNIVERSITY BLVD. WHEN IT WILL COMBINE WITH FLOW FROM BASIN C AT THE UNIVERSITY BLVD./ CLARK CARR BLVD INTERSECTION.

DSA
Darren Sowell
ARCHITECTS
4700 Lincoln N.E., Suite 111
Albuquerque, N.M. 87109
Phone: (505) 341-6389
Fax: (505) 341-6391

Sunport Center
Conceptual Grading Plan
Prepared for:
City of Albuquerque Aviation Department

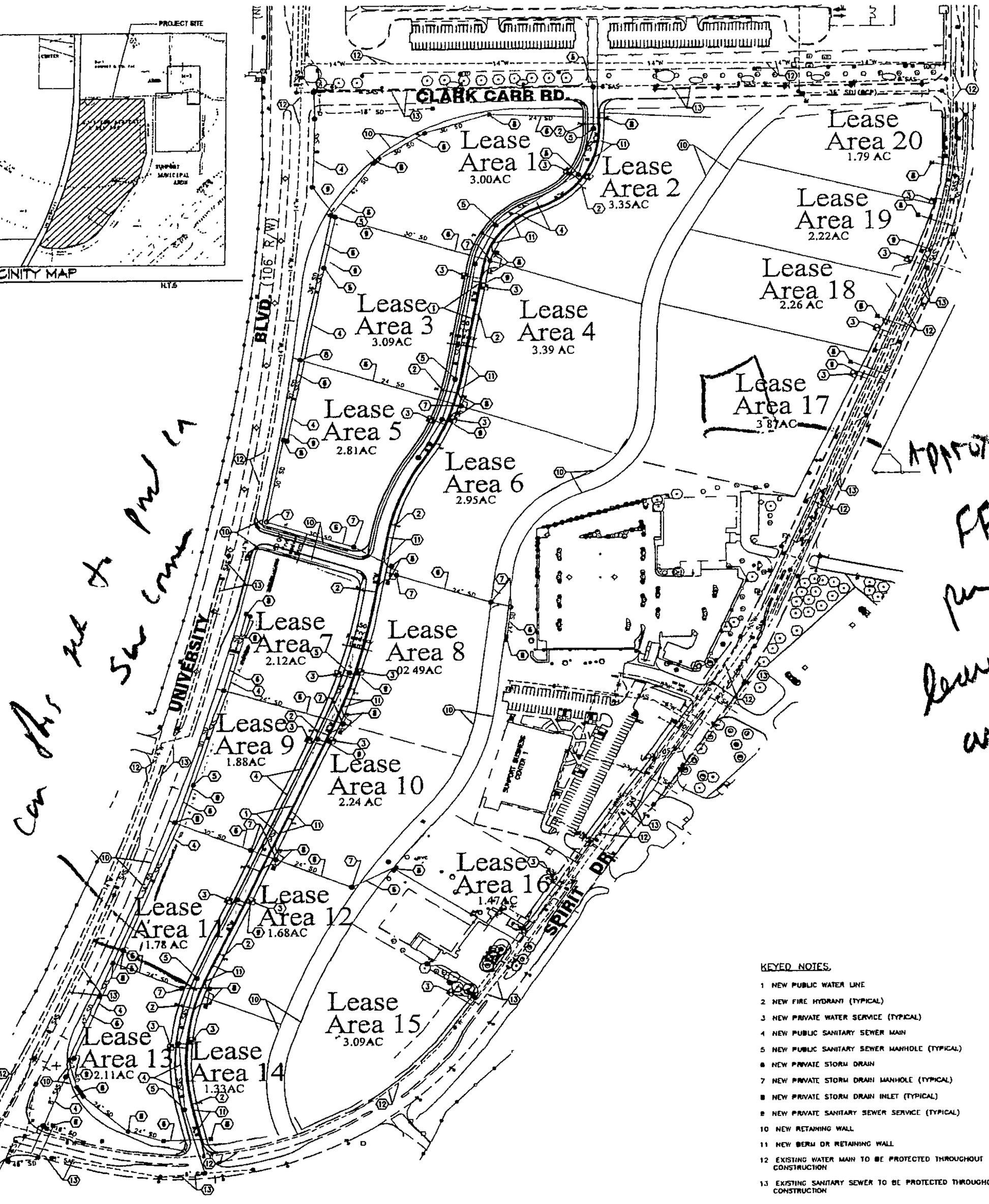
GRADING PLAN

Scale

Date: January 11, 2000
Project Number: 0109
Drawn By: MB
Checked: SD
Job No.

C-201

6 OF 6



KEYED NOTES

1 NEW PUBLIC WATER LINE
2 NEW FIRE HYDRANT (TYPICAL)
3 NEW PRIVATE WATER SERVICE (TYPICAL)
4 NEW PUBLIC SANITARY SEWER MAIN
5 NEW PUBLIC SANITARY SEWER MANHOLE (TYPICAL)
6 NEW PRIVATE STORM DRAIN
7 NEW PRIVATE STORM DRAIN MANHOLE (TYPICAL)
8 NEW PRIVATE STORM DRAIN INLET (TYPICAL)
9 NEW PRIVATE SANITARY SEWER SERVICE (TYPICAL)
10 NEW RETAINING WALL
11 NEW BERM OR RETAINING WALL
12 EXISTING WATER MAIN TO BE PROTECTED THROUGHOUT CONSTRUCTION
13 EXISTING SANITARY SEWER TO BE PROTECTED THROUGHOUT CONSTRUCTION

SCALE 1" = 100'

Sunport Center
Conceptual Utility Plan
Prepared for:
City of Albuquerque Aviation Department

DSA
Darren Sowell
ARCHITECTS
4100 Lincoln N.E., Suite 111
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Fax: (505) 343-6301

UTILITY PLAN

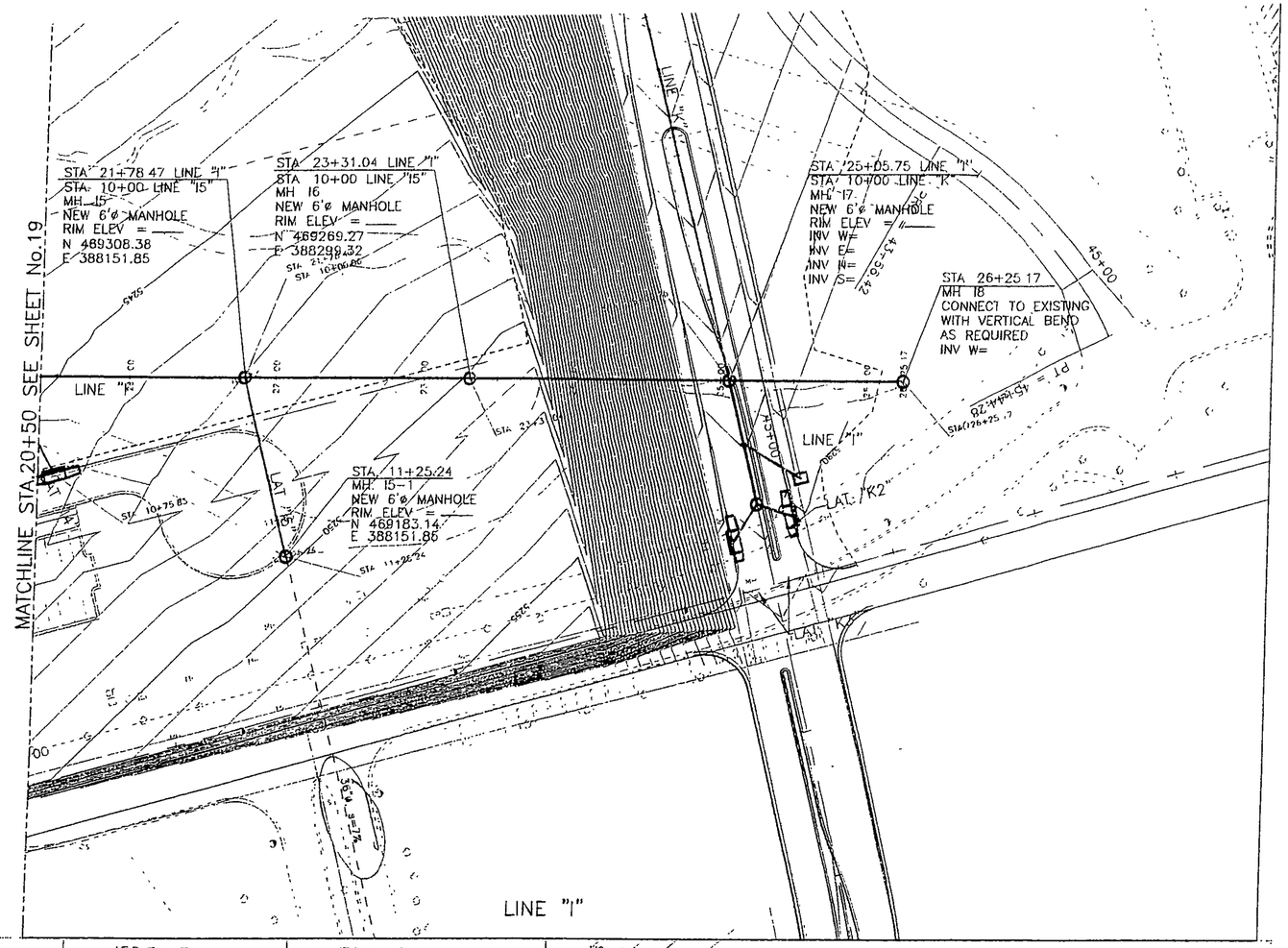
Scale

Date January 11, 2008
Project Number 0702
Drawn By MB
Checked DS
Cad No

C-301

6 OF 6

APPENDIX B- SCHEMATIC OF EXISTING STORM DRAIN SYSTEM



Item No 926.150

4'vF MH 6'dia Type E Xtra depth 14'-18'D
Item No 920.160
3'vF MH 6'dia Type E Xtra D, >18'D
Item No 920.170

Item No 701.150 Trch, BF 42-60 Swr 8' Deep
91 Lf

Item 701.160 Trch, BF 42-60 Swr 8-12' Deep
209 LF

Item 701.172 Trch, BF 42-60 Swr 12-16' Deep
43 LF

Item 701.180 Trch, BF 42-60 Swr 16-20' Deep
43 LF

Item 701.190 Trch, BF 42-60 Swr 20' Deep
61 LF

8-12 = 209
12-16 = 43
16-20 = 43
20' = 61
Total = 447 LF

Storm Drain
Item No 910.021 48" RCP III
447 LF

N

0 50 100
1" = 50'
GRAPHIC SCALE

LEGEND

- PROPOSED S.D MANHOLE
- PROPOSED TYPE "D" DROP INLET
- PROPOSED TYPE "A" DROP INLET
- PROPOSED FILTER DAM
- PROPOSED RIP-RAP
- 24"ø PROPOSED S.D. LINE AND SIZE

NOTE:
ALL DROP INLETS ARE TYPE "A" OR TYPE "D" UNLESS OTHERWISE NOTED ON THE LAYOUT PLAN

"I-N16 RESET" AN ACS ALUMINUM CAP APPROX S.10' E. 1180 FT. FROM THE INTERSECTION OF EXISTING ACCESS ROAD "B" AND CLARK CARR BLVD. AND APPROX. 100 FT. SSE OF A CHAIN GATE ALIGNED EAST TO WEST
ELEVATION = 5308.73

Field Notes By: URS GREINER WOODWARD CLYDE
Date: 12/98 THRU 2/99
No. 2050

JOHN M. PROVINE 10997 NEW MEXICO REGISTERED PROFESS IONAL ENGINEER

MOLZEN-CORBIN & Associates
ENGINEERS/ARCHITECTS/PLANNERS Albuquerque • Las Cruces • Los Alamos

BPLW
Architects & Engineers, P.A.
Designing to Shape the Future

No.	Date	Remarks	By

Designed By: KSF Date: 4/99
Drawn By: K/C Staff Date: 4/99
Checked By: JMP Date: 4/99

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

Remote Car Rental Facility
StormDrain Line "I"–Sta.20+50 to E.O.L.

Design Review Committee	City Engineer Approval	Last Design Update	No / Day / Yr	No / Day / Yr

NEXT SHEET NO. M-15

Y10

Y9

Y8

Y7

Y6

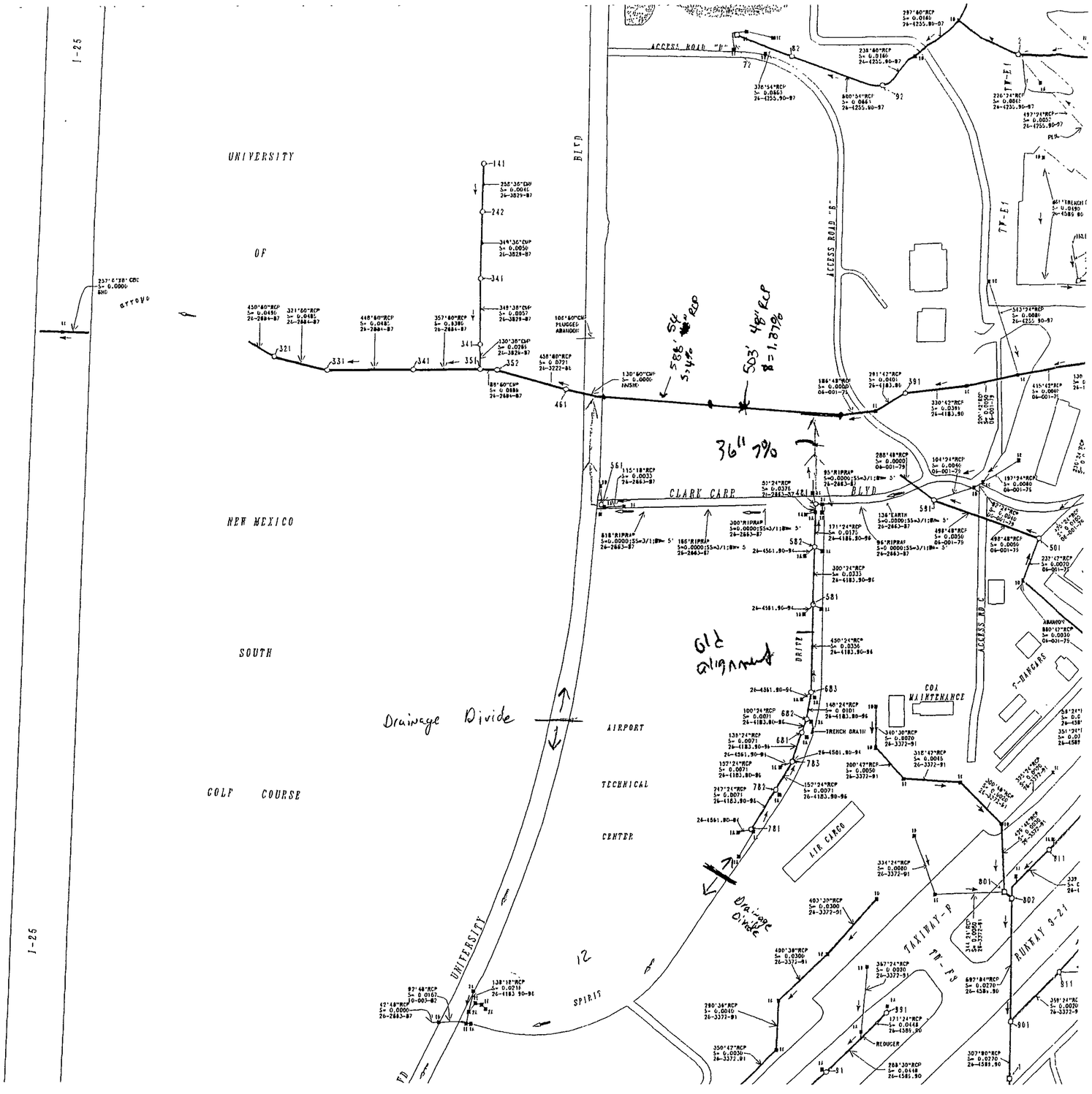
Y5

Y4

Y3

Y2

NEXT SHEET NO. N-14



NEXT SHEET NO. N-16

Storm Legend

- Lateral Stubout Inlet Connector
- Collector
- Reservor Drain Siphon
- Double Pipe
- Force Main
- Abandon Lines
- Manhole
- Inlet Catch Basin
- Junction Box
- Vault
- Standpipe/Riser
- Surface Flow
- Pipe Flow
- Water Course Holding Ponds Dams
- Well
- Reservoir
- Pump Station

0 100 200 400 600

SCALE

MAP GRID

Notes.

1 Map is for information only and is subject to corrections

4/5/99 PS ✓

STA 5+56.30 LINE "B" =
STA 10+00 LINE "B1"
MH B1
NEW 4'Ø MANHOLE
RIM ELEV. =
N 470007.96
E 387033.13

STA 10+00 LINE "B" =
STA 10+00 LINE "1"
J BOX. B1
NEW JUNCTION BOX
RIM ELEV. =
N 469564.72
E 387012.76

STA 12+81.24 LINE "B" =
STA 10+00 LINE "B2"
MH. B3
NEW 4'Ø MANHOLE
RIM ELEV. =
N 469283.58
E 387020.03

STA 14+90.02
MH. B4
NEW 4'Ø MANHOLE
CONECTED TO EXISTING
SD TO SOUTH
REMOVE AND DISPOSE
EXISTING HEADWALL
RIM ELEV. =
N 469074.87
E 387025.43

STA 15+99.30
DI B1
NEW TYPE 'A' DROP INLET
GRADE ELEV. =
N 469012.55
E 387115.04

Remove and replace existing 60"ø RCP

LINE "B"

188.45 LF. 42" SD. @ 0.90% | 133.41 LF. 42" SD. @ 0.90% | 121.90 LF. 42" SD. @ 0.90% | 284.24 LF. 30" SD. @ 6.51% | 205.78 LF. 24" SD. @ 6.56% | 109.06 LF. 18" SD. @ 9.15%

STA. 5+56.30
MH B1
INV NW=5192.00
INV S=5192.00
INV E=5192.00

STA. 7+44.75
MH B2
INV N=5190.30
INV S=5190.30
INV E=5190.30

STA. 8+78.16
DI B1
INV N=5189.10
INV S=5189.10
INV E=5190.10

STA. 10+00 LINE "B" =
STA. 10+00 LINE "1"
J BOX B1
INV E=5188.0

EXISTING GROUND
FINISH GRADE

18" SD
0-8 = 34
8-12 = 75
Total = 109 LF

1 ea - MH, 4' dia Type E (Modified)
Item No 920.080
1 ea - MH, 4' dia Type G (Modified)
Item No 920.070
1 ea Catch Basin, Type "D" Single Grate
Item No 415050

30" SD
0-8 = 231
8-12 = 53
Total = 284 LF

1 ea Junction box

24" SD
0-8 = 59
8-12 = NIL
Total = 206 LF

42" SD
0-8 = 110
8-12 = 139
Total = 249 LF

2 ea - MH, 4' dia Type F (Modified)
Item 920.150

Item No 701.180 Trch. BF 18-36" Swr < 8'
323 LF
Item No 701.110 Trch BF 18-36" Swr 8-12'
276 LF
Item No 701.150 Trch BF 42-66" Swr <8
110 LF
Item No 701.166 Trch. BF 42-66" Swr 8-12
331 LF

Storm Drain
Item No 910.005 18" RCP III
109 LF
Item No 910.015 30" RCP III
284 LF
Item 910.019 42" RCP III
444 LF
Item No 910.009 24" RCP III
206 LF

0 50 100
1"= 50'
GRAPHIC SCALE

LEGEND

- PROPOSED S.D. MANHOLE
- PROPOSED TYPE "D" DROP INLET
- PROPOSED TYPE "A" DROP INLET
- PROPOSED FILTER DAM
- PROPOSED RIP-RAP
- 24"ø PROPOSED S.D. LINE AND SIZE

NOTE:
ALL DROP INLETS ARE TYPE "A" OR TYPE "D" UNLESS OTHERWISE NOTED ON THE LAYOUT PLAN

T-1116 RESET AN ACS ALUMINUM CAP APPROX. S 10° E, 1180 FT. FROM THE INTERSECTION OF EXISTING ACCESS ROAD "B" AND CLARK CARR BLVD. AND APPROX. 100 FT SSE OF A CHAIN GATE ALIGNED EAST TO WEST
ELEVATION = 5308.73

No.	Date	Revisions	By
2050	12/98	Field Notes	
	THRU	URS GREINER	
	2/99	WOODWARD CLYDE	

MOLZEN-CORBIN & Associates
ENGINEERS/ARCHITECTS/PLANNERS Albuquerque • Las Cruces • Las Alamos

BPLW
Designing to Shape the Future

JOHN W. PROVINCE 10997 NEW MEXICO REGISTERED PROFESSIONAL ENGINEER

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

Prepared By: KEF

LANDS OF UNM

℄ PT STA. 46+29.70

48" RCP

8" SAS

8" SAS

24" RCP

N 74° 12' 54" W - 219.50'

8" W

8" W

18" RCP

18" RCP

45+35.00
4" SASVC

+75 ± 20 ± RT.
PCC 8" WATERMAIN
1 - REMOVE EXIST. 8" CAP
1 - NON-P. CONN.

12"

14"

DRAINAGE EASE..

TEL.

STA. 48+49.20 ℄ SPIRIT DRIVE
= STA. 10+00.00 ℄ UNIVERSITY BLVD.

UNIVERSITY BLVD. SE

12" SAS

14" W

LANDS OF UNM

APPENDIX C- CALCULATIONS

FTZ Drainage
Albuquerque, New Mexico

3?

Precipitation Depths$_{100\text{-year}}$ (inches)

P_{6hr}	P_{24hr}	P_{360}	P_{1440}	P_{10day}
2.01	2.3	2.75	3.3	3.95

Peak Discharge$_{100\text{-year}}$ (cfs/acre)

A	B	C	D
1.56	2.28	3.14	4.7

Tc 0.2 hr
Zone 2 Peak Intensity (in/hr):
I = 5.05

Existing

BASIN A

Land Treatment	Area (ft²)	Area (acre)	% of Total Area	Excess Prec$_{100\text{-6}}$ (in)	Weighted E (in)	Volume$_{360}$ (acre-ft)	Volume$_{1440}$ (acre-ft)	Volume$_{10day}$ (acre-ft)	$Q_{100\text{-year/60min}}$ (cfs)	Rational Method, C	Rational Method, Q (cfs)
A		0.00	0.00%	0.53	--	0.0000	--	--	0.0000	0.31	0.00
B		4.64	20.00%	0.78	--	0.6013	--	--	10.5792	0.45	10.54
C		6.96	30.00%	1.13	--	0.9019	--	--	21.8544	0.62	21.79
D		11.60	50.00%	2.12	--	1.5032	--	--	54.5200	0.93	54.48
Totals	0.0000	23.20	100.00%	--	1.5550	3.0063	3.3930	4.5530	86.9536	--	86.82
					check	3.0063					

BASIN B

Land Treatment	Area (ft²)	Area (acre)	% of Total Area	Excess Prec$_{100\text{-6}}$ (in)	Weighted E (in)	Volume$_{360}$ (acre-ft)	Volume$_{1440}$ (acre-ft)	Volume$_{10day}$ (acre-ft)	$Q_{100\text{-year/60min}}$ (cfs)	Rational Method, C	Rational Method, Q (cfs)
A		3.84	80.00%	0.53	--	0.1856	--	--	5.9904	0.31	6.01
B		0.96	20.00%	0.78	--	0.0464	--	--	2.1886	0.45	2.18
C		0.00	0.00%	1.13	--	0.0000	--	--	0.0000	0.62	0.00
D		0.00	0.00%	2.12	--	0.0000	--	--	0.0000	0.93	0.00
Totals	0.0000	4.80	100.00%	--	0.5800	0.2320	0.2320	0.2320	8.1792	--	8.19
					check	0.2320					

BASIN C

Land Treatment	Area (ft²)	Area (acre)	% of Total Area	Excess Prec$_{100\text{-6}}$ (in)	Weighted E (in)	Volume$_{360}$ (acre-ft)	Volume$_{1440}$ (acre-ft)	Volume$_{10day}$ (acre-ft)	$Q_{100\text{-year/60min}}$ (cfs)	Rational Method, C	Rational Method, Q (cfs)
A		20.52	90.00%	0.53	--	0.9491	--	--	32.0112	0.31	32.12
B		2.28	10.00%	0.78	--	0.1055	--	--	5.1984	0.45	5.18
C		0.00	0.00%	1.13	--	0.0000	--	--	0.0000	0.62	0.00
D		0.00	0.00%	2.12	--	0.0000	--	--	0.0000	0.93	0.00
Totals	0.0000	22.80	100.00%	--	0.5550	1.0545	1.0545	1.0545	37.2096	--	37.31
					check	1.0545					

BASIN D

Land Treatment	Area (ft²)	Area (acre)	% of Total Area	Excess Prec$_{100\text{-6}}$ (in)	Weighted E (in)	Volume$_{360}$ (acre-ft)	Volume$_{1440}$ (acre-ft)	Volume$_{10day}$ (acre-ft)	$Q_{100\text{-year/60min}}$ (cfs)	Rational Method, C	Rational Method, Q (cfs)
A		19.08	90.00%	0.53	--	0.8825	--	--	29.7648	0.31	29.87
B		2.12	10.00%	0.78	--	0.0981	--	--	4.8336	0.45	4.82
C		0.00	0.00%	1.13	--	0.0000	--	--	0.0000	0.62	0.00
D		0.00	0.00%	2.12	--	0.0000	--	--	0.0000	0.93	0.00
Totals	0.0000	21.20	100.00%	--	0.5550	0.9805	0.9805	0.9805	34.5984	--	34.69
					check	0.9805					

BASIN E

Land Treatment	Area (ft²)	Area (acre)	% of Total Area	Excess Prec$_{100\text{-6}}$ (in)	Weighted E (in)	Volume$_{360}$ (acre-ft)	Volume$_{1440}$ (acre-ft)	Volume$_{10day}$ (acre-ft)	$Q_{100\text{-year/60min}}$ (cfs)	Rational Method, C	Rational Method, Q (cfs)
A		0.00	0.00%	0.53	--	0.0000	--	--	0.0000	0.31	0.00
B		0.00	0.00%	0.78	--	0.0000	--	--	0.0000	0.45	0.00
C		0.36	100.00%	1.13	--	0.0339	--	--	1.1304	0.62	1.13
D		0.00	0.00%	2.12	--	0.0000	--	--	0.0000	0.93	0.00
Totals	0.0000	0.36	100.00%	--	1.1300	0.0339	0.0339	0.0339	1.1304	--	1.13
					check	0.0339					

Developed

BASIN A

Land Treatment	Area [ft²]	Area [acre]	% of Total Area	Excess $Prec_{100\text{-}6}$ [in]	Weighted E [in]	$Volume_{360}$ [acre-ft]	$Volume_{1440}$ [acre-ft]	$Volume_{10day}$ [acre-ft]	$Q_{100\text{-}year\ runoff\ flow}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0.00	0.00%	0.53	--	0.0000	--	--	0.0000	0.31	0.00
B		4.64	20.00%	0.78	--	0.0075	--	--	10.5792	0.45	10.54
C		0.00	0.00%	1.13	--	0.0000	--	--	0.0000	0.62	0.00
D		18.56	80.00%	2.12	--	2.4051	--	--	87.2320	0.93	87.17
Totals	0.0000	23.20	100.00%	--	1.8520	3.0063	3.6250	5.4810	97.8112	--	97.71
					check	3.5805					

BASIN B

Land Treatment	Area [ft²]	Area [acre]	% of Total Area	Excess $Prec_{100\text{-}6}$ [in]	Weighted E [in]	$Volume_{360}$ [acre-ft]	$Volume_{1440}$ [acre-ft]	$Volume_{10day}$ [acre-ft]	$Q_{100\text{-}year\ runoff\ flow}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0.00	0.00%	0.53	--	0.0000	--	--	0.0000	0.31	0.00
B		0.96	20.00%	0.78	--	0.0464	--	--	0.0000	0.45	2.18
C		0.00	0.00%	1.13	--	0.0000	--	--	0.0000	0.62	0.00
D		3.84	80.00%	2.12	--	0.1856	--	--	18.0480	0.93	18.03
Totals	0.0000	4.80	100.00%	--	1.8520	0.2320	0.3600	0.7440	18.0480	--	20.22
					check	0.7408					

BASIN C

Land Treatment	Area [ft²]	Area [acre]	% of Total Area	Excess $Prec_{100\text{-}6}$ [in]	Weighted E [in]	$Volume_{360}$ [acre-ft]	$Volume_{1440}$ [acre-ft]	$Volume_{10day}$ [acre-ft]	$Q_{100\text{-}year\ runoff\ flow}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0.00	0.00%	0.53	--	0.0000	--	--	0.0000	0.31	0.00
B		4.56	20.00%	0.78	--	0.2109	--	--	10.3968	0.45	10.36
C		0.00	0.00%	1.13	--	0.0000	--	--	0.0000	0.62	0.00
D		18.24	80.00%	2.12	--	0.8436	--	--	85.7280	0.93	85.66
Totals	0.0000	22.80	100.00%	--	1.8520	1.0545	1.6625	3.4865	96.1248	--	96.03
					check	3.5188					

BASIN D

Land Treatment	Area [ft²]	Area [acre]	% of Total Area	Excess $Prec_{100\text{-}6}$ [in]	Weighted E [in]	$Volume_{360}$ [acre-ft]	$Volume_{1440}$ [acre-ft]	$Volume_{10day}$ [acre-ft]	$Q_{100\text{-}year\ runoff\ flow}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0.00	0.00%	0.53	--	0.0000	--	--	0.0000	0.31	0.00
B		4.24	20.00%	0.78	--	0.1961	--	--	9.6672	0.45	9.64
C		0.00	0.00%	1.13	--	0.0000	--	--	0.0000	0.62	0.00
D		16.96	80.00%	2.12	--	0.7844	--	--	79.7120	0.93	79.65
Totals	0.0000	21.20	100.00%	--	1.8520	0.9805	1.5458	3.2418	89.3792	--	89.29
					check	3.2719					

BASIN E

Land Treatment	Area [ft²]	Area [acre]	% of Total Area	Excess $Prec_{100\text{-}6}$ [in]	Weighted E [in]	$Volume_{360}$ [acre-ft]	$Volume_{1440}$ [acre-ft]	$Volume_{10day}$ [acre-ft]	$Q_{100\text{-}year\ runoff\ flow}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0.00	0.00%	0.53	--	0.0000	--	--	0.0000	0.31	0.00
B		0.00	0.00%	0.78	--	0.0000	--	--	0.0000	0.45	0.00
C		0.00	0.00%	1.13	--	0.0000	--	--	0.0000	0.62	0.00
D		0.36	100.00%	2.12	--	0.0339	--	--	1.6920	0.93	1.69
Totals	0.0000	0.36	100.00%	--	2.1200	0.0339	0.0459	0.0819	1.6920	--	1.69
					check	0.0636					

Land treatment types

B 2.28 .456

D 4.707 3.76 OK

4.71

basically Road is 100% D
Less than 80% D
is all of what

24" RCP
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	University & Clark Carr Road
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.065600	ft/ft
Diameter	24.00	in

Results		
Depth	2.00	ft
Discharge	57.94	cfs
Flow Area	3.14	ft^2
Wetted Perimeter	6.28	ft
Top Width	0.00	ft
Critical Depth	1.99	ft
Percent Full	100.00	
Critical Slope	0.061633	ft/ft
Velocity	18.44	ft/s
Velocity Head	5.29	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	62.32	cfs
Full Flow Capacity	57.94	cfs
Full Flow Slope	0.065600	ft/ft

42"
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	FTZ
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.009500	ft/ft
Diameter	42.00	in

Results		
Depth	3.50	ft
Discharge	98.06	cfs
Flow Area	9.62	ft^2
Wetted Perimeter	11.00	ft
Top Width	0.00	ft
Critical Depth	3.05	ft
Percent Full	100.00	
Critical Slope	0.008660	ft/ft
Velocity	10.19	ft/s
Velocity Head	1.61	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	105.48	cfs
Full Flow Capacity	98.06	cfs
Full Flow Slope	0.009500	ft/ft

18" UNIVERSITY & SPIRIT DR
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	FTZ
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.021800	ft/ft
Diameter	18.00	in

Results		
Depth	1.50	ft
Discharge	15.51	cfs
Flow Area	1.77	ft²
Wetted Perimeter	4.71	ft
Top Width	0.00	ft
Critical Depth	1.42	ft
Percent Full	100.00	
Critical Slope	0.018849	ft/ft
Velocity	8.78	ft/s
Velocity Head	1.20	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	16.68	cfs
Full Flow Capacity	15.51	cfs
Full Flow Slope	0.021800	ft/ft

48" UNIVERSITY & SPIRIT DR
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	FTZ
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.016700	ft/ft
Diameter	48.00	in

Results		
Depth	4.00	ft
Discharge	185.62	cfs
Flow Area	12.57	ft²
Wetted Perimeter	12.57	ft
Top Width	0.00	ft
Critical Depth	3.80	ft
Percent Full	100.00	
Critical Slope	0.014462	ft/ft
Velocity	14.77	ft/s
Velocity Head	3.39	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	199.67	cfs
Full Flow Capacity	185.62	cfs
Full Flow Slope	0.016700	ft/ft

54"

Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	FTZ
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.040100	ft/ft
Diameter	54.00	in

Results		
Depth	4.50	ft
Discharge	393.77	cfs
Flow Area	15.90	ft^2
Wetted Perimeter	14.14	ft
Top Width	0.00	ft
Critical Depth	4.46	ft
Percent Full	100.00	
Critical Slope	0.037136	ft/ft
Velocity	24.76	ft/s
Velocity Head	9.53	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	423.58	cfs
Full Flow Capacity	393.77	cfs
Full Flow Slope	0.040100	ft/ft

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(Rev. 1-28-03)

N-15/D006

PROJECT TITLE: Albuquerque International Sunport- Foreign Trade Zone ZONE MAP/DRG. FILE #: L-16, M-15, M-16, M-17, M-18, N-15, N-16, N-17, N-18, P-15, P-16
DRB#: _____ EPC#: WORK ORDER#: _____

LEGAL DESCRIPTION: Sunport Municipal Addition
CITY ADDRESS: 2200 Sunport Blvd. SE, Albuquerque, NM 87106

ENGINEERING FIRM: Molzen-Corbin & Associates CONTACT: Mike Provine
ADDRESS: 2701 Miles Road SE PHONE: 242-5700
CITY, STATE: Albuquerque, NM ZIP CODE: 87106

OWNER: COA/ Aviation Department CONTACT: Jim Hinde
ADDRESS: 2200 Sunport Blvd. SE PHONE: 255-8668
CITY, STATE: Albuquerque, NM ZIP CODE: 87106

ARCHITECT: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY STATE: _____ ZIP CODE: _____

SURVEYOR: Santiago Romero Jr. & Associates, Inc. CONTACT: Santiago Romero
ADDRESS: 8708 Brandywine Rd NE PHONE: 884-5119
CITY, STATE: Albuquerque, NM ZIP CODE: 87111

CONTRACTOR: _____ CONTACT. _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE. _____

DMP ?

CHECK TYPE OF SUBMITTAL:
__X__ DRAINAGE REPORT
_____ DRAINAGE PLAN 1st SUBMITTAL,
REQUIRES TCL or equal
_____ DRAINAGE PLAN RESUBMITTAL
_____ CONCEPTUAL GRADING AND DRAINAGE PLAN
_____ GRADING PLAN
_____ EROSION CONTROL PLAN
_____ ENGINEER'S CERTIFICATION (HYDROLOGY)
_____ CLOMR/LOMR
_____ TRAFFIC CIRCULATION LAYOUT (TCL)
_____ ENGINEERS CERTIFICATION (TCL)
_____ ENGINEERS CERTIFICATION (DRB APPR. SITE PLAN)
_____ OTHER

CHECK TYPE OF APPROVAL SOUGHT:
_____ SIA/FINANCIAL GUARANTEE RELEASE
_____ PRELIMINARY PLAT APPROVAL
_____ S. DEV. PLAN FOR SUB'D APPROVAL
_____ S. DEV. PLAN FOR BLDG. PERMITAPPROVAL
_____ SECTOR PLAN APPROVAL
_____ FINAL PLAT APPROVAL
_____ FOUNDATION PERMIT APPROVAL
_____ BUILDING PERMIT APPROVAL
_____ CERTIFICATE OF OCCUPANCY (PERM.)
_____ CERTIFICATE OF OCCUPANCY (TEMP.)
_____ GRADING PERMIT APPROVAL
_____ PAVING PERMIT APPROVAL
_____ WORK ORDER APPROVAL
__X__ OTHER (SPECIFY)
DMP

WAS A PRE-DESIGN CONFERENCE ATTENDED:
__X__ YES
_____ NO
_____ COPY PROVIDED

DATE SUBMITTED: 11/2/10 BY: Dan Hoga

RECEIVED
NOV 0 2 2010
HYDROLOGY SECTION

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope to the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.

2. **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres

3. **Drainage Report:** Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more

CLARK

CARR

RD

N15

N16

ACCESS RD C

DR

LUV

LA

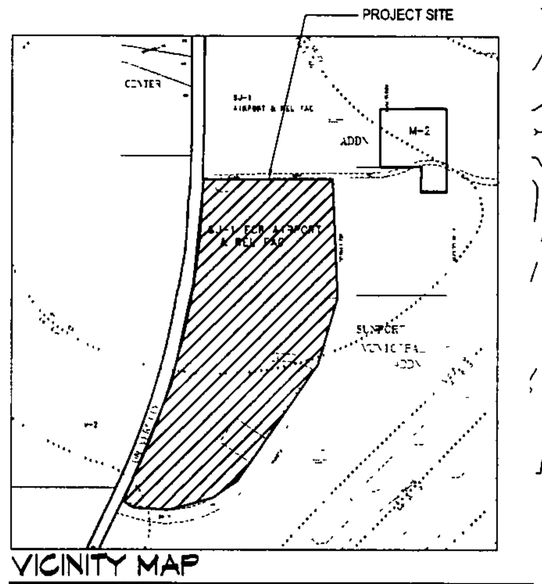
Site visit w/ Mike Provine 7-13-10

cc

1. Identify basin for Spirit drive so that Basin + can drain to CF

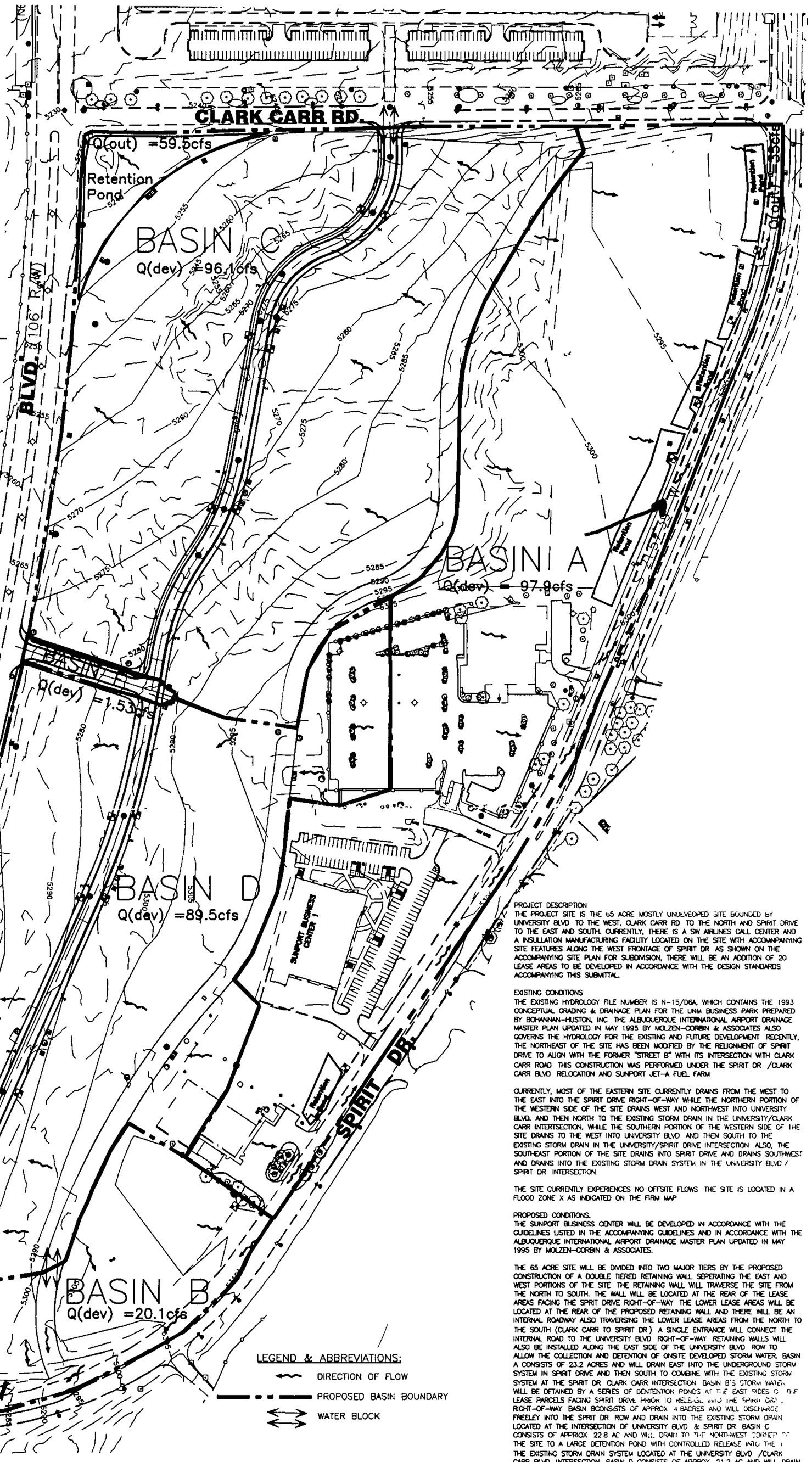
2 Maintain Q_{EXIT} at south outfall

3 only minor problems at South outfall



VICINITY MAP

N-15 NTS



N

SCALE 1" = 100' 0 50' 100'

Sunport Center
Conceptual Grading Plan
Prepared for:
City of Albuquerque Aviation Department

PROJECT DESCRIPTION
THE PROJECT SITE IS THE 65 ACRE MOSTLY UNDEVELOPED SITE BOUNDED BY UNIVERSITY BLVD TO THE WEST, CLARK CARR RD TO THE NORTH AND SPIRIT DRIVE TO THE EAST AND SOUTH. CURRENTLY, THERE IS A SW AIRLINES CALL CENTER AND A INSULLATION MANUFACTURING FACILITY LOCATED ON THE SITE WITH ACCOMPANYING SITE FEATURES ALONG THE WEST FRONTAGE OF SPIRIT DR AS SHOWN ON THE ACCOMPANYING SITE PLAN FOR SUBDIVISION, THERE WILL BE AN ADDITION OF 20 LEASE AREAS TO BE DEVELOPED IN ACCORDANCE WITH THE DESIGN STANDARDS ACCOMPANYING THIS SUBMITTAL.

EXISTING CONDITIONS
THE EXISTING HYDROLOGY FILE NUMBER IS N-15/D6A, WHICH CONTAINS THE 1993 CONCEPTUAL GRADING & DRAINAGE PLAN FOR THE UNM BUSINESS PARK PREPARED BY BOHANNAN-HUSTON, INC THE ALBUQUERQUE INTERNATIONAL AIRPORT DRAINAGE MASTER PLAN UPDATED IN MAY 1995 BY MOLZEN-CORBIN & ASSOCIATES ALSO GOVERNS THE HYDROLOGY FOR THE EXISTING AND FUTURE DEVELOPMENT RECENTLY, THE NORTHEAST OF THE SITE HAS BEEN MODIFIED BY THE RELIGNMENT OF SPIRIT DRIVE TO ALIGN WITH THE FORMER "STREET B" WITH ITS INTERSECTION WITH CLARK CARR ROAD THIS CONSTRUCTION WAS PERFORMED UNDER THE SPIRIT DR /CLARK CARR BLVD RELOCATION AND SUNPORT JET-A FUEL FARM

CURRENTLY, MOST OF THE EASTERN SITE CURRENTLY DRAINS FROM THE WEST TO THE EAST INTO THE SPIRIT DRIVE RIGHT-OF-WAY WHILE THE NORTHERN PORTION OF THE WESTERN SIDE OF THE SITE DRAINS WEST AND NORTH-WEST INTO UNIVERSITY BLVD. AND THEN NORTH TO THE EXISTING STORM DRAIN IN THE UNIVERSITY/CLARK CARR INTERTSECTION, WHILE THE SOUTHERN PORTION OF THE WESTERN SIDE OF THE SITE DRAINS TO THE WEST INTO UNIVERSITY BLVD AND THEN SOUTH TO THE EXISTING STORM DRAIN IN THE UNIVERSITY/SPIRIT DRIVE INTERSECTION ALSO, THE SOUTHEAST PORTION OF THE SITE DRAINS INTO SPIRIT DRIVE AND DRAINS SOUTHWEST AND DRAINS INTO THE EXISTING STORM DRAIN SYSTEM IN THE UNIVERSITY BLVD / SPIRIT DR INTERSECTION

THE SITE CURRENTLY EXPERIENCES NO OFFSITE FLOWS THE SITE IS LOCATED IN A FLOOD ZONE X AS INDICATED ON THE FIRM MAP

PROPOSED CONDITIONS.
THE SUNPORT BUSINESS CENTER WILL BE DEVELOPED IN ACCORDANCE WITH THE GUIDELINES LISTED IN THE ACCOMPANYING GUIDELINES AND IN ACCORDANCE WITH THE ALBUQUERQUE INTERNATIONAL AIRPORT DRAINAGE MASTER PLAN UPDATED IN MAY 1995 BY MOLZEN-CORBIN & ASSOCIATES.

THE 65 ACRE SITE WILL BE DIVIDED INTO TWO MAJOR TIERS BY THE PROPOSED CONSTRUCTION OF A DOUBLE TIERED RETAINING WALL SEPERATING THE EAST AND WEST PORTIONS OF THE SITE THE RETAINING WALL WILL TRAVERSE THE SITE FROM THE NORTH TO SOUTH. THE WALL WILL BE LOCATED AT THE REAR OF THE LEASE AREAS FACING THE SPRIT DRIVE RIGHT-OF-WAY THE LOWER LEASE AREAS WILL BE LOCATED AT THE REAR OF THE PROPOSED RETAINING WALL AND THERE WILL BE AN INTERNAL ROADWAY ALSO TRAVERSING THE LOWER LEASE AREAS FROM THE NORTH TO THE SOUTH (CLARK CARR TO SPIRIT DR) A SINGLE ENTRANCE WILL CONNECT THE INTERNAL ROAD TO THE UNIVERSITY BLVD RIGHT-OF-WAY RETAINING WALLS WILL ALSO BE INSTALLED ALONG THE EAST SIDE OF THE UNIVERSITY BLVD ROW TO ALLOW THE COLLECTION AND DETENTION OF ONSITE DEVELOPED STORM WATER. BASIN A CONSISTS OF 23.2 ACRES AND WILL DRAIN EAST INTO THE UNDERGROUND STORM SYSTEM IN SPIRIT DRIVE AND THEN SOUTH TO COMBINE WITH THE EXISTING STORM SYSTEM AT THE SPIRIT DR CLARK CARR INTERSECTION BASIN B'S STORM WATER WILL BE DETAINED BY A SERIES OF DENTENTION PONDS AT THE EAST SIDES OF THE LEASE PARCELS FACING SPIRIT DRIVE PRIOR TO RELEASE INTO THE SPIRIT DR. RIGHT-OF-WAY. BASIN BCONSISTS OF APPROX 4 BACRES AND WILL DISCHARGE FREELEY INTO THE SPRIT DR ROW AND DRAIN INTO THE EXISTING STORM DRAIN LOCATED AT THE INTERSECTION OF UNIVERSITY BLVD & SPIRIT DR BASIN C CONSISTS OF APPRIOX 22.8 AC AND WILL DRAIN TO THE NORTH-WEST CORNER OF THE SITE TO A LARGE DETENTION POND WITH CONTROLLED RELEASE INTO THE EXISTING STORM DRAIN SYSTEM LOCATED AT THE UNIVERSITY BLVD /CLARK CARR BLVD INTERSECTION BASIN D CONSISTS OF APPROX 21.2 AC AND WILL DRAIN TO THE SOUTHWEST CORNER OF THE SITE TO A LARGE DETENTION POND WITH CONTROLLED RELEASE INTO THE EXISTING STORM DRAIN SYSTEM LOCATED AT THE UNIVERSITY BLVD /SPIRIT DR INTERSECTION BASIN E IS A SMALL BASIN OF APPROX 3.6 AC WHICH IS SERVES AS THE MAIN ENTRY INTO THE SITE FROM UNIVERSITY BLVD THIS BASIN WILL DRAIN INTO WEST INTO THE UNIVERSITY BLVD RIGHT OF WAY AND FLOW NORTH ALONG UNIVERSITY BLVD WHEN IT WILL COMBINE WITH FLOWS FROM BASIN C AT THE UNIVERSITY BLVD / CLARK CARR BLVD INTERSECTION.

DSA
Darren Sowell
ARCHITECTS
4700 Lincoln N.E., Suite 111
Albuquerque N.M. 87109
Phone (505) 342-6200
Fax (505) 342-6201

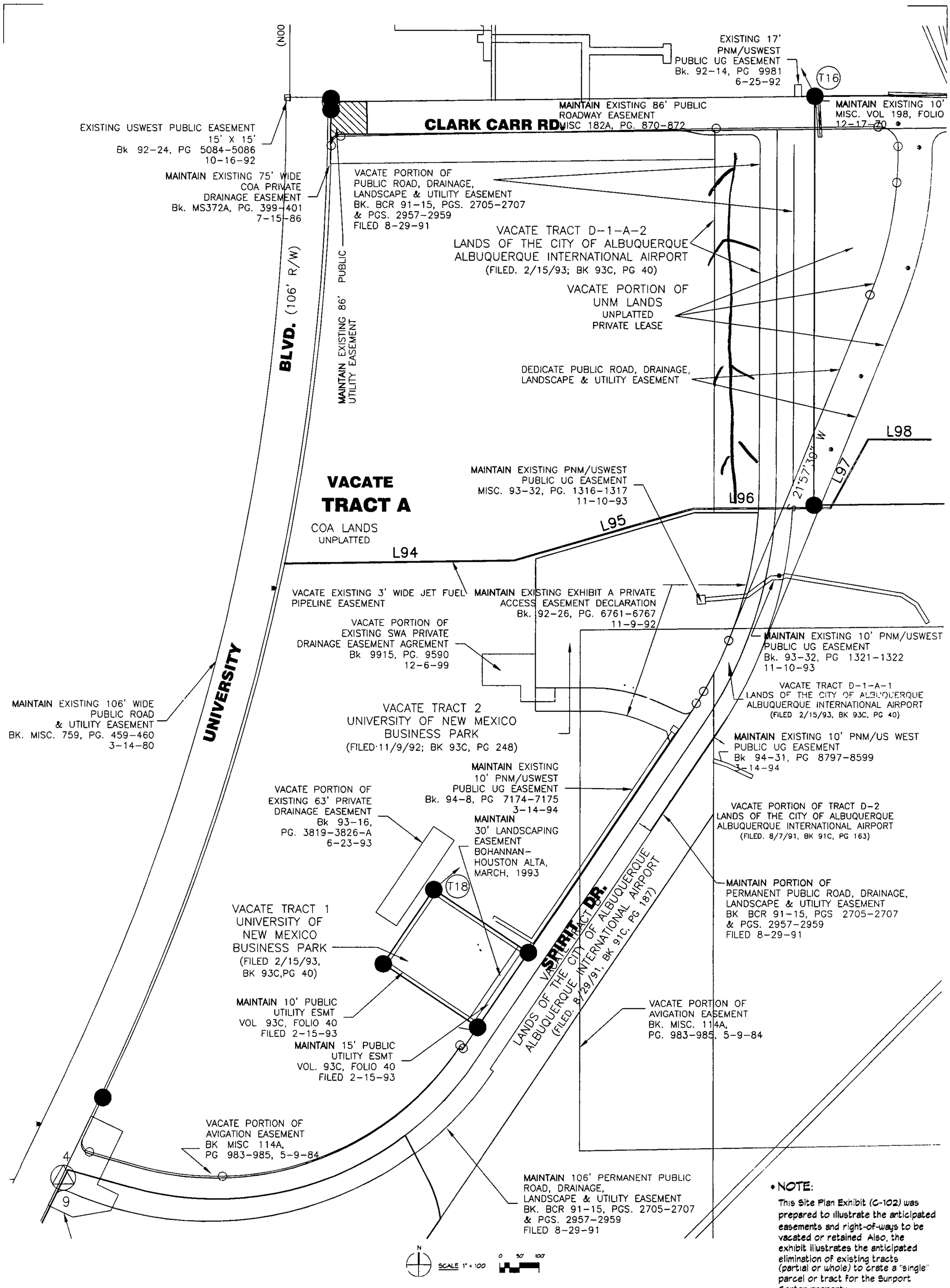
GRADING PLAN

Scale

C-201

5 OF 6

Date	January 11, 2008
Project Number	0705
Drawn By	MS
Checked	DS
Cad No	



* NOTE:

This Site Plan Exhibit (C-102) was prepared to illustrate the anticipated easements and right-of-ways to be vacated or retained Also, the exhibit illustrates the anticipated elimination of existing tracts (partial or whole) to crate a "single" parcel or tract for the Sunport Center property

Sunport Center
* Site Plan Exhibit
Prepared for:
City of Albuquerque Aviation Department

DSA
Darren Sowell
ARCHITECTS
4700 Lincoln NE, Suite 111
Albuquerque NM 87109
Phone (505) 342-6200
Fax (505) 342-6201

SITE PLAN EXHIBIT

Scale

Date	January 1 2005
Project Number	0705
Drawn By	MS
Checked	DS
Cad No.	

C-102

2 OF 6

Q100=10.0cfs
INV:5238.49
J4-2
A=0.11ac
Q100=0 51cfs
Qcap=8 0cfs
148.32'
INV:5238.19
10.0cfs
I6
A=2.73ac
Q100=12.6cfs
Qcap=10 0cfs
INV:5238.94
42"ø SD.
Q100=
Qcap=31 8cfs
184.33'
I6
RIM:5251.45
INV W,E:5240.00
INV:5238.34
INV:5240.0
J5
INV SW:5238.05
RIM:5244.24
101.47'
INV W,E:5237.0
RIM:5243.3
J4
J4-1
A=0 12ac
Q100=0.56cfs
Qcap=8 0cfs
48"ø SD.
Q100=17 2cfs
Qcap=168 0cfs
152.57'
I5-2
RIM:5246.65
INV:5238.00
101.72'
36"ø SD
Q100=
Qcap=150 7cfs
42"ø SD
Q100=
Qcap=31 8cfs
I5
RIM:5247.98
INV E,W,NE:5237.90
INV W:5238 90
125.24'
I5-1
RIM:5251.30
INV:5245.30
J3-2
J3-1
24"ø SD.
Q100=5 74cfs
Qcap=22.6cfs
300.25'
I5-1
A=2 49ac
Q100=11.5cfs
Qcap=10.0cfs
48"ø SD.
Q100=17.2cfs
Qcap=168.0cfs
I5-2
A=0 64ac
Q100=2 96cfs
Qcap=7.8cfs
J3-3
J3-1
A=0 52ac
Q100=2 41cfs
Qcap=8 0cfs
J3-2
A=0 59ac
Q100=2.73cfs
Qcap=8 0cfs
J3-3
A=0.21ac
Q100=0.97cfs
Qcap=8 0cfs
INV:5235.0
INV:5235.0
164.88'
18.7cfs
18" ø
INV 5236 00
270.21'
75.83'
INV:5242.00
18"ø SD
Q100=10 0cfs
Qcap=7.42cfs
I4
RIM:5245.08
INV N:5235.64
INV E,W:5235.64
INV S:5239.58
18"ø SD
Q100=2 96cfs
Qcap=18 7cfs
J3-1
J3
RIM.5240 92
INV NE,SE:5232.33
INV W,E:5231.0
24"ø SD
Q100=11.9cfs
Qcap=22.6cfs
J2-1
276.0'
48"ø SD.
Q100=27 6cfs
Qcap=168.0cfs
337.72'
I4-2
A=1 13ac
Q100=5 23cfs
Qcap=7 8cfs
I4-1
A=2 46ac
Q100=11.4cfs
Qcap=10.0cfs
INV:5232.50
18"ø SD.
Q100=10.0cfs
Qcap=7.42cfs
18"ø SD.
Q100=5 23cfs
Qcap=12.0cfs
187.50'
165.26'
INV:5236.00
J2-2
J2-1
A=0.78ac
Q100=3.61cfs
Qcap=8.0cfs
INV:5235.00
I3
RIM:5241.10
INV E,W:5231.00
INV:5231.00
INV:5233.87
J1
A=2.01ac
Q100=9.30cfs
Qcap=8.0cfs
INV:5235.00
J2-2
A=0 22ac
Q100=1.02cfs
Qcap=7.0cfs
INV:5234.56
54"ø SD
Q100=40.2cfs
Qcap=392 3cfs
326.23'
30"ø SD.
Q100=16.8cfs
Qcap=71 0cfs
136.42'
18"ø SD.
Q100=8.0cfs
Qcap=24.0cfs
142.84'
30"ø SD.
Q100=25 7cfs
Qcap=71.0cfs
I3
A=1.18ac
Q100=5 46cfs
Qcap=10 0cfs
J1
RIM:5235.96
INV SW,NE,E:5227.03
18"ø SD.
Q100=5.46cfs
Qcap=12 8cfs
310.62'
INV:5227.00
249.28'
I2
RIM:5230.28
INV N,E,W:5218.00
INV S:5223.25
I2-2
261.87'
54"ø SD
Q100=71 4cfs
Qcap=394.0cfs
18"ø SD.
Q100=10.0cfs
Qcap=14 8cfs
24"ø SD.
Q100=47.0cfs
Qcap=31 9cfs
I2-3
A=1.49ac
Q100=6.89cfs
Qcap=12 0cfs
30"ø SD
Q100=48 7cfs
Qcap=58 0cfs
I2-1
A=2 15ac
Q100=9.95cfs
Qcap=16 0cfs
I2-2
A=8 01ac
Q100=37.1cfs
Qcap= 6.5cfs
INV NW 5213.46
INV SW:5213.30
B5
A=3.9 ac
Q100=14.5cfs
Qcap=14.5cfs
3.91c
B5
B4
A=2.27ac
Q100=10.5cfs
Qcap=14.5cfs
H1-2
A=1 72ac
Q100=7.96cfs
Qcap=14 5cfs
18"ø SD
Q100=7.96cfs
Qcap=21 0cfs
MH:I1
RIM:5221.68
INV E,W:5207.5
INV NE:5211.24
57.71'
60 64'
INV N:5213.68
INV SE:5217.52
INV.5215.6
INV:5220.0
42"ø SD.
Q100=38.9cfs
Qcap=95.4cfs
MH B2
RIM:5200.08
INV N,S:5190.30
INV W:5191.02
B3
A=0.23ac
Q100=1.06cfs
Qcap=10 0cfs
1227.7cfs
60" ø
0.33ac
18"ø SD
Q100=10 5cfs
Qcap=37.7cfs
89.28'
JB B1
RIM:5204.46
INV E:5188.0
121.84'
281.24'
208.78'
B3
RIM:5216.58
INV N,S,E:5206 5
42"ø SD.
Q100=39.03cfs
Qcap=105.2cfs
B4
RIM:5224 69
INV N:5220.0
42"ø SD.
Q100=24 53cfs
Qcap=81 1cfs
INV:5191.90
66.66'
INV:5191.23
133.41
INV S:5189.10
B2-1
A=0.86ac
Q100=1.80cfs
Qcap=14.5cfs
18"ø SD.
Q100=1.80cfs
Qcap=10 5cfs
B2-2
A=0.68ac
Q100=1.43cfs
Qcap=14.5cfs
42"ø SD.
Q100=50.7cfs
Qcap=95.4cfs
112.24'
I1a&b
A=2 85ac
Q100=0cfs
Q100(a&b)=13 19cfs
Qcap(a&b)=14.5
I1b
INV:5201.83
I1a
INV S,W:5200.97
86.23'
18"ø SD
Q100=2.60cfs
Qcap=10 6cfs
B2-4
18"ø SD
Q100=13 2cfs
Qcap=17.3cfs
I1c
INV NW:5196.31
INV S:5198.66
18"ø SD
Q100=13.2cfs
Qcap=17.3cfs
I1c&d
B2-3
INV:5192.67
36.50'
INV.5192.17
B2-3
A=0 25ac
Q100=0 53cfs
Qcap=14.5cfs
18"ø SD.
Q100=0.53cfs
Qcap=10 5cfs
B2-4
A=0 31ac
Q100=0 65cfs
Qcap=14 5cfs
92.91'
I1c&d
A=1 42ac
Q100(c)=0cfs
Q100(d)=6 57cfs
Qcap(a&b)=14 5
I1d
INV:5201.83
18"ø SD
Q100=6.57cfs
Qcap=17 3cfs
89.28'
18"ø SD
Q100=10 5cfs
Qcap=37.7cfs

PRC
PRC
PRC
STO
WAT
SUB
PRC

NOT
ALL
"A"
OTH
LAY

MOLZEN-(
ENGINEERS/ARCHITEC
BP
Architects &
6200 Uptown
Suite 400
Albuquerque, N
(505) 881-27
Designin

TITLE: Rem

60
UNIVERSITY
48
18
24
42
48
24
36
18
18
18
18
24
30
42
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18
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48
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42
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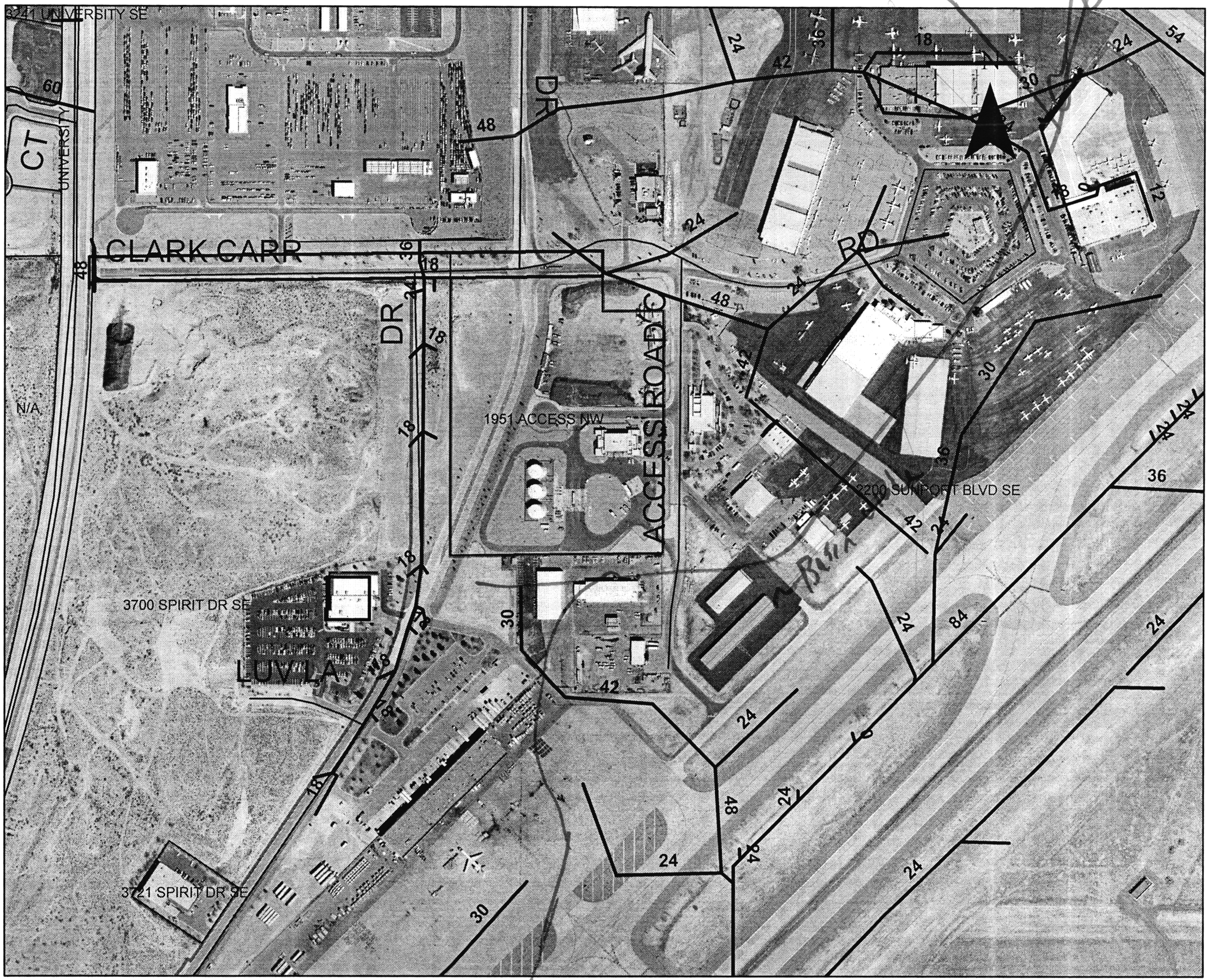
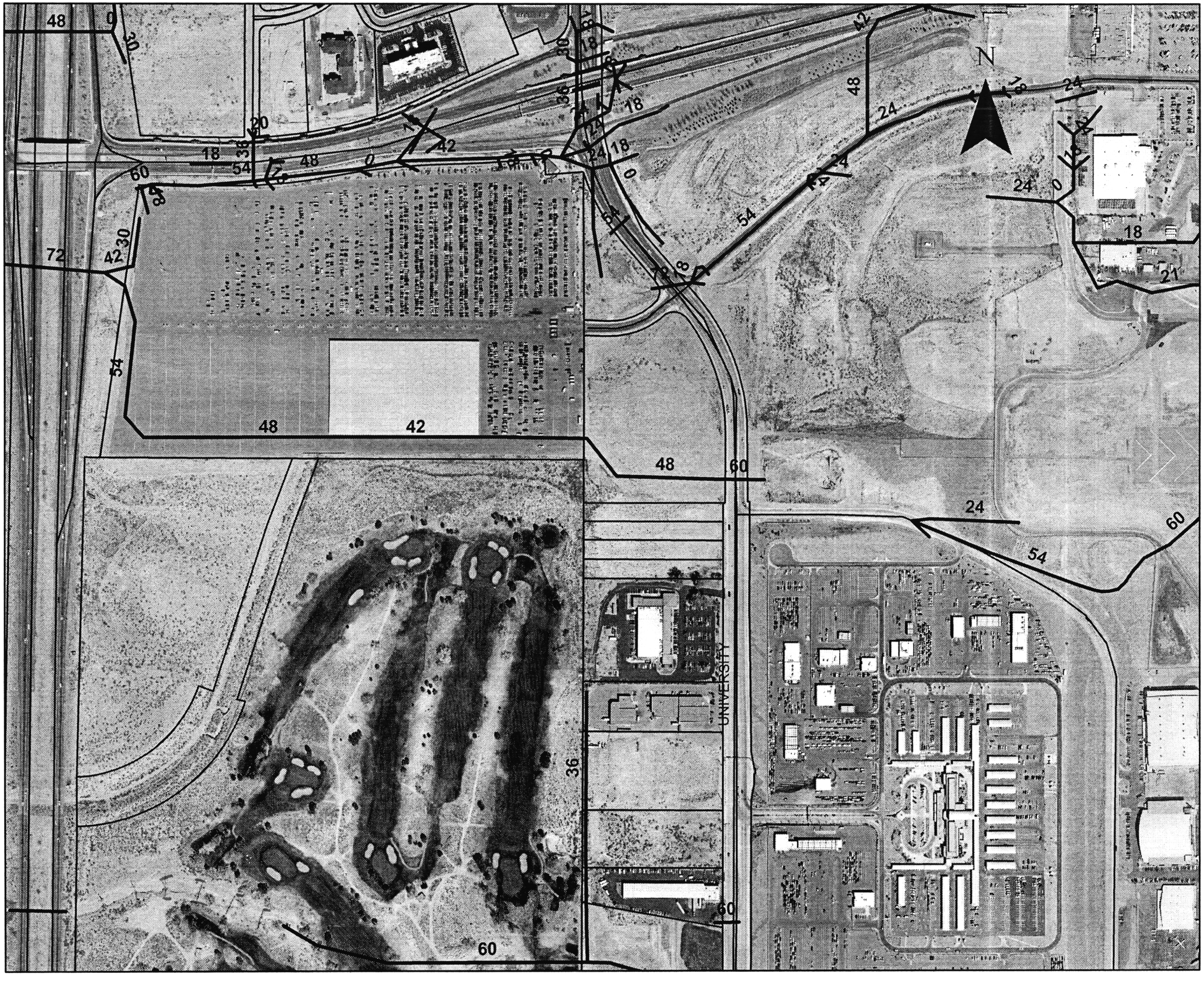
90
N


3241 UNIVERSITY SE
UNIVERSITY CT
CLARK CARR DR
1951 ACCESS NW
ACCESS ROAD
2200 SUNPORT BLVD SE
3700 SPIRIT DR SE
3721 SPIRIT DR SE
LUVLAB
N/A
60
48
24
18
30
42
36
54
12
84


N
UNIVERSITY
48
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30
18
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42
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72
24
21
60

CITY OF ALBUQUERQUE
PLANNING DEPARTMENT
DEVELOPMENT SERVICE / HYDROLOGY SECTION

2 — **DATE:** _____
CONFERENCE RECAP

ZONE ATLAS PAGE NO: N15
DRAINAGE FILE: N15/D006
ZONING: SU-1
DRB:
SUBJECT: _____
STREET ADDRESS (IF KNOWN): _____
SUBDIVISION NAME: Sunport Foreign Trade Zone

APPROVAL REQUESTED:

ATTENDANCE: Curtis Cherne, Jim Hinde, Mik Provine, Dan Hogan

FINDINGS:

1. Maintain historic flows at Spirit / University or improve earthen channel south of Golf Course. This includes rd sites drain to University Blvd.
2. Provide Analysis Point at Clark Carr / University The drain applicable to 50 capacity
3. Same as above for Clark Carr and old spirit
4. Provide offsite flows into Spirit Dr from sites to the east/south of spirit Dr.
5. Defer SD infrastructure to site plan for Bld's Permit Submittal to DRB.

THE UNDERSIGNED AGREES THAT THE ABOVE FINDINGS ARE SUMMARIZED ACCURATELY AND ARE SUBJECT TO CHANGE IF FURTHER INVESTIGATION REVEALS THAT THEY ARE NOT REASONABLE OR THAT THEY ARE BASED ON INACCURATE INFORMATION.

SIGNED: Curtis A. Cherne
NAME (PRINT): Curtis A. Cherne

SIGNED: James D. Hinde
NAME (PRINT): JAMES D. HINDE

NOTE PLEASE PROVIDE A COPY OF THIS RECAP WITH YOUR DRAINAGE SUBMITTAL.

CITY OF ALBUQUERQUE

August 30, 2011

Daniel W. Hogan, P.E.
Molzen-Corbin & Associates
2701 Miles Rd SE
Albuquerque, NM 87106

Re: Sunport Foreign Trade Zone Tract A Replat Drainage Analysis

Received 08-15-11 (N15/D006)

Dear Mr. Hogan,

Based upon the information provided in your submittal received 08-15-11, the above referenced plan cannot be approved as the Master Drainage Plan for Sunport Foreign Trade Zone until the following comments are addressed:

- Breakdown the basins to show the exact runoff draining to Spirit Dr. (north of the high point in the street). The proposed runoff should be routed to the detention pond north of the Basin A.
- Please confirm the storm drain pipe sizes on Spirit Dr. The plan shows 30" storm drain pipes, and the as-built shows 24" storm drain pipes.
- Under the proposed conditions, please show the allowable discharge for Basin A. Include all the existing storm structures and sizes at the point of discharge.
- Show existing infrastructure as existing and proposed infrastructure as proposed.
- Enlarge the font for the AHYMO calculations and thicken the proposed contours.
- Stamp and date the plans and the drainage report.
- Change the title of the plan to Master Drainage Plan.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Shahab Biazar, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

Copy: file

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

CITY OF ALBUQUERQUE

Original Sent To
Main File

RECEIVED

NOV 0 9 2010

MOLZEN-CORBIN & ASSOCIATES

November 5, 2010

Daniel W. Hogan, P.E.
Molzen-Corbin & Associates
2701 Miles Rd SE
Albuquerque, NM 87106

Re: Sunport Foreign Trade Zone Tract A Replat Drainage Analysis

Engineer's Stamp 11-2-10 (N15/D006)

Dear Mr. Hogan,

Based upon the information provided in your submittal received 11-2-10, the above referenced plan cannot be approved as the Drainage Analysis until the following comments are addressed:

- Provide a full size (24" x 36") Existing Conditions Basin Map, Proposed Conditions Basin Map and Conceptual Grading Plan. Plans should include storm drain and the Conceptual Grading Plan should include approximate finished floors for buildings in lease areas.
- Provide an Analysis Point at the intersections of University Blvd with Clark Carr and Spirit Dr with existing and proposed flows. This could be shown on the basin maps.
- The submittal should be a Master Drainage Plan for the benefit of future site design.
- The Work Order, 4183, shows the capacity of the 36" storm drain at the north end of Spirit Dr to be 58.15 cfs (0.76%). The proposed conditions for Basin A state the capacity of this storm drain to be 176.46 cfs.
    - In addition, the Work Order, 4183, does not seem to take into account the flows from the Sate Aviation Office (approx 15 cfs).
    - Provide existing piped and overland flows into the Spirit Dr storm drain.
- In the existing condition it appears that about 1 to 2 acres in proposed Basin A drain to Spirit Dr. with a Land Treatment of "B". The proposed condition should not exceed this flow into Spirit Dr.
- Basin B is near the high point in Spirit Dr. It would appear that flows from Basin B would reach the storm drain at the same time as the rest of the basin.
- Will storm drain be required in the north-south access road? It seems this road would be a basin divide.
- Is there enough grade for flows from Lease areas 7 and 9 to get into the pond at the southwest corner?

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

CITY OF ALBUQUERQUE

If you have any questions, you can contact me at 924-3695.

Sincerely,

Curtis A. Cherne, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Copy: file

- In the existing condition it appears that about 1 to 2 acres in proposed Basin A drain to Spirit Dr. with a Land Treatment of "B". The Proposed condition should not exceed this flow into Spirit Dr.

  - *Since Basin B is divided by the retaining walls, only Lease Area 15 (3.09 acres) will drain to Spirit Dr. The area below the retaining wall will be picked up by an inlet at the southwest corner of Lease Area 14 (see Plate 3). With the steep grade on Spirit Dr., street capacity and inlet capacity should not be a problem for the 10± cfs proposed to be released. Considering the rest of the site goes through ponding we thought the situation would be acceptable.*

- Basin B is near the high point in Spirit Dr. It would appear that the flows from Basin B would reach the storm drain at the same time as the rest of the basin.

  - *We concur, The report has been changed to reflect this comment. Considering the rest of the site goes through ponding, street capacity and inlet capacity should not be a problem.*

- Will storm drain be required in the north-south access road? It seems this road would be a basin divide.

  - *The roadway is essentially a drainage divide, although the lease areas east of the north-south access road are picked up in storm drains and routed to one of the two ponds on the lower tier. The larger sized maps provided as part of the first comment make this much easier to see. The report language has also been modified to better reflect the proposed storm drain and its function.*

- Is there enough grade for flow from Lease areas 7 and 9 to get into the pond at the southwest corner?

  - *These two lease areas are set higher than University Blvd. by use of a retaining wall (note 10) along University Blvd. This retaining wall will provide the elevation needed to provide the grade needed. The larger sized maps provided as part of the first comment make this much easier to see. The report language has also been modified to better reflect the proposed storm drain and its function.*

Respectfully,

Dan Hogan P.E. & P.S.
Senior Engineer

MOLZENCORBIN

August 11, 2011

Curtis A. Cherne, P.E.,
Senior Engineer, Planning Dept.
Development and Building Services
City of Albuquerque
600 2nd St. NW
Albuquerque, NM 87103

RE: Sunport Foreign Trade Zone, Tract A Replat Drainage Analysis (N15/D006

Dear Mr. Cherne:

The purpose of this letter is to summarize how Molzen-Corbin addressed comments from you on the referenced project. Below is each of your concerns provided to us in your letter dated November 5, 2010 followed by an explanation of how each concern was addressed.

- Provide a full size (24" x 36") Existing Conditions Basin Map, Proposed Conditions Basin Map and Conceptual Grading Plan. Plans should include storm drain and the Conceptual Grading Plan should include Approximate finished floors for buildings in the lease areas.

  Three full sized Plates have been provided with the requested information.

- Provide an Analysis Point at the intersections of University Blvd with Clark Carr and Spirit Dr with existing and proposed flows. This could be shown on the basin maps.

  Analysis Points at the requested points have been shown on the basin maps.

- The submittal should be a Master Drainage Plan for the benefit of future site design.

  The document title has been revised.

- The Work Order 4183, shows the capacity of the 36" storm drain at the north end of Spirit Dr to be 58.15 cfs (0.76%). The proposed conditions for Basin A state the capacity of this storm drain to be 176.46 cfs.
  - In addition, the Work Order 4183, does not seem to take into account the flows from the State Aviation Office.
  - Provide existing piped and overland flows into Spirit Dr storm drain.

  We agree with the capacity given in Work Order 4183 for a 36" pipe at 0.76% slope. This report is proposing to tie into the system about 350 feet downstream of that point where the slope increases to 16.6% and then flattens to 1.38%. The maximum flow rate given in the Remote Car Rental Facility, Revised Composite Drainage Plan (Plate 9) is 150.7cfs.

MOLZENCORBIN

LETTER OF TRANSMITTAL

2701 Miles Road SE, Albuquerque, NM 87106
(505) 242-5700

1155 Commerce, Suite F, Las Cruces, NM 88011
(575) 522-0049

TO: Shahab Biazar, P.E.
Senior Engineer, Planning, Dev.
City of Albuquerque

DATE 9-2-11	JOB NO
ATTENTION Shahab Biazar, P E	
RE	
ABQ Aviation, Drainage Report for FTZ Replat	
Resubmittal	

WE ARE SENDING YOU Attached Under separate cover via _____ the following items.

COPIES	DATE	NO.	DESCRIPTION
1	9/2/2011		Master Drainage Plan – Albuquerque. International Sunport Foreign Trade zone
			N-15/D006 R
			F. P.

THESE ARE TRANSMITTED as checked below:

(For approval) For your use As requested For review and comment

Other _____

REMARKS

SECTION
HYD
SEP 2 2011
RECEIVED

COPY TO _____ SIGNED: 9/2/11

If enclosures are not as noted, kindly notify us at once

OAD B

K1
A=4 1ac
Q_{100}=14.8cfs
Q_{cor}=13.0cfs

18"ø SD.
Q_{100}=13.0cfs
Q_{cor}=48 3cfs

K3
RIM 5295 93
INV NE:5289.00
INV S:5288.5

24"ø SD.
Q_{100}=13 0cfs
Q_{cor}=26.6cfs

446 19'

INV:5278 06±

BEND
INV:5288.95

48"ø SD
Q_{100}=
Q_{cor}=587 0cfs

109.09'

I7
RIM:5288.34
INV N,E,W:5270.73

I6

12"ø SD
Q_{100}=
Q_{cor}=2 52cfs

42"ø SD.
Q_{100}=
Q_{cor}=651.9cfs

134.42'

48"ø SD
Q_{100}=17.2cfs
Q_{cor}=585 0cfs

185.04'

I5-3
RIM:5250.02
INV:5238.19

J4-3
A=1 01ac
Q_{100}=4.67cfs
Q_{cor}=10.0cfs

INV:5238.49

J4-2
A=0.11ac
Q_{100}=0.51cfs
Q_{cor}=8.0cfs

148.32'

10.0cfs

I6
A=2.73ac
Q_{100}=12.6cfs
Q_{cor}=10.0cfs

INV:5238.94

42"ø SD
Q_{100}=
Q_{cor}=31 8cfs

184.33'

I6
RIM:5251.45
INV W,E:5240 00

-2 INV:5238.34
J4-1 INV:5240.0

INV SW:5238.0
RIM:5244.24

J4-1
A=0.12ac
Q_{100}=0.56cfs
Q_{cor}=8.0cfs

101.47'

INV W,E:5237.0
RIM:5243.3

48"ø SD.
Q_{100}=17 2cfs
Q_{cor}=168 0cfs

152.57'

I5-2
RIM:5246.65
INV:5238.00

101.72'

36"ø SD
Q_{100}=
Q_{cor}=150 7cfs

125.24'

I5
RIM:5247.98
INV E,W,NE:5237.90
INV W:5238 90

I5-1
RIM:5251 30
INV.5245.30

MH:H8
RIM:5245.41
INV W:5239.75
INV SE:5241.14

200 5'

J3-2

J3-1

24"ø SD.
Q_{100}=5 74cfs
Q_{cor}=22.6cfs

300.25'

I5-1
A=2 49ac
Q_{100}=11.5cfs
Q_{cor}=10.0cfs

48"ø SD.
Q_{100}=17.2cfs
Q_{cor}=168 0cfs

I5-2
A=0 6+ac
Q_{100}=2 96cfs
Q_{cor}=7 8cfs

24"ø SD
Q_{100}=0.69cfs
Q_{cor}=37.9cfs

J3-3

J3-1
A=0 52ac
Q_{100}=2.41cfs
Q_{cor}=8 0cfs

J3-2
A=0 59ac
Q_{100}=2.73cfs
Q_{cor}=8.0cfs

J3-3
A=0.21ac
Q_{100}=0.97cfs
Q_{cor}=8 0cfs

INV:5236 00

270.21'

18"ø SD
Q_{100}=10 0cfs
Q_{cor}=7.42cfs

164.88'

18.7cfs
18" ø

75.83'

INV:5242.00

I4
RIM:5245.08
INV N:5235 64
INV E,W:5235.64
INV S:5239.58

18"ø SD
Q_{100}=2 96cfs
Q_{cor}=18.7cfs

41.16
W:5234 0

INV:5235 0

INV:5235.0

J3-1

J3
RIM.5240.92
INV NE,SE:5232.33
INV W,E.5231.0

MH H6
RIM:5240.40
INV W,E:5232.0
INV NE:5232 5

H5

24"ø SD
Q_{100}=8.05cfs
Q_{cor}=37.0cfs

18"ø SD
Q_{100}=3.29cfs
Q_{cor}=23 0cfs

MH:H5
RIM:5238 86
INV W,E:5227.75
INV NE.5223.35

30"ø SD.
Q_{100}=11.34cfs
Q_{cor}=67.4cfs

24"ø SD.
Q_{100}=11 9cfs
Q_{cor}=22.6cfs

J2-1

276.0'

J2-2

INV:5235.00

J2-1
A=0.78ac
Q_{100}=3.61cfs
Q_{cor}=8.0cfs

H4
A=0.71ac
Q_{100}=3.29cfs
Q_{cor}=7.80cfs

MH:H4
RIM:5236.23
INV E,W:5224 75
INV N:5230.19

J1
A=2.01ac
Q_{100}=9.30cfs
Q_{cor}=8 0cfs

INV:5234.56

INV:5235.00

J2-2
A=0.22ac
Q_{100}=1.02cfs
Q_{cor}=7.0cfs

INV W,E:5231.00
INV SE,NE:5232.3
RIM:5238.67

30"ø SD
Q_{100}=16.8cfs
Q_{cor}=71.0cfs

136.42'

I4-1
A=2 46ac
Q_{100}=11 4cfs
Q_{cor}=10.0cfs

INV:5232.50

18"ø SD
Q_{100}=10.0cfs
Q_{cor}=7 42cfs

18"ø SD
Q_{100}=5.23cfs
Q_{cor}=12.0cfs

I4-2
A=1 13ac
Q_{100}=5 23cfs
Q_{cor}=7 8cfs

INV:5236.00

187.50'

165.26'

337.72'

48"ø SD.
Q_{100}=27.6cfs
Q_{cor}=168 0cfs

54"ø SD
Q_{100}=40.2cfs
Q_{cor}=392 3cfs

326.23'

I3
RIM:5241.10
INV E,W:5231 00
INV:5231 00
INV:5233.87

18"ø SD.
Q_{100}=8 0cfs
Q_{cor}=24 0cfs

142.84'

287.8'

J1
RIM:5235.96
INV SW,NE,E:5227.03

30"ø SD.
Q_{100}=25.7cfs
Q_{cor}=71.0cfs

I3
A=1 18ac
Q_{100}=5 46cfs
Q_{cor}=10 0cfs

18"ø SD
Q_{100}=5.46cfs
Q_{cor}=12.8cfs

INV:5227.00

310.62'

249.28'

I2
RIM:5230 28
INV N,E,W 5218.00
INV S:5223 25

30"ø SD.
Q_{100}=14.6cfs
Q_{cor}=63.5cfs

165.0'

MH:H3
RIM:5227.91
INV NE:5218 75
INV W.5217.75

I2-2

261.87'

30"ø SD
Q_{100}=16 4cfs
Q_{cor}=99 6cfs

110.14'

54"ø SD.
Q_{100}=71 4cfs
Q_{cor}=394 0cfs

MH:H2
RIM:5225 21
INV E,W:5211.23
INV N:5212 23

18"ø SD
Q_{100}=10.0cfs
Q_{cor}=14 8cfs

24"ø SD
Q_{100}=47 0cfs
Q_{cor}=31.9cfs

I2-3
A=1 49ac
Q_{100}=6 89cfs
Q_{cor}=12.0cfs

B5
A=3 9 ac
Q_{100}=14.5cfs
Q_{cor}=14.5cfs

30"ø SD
Q_{100}=19.9cfs
Q_{cor}=99 6cfs

18"ø SD
Q_{100}=7.96cfs
Q_{cor}=21.0cfs

I2-1
A=2 15ac
Q_{100}=9.95cfs
Q_{cor}=16 0cfs

I2-2
A=8 01ac
Q_{100}=37.1cfs
Q_{cor}= 6.5cfs

INV NW 5213 46
INV SW:5213.30

30"ø SD
Q_{100}=48.7cfs
Q_{cor}=58.0cfs

104.63'

MH:H1
RIM:5219.32
INV N,E,W:5205.0
INV S:5209.0

H1-2
A=1 72ac
Q_{100}=7.96cfs
Q_{cor}=14 5cfs

57.71'

MH:I1
RIM:5221.68
INV E,W:5207.5
INV NE:5211.24

B4
A=2.27ac
Q_{100}=10.5cfs
Q_{cor}=14.5cfs

INV:5215.6

INV N:5213.68
INV SE:5212.52

60.64'

INV:5220.0

42"ø SD
Q_{100}=38 9cfs
Q_{cor}=95.4cfs

MH:B1
RIM:5204.08
INV E,S,NW:5192 00
INV N:5209.0

MH:B2
RIM:5200.08
INV N,S:5190.30
INV W:5191.02

B3
A=0.23ac
Q_{100}=1.06cfs
Q_{cor}=10 0cfs

1227.7cfs
60" ø

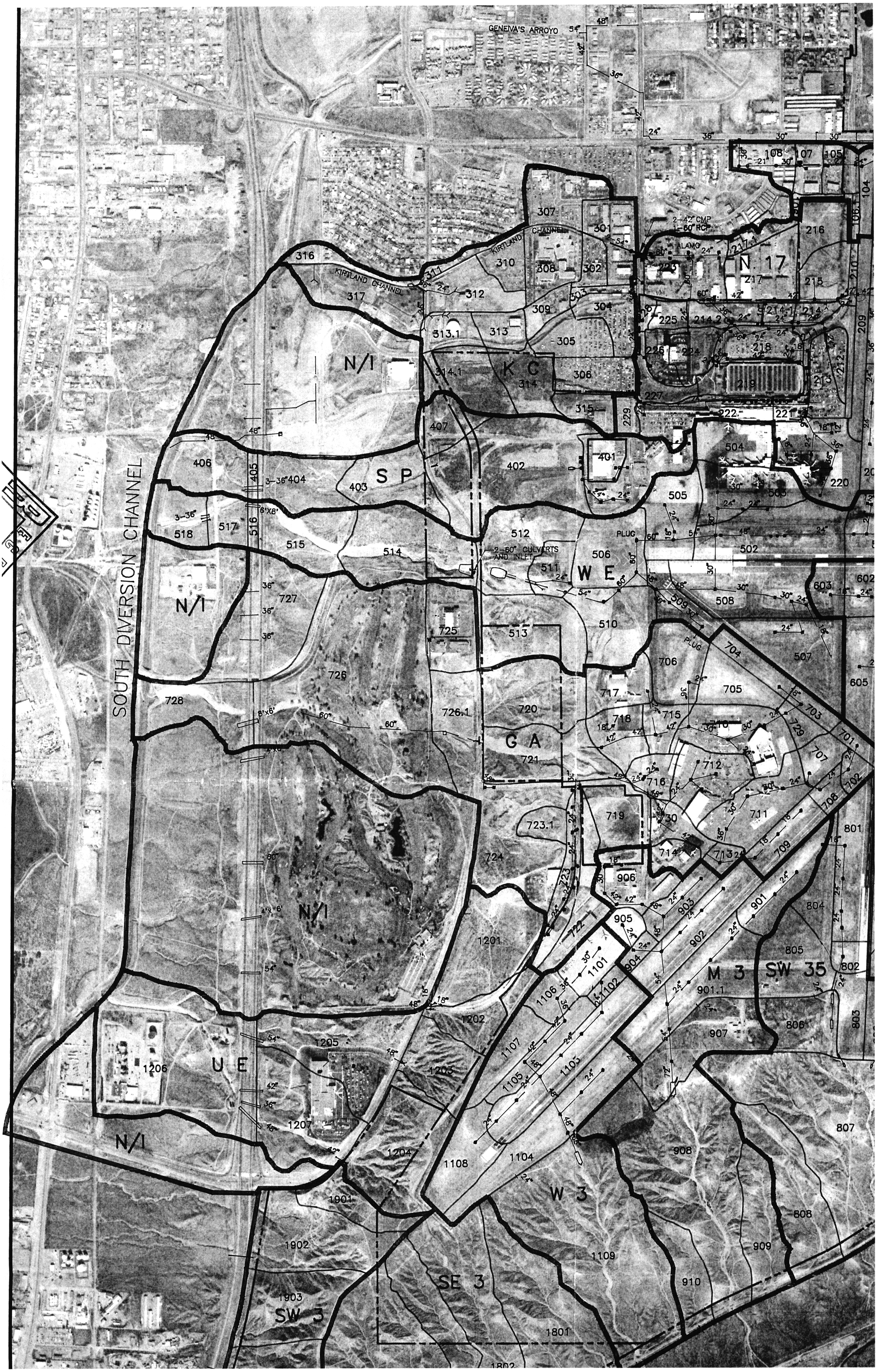
0.33ac

18"ø SD
Q_{100}=10 5cfs
Q_{cor}=37 7cfs

89.28'

62.99'

188.45'


GENEIVA'S ARROYO
KIRTLAND CHANNEL
KIRTLAND CHANNEL
SOUTH DIVERSION CHANNEL
ALAMO
2-42" CMP
1-60" RCP
2-60" CULVERTS AND INLET
PLUG
PLUG
N/I
N/I
N/I
N/I
K C
S P
W E
G A
U E
N 17
M 3
SW 35
W 3
SE 3
SW 3
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803

SUB-BASIN NO.	AREA (sq mi)	Q10 (cfs)	Q100 (cfs)	V10 (ac-ft)	V100 (ac-ft)	OUTFALL	DESCRIPTION
Σ	0.2525	68.40	82.87	8.807	17.101	48"SD	to Tijeras Arroyo

H. Basin GA.

This 0.7446 square mile basin encompasses the general aviation area located south and west of the intersection of Runways 17-35 and 3-21. These drainage basins also include areas around Clark Carr, Spirit Drive, the UNM Golf Course and pass through I-25 near the old railroad track crossing.

Flows are conveyed mostly by storm sewers which discharge into channels and then through culverts beneath I-25. There are some problems with the crossing structures on University Avenue due to low inlet capacities of these structures.

TABLE III-7
Basin GA

SUB-BASIN NO.	AREA (sq mi)	Q10 (cfs)	Q100 (cfs)	V10 (ac-ft)	V100 (ac-ft)	OUTFALL	DESCRIPTION
701	0.0042	6.78	11.00	0.219	0.379	24" SD	R/W 12-35 NW of 17-35
702	0.0087	10.91	15.58	0.470	0.803	24" SD	R/W 3-21 SW of 17-35
703	0.0186	12.83	20.48	0.955	1.658	24" SD	R/W 12-35 NW of 17-35
704	0.0107	15.33	25.02	0.549	0.954	18" SD	R/W 12-35 NW of 17-35
705	0.0162	20.48	10.19	0.565	1.128	24" SD	Between R/W 12-30 & GA Area
706	0.0386	12.40	19.61	1.401	2.754	36" SD	Between R/W 12-30 & GA Area
707	0.0226	19.07	28.03	1.077	1.916	24" SD	Between T/W C & GA Area
708	0.0141	14.85	21.53	0.736	1.270	24" SD	Between R/W 3-21 & T/W C
709	0.0653	63.21	67.42	3.812	6.365	24" SD	Between R/W 3-21 & T/W C
710	0.0638	63.43	96.42	3.815	6.322	42" SD	GA Area North
711	0.0513	55.35	54.20	3.125	5.154	36" SD	GA Area SE
712	0.1259	107.56	136.09	7.330	12.237	24" SD	GA Area West
713	0.0699	66.46	72.42	4.008	6.726	42" SD	GA Area South
714	0.0232	36.99	60.20	1.191	2.068	Surface	GA Area SW
715	0.1119	75.01	114.48	5.615	9.814	42" SD	GA Area NW
716	0.1353	112.63	144.56	7.812	13.074	48" SD	GA Area West

SUB-BASIN NO.	AREA (sq mi)	Q10 (cfs)	Q100 (cfs)	V10 (ac-ft)	V100 (ac-ft)	OUTFALL	DESCRIPTION
717	0.0159	19.10	34.27	0.631	11.58	24" SD	GA Area NW
718	0.1271	90.23	139.16	6.361	11.29	42" SD	GA Area NW
719	0.0209	18.26	37.68	0.468	1.10	36" SD	W. Side Spirit Drive, S. Side Clark C
720	0.4077	193.01	294.80	16.885	3.809	60" SD	E. Side Univ., N. of Clark Carr
721	0.4542	198.05	320.18	17.477	32.544	60" SD	E. Side Univ., N. Side Clark Carr
722	0.0419	14.00	28.51	0.925	2.149	24" SD	Between Freight Apron & Spirit Drive
723	0.0582	20.38	43.36	1.281	29.62	24" SD	Spirit Drive
723.1	0.4784	182.19	32.06	15.454	27.116	Surface	W. Side Spirit Drive
724	0.0465	20.75	59.72	0.592	1.736	48" SD	Between Spirit Drive & Univ.
725	0.5022	189.34	285.40	19.047	35.582	24" SD	W. Side Univ., NE Side Golf Course
726	0.4784	177.42	268.81	17.832	33.509	8'X6' CLV	UNM Golf Course
726.1	0.6575	196.46	384.64	21.402	42.149	60"	W. Side Univ., E. Side Golf Course
727	0.7446	207.03	449.84	23.007	46.031	3-36" CLV	Between I-25 & RR Tracks
728	0.6919	198.79	395.97	22.036	43.682	arroyo	Between I-25 & SDC
730	0.1043	83.47	103.48	5.825	9.846	42"50	E Access Road C
Σ	0.7446	207.0	449.84	23.007	46.031	Open Chan.	to South Diversion Channel

I. **Basin SW35.** This is a 0.123 square mile basin surrounding the southern end of runway 17-35 from the intersection with Runway 3-21 to the south runway end. No capacity problems exist in this area, however, the system outfall on the escarpment has experienced erosion problems. This area is scheduled for major renovations as the AMP has planned this area to be the new freight operations area. See Section IV for proposed Improvements.

TABLE III-8
Basin SW35

SUB-BASIN NO.	AREA (sq mi)	Q10 (cfs)	Q100 (cfs)	V10 (ac-ft)	V100 (ac-ft)	OUTFALL	DESCRIPTION
801	0.0431	26.90	47.05	1.551	2.980	24" SD	W. Side R/W 17-35, S. of R/W 3-21
802	0.0491	17.10	19.97	1.867	3.524	24" SD	W. Side R/W 17-35, S. end

channels on undeveloped property. These flows then eventually reach the South Diversion Channel. There are no identified problems within this basin relating to airport development.

L. **Basin W3.** This 0.13 square mile basin includes the southern most end of Runway 3-21 including most of the existing freight apron. The upper reaches of this basin includes the concrete freight apron. This apron contains several drop inlets and a 36" storm sewer. A second storm sewer exists between Runway 3-21 and the parallel taxiway and these two systems connect near the south end of the runway where a 48" storm sewer conveys flows beneath the runway to the southeast, eventually discharging the flows to the Tijeras Arroyo. No problems exist with capacity but erosion problems do occur at the discharge point on the escarpment where flows are directed to the Tijeras Arroyo.

TABLE III-10
Basin W3

SUB-BASIN NO.	AREA (sq mi)	Q10 (cfs)	Q100 (cfs)	V10 (ac-ft)	V100 (ac-ft)	OUTFALL	DESCRIPTION
1101	0.0140	26.71	41.19	0.936	1.506	36" SD	Freight Apron
1102	0.0037	7.39	9.51	0.260	0.417	24" SD	Freight Apron to TW F
1103	0.0591	37.10	67.92	2.437	4.508	48" SD	Runway 3-21
1104	0.0500	28.33	56.03	1.422	3.056	48" SD	SE of Runway
1105	0.0516	29.38	54.83	2.006	3.786	48" SD	R/W 3-21 to T/W F
1106	0.0376	17.81	34.40	1.443	2.723	36" SD	S of Freight apron
1107	0.0590	28.90	54.61	0.987	3.015	surface	S of Freight apron
1108	0.0805	45.15	76.62	2.997	5.759	24" SD	R/W 3 overrun
Σ	0.1305	73.04	131.31	4.419	8.815	66" SD	to Tijeras Arroyo

M. **Basin UE.** This 0.36680 square mile basin includes areas between the west airport boundary and the South Diversion Channel in the Ethicon Plant area. No airport area flows reach these watersheds and almost all drainage is conveyed through culverts. The higher reaches of the watershed include those areas adjacent to the University/Spirit Drive intersection. Flows are directed to this intersection where they are collected by several drop inlets and a short segment of storm sewer. These flows are then discharged through a 48" culvert beneath University into a natural channel. Several more drainage areas between the airport boundary and University are currently undeveloped and flows are conveyed beneath University through a series of culvert pipes. The middle portion of the basin includes the Ethicon plant area. Flows are then conveyed under I-25 through culvert pipes discharging to natural channels. Finally all flows discharge to the South Diversion Channel just north of Rio Bravo.

The character of this area will change significantly in the very near future. A grading and drainage plan for this area, known as the UNM Business Park has been submitted for approval to develop the areas adjacent to the Spirit Drive/University Intersection.

TABLE III-11
Basin UE

SUB-BASIN NO.	AREA (sq mi)	Q10 (cfs)	Q100 (cfs)	V10 (ac-ft)	V100 (ac-ft)	OUTFALL	DESCRIPTION
1201	0.0459	20.48	58.95	0.584	1.713	DI	Spirit Drive to University
1202	0.0692	32.90	91.38	0.946	2.673	DI	AIA Boundary to Spirit Drive
1203	0.0970	35.77	111.64	1.328	3.728	48" CLV	AIA Boundary to University
1204	0.0544	23.80	68.13	0.748	2.064	42" CLV	AIA Boundary to University
1205	0.2015	72.10	205.16	2.999	8.071	54" CLV	University to I-25
1206	0.0625	32.10	78.46	1.152	2.785	SDC	I-25 to Broadway
1207	0.3043	57.06	132.46	4.621	12.263	42" CLV 36" CLV 48" CLV	University to I-25
Σ	0.3668	71.83	189.7	5.773	15.048	Open Chan.	to South Diversion Channel

N. **Basin RB.** This basin includes areas immediately adjacent to Rio Bravo Boulevard from the south side of Ethicon, along Broadway to the South Diversion Channel. This area was included in the computer models for this AIA DMP, however, this is not an area of great concern as no airport property flows reach this basin. There are no known problems in this basin.

O. **Middle Basin.** This 1.454 square mile basin is the largest basin in this design project and includes approximately 60 percent of the Runway 8-26 area to the east of Runway 17-35 and the area north to Gibson Boulevard. Developed areas within KAFB make up roughly 80 percent of the basin. The existing drainage situation consists of several collection systems within KAFB and along Runway 8-26 that drain to a 60" (84 cfs capacity) and parallel 2-24" outfalls (22 cfs capacity). Under the 10 year 6 hour design storm, these outfalls have insufficient capacity to handle the runoff from the various collection system. The outfalls discharge to the area south of the control tower through a system of channels and a 66" culvert at Kirtland Road. Below Kirtland Road, the existing arroyo carries the runoff to the Tijeras Arroyo. Including the local runoff from the areas south of the airport, the existing peak discharge reaching Kirtland Road is 117 cfs and 60.4 AF of runoff volume.

The master planned system includes new collection branches to provide drainage capacity along the reconstructed taxiway E, a parallel 72" outfall will collect the flows from the various collection systems and carry the combined flow to the detention facility. The proposed detention facility consists of an excavated reservoir on KAFB just north of Kirtland Road with the road serving as the embankment for the structure. Under the master plan flows, the facility is

F. **WE Basin.** The WE Basin incorporates the area south and west of the existing terminal area with boundaries of Runway 12-30 to the south, Taxiway C to the east, the existing terminal building to the north and its discharge point to the South Diversion Channel to the west.

Changes to the facilities in this basin that are proposed under the Master Plan include the demolition of the old Air Freight Building located within subbasin 505. Extension of the existing storm drain system is recommended to follow the demolition of the building to relieve ponding occuring on the terminal apron between the B and C concourses. The extension of the drain (a 36-inch enlarged to a 42-inch connecting to the existing 60-inch) was planned during the Taxiway E Improvements project. A stub was installed at the 60-inch tee constructed near the northwest corner of Runway 8.

Downstream of the airfield, WE Basin discharges into a rip-rap lined channel and detention pond east of University Blvd. In order to maintain the future flows to near existing conditions, it is recommended that a restrictor plate be installed upstream. A 48-inch equivalent orifice installed at the 60" x 60" x 48" junction near the southwest corner of Runway 8 would help maintain existing conditions.

There is expected to be development west of University Blvd. in the Sunport Business Park, specifically in subbasins 514 and 515. Discussions between the developer and the City indicate that the natural arroyo that carries the basin discharge may be relocated to the south property boundary, approximately on the southern border of subbasins 514 and 515. The channel will run west until it nears Interstate 25 where it will be turned north to discharge through the Interstate at the 6'x 8' concrete box culvert. The future conditions modelling does not indicate the relocation of the arroyo and does not indicate that there will be any capacity problems at the Interstate crossing.

The Table IV-2 indicates the addition of the storm drain into subbasin 504 from the 60-inch drain. There are not any other improvements recommended as far as new drain systems in WE basin.

TABLE IV-2
Improvements to WE Basin

SUBBASIN NO.	PIPE DIAMETER	FLOW, 10 and 100-year, cfs	COMMENTS
504-505A	36-inch	39.2 (10) 43.4 (100)	Pipe to collect discharge from subbasin 504.
505A-60" tee	42-inch	57.6 (10) 59.0 (100)	Pipe collects NW corner of 505

G. **GA Basin.** The Master Plan identifies several parcels within the GA Basin which are recommended for development. With these parcels developed, the GA Basin should be

considered essentially fully developed. Subbasins 720, 721, and 724 contain the parcels which have been identified as airport support areas and will be typical of a light industrial or business park.

The capacity problem at the University crossing (60" and 36" CMP) with the 100-year event will be resolved with the proposed diversion of portions of the GA Basin to the M3 Basin discussed later in this section. Modelling indicates that the pond on the east side of University Blvd. will exceed the available capacity. During the 100-year event, a peak flow, 100-year, will reach approximately 320 cfs with a volume of 32.5 a-f resulting in over topping of University Blvd. With the recommended diversion upstream, the 100-year future flow is 299 cfs with a volume of approximately 28 a-f. This results in approximately two feet lowering of the maximum water surface.

There are no other improvements proposed for GA Basin in this study. As development is continued as recommended in the Master Plan, discharge to the University Arroyo should be metered to maintain the existing conditions. Construction of a detention pond near the discharges of the three branches of GA Basin with an outflow controlled to existing conditions would also help maintain the crossing under University Blvd.

H. **<u>M3 Basin (SE35, SW35, W3, SE3).</u>** Under the future conditions, SE35, SW35, W3, SE3 and M3 Basins have been consolidated to form one basin with a detention pond at the discharge point off of the airfield. The intent of the consolidation is to provide a common controlled discharge point off the southeast side of upgraded Runway 3-21, new Air Cargo Freight Facility, expansion on the existing Air Freight Ramp, and to relieve GA Basin by diverting flow from the north and east sides of the General Aviation Area. Consolidation of five discharge points at natural arroyos into one discharge from a detention pond with a controlled outlet will also allow more efficient storm water monitoring if required under AIA's EPA NPDES storm water permit.

The changes proposed in the Master Plan for this part of the airport will fully develop the basins. Additional capacity is required in the storm drains as well as additional trunk lines required to consolidate the flow. It anticipated that the majority of the storm drains will be constructed as part of the Runway 3-21 Upgrade project. An exception may be the new trunk line that will collect discharge from the proposed Air Cargo Facility. Installation of this line could occur when the new apron is constructed delaying the diversion of existing SE35 and approximately half of SW35 flows to the detention pond. Existing drains have the capacity for the additional flows which will result with construction of the northeastern reach of the southern parallel taxiway for Runway 3-21 and the extension of Taxiway D, south of Taxiway E.

Table IV-3 contains the new drains that would serve a consolidated M3 Basin as shown on Plate 3. All of the collector lines are not included in Table IV-XX. In most cases, these lines conceptually are 24 and 30-inch drains. The middle branch depends primarily on existing lines with the exception of new collector lines in subbasins 902 and 901.1

TABLE IV-3
Improvements to M3 Basin

SUBBASIN NO.	PIPE DIAMETER	FLOWS, 10 and 100 year, cfs	COMMENTS
609-608	60-inch	56.3 (10) 82.9 (100)	Drain for SE35
608-607	66-inch	113.4 (10) 171.6 (100)	Across new taxiway. Carries flow to new Air Cargo Apron
607-616	72-inch	442 (10) 676 (100)	GA diversion, SE35 diversion, most of 616
616-Pond	84-inch	442 (10) 700 (100)	East branch discharge to pond
1104-1103	30-inch	19.4 (10)	Collector in 1104 and 1103
1103-pond	60-inch	144 (10) 179 (100)	Discharge from west branch to pond

There are three branches in M3 Basin. SE35 and SW35 along with diversion from a portion of the north side of GA Basin make up the east branch. The middle branch contains the diversion from the southeastern portion of GA Basin as well as M3 Basin and a portion of W3 Basin. The south branch contains SE3 and a portion of W3.

The location of the detention pond is conceptually selected for its central location and because it is currently a major discharge point for existing flows from M3 and W3 Basins. The detention pond is sized to accept 100-year, 6-hour flows and volumes. The volume of the pond should accept approximately 75 a-f of storm water at a peak flow of approximately 1000 cfs. Discharge from the detention pond will be controlled at approximately 95.2 cfs with a volume of approximately 83 a-f. This discharge is equivalent to the 10-year flow for the existing outfalls combined. Consolidation of five discharge points in the existing basins will also allow more efficient storm water discharge monitoring.

I. **UE, SW3 Basin.** The UE and SW3 Basins within airport property lie off of the airfield on steep terrain. Future development is restricted in these basins due to the terrain and proximity to the protected zones for Runway 3-21 after it has been upgraded to air carrier status. UE Basin does contain developable property which is owned by UNM and identified as subbasins 1201, 1202 and 1203 on Plate 1. Subbasins are addressed as Basin C1 in Drainage Report and Conceptual Grading Plan for UNM Business Park, Jan. 1993, Bohannon-Huston Inc. This report indicates that the existing 48-inch crossing under University Blvd. has sufficient capacity to handle developed flows from this basin.

Subbasin 1201 is identified as Basins A-4, A-3 and C-2 in the Bohannon-Huston report. Flows from these A-3 and A-4, the most northern portion of subbasin 1201, will be carried by a storm drain to University Blvd. then to a detention basin located to the northwest of the existing 48-

inch crossing. The drain system will designed to accommodate the 100-year runoff. Discharge from the pond will be controlled to a level less than existing. Pond capacity is proposed at 4 a-f.

J. **Middle, Eend, Air Guard, Far East End Basins.** These basins, which lie to the east of Runway 17-35 and discharge to the south through KAFB property, were analyzed under the Taxiway E and A improvement projects in order that systems which would handle fully developed flows from KAFB and the airfield were constructed while Runway 8-26, Taxiway A and Taxiway E were closed. This study does not address additional development or future conditions for these basins due to the capacity of the upgraded systems constructed. Section III, Existing Conditions, contains as-constructed information on these basins. The existing systems are considered adequate to accommodate foreseeable future conditions.

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(Rev 1-28-03)

N15-0006?

PROJECT TITLE: Albuquerque International Sunport- Foreign Trade Zone ZONE MAP/DRG. FILE #: L-16, M-15, M-16, M-17, M-18, N-15, N-16, N-17, N-18, P-15, P-16
DRB# _____ EPC# WORK ORDER#: _____

LEGAL DESCRIPTION: Albuquerque International Sunport
CITY ADDRESS: 2200 Sunport Blvd SE, Albuquerque, NM 87106

ENGINEERING FIRM: Molzen-Corbin & Associates CONTACT Mike Provine
ADDRESS 2701 Miles Road SE PHONE. 242-5700
CITY, STATE Albuquerque, NM ZIP CODE. 87106

OWNER: COA/ Aviation Department CONTACT Jim Hinde
ADDRESS: 2200 Sunport Blvd. SE PHONE 255-8668
CITY, STATE: Albuquerque, NM ZIP CODE: 87106

ARCHITECT. _____ CONTACT _____
ADDRESS. _____ PHONE _____
CITY STATE: _____ ZIP CODE _____

SURVEYOR: Santiago Romero Jr & Associates, Inc CONTACT Santiago Romero
ADDRESS: 8708 Brandywine Rd NE PHONE: 884-5119
CITY, STATE: Albuquerque, NM ZIP CODE: 87111

CONTRACTOR. _____ CONTACT _____
ADDRESS _____ PHONE _____
CITY, STATE _____ ZIP CODE _____

RECEIVED
AUG 15 2011
HYDROLOGY

CHECK TYPE OF SUBMITTAL
X DRAINAGE REPORT
_____ DRAINAGE PLAN 1st SUBMITTAL,
REQUIRES TCL or equal
_____ DRAINAGE PLAN RESUBMITTAL
_____ CONCEPTUAL GRADING AND DRAINAGE PLAN
_____ GRADING PLAN
_____ EROSION CONTROL PLAN
_____ ENGINEER'S CERTIFICATION (HYDROLOGY)
_____ CLOMR/LOMR
_____ TRAFFIC CIRCULATION LAYOUT (TCL)
_____ ENGINEERS CERTIFICATION (TCL)
_____ ENGINEERS CERTIFICATION (DRB APPR SITE PLAN)
_____ OTHER

CHECK TYPE OF APPROVAL SOUGHT:
_____ SIA/FINANCIAL GUARANTEE RELEASE
_____ PRELIMINARY PLAT APPROVAL
_____ S. DEV PLAN FOR SUB'D APPROVAL
_____ S DEV. PLAN FOR BLDG PERMITAPPROVAL
_____ SECTOR PLAN APPROVAL
X FINAL PLAT APPROVAL
_____ FOUNDATION PERMIT APPROVAL
_____ BUILDING PERMIT APPROVAL
_____ CERTIFICATE OF OCCUPANCY (PERM.)
_____ CERTIFICATE OF OCCUPANCY (TEMP.)
_____ GRADING PERMIT APPROVAL
_____ PAVING PERMIT APPROVAL
_____ WORK ORDER APPROVAL
_____ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED
X YES
_____ NO
_____ COPY PROVIDED

DATE SUBMITTED: 8/11/11 BY: Dan Hogan

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal The particular nature, location and scope to the proposed development defines the degree of drainage detail One or more of the following levels of submittal may be required based on the following.

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans

2 **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres

3 **Drainage Report:** Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more

Change Access

DRN # 016/D002B

CITY OF ALBUQUERQUE, NEW MEXICO
AVIATION DEPARTMENT

PLANS FOR CONSTRUCTION OF

ALBUQUERQUE INTERNATIONAL AIRPORT
ACCESS ROAD "D"
CLARK CARR BLVD. TO UNIVERSITY BLVD.

APRIL 1991

VICINITY MAP
N.T.S.
MAP No. N-15

INDEX TO DRAWINGS

SHEET No	TITLE	SHEET No	TITLE
1	TITLE SHEET	17	STORM DRAIN PLAN & PROFILES, STA 21+00 TO 32+00
2A	PLAT	18	STORM DRAIN PLAN & PROFILES, STA 32+00 TO 43+15
2B	PLAT	19	SEWER & WATER-PLAN & PROFILE STA 10+00 TO 21+00
3	QUANTITY SHEET	20	SEWER & WATER-PLAN & PROFILE STA 21+00 TO 32+00
4	GENERAL NOTES	21	SEWER & WATER-PLAN & PROFILE STA 32+00 TO 43+15
5	LAYOUT & TYPICAL SECTIONS	22	SEWER & WATER-PLAN &PROFILE STA 43+15 TO 48+15 69
6	STREET PLAN & PROFILE STA 10+00 TO 21+00	23	STORM DRAINAGE DETAILS
7	STREET PLAN & PROFILE STA 21+00 TO 32+00	24	MISCELLANEOUS DETAILS
8	STREET PLAN & PROFILE STA 32+00 TO 43+15	25	FILL AREA REMOVAL PLAN
9	STREET PLAN & PROFILE STA 43+15 TO 48+15 69	26	FILL AREA GRADING PLAN
10	CLARK CARR BLVD INTERSECTION	27	FILL AREA STORM SEWER PLAN & PROFILE
11	UNIVERSITY BLVD INTERSECTION	28	LANDSCAPE PLAN STA 10+00 TO STA 32+00
12	LIGHTING, SIGNING, STRIPING & ELECTRICAL SERVICE PLAN	29	LANDSCAPE PLAN STA 32+00 TO STA 48+15 69
13	LIGHTING AND FENCING DETAILS	30	LANDSCAPING DETAILS
14	GRADING PLAN STA 10+00 TO 32+00	30A	IRRIGATION PLAN STA 10+00 TO STA 32+00
15	GRADING PLAN STA 32+00 TO 48+15 69	30B	IRRIGATION PLAN STA 32+00 TO STA 48+15 69
16	STORM DRAIN PLAN & PROFILES, STA 10+00 TO 21+00		

CAUTION
NOTE: THAT ALL EXISTING UTILITIES MAY NOT BE SHOWN HEREON AND THAT ANY EXISTING UTILITIES THAT ARE SHOWN ARE IN APPROXIMATE LOCATION ONLY. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT ALL UTILITY OWNERS AND TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO ANY EXCAVATION TO DETERMINE THE ACTUAL LOCATIONS OF UTILITIES AND OTHER IMPROVEMENTS

ALL IDEAS, DESIGNS, ARRANGEMENTS AND PLANS INDICATED OR REPRESENTED BY THIS INSTRUMENT ARE OWNED BY AND THE PROPERTY OF MOLZEN-CORBIN & ASSOCIATES AND WERE CREATED AND DEVELOPED FOR USE ON AND IN CONNECTION WITH THE SPECIFIED PROJECT. THESE IDEAS, DESIGNS, ARRANGEMENTS, OR PLANS SHALL NOT BE USED BY ANY PERSON, FIRM OR CORPORATION FOR ANY PURPOSE WHATSOEVER WITHOUT THE WRITTEN CONSENT OF MOLZEN-CORBIN & ASSOCIATES

THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH SHALL REMAIN THE RESPONSIBILITY OF THE CONTRACTOR

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

REV	SHEETS	CITY	ENGR	DATE	USER	DEPT	DATE	USER	DEPT	DATE

APPROVAL OF REVISIONS

RECORD DRAWING
DATE | INIT. BY | CHKD. BY
MOLZEN-CORBIN & Associates

MOLZEN-CORBIN & Associates

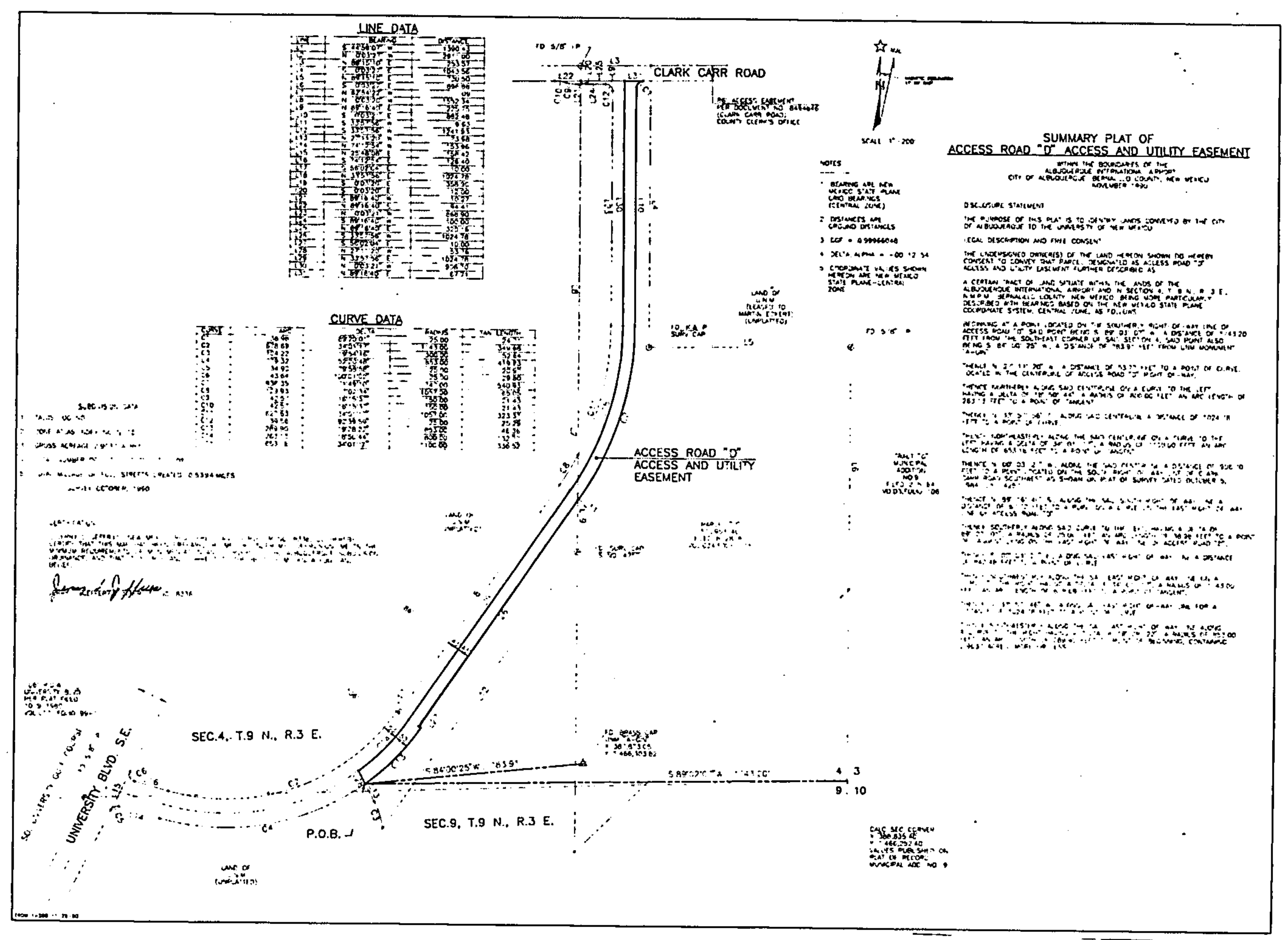
APPROVED FOR CONSTRUCTION

CITY ENGINEER

PROJECT NUMBER
4183

SHEET 1 OF 30

SCANNED BY
BY LASON



LASON 1-505-344-9404
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SCANNED BY
BY LASON

AS BUILT INFORMATION

MICRO-FILM INFORMATION

BENCH MARKS

UNV BRASS CAP "A GIN"
ELEV 5308.73

SURVEY INFORMATION

FIELD NOTES

NO	BY	DATE
	KRAVETZ & ASSOCIATES	

ENGINEER'S SEAL

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
		M. PROVINE	10/19/90
		K. HOCHHALTER/J. SPINELLO	10/25/90

RECORD DRAWING

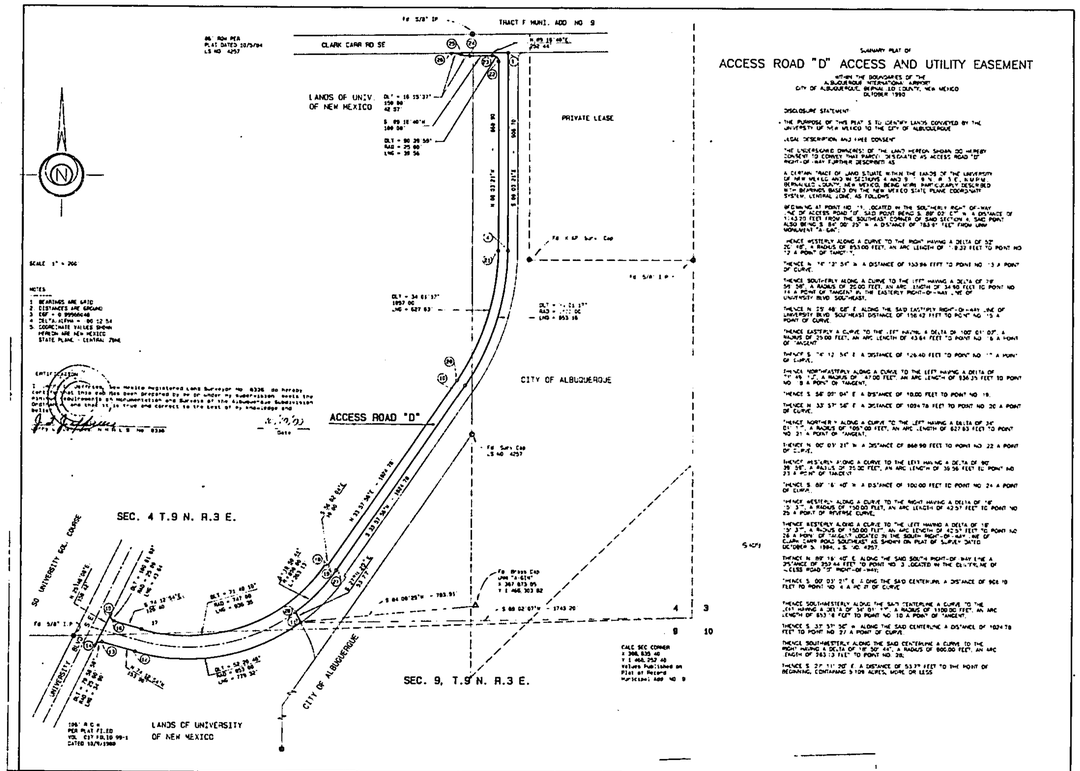
HOLZEN-CORBIN & Associates

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ABQ INT'L AIRPORT

ACCESS ROAD D
PLAT

DRAWING NO.	4183	MAP NO. N-15	SHEET 2A OF 30



SUMMARY PLAT OF

ACCESS ROAD "D" ACCESS AND UTILITY EASEMENT

WITHIN THE BOUNDARIES OF THE ALBUQUERQUE INTERNATIONAL AIRPORT CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO OCTOBER 1992

DISCLOSURE STATEMENT

THE PURPOSE OF THIS PLAT IS TO GRANTEE LANDS CONVEYED BY THE UNIVERSITY OF NEW MEXICO TO THE CITY OF ALBUQUERQUE

LEGAL DESCRIPTION AND FREE CONSENT

THE UNDERSIGNED OWNER(S) OF THE LAND HEREIN SHOWN DO HEREBY CONSENT TO CONVEY THIS PLAT(S) DESIGNATE AS ACCESS ROAD "D" RIGHT-OF-WAY FURTHER DESCRIBED AS

A CERTAIN TRACT OF LAND SITUATE WITHIN THE LANDS OF THE UNIVERSITY OF NEW MEXICO AND IN SECTIONS 4 AND 9, T. 9 N., R. 3 E., N.M.P.M., BERNALILLO COUNTY, NEW MEXICO, BEING MORE PARTICULARLY DESCRIBED BY BEARINGS BASED ON THE NEW MEXICO STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, AS FOLLOWS

BEGINNING AT POINT NO "1", LOCATED IN THE SOUTHERLY RIGHT-OF-WAY LINE OF ACCESS ROAD "D", SAID POINT BEING N. 88° 20' E., A DISTANCE OF 1,343.05 FEET FROM THE SOUTHEAST CORNER OF SAID SECTION 4, SAID POINT ALSO BEING S. 84° 06' 25" W., A DISTANCE OF 783.91 FEET FROM UNM MONUMENT "G GM";

THENCE WESTERLY ALONG A CURVE TO THE RIGHT HAVING A DELTA OF 52° 25' 19", A RADIUS OF 25.00 FEET, AN ARC LENGTH OF 22.87 FEET TO POINT NO "2" A POINT OF TANGENT;

THENCE S. 74° 12' 37" W. A DISTANCE OF 132.84 FEET TO POINT NO "3" A POINT OF CURVE;

THENCE SOUTHERLY ALONG A CURVE TO THE LEFT HAVING A DELTA OF 90° 00' 00", A RADIUS OF 25.00 FEET, AN ARC LENGTH OF 39.27 FEET TO POINT NO "4" A POINT OF TANGENCY ON THE EASTERLY RIGHT-OF-WAY LINE OF UNIVERSITY BLVD SOUTHEAST;

THENCE S. 15° 47' 23" E. ALONG THE SAID EASTERLY RIGHT-OF-WAY LINE OF UNIVERSITY BLVD SOUTHEAST DISTANCE OF 156.42 FEET TO POINT NO "5" A POINT OF CURVE;

THENCE EASTERLY A CURVE TO THE LEFT HAVING A DELTA OF 100° 01' 00", A RADIUS OF 25.00 FEET, AN ARC LENGTH OF 43.64 FEET TO POINT NO "6" A POINT OF TANGENT;

THENCE S. 74° 12' 37" E. A DISTANCE OF 126.40 FEET TO POINT NO "7" A POINT OF CURVE;

THENCE NORTHEASTERLY ALONG A CURVE TO THE LEFT HAVING A DELTA OF 90° 00' 00", A RADIUS OF 57.00 FEET, AN ARC LENGTH OF 89.53 FEET TO POINT NO "8" A POINT OF TANGENT;

THENCE S. 56° 09' 04" E. A DISTANCE OF 10.00 FEET TO POINT NO "9".

THENCE N. 33° 37' 56" E. A DISTANCE OF 1059.78 FEET TO POINT NO "10" A POINT OF CURVE;

THENCE NORTHERLY ALONG A CURVE TO THE LEFT HAVING A DELTA OF 26° 03' 00", A RADIUS OF 1,970.00 FEET, AN ARC LENGTH OF 827.83 FEET TO POINT NO "11" A POINT OF TANGENT;

THENCE N. 00° 01' 01" E. A DISTANCE OF 868.90 FEET TO POINT NO "12" A POINT OF CURVE;

THENCE NORTHERLY ALONG A CURVE TO THE LEFT HAVING A DELTA OF 90° 00' 00", A RADIUS OF 25.00 FEET, AN ARC LENGTH OF 39.56 FEET TO POINT NO "13" A POINT OF TANGENT;

THENCE S. 89° 15' 40" E. A DISTANCE OF 100.00 FEET TO POINT NO "14" A POINT OF CURVE;

THENCE WESTERLY ALONG A CURVE TO THE RIGHT HAVING A DELTA OF 16° 13' 37", A RADIUS OF 150.00 FEET, AN ARC LENGTH OF 42.57 FEET TO POINT NO "15" A POINT OF REVERSE CURVE;

THENCE WESTERLY ALONG A CURVE TO THE LEFT HAVING A DELTA OF 18° 32' 37", A RADIUS OF 150.00 FEET, AN ARC LENGTH OF 47.57 FEET TO POINT NO "16" A POINT OF TANGENT LOCATED IN THE SOUTH RIGHT-OF-WAY LINE OF CLARK CARR ROAD SOUTHEAST AS SHOWN ON PLAT OF SURVEY DATED DECEMBER 5, 1984, L.S. NO. 4257.

THENCE N. 89° 15' 40" E. ALONG THE SAID SOUTH RIGHT-OF-WAY LINE A DISTANCE OF 932.44 FEET TO POINT NO "1" LOCATED IN THE CENTERLINE OF ACCESS ROAD "D" RIGHT-OF-WAY;

THENCE S. 00° 03' 27" E. ALONG THE SAID CENTERLINE A DISTANCE OF 904.19 FEET TO POINT NO "2" A PC OF CURVE

THENCE SOUTHEASTERLY ALONG THE SAID CENTERLINE A CURVE TO THE RIGHT HAVING A DELTA OF 26° 03' 00", A RADIUS OF 1,920.00 FEET, AN ARC LENGTH OF 873.18 FEET TO POINT NO "3" A POINT OF TANGENT;

THENCE S. 33° 33' 56" E. ALONG THE SAID CENTERLINE A DISTANCE OF 1059.78 FEET TO POINT NO "4" A POINT OF CURVE

THENCE SOUTHEASTERLY ALONG THE SAID CENTERLINE A CURVE TO THE RIGHT HAVING A DELTA OF 19° 56' 40", A RADIUS OF 800.00 FEET, AN ARC LENGTH OF 783.13 FEET TO POINT NO. 25.

THENCE S. 27° 11' 29" E. A DISTANCE OF 53.37 FEET TO THE POINT OF BEGINNING, CONTAINING 5.126 ACRES, MORE OR LESS

KRAWIETZ & ASSOC., INC.

