CITY OF ALBUQUERQUE

PLANNING DEPARTMENT – Development Review Services

Richard J. Berry, Mayor

July 18, 2014

Bruce Stidworthy, PE
BOHANNAN-HUSTON, INC.
7500 Jefferson Street NE Courtyard I
Albuquerque, NM 87109

RE: **Affinity At Albuquerque Senior Housing** - McMahon & Finland
Drainage Plan for Site Development for Building Permit
Engineer's Stamp Date 7-3-2014 (File: A11D014)

Dear Mr. Stidworthy:

Based upon the information provided in your submittal received 7-3-14, the above referenced plan cannot be approved for Building Permit and Grading Permit. Please attach a copy of this approved plan in the construction sets when submitting for a building permit.

Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

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

Sincerely,

Rita Harmon, P.E.
Senior Engineer, Planning Dept.
Development Review Services

Orig: Drainage file
c.pdf: via Email: Recipient, Tim Sims, Monica Ortiz

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 02/2013)

Project Title: Affinity at Albuquerque Senior Housing Building Permit #: _____ City Drainage #: A11D014

DRB#: 1000875 EPC#: _____ Work Order#: _____

Legal Description: Lots B-1 & D-1, Fineland Development

City Address: Northeast corner of McMahon & Fineland

Engineering Firm: Bohannan Huston, Inc. Contact: Bruce Stidworthy or Matt Satches

Address: 7500 Jefferson St NE Courtyard 1

Phone#: (505) 823-1000 Fax#: (505) 798-7988 E-mail: bstidworthy@bhinc.com & msatches@bhinc.com

Owner: Inland Group Contact: Robert Ketner

Address: 1620 N. Mamer Rd Bldg. B, Spokane, Washington 99203

Phone#: (509) 321-3204 Fax#: (509) 922-2251 E-mail: robertk@inlandconstruction.com

Architect: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Surveyor: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Contractor: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

TYPE OF SUBMITTAL:

- ____ DRAINAGE REPORT
- ____ DRAINAGE PLAN 1st SUBMITTAL
- X DRAINAGE PLAN RESUBMITTAL
- ____ CONCEPTUAL G & D PLAN
- X GRADING PLAN
- ____ EROSION & SEDIMENT CONTROL PLAN (ESC)
- ____ ENGINEER'S CERT (HYDROLOGY)
- ____ CLOMR/LOMR
- ____ TRAFFIC CIRCULATION LAYOUT (TCL)
- ____ ENGINEER'S CERT (TCL)
- ____ ENGINEER'S CERT (DRB SITE PLAN)
- ____ ENGINEER'S CERT (ESC)
- ____ SO-19
- ____ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

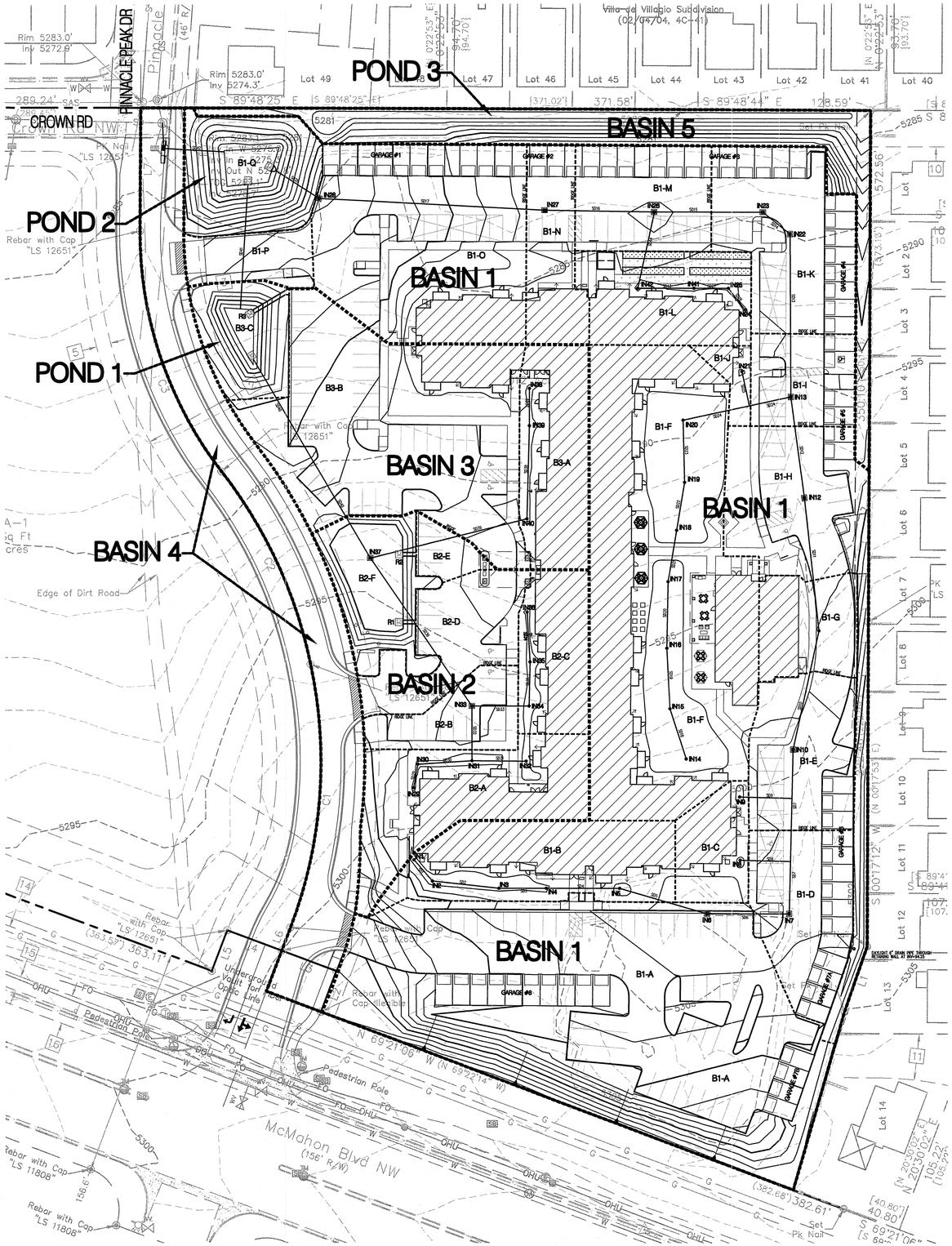
- ____ SIA/FINANCIAL GUARANTEE RELEASE
- ____ PRELIMINARY PLAT APPROVAL
- ____ S. DEV. PLAN FOR SUB'D APPROