

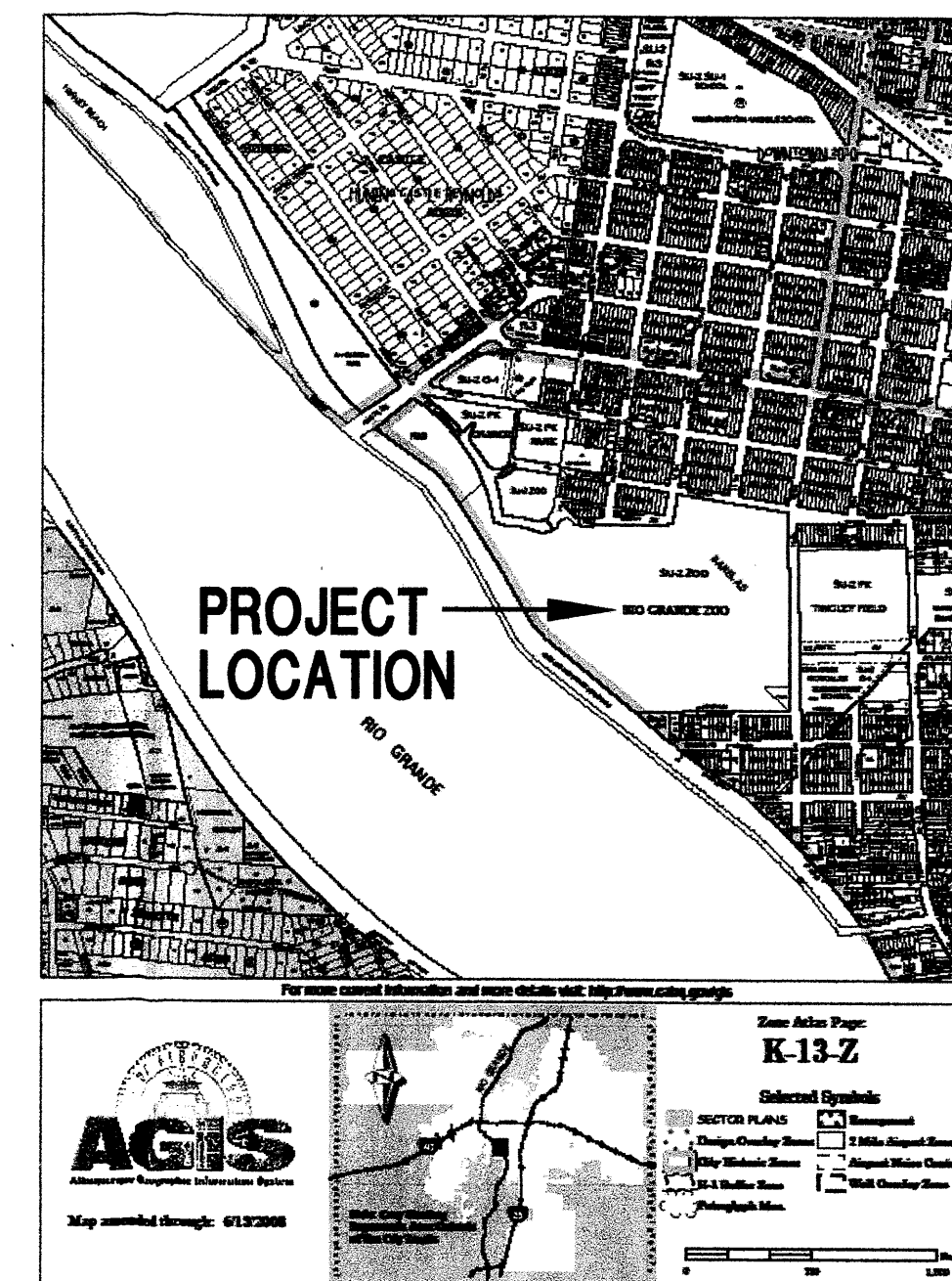
ABBREVIATIONS

FF FINISHED FLOOR
GRD GROUND ELEVATION
RD ROAD ELEVATION
TOC TOP OF CONCRETE
TOW TOP OF WALL
TRK TRACK ELEVATION
WD WOOD ELEVATION
WSE WATER SURFACE ELEVATION