LASON 1-505-344-9404
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SCANNED BY LASON

AS BUILT INFORMATION

BENCH MARKS

SURVEY INFORMATION

FIELD NOTES BY ____ DATE ____

NO ____ DATE ____ BY ____ REMARKS

REVISIONS

DESIGN

ENGINEER'S SEAL

MICRO-FILM INFORMATION

RECORD DRAWING

DATE	DRFT BY	CHKD BY
11/92	MBC	

MOLZEN-CORBIN & ASSOCIATES

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
ABQ INT'L AIRPORT
ACCESS ROAD D
PLAT

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
D.P.W. CHAIRP.			WATER		
TRANS. DEV.			WASTEWATER		
HYDROLOGY					
AVIATION					

DRAWING NO. 4183 | MAP NO. N-15 | SHEET 28 OF 30

SUMMARY OF QUANTITIES

BID ITEM	ITEM ID	DESCRIPTION	UNIT	ESTIM QUANT	FINAL QUANT
1	0019 02	CONSTRUCTION TRAFFIC CONTROL COMPLETE	LS	1	1
2	0201 01	SITE CLEARING AND GRUBBING COMPLETE	LS	1	1
3	0205 01	UNCLASSIFIED EXCAVATION	CY	76906	76906
4	0301 02	SUB-BASE PREPERATION 12"	SY	15668	15668
5	P-401	PLANT MIX BITUMINOUS PAVEMENT	TON	5603	5603
6	P-401	BITUMINOUS MATERIAL	TON	286	286
7	0336 01	PRIME COAT	SY	0	0
8	0336 12	TACK COAT	SY	29668	29668
9	0340 03	VALLEY GUTTER AND CURB PCC	SF	4885	4885
10	0340 05	CURB AND GUTTER STANDARD PCC	LF	4456	4456
11	0340 06	CURB AND GUTTER MEDIAN PCC	LF	3717	3717
12	0340 30	4" MEDIAN PAVEMENT PCC INCLUDING SUB-GRADE PREP	SF	320	320
13	0341 01	ASPHALT CONCRETE CURB MACHINE EXTRUDED	LF	850	850
14	0343 08	REMOVE AND DISPOSE, EXISTING CURB AND GUTTER, PCC	LF	1166	1166
15	0420 10	2" ELECTRICAL CONDUIT	LF	4613	4613
16	0420 20	ELECTRICAL PULL BOX 13"x24"	EA	5	5
17	0420 30	STREET LIGHT FOUNDATION	EA	28	28
18		ELECTRICAL TRANSFORMER PAD	EA	1	1
19		ELECTRICAL CONTROL BOX	EA	1	1
20	0420 110	PANEL SIGN, ALUMINUM	SF	57	57
21	0420 112	STREET POST AND BASE FOR PANEL SIGN	LF	110	110
22	0420 115	PAINTED MARKINGS REFLECTORIZED 4"	LF	2257	2257
23	0510 10	CUT-OFF WALL, PCC	CY	6	6
24	0701 01	TRENCH BACKFILL AND COMPACT 0 TO 8	LF	0	0
25	0701 02	TRENCH BACKFILL AND COMPACT 8 TO 12	LF	2745	2745
26	0701 10	STORM DRAIN TRENCH & BACKFILL 0 TO 8	LF	2510	2510
27	0701 11	STORM DRAIN TRENCH & BACKFILL 8 TO 12	LF	600	600
28	0801 03	8" PVC C-900 CLASS 150 PIPE	LF	776	776
29	0801 59	NON-PRESSURE CONNECTION WL W/PIPE REQUIRED CIP	LF	1	1
30	0801 65	C I OR D I CLASS 250 MJ FITTINGS	LB	833	833
31	0801 82	8" GATE VALVE W/BOX AND LID CIP	EA	2	2
32	0901 03	8" PVC SDR-35 SAS PIPE	LF	2745	2745
33	0901 61	WET CONNECTION OF NEW 8" SAS TO EXISTING MANHOLE	EA	2	2
34	0901 80	SAS TV-VIDEO, POST CONSTRUCTION	HR	7	7
35	0910 05	18" RCP CLASS III	LF	739	739
36	0910 09	24" RCP CLASS III	LF	.596	1596
37	0910 13	30" RCP, CLASS III	LF	0	0
38	0910 19	42" RCP CLASS III	LF	497	497
39	0910 21	48" RCP, CLASS III	LF	60	60
40	0915 01	CATCH BASIN TYPE A SINGLE GRATE CIP	EA	10	10
41	0915 02	CATCH BASIN TYPE AA DOUBLE GRATE, CIP	EA	5	6
42	0915 06	CATCH BASIN TYPE D DOUBLE GRATE CIP	EA	0	0
43	0920 01	MANHOLE, 4 DIA TYPE C 0 TO 6	EA	1	1
44	0920 07	MANHOLE, 4 DIA TYPE C OR E, 6 TO 10	EA	12	12
45		SPECIAL TRENCH CATCH BASIN CIP	EA	1	1
46	0920 55	MANHOLE STEPS	EA	113	113
47	0920 13	MANHOLE 6 DIA TYPE C 0 TO 6'	EA	6	6
48	0920 14	MANHOLE 6' DIA TYPE C OR E 6' TO 10	EA	0	0
49	0920 15	MANHOLE 6 DIA TYPE C OR E 10 TO 14	EA	0	0
50		PCC DITCH CHECKS, CIP	EA	91	91
51		HEAVY NYLON MONOFILAMENT EROSION CONTROL FABRIC	SF	19890	19890
52		IRRIGATION ELECTRICAL SERVICE CIP	LS	1	1
53	1011 01	SEEDING, CLASS A, NATIVE	SY	43560	43560
54		SOD SOIL AMENDMENTS	SY	5850	5850
55		2.5" CAL LONDON PLANE TREE	EA	44	44
56		7 HT JAPANESE BLACK PINE	EA	36	36
57		2" CAL BRADFORD PEAR	EA	32	32
58		2" CAL CRABAPPLE	EA	17	17
59		3 HT FORSYTHIA	EA	3	3
60		3 HT FLOWERING QUINCE	EA	32	32
61		IRRIGATION SYSTEM CIP	LS	1	1
62	F-161	5 STRAND BARBED WIRE FENCE	LF	5264	5264
63	0410 04	REMOVAL OF EXISTING CHAIN LINK FENCE	SF	0	0
64		REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LS	1	1
65		CONNECTION OF 42" RCP TO EXISTING LINE	EA	3	3
66		CONNECTION OF 48" RCP TO EXISTING LINE	EA	1	1
67		RELOCATION OF FILL AREA CONCRETE RUBBLE	LS	1	1
68		REFLECTORIZED PLASTIC TURN ARROWS	EA	7	7
69		CONSTRUCTION MOBILIZATION COMPLETE	LS	1	1
70	0915 06	CATCH BASIN TYPE E DOUBLE GRATE CIP	EA	4	4
71	0810 86	14" BUTTERFLY VALVE, CIP	EA	1	1
72		PCC STILLING BASIN INCLUDING ALL RIP-RAP CIP	LS	0	0
73		18"x92" CMP CULVERT W/END SECTIONS CIP	LF	92	92
74		CONNECT 10 EXIST SD W/ CATCH BASIN TYPE E INCL TEMP INLET COVER, CIP	EA	1	1
75		RELOCATE IRRIGATION PIPE CONTROL CABLE AND VALVE BOX MATERIAL	LS	1	1
76		RELOCATE IRRIGATION PIPE, CONTROL CABLE AND VALVE BOX LABOR AND EQUIPMENT	HR	25.41	25.41
77		HAUL & PLACE EXCAVATED MATL TO AREA SOUTH OF GEORGE RD	CY	10062	10062
78		MANHOLE 6' DIA TYPE C 14 TO 20	EA	1	1
79		INSTALL 2-4" TYPE C DUCT, INCL TRENCHING BACKFILL & COMPACTION 0 TO 6 DEPTH COMPLETE	LF	829	829
80		INSTALL 2-4" TYPE C DUCT INCL TRENCHING, BACKFILL & COMPACTION 6 TO 10' DEPTH COMPLETE	LF	877	877
81		INSTALL 2-4" TYPE C DUCT, INCL TRENCHING BACKFILL & COMPACTION 10 TO 14' DEPTH COMPLETE	LF	107	107
82		FURNISH & INSTALL PRECAST TELEPHONE VAULTS IN ACCORD W/US WEST GUIDELINES COMPLETE	EA	2	2
83		ADDITIONAL DEPTH FOR 2" SERVICE SHUT-OFF	LS	1	1
84		INSTALL 8"x14" TAPPING SADDLE INCLUDING TRENCHING, BACKFILL, & COMPACTION & RESTOCK FEES, COMPLETE	EA	1	1

REMOVAL OF STRUCTURES AND OBSTRUCTIONS

DESCRIPTION	STATION	OFFSET
STORM DRAIN INLET	10+33 +/-	-25.00' +/-
STORM DRAIN INLET	10+52 +/-	11.00 +/-
36" RCP	10+25 - 10+50 +/-	-10.00 +/-
18" RCP	10+25 - 10+31 +/-	-10.00 -22.00 +/-
DRAINAGE STRUCTURE	48+00 +/-	-60.00 +/-
GUARD RAIL	48+12 +/-	80.00 R TO 200.00 L
DITCH CHECKS PCC	10+47 +/-	240 R TO 95 L
C & G INCLUDES PAVEMENT REMOVAL	10+35 +/- 48+15 +/-	255 R TO 87 L 160 R TO 260 L

NOTES

1 ALL ITEMS LISTED ABOVE ARE TO BE CONSTRUCTED AND PAID FOR AS PER CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION WITH THE EXCEPTION OF THE ITEMS LISTED BELOW

A) ASPHALT CONCRETE BASE COURSE SEE SPECIFICATIONS FOR DETAILS

B) ASPHALT CONCRETE SURFACE COURSE SEE SPECIFICATIONS FOR DETAILS

C) 5 STRAND BARBED WIRE SECURITY FENCE

D) RECLAMATION SEEDING

E) SOD SOILS AMENDMENTS

F) TREES

PER ADD #1 G) IRRIGATION SYSTEM (SHALL BE PAID FOR AS LUMP SUM ITEM)

H) MOBILIZATION (SEE SPECIFICATIONS FOR DETAILS)

2 ALL MATERIALS OR LABOR REQUIRED TO COMPLETE THIS PROJECT BUT NOT LISTED IN THE BID PROPOSAL SHALL BE CONSIDERED INCIDENTAL ITEMS FOR WHICH THERE WILL BE NO ADDITIONAL PAYMENT IN ANY CASE THE BID PROPOSAL SHALL BE USED FOR DETERMINING ITEM UNITS AND COSTS FOR BIDDING AND PAYMENT PURPOSES

3 ALL COSTS FOR BLOCKING REQUIRED FOR WATERLINE JOINTS AND VALVES SHALL BE INCLUDED IN THE UNIT BID PRICES FOR FITTINGS AND VALVES

4 PAYMENT FOR NON PRESSURIZED CONNECTIONS SHALL INCLUDE ALL PIPE REQUIRED TO CONNECT THE NEW WATERLINE WITH THE EXISTING WATERLINE AS SHOWN PAYMENTS FOR FITTINGS SHALL BE MADE UNDER THE BID ITEM FOR C I OR D I MJ FITTINGS

RECORD DRAWING

DATE	DRFT BY	CHKD BY

MOLZEN-CORBIN & Associates

SCANNED BY

AS BUILT INFORMATION

CONTRACTOR ____
WORK STAKED BY ____ DATE ____
INSPECTOR'S ACCEPTANCE BY ____ DATE ____
FIELD VERIFICATION BY ____ DATE ____
DRAWINGS CORRECTED BY ____ DATE ____

MICRO-FILM INFORMATION

RECORDED BY ____ DATE ____
NO ____

BENCH MARKS

SURVEY INFORMATION

FIELD NOTES

NO	BY	DATE

ENGINEER'S SEAL

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

NO	DATE	REMARKS	BY

REVISIONS

DESIGN

DESIGNED BY CDB DATE 1-91
DRAWN BY STAFF DATE 4-91
CHECKED BY JMP DATE 1 91

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ACCESS ROAD D
QUANTITY SHEET

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
D R C CHAIR			WATER		
TRANS DEV			WASTEWATER		
HYDROLOGY					
AVIATION					

DRAWING NO 4183 | MAP NO N-15 | SHEET 3 OF 30

QUANT DWG 1= 12 04 92

GENERAL NOTES:

1 ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED UNDER CONTRACT SHALL EXCEPT AS OTHERWISE STATED OR PROVIDED HEREON BE CONSTRUCTED IN ACCORDANCE WITH THE "CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION 1986 (COA STND) AS REVISED

2 TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION CONTRACTOR MUST CONTACT ONE CALL SYSTEM INC 260-1990 FOR LOCATION OF EXISTING UTILITIES

3 PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL OBSTRUCTIONS SHOULD A CONFLICT EXIST THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH MINIMUM AMOUNT OF DELAY

4 NOTE THAT ALL EXISTING UTILITIES MAY NOT BE SHOWN HEREON AND THAT ANY EXISTING UTILITIES THAT ARE SHOWN ARE IN AN APPROXIMATE LOCATION ONLY IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT ALL THE UTILITY OWNERS AND CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO ANY EXCAVATIONS TO DETERMINE THE ACTUAL LOCATION OF UTILITIES AND OTHER IMPROVEMENTS THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE CAUSED BY HIS FAILURE TO LOCATE IDENTIFY AND PRESERVE ANY AND ALL EXISTING UTILITIES, PIPELINES AND UNDERGROUND UTILITY LINES

5 ALL WATER VALVE BOXES AND SEWER MANHOLES WITHIN THE NEW PAVEMENT ARE TO BE ADJUSTED TO FINISH GRADE PER COA STND DETAILS

6 THE CONTRACTOR SHALL COORDINATE THE WATER VALVE SHUT-OFF OPERATION WITH THE WATER SYSTEMS DIVISION (857-8200) NOT LESS THAN THREE (3) WORKING DAYS PRIOR TO INITIATING ANY WORK AFFECTING EXISTING WATER UTILITIES WATER SERVICE SHALL BE MAINTAINED TO ALL CUSTOMERS AT ALL TIMES DURING CONSTRUCTION SEE SECTION 18 GENERAL CONDITIONS OF THE STANDARD SPECIFICATIONS

7 CONTRACTOR MUST SUBMIT A CONSTRUCTION SIGNING AND BARRICADING PLAN TO THE CITY OF ALBUQUERQUE, CONSTRUCTION COORDINATOR AND RECEIVE A BARRICADING PERMIT PRIOR TO BARRICADING OR CLOSING A CITY STREET ALL CONSTRUCTION SIGNING AND BARRICADING SHALL COMPLY WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES 1978 EDITION CONTRACTOR SHALL ADHERE TO SECTION 19 GENERAL CONDITIONS OF THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION 1986 AS REVISED FOR THE TRAFFIC CONTROL PLAN COORDINATE W/TRANSPORTATION @ 768-2551

8 EXISTING CURB AND GUTTER AND ASPHALT PAVEMENT NOT TO BE REMOVED UNDER THE CONTRACT WHICH IS DAMAGED OR DISPLACED BY THE THE CONTRACTOR SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT HIS EXPENSE

9 ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL STATE AND LOCAL LAWS RULES AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH

10 ALL FITTINGS ON WATERLINES SHALL HAVE CONCRETE BLOCKING IN ACCORDANCE WITH CITY STD DWG 2320 EXCEPT WHERE SPECIFICALLY INDICATED TO HAVE LOCKED MECHANICAL JOINTS

11 THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL EXISTING MONUMENTATION CONTROLS IN THE EVENT OF INADVERTENT DESTRUCTION OR ALTERATION, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE CITY CHIEF SURVEYOR

12 SEE COA STANDARD DETAIL 2465 FOR PAVEMENT CUTS AND REPLACEMENT

13 PNM WILL PROVIDE AT NO COST TO THE CITY OR THE CONTRACTOR THE REQUIRED PERSONNEL FOR INSPECTION OR OBSERVATION DEEMED NECESSARY BY PNM WHILE THE CONTRACTOR IS EXPOSING PNM'S CABLES HOWEVER THE CONTRACTOR SHALL BE CHARGED THE TOTAL COST ASSOCIATED WITH REPAIRS TO ANY DAMAGED CABLES OR FOR ANY COST ASSOCIATED WITH SUPPORTING OR RELOCATING THE POLES AND CABLES DURING CONSTRUCTION

14 A DISPOSAL SITE APPROVED BY THE PROJECT ENGINEER FOR ALL EXCESS EXCAVATION MATERIAL ASPHALTIC PAVING CONCRETE PAVING ETC SHALL BE OBTAINED BY THE CONTRACTOR IN COMPLIANCE WITH APPLICABLE REGULATIONS ALL COSTS INCURRED IN OBTAINING A DISPOSAL SITE AND IN HAUL THERETO SHALL BE CONSIDERED INCIDENTAL TO "THE CONTRACT" AND NO SEPARATE PAYMENT WILL BE MADE THEREFOR

15 THE CONTRACTOR WILL BE REQUIRED TO CONFINE HIS WORK WITHIN THE CONSTRUCTION LIMITS AND/OR RIGHT-OF-WAY TO PRESERVE EXISTING VEGETATION AND PRIVATE PROPERTY

16 WHERE REMOVAL OF EXISTING CURBS AND GUTTER SIDEWALK OR PAVEMENT IS REQUIRED CONTRACTOR SHALL SAWCUT AND/OR REMOVE TO THE NEAREST JOINT CURB AND GUTTER SHOWN AS EXISTING AND NOT TO BE REMOVED UNDER THIS CONTRACT WHICH IS DAMAGED OR DISPLACED BY THE CONTRACTOR SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE

17 ALL DIMENSIONS AND RADII OF CURB AND CURB RETURNS ARE SHOWN TO FACE OF CURB

18 ALL STATIONING IS BASED ON CONSTRUCTION CENTERLINE DATA

19 EXISTING WATER VALVE BOXES AND MANHOLE COVERS ENCOUNTERED WITHIN THE AREAS OF IMPROVEMENTS SHALL BE ADJUSTED TO GRADE AS PER CITY OF ALBUQUERQUE STD DWG 2325 AND 2326 ALL PRIVATELY OWNED VALVE UTILITY BOXES SHALL BE ADJUSTED BY THE UTILITY OWNER CONTRACTOR SHALL COORDINATE HIS WORK WITH THE RESPECTIVE UTILITY OWNERS CONTRACTOR SHALL NOTIFY UTILITY OWNERS AT LEAST ONE WEEK PRIOR TO RAISING VALVES BOXES ADJUSTED TO GRADE

20 THE COST OF HAULING EARTHWORK ON THIS PROJECT SHALL BE INCLUDED IN THE UNIT BID PRICES FOR UNCLASSIFIED EXCAVATION AND NO DIRECT MEASUREMENT OR PAYMENT WILL BE MADE THEREFOR UNCLASSIFIED EXCAVATION SHALL BE PLACED AS SHOWN & DESCRIBED ON SHEET 26 OF THESE DRAWINGS

21 WHEN ABUTTING NEW PAVEMENT CUT EXISTING PAVEMENT TO A NEAT STRAIGHT LINE TO MATCH NEW SURFACING DEPTH PAVEMENT CUT SHALL BE MADE AT A LOCATION SUITABLE FOR REMOVING BROKEN & CRACKED PAVEMENT NO PAYMENT WILL BE MADE FOR CUTTING EXISTING PAVEMENT AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION

22 WHEN EXISTING LANDSCAPING IS DISTURBED OR DAMAGED IT SHALL BE RESTORED TO EXISTING CONDITION INCLUDING PLANTING REPLACEMENT SOD TREES SHRUBS AND FLOWERS AND REPAIR OF EXISTING IRRIGATION SYSTEM

23 CONSTRUCTION OF THE AIR CARGO FACILITY WILL BE ON-GOING DURING THE CONSTRUCTION OF THIS PROJECT THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE AIR CARGO CENTER CONTRACTOR FOR THE PURPOSE OF MATCHING PAVEMENT AND CURB & GUTTER AT THE PARKING LOT AND CARGO CENTER ENTRANCES THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE AIR CARGO CENTER CONTRACTOR TO ELIMINATE CONSTRUCTION CONFLICTS BETWEEN THE PROJECTS

LEGEND

DESCRIPTION	NEW	EXISTING
SANITARY SEWER LINE		SAS
SANITARY SEWER MANHOLE		
STORM DRAIN LINE	SD	
STORM DRAIN MANHOLE		
STORM DRAIN INLETS		
WATER LINE	W	W
GATE VALVE		
FIRE HYDRANTS		
REDUCERS		
WATER SERVICE CONNECTION		
TEES		
CROSSES		
BENDS		
CAPS & PLUGS		
GAS LINES	G	G
UNDERGROND TELEPHONE	UT	UT
POWER OR TELEVISION POLE		
CABLE TELEVISION		CT
UNDERGROUND ELECTRIC	UE	UE
CENTER LINES		
EXISTING GROUND		

DESIGNED BY LASON
DRAWN BY LASON

RECORD DRAWING
DATE INITIAL CHKD

NOLTEN-CORBIN & Associates

JEN NOTES.DWG
10-22-92

SURVEY INFORMATION
FIELD NOTES

NO	BY	DATE

BENCH MARKS

AS BUILT INFORMATION

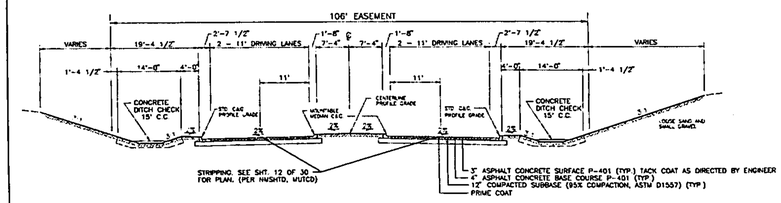
NO	DATE	REMARKS	BY
		DESIGN	
		AS BUILT	

ENGINEER'S SEAL

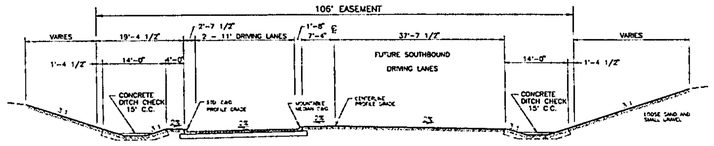
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
ACCESS ROAD D
GENERAL NOTES

APPROVALS	ENGINEER	DATE	APPROVALS	EN. MEEP	DATE
D & C CHAP			WATER		
TRANS DEV			WASTEWATER		
HYDROLOGY					
AVIATION					

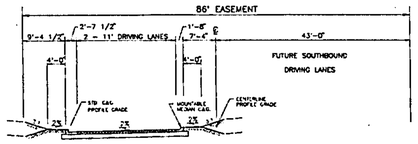
DRAWING NO 4183 | MAP NO N-15 | SHEET 4 OF 30



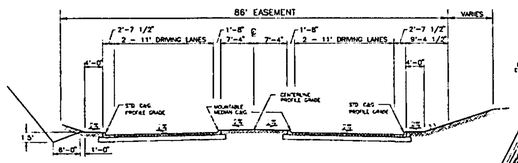
DEEP CUT – NEAR UNIVERSITY BLVD. INTERSECTION
STA. 46+30.7 – 47+08



DEEP CUT – GOING UP TO MESA
STA. 36+26.92 – 42+63.5

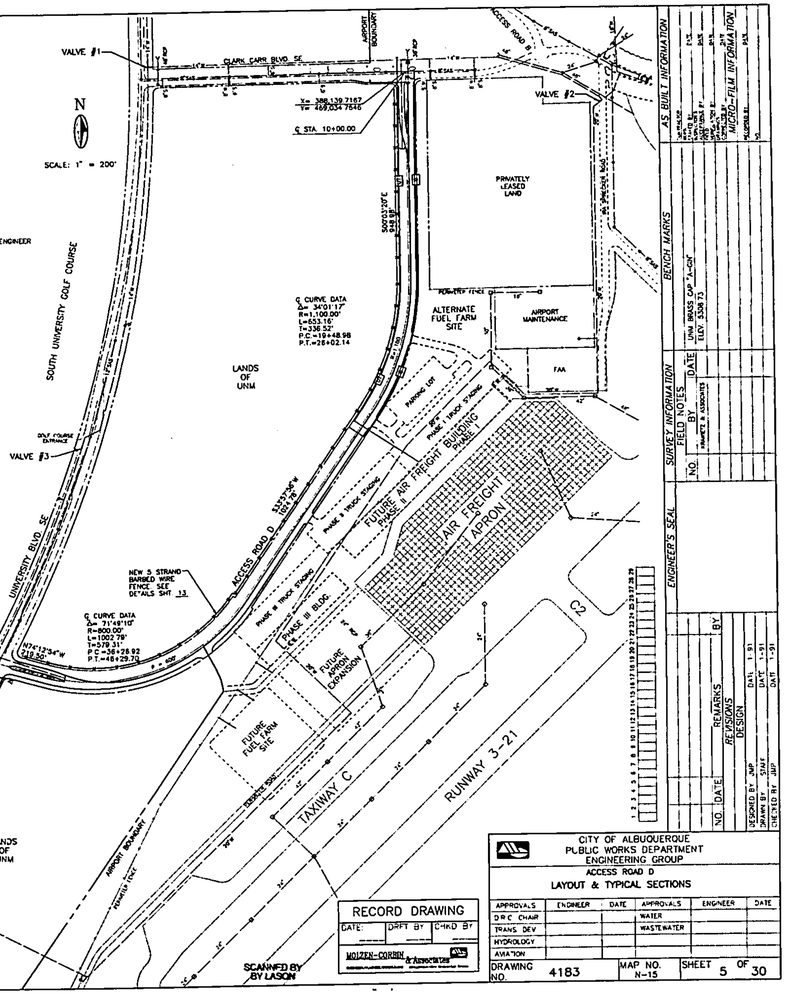


SHALLOW CUTS AND FILLS ON TOP OF MESA
STA. 14+83.41 – 36+26.92



SHALLOW CUT – NEAR CLARK CARR BLVD. INTERSECTION
STA. 10+82 – 12+00

TYPICAL ROADWAY SECTIONS
1" = 10'



RECORD DRAWING
DATE: | DRFT BY | CHKD BY
MOLZEN-CORBIN & Associates

SCANNED BY BY LASON

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
ACCESS ROAD D
LAYOUT & TYPICAL SECTIONS

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIR			WATER		
TRANS DEV			WASTEWATER		
HYDROLOGY					
AVIATION					

DRAWING NO. 4183 | MAP NO. N-15 | SHEET 5 OF 30

SURVEY INFORMATION
FIELD BOOK NO. | BY | DATE
MOLZEN-CORBIN & ASSOCIATES

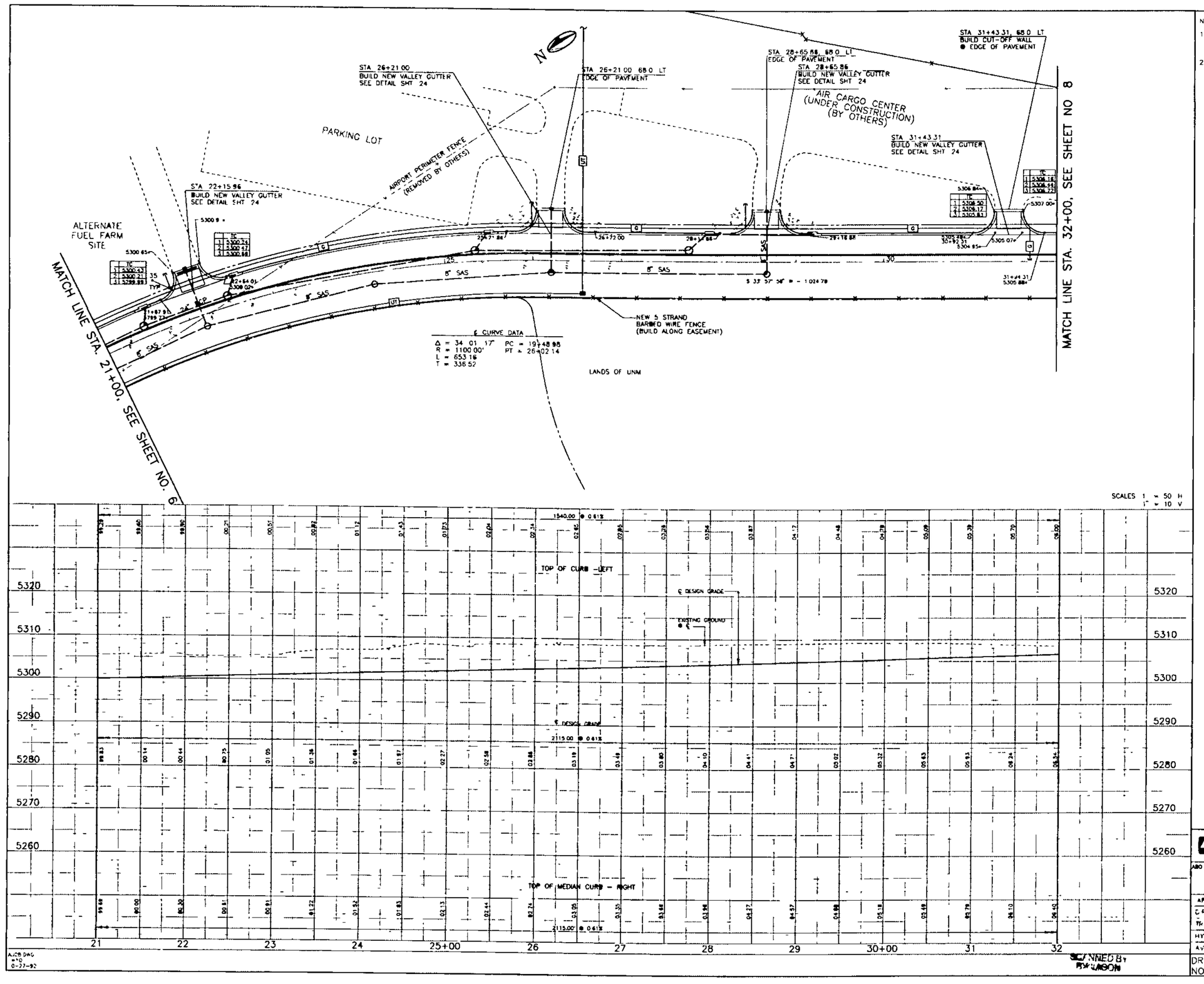
AS BUILT INFORMATION
BENCH MARKS
UNM BRASS CAP "A-624"
ELEV. 5308.73
MICRO-FILM INFORMATION

ENGINEER'S SEAL

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
		DRAWN BY	
		CHECKED BY	

RECORD D.P. JMP DATE 1-91
STAKE DATE 1-91
JMP

LAYOUT DWG 10-226 10-24-93



NOTE

1 ALL DIMENSIONS AND RADII OF CURB AND CURB RETURNS ARE SHOWN TO FACE OF CURB

2 TURNOUTS SHOWN ON THIS SHEET ● STA 22+59.77, STA. 26+21.00 STA. 28+65.86 AND STA. 31+43.31 SHALL HAVE A WIDTH OF 32' FACE TO FACE, AT THE CUT OFF WALL

+ = AS BUILT ELEVATION

RECORD DRAWING

DATE | DRAFT BY (FIRM'S NAME)

WOLZEN-CORBIN & Associates

AS BUILT INFORMATION

BENCH MARKS

DNM BRASS CAP "A-CM"
ELEV 5308.73

SURVEY INFORMATION
FIELD NOTES

NO	BY	DATE
	KRAMER & ASSOCIATES	

ENGINEER'S SEAL

MICRO-FILM INFORMATION

NO	DATE	REVISIONS	BY
		DESIGN	
		REMARKS	

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ABQ INT'L AIRPORT

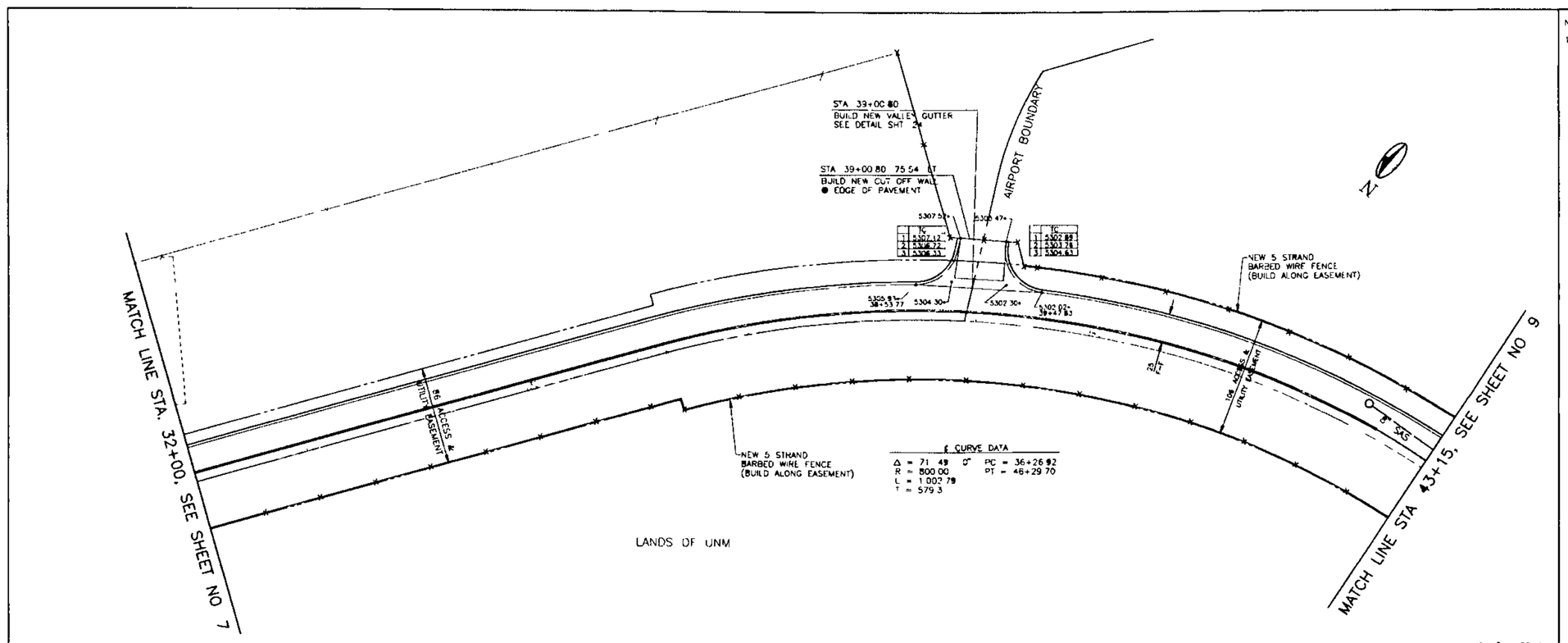
ACCESS ROAD D

STREET PLAN & PROFILE
STA 21+00 TO STA 32+00

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
CRC CHAIR			WATER		
TRANS DIV			WASTEWATER		
HYDROLOGY					
AVIATION					

DRAWING NO 4183 | MAP NO N-15 | SHEET 7 OF 30

ACAD DWG #10 0-27-92


STA. 39+00.80
BUILD NEW VALLEY GUTTER
SEE DETAIL SHT
STA 39+00.80 75.54 LT
BUILD NEW CUT OFF WALL
@ EDGE OF PAVEMENT
AIRPORT BOUNDARY
NEW 5 STRAND
BARBED WIRE FENCE
(BUILD ALONG EASEMENT)
MATCH LINE STA. 32+00, SEE SHEET NO 7
MATCH LINE STA 43+15, SEE SHEET NO 9
LANDS OF UNM
℄ CURVE DATA
Δ = 71 48 0" PC = 36+26.82
R = 800.00 PT = 43+29.70
L = 1,002.78
T = 579.3
SCALES 1" = 50' H
1" = 10' V
TOP OF CURB - LEFT
TOP OF MEDIAN CURB - RIGHT
℄ DESIGN GRADE
EXISTING GROUND
5330
5320
5310
5300
5290
5280
5270
32
33
34
35+00
36
37
38
39
40+00
41
42
43

NOTE

1 ALL DIMENSIONS AND RADII OF CURB AND CURB RETURNS ARE SHOWN TO FACE OF CURB

+ = AS-BUILT ELEVATION

RECORD DRAWING

DATE | CHKD. BY | CHKD. BY

MOLZEN-CORBIN & Associates

SURVEY INFORMATION
FIELD NOTES

NO	DATE	BY
		ROBERTS & ASSOCIATES

BENCH MARKS

UNM BRASS CAP "A-104"
ELEV = 5108.71

AS BUILT INFORMATION

24"W		BSE
18"W		BSE
12"W		BSE
8"W		BSE
24"CMP		BSE
18"CMP		BSE
12"CMP		BSE
8"CMP		BSE

AS-BUILT-FILM INFORMATION

1"=50' H	BSE
1"=10' V	BSE

ENGINEER'S SEAL

NO	DATE	REMARKS REVISIONS	BY
1	10/15/90	ADDED 24" W DRAINS	BSE
2	10/15/90	ADDED 24" CMP	BSE

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ABQ INTL AIRPORT

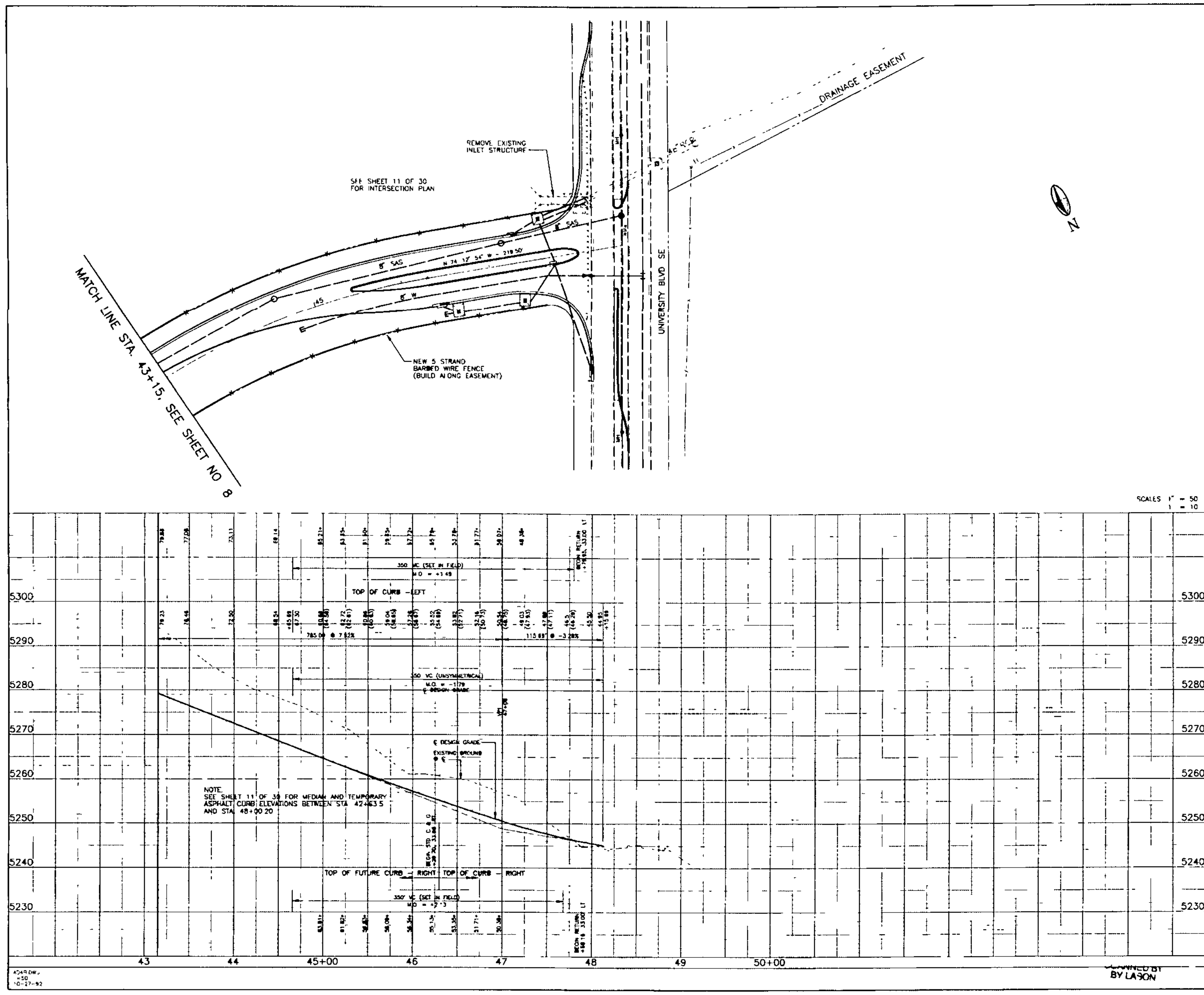
ACCESS ROAD B

STREET PLAN & PROFILE
STA 32+00 TO STA 43+15

APPROVALS	ENGINEER	DATE	APPROVALS	EN INEER	DATE
CHIEF, UHAP			WATER		
TRANS DIV			WASTEWATER		
MMED DIV					
AVIATION					

DRAWING NO 4183 | MAP NO N-15 | SHEET 8 OF 30

SCANNED BY LASON



NOTE
1 SEE SHT 3 FOR REMOVAL OF STRUCTURES

* = AS-BUILT ELEVATION

RECORD DRAWING

DATE	ENTERED	CHECKED BY

MOLZEN-CORBIN & Associates

ENGINEER'S SEAL	SURVEY INFORMATION			BENCH MARKS	AS BUILT INFORMATION
	FIELD NOTES				
	NO	BY	DATE	UNM BRASS CAP "A-GN"	CONTRACTOR
		KRAWIETZ & ASSOCIATES		ELEV 5308 73	STAKED BY ___ DATE
					ACCEPTED BY ___ DATE
					INSPECTION BY ___ DATE
					DRAWINGS CORRECTED BY ___ DATE
					MICRO FILM INFORMATION
					RECORDED BY ___ DATE
					NO

NO	DATE	REMARKS	BY
		REVISIONS	

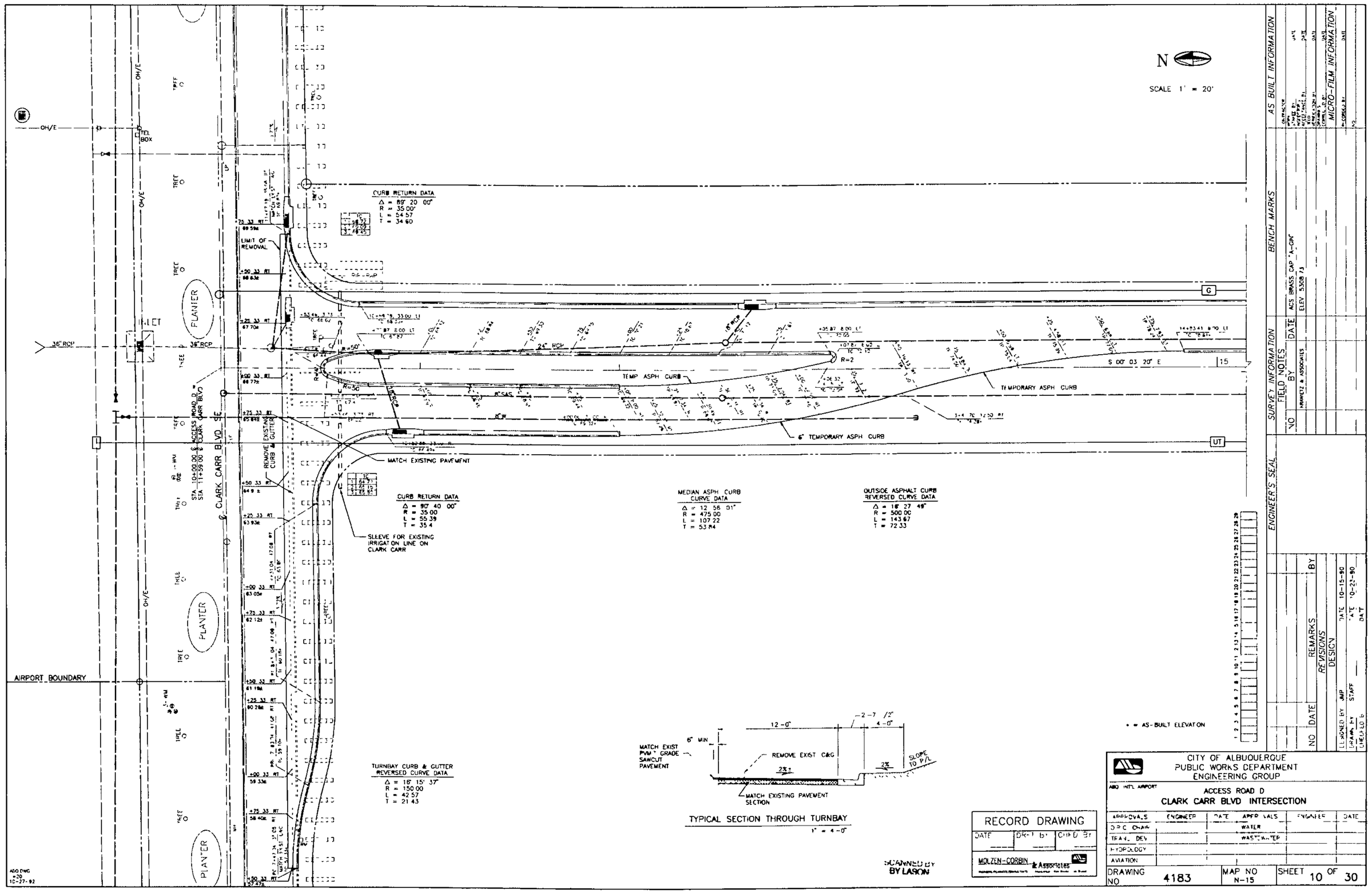
DESIGN
DESIGNED BY M. PROVINE DATE 10/10/90
DRAWN BY K. HOCHHALTER/J. SPINELLO DATE 10/10/90
CHECKED BY DATE

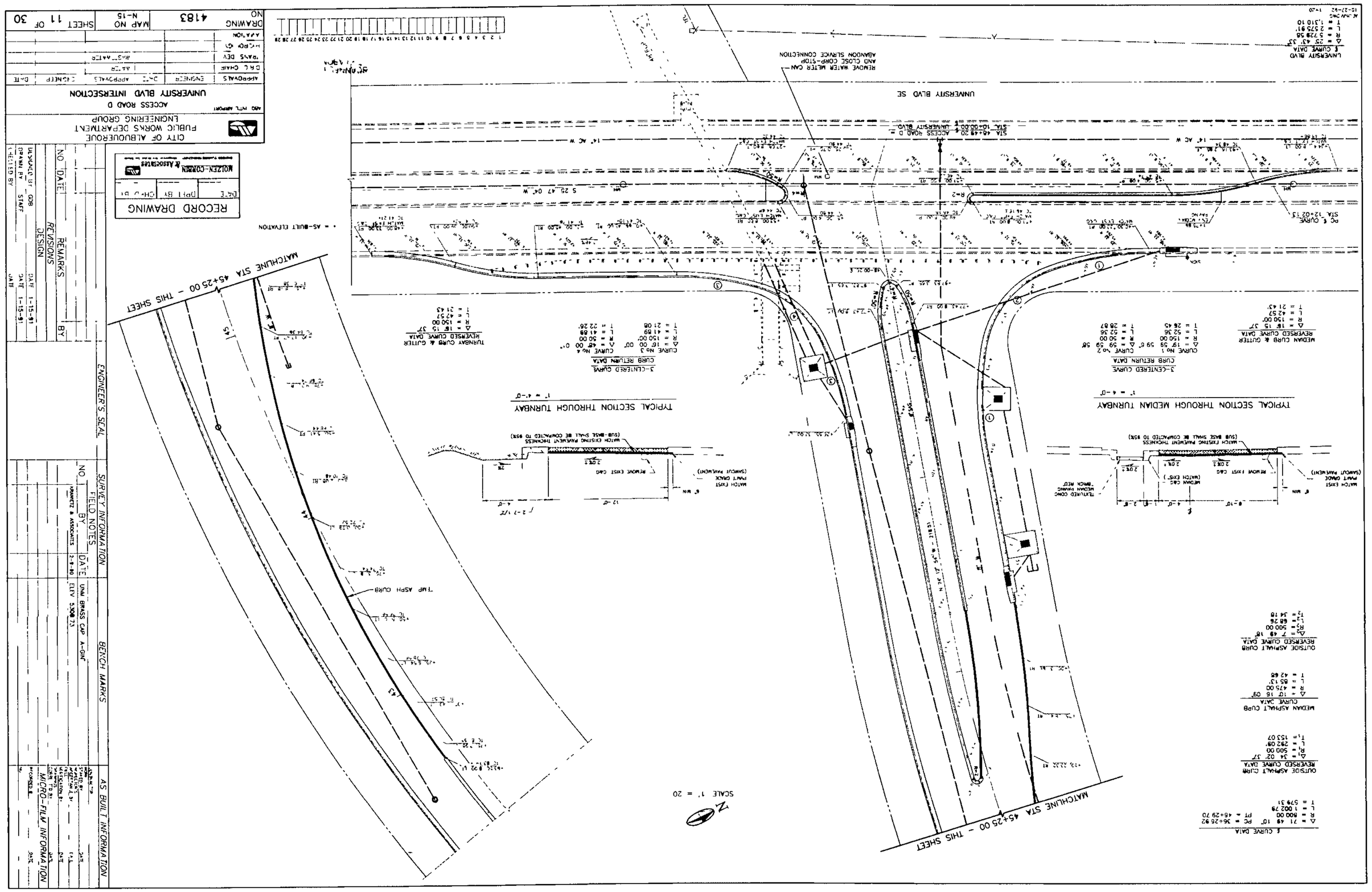
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

