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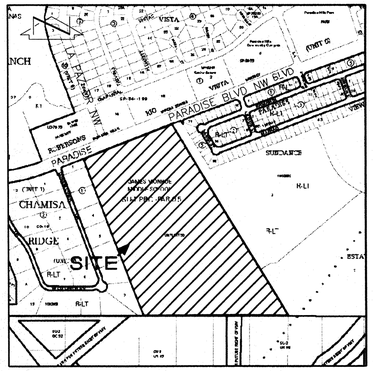
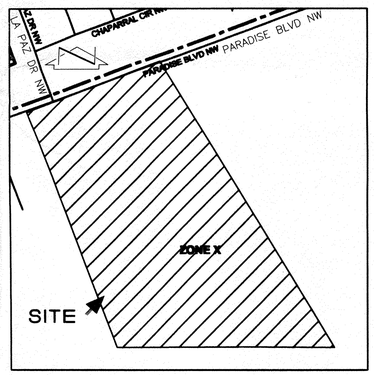


(D2) VICINITY MAP B-10
SCALE: 1" = 750'



(B2) F.I.R.M. PANEL 104 OF 825
SCALE: 1" = 500'

MASTER DRAINAGE REPORT

I. EXECUTIVE SUMMARY AND INTRODUCTION

THE JAMES MONROE MIDDLE SCHOOL SITE LIES IN A RAPIDLY DEVELOPING AREA OF ALBUQUERQUE'S NORTHWEST MESA. THIS SITE IS AN UNPLATTED TRACT ENCOMPASSING APPROXIMATELY 40 ACRES ON WHICH ALBUQUERQUE PUBLIC SCHOOLS (APS) PLANS TO CONSTRUCT A NEW ELEMENTARY SCHOOL AT THE SOUTHERN PORTION OF THE PROPERTY THAT ALREADY HOSTS THE JAMES MONROE MIDDLE SCHOOL. AT THE TIME OF THE JAMES MONROE MIDDLE SCHOOL INITIAL CONSTRUCTION, DEVELOPED RUNOFF WAS DRAINED TO TEMPORARY RETENTION PONDS ALONG PARADISE BOULEVARD NW UNTIL DEVELOPMENT OF PARADISE BOULEVARD NW PUBLIC INFRASTRUCTURE, WHICH WOULD ALLOW FOR THE FLOWS TO ENTER A FUTURE PUBLIC STORM DRAIN. IN 2005, ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY (AMAFCA) AGREED TO CONSTRUCT A STORM DRAINAGE OUTLET NEAR LYONS BOULEVARD NW AND PARADISE BOULEVARD NW AS PART OF THE PIEDRAS MERCADAS DIVERSION STORM DRAIN PROJECT CONCURRENT WITH A COST SHARING AGREEMENT WITH THE AFFECTED PROPERTY DEVELOPERS THAT DRAIN TO THE OUTFALL. THE PARTICIPATING PROPERTY OWNERS AGREED TO DESIGN AND CONSTRUCT THE CHAMISA MASTER STORM DRAIN.

THE PURPOSE OF THIS SUBMITTAL IS TO UPDATE THE DRAINAGE REQUIREMENTS FOR THE PROPERTY, AND OBTAIN GRADING AND PAVING PERMITS FOR ONSITE PRIVATE ROADWAY AND STORM DRAIN IMPROVEMENTS TO SUPPORT THE NEW ELEMENTARY SCHOOL. THIS SUBMITTAL WILL ALSO PROVIDE A BASIS TO RELEASE (OR VACATE) EXISTING PUBLIC DRAINAGE EASEMENTS ON THE PROPERTY AND TO PROVIDE A BASIS FOR GRANTING A PERMANENT PUBLIC DRAINAGE EASEMENT FOR THE ULTIMATE CONSTRUCTION OF PUBLIC DRAINAGE FACILITIES ON THE SUBJECT PROPERTY.

II. PROJECT DESCRIPTION

AS SHOWN BY VICINITY MAP B-10, THE SITE IS LOCATED ON ALBUQUERQUE'S NORTHWEST MESA ALONG THE SOUTH RIGHT-OF-WAY OF PARADISE BOULEVARD NW, APPROXIMATELY 0.6 MILE EAST OF THE INTERSECTION WITH UNIVERSE BOULEVARD NW. PARADISE BOULEVARD NW IS CURRENTLY DEVELOPED WITH TEMPORARY PAVEMENT, AND PERMANENT WATER AND SANITARY SEWER MAINS. CHAMISA RIDGE SUBDIVISION IS COMPLETE AT THE WEST BOUNDARY. THE PROPERTIES ALONG THE EASTERN AND SOUTHERN BOUNDARIES OF THE TRACT REMAIN UNDEVELOPED. AS SHOWN BY PANEL 104 OF 825 OF THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAPS, BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS, DATED NOVEMBER 19, 2003, THIS PROPERTY DOES NOT LIE WITHIN A DESIGNATED FLOOD HAZARD ZONE.

III. BACKGROUND DOCUMENTS

THE FOLLOWING IS A LIST OF DOCUMENTS RELATED TO THE SITE AND SURROUNDING AREA. THIS LIST MAY NOT BE ALL INCLUSIVE, HOWEVER, REPRESENTS A SUMMARY OF RELEVANT PLANS AND DOCUMENTS WHICH ARE KNOWN TO THE ENGINEER AT THE TIME OF PLAN PREPARATION.

A. GRADING AND DRAINAGE REPORT DATED MAY 12, 2000 PREPARED BY BOHANNAN-HUSTON FOR APS WITH THE INTENT OF OBTAINING A BUILDING PERMIT FOR THE CONSTRUCTION OF THE NORTHWEST MESA MIDDLE SCHOOL (A.K.A. JAMES MONROE MIDDLE SCHOOL). THIS DOCUMENT PROVIDED THE EXISTING BASIN BOUNDARIES AND HYDROLOGIC CALCULATIONS USED IN THIS PLAN.

B. PUBLIC DRAINAGE EASEMENT GRANTED BY DOCUMENT FILED APRIL 19, 2001, BOOK A19, PAGE 1967, DOCUMENT 2001043516. THIS DOCUMENT IDENTIFIES THE MEATS AND BOUNDS OF THE EASEMENT WHICH ENCUMBERS THE SUBJECT PROPERTY.

C. CHAMISA MASTER STORM DRAIN DRAINAGE IMPROVEMENT AGREEMENT DATED DECEMBER 9, 2004 AMONG AMAFCA, THE CITY, APS AND PARTICIPATING LAND DEVELOPERS. THIS DOCUMENT DEMONSTRATES THE PARTICIPATION OF THE DEVELOPERS AND THE ABILITY TO DRAIN DEVELOPED RUNOFF TO THE FUTURE SYSTEM.

D. DRAINAGE REPORT DATED DECEMBER 22, 2004 PREPARED BY TIERRA WEST, LLC FOR THE INTENT OF THE DEVELOPMENT OF THE CHAMISA RIDGE SUBDIVISION PHASE 2. THIS DOCUMENT IDENTIFIES THE DEVELOPMENT OF ADJACENT PROPERTY.

E. COOPERATIVE FUNDING, CONSTRUCTION AND MAINTENANCE AGREEMENT FOR THE LYON BOULEVARD STORM DRAIN EXTENSION PROJECT DATED FEBRUARY 8, 2005 AMONG AMAFCA, THE CITY OF ALBUQUERQUE (THE CITY), BERNALILLO AND SANDOVAL COUNTIES, APS, AND PARTICIPATING LAND DEVELOPERS. THIS DOCUMENT IS INTEGRAL TO THE CHAMISA MASTER STORM DRAIN DRAINAGE IMPROVEMENT AGREEMENT IDENTIFIED PREVIOUSLY.

THE PROPOSED DRAINAGE CONCEPT OF CONVEYING DEVELOPED RUNOFF TO A PERMANENT DETENTION POND TO BE MAINTAINED BY THE CITY AND LOCATED AT THE SOUTHEAST CORNER OF THE PROPERTY AS DESCRIBED HEREIN IS IN ACCORDANCE WITH THE POLICIES AND REQUIREMENTS OF THE ABOVE LISTED DOCUMENTS.

IV. EXISTING CONDITIONS

THE UNPLATTED LANDS OF APS AS DESCRIBED HEREIN IS DEVELOPED WITH THE JAMES MONROE MIDDLE SCHOOL ON THE NORTHERLY PORTION OF THE PROPERTY. THE SOUTHERN PORTION OF THE SITE IS UNDEVELOPED WITH SPARSE GROUND COVER AND NATIVE VEGETATION. THE DRAINAGE REPORT PREPARED BY BOHANNON-HUSTON FOR THE CONSTRUCTION OF THE MIDDLE SCHOOLS DIVIDED THE PROPERTY INTO FOUR DRAINAGE BASINS DESIGNATED AS 'A' THROUGH 'D'. BASINS 'A' THROUGH 'C' TREAT THE DEVELOPED RUNOFF BY DIVERTING IT TO THREE TEMPORARY RETENTION PONDS LOCATED ALONG PARADISE BOULEVARD NW. THESE PONDS ALSO ACCEPT INTERIM OFFSITE FLOWS GENERATED BY THE PARADISE BOULEVARD NW ROW. BASIN 'D' IS DESIGNATED AS THE UNDEVELOPED PORTION OF THE PROPERTY SOUTH OF THE DEVELOPED SCHOOL. AT THE TIME OF PLAN PREPARATION, THE BOHANNAN-HUSTON REPORT IDENTIFIED OFFSITE FLOWS ENTERING BASIN 'D' AT THE WESTERN BOUNDARY. PHASE 2 OF THE CHAMISA RIDGE SUBDIVISION HAS BEEN CONSTRUCTED AT THE WESTERN BOUNDARY OF THE PROPERTY SINCE. DEVELOPMENT OF CHAMISA RIDGE SUBDIVISION INCLUDED THE CONSTRUCTION OF A TEMPORARY RETENTION POND AT THE SOUTHEASTERN CORNER, WITH THE INTENT OF THE FACILITY BEING REMOVED ONCE THE CHAMISA MASTER STORM DRAIN IS CONSTRUCTED IN ACCORDANCE WITH THE BACKGROUND DOCUMENTS DESCRIBED HEREIN. THE OVERFLOW FOR THE TEMPORARY RETENTION POND IS LOCATED ALONG THE SOUTHERN BOUNDARY OF THE CHAMISA RIDGE SUBDIVISION, THEREFORE OFFSITE FLOWS NO LONGER IMPACTS THIS SITE FROM THE WEST. THE SOUTHERN BOUNDARY ABUTS UNPLATTED LANDS WITHIN THE ALAMEDA LAND GRANT AND TRACT 1 PARADISE HILLS (BULK LAND PLAT), WHICH ARE TOPOGRAPHICALLY LOWER THAN THIS SITE AND HENCE DO NOT CONTRIBUTE OFFSITE FLOWS. THE EASTERLY PROPERTY LINE ADJOINS THE BULK PLATTED LAND OF SUNDANCE ESTATES, WHICH IS ALSO TOPOGRAPHICALLY LOWER THAN THIS PROPERTY AND SIMILARLY DOES NOT CONTRIBUTE OFFSITE FLOWS. THE SUNDANCE ESTATES DEVELOPMENT IS SUBJECT TO THE COOPERATIVE AGREEMENTS FOR THE PIEDRAS MERCADAS DIVERSION STORM DRAIN OUTFALL AND THE CHAMISA MASTER STORM DRAIN PROJECT.

V. DEVELOPED CONDITIONS

THIS UNPLATTED LAND OF APS IS TO INCLUDE AN ELEMENTARY SCHOOL IN ADDITION TO THE EXISTING MIDDLE SCHOOL. DEVELOPED FLOWS FROM A PORTION OF THE EXISTING MIDDLE SCHOOL (DRAINAGE BASINS 'A' THROUGH 'C') AND THE PROPOSED ELEMENTARY SCHOOL (DRAINAGE BASIN 'D') WILL BE CONVEYED TO AN INTERIM RETENTION POND TO BE LOCATED AT THE SOUTHEAST PROPERTY CORNER. A NEW ACCESS ROAD WILL BE CONSTRUCTED FROM THE EXISTING EASTERLY PARADISE BOULEVARD NW SCHOOL ENTRANCE, ALONG THE PERIMETER OF THE EAST, SOUTH AND WEST PROPERTY LINES TO CONNECT AT THE EXISTING BUS LOOP AT THE SOUTHWEST QUADRANT OF THE MIDDLE SCHOOL. THE ACCESS ROAD WILL ALSO SERVE TO CONVEY SURFACE RUNOFF, AND PRIVATE STORM DRAIN FACILITIES UNDER THE ROAD WILL CONVEY RETENTION POND OVERFLOW FROM DRAINAGE BASINS 'A' AND 'B' TO THE NEW POND. DEVELOPED RUNOFF FROM THE ELEMENTARY SCHOOL SITE (DRAINAGE BASIN 'D') WILL BE CONVEYED TO THE NEW POND BY SURFACE DRAINAGE AND PRIVATE STORM DRAIN FACILITIES. DRAINAGE BASIN 'C' RUNOFF PATTERNS REMAIN UNCHANGED AND WILL CONTINUE TO DRAIN TO THE RETENTION POND LOCATED AT THE NORTHWEST PROPERTY CORNER.