LEGEND

- EXISTING PULLBOX
- EXISTING ELECTRIC BOX
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING CLEANOUT
- EXISTING SIGN
- EXISTING SALT CEDAR
- EXISTING COTTONWOOD TREE
- EXISTING CONTOUR (MAJOR)
- DRAINAGE BASIN
- BUILDING RIDGELINE
- FLOW ARROW
- EXISTING BUILDING OUTLINE
- EXISTING WOOD BASE FOR TRACK
- EXISTING RAILROAD TRACK
- TEMPORARY CONTROL POINT
- DRAINAGE BASIN DESIGNATION
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- PROPOSED CONTOUR

RECEIVED
JUL 14 2010
HYDROLOGY SECTION



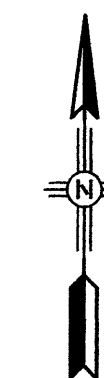
GENERAL NOTES

- NO LINE LOCATION WORK WAS PERFORMED. CONTRACTOR SHALL NOTIFY ENGINEER OF CONFLICTS WITH UNDERGROUND UTILITIES SO THAT MODIFICATIONS CAN BE MADE TO THE GRADING PLAN.
- FINISHED FLOOR VARIES WITH LOWEST FF=4949.64

KEYED NOTES

- TOP OF LANDING TO MATCH FINISHED FLOOR.
- FIVE RISERS AT 0.5'/RISER. SEE ARCHITECTURAL SHEETS FOR STEP DETAILS.
- TWO RISERS AT 0.5'/RISER. SEE ARCHITECTURAL SHEETS FOR DETAILS.
- PROPOSED DIRT ACCESS ROAD.
- REMOVE AND DISPOSE OF EXISTING PCC PAD AT EXISTING WATER VALVE. CONSTRUCT NEW PCC PAD AROUND WATER VALVE PER COA STD. DWG 2326 AND 2461. NEW PAD ELEVATION=4949.50
- EXISTING SHED TO BE MOVED PRIOR TO FINAL GRADING.
- SEE ARCHITECTURAL SHEETS FOR BUILDING LAYOUT ON SITE.

SEE SHEET C.1A (1 OF 3) FOR HYDROLOGY CALCULATIONS.
SEE SHEET C.1C (3 OF 3) FOR SITE DATA TABLES.



SCALE: 1" = 10'
CONTOUR INTERVAL=0.5'

Smith Engineering Company
A Full Service Engineering Company
3001 San Pedro Boulevard, N.E., 8th Fl., Suite 200 Albuquerque, New Mexico 87106

CITY OF ALBUQUERQUE
ALBUQUERQUE BIOPARK

AUSTRALIAN EXHIBIT, PHASE II
PROPOSED GRADING PLAN

Design Review Committee	City Engineer Approval	No. / Day / Yr.	No. / Day / Yr.
Project No. 124801	Zone Map No. K-13-Z	Sheet No. C.1B	Drawing No. Of 2 3

CONTRACTOR	DATE
WORK STAGED BY	DATE
ACCEPTANCE BY	DATE
FIELD LOCATION BY	DATE
DRAWINGS CORRECTED BY	DATE
MICRO-FILM INFORMATION	DATE
RECORDED BY	DATE
NO.	

AS BUILT INFORMATION	BENCH MARKS
ELEVATIONS ARE NAVD 88 ADJUSTED TO THE AGS CONTROL MONUMENT "15-J12"	
ELEVATION = 4965.63 FEET	

SURVEY INFORMATION	FIELD NOTES
NO. 11599	DATE 05/10
STEVE TOLER	

ENGINEER'S SEAL

REVISIONS	BY	DATE
DESIGN	PJC	07/10
	CMC	07/10
	PJC	07/10

**SEE SHEET C.1.B (2 OF 3) FOR
PROPOSED CONDITIONS, DRAINAGE
BASINS, PROPOSED GRADING, AND
VICINITY MAP.**

HYDROLOGY CALCULATIONS

Project Description: The project consists of the construction of a new crocodile exhibit building at the City of Albuquerque Zoo. The site is an existing area contained within the zoo limits and located on the east side of the facility. The existing ground area consists of type "C" material, mostly compacted soils. There are no natural grasses or other ground cover on the site. An excavation was begun in the past in anticipation of the crocodile exhibit building, but this excavation is still on the site next to the existing Australian Exhibit Building and serves to collect runoff during rainfall events. This area will be filled in during the construction of the new facility and new drainage ponds will be constructed outside the new building limits.