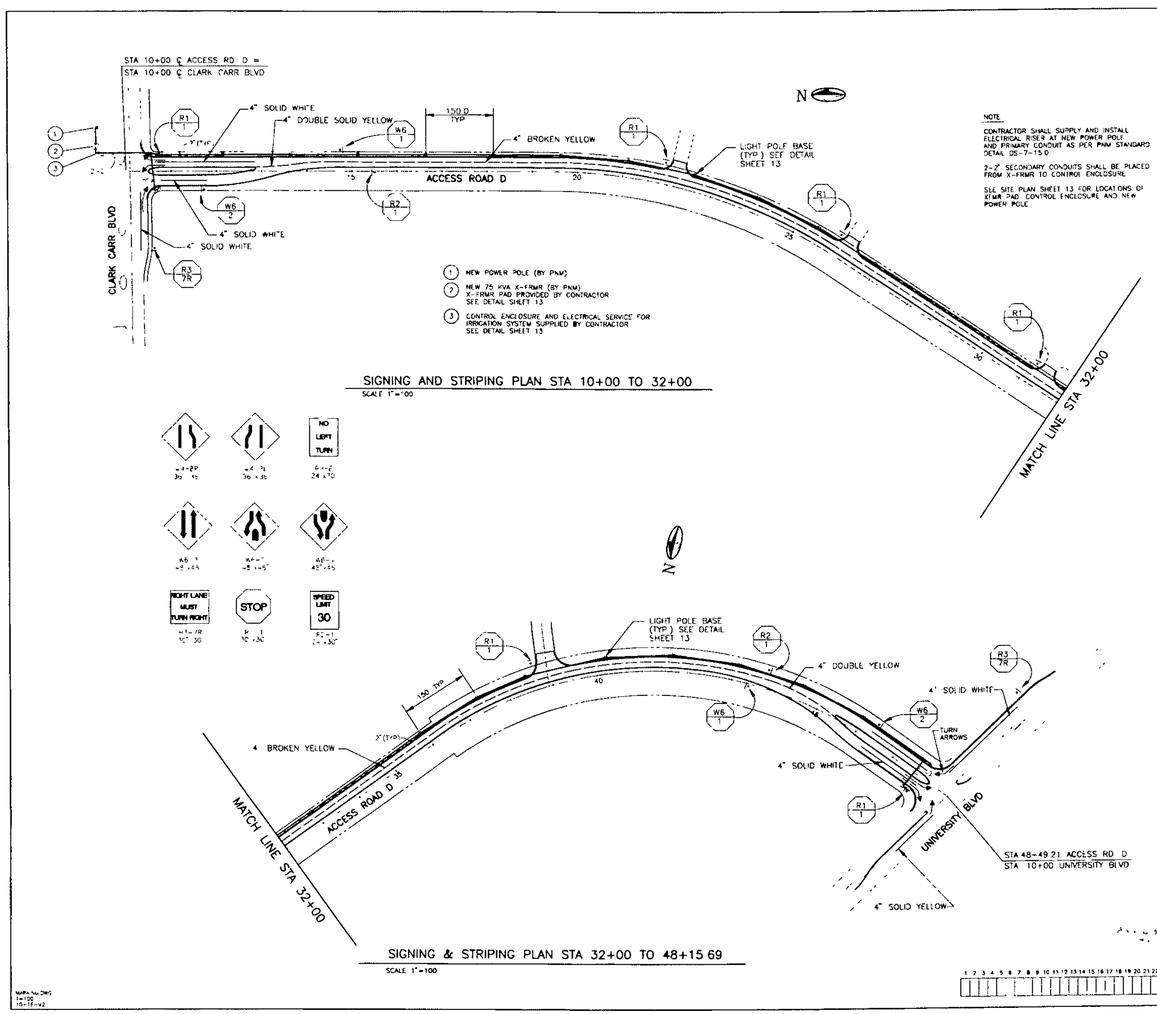
ABQ INTL AIRPORT
ACCESS ROAD D
STREET PLAN & PROFILE
STA.43+15 TO STA.48 15.69

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIR			WATER		
TRANS DEV			WASTEWATER		
HYDROLOGY					
AVIATION					

DRAWING NO 4183 | MAP NO N-15 | SHEET 9 OF 30


N
SCALE 1" = 20'
CURB RETURN DATA
Δ = 89° 20' 00"
R = 35.00'
L = 54.57
T = 34.80
LIMIT OF REMOVAL
TEMP ASPH CURB
TEMPORARY ASPH CURB
6" TEMPORARY ASPH CURB
MATCH EXISTING PAVEMENT
CURB RETURN DATA
Δ = 90° 40' 00"
R = 35.00
L = 55.39
T = 35.4
SLEEVE FOR EXISTING IRRIGATION LINE ON CLARK CARR
MEDIAN ASPH. CURB CURVE DATA
Δ = 12° 56' 01"
R = 475.00
L = 107.22
T = 53.84
OUTSIDE ASPHALT CURB REVERSED CURVE DATA
Δ = 18° 27' 48"
R = 500.00
L = 143.67
T = 72.33
CLARK CARR BLVD
AIRPORT BOUNDARY
PLANTER
TURNBAY CURB & GUTTER REVERSED CURVE DATA
Δ = 18° 15' 37"
R = 150.00
L = 42.52
T = 21.43
MATCH EXIST PVM'T GRADE SAWCUT PAVEMENT
6" MIN
REMOVE EXIST C&G
SLOPE 10 P/L
MATCH EXISTING PAVEMENT SECTION
TYPICAL SECTION THROUGH TURNBAY
1" = 4'-0"
* = AS-BUILT ELEVATION
AS BUILT INFORMATION
BENCH MARKS
SURVEY INFORMATION
FIELD NOTES
ENGINEER'S SEAL
REVISIONS
RECORD DRAWING
DATE
BY
CHK'D BY
MOLZEN-CORBIN & Associates
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
ABQ INTL AIRPORT
ACCESS ROAD D
CLARK CARR BLVD INTERSECTION
DRAWING NO 4183
MAP NO N-15
SHEET 10 OF 30


UNIVERSITY BLVD SE
ACCESS ROAD D
REMOVE WATER WATER CAN
AND CLOSE COMP-STOP
ABANDON SERVICE CONNECTION
MATCHLINE STA 45+25.00 - THIS SHEET
MATCHLINE STA 45+25.00 - THIS SHEET
SCALE 1" = 20
TYPICAL SECTION THROUGH TURNABY
TYPICAL SECTION THROUGH MEDIAN TURNABY
RECORD DRAWING
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
UNIVERSITY BLVD INTERSECTION
ACCESS ROAD D
DRAWING NO 4183
MAP NO N-15
SHEET 11 OF 30
ENGINEER'S SEAL
SURVEY INFORMATION
FIELD NOTES
BENCH MARKS
AS BUILT INFORMATION
MICRO-FILM INFORMATION
REVISIONS
NO. DATE BY
MOLZEN-CORBIN & ASSOCIATES



NOTES

1. ALL TRAFFIC SIGNING SHALL CONFORM TO THE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES LATEST EDITION OR AS DIRECTED BY THE ENGINEER
2. ALL MATERIALS USED IN THE CONSTRUCTION OF SIGNS OR MARKING SHALL CONFORM TO DIVISION 700 OF THE NEW MEXICO STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
3. COORDINATE ALL ELECTRICAL WORK WITH PNM. CONTRACTOR SHALL CONTACT PNM WHEN NEW POWER POLE NEEDS TO BE SET. PNM TO SET LIGHT POLES, FIXTURES AND INSTALL CONDUCTOR

LIGHT BASE STATION & OFFSET

STATION	OFFSET FT	STATION	OFFSET FT
10+68.70	-37.00	31+05.75	-37.00
12+14.36	-37.00	32+92.34	-37.00
13+64.36	-37.00	34+92.34	-37.00
15+14.36	-37.00	35+92.34	-37.00
16+64.36	-37.00	37+37.22	-37.00
18+14.36	-37.00	38+98.28	-37.00
18+64.36	-37.00	40+23.93	-37.00
21+08.96	-37.00	41+67.29	-37.00
22+54.08	-37.00	43+10.64	-37.00
23+89.18	-37.00	44+54.00	-37.00
25+44.28	-37.00	45+97.35	-37.00
26+92.34	-37.00	47+79.33	-37.00
28+42.34	37.00	47+74.34	37.00
29+92.34	-37.00		

PULL BOX STATION & OFFSET

STATION	OFFSET FT	STATION	OFFSET FT
47+58.04	39.00	10+55.28	-41.08
47+80.13	-36.00	9+47.35	-41.18
10+64.11	43.75		

RECORD DRAWING

DATE | SHEET SEAL | CHKD BY

MOLZEN-CORBIN & Associates

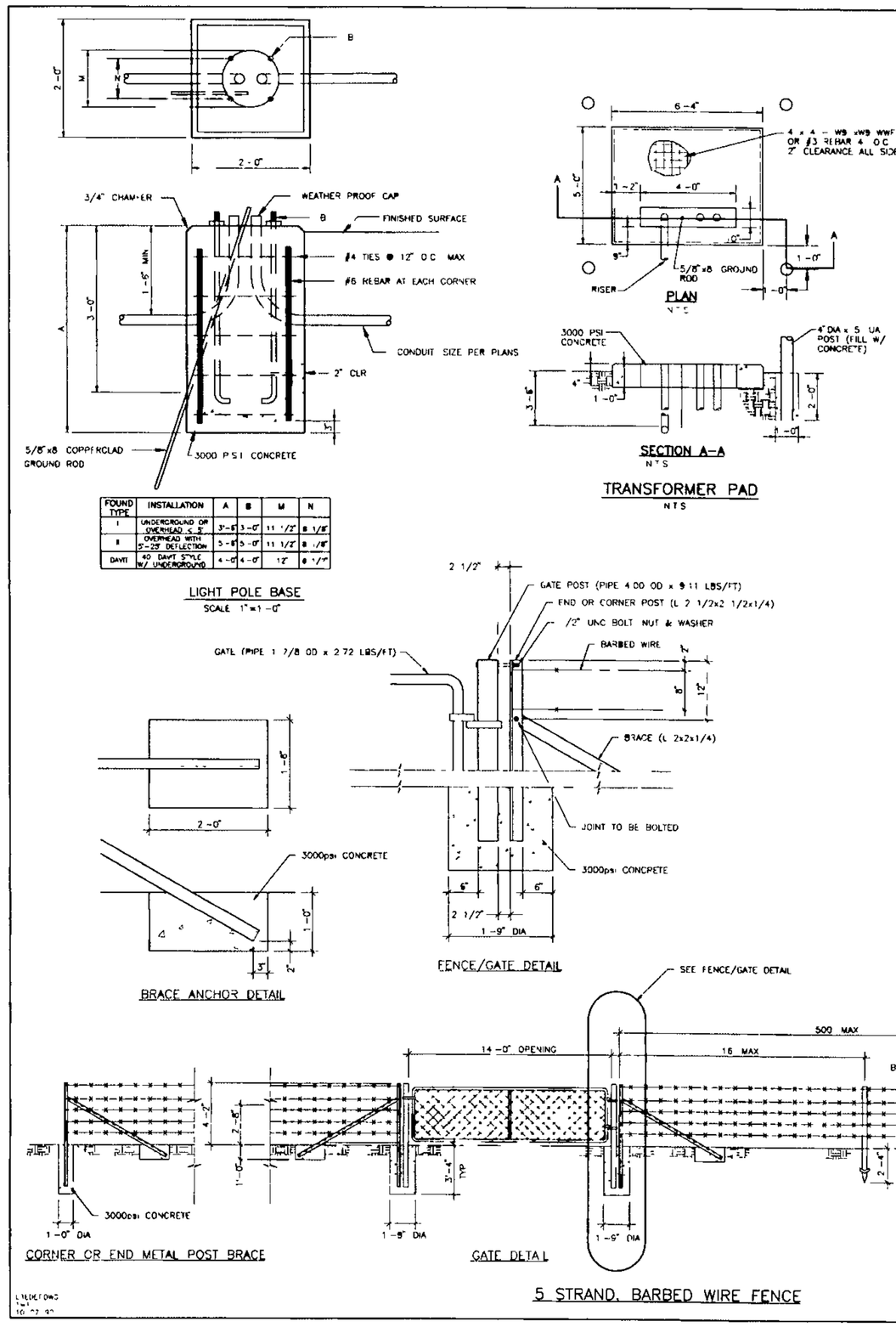
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ACCESS ROAD D
LIGHTING, SIGNING, STRIPING, & ELECTRICAL SERVICE PLAN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIR			WATER		
TRANS DEV			WASTEWATER		
HYDROLOGY					

DRAWING NO 4183 | MAP NO N-15 | SHEET 12 OF 30

AS BUILT INFORMATION
BENCH MARKS
SURVEY INFORMATION
FIELD NOTES BY DATE
NO
ENGINEER'S SEAL
REMARKS
REVISIONS
NO DATE
DESIGN BY DATE
DRAWN BY DATE
CHECKED BY DATE



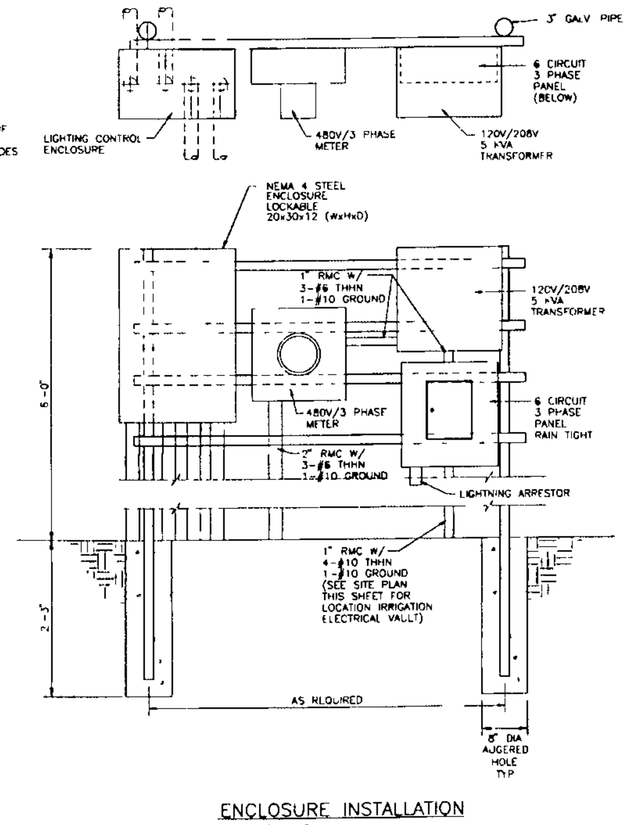
FOUND TYPE	INSTALLATION	A	B	M	N
I	UNDERGROUND OR OVERHEAD ≤ 2	3'-6"	3'-0"	11 1/2"	# 1/8"
II	OVERHEAD WITH 2'-0" DEFLECTION	5'-6"	5'-0"	11 1/2"	# 1/8"
DWG	40 GAUGE STYLE W/ UNDERGROUND	4'-0"	4'-0"	12"	# 1/4"

LIGHT POLE BASE
SCALE 1"=1'-0"

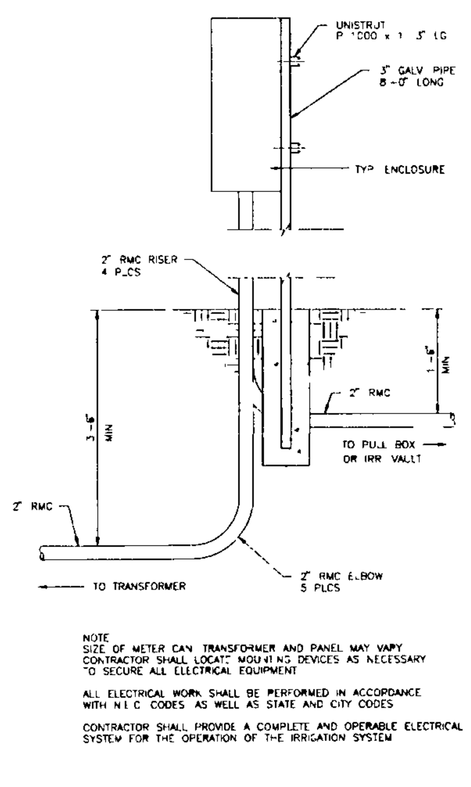
PLAN
N.T.S

SECTION A-A
N.T.S

TRANSFORMER PAD
N.T.S



ENCLOSURE INSTALLATION
SCALE 1"=1'-0"



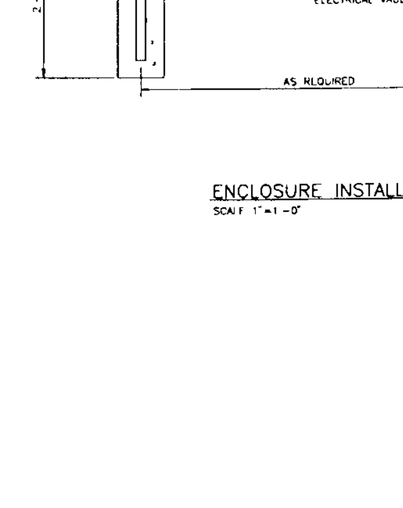
NOTE
SIZE OF METER CAN, TRANSFORMER AND PANEL MAY VARY. CONTRACTOR SHALL LOCATE MOUNTING DEVICES AS NECESSARY TO SECURE ALL ELECTRICAL EQUIPMENT

ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH N.E.C. CODES AS WELL AS STATE AND CITY CODES

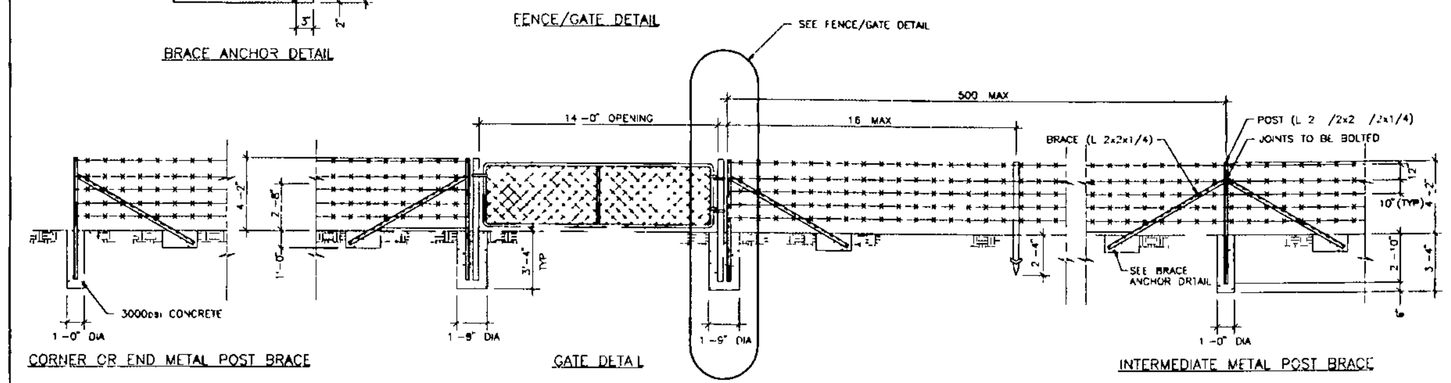
CONTRACTOR SHALL PROVIDE A COMPLETE AND OPERABLE ELECTRICAL SYSTEM FOR THE OPERATION OF THE IRRIGATION SYSTEM

BRACE ANCHOR DETAIL

FENCE/GATE DETAIL



NEW POWER REQUIREMENTS-SITE PLAN
SCALE NONE



CORNER OR END METAL POST BRACE

GATE DETAL

INTERMEDIATE METAL POST BRACE

5 STRAND, BARBED WIRE FENCE

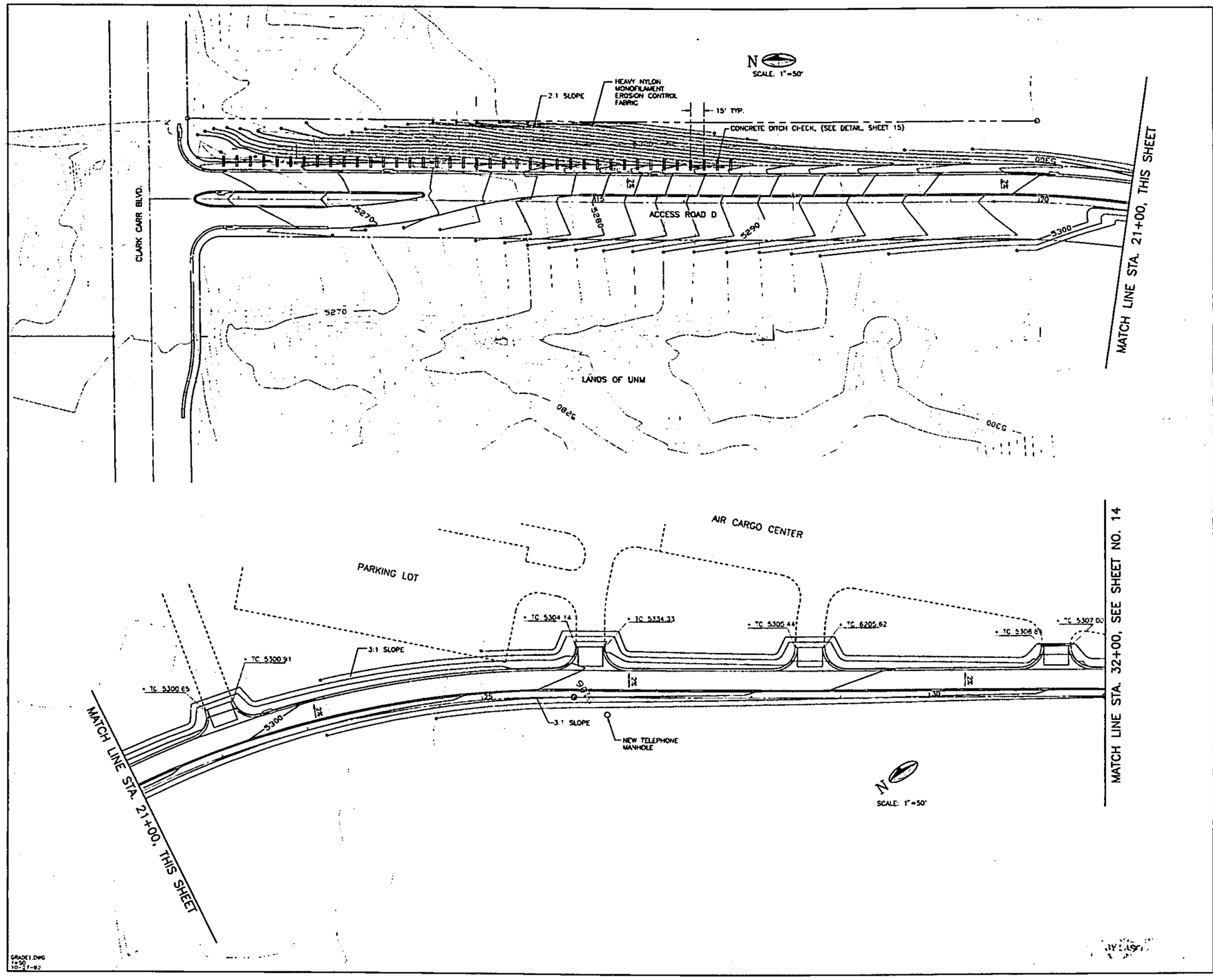
RECORD DRAWING
DATE | SHEET NO | BY
MOLZEN-CORBIN & Associates

AS BUILT INFORMATION
BENCH MARKS
SURVEY INFORMATION
FIELD NOTES
NO | BY | DATE
ENGINEER'S SEAL
REMARKS
REVISIONS
NO | DATE
DESIGN
DRAWN BY
CHK'D BY
DATE
MICRO-FILM INFORMATION
ROLL NO.
JOB NO.

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
ACCESS ROAD D
LIGHTING AND FENCING DETAILS

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIR			WATER		
TRANS. DIV.			WASTEWATER		
HYDROLOGY					
ARMORY					

DRAWING NO 4183 | MAP NO N-15 | SHEET 13 OF 30



NOTE

1. NYLON EROSION CONTROL FABRIC SHALL BE PLACED ON ALL 2:1 SLOPES. 2:1 SLOPES SHALL ALSO RECEIVE SEEDING.
2. DITCH CHECKS SHALL BE PLACED WITH THE CENTER OF THE STRUCTURE PLACED A" THE FLOW LINE OF THE DITCH.
3. LOCATION AND NUMBER OF DITCH CHECKS SHALL BE DETERMINED BY ENGINEER IN THE FIELD
4. SEE SHEETS 16, 17 AND 18 FOR STORM DRAINAGE PLAN AND PROFILES

+ = AS-BUILT ELEVATION

RECORD DRAWING

DATE: | DRAFT BY | CHK'D BY

MOLZEN-CORBIN & Associates

SURVEY INFORMATION

NO.	FIELD NOTES BY	DATE
1	KRAMER & ASSOCIATES	

BENCH MARKS

UNM BRASS CAP "A-104"
ELEV. = 5308.73

AS BUILT INFORMATION

(N.M.S.L.V.D. OF 1929)
"I" FIELD BY: JLS
FIELD BOOK #: 1
DATE: 4-91
"I" DRAWN BY: AMP
DATE: 4-91
"I" CHK'D BY: JLS
DATE: 4-91

MICRO-FILM INFORMATION

"I" SURVEY BY: BHT

NO.	REMARKS	DATE	BY
	REVISIONS		
	DESIGN	DATE 1-91	
	DESIGNED BY: GDB	DATE 1-91	
	DRAWN BY: GDB	DATE 4-91	
	CHK'D BY: JMP		

ENGINEER'S SEAL

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

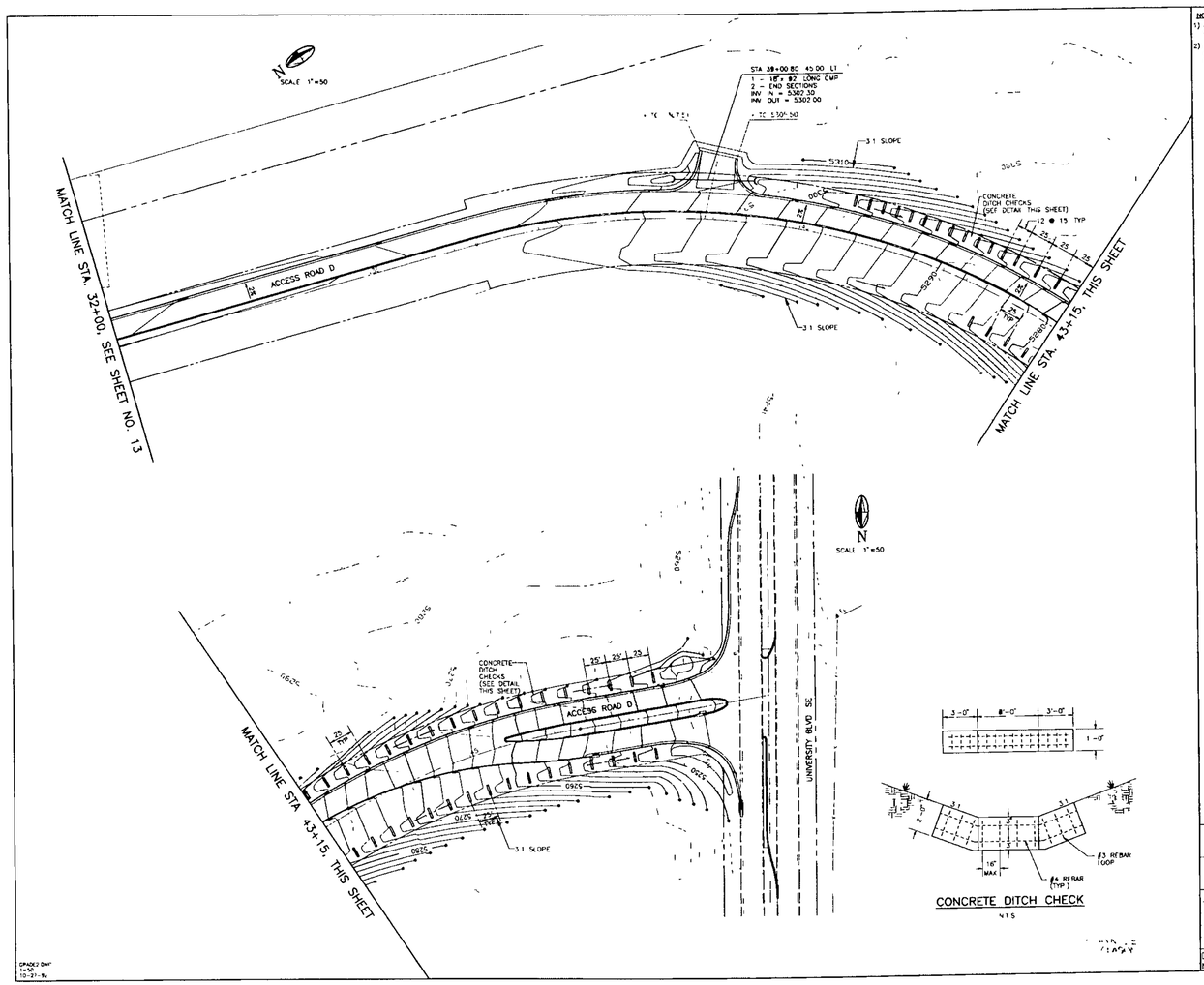
ACCESS ROAD D

GRADING PLAN STA. 10+00 TO 32+00

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIR			WATER		
TRANS. DEV.			WASTEWATER		
HYDROLOGY					
AVIATION					

DRAWING NO. 4183 | MAP NO. N-15 | SHEET 14 OF 30

GRADE1.DWG
10-07-92



NOTES

1) ALL DISTURBED AREAS SHALL BE FINE GRADED AND SEED. (EROSION CONTROL)

2) LOCATION AND NUMBER OF CONCRETE DITCH CHECKS SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD

+ = AC-PAVT ELEVATION

RECORD DRAWING

DATE | CONT ED | FIELD

MOLZEN-CORBIN & Associates

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ACCESS ROAD D

GRADING PLAN STA. 32+00 TO 48+15.69

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
C.E.C. CHAP			WATER		
TRANS. DEV.			WASTEWATER		
HYDROLOGY					
PARKS & REC.					

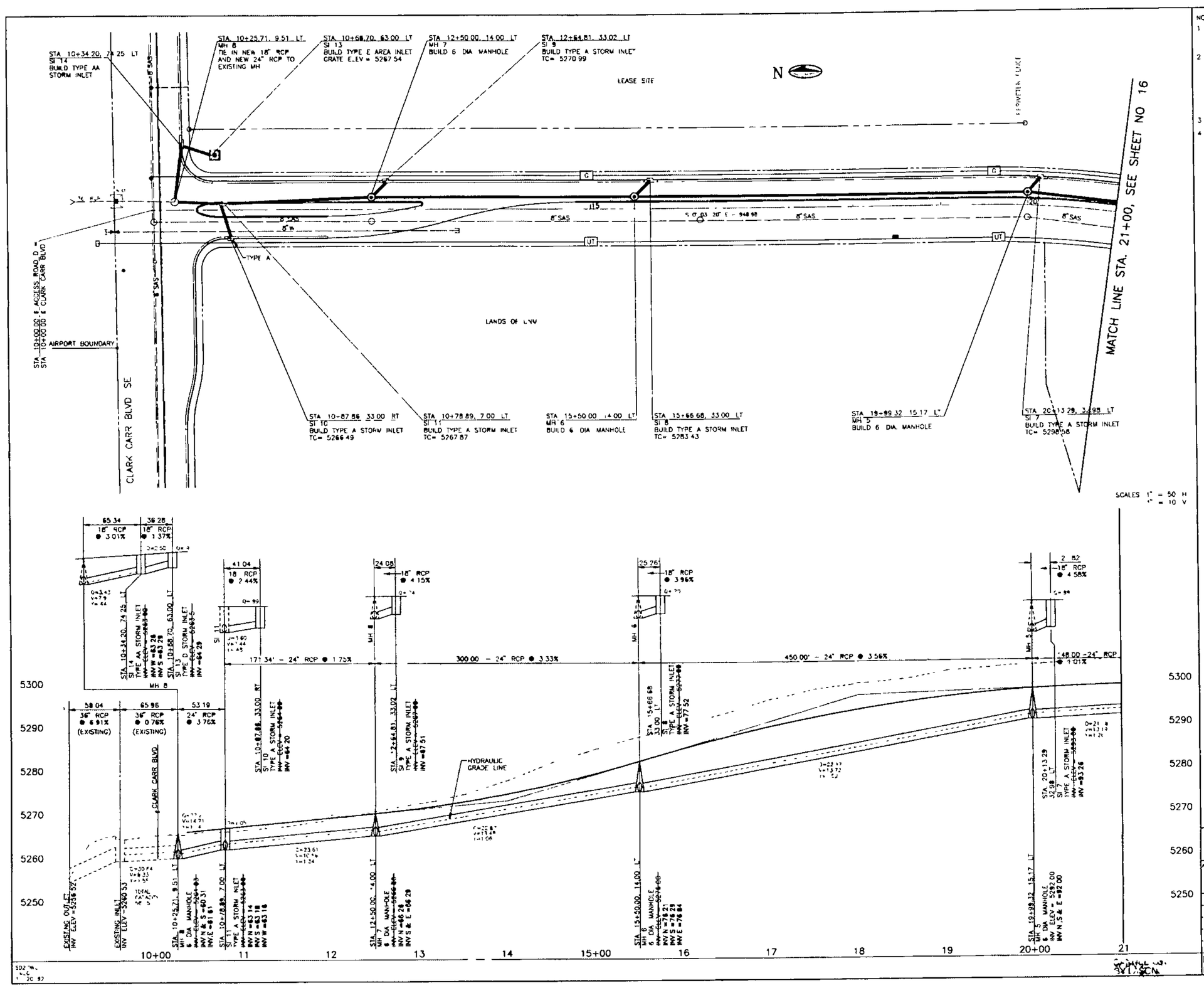
DRAWING NO 4183 | MAP NO N-15 | SHEET 15 OF 30

SURVEY INFORMATION
FIELD NOTES BY DATE
NO.

BENCH MARKS
AS BUILT INFORMATION
MICRO-FILM INFORMATION

ENGINEER'S SEAL

NO | DATE | REMARKS | BY
REVISIONS
DESIGN
DRAWN BY
TRACED BY
CHECKED BY
DATE
SCALE
SHEET



NOTE

1 ALL FLOW QUANTITIES SHOWN ON THIS SHEET ARE DESIGN STORM QUANTITIES (10 YEARS)

2 BACKFILL FOR STORM DRAIN SYSTEM SHALL BE PLACED IN 8" LIFTS AND COMPACTED TO 95% OF MAXIMUM DRY DENSITY AS PER ASTM D-1557 THIS BACKFILL SHALL INCLUDE PIPE STRUCTURES AND MANHOLES SUBGRADE BELOW STRUCTURES SHALL BE COMPACTED TO 95% OF MAXIMUM DRY DENSITY

3 ALL RCP TO BE CLASS III

4 TOP OF CURB ELEVATIONS GIVEN FOR STORM INLETS ARE AT CENTER OF GRATE

AS BUILT INFORMATION

BENCH MARKS

SURVEY INFORMATION
FIELD NOTES

NO	DATE	BY
1		

MICRO-FILM INFORMATION

ENGINEER'S SEAL

RECORD DRAWING

DATE	DRAFT BY	INV'D BY

MOLZEN-CORBIN & Associates

NO	REMARKS	DATE	BY
	REVISIONS		
	DESIGN	12-11-90	

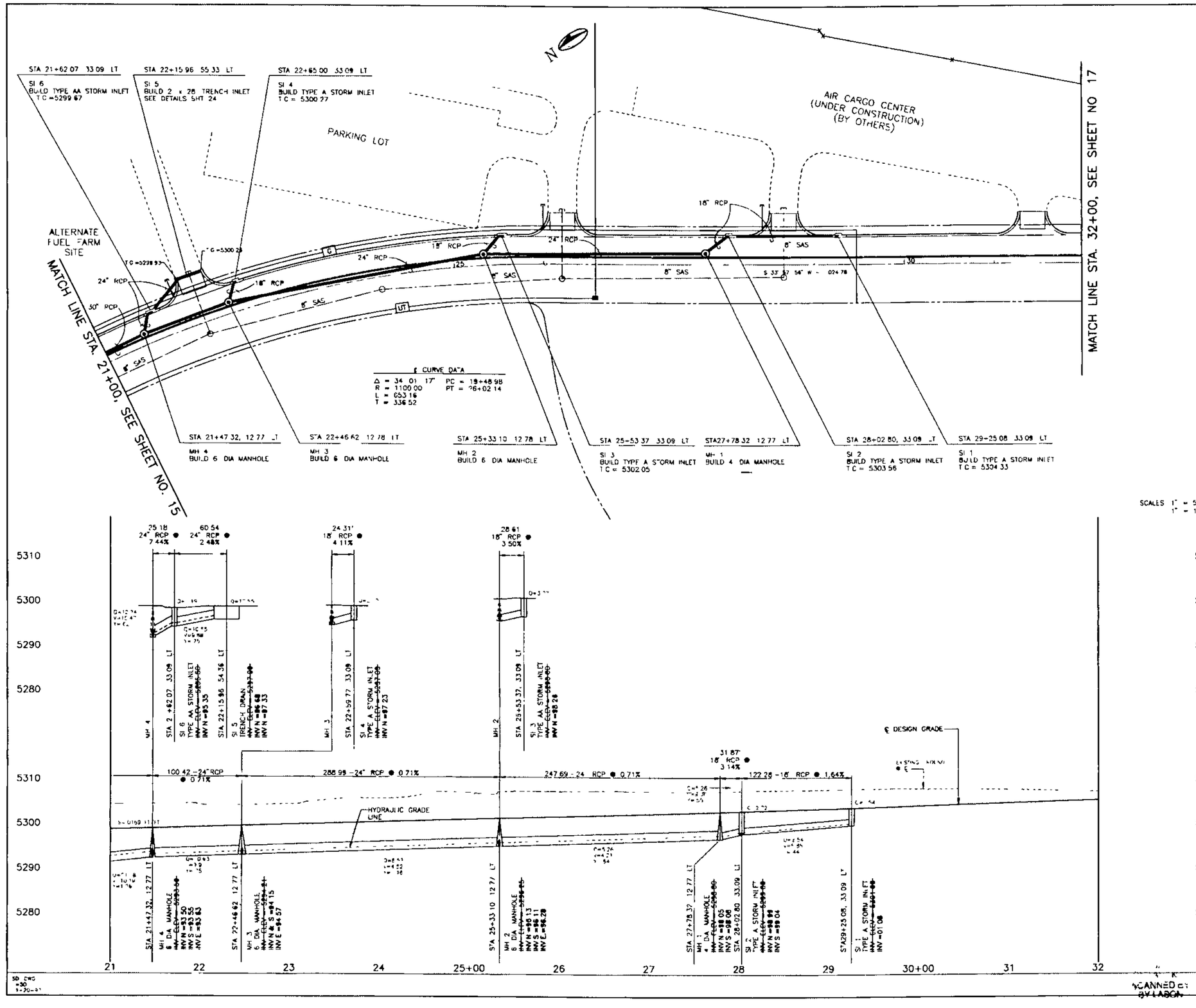
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ABQ INT'L AIRPORT

ACCESS ROAD D
STORM DRAIN PLAN & PROFILES
STA 10+00 TO STA 21+00

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
CITY ENGR			WATER		
TRANS DEV			WATER/TRK		
HYDROLOGY					

DRAWING NO 4183 | MAP NO N-15 | SHEET 16 OF 30



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3 ALL RCP SHALL BE CLASS III
4 TOP OF CURB ELEVATIONS SHOWN FOR STORM INLETS ARE AT CENTER OF GRATE
5 ALL BEDDING AND BACKFILL MATERIAL WITHIN 12" OF THE PIPE SHALL BE CLASS D THERE SHALL BE NO ROCKS LARGER THAN 1" DIA AND SHALL BE CLEAN GRAVEL OR SAND UNLESS OTHERWISE PROVIDED BY THE ENGINEER

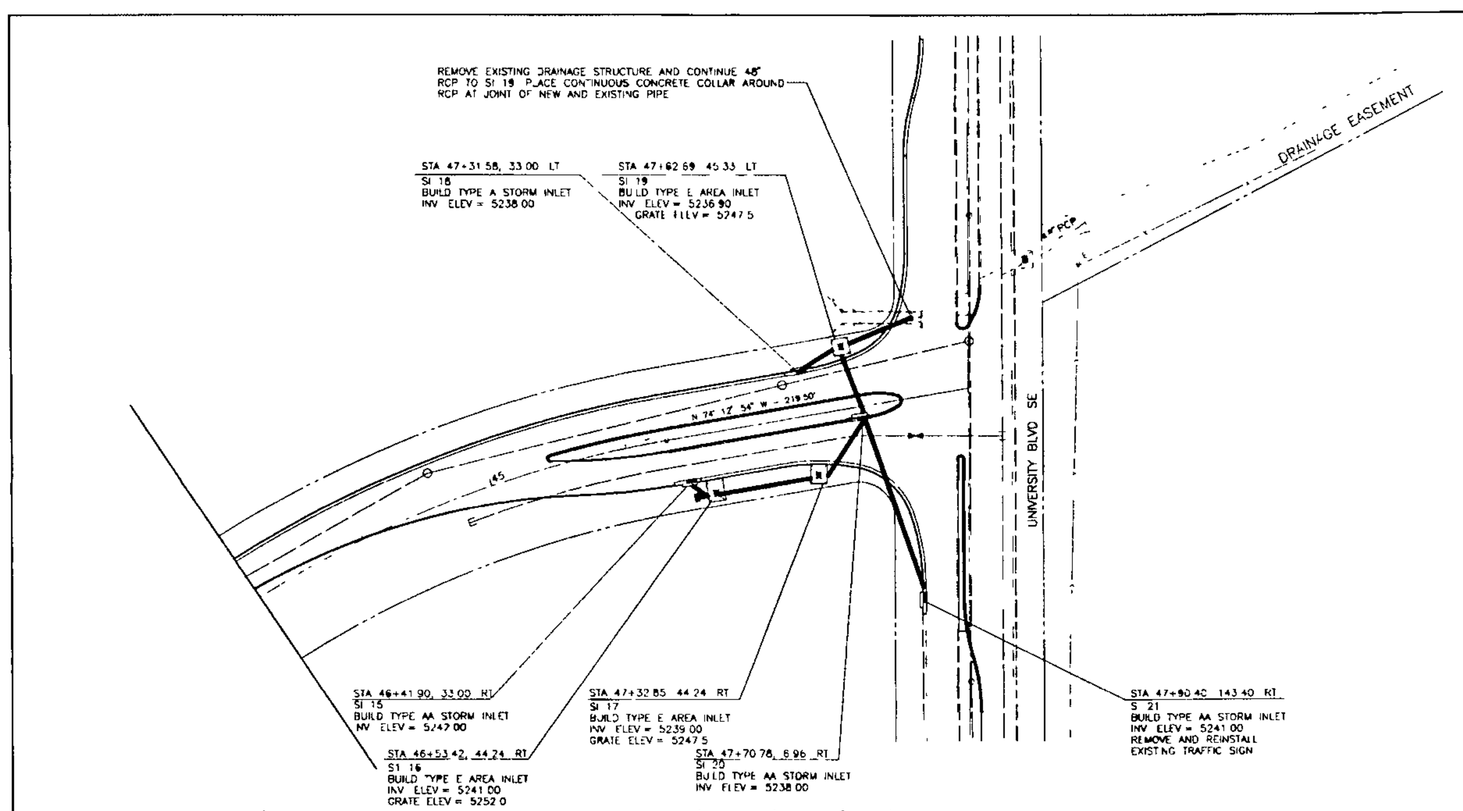
AS BUILT INFORMATION
BENCH MARKS
SURVEY INFORMATION
FIELD NOTES BY
DATE
NO
REMARKS
REVISIONS
BY
DATE
MICRO-FILM INFORMATION
ENGINEER'S SEAL