THE PROPOSED TEMPORARY RETENTION POND AT THE SOUTHEAST PROPERTY CORNER IS INTENDED TO BE THE PERMANENT DETENTION POND HAVING 4.4 ACRE-FEET CAPACITY AS OUTLINED IN THE CHAMISA STORM DRAINAGE IMPROVEMENT AGREEMENT TO WHICH APS IS A PARTY. THE PROPOSED 4.67 ACRE-FT VOLUME OF THE POND IS GREATER THAN THE V100 10-DAY VOLUME OF 4.63 ACRE-FT REQUIRED FOR DRAINAGE BASIN 'D' (3.72 ACRE-FT) AND THE VOLUME DISPLACED IN THE EXISTING RETENTION POND IN BASIN 'A' REQUIRED FOR THE NEW ACCESS ROAD (0.91 ACRE-FT), AND IS GREATER THAN THE 4.4 ACRE-FT REQUIRED BY THE CHAMISA MASTER STORM DRAIN PLAN. UNTIL THE RECEIVING DOWNSTREAM STORM DRAIN FACILITIES ARE CONSTRUCTED, THE POND WILL ACT AS AN INTERIM RETENTION POND WITH A STRUCTURAL OVERFLOW SPILLWAY. THE OVERFLOW OF THE POND WILL BE LOCATED IN THE HISTORIC DISCHARGE POINT AT THE EAST PROPERTY LINE.

AN EXISTING PUBLIC DRAINAGE EASEMENT GRANTED BY DOCUMENT FILED APRIL 19, 2001, BOOK A19, PAGE 1967, DOCUMENT NO. 2001043516 COVERS THE SOUTHWESTERLY QUADRANT FOR THE PURPOSE OF CONVEYING OFFSITE FLOWS FROM THE WEST AS OUTLINED IN THE BOHANNON-HUSTON REPORT ASSOCIATED WITH THE CONSTRUCTION OF THE MIDDLE SCHOOL. THIS EASEMENT MUST BE RELEASED (OR VACATED) TO ACCOMMODATE THE DEVELOPMENT OF THE ELEMENTARY SCHOOL. THIS IS SUPPORTED BY:

1. THE OFFSITE FLOWS DESCRIBED IN THE BOHANNAN-HUSTON REPORT DATED MAY, 2000 HAVE BEEN INTERCEPTED BY THE DEVELOPMENT OF THE CHAMISA RIDGE SUBDIVISION
2. THE DRAINAGE OUTFALL CONDITION HAS CHANGED SINCE THE ORIGINAL DEVELOPMENT OF THE MIDDLE SCHOOL.
3. A PUBLIC DRAINAGE EASEMENT WITH A DIFFERENT CONFIGURATION IS REQUIRED TO ACCOMMODATE THE PROPOSED PUBLIC DRAINAGE FACILITIES OUTLINED IN THE CHAMISA MASTER STORM DRAIN DRAINAGE IMPROVEMENT AGREEMENT DATED DECEMBER 9, 2004.

AS DISCUSSED HEREIN, A PUBLIC DRAINAGE EASEMENT WILL BE GRANTED TO ENCOMPASS THE PROPOSED PUBLIC DRAINAGE IMPROVEMENTS OUTLINED IN THE AGREEMENT, EITHER BY SEPARATE INSTRUMENT OR BY PLATTING ACTION.

VI. DRAINAGE SITE PLAN

THE DRAINAGE SITE PLAN ON SHEETS 3 AND 4 SHOWS: 1) EXISTING GRADES INDICATED BY CONTOURS AT 1 FOOT INTERVALS FROM A TOPOGRAPHIC SURVEY DATED JULY, 2007 PREPARED BY THIS OFFICE, 2) BOUNDARY AND EASEMENT DATA FROM A BOUNDARY SURVEY DATED JULY 13, 2007 CONDUCTED BY THIS OFFICE, 3) THE LIMIT AND CHARACTER OF EXISTING IMPROVEMENTS AS SHOWN BY THE AFOREMENTIONED TOPOGRAPHIC SURVEY, 4) THE LIMIT AND CHARACTER OF THE PROPOSED PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS AND ACCESS ROAD TO SERVE THE PARCEL, AND 5) THE PROPOSED LIMITS OF THE PUBLIC DRAINAGE EASEMENT.

VII. CALCULATIONS

THE 100-YEAR, 6-HOUR RAINFALL EVENT. THE PROCEDURE FOR 40-ACRE AND SMALLER BASINS, AS SET FORTH THE CALCULATIONS APPEARING HEREON ANALYZE BOTH THE EXISTING AND DEVELOPED CONDITIONS FOR

IN THE REVISION OF SECTION 22.2, HYDROLOGY OF THE DEVELOPMENT PROCESS MANUAL, VOLUME 2, DESIGN CRITERIA, DATED JANUARY, 1993, HAS BEEN USED TO QUANTIFY THE PEAK RATE OF DISCHARGE, AND VOLUME OF RUNOFF GENERATED. FLOWMASTER 6.0 BY HAESTAD METHODS WAS USED TO QUANTIFY THE OVERFLOW CAPACITY AND THE STORM DRAIN PIPE CAPACITIES. THE AVERAGE END AREA METHOD WAS USED TO QUANTIFY THE RETENTION POND VOLUMES.

VIII. CONCLUSIONS

A. THE PROPOSED SITE IMPROVEMENTS AND DRAINAGE CONCEPT ARE CONSISTENT WITH THE DEVELOPMENT CRITERIA ESTABLISHED BY PREVIOUSLY APPROVED PLANS FOR THE SITE (NORTHWEST MESA MS DRAINAGE REPORT; COOPERATIVE FUNDING, CONSTRUCTION AND MAINTENANCE AGREEMENT FOR THE LYON BOULEVARD STORM DRAIN EXTENSION PROJECT;
B. THE DEVELOPED OVERFLOW RUNOFF FROM DRAINAGE BASINS 'A' AND 'B' WILL BE CONVEYED CHAMISA MASTER STORM DRAIN DRAINAGE IMPROVEMENT AGREEMENT). VIA PRIVATE STORM DRAIN FROM THE EXISTING RETENTION PONDS TO THE NEW BASIN LOCATED AT THE SOUTHEAST CORNER OF THE PROPERTY.
C. DEVELOPED RUNOFF FROM THE ELEMENTARY SCHOOL DEVELOPMENT WITHIN DRAINAGE BASIN 'D' WILL BE CONVEYED TO THE NEW POND AT THE SOUTHEAST CORNER OF THE PROPERTY.
D. THE PROPOSED INTERIM RETENTION POND TO BE LOCATED AT THE SOUTHEAST CORNER OF THE PROPERTY IS SIZED TO ACCOMMODATE THE ULTIMATE SIZE OF THE PERMANENT DETENTION BASIN OF 4.4 ACRE-FEET AS OUTLINED BY THE CHAMISA STORM DRAIN DRAINAGE IMPROVEMENT AGREEMENT.
E. THE FUTURE CHAMISA STORM DRAIN PROJECT WILL CONVERT THE INTERIM RETENTION BASIN TO THE PERMANENT DETENTION BASIN, AND THE FACILITY IS SUBJECT TO A PUBLIC DRAINAGE EASEMENT FOR MAINTENANCE AND OPERATION.
F. THE PROPERTY IS SUBJECT TO A PUBLIC DRAINAGE EASEMENT FOR A PUBLIC STORM DRAIN EXTENSION BY THE CHAMISA MASTER STORM DRAIN PROJECT.
G. THE OUTFALL FOR THE CHAMISA STORM DRAIN PROJECT IS LYON BOULEVARD STORM DRAIN EXTENSION AND THE PIEDRAS MERCADAS DIVERSION STORM DRAIN PROJECT DOWNSTREAM TO BE CONSTRUCTED BY AMAFCA.
H. THE EXISTING DRAINAGE EASEMENT ENCUMBERING THE SITE DATED APRIL 19, 2001 NEEDS TO BE RELEASED OR VACATED TO ACCOMMODATE THE DEVELOPMENT OF THE ELEMENTARY SCHOOL.
I. THERE ARE NO DPM DESIGN VARIANCES ASSOCIATED WITH THIS PROJECT.

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08/31/2007

JAMES MONROE MIDDLE SCHOOL ELEMENTARY SCHOOL PROTOTYPE NO. 2

NO.	DATE	BY	REVISIONS

PROJECT No.	2006.186.7
DESIGNED BY	G.R.B.
DRAWN BY	C.F.A.
APPROVED BY	J.G.M.
SHEET TITLE	

MASTER DRAINAGE REPORT

C-101
SHEET 1 OF 5

File Path:	[redacted]
File Name:	618670R.DWG
Plot Date:	08-30-2007
Plot Time:	2:08 pm

CALCULATIONS

I. SITE CHARACTERISTICS

A. PRECIPITATION ZONE = 1

B. $P_{6,100} = P_{360} = 2.20$

C. TOTAL PROJECT AREA (A_T) = 1,726,932 SF

D. LAND TREATMENTS

1. EXISTING LAND TREATMENT

a. BASIN A TOTAL = 455,112 SF = 10.45 AC

TREATMENT	AREA (SF/AC)	%
B	62,179/1.43	14
C	67,738/1.56	15
D	325,195/7.47	71

b. BASIN B TOTAL = 277,500 SF = 6.37 AC

TREATMENT	AREA (SF/AC)	%
B	58,465/1.34	21
C	111,385/2.56	40
D	107,650/2.47	39

c. BASIN C TOTAL = 83,528 SF = 1.92 AC

TREATMENT	AREA (SF/AC)	%
B	8,353/0.19	10
C	62,646/1.44	75
D	12,529/0.29	15

d. BASIN D TOTAL = 910,792 SF = 20.91 AC

TREATMENT	AREA (SF/AC)	%
A	546,475/12.55	60
B	182,158/4.18	20
C	91,080/2.09	10
D	91,079/2.09	10

2. DEVELOPED LAND TREATMENT

a. BASIN A TOTAL = 682,938 SF = 15.68 AC

TREATMENT	AREA (SF/AC)	%
B	62,179/1.43	14
C	67,738/1.56	15
D	325,195/7.47	71

b. BASIN B TOTAL = 914,995 SF = 21.01 AC

TREATMENT	AREA (SF/AC)	%
B	58,465/1.34	21
C	111,385/2.56	40
D	107,650/2.47	39

c. BASIN C TOTAL = 83,528 SF = 1.92 AC

TREATMENT	AREA (SF/AC)	%
B	8,353/0.19	10
C	62,646/1.44	75
D	12,529/0.29	15

d. BASIN D TOTAL = 910,792 SF = 20.91 AC

TREATMENT	AREA (SF/AC)	%
B	227,698/5.23	25
C	227,698/5.23	25
D	455,396/10.45	50

II. HYDROLOGY

A. EXISTING CONDITION

1. BASIN A

a. VOLUME
$E_W = (E_{AA}+E_{BA}+E_{CA}+E_{DA})/A_T$
$E_W = ((0.00*0.44) + (1.43*0.67) + (1.56*0.99) + (7.47*1.97)/10.45 = 1.65$ IN
$V_{100} = (E_W/12)A_T = (1.65/12)10.45 = 1.43$ AC-FT = 62,446 CF

$V_{10\text{-DAY}} = (V_{100}) + A_D(P_{10\text{-DAY}} - P_{360})/12 = 2.35$ AC-FT = 102,283 CF

b. PEAK DISCHARGE
$Q_P = Q_{PAA}+Q_{PBA}+Q_{PCA}+Q_{PDA}$
$Q_P = Q_{100} = ((0.00*1.29) + (1.43*2.03) + (1.56*2.87) + (7.47*4.37)) = 40.0$ CFS

2. BASIN B

a. VOLUME
$E_W = (E_{AA}+E_{BA}+E_{CA}+E_{DA})/A_T$
$E_W = ((0.00*0.44) + (1.34*0.67) + (2.56*0.99) + (2.47*1.97)/6.37 = 1.30$ IN
$V_{100} = (E_W/12)A_T = (1.30/12)6.37 = 0.69$ AC-FT = 30,126 CF

$V_{10\text{-DAY}} = (V_{100}) + A_D(P_{10\text{-DAY}} - P_{360})/12 = 0.99$ AC-FT = 43,313 CF

b. PEAK DISCHARGE
$Q_P = Q_{PAA}+Q_{PBA}+Q_{PCA}+Q_{PDA}$
$Q_P = Q_{100} = ((0.00*1.29) + (1.34*2.03) + (2.56*2.87) + (2.47*4.37)) = 20.9$ CFS

3. BASIN C

a. VOLUME
$E_W = (E_{AA}+E_{BA}+E_{CA}+E_{DA})/A_T$
$E_W = ((0.00*0.44) + (0.19*0.67) + (1.44*0.99) + (0.29*1.97)/1.92 = 1.10$ IN
$V_{100} = (E_W/12)A_T = (1.10/12)1.92 = 0.18$ AC-FT = 7,692 CF

$V_{10\text{-DAY}} = (V_{100}) + A_D(P_{10\text{-DAY}} - P_{360})/12 = 0.21$ AC-FT = 9,226 CF

b. PEAK DISCHARGE
$Q_P = Q_{PAA}+Q_{PBA}+Q_{PCA}+Q_{PDA}$
$Q_P = Q_{100} = ((0.00*1.29) + (0.19*2.03) + (1.44*2.87) + (0.29*4.37)) = 5.8$ CFS

4. BASIN D

a. VOLUME
$E_W = (E_{AA}+E_{BA}+E_{CA}+E_{DA})/A_T$
$E_W = ((12.55*0.44) + (4.18*0.67) + (2.09*0.99) + (2.09*1.97)/20.91 = 0.69$ IN
$V_{100} = (E_W/12)A_T = (0.69/12)20.91 = 1.21$ AC-FT = 52,674 CF

b. PEAK DISCHARGE
$Q_P = Q_{PAA}+Q_{PBA}+Q_{PCA}+Q_{PDA}$
$Q_P = Q_{100} = ((12.55*1.29) + (4.18*2.03) + (2.09*2.87) + (2.09*4.37)) = 39.8$ CFS

B. DEVELOPED CONDITION

1. BASIN A

a. VOLUME
$E_W = (E_{AA}+E_{BA}+E_{CA}+E_{DA})/A_T$
$E_W = ((0.00*0.44) + (1.43*0.67) + (1.56*0.99) + (7.47*1.97)/10.45 = 1.65$ IN
$V_{100} = (E_W/12)A_T = (1.65/12)10.45 = 1.43$ AC-FT = 62,446 CF

$V_{10\text{-DAY}} = (V_{100}) + A_D(P_{10\text{-DAY}} - P_{360})/12 = 2.35$ AC-FT = 102,283 CF

b. PEAK DISCHARGE
$Q_P = Q_{PAA}+Q_{PBA}+Q_{PCA}+Q_{PDA}$
$Q_P = Q_{100} = ((0.00*1.29) + (1.43*2.03) + (1.56*2.87) + (7.47*4.37)) = 40.0$ CFS

2. BASIN B

a. VOLUME
$E_W = (E_{AA}+E_{BA}+E_{CA}+E_{DA})/A_T$
$E_W = ((0.00*0.44) + (1.34*0.67) + (2.56*0.99) + (2.47*1.97)/6.37 = 1.30$ IN
$V_{100} = (E_W/12)A_T = (1.30/12)6.37 = 0.69$ AC-FT = 30,126 CF

$V_{10\text{-DAY}} = (V_{100}) + A_D(P_{10\text{-DAY}} - P_{360})/12 = 0.99$ AC-FT = 43,313 CF

b. PEAK DISCHARGE
$Q_P = Q_{PAA}+Q_{PBA}+Q_{PCA}+Q_{PDA}$
$Q_P = Q_{100} = ((0.00*1.29) + (1.34*2.03) + (2.56*2.87) + (2.47*4.37)) = 20.9$ CFS

3. BASIN C

a. VOLUME
$E_W = (E_{AA}+E_{BA}+E_{CA}+E_{DA})/A_T$
$E_W = ((0.00*0.44) + (0.19*0.67) + (1.44*0.99) + (0.29*1.97)/1.92 = 1.10$ IN
$V_{100} = (E_W/12)A_T = (1.10/12)1.92 = 0.18$ AC-FT = 7,692 CF

$V_{10\text{-DAY}} = (V_{100}) + A_D(P_{10\text{-DAY}} - P_{360})/12 = 0.21$ AC-FT = 9,226 CF

b. PEAK DISCHARGE
$Q_P = Q_{PAA}+Q_{PBA}+Q_{PCA}+Q_{PDA}$
$Q_P = Q_{100} = ((0.00*1.29) + (0.19*2.03) + (1.44*2.87) + (0.29*4.37)) = 5.8$ CFS

4. BASIN D

a. VOLUME
$E_W = (E_{AA}+E_{BA}+E_{CA}+E_{DA})/A_T$
$E_W = ((0.00*0.44) + (5.23*0.67) + (5.23*0.99) + (10.45*1.97)/20.91 = 1.40$ IN
$V_{100} = (E_W/12)A_T = (1.40/12)20.91 = 2.44$ AC-FT = 106,259 CF

$V_{10\text{-DAY}} = (V_{100}) + A_D(P_{10\text{-DAY}} - P_{360})/12 = 3.72$ AC-FT = 162,045 CF

b. PEAK DISCHARGE
$Q_P = Q_{PAA}+Q_{PBA}+Q_{PCA}+Q_{PDA}$
$Q_P = Q_{100} = ((0.00*1.29) + (5.23*2.03) + (5.23*2.87) + (10.45*4.37)) = 71.3$ CFS

C. COMPARISON

1. BASIN A

a. VOLUME
$\Delta V_{100} = 62,446 - 62,446 = -$ CF (NO CHANGE)

b. PEAK DISCHARGE
$\Delta Q_{100} = 40.0 - 40.0 = -$ CFS (NO CHANGE)