Hydrology: The tables and figures referenced in this analysis are taken from the City of Albuquerque (COA) Design Process Manual (DPM). A stated above, the existing area is a combination of Type "C" and Type "D" land use. The proposed project will create some added land use "D" (building area) and will remove some of the existing Type "C" land use. The area description is provided in Table A-4. The site is located in precipitation Zone 2 (Figure 1-1). The existing discharge from the Total 29, and these are 3.14 cfs/acre for land use "C" and 4.70 cfs/acre for land use "D". Excess precipitation amounts are taken from Table A-8, and these are 1.13 inches for land use "C" and 2.12 inches for land use "D".

The existing project area is divided into two (2) drainage basins labeled Basin 1 and Basin 2 on Sheet 1 of 3, "Existing Conditions Hydrology Sheet" (also labeled Sheet C.1.A). These two areas currently drain to the retention pond located east of the existing Australian Exhibit Building and the runoff percolates into the existing soils. Peak runoff rates and runoff volumes for the existing conditions is shown in the tables below this narrative. The proposed Australian Exhibit Building will be located on the site and to the east side of the existing Australian Exhibit Building. The new facility will have a new flat, single running roof ridge that matches the existing building roof ridge and drains approximately north and south. Due to the roof configuration, there are three drainage basins created with the construction of the new building. These are labeled Basin A, Basin B, and Basin C on Sheet 2 of 3, "Proposed Grading Plan" (also labeled C.1.B). Runoff from the facility will be directed away from the building into new ponding areas located on the north, east and south sides of the proposed facility and runoff to these areas will be allowed to percolate into the ground. The finish floor of the new building varies and these are shown on the grading plan, however, the lowest elevation inside the proposed and existing buildings is 949.7.

Each of the proposed drainage basins will drain to new ponding areas in their respective areas. Drainage basin A will drain to a new pond on the north side of the building. This pond will contain the 100-Year runoff from the basin and the high water surface elevation will be approximately 4948.0 (1.7 feet below the proposed finish floor elevation).

Drainage Basin B will drain to the east side of the building. The volume of water that will reach this basin will be 265 cubic feet. The 100-year storm will produce a high water surface elevation in Pond B of 4947.2 (2.5 feet below the finish floor elevation).

Drainage Basin C will drain to the south side of the building into a proposed retention pond. The 100-Year water surface elevation in this pond will be 4946.4. The resulting water surface elevation is 3.3 feet below the proposed finish floor elevation.

In each instance, the runoff in the ponds will percolate into existing soils as matches the current drainage condition.

EXISTING CONDITIONS FOR 100-YEAR, 6-HOUR STORM	BASIN 1	BASIN 2	TOTALS
AREA, AC			
LAND USE "C"	0.21	0.24	
LAND USE "D"	0.04	0.04	
TOTAL BASIN AREA	0.25	0.28	0.53
PEAK RUNOFF RATES, CFS			
LAND USE "C"	0.67	0.77	
LAND USE "D"	0.18	0.18	
TOTAL RUNOFF, CFS	0.85	0.95	1.80
RUNOFF VOLUME, CUBIC FEET			
LAND USE "C"	871	988	
LAND USE "D"	289	302	
TOTAL RUNOFF VOLUME, CUBIC FEET	1160	1290	2450

PROPOSED CONDITIONS FOR 100-YEAR, 6-HOUR STORM AREA, AC	BASIN A	BASIN B	BASIN C	TOTALS
LAND USE "C"	0.11	0.038	0.15	
LAND USE "D"	0.09	0.012	0.13	
TOTAL BASIN AREA	0.20	0.05	0.28	0.53
PEAK RUNOFF RATES, CFS				
LAND USE "C"	0.35	0.12	0.47	
LAND USE "D"	0.42	0.06	0.61	
TOTAL RUNOFF, CFS	0.77	0.18	1.08	2.03
RUNOFF VOLUME, CUBIC FEET				
LAND USE "C"	452	166	602	
LAND USE "D"	703	99	1020	
TOTAL RUNOFF VOLUME, CUBIC FEET	1155	265	1622	3042

100-YEAR, 10-DAY RUNOFF VOLUME CALCULATIONS: The precipitation values for the 100-Year, 6-Hour event and the 100-Year, 10-Day event are taken from Table A-2 of the DPM. The formula for calculating the required 100-Year, 10-Day ponding volume is equation (a-9) taken from page 22-14 of the DPM.