RECORD DRAWING
DATE
CHKD BY
APPROVED
MOLZEN-CORBIN & Associates

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
ABQ INT'L AIRPORT
ACCESS ROAD D
STORM DRAIN PLAN & PROFILES
STA 21+00 TO STA 32+00

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
C P HAIR			WATER		
PUBLIC DEV			AA TRANSP		
HYDROLOGY					
AVIATION					

DRAWING NO 4183 | MAP NO N-15 | SHEET 17 OF 30



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3 ALL RCP SHALL BE CLASS III

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AS BUILT INFORMATION
BENCH MARKS
SURVEY INFORMATION
FIELD NOTES BY
NO. DATE
UNM BRASS CAP "A-GM"
ELEV 5308.73
S. SEAL
ENGINEER'S SEAL
REMARKS
REVISIONS
NO. DATE
MICRO-FILM INFORMATION

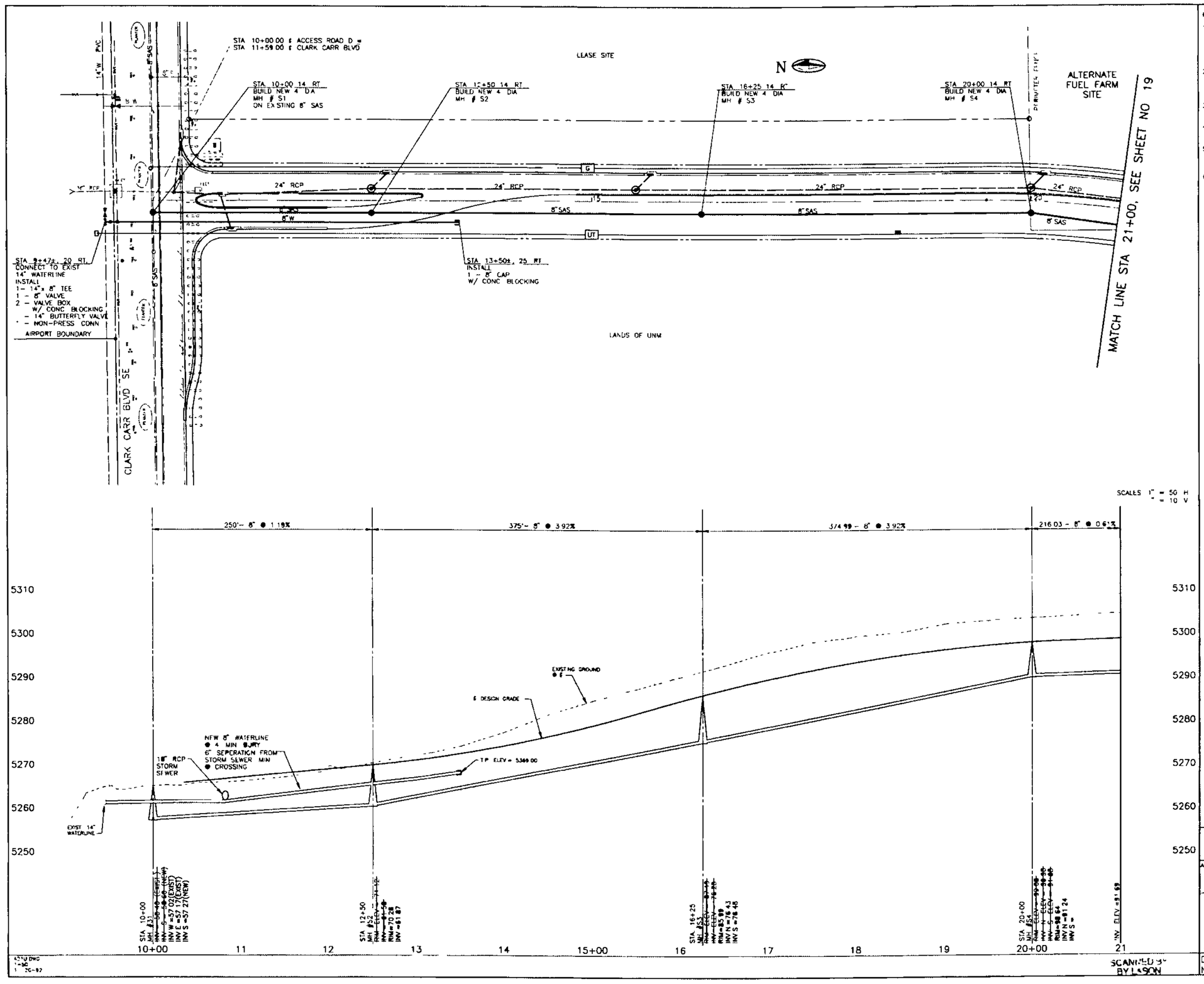
RECORD DRAWING
DATE EDIT BY COMPLETED
MOLZEN-CORBIN & ASSOCIATES

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
ABQ INT'L AIRPORT
ACCESS ROAD D
STORM DRAIN PLAN & PROFILES
STA 43+15 TO STA 48+15.69

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DPC Chair			MAT'L & MAT'L LAB		
Trans Dir.					
Hydrology					

DRAWING NO 4183 | MAP NO N-15 | SHEET 18 OF 30

SCANNED BY LASER



NOTE

1 ALL WATER AND SEWER LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AS REVISED

2 BACKFILL FOR WATER AND SANITARY SEWER LINES SHALL BE PLACED IN 8" LIFTS AND COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY AS PER ASTM D-1557

3 ALL WATER LINE PIPE SHALL BE C-900 CLASS 150

4 ALL SANITARY SEWER LINE PIPE SHALL BE PVC SDR-35

5 SEE SHEET 5 FOR VALVE SHUT OFF PLAN SHUT OFF VALVES 1 & 2 TO ISOLATE 14" WATER LINE AT CLARK CARR BLVD

6 ALL BEDDING AND BACKFILL MATERIAL WITHIN 1Z OF THE PIPE SHALL BE CLASS D THERE SHALL BE NO ROCKS LARGER THAN " DIA, AND SHALL BE CLEAN GRAVEL OR SAND UNLESS OTHERWISE PROVIDED BY THE ENGINEER

AS BUILT INFORMATION

BENCH MARKS

SURVEY INFORMATION
NO. | FIELD NOTES BY | DATE

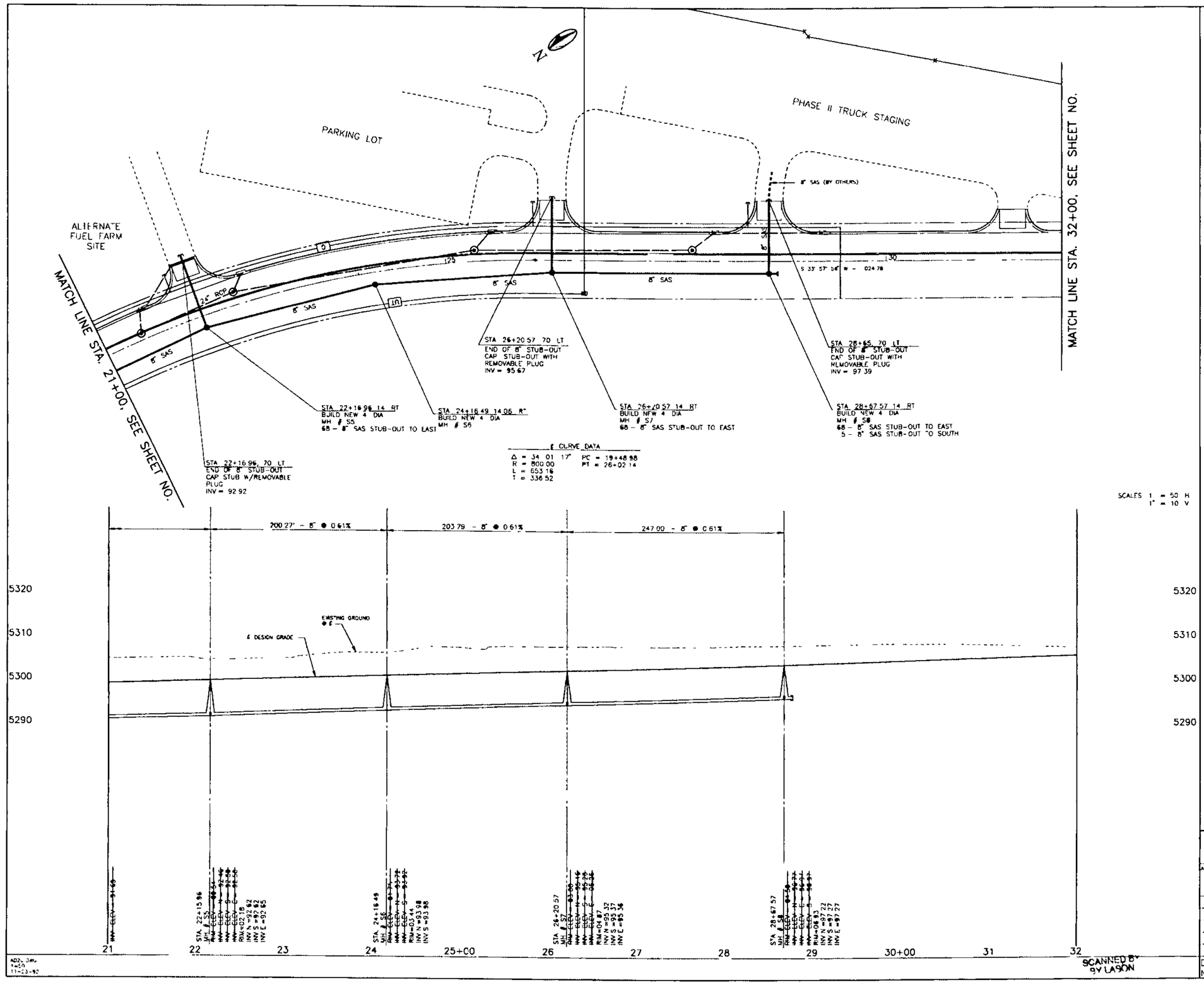
RECORD DRAWING
DATE | DRFT BY | CHK'D BY

MOLZEN-CORBIN & Associates

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
ABQ INTL AIRPORT
ACCESS ROAD D
SEWER & WATER - PLAN & PROFILE
STA 10+00 TO STA 21+00

APPROVALS | DATE
CITY ENGINEER
DRC CHAIR
PARKS DEPT
TRAFFIC ENGR
HYDROLOGY
AVIATION

DRAWING NO	MAP NO	SHEET
4183	N-15	19 OF 30



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SCALES 1" = 50' H
1" = 10' V

AS BUILT INFORMATION

BENCH MARKS
3/4" BRASS CAP "A-14"
ELEV = 5326.75

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

MICRO-FILM INFORMATION

ENGINEER'S SEAL

NO	DATE	REMARKS
		REVISIONS
		DESIGN
		DRAWN BY
		CHECKED BY

DATE 10-15-90
DATE 4-91

RECORD DRAWING

DATE	DRAWN BY	CHECKED BY

MOLZEN-CORBIN & ASSOCIATES

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ABQ INT'L AIRPORT

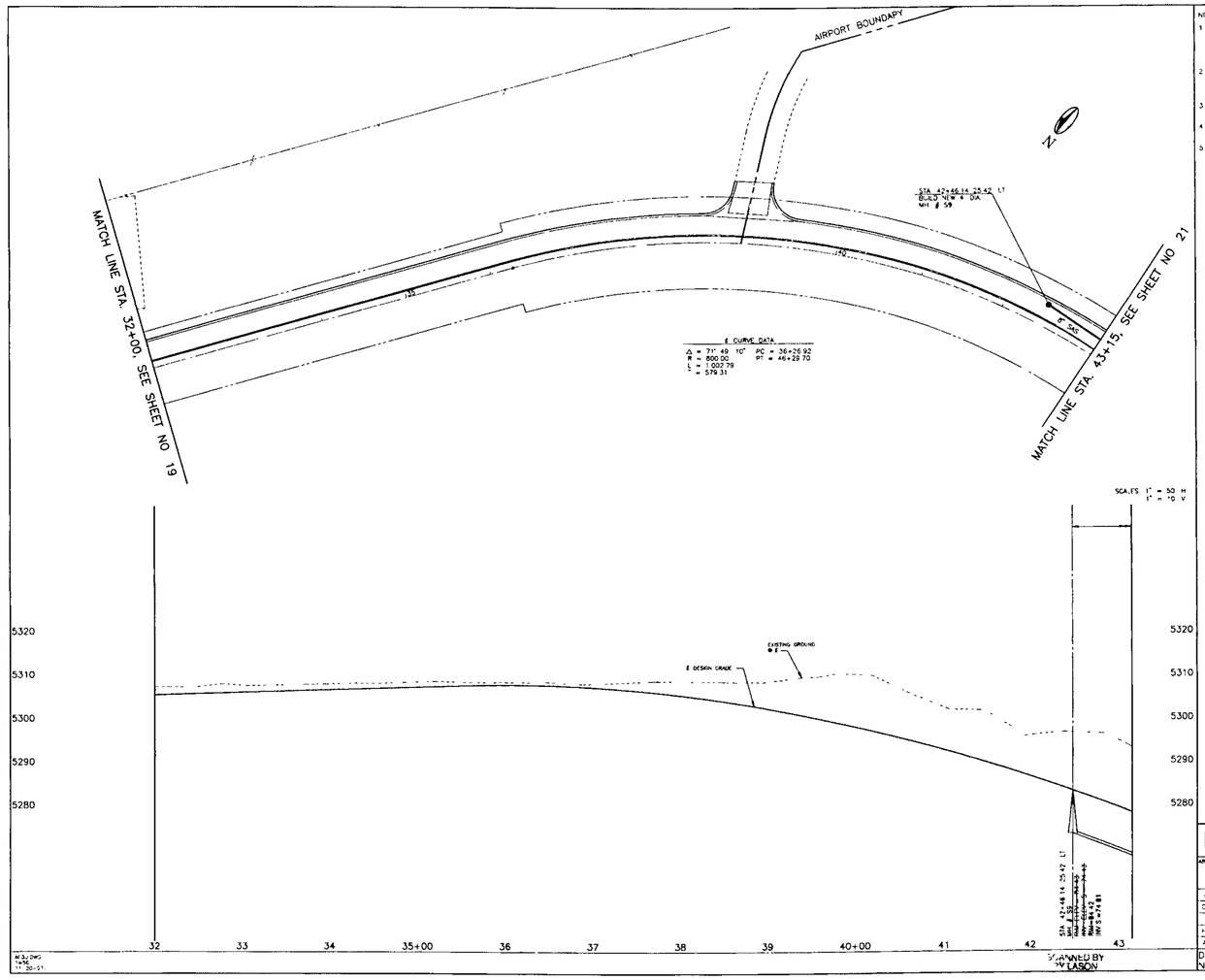
ACCESS ROAD D
SEWER & WATER - PLAN & PROFILE
STA 21+00 TO STA 32+00

APPROVALS	ENGINEER	DATE
CITY ENGR		
TRANS DEV		
HYDROLOGY		
AVIATION		

APPROVALS	ENGINEER	DATE
WATER		
WASTEWATER		

DRAWING NO 4183 | MAP NO N-15 | SHEET 20 OF 30

SCANNED BY LASON



NOTE

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2. BACKFILL FOR WATER AND SANITARY SEWER LINES SHALL BE PLACED IN 8" LIFTS AND COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY AS PER ASTM D 1557
3. ALL WATER LINE PIPE SHALL BE C-900 CLASS 150
4. ALL SANITARY SEWER LINE PIPE SHALL BE PVC SDR-35
5. ALL BEDDING AND BACKFILL MATERIAL WITHIN 2' OF THE PIPE SHALL BE CLASS D THERE SHALL BE NO ROCKS LARGER THAN 1" DIA AND SHALL BE CLEAN GRAVEL OR SAND UNLESS OTHERWISE PROVIDED BY THE ENGINEER

AS BUILT INFORMATION

BENCH MARKS

SURVEY INFORMATION

FIELD NOTES BY: DATE: BOOK: PAGE:

NO | DATE | REMARKS | BY

REVISIONS

DESIGN

ENGINEER'S SEAL

RECORD DRAWING

DATE | DRWN BY | CHKD BY

MOLZEN-CORBIN & Associates

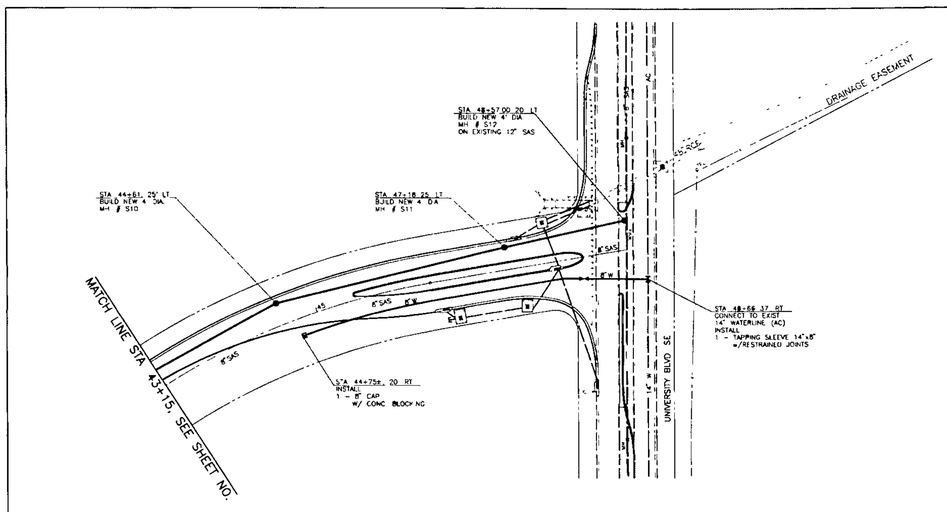
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

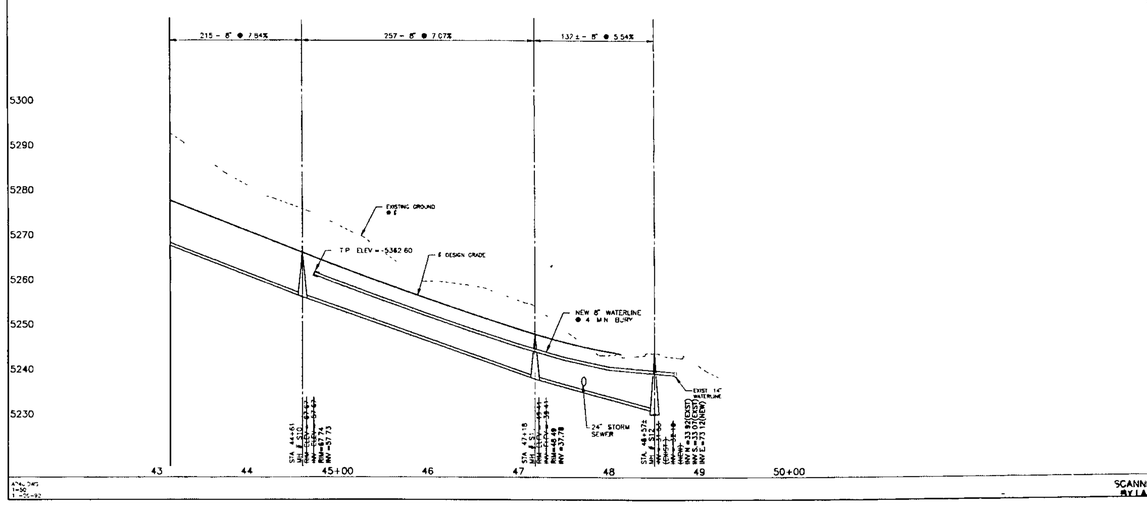
ABQ INT'L AIRPORT
ACCESS ROAD D
SEWER & WATER – PLAN & PROFILE
STA 32+00 TO STA 43+15

APPROVALS	PRINT P.	DATE	APPROVALS	DRWG P.	DATE
DES CHAIR			WATER		
WAST EEN			WASTEWATER		
HYDROLOGY					
AVIATION					

DRAWING NO 4183 | MAP NO N-15 | SHEET 21 OF 30

SCANNED BY TASON





SCALES 1" = 50' H
1" = 10' V

NOTE

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6 SEE SHEET 5 FOR VALVE SHUT OFF PLAN SHUT OFF VALVES 3 AND 4 TO ISOLATE 14" WATER LINE AT UNIVERSITY BLVD

SURVEY INFORMATION
FIELD NOTES BY: DATE
UNMETZ & ASSOCIATES

BENCH MARKS
1) 2" BRASS CAP "A-CM"
ELEV. 5308.73

AS BUILT INFORMATION
DATE
BY
MICRO-FILM INFORMATION
ROLL

SEAL
ENGINEER'S SEAL

REVISIONS
NO DATE REMARKS BY

DESIGN DRAWN CHKD APPD DATE
10-3-90
10-11-90

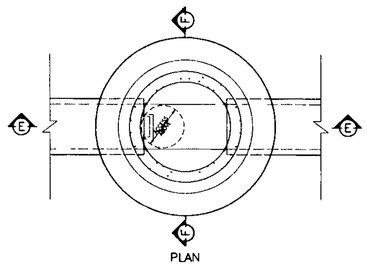
RECORD DRAWING
DATE APP'D CHK'D
MOLZEN-CORBIN & Associates

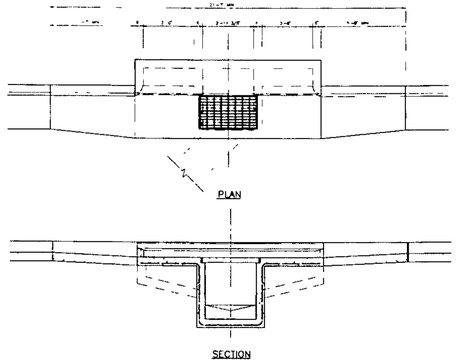
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
ABQ INT'L AIRPORT
ACCESS ROAD D
SEWER & WATER - PLAN & PROFILE
STA 43+15 TO STA 48+15.69

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
C.P.C. CHAIR			WATER		
TRANS. DEV.			WASTEWATER		
HYDROLOGY					
AVIATION					

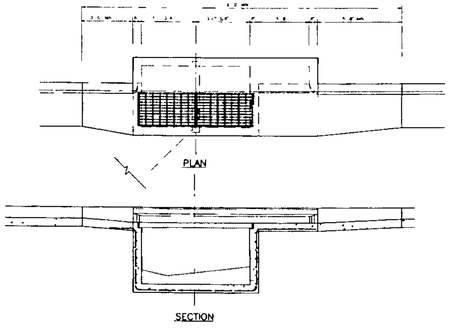
DRAWING NO 4183 | MAP NO N-15 | SHEET 22 OF 30

SCANNED BY
RV LASON





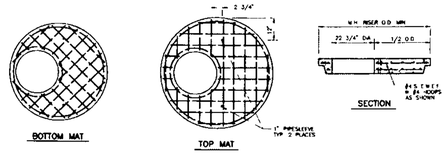
TYPE A (SUMP) STORM INLET



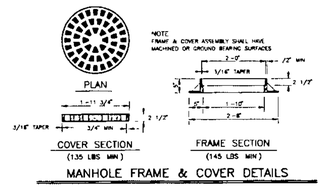
TYPE DOUBLE A STORM INLET

ACCESS MANHOLE

PIPE DIA ≥ 48"

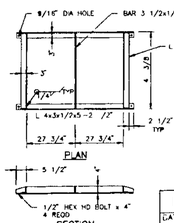


CONCRETE COVER FOR SHALLOW MANHOLE



MANHOLE FRAME & COVER DETAILS

NOTE
1 MAKE A COVER ASSEMBLY SHALL HAVE MACHINED OR GROUND BEARING SURFACES



TYPE E INLET FRAME

NOTE

1 THE DETAILS SHOWN ON THIS SHEET DO NOT CONTAIN ALL THE INFORMATION NEEDED FOR CONSTRUCTION. STORM DRAINAGE CONSTRUCTION SHALL CONFORM TO CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION EXCEPT AS OTHERWISE SHOWN ON THIS SHEET.

2 ALL BENDS WYES AND OTHER FITTINGS NECESSARY FOR CONSTRUCTION OF THE STORM DRAIN SYSTEM SHALL BE PREFABRICATED AND MEET THE SPECIFICATIONS SET FORTH IN THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.

3 DO NOT USE THE CITY ALTERNATE GRATE (SID DWG NO 2221) FOR SUMP CONDITION INLETS

RECORD DRAWING

DATE | EFFECTIVE | LAND SURVEYOR

MOLZEN-CORBIN & Associates

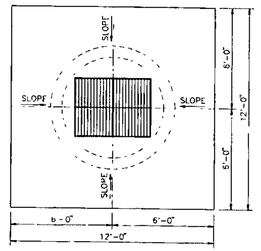
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ABQ INT'L AIRPORT
ACCESS ROAD D
STORM DRAINAGE DETAILS

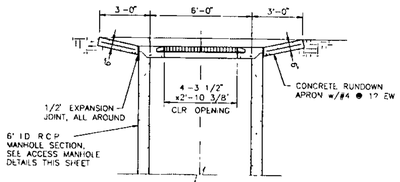
APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
D.R.C. CHAIR			WATER		
TRANS. DEV			WASTEWATER		
HYDROLOGY					
AVIATION					

DRAWING NO 4183 | MAP NO | SHEET 23 OF 30

AS BUILT INFORMATION
BENCH MARKS
SURVEY INFORMATION
FLOWLINES
NO | DATE | BY
MICRO-FILM INFORMATION
ENGINEER'S SEAL
REVISIONS
NO | DATE | REMARKS | BY

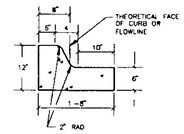


PLAN

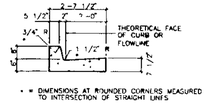


SECTION

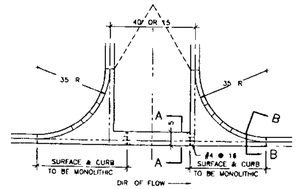
TYPE E (AREA) STORM INLET



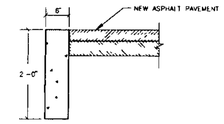
MOUNTABLE MEDIAN CURB
NTS



STANDARD CURB & GUTTER
NTS

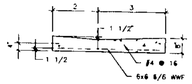


PLAN

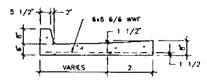


CUT-OFF WALL
NTS

NOTE: CUT-OFF WALL TO BE CONSTRUCTED SO THAT OUTSIDE FACE OF CUT-OFF WALL MATCHES END OF CURB AND GUTTER

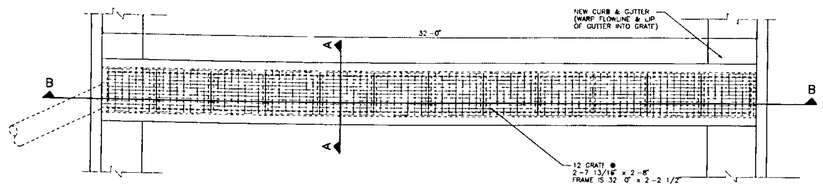


SECTION AA

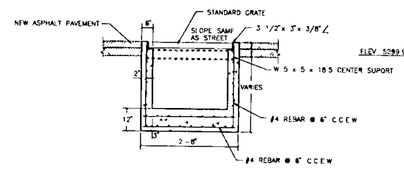


SECTION BB

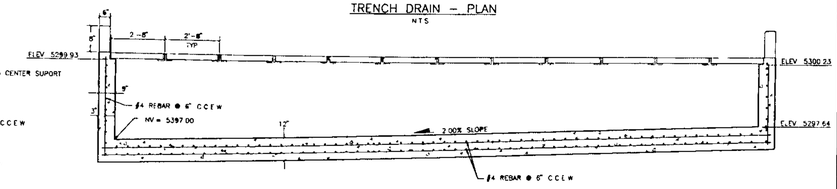
PAVING CONCRETE VALLEY GUTTER



TRENCH DRAIN - PLAN
NTS



SECTION A-A
NTS



CONTRACTOR TO MATCH STANDARD CURB AND GUTTER SECTION WITH CURB ON TRENCH DRAIN TO MAKE A SMOOTH NEAT TRANSITION

SECTION B-B
NTS

NOTES

1 CURBS GUTTERS CUT-OFF WALLS CONSTRUCTED OF P.C.C.

2 FOR STANDARD C & G AND MOUNTABLE MEDIAN CURB PROVIDE CONTROL JTS @ 10' O.C. AND EXP. JTS 50' O.C. AND AT CURB RETURNS.

3 EDGES OF CURBS NOT SPECIFICALLY DIMENSIONED SHALL BE EDGED WITH A 3/8" EDGING TOOL.

4 STD. C & G. REQUIRES FULL FORM ON ALL FACES EXCEPT WITH PRIOR APPROVAL FROM ENGINEER.

5 AFTER CLEANING SURFACE OF SCALE RUST ETC. GRATING FRAME AND CENTER SUPPORT SHALL BE PAINTED WITH ONE SHOP COAT RED OXIDE, TWO FINISH COATS ALUMINUM PAINT (AASHTO M 69)

6 THE DETAILS ON THIS SHEET MAY NOT CONTAIN ALL OF THE INFORMATION REQUIRED FOR CONSTRUCTION. REFER TO THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AS REVISED

SURVEY INFORMATION
FIELD NOTES: BK. PG. DATE
BENCH MARKS
AS BUILT INFORMATION

NO	BY	DATE

ENGINEER'S SEAL

NO	DATE	REMARKS REVISIONS DESIGN	BY	DATE

DESIGN BY:
DRAWN BY:
CHECKED BY:

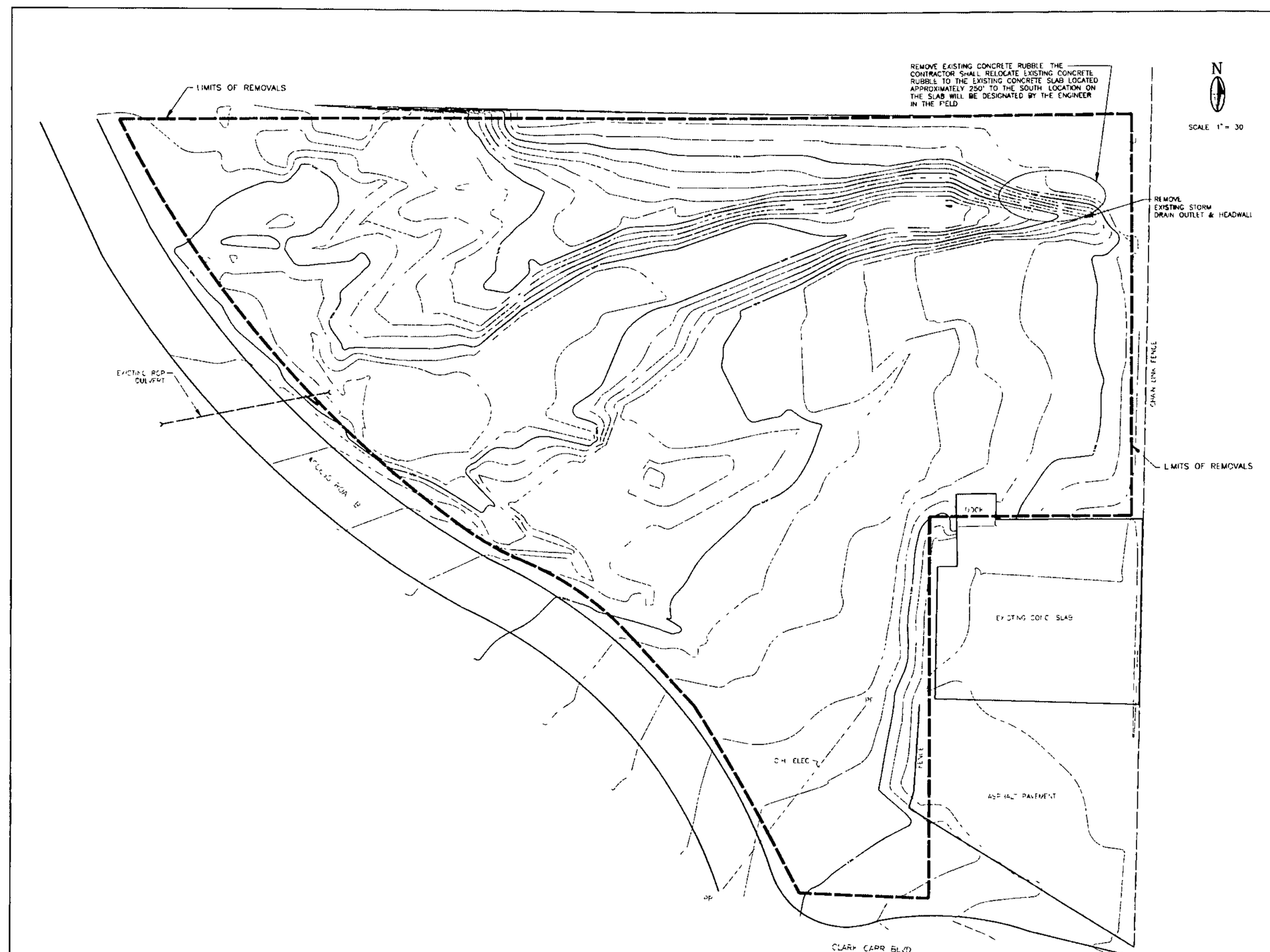
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ACCESS ROAD D

MISCELLANEOUS DETAILS

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
J.R.L. "HAR"			WATER		
TRANS. DEV.			WASTEWATER		
HYDROLOGY					
AVIATION					

DRAWING NO 4183 | MAP NO N-15 | SHEET 24 OF 30



NOTES

LOCATE ALL EXISTING UTILITIES ON SITE PRIOR TO CONSTRUCTION

REMOVE EXISTING DEBRIS FROM SITE INCLUDING TREES FENCING POWER POLES ABANDONED WATER LINES TRASH AND ALL ORGANIC OR DEGRADABLE MATERIAL PRIOR TO PLACING FILL MATERIAL

ALL FILL MATERIAL SHALL BE PLACED AS STRUCTURAL FILL MATERIAL SHALL BE PLACED IN LIFTS AND COMPACTED TO A MINIMUM OF 90% OF MAXIMUM DRY DENSITY AS PER ASTM (D1557)

CONTRACTOR SHALL PROVIDE ALL WATER AND COMPACTION EQUIPMENT REQUIRED TO PLACE MATERIAL AS PREVIOUSLY SPECIFIED

FINISH SURFACE OF SITE SHALL BE GRADED SMOOTH AND CONFORM TO THE FINISH CONTOURS SHOWN ON SHEET 26

THE AVIATION DEPARTMENT SHALL BE RESPONSIBLE FOR THE DISCONNECTION OF POWER TO THE POWER POLE TO BE REMOVED AND DISPOSED OF BY THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE THIS EFFORT WITH THE ENGINEER

SURVEY INFORMATION
FIELD NOTES BY DATE
NO
KRAMER & ASSOCIATES

BENCH MARKS
AS BUILT INFORMATION
DESCRIPTION
SET
SET
SET
SET
MICRO-FILM INFORMATION
SET
TELEPHONE NO.

SEAL

ENGINEER'S SEAL

NO	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
	JULY 1-91	DRAWN BY: GDB	
	SEPT 4-91	CHECKED BY: STAFF	
	DATE		

RECORD DRAWING
DATE | CKED BY | LHKD BY
MOLZEN-CORBIN & Associates

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

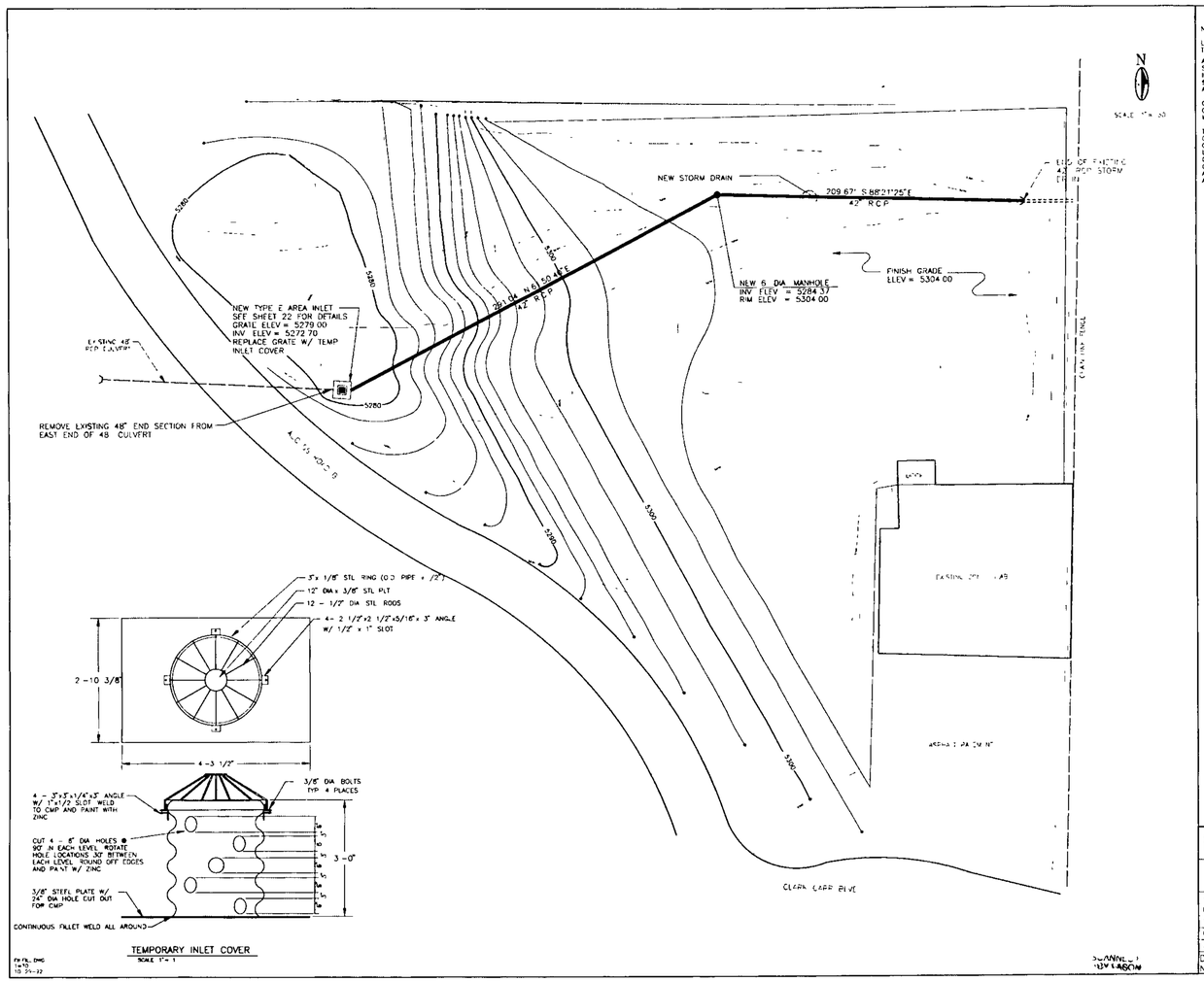
ACCESS ROAD D
FILL AREA REMOVAL PLAN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIR			WATER		
TRANS DEV			WASTEWATER		
HYDROLOGY					
AVIATION					

DRAWING NO. 4183 | MAP NO N-15 | SHEET 25 OF 30

ACDBUR.DAC
10-21-92

SCANNED BY



TEMPORARY INLET COVER
SCALE 1" = 1'

NOTES

LOCATE ALL EXISTING UTILITIES ON SITE PRIOR TO CONSTRUCTION

ALL FILL MATERIAL SHALL BE PLACED AS STRUCTURAL FILL. MATERIAL SHALL BE PLACED IN LIFTS AND COMPACTED TO A MINIMUM OF 90% OF MAXIMUM DRY DENSITY AS PER ASTM (D1557)

CONTRACTOR SHALL PROVIDE ALL WATER AND COMPACTION EQUIPMENT REQUIRED TO PLACE MATERIAL AS PREVIOUSLY SPECIFIED

THE FINISHED SURFACE OF SITE SHALL BE GRADED SMOOTH AND CONFORM TO THE FINISH CONTOURS AS ALLOWED BY THE AMOUNT OF UNCLASSIFIED EXCAVATION AVAILABLE. THE CONTRACTOR SHALL ADJUST THE TOP OF THE GRATE AND INLET ELEVATIONS, IF NECESSARY AS DIRECTED BY THE ENGINEER WHEN THE ACTUAL FINISHED SURFACE IS KNOWN.