2. BASIN B

a. VOLUME
$\Delta V_{100} = 30,126 - 30,126 = -$ CF (NO CHANGE)

b. PEAK DISCHARGE
$\Delta Q_{100} = 20.9 - 20.9 = -$ CFS (NO CHANGE)

3. BASIN C

a. VOLUME
$\Delta V_{100} = 7,692 - 7,692 = -$ CF (NO CHANGE)

b. PEAK DISCHARGE
$\Delta Q_{100} = 5.8 - 5.8 = -$ CFS (NO CHANGE)

4. BASIN D

a. VOLUME
$\Delta V_{100} = 106,259 - 52,674 = 53,585$ CF (INCREASE)

b. PEAK DISCHARGE
$\Delta Q_{100} = 71.3 - 39.8 = 31.5$ CFS (INCREASE)

III. HYDRAULIC CALCULATIONS

A. CONCRETE SPILLWAY/OVERFLOW CALCULATIONS

WEIR CALCULATIONS BY HAESTAD METHODS FLOWMASTER 6.0

BASIN DESCRIPTION	DISCHARGE (CFS)	HEADWATER HEIGHT (FT)	CREST LENGTH (FT)	FLOW AREA (SF)	VELOCITY (FT/S)
BASIN D POND OVERFLOW	132.2	1	40	40.0	3.3

B. PIPE CAPACITY CALCULATIONS

PIPE CAPACITY CALCULATIONS BY HAESTAD METHODS FLOWMASTER 6.0

BASIN DESCRIPTION	DIAMETER (IN)	SLOPE (FT/FT)	n	PIPE CAPACITY (CFS)	
BASINS A & B TO BASIN D	36	0.0090	0.013	68.0	> Q_{100} = 60.9 CFS
BASIN D	36	0.0110	0.013	75.2	> Q_{100} = 71.2 CFS
BASINS A, B & D TO POND	48	0.0090	0.013	147.2	> Q_{100} =132.1 CFS

C. POND VOLUME CALCULATIONS

USING AVERAGE END AREA METHOD

1. EXISTING BASIN A RETENTION POND

ELEVATION	AREA (SF)	VOLUME (CF)	TOTAL VOLUME (CF)	TOTAL VOLUME (AC-FT)
5375	5,080		–	
5376	19,300	12,190	12,190	0.28
5377	24,500	21,900	34,090	0.78
5378	27,875	26,188	60,278	1.38

C. POND VOLUME CALCULATIONS (CONTINUED)

2. MODIFIED BASIN A RETENTION POND (PROPOSED)

ELEVATION	AREA (SF)	VOLUME (CF)	TOTAL VOLUME (CF)	TOTAL VOLUME (AC-FT)
5375	5,080		–	
5376	11,510	8,295	8,295	0.19
5377	13,275	12,393	20,688	0.47

3. CHAMISA MASTER STORM DRAIN SURGE POND/TEMPORARY RETENTION POND (BASIN D)

ELEVATION	AREA (SF)	VOLUME (CF)	TOTAL VOLUME (CF)	TOTAL VOLUME (AC-FT)
5358.6	–		–	
5359	1,875	938	938	0.02
5360	9,920	5,898	6,835	0.16
5361	27,980	18,950	25,785	0.59
5362	52,350	40,165	65,950	1.51
5363	69,775	61,063	127,013	2.92
5364	83,130	76,453	203,465	4.67

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08-31-2007

JAMES MONROE MIDDLE SCHOOL
ELEMENTARY SCHOOL PROTOTYPE NO. 2

NO.	DATE	BY	REVISIONS

PROJECT No.	2006.186.7
DESIGNED BY	G.R.B.
DRAWN BY	C.F.A.
APPROVED BY	J.G.M.