	BASIN 1	BASIN 2	BASIN A	BASIN B	BASIN
Runoff Volume, 100-Year, 6-Hour, acre-feet	1160	1290	1155	265	1622
Land Use "D" Area, acres	0.04	0.04	0.09	0.012	0.13
Precipitation, 100-Year, 10-Day, inches	3.95	3.95	3.95	3.95	3.95
Precipitation, 100-Year, 6-Hour, inches	2.35	2.35	2.35	2.35	2.35
Runoff Volume, 100-Year, 10-Day, acre-feet	0.032	0.035	0.039	0.008	0.055
Runoff Volume, 100-Year, 10-Day, cubic feet	1302	1502	1476	335	2177



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CITY OF ALBUQUERQUE
ALBUQUERQUE BIOPARK

TITLE: **AUSTRALIAN EXHIBIT, PHASE II
EXISTING HYDROLOGY**

Design Review Committee	City Engineer Approval	Φ	No. /
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	Upd	
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Project No.	Zone Map No.	Sheet No.	Dr.
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124801	K-13-Z	C.1.A
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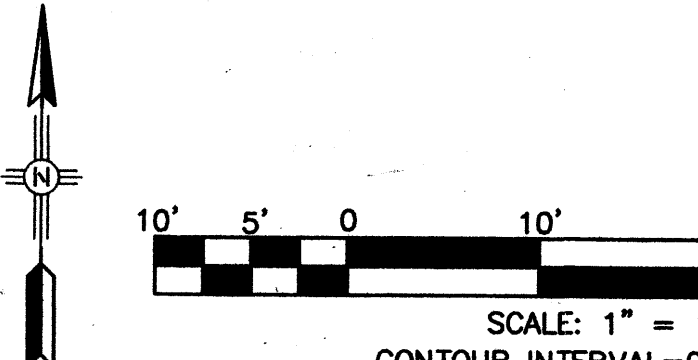
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ABBREVIATIONS

GRD	GROUND ELEVATION
RD	ROAD ELEVATION
TOC	TOP OF CONCRETE
TRK	TRACK ELEVATION
WD	WOOD ELEVATION

LEGEND

-  EXISTING PULLBOX
 EXISTING ELECTRIC BOX
 EXISTING FIRE HYDRANT
 EXISTING WATER VALVE
 EXISTING SIGN
 EXISTING SALT CEDAR
 EXISTING COTTONWOOD TREE
 EXISTING CONTOUR (MAJOR)
 DRAINAGE BASIN
 BUILDING RIDGE LINE
 FLOW ARROW
 EXISTING BUILDING OUTLINE
 EXISTING WOOD BASE FOR TRACK
 EXISTING RAILROAD TRACK
 TEMPORARY CONTROL POINT
 DRAINAGE BASIN DESIGNATION
 EXISTING SPOT ELEVATION
 PROPOSED SPOT ELEVATION
 PROPOSED CONTOUR



Node ID	Northing	Easting	Description	Elevation
1	1484648.35	1517673.18	GRD	4949.00
2	1484672.73	1517673.76	GRD	4948.50
3	1484644.17	1517678.50	GRD	4949.50
4	1484652.81	1517685.36	GRD	4949.00
5	1484654.36	1517686.08	GRD	4949.00
6	1484664.84	1517690.95	GRD	4948.50
7	1484653.73	1517688.65	GRD	4949.00
8	1484664.94	1517696.24	GRD	4948.50
9	1484684.48	1517690.03	PCC, GRD	4948.00
10	1484676.15	1517692.23	PC, GRD	4948.00
11	1484653.48	1517702.63	GRD	4949.50
12	1484657.80	1517709.18	GRD	4949.50
13	1484665.35	1517718.90	GRD	4949.00
14	1484673.66	1517715.05	GRD	4948.50
15	1484702.97	1517724.65	GRD	4948.50
16	1484659.75	1517754.13	GRD	4949.50
17	1484666.20	1517765.61	GRD	4949.00
18	1484686.59	1517783.63	PCC, GRD	4948.00
19	1484678.16	1517781.41	PC, GRD	4948.00
20	1484675.41	1517792.46	GRD	4948.50
21	1484657.46	1517784.29	GRD	4949.00
22	1484653.04	1517785.99	GRD	4949.00
23	1484657.82	1517798.38	GRD	4948.50
24	1484669.21	1517806.02	PCC, GRD	4948.00
25	1484673.25	1517813.68	PCC, GRD	4948.00
26	1484663.86	1517815.20	PCC, GRD	4946.50
27	1484663.89	1517817.57	PCC, GRD	4946.50
28	1484658.48	1517808.41	PCC, GRD	4948.00
29	1484662.25	1517815.21	PRC, GRD	4946.50
30	1484662.94	1517823.32	GRD	4948.00
31	1484636.34	1517816.96	GRD	4948.00
32	1484617.96	1517828.46	PCC, GRD	4946.50
33	1484619.93	1517834.11	PCC, GRD	4946.50
34	1484608.21	1517834.07	PCC, GRD	4946.50
35	1484608.24	1517828.08	PRC, GRD	4946.50
36	1484606.19	1517828.71	PRC, GRD	4946.50
37	1484605.77	1517818.06	GRD	4948.00
38	1484599.15	1517814.04	PC, GRD	4947.50
39	1484595.13	1517823.06	PC, GRD	4947.50
40	1484580.30	1517828.79	PC, GRD	4947.50
41	1484572.00	1517829.93	GRD	4947.50
42	1484585.32	1517808.64	PC, GRD	4945.00
43	1484584.17	1517811.22	PC, GRD	4945.00
44	1484581.15	1517812.38	PC, GRD	4945.00
45	1484578.60	1517812.49	PC, GRD	4945.00
46	1484580.83	1517748.63	GRD	4948.50
47	1484577.35	1517753.91	PC, GRD	4948.00
48	1484582.23	1517756.32	PC, GRD	4948.00
49	1484573.32	1517756.68	PC, GRD	4947.50
50	1484578.20	1517759.09	PC, GRD	4947.50