AS BUILT INFORMATION
BENCH MARKS
SURVEY INFORMATION
FIELD NOTES BY
NO DATE
ENGINEER'S SEAL
REVISIONS
NO DATE REMARKS BY
8/91 PROPOSED STORM SEWER LAYOUT JMP
DESIGN
DRAWN BY
CHECKED BY
DATE
STAFF
MICRO-FILM INFORMATION
ROLL NO.
MAP 1 - 81"
DETAIL 4 - 81"

RECORD DRAWING
DATE | MADE BY | CHECKED BY

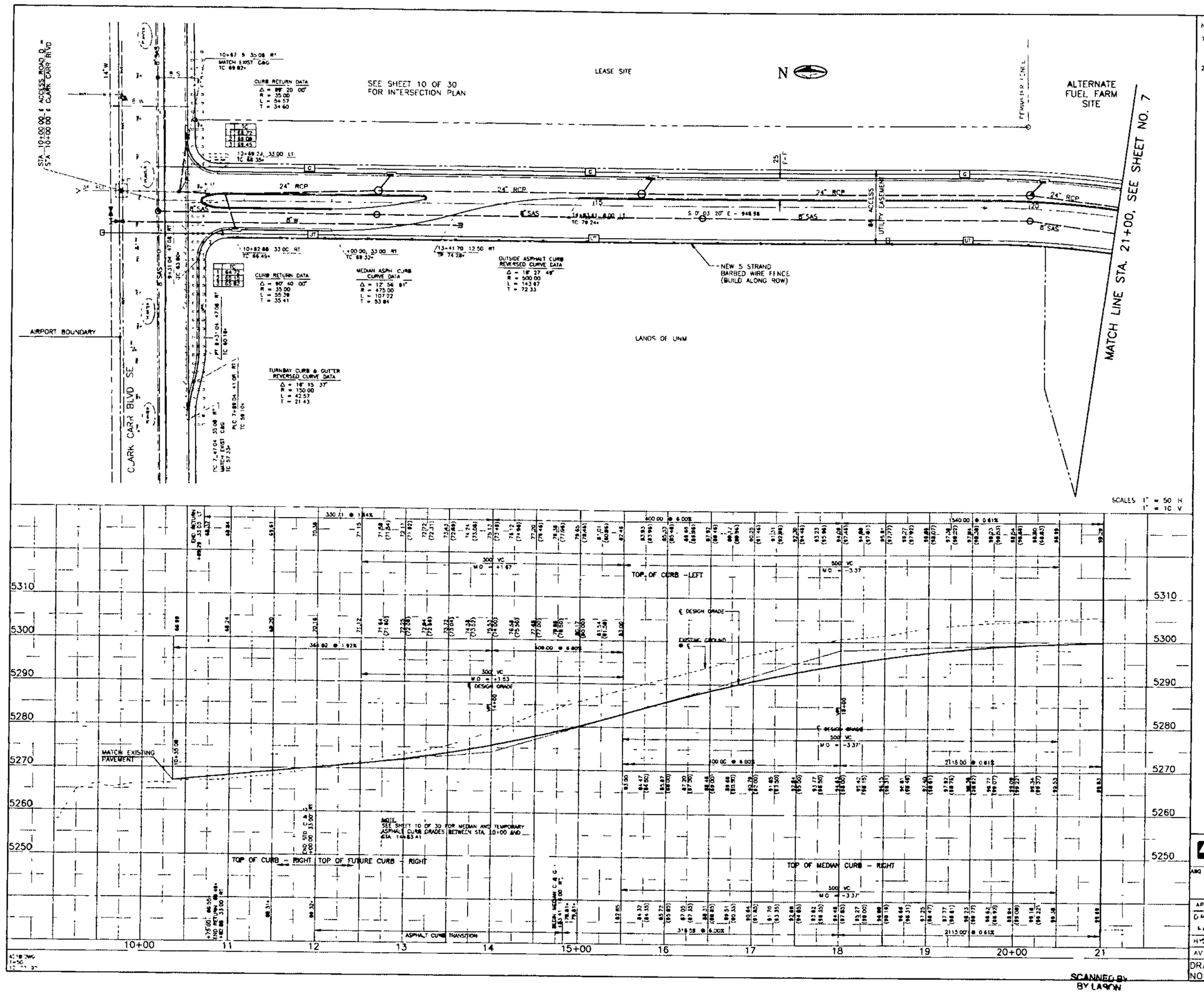
MOLZAN-CORBIN & Associates

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ACCESS ROAD D
FILL AREA GRADING PLAN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DIR'C CHAR			WATER		
TRAFFIC ENG			WASTEWATER		
HYDROLOGY					
PARKS					

DRAWING NO 4183 | MAP NO N-15 | SHEET 26 OF 30



NOTE

1 ALL DIMENSIONS AND RADII OF CURB AND CURB RETURNS ARE SHOWN TO FACE OF CURB

2 SEE SHT. 3 FOR REMOVAL OF EXISTING STRUCTURES

+ = AS-BUILT ELEVATION

RECORD DRAWING

DATE	DRFT BY	CHKD BY

MOLZEN-CORBIN & Associates

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ABQ INT. AIRPORT

ACCESS ROAD D
STREET PLAN & PROFILE
STA 10+00 TO STA 21+00

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DPE CHIEF			WATER		
PARK DEPT			WASTEWATER		
HYDROLOGY					
AVIATION					

DRAWING NO 4183 | MAP NO N-15 | SHEET 6 OF 30

AS BUILT INFORMATION

SURVEY INFORMATION

NO	FIELD NOTES BY	DATE
	ROBERTS & MADDUX	

BENCH MARKS

UNM BRASS CAP A-GK
ELEV 5504.73

NO	REMARKS	DATE
	REVISIONS	
	DESIGN	

ENGINEER'S SEAL

SCANNED BY LASER

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ACCESS ROAD D

FILL AREA STORM SEWER PLAN & PROFILE

APPROVALS	ENGINEER	DATE	AS-BUILT	DATE
CITY ENGR				
PROJECT MGR				
DESIGN MGR				
SURVEY MGR				
CONSTR MGR				

SPEC. CHAP.	DATE	AS-BUILT	DATE

MASTER PLAN

DRAWING NO	4183	MAP NO N-15	SHEET 27 OF 30

RECORD DRAWING

CHKD BY	DEPT E	CHKD BY

MOLZEN-CORBIN & Associates

NO	DATE	REVISED STORM SEWER LAYOUT	INT
1	8/91		CN

REVISIONS
REMARKS
DESIGN
DRAWN
CHKD
APP'D
DATE
SCALE

ENGINEER'S SEAL

SURVEY INFORMATION

NO	DATE	BY

BENCH MARKS

AS BUILT INFORMATION

MICRO-FILM INFORMATION

NOTE
1) ENTIRE SITE AND DISTURBED AREAS SHALL RECEIVE EROSION CONTROL (SECOND & MULCHING)

HORIZ SCALE 1"=50'
VERT SCALE 1"=5'

STA 0+00 71 NEW TYPE E AREA INLET JUNCTION WITH CONNECTING NEW 42" RCP W/ EXISTING 48" RCP
INV IN = 5272.5
INV OUT = 5272.5

STA 2+91 04 BLKD 6' DIA MANHOLE
INV ELEV = 5264.57

STA 5+00 71 TYPE E INLET CONNECTED TO EXISTING 48" RCP
INV=5262.74

291 04 - 42" RCP @ 4.01%

209 67 - 42" RCP @ 1.99%

FINISH GRADE

EXISTING GROUND

ACCESS ROAD B

0+00 0+50 1+00 1+50 2+00 2+50 3+00 3+50 4+00 4+50 5+00 5+50 6+00 6+50 7+00

5265 5270 5275 5280 5285 5290 5295 5300 5305 5310

LINE No	STARTING STA	ENDING STA	BEARING	DISTANCE
1	0+00 00	2+91 04	N 61° 50' 40" E	291 04
2	2+91 04	5+00 71	S 88° 21' 25" E	209 67

ASPHALT PAVING

EXIST. CONC. S.W.

ACCESS ROAD B

709 57 S 88° 21' 25" E

REMOVE EXISTING HEADWALL AND CONNECT NEW 42" RCP TO EXISTING

FINISH GRADE ELEV = 5324.00

EXISTING R.C.P. 4'-3"W

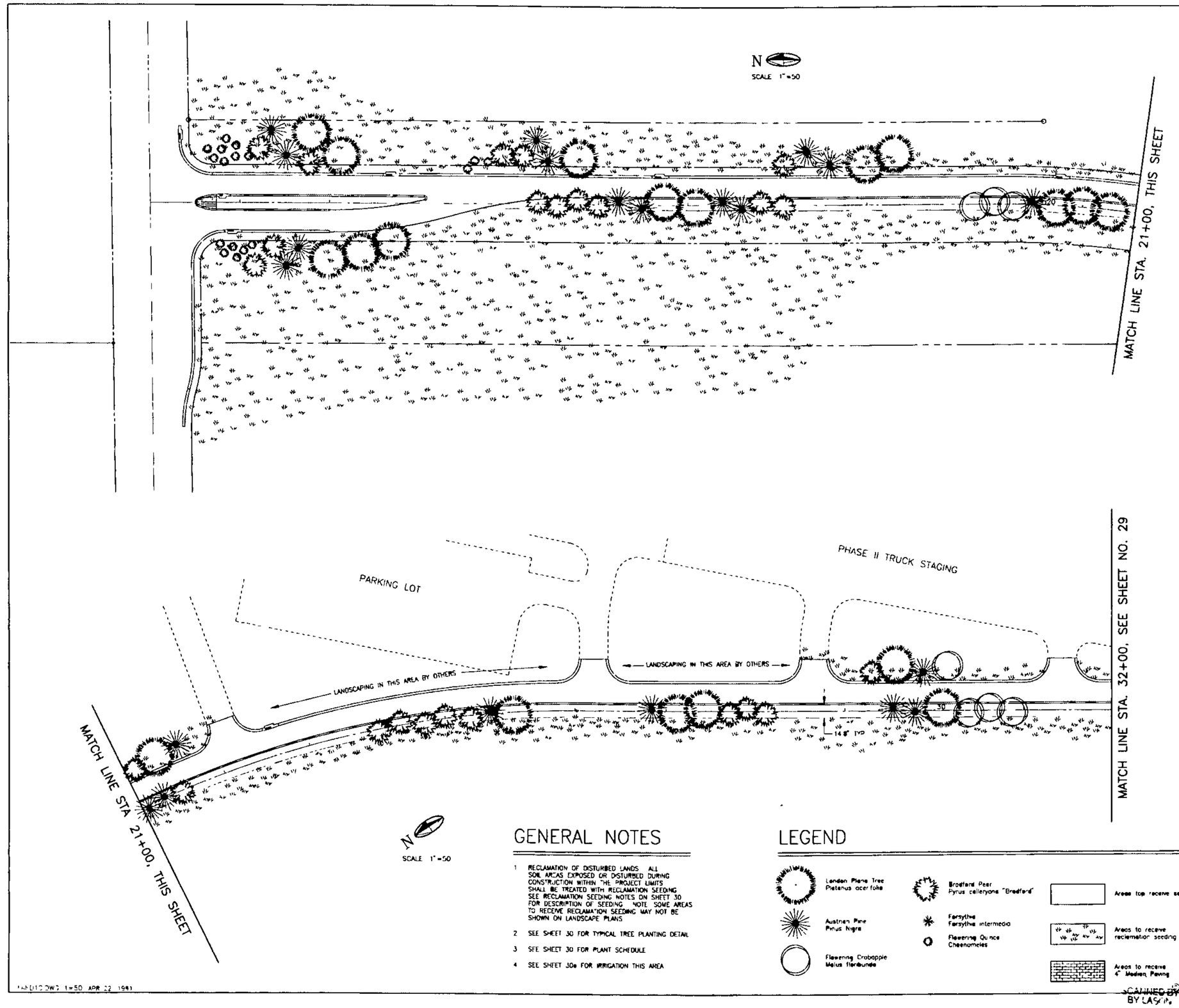
STA 2+91 04 BLKD 6' DIA MANHOLE

REMOVE EXISTING 48" END SECTION FROM EAST END OF 48" CULVERT

NEW TYPE E AREA INLET SEE SHEET 22 FOR DETAILS GRATE ELEV = 5278.00 INV ELEV = 5272.70

BENCH MARK

N



GENERAL NOTES

1. RECLAMATION OF DISTURBED LANDS. ALL SOIL AREAS EXPOSED OR DISTURBED DURING CONSTRUCTION WITHIN THE PROJECT LIMITS SHALL BE TREATED WITH RECLAMATION SEEDING. SEE RECLAMATION SEEDING NOTES ON SHEET 30 FOR DESCRIPTION OF SEEDING. NOTE: SOME AREAS TO RECEIVE RECLAMATION SEEDING MAY NOT BE SHOWN ON LANDSCAPE PLANS
2. SEE SHEET 30 FOR TYPICAL TREE PLANTING DETAIL
3. SEE SHEET 30 FOR PLANT SCHEDULE
4. SEE SHEET 30a FOR IRRIGATION THIS AREA

LEGEND

- London Plane Tree — Platanus acerifolia
- Austrian Pine — Pinus Nigra
- Flowering Crabapple — Malus floribunda
- Bradford Pear — Pyrus calleryana "Bradford"
- Forsythia — Forsythia intermedia
- Flowering Quince — Chaenomeles
- Areas top receive sod
- Areas to receive reclamation seeding
- Areas to receive 4" Medium Paving

SCANNED BY LASER IMAGING

SURVEY INFORMATION
NO. FIELD NOTES DATE
BY
KRAMETZ & ASSOCIATES

BENCH MARKS
UNM BRASS CAP "LA9"
ELEV. = 5508.33

AS BUILT INFORMATION
NO. SHEET #
CONTRACTOR
CONTRACT #
NOTICE TO PROCEED
SUBSTANTIAL COMPLETION
SHEETS #
MICRO-FILM INFORMATION
MICRO FILM #

ENGINEER'S SEAL

NO	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	DATE 3-91
		DRAWN BY JDP	DATE 3-91
		CHECKED BY JCC	DATE

RECORD DRAWING
DATE SHEET BY

MOLZEN-CORBIN & ASSOCIATES

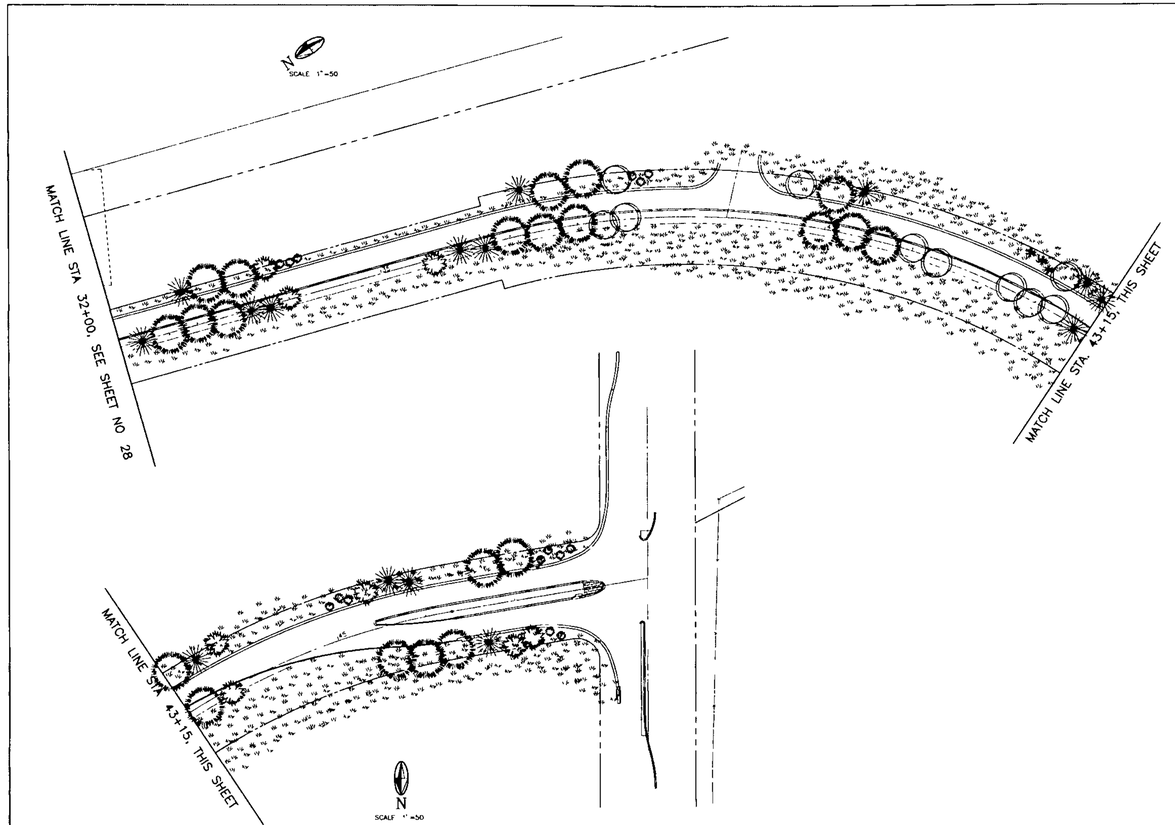
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ACCESS ROAD D

LANDSCAPING PLAN STA. 10+00 TO 32+00

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
EPC CHAIR			WATER		
TRANS. DIV.			WASTEWATER		
HYDROLOGY					

DRAWING NO 4183 | MAP NO N-15 | SHEET 28 OF 30



GENERAL NOTES

1. RECLAMATION OF DISTURBED LANDS ALL SOIL AREAS EXPOSED OR DISTURBED DURING CONSTRUCTION WITHIN THE PROJECT LIMITS SHALL BE TREATED WITH RECLAMATION SEEDING SEE RECLAMATION SEEDING NOTES ON SHEET 30 FOR DESCRIPTION OF SEEDING NOTE SOME AREAS TO RECEIVE RECLAMATION SEEDING MAY NOT BE SHOWN ON LANDSCAPE PLANS
2. SEE SHEET 30 FOR TYPICAL TREE PLANTING DETAIL
3. SEE SHEET 30 FOR PLANT SCHEDULE
4. SEE SHEET 30a FOR IRRIGATION THIS AREA

LEGEND

- London Plane Tree — Platanus acerifolia
- Austrian Pine — Pinus Nigra
- Flowering Crabapple — Malus Hartbuska
- Bradford Pear — Pyrus calleryana "Bradford"
- Forsythe — Forsythe intermedia
- Flowering Quince — Cheanomeles
- Areas top receive sod
- Areas to receive reclamation seeding
- Areas to receive 4" Modern Paving

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SURVEY INFORMATION

NO	FIELD NOTES BY	DATE
	SURVEY & MONUMENTS	

BENCH MARKS

USGS BRASS CAP "A 124"
ELEV. 5309.73

AS BUILT INFORMATION

CONTRACTOR
CONTRACT #
CONTRACT DATE
NOTICE TO PROCEED
CONSTRUCTION COMPLETED
FINAL ACCEPTANCE
MICRO-FILM INFORMATION
ROLL NUMBER
FRAME NUMBER

ENGINEER'S SEAL

NO	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	

DESIGNED BY JOP DATE 3-91
DRAWN BY JCC DATE 3-91
CHECKED BY PAL

RECORD DRAWING

DATE | INPT BY | CHK'D BY

MOLZEN-CORBIN & Associates

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ACCESS ROAD D

LANDSCAPING PLAN STA. 32+00 TO 48+15.69

APPROVALS	ENGINEER	DATE	APPROVALS	AGENCY	DATE
DRC CHAIR			WATER		
TRANS DEV			WASTEWATER		
HYDROLOGY					

DRAWING NO 4183 | MAP NO N-15 | SHEET 29 OF 30

SCANNED BY TYDON

RECLAMATION SEEDING NOTES

Reclamation of disturbed lands. All soil areas exposed or disturbed during construction within the project limits shall be treated with reclamation seeding. All areas to receive reclamation seeding under this contract may not be shown on landscape plans.

1. Mulch for seeded areas shall be Barley straw at a rate of 1.5 tons per acre.
2. Reclamation seed mix

SPECIES	ORIGIN	LBS. PURE LIVE SEED PER ACRE
Annual Rye	Any	2.0
Blue Grama	Hatchita	0.5
Sideoats Grama	Vaughn or Nuner	4.0
Western Wheatgrass	Barton or Arriba	4.0
Buffalograss	Texana	4.0
Sand Dropseed	Any	0.5
Indian Ricegrass "Paloma"	Any	3.0
	SUBTOTAL	18.0
Penstemen strictus	Rooter	2.0
Penstemon ambiguin	Any	2.0
Coreopsis lanceolata	Any	2.0
Chrysanthemum leucanthemum	Any	2.0
	SUBTOTAL	8.0

3. Fertilizer requirements

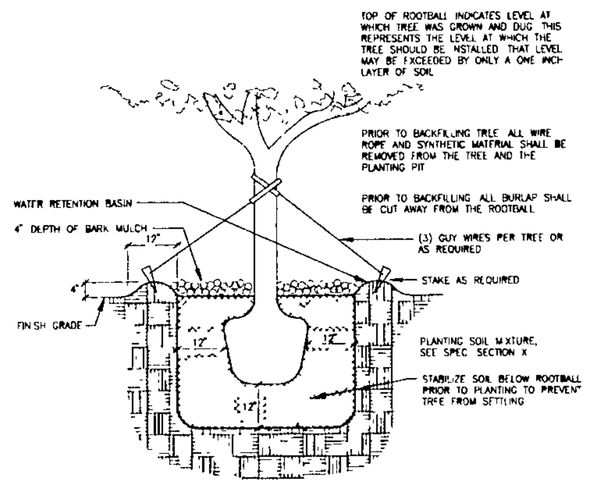
CHEMICAL	ACTUAL MINIMUM POUNDS PER ACRE
Slow release nitrogen (urea or formelectyde)	50.0
Phosphorus (P_2O_5)	48.0
Water soluble sulpher	48.0

4. Watering.

After planting reclamation seed, water shall be applied as follows
First two weeks Four applications at one inch each timed three days apart
One application of one inch each week thereafter until acceptance by Owner

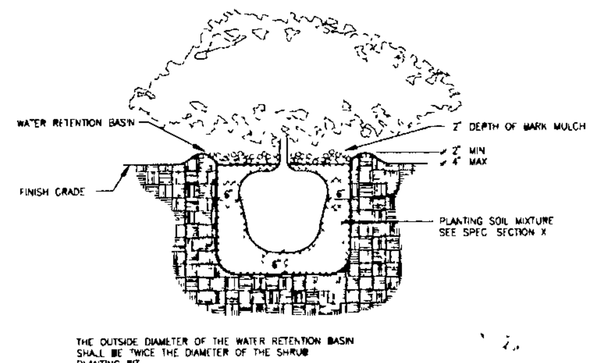
PLANT SCHEDULE

SYMBOL	QUANTITY	COMMON NAME / BOTANICAL NAME	SIZE	MATURE SIZE HEIGHT	MATURE SIZE SPREAD	CONDITION
	44	London Plane Tree Platanus acerifolia	2-1/2" CAL	50'	35	B&B
	38	Austrian Pine Pinus nigra	8 HT	35	25	B&B
	17	Flowering Crabapple Malus floribunda	2" CAL	20	30	B&B
	35	Bradford Pear Pyrus calleryana "Bradford"	2" CAL	30	25	B&B
	6	Forsythia Forsythia intermedia	3 HT	10	7	5 GAL
	32	Flowering Quince Chaenomeles Carel See	3 HT	6	8'	5 GAL
		SOD - BLUEGRASS FESCUE RYE MIX - LOCALLY GROWN - FRESHLY CUT				
		RECLAMATION SEEDING - SEE NOTES				



TYPICAL TREE PLANTING DETAIL

NTS



THE OUTSIDE DIAMETER OF THE WATER RETENTION BASIN SHALL BE TWICE THE DIAMETER OF THE SHRUB PLANTING PIT

TYPICAL SHRUB PLANTING DETAIL

NTS

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SURVEY INFORMATION
FIELD NOTES: BY — DATE
NO.

BENCH MARKS
DNM BRASS CAP "A-GM"
ELEV. = 5369.73

AS BUILT INFORMATION
CONTRACTOR:
CONTRACT #:
NOTICE TO PROCEED:
CONTRACT TIME:
FINAL INSPECTION:
CONSTRUCTION COMPLETED:
CONTRACTOR'S WARRANTY EXPIRES:

MICRO-FILM INFORMATION
ROLL #:
FRAME #:

ENGINEER'S SEAL

NO	DATE	REVISIONS / DESIGN	BY
1	3-91	AS BUILT	JDP
2	3-91	AS BUILT	JCC

RECORD DRAWING
DATE
MOLZEN-CORBIN & Associates

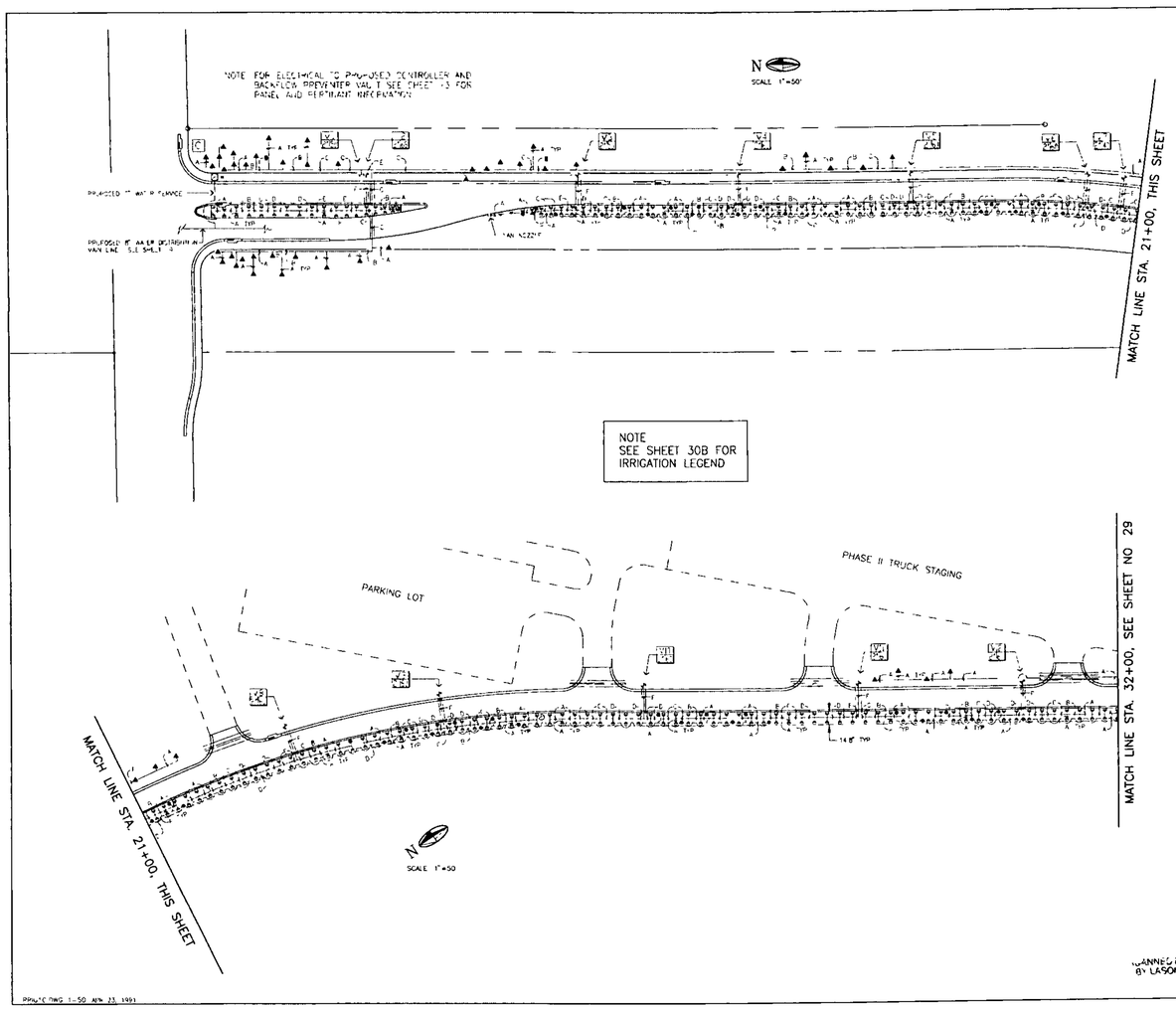
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ACCESS ROAD D

LANDSCAPING AND IRRIGATION NOTES AND DETAILS

SURVEY & CALC	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIR			DATE		
TRANS DEV			AASHTO 4-3-91		
HYDROLOGY					

DRAWING NO 4183 | MAP NO N-15 | SHEET 30 OF 30



PRINTED TUE. 1:50 APR 23, 1991

SURVEY INFORMATION

NO	FIELD NOTES	BY	DATE
		CRAMER & ASSOCIATES	

BENCH MARKS

UNM BRASS CAP "A-104"
ELEV. = 5368.33

AS BUILT INFORMATION

NO	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	

ENGINEER'S SEAL

RECORD DRAWING

DATE	PREPARED BY
	MOLZEN-CORBIN & ASSOCIATES

IRRIGATION DESIGN SERVICES
P.O. BOX 74630 SUITE 200
ALBUQUERQUE, NEW MEXICO 87125
(505)-823-4729
ANTHONY (TONY) R. LABARBERA
IRRIGATION CONSULTANT

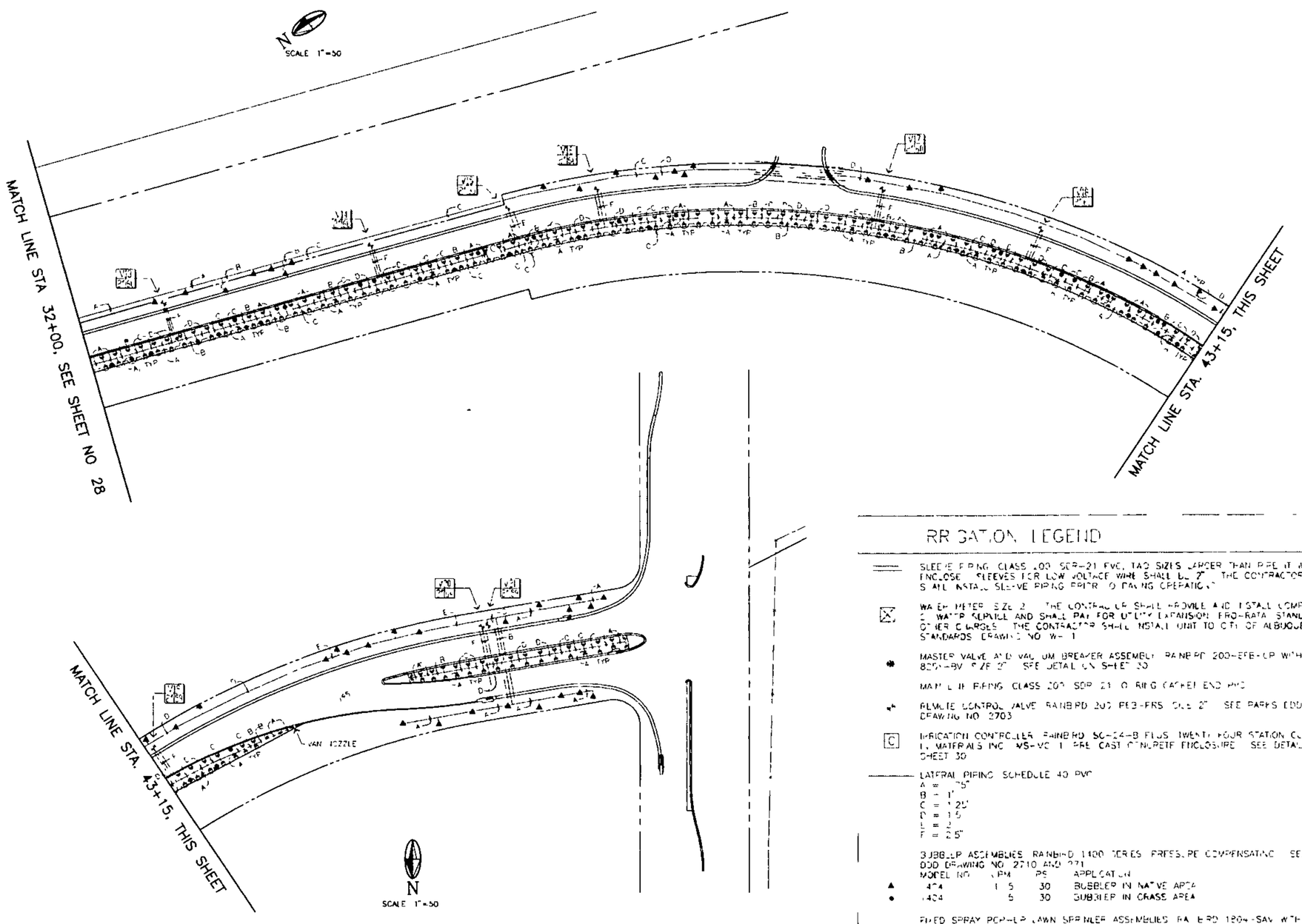
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

ACCESS ROAD D

IRRIGATION PLAN STA. 10+00 TO 32+00

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
L.P.C. CHAIR			WATER		
TRANS. DEV.			WASTEWATER		
WATERLOCK					

DRAWING NO 4183 | MAP NO N-15 | SHEET 30A OF 30



IRRIGATION LEGEND

SLEEVE PIPING CLASS 200 SCH-21 PVC, TAG SIZES LARGER THAN PIPE IT WILL ENCLOSE. SLEEVES FOR LOW VOLTAGE WIRE SHALL BE 2". THE CONTRACTOR SHALL INSTALL SLEEVE PIPING PRIOR TO PAVING OPERATIONS.

WATER METER SIZE 2". THE CONTRACTOR SHALL PROVIDE AND INSTALL COMPLETE 2" WATER SERVICE AND SHALL PAY FOR UTILITY EXPANSION FEE/RATE STANLEY AND OTHER CHARGES. THE CONTRACTOR SHALL INSTALL UNIT TO CITY OF ALBUQUERQUE STANDARDS DRAWING NO W-1

MASTER VALVE AND VACUUM BREAKER ASSEMBLY RAINBIRD 200-EPB-CP WITH EBPC 850-ABV SIZE 2". SEE DETAIL ON SHEET 30

MAINLINE PIPING CLASS 200 SDR 21 O RING GASKET END PVC

REMOTE CONTROL VALVE RAINBIRD 200 PEB-FRS SIZE 2". SEE PARTS EDD DRAWING NO 2703

IRRIGATION CONTROLLER RAINBIRD SCC24-B PLUS, TWENTY FOUR STATION CONTROLLER L. WATERMAN INC MS-VC 1 SRE CAST IN-CONCRETE ENCLOSURE. SEE DETAIL ON SHEET 30

LATERAL PIPING SCHEDULE 40 PVC
A = 1"
B = 1"
C = 1 1/4"
D = 1 1/2"
E = 2"
F = 2 1/2"

BUBBLER ASSEMBLIES RAINBIRD 1400 SERIES PRESSURE COMPENSATING SEE PARTS EDD DRAWING NO. 2710 AND 2711

	MODEL NO.	GPM	PSI	APPLICATION
▲	1404	1.5	30	BUBBLER IN NATIVE AREA
●	1402	.5	30	BUBBLER IN GRASS AREA

FIXED SPRAY POP-UP LAWN SPRINKLER ASSEMBLIES RAINBIRD 1804-SAM WITH FRS SCREENS. SEE PARTS EDD NO. 2709

	NOZZLE	AREA OF COVERAGE	GPM	PSI	PR
⊕	VAN	4 RADIUS	.47	30	.158
▲	8H-2	14 RADIUS	1.20	30	.97
■	8-5-H	14 RADIUS	1.33	30	1.97
◆	8H5-H	4 RADIUS	1.00	30	.97
★	1555T	4 X 10' RECTANGLE	1.21	30	1.94

QUICK REFERENCE VALVING LEGEND

VALVE I.D. NUMBER
SFV
VALVE SIZE

SAMPLE

NOTES REFERENCES TO "PARKS EDD DRAWINGS" ARE TO CITY OF ALBUQUERQUE PARKS AND RECREATION DEPARTMENT DESIGN DEVELOPMENT DIVISION STANDARD CONSTRUCTION DETAILS AND SPECIFICATIONS.

IRRIGATION SPECIFICATIONS FOR THIS PROJECT SHALL BE THOSE INCLUDED IN THE CITY OF ALBUQUERQUE, PARKS AND RECREATION DEPARTMENT DESIGN DEVELOPMENT DIVISION STANDARD CONSTRUCTION DETAILS AND SPECIFICATIONS

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AS BUILT INFORMATION
BENCH MARKS
LINE BRASS CAP "LOOP"
ELEV. 5308.73
SURVEY INFORMATION
FIELD NOTES BY
DATE
NO
KRAMETZ & ASSOCIATES
MICRO-FILM INFORMATION
ENGINEER'S SEAL
REVISIONS
DESIGN
DRAWN BY
CHECKED BY
DATE
APRIL 1991
REMARKS
NO
DATE

RECORD DRAWING
DATE 2-7-91 CHKD S

WOLZEN-CORBIN & Associates

IRRIGATION DESIGN SERVICES
P.O. BOX 26800 SUITE 200
ALBUQUERQUE, NEW MEXICO 87125
(505) 873 4329
ANTHONY (TONY) R. LUBARR
IRRIGATION CONSULTANT

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
ACCESS ROAD D
IRRIGATION PLAN STA. 32+00 TO 48+15.69

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIR			WATER		
TRANS DEV			WASTEWATER		
HYDROLOGY					

DRAWING NO 4183 | MAP NO N-15 | SHEET 30B OF 30

CITY OF ALBUQUERQUE

September 2, 2011

Daniel W. Hogan, P.E.
Molzen-Corbin & Associates
2701 Miles Rd SE
Albuquerque, NM 87106

Re: Sunport Foreign Trade Zone Tract A Replat Master Drainage Plan and Conceptual Grading and Drainage Plan, Engineer's Stamp Date Received 09-02-11 (N15/D006)

Dear Mr. Hogan,

Based upon the information provided in your submittal dated 9-2-11, the above referenced plan is approved for Replat and Conceptual Grading and Drainage.

Please include a copy of this plan with your future submittal for this site. Site specific grading and drainage plan will be required for Building Permit approval.

If you have any questions, you can contact me at 924-3695.

Sincerely,

Shahab Biazar, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

Copy: file

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

[redacted]

MOLZEN-CORBIN & Associates

ENGINEERS/ARCHITECTS/PLANNERS

MASTER DRAINAGE PLAN FOR

ALBUQUERQUE INTERNATIONAL SUNPORT

RECEIVED
SEP 2 2011
HYDROLOGY
SECTION

ALBQUERQUE, NEW MEXICO
FOREIGN TRADE ZONE
TRACT "A" REPLAT

August 2011

City of Albuquerque – Aviation Department
2200 Sunport Blvd. SE
P.O. Box 9948
Albuquerque, New Mexico 87106
(505) 244-7805

CONSULTING ENGINEER

Molzen Corbin
2701 Miles Road, SE
Albuquerque, New Mexico 87106
(505) 242-5700

I, Daniel W. Hogan, New Mexico Registered Professional Engineer No. 9094, do hereby certify that the following documents were made under my supervision and direction and that same is true and correct to the best of my knowledge and belief.

Daniel W. Hogan 9/2/11
N.M.P.E. Date

MOLZENCORBIN
ENGINEERS | ARCHITECTS | PLANNERS

Sunport Center- Foreign Trade Zone Drainage Analysis
Albuquerque International Sunport
Albuquerque, New Mexico

PURPOSE AND SITE LOCATION

The site for the Sunport Center- Foreign Trade Zone is located on the south end of University Boulevard between the UNM Golf Course and the Albuquerque International Sunport. It is bordered by Clark Carr Road on the north, University Boulevard on the west and Spirit Drive on the east and south (see location map). The site is approximately 72+ acres of mostly undeveloped land that is planned for development into approximately 20 lease areas. This area has previously been analyzed in the Albuquerque International Sunport Storm Drainage Master Plan (Molzen-Corbin & Associates, May 1995) as well as in the Albuquerque International Sunport Rent-A-Car Facility Drainage Report (Molzen-Corbin & Associates, September 1999). This analysis takes into account drainage information from these two documents.

There currently is an existing storm drain system located on the east side of the site along Spirit Drive as well as on the west in University Boulevard at the intersection of Spirit and Clark Carr as described below. In the Albuquerque International Sunport Storm Drainage Master Plan this site is considered Sub-basins 724, 723, 1201, and a small portion of 1202.

Existing Conditions

The site is located on the sandy slope of the mesa that the Albuquerque International Sunport resides on and is part of the airport property. The site generally slopes from east to west in varying amounts, but at an average of about 3.5 percent slope, with Clark Carr Road located along the north side of the site and University Boulevard located on the west. The two existing developed sites that are adjacent to Spirit Drive have been graded to partially slope toward Spirit Drive but some of the site slopes west with small retention ponds located at the west end of the lot(s). Other than a small portion of the two existing developments and a small strip of land adjacent to Spirit Drive, the runoff from the site presently flows overland toward the west into an unimproved ditch along University Boulevard. During large or high intensity storms this ditch can overflow and run into University Boulevard right-of-way causing sediment and debris to settle on University Boulevard. There is a drainage divide on University Boulevard approximately 1200 feet south of its intersection with Clark Carr Road. Runoff reaching University Boulevard south of this point will flow south toward the existing inlets at the intersection of Spirit Drive and University Boulevard, and runoff north of this point will flow north toward the inlets at the intersection of Clark Carr Road and University Boulevard. This drainage divide splits the existing runoff approximately in half from the center of the site going in each direction.

The existing drainage system consists of three storm drains, one at each apex of the semi-triangular shaped site. These storm drains will be used to drain the proposed developed site, but the development will not require an increase in capacity in the existing system. The existing drainage system(s) are described as follows:

1. The first system is in Spirit Drive and runs along the east side of the site to the intersection of Spirit Drive and Clark Carr Road. From this point a 36 inch line runs west in Clark Carr about 350 feet and then turns north and runs about 325 feet where it ties into a 48 inch storm drain that runs west through the Remote Car Rental Facility. This system eventually outfalls as a 60 inch line into an improved arroyo with gabion drop structures before it enters the South Diversion Channel. Runoff from a portion of the two existing developments located on this site currently drain into this system.
2. The second system is located at the southwest apex of the site in the intersection of Spirit Drive and University Boulevard. This system is limited to a few inlets in the street at the intersection and a couple of median inlets constructed over 6 foot diameter manholes to pick up flows from off the roadway. These inlets all tie into a 48 inch pipe that then outfalls to an arroyo on the west side of University.
3. The third system is located at the northwest apex of the site at the intersection of Clark Carr Road and University Boulevard. This system is limited to a few inlets in the street at the intersection and two median inlets constructed over 6 foot diameter manholes to pick up flows from the site. The system then goes north in University Boulevard and ties into the same system mentioned above (the first system) about 1100 feet downstream of where the Spirit Drive line connects. At the point of connection, the pipe is 60 inches in diameter and it remains that size until it outfalls into the arroyo.

Proposed Conditions

Since this development is following the Albuquerque International Sunport Storm Drainage Master Plan (Molzen Corbin, May 1995) and the Albuquerque International Sunport Rent-A-Car Drainage Report (Molzen Corbin, September 1999), the overall runoff pattern and existing storm drainage system is not proposed to be changed. In order not to exceed the existing capacity of the storm drains, the developed runoff from the site will be ponded in several locations prior to release into the existing storm drainage system. A private storm drain system will be constructed on site to direct developed flows to these private ponds. Although the proposed systems with preliminary pipe sizes are show on Plate 3, the intent is that as a private system it will be allowed to vary in order to accommodate the needs of development and the individual lease holders. Any variance from the proposed storm drain and/or pond layout will be required to meet the overall intent of this document and the Albuquerque International Sunport Storm Drainage Master Plan referenced above plus all the current drainage criteria at the time of development, including probable retention of "First Flush" flows for pollution reduction.

The site will be graded into two major tiers by the proposed construction of a double stepped retaining wall separating the east and west portions of the site. The retaining walls will meander across the site from north to south generally parallel to University Blvd. but offset 400 to 800 feet east of University Blvd. Retaining walls will also be installed along the east side of University Blvd. to allow the collection and detention of onsite developed storm water. The upper tier level consists of drainage basins A and B. The upper tier will be graded to drain toward Spirit Dr. and then into one of the two storm drain systems in Spirit Dr. with the exception of a small portion of the most western edge of the upper tier that contain temporary retention ponds for two existing developments. These temporary retention ponds will drain into the lower tier using storm drains. Basin A will enter the system on Clark Carr Rd. just west of

the intersection of Spirit Dr. and Clark Carr Rd., while Basin B will enter the system located near the intersection of Spirit Dr. and University Blvd. The lower tier level consists of drainage areas C, D, and E. This lower tier is split approximately in half by the entrance road off University Blvd. and will be graded so the entrance road and the area north of the entrance (Basins C and E) will drain toward the intersection of Clark Carr Rd. and University Blvd., while the remainder of the lower tier (Basin D) will drain toward the intersection of Spirit Dr. and University Blvd. An internal roadway traverses the lower tier north to south between Clark Carr Rd. and Spirit Dr. Storm flows from lease areas east (uphill) of the internal north-south roadway will not enter the roadway instead they will enter a series of private storm drains running between lease areas and be directed towards one of the two intersections mentioned above. All of the flow from the lower tier will pass through one of two detention basins located at the northwest and south west apexes of the site prior to being released into the existing systems at a controlled rate that meets downstream capacity and the intent of the Albuquerque International Sunport Storm Drainage Master Plan. Below is a more detailed description of each basin.

Basin A consists of approximately 23.2 acres located in the northeast corner of the site on the upper tier. This area will be developed into approximately 4 lease lots in addition to the existing development. Runoff from a small area along Spirit drive will drain into the storm drain system along Spirit Dr. (the first system) by placing addition inlets on the lease areas that connect to the existing storm drain in Sprit Dr. Most of the new lease area will flow west to a swale along the top of the retaining wall for the upper tier and then north in the swale to a detention pond that will tie into the existing 36 inch pipe located in Clark Carr Rd. about 350 feet west of Spirit Dr. (see Plate 3). The overall required developed flow from this basin is 97.71 cfs with a 100 year 24 hour volume of 3.63 ac-ft. The 36 inch RCP located on the far north end of this basin in Clark Carr Road 350 feet west of Spirit Dr. has a capacity of 150.7 cfs according to the Albuquerque International Sunport Rent-A-Car Facility Drainage Report. Flows from Basin A will be routed to this 36 inch storm drain through the detention pond mentioned above and released at a rate that will be within the constraint of upstream flows and the maximum flow of 150.7 cfs. The existing area that has already been developed will not be changed. Calculations for this area can be seen in the appendix.

Basin B consists of approximately 4.8 acres located in the southeast corner of the site. This area is planned to be developed into 2 lease lots. Runoff from 3.09 acres of this basin (Lease Area 16) will drain east directly into the Spirit Dr. right-of-way and flow in the street to the storm drain system located in the intersection of Spirit Drive and University Boulevard. Spirit Drive appears to have capacity for this flow based on the Albuquerque Development Process Manual Plate 22.3 D-3. The remainder of Basin B will enter a storm drain at the intersection of Spirit Dr. and the proposed north-south roadway and be diverted through the proposed detention pond at the southwest apex of the site.