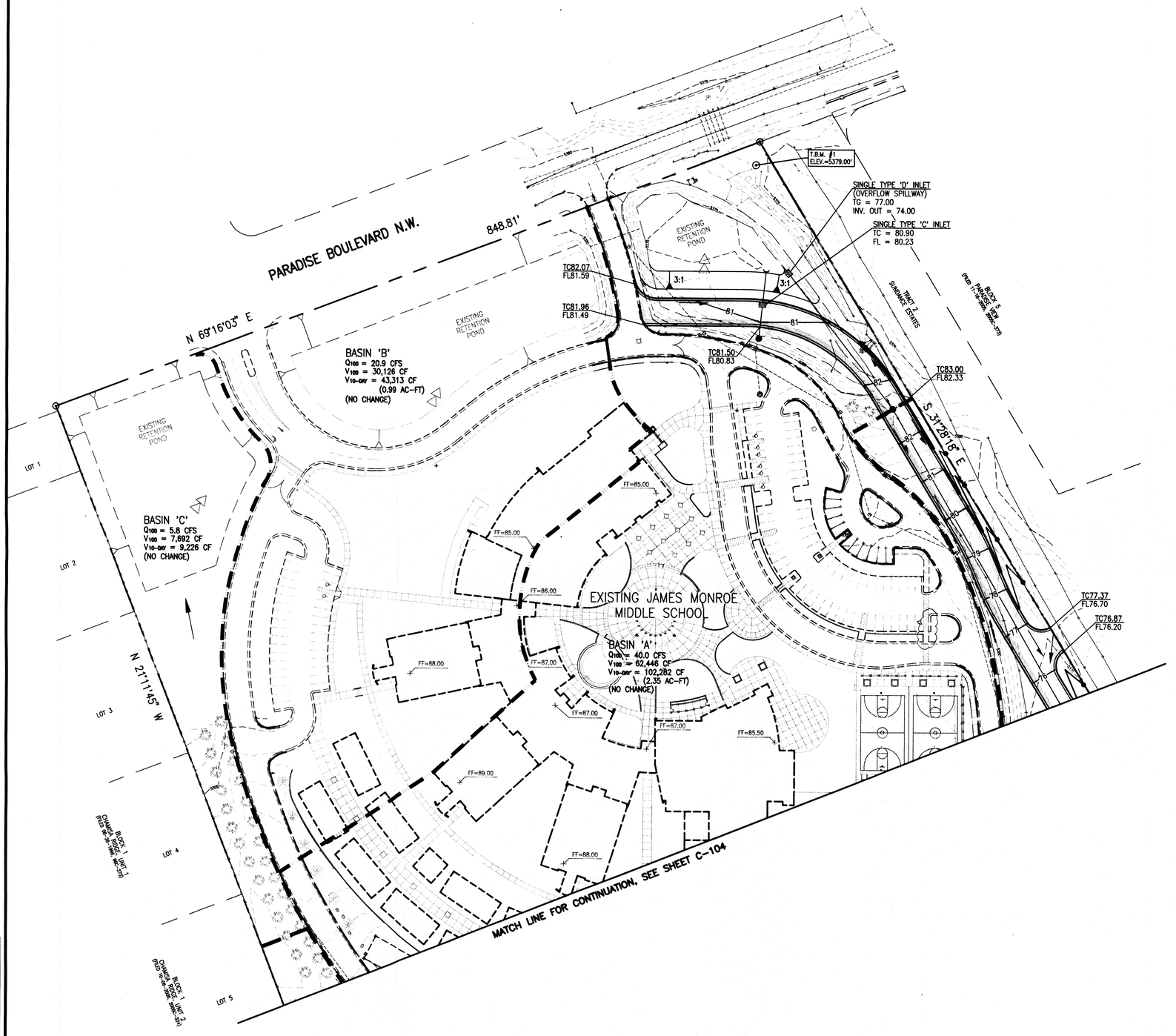
SHEET TITLE

MASTER DRAINAGE REPORT

C-102

SHEET 2 OF 5

File Path: [redacted] | Plot Date: 08-30-2007
File Name: 61867HC.DWG | Plot Time: 2:43 pm



A1 DRAINAGE SITE PLAN (NORTH)
SCALE: 1" = 60'

LEGAL DESCRIPTION

A CERTAIN TRACT OF LAND LOCATED WITHIN THE CORPORATE LIMITS OF THE CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO, COMPRISING A PORTION OF PROJECTED SECTION 10, TOWNSHIP 11 NORTH, RANGE 2 EAST N.M.P.M. (TOWN OF ALAMEDA GRANT), BEING AN UNPLATTED TRACT OF LAND (UPC NO. 101006534808040710) AS DESCRIBED BY A WARRANTY DEED FILED IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO ON DECEMBER 07, 1972, BOOK D932, PAGE 460, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF THE PARCEL HEREIN DESCRIBED, BEING THE SOUTHEAST PROPERTY CORNER OF LOT 8, BLOCK 1, CHAMISA RIDGE, UNIT 2, AS THE SAME IS SHOWN AND DESIGNATED ON THE PLAT FILED IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO ON OCTOBER 06, 2005, BOOK 2005C, PAGE 324, ALSO BEING A POINT ON THE NORTH PROPERTY LINE OF TRACT 1, PARADISE HILLS, AS THE SAME IS SHOWN AND DESIGNATED ON THE BULK LAND PLAT FILED IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO ON AUGUST 17, 1981, BOOK C18, PAGE 157 WHENCE THE USGLO/ACS CONTROL STATION STAMPED "T11N, R2E, S15, S14, S22, S23, 1911" BEARS S 45°37'48" E A DISTANCE OF 4676.86 FEET; THENCE N 21°11'45" W A DISTANCE OF 1492.46 FEET TO THE NORTHWEST CORNER OF THE PARCEL HEREIN DESCRIBED, BEING AN ANGLE POINT ON THE SOUTH RIGHT-OF-WAY LINE OF PARADISE BOULEVARD N.W.; THENCE N 69°16'03" E A DISTANCE OF 848.81 FEET ALONG SAID SOUTH RIGHT-OF-WAY LINE TO THE NORTHEAST CORNER OF THE PARCEL HEREIN DESCRIBED, BEING THE NORTHWEST PROPERTY CORNER OF TRACT 2, SUNDANCE ESTATES, AS THE SAME IS SHOWN AND DESIGNATED ON THE BULK LAND PLAT FILED IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO ON DECEMBER 13, 2004, BOOK 2004C, PAGE 385; THENCE S 31°28'18" E A DISTANCE OF 1988.00 FEET TO THE SOUTHEAST CORNER OF THE PARCEL HEREIN DESCRIBED, BEING THE SOUTHWEST PROPERTY CORNER OF TRACT 7, OF SAID SUNDANCE ESTATES; THENCE N 89°50'27" W A DISTANCED OF 1292.11 FEET TO THE POINT OF BEGINNING AND CONTAINING 39.6451 ACRES MORE OR LESS.

BENCHMARKS

PROJECT BENCHMARK

ACS 1 3/4" ALUMINUM DISK STAMPED "ACS BM, 11-B10", EPOXIED TO TOP OF NORTH CURB ON PARADISE BOULEVARD N.W., 7 FEET WEST OF THE CENTERLINE OF BIG SAGE N.W. (CENTERLINE EXTENDED TO NORTH CURB LINE USING CENTERLINE MONUMENTS ON BIG SAGE).
ELEVATION = 5403.61 FEET (NAVD 88)

T.B.M. #1

A REBAR #5 WITH JMA RED CAP STAMPED "NMPS #11184", AS SHOWN ON THIS SHEET.
ELEVATION = 5379.00 FEET (NAVD 88)

T.B.M. #2

A CHISELED "□" AT SOUTHEAST CORNER OF BASKETBALL COURT, AS SHOWN ON SHEET 4.
ELEVATION = 5383.45 FEET (NAVD 88)

SURVEY NOTE

THIS IS NOT A BOUNDARY SURVEY; DATA IS SHOWN FOR ORIENTATION ONLY. THE BOUNDARY INFORMATION DEPICTED BY THIS PLAN IS BASED UPON THE BOUNDARY SURVEY PREPARED BY HIGH MESA CONSULTING GROUP NMPS NO. 11184, DATED 7/13/07. TOPOGRAPHIC INFORMATION IS BASED UPON A TOPOGRAPHIC SURVEY PREPARED BY HIGH MESA CONSULTING GROUP DATED 7/13/07, NMPS NO. 11184 WITH RECORD SITE PLAN DATA (FROM APS) DEPICTED IN AREAS OUTSIDE THE TOPOGRAPHIC SURVEY LIMITS.