NODE ID	NORTHING	EASTING	DESCRIPTION	ELEVATION
51	1484569.65	1517767.54	PC, GRD	4945.00
52	1484567.21	1517766.34	PC, GRD	4945.00
53	1484553.10	1517756.99	GRD	4948.50
54	1484556.74	1517760.07	GRD	4948.00
55	1484554.63	1517770.10	PC, GRD	4945.00
56	1484552.20	1517772.13	PC, GRD	4945.00
57	1484549.70	1517759.88	GRD	4948.00
58	1484553.05	1517762.74	GRD	4947.50
59	1484537.32	1517761.56	GRD	4947.50
60	1484540.03	1517796.36	PC, GRD	4945.00
61	1484542.49	1517802.00	PC, GRD	4945.00
62	1484664.74	1517886.19	GRD	4948.55
63	1484660.07	1517672.85	GRD	4948.75

NO.	DELTA	RADIUS	LEN.
1	100°28'35"	4.00	7.01
2	46°40'44"	4.00	3.26
3	85°46'33"	2.00	2.99
4	85°46'33"	4.00	5.99
5	85°46'33"	4.00	5.99
6	89°45'32"	2.00	3.13
7	37°18'35"	4.00	2.60
8	30°02'54"	16.16	8.48
9	89°45'32"	7.00	10.97
10	49°04'32"	2.58	2.21
11	124°15'20"	3.24	7.02
12	14°48'01"	45.49	11.75
13	15°46'36"	35.46	9.76
14	21°50'00"	124.01	47.26
15	13°22'51"	198.38	46.33
16	51°20'48"	1.86	1.66
17	108°03'08"	1.47	2.76
18	18°33'55"	43.73	14.17
19	116°29'49"	5.09	10.36
20	19°55'32"	31.77	11.05
21	149°41'05"	4.51	11.79
22	61°15'15"	91.89	98.24
23	39°16'03"	88.08	60.37
24	144°43'35"	4.52	11.42

GRD PROPOSED GROUND
PC PROPOSED POINT OF CURVATURE
PCC PROPOSED POINT OF COMPOUND CURVATURE
PRC PROPOSED POINT OF REVERSE CURVATURE

 Smith Engineering Company A Full Service Engineering Company 3005 San Pedro Boulevard, S.E., Bldg. #4, Suite 200 Albuquerque, New Mexico 87110				DATE	DESIGNED BY	DRAWN BY	CHECKED BY
				NO.			
CITY OF ALBUQUERQUE ALBUQUERQUE BIOPARK							
TITLE: AUSTRALIAN EXHIBIT, PHASE II SITE DATA TABLES							
Design Review Committee	City Engineer Approval	Last Design Update	No. / Day / Yr.	No. / Day / Yr.			
Project No. 124801	Zone Map No. K-13-Z	Sheet No. C.1.C	Drawing No.	Of	3	3	