Basin C consists of approximately 22.8 acres located in the northwest corner of the site. This area is planned to be developed into 6 lease lots including a portion of proposed north-south roadway through the site. Runoff from the lease areas in this basin will enter a series of private storm systems running between the lease areas and directed towards the far northwest corner of the site into a detention pond. The detention pond will be sized so the release rate does not exceed the capacity of the existing storm drain system located at the intersection of Clark Carr

Road and University Blvd. The constraints in this area come from a 60 inch storm drain located just north of the intersection of Clark Carr Road and University Boulevard. There currently are three branches from the existing drainage system that intersect at this location. These is a 54 inch reinforced concrete pipe coming from the east, a 42 inch reinforced concrete pipe coming from the north, and a 24 inch pipe coming from the south. The 24 inch pipe limits the amount of runoff that can be sent from this site into the existing storm drain system. The required developed capacity for this basin is 96.0 cfs and a 100 year 24 hour volume of 1.67 ac-ft. . The capacity allowed to leave this basin is limited by a 24 inch pipe with a capacity of 58.0 cfs which matches the undeveloped flows from this basin. The proposed detention pond will be sized to limit the flows to 58.0 cfs including flow from Clark Carr Rd. west of the Spirit Dr. storm drain system. Calculations for this area can be seen in the appendix.

Basin D consists of approximately 21.2 acres located in the southwest corner of the site. This area is planned to be developed into 8 lease lots including a portion of proposed north-south roadway through the site. Runoff from this area will drain towards the far southwest apex of the site into a detention pond. The detention pond will connect to the existing storm drain system located at the intersection of Spirit Drive and University Boulevard. After reviewing the existing system based on information from the Albuquerque International Sunport Storm Drainage Master Plan it was determined that this area will require a controlled release into the system. The constraints in this area come from an 18 inch reinforced concrete located just east of the intersection of Spirit Drive and University Boulevard. This pipe connects to an existing 24 inch reinforced concrete pipe and this pipe connects to a 48 inch reinforced concrete pipe that outfalls on the west side of University Boulevard. The 48 inch pipe has the capacity to handle flows from this area; however, constraints are created from the 18 inch pipe where the detention pond drainage system will tie into. The required capacity for this basin is 89.29 cfs and a 100 year 24 hour volume of 1.56 ac-ft.The capacity available to leave this basin is limited by a 18 inch RCP with a capacity of 15.51 cfs. The proposed detention pond will be sized to limit the flows to 15.51 cfs capacity leaving the developed site. Calculations for this area can be seen in the appendix.

Basin E is small, consisting of 0.36 acres which serves as the main entry into the site from University Boulevard. Runoff from this basin will drain west into University Boulevard right-of-way and and then flow north to the drainage system located at Clark Carr Road and University Boulevard intersection. The required capacity for this basin is 1.69 cfs. This matches the existing drainage pattern and is proposed to be allowed to have free discharge into University Blvd.

In the appendix are the capacities and volumes required for each Basin under developed conditions as well as capacities for the existing drainage system.

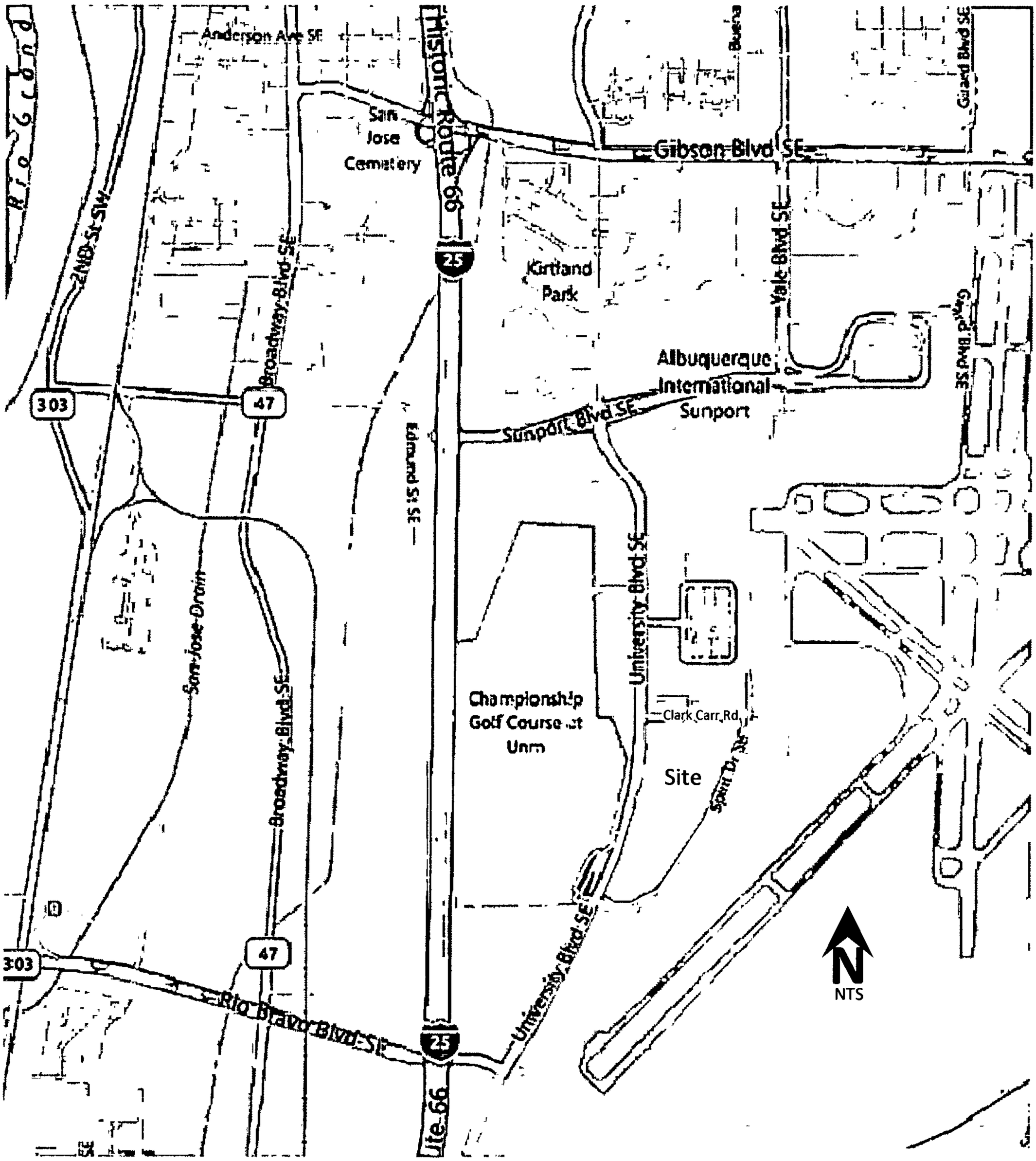
CONCLUSION

The drainage for the proposed development closely follows what has been previously proposed and modeled for future development in the Albuquerque International Sunport Storm Drainage Master Plan and the Albuquerque International Sunport Rent-A-Car Facility Drainage Report. Developed runoff will be controlled on site with detention ponds in order to maintain the same

release flow rates modeled for the existing system and meet the existing downstream system capacity. A private drainage system will be completed as development occurs and allowed to vary in order to accommodate the needs of development and the individual lease holders as long as the release rates and the intent of this and previous reports are met. The pond volumes will be determined at the time of development and are dependent on the phasing of development.

APPENDIX A- LOCATION

Albuquerque Sunport
Foreign Trade Zone
Location



APPENDIX B- SCHEMATIC OF EXISTING STORM DRAIN SYSTEM

LANDS OF UNM

℄ PT STA. 46+29.70

8" SAS

8" SAS

N 74° 12' 54" W - 219.50'

8" W

18" RCP

48" RCP

24" RCP

18" RCP

12"

14"

DRAINAGE EASE.

TEL.

STA. 48+49.20 ℄ SPIRIT DRIVE
= STA. 10+00.00 ℄ UNIVERSITY BLVD

12" SAS

UNIVERSITY BLVD. SE

14" W

45+35.00
4" SASVC

±75.1 - 20.± RT.
PCC 8" WATERMAIN
1 - REMOVE EXIST 8" CAP
1 - NON-P. CONN.

LANDS OF UNM

NEXT SHEET NO. M-15

Y10

Y9

Y8

Y7

Y6

Y5

Y4

Y3

Y2

NEXT SHEET NO. N-14

I-25

NEW MEXICO

SOUTH

GOLF COURSE

UNIVERSITY

OF

FITCH

ACCESS ROAD B

CLARK CIRC

BLVD

DRIVE

ACCESS RD C

CO/ MAINTENANCE

HANGARS

AIRPORT

TECHNICAL

CENTER

LEE CIRCLE

Drainage Divide

Drainage Divide

BATTERY (T)

SPIRIT

TASMAN-E

TM-E3

KUNTZ S-2

TX-E1

TF-E1

503' 48" RCP
S = 1.87%

586' SK
S = 4%

NEXT SHEET NO. N-16

Storm Legend

- Lateral Stubout Inlet Connector
- Collector
- Reservor Drain Siphon
- Double Pipe
- Force Main
- Abandon Lines
- Manhole
- Inlet Catch Basin
- Junction Box
- Vault
- Standpipe/Riser
- Surface Flow
- Pipe Flow
- Water Course Holding Ponds Dams
- Well
- Reservoir
- Pump Station

0 100 200 400 600

SCALE

MAP GRID

Notes:

1. Map is for informal use only

STA 5+86.30 LINE "F"
STA 10+00 LINE "B1"
MH B1
NEW 4'ø MANHOLE
RIM ELEV. =
N 470807.96
E 387033.13

STA 10+60 LINE "B" =
STA 10+00 LINE "F"
J BOX B1
NEW JUNCTION BOX
RIM ELEV. =
N 469564.72
E 387012.76

STA 12+81.27 LINE "B" =
STA 10+00 LINE "B2"
MH B3
NEW 4'ø MANHOLE
RIM ELEV. =
N 469285.58
E 387020.03

STA 14+90.02
MH B4
NEW 4'ø MANHOLE
CONNECTED TO EXISTING
SD TO SOUTH
REMOVE AND DISPOSE
EXISTING HEADWALL
RIM ELEV. =
N 469074.83
E 387026.43

STA 15+68.30
DI B1
NEW TYPE 'A' DROP INLET
GRADE ELEV. =
N 469012.80
E 387044.50

Remove and replace existing 60"ø RCP

LINE "B"

188.45 LF. 42" SD @ 0.90% | 133.41 LF. 42" SD @ 0.90% | 121.90 LF. 42" SD @ 0.90% | 284.24 LF. 30" SD. @ 6.51% | 205.78 LF. 24" SD. @ 6.56% | 209.06 LF. 18" SD @ 9.15%

STA 5+56.30
MH B1
INV IN=5192.00
INV S=5192.00
INV E=5192.00

STA 7+44.75
MH B2
INV N=5190.30
INV S=5190.30
INV E=5190.30

STA 8+79.16
DI B1
INV N=5189.10
INV S=5189.10
INV E=5190.10

STA 10+00 LINE "B" =
STA 10+00 LINE "F"
J BOX B1
INV E=5188.0

EXISTING GROUND
FINISH GRADE

18" SD
0+83 = 79
2+12 = 95
Total = 1091'

1 ea. MH, 4' ø Std Type B (Item No. 720.010)
1 ea. MH, 4' ø Std Type B (Item No. 720.010)
1 ea. Curb Basin, Type 'D' Single Grate (Item No. 725.050)
1 ea. Junction Box
1 ea. (Item No. 725.150)

Item No. 701.150 Total 18" = 1091 LF
323 LF
Item No. 701.150 Total 24" = 767 LF
276 LF
Item No. 701.150 From B2 to B3 Sum C&G
110 LF
Item No. 701.166 Total 30" = 334 LF
334 LF

Storm Drain
Item No. 701.060 18" RCP = 194 LF
Item No. 701.062 30" RCP = 334 LF
Item No. 701.063 42" RCP = 276 LF
Item 725.015 = 444 LF
Item No. 701.063 24" RCP = 206 LF

0 50 100
1" = 50'
GRAPHIC SCALE

LEGEND
- PROPOSED S.D MANHOLE
- PROPOSED TYPE "D" DROP INLET
- PROPOSED TYPE "A" DROP INLET
- PROPOSED FILTER DAM
- PROPOSED RIP-RAP
- 24"ø PROPOSED S.D. LINE AND SIZE

NOTE
ALL DROP INLETS ARE TYPE "A" OR TYPE "D" UNLESS OTHERWISE NOTED ON THE LAYOUT PLAN

MOLZEN-CORBIN & Associates
ENGINEERS/ARCHITECTS/PLANNERS
Albuquerque • Las Cruces • Los Alamos

BPLW
Designing To Shape The Future

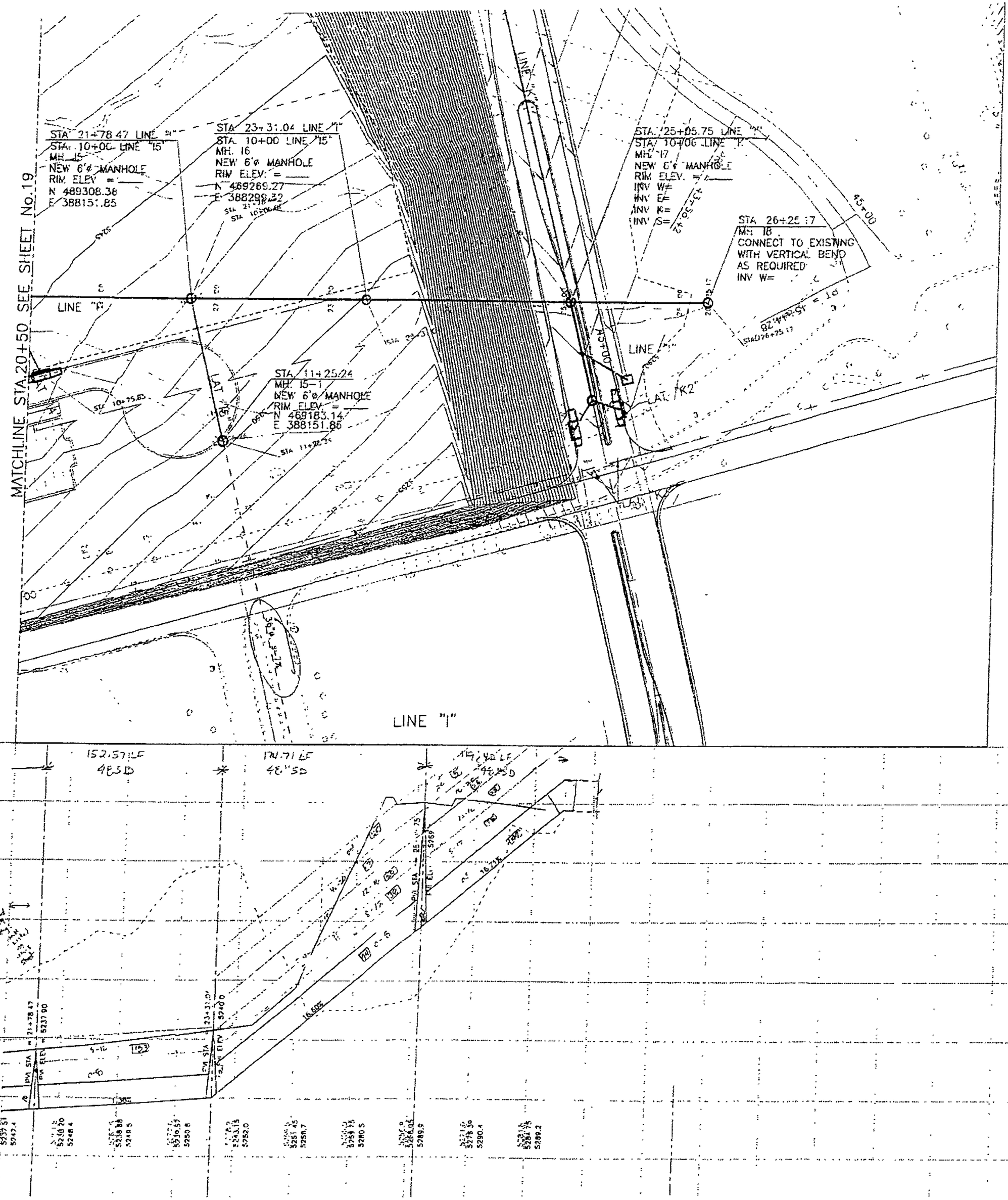
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

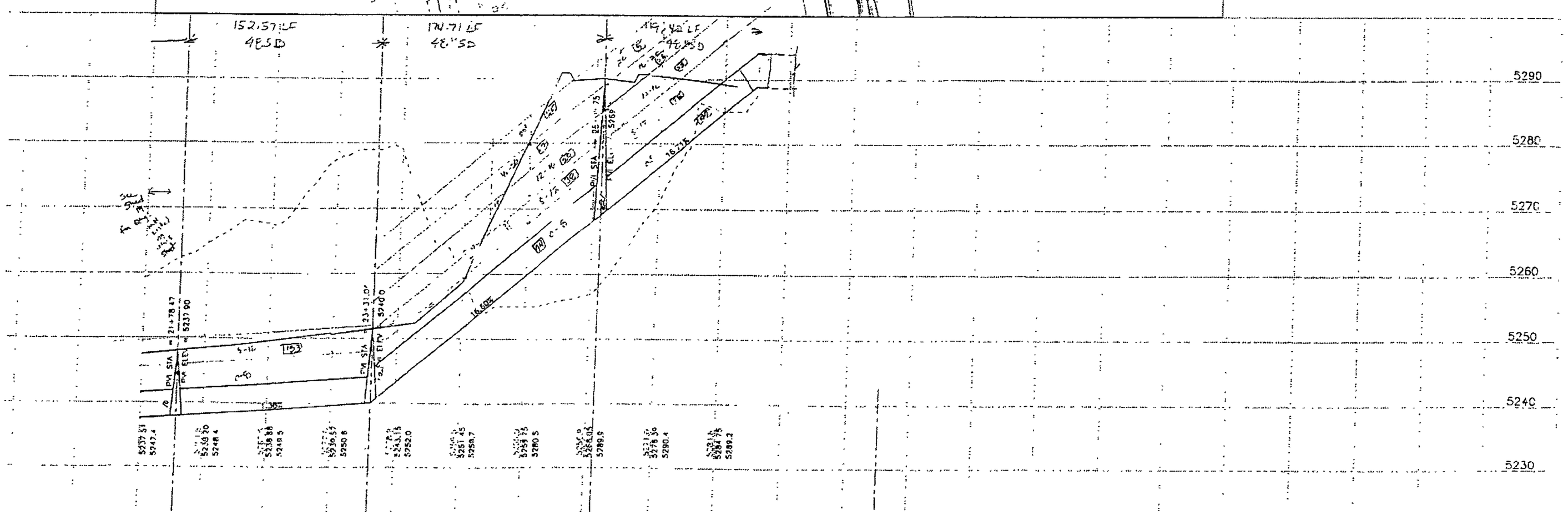
Field Notes By: UPS GREHMER
Date: 12/99 THRU 2/99
Proj. No. 2050

ST-116 RESET AN ACS ALUMINUM CAP APPROX 5.10 E, 1180 FT FROM THE INTERSECTION OF EXISTING ACCESS ROAD "B" AND CLARK CARR BLVD. AND APPROX 100 FT SSE OF A CHAIN GATE ALIGNED EAST TO WEST
ELEVATION = 5308.73

JOHN W. PROI 10997 NEW MEXICO REGISTERED PROFESSIONAL ENGINEER

Remarks | Date | No.





Item No 926.150

4 ea MH Adj Type E Xtra Depth 48" Dia
Item No 926.160
3 ea MH Adj Type E Xtra L. >18"
Item No 920.170

Item No 711.150 Trch. BF 42-60 Swr & Drn
91 LF

Item 701.160 Trch. BF 42-60 Swr 8-12 Deep
209 LF

Item 701.172 Trch. BF 42-60 Swr 16-20 Deep
43 LF

Item 701.180 Trch. BF 42-60 Swr 16-20 Deep
43 LF

Item 701.196 Trch. BF 42-60 Swr 20-24 Deep
61 LF

8-12 = 209
12-16 = 43
16-20 = 43
20 = 61
Total = 447 LF

Storm Drain
Item No 910 0A1 45" RCP III
447 LF

N

0 50 100
1" = 50'
GRAPHIC SCALE

LEGEND

- PROPOSED S.D. MANHOLE
- PROPOSED TYPE "D" DROP INLET
- PROPOSED TYPE "A" DROP INLET
- PROPOSED FILTER DAM
- PROPOSED RIP-RAP
- 24"ø PROPOSED S.D. LINE AND SIZE

NOTE:
ALL DROP INLETS ARE TYPE "A" OR TYPE "D" UNLESS OTHERWISE NOTED ON THE LAYOUT PLAN

1-N16 RESET AN ACS ALUMINUM CAP APPROX. S 10° E, 1180 FT FROM THE INTERSECTION OF EXISTING ACCESS ROAD "B" AND CLARK CARR BLVD, AND APPROX 100 FT SSE OF A CHAIN GATE ALIGNED EAST TO WEST
ELEVATION = 5306.73

No.	Date	Remarks	By
1	12/98		
2	THRU		
3	2/99		

Field Notes
No. 2050
By: URS GREINER WOODWARD CLYDE
Date: 12/98 THRU 2/99

Designed By: HSF Date: 4/99
Drawn By: M/C STAFF Date: 4/99
Checked By: JMP Date: 4/99

JOHN M. PROVINE 10997 NEW MEXICO REGISTERED PROFESSIONAL ENGINEER

MOLZEN-CORBIN & Associates
ENGINEERS/ARCHITECTS/PLANNERS

BPLW
Engineers & Surveyors
Designing to Shape the Future

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

Remote Car Rental Facility
StormDrain Line "I"-Sta.20+50 to E.O.L.

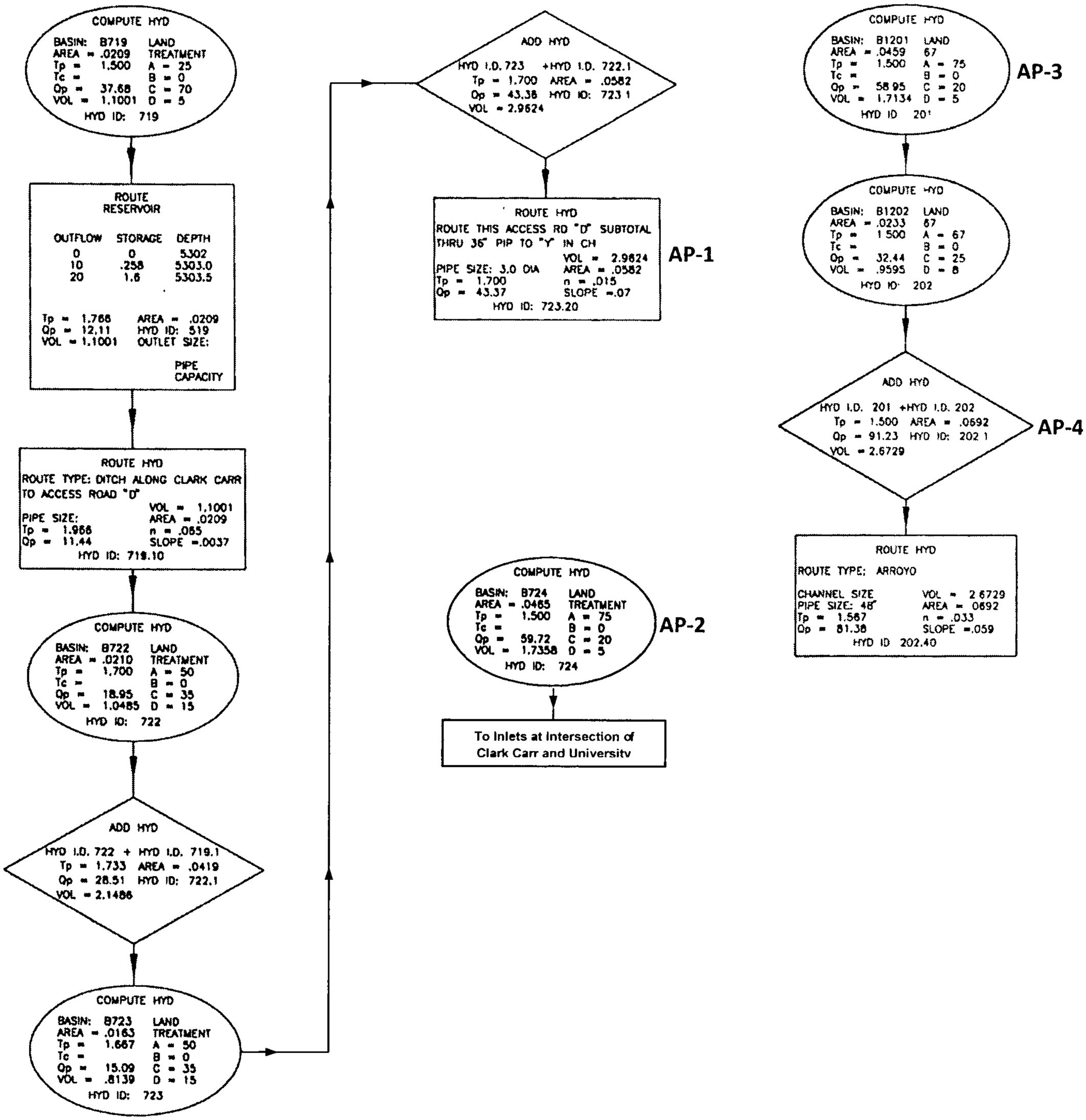
Design Review Committee | City Engineer Approval | Last Design Update

APPENDIX C- CALCULATIONS

AHYMO Flow Charts*

Drainage Basin GA, Sub-Basins 719 and 722 thru 724
Drainage Basin UE, Sub-Basins 1201 and 1202

100 Year Existing

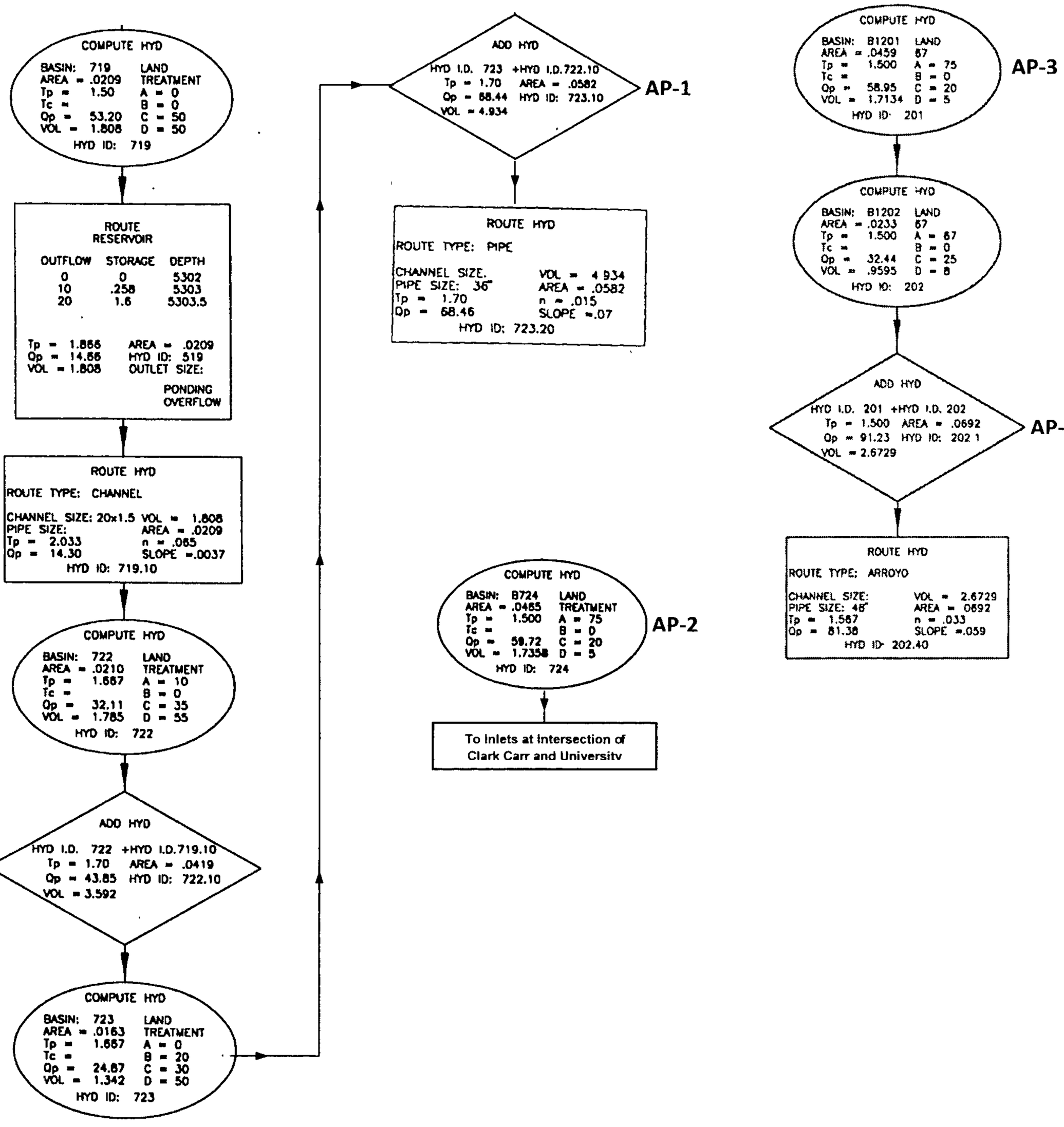


* Flow charts and data from:
Albuquerque International Airport, Albuquerque, New Mexico
Storm Drainage Master Plan, August 1995, by Molzen-Corbin & Associates

AHYMO Flow Charts*

Drainage Basin GA, Sub-Basins 719 and 722 thru 724
Drainage Basin UE, Sub-Basins 1201 and 1202

100 Year Developed



* Flow charts and data from:
  Albuquerque International Airport, Albuquerque, New Mexico
  Storm Drainage Master Plan, August 1995, by Molzen-Corbin & Associates

FTZ Drainage
Albuquerque, New Mexico

Precipitation Depths$_{100\text{-}Year}$ [inches]:

P_{60}	P_{360}	P_{1440}	P_{4days}	P_{10days}
2.01	2 35	2 75	3.3	3 95

Peak Discharge$_{100Year/6Hour}$ [cfs/acre]:

A	B	C	D
1.56	2.28	3.14	4 7

Tc 0 2 hr
Zone 2 Peak Intensity [in/hr]:
I = 5.05

Existing

BASIN A

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	$Q_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0 00	0 00%	0 53	--	0 0000	--	--	0 0000	0.31	0 00
B		4 64	20 00%	0 78	--	0 6013	--	--	10 5792	0.45	10 54
C		6 96	30 00%	1.13	--	0 9019	--	--	21 8544	0.62	21 79
D		11 60	50 00%	2 12	--	1 5032	--	--	54 5200	0.93	54 48
Totals	**0.0000**	**23.20**	100 00%	--	**1.5550**	**3.0063**	**3.3930**	**4.5530**	**86.9536**	--	**86.82**
					check	3 0063					

BASIN B

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	$Q_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		3 84	80 00%	0 53	--	0 1856	--	--	5.9904	0 31	6 01
B		0 96	20 00%	0 78	--	0 0464	--	--	2 1888	0 45	2 18
C		0 00	0 00%	1 13	--	0 0000	--	--	0 0000	0.62	0 00
D		0 00	0 00%	2 12	--	0 0000	--	--	0 0000	0.93	0 00
Totals	**0.0000**	**4.80**	100 00%	--	**0.5800**	0 2320	**0.2320**	**0.2320**	**8.1792**	--	**8.19**
					check	0 2320					

BASIN C

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	$Q_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		20 52	90 00%	0 53	--	0 9491	--	--	32 0112	0 31	32 12
B		2 28	10 00%	0 78	--	0 1055	--	--	5 1984	0 45	5 18
C		0 00	0 00%	1.13	--	0 0000	--	--	0 0000	0.62	0 00
D		0 00	0 00%	2 12	--	0 0000	--	--	0 0000	0.93	0 00
Totals	**0.0000**	**22.80**	100 00%	--	**0.5550**	**1.0545**	**1.0545**	**1.0545**	**37.2096**	--	**37.31**
					check	1 0545					

BASIN D

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	$Q_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		19 08	90 00%	0 53	--	0 8825	--	--	29 7648	0.31	29 87
B		2 12	10 00%	0 78	--	0 0981	--	--	4 8336	0.45	4 82
C		0 00	0 00%	1.13	--	0 0000	--	--	0 0000	0 62	0 00
D		0 00	0 00%	2.12	--	0 0000	--	--	0 0000	0 93	0 00
Totals	**0.0000**	**21.20**	100 00%	--	**0.5550**	**0.9805**	**0.9805**	**0.9805**	**34.5984**	--	**34.69**
					check	0 9805					

BASIN E

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	$Q_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0 00	0 00%	0.53	--	0 0000	--	--	0 0000	0.31	0 00
B		0 00	0 00%	0.78	--	0 0000	--	--	0 0000	0.45	0 00
C		0 36	100 00%	1.13	--	0 0339	--	--	1 1304	0.62	1.13
D		0 00	0 00%	2.12	--	0 0000	--	--	0 0000	0.93	0 00
Totals	**0.0000**	**0.36**	100 00%	--	**1.1300**	**0.0339**	**0.0339**	**0.0339**	**1.1304**	--	**1.13**
					check	0 0339					

Developed

BASIN A

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0 00	0 00%	0 53	--	0 0000	--	--	0 0000	0 31	0 00
B		4 64	20 00%	0.78	--	0 6013	--	--	10 5792	0 45	10 54
C		0 00	0 00%	1.13	--	0 0000	--	--	0 0000	0.62	0 00
D		18 56	80 00%	2 12	--	2 4051	--	--	87 2320	0.93	87 17
Totals	**0.0000**	**23.20**	100 00%	--	**1.8520**	**3.0063**	**3.6250**	**5.4810**	**97.8112**	--	**97.71**
					check	3 5805					

BASIN B

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0 00	0 00%	0 53	--	0 0000	--	--	0 0000	0.31	0 00
B		0 96	20 00%	0 78	--	0 0464	--	--	0 0000	0.45	2 18
C		0 00	0 00%	1.13	--	0 0000	--	--	0 0000	0.62	0 00
D		3 84	80 00%	2.12	--	0 1856	--	--	18 0480	0.93	18 03
Totals	**0.0000**	**4.80**	100 00%	--	**1.8520**	0 2320	**0.3600**	**0.7440**	**18.0480**	--	**20.22**
					check	0 7408					

BASIN C

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0 00	0 00%	0 53	--	0 0000	--	--	0 0000	0.31	0 00
B		4 56	20 00%	0 78	--	0 2109	--	--	10 3968	0.45	10 36
C		0 00	0 00%	1 13	--	0 0000	--	--	0 0000	0.62	0 00
D		18 24	80 00%	2 12	--	0 8436	--	--	85 7280	0.93	85 66
Totals	**0.0000**	**22.80**	100 00%	--	**1.8520**	**1.0545**	**1.6625**	**3.4865**	**96.1248**	--	**96.03**
					check	3 5188					

BASIN D

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0 00	0 00%	0 53	--	0 0000	--	--	0 0000	0 31	0 00
B		4 24	20 00%	0 78	--	0 1961	--	--	9 6672	0 45	9 64
C		0 00	0 00%	1 13	--	0 0000	--	--	0 0000	0.62	0 00
D		16 96	80 00%	2 12	--	0 7844	--	--	79 7120	0.93	79 65
Totals	**0.0000**	**21.20**	100 00%	--	**1.8520**	**0.9805**	**1.5458**	**3.2418**	**89.3792**	--	**89.29**
					check	3 2719					

BASIN E

Land Treatment	Area [ft^2]	Area [acre]	% of Total Area	Excess Prec.$_{100\text{-}6}$ [in]	Weighted E [in]	Volume$_{360}$ [acre-ft]	Volume$_{1440}$ [acre-ft]	Volume$_{10day}$ [acre-ft]	Q$_{100Yr/6Hr}$ [cfs]	Rational Method, C	Rational Method, Q [cfs]
A		0 00	0 00%	0 53	--	0 0000	--	--	0 0000	0.31	0 00
B		0 00	0 00%	0 78	--	0 0000	--	--	0 0000	0 45	0 00
C		0 00	0 00%	1 13	--	0 0000	--	--	0 0000	0 62	0 00
D		0 36	100 00%	2.12	--	0 0339	--	--	1 6920	0 93	1 69
Totals	**0.0000**	**0.36**	100 00%	--	**2.1200**	**0.0339**	**0.0459**	**0.0819**	**1.6920**	--	**1.69**
					check	0 0636					

24" RCP
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	University & Clark Carr Road
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.065600	ft/ft
Diameter	24.00	in

Results		
Depth	2.00	ft
Discharge	57.94	cfs
Flow Area	3.14	ft²
Wetted Perimeter	6.28	ft
Top Width	0.00	ft
Critical Depth	1.99	ft
Percent Full	100.00	
Critical Slope	0.061633	ft/ft
Velocity	18.44	ft/s
Velocity Head	5.29	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	62.32	cfs
Full Flow Capacity	57.94	cfs
Full Flow Slope	0.065600	ft/ft

42"
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	FTZ
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.009500	ft/ft
Diameter	42.00	in

Results		
Depth	3.50	ft
Discharge	98.06	cfs
Flow Area	9.62	ft^2
Wetted Perimeter	11.00	ft
Top Width	0.00	ft
Critical Depth	3.05	ft
Percent Full	100.00	
Critical Slope	0.008660	ft/ft
Velocity	10.19	ft/s
Velocity Head	1.61	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	105.48	cfs
Full Flow Capacity	98.06	cfs
Full Flow Slope	0.009500	ft/ft

18" UNIVERSITY & SPIRIT DR
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	FTZ
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.021800	ft/ft
Diameter	18.00	in

Results		
Depth	1.50	ft
Discharge	15.51	cfs
Flow Area	1.77	ft²
Wetted Perimeter	4.71	ft
Top Width	0.00	ft
Critical Depth	1.42	ft
Percent Full	100.00	
Critical Slope	0.018849	ft/ft
Velocity	8.78	ft/s
Velocity Head	1.20	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	16.68	cfs
Full Flow Capacity	15.51	cfs
Full Flow Slope	0.021800	ft/ft

48" UNIVERSITY & SPIRIT DR
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	FTZ
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.016700	ft/ft
Diameter	48.00	in

Results		
Depth	4.00	ft
Discharge	185.62	cfs
Flow Area	12.57	ft²
Wetted Perimeter	12.57	ft
Top Width	0.00	ft
Critical Depth	3.80	ft
Percent Full	100.00	
Critical Slope	0.014462	ft/ft
Velocity	14.77	ft/s
Velocity Head	3.39	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	199.67	cfs
Full Flow Capacity	185.62	cfs
Full Flow Slope	0.016700	ft/ft

54"

Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	FTZ
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.040100	ft/ft
Diameter	54.00	in

Results		
Depth	4.50	ft
Discharge	393.77	cfs
Flow Area	15.90	ft^2
Wetted Perimeter	14.14	ft
Top Width	0.00	ft
Critical Depth	4.46	ft
Percent Full	100.00	
Critical Slope	0.037136	ft/ft
Velocity	24.76	ft/s
Velocity Head	9.53	ft
Specific Energy	FULL	ft
Froude Number	FULL	
Maximum Discharge	423.58	cfs
Full Flow Capacity	393.77	cfs
Full Flow Slope	0.040100	ft/ft

MOLZENCORBIN

RECEIVED
SEP 2 2011
HYDROLOGY
SECTION

September 2, 2011

Shahab Biazar, P.E.,
Senior Engineer, Planning Dept.
Development and Building Services
City of Albuquerque
600 2nd St. NW
Albuquerque, NM 87103

RE: Sunport Foreign Trade Zone, Tract A Replat Drainage Analysis (N15/D006)

Dear Mr. Biazar,

The purpose of this letter is to summarize how Molzen-Corbin addressed comments from you on the referenced project. Below is each of your concerns provided to us in your letter dated August 30, 2011 followed by an explanation of how each concern was addressed.

- Breakdown the Basins to show the exact runoff draining to Spirit Dr. (north of the high point in the street). The proposed runoff should be routed to the detention pond north of Basin A.

  - *The flow allowed to drain to Spirit Drive is proposed to be limited to the existing flow rate in the undeveloped state, which is approximately 4.6 cfs. Most new development is to drain generally west and north away from the roadway and toward the proposed detention pond. The development that presently exists on the west side of Spirit Dr. appears to follow this approach, although the existing ponds presently retain the runoff.*

    Plates 1 thru 3 have been modified to reflect this restraint.

- Please confirm the storm drain pipe sizes on Spirit Dr. The plan shows 30" storm drain pipes, and the as-built show 24" storm pipes.

  - *The drawings have been corrected to correlate with the as-built drawings, which is the best information available.*

- Under the proposed conditions, please show the allowable discharge for Basin A. Include all the existing storm structures and sizes at the point of discharge.

  - *The allowable discharge of 15 cfs has been added to plate 2. The existing structures have also been show in more detail with sizes.*

- Show existing infrastructure as existing and proposed infrastructure as proposed.

  - *Plate 3, Conceptual Storm Drain and Utility Plan Proposed Conditions, has been modified to better reflect what is existing and proposed, a unique symbol has also been given for AP points to help avoid confusion.*

- Enlarge the font for the AHYMO calculations (flow charts) and thicken the proposed contours.

  The flow charts have been enlarged and the existing contours darkened to the extent possible.

- Stamp and date the plans and the drainage Report.

  The Report and attachments have been stamped, signed and dated.

- Change the title of the plan to Master Drainage Plan.

  The Report and attachments all include Master Drainage Plan in the Title.

Respectfully,

Dan Hogan P.E. & P.S.
Senior Engineer

N15/D006

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(Rev. 1-28-03)

PROJECT TITLE: Albuquerque International Sunport- Foreign Trade Zone ZONE MAP/DRG FILE #: L-16, M-15, M-16, M-17, M-18, N-15, N-16, N-17, N-18, P-15, P-16
DRB#: 10DRB-70295 EPC#: WORK ORDER#: _____

LEGAL DESCRIPTION: Albuquerque International Sunport
CITY ADDRESS: 2200 Sunport Blvd. SE, Albuquerque, NM 87106

ENGINEERING FIRM. Molzen-Corbin & Associates CONTACT: Mike Provine
ADDRESS: 2701 Miles Road SE PHONE: 242-5700
CITY, STATE: Albuquerque, NM ZIP CODE: 87106

OWNER COA/ Aviation Department CONTACT: Jim Hinde
ADDRESS: 2200 Sunport Blvd. SE PHONE: 255-8668
CITY, STATE: Albuquerque, NM ZIP CODE: 87106

ARCHITECT: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY STATE: _____ ZIP CODE: _____

SURVEYOR: Santiago Romero Jr. & Associates, Inc. CONTACT: Santiago Romero
ADDRESS: 8708 Brandywine Rd NE PHONE 884-5119
CITY, STATE: Albuquerque, NM ZIP CODE: 87111

CONTRACTOR: _____ CONTACT. _____
ADDRESS: _____ PHONE _____
CITY, STATE: _____ ZIP CODE: _____

CHECK TYPE OF SUBMITTAL:
__X__ DRAINAGE REPORT
_____ DRAINAGE PLAN 1st SUBMITTAL,
REQUIRES TCL or equal
_____ DRAINAGE PLAN RESUBMITTAL
_____ CONCEPTUAL GRADING AND DRAINAGE PLAN
_____ GRADING PLAN
_____ EROSION CONTROL PLAN
_____ ENGINEER'S CERTIFICATION (HYDROLOGY)
_____ CLOMR/LOMR
_____ TRAFFIC CIRCULATION LAYOUT (TCL)
_____ ENGINEERS CERTIFICATION (TCL)
_____ ENGINEERS CERTIFICATION (DRB APPR SITE PLAN)
_____ OTHER

CHECK TYPE OF APPROVAL SOUGHT:
_____ SIA/FINANCIAL GUARANTEE RELEASE
_____ PRELIMINARY PLAT APPROVAL
_____ S. DEV. PLAN FOR SUB'D APPROVAL
_____ S. DEV. PLAN FOR BLDG PERMITAPPROVAL
_____ SECTOR PLAN APPROVAL
__X__ FINAL PLAT APPROVAL
_____ FOUNDATION PERMIT APPROVAL
_____ BUILDING PERMIT APPROVAL
_____ CERTIFICATE OF OCCUPANCY (PERM.)
_____ CERTIFICATE OF OCCUPANCY (TEMP.)
_____ GRADING PERMIT APPROVAL
_____ PAVING PERMIT APPROVAL
_____ WORK ORDER APPROVAL
_____ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:
__X__ YES
_____ NO
_____ COPY PROVIDED

DATE SUBMITTED: Dan Hogue BY: 9/2/11

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope to the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.

2 **Drainage Plans:** Required for building permits, grading permits, paving permits and site plans less than five (5) acres

3. **Drainage Report:** Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more