LEGEND

25.41	PROPOSED SPOT ELEVATION
25.41	EXISTING FLOWLINE ELEVATION
08	PROPOSED CONTOUR
08	EXISTING CONTOUR
	PROPOSED FLOWLINE
	ROOF DRAINAGE
	EXISTING ROOF DRAINAGE
	NEW BUILDING ENVELOPE
	RIGHT OF WAY LINE
	PUBLIC EASEMENT LINE
	PROPOSED CONCRETE
	HIGH POINT
INV	INVERT
TG	TOP OF GRATE
TC	TOP OF CURB
TA	TOP OF ASPHALT PAVEMENT
	PROPOSED SLOPE
	PROPOSED ASPHALT
	PROPOSED RIP-RAP
	PROPOSED BASIN BOUNDARY

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08-31-2007

JAMES MONROE MIDDLE SCHOOL
ELEMENTARY SCHOOL PROTOTYPE NO. 2

NO.	DATE	BY	REVISIONS

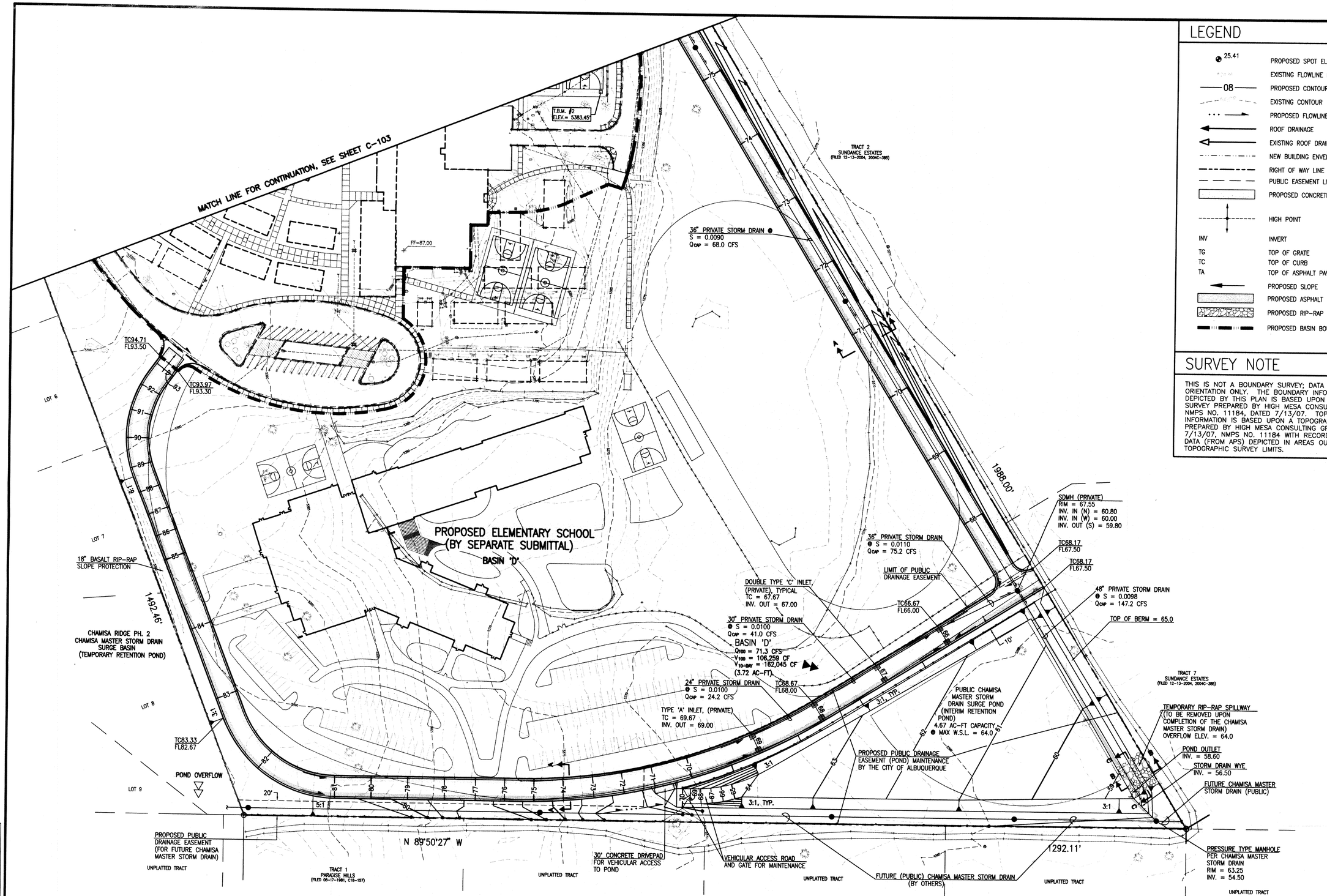
PROJECT No.	2006.186.7
DESIGNED BY	G.R.B.
DRAWN BY	C.F.A.
APPROVED BY	J.G.M.

SHEET TITLE

MASTER DRAINAGE REPORT

C-103
SHEET 3 OF 5

File Path: [redacted]
File Name: 6186705PN.DWG
Plot Date: 08-30-2007
Plot Time: 2:56 pm



LEGEND

25.41	PROPOSED SPOT ELEVATION
25.41	EXISTING FLOWLINE ELEVATION
08	PROPOSED CONTOUR
08	EXISTING CONTOUR
	PROPOSED FLOWLINE
	ROOF DRAINAGE
	EXISTING ROOF DRAINAGE
	NEW BUILDING ENVELOPE
	RIGHT OF WAY LINE
	PUBLIC EASEMENT LINE
	PROPOSED CONCRETE
	HIGH POINT
INV	INVERT
TG	TOP OF GRATE
TC	TOP OF CURB
TA	TOP OF ASPHALT PAVEMENT
	PROPOSED SLOPE
	PROPOSED ASPHALT
	PROPOSED RIP-RAP
	PROPOSED BASIN BOUNDARY

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A1 DRAINAGE SITE PLAN (SOUTH)
SCALE: 1" = 60'

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08-31-2007

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ELEMENTARY SCHOOL PROTOTYPE NO. 2

NO.	DATE	BY	REVISIONS

PROJECT No.	2006.186.7
DESIGNED BY	G.R.B.
DRAWN BY	C.F.A.
APPROVED BY	J.G.M.
SHEET TITLE	

MASTER DRAINAGE REPORT

C-104
SHEET 4 OF 5

File Path: [redacted] | Plot Date: 08-30-2007
File Name: 61867DSPS.DWG | Plot Time: 4:22 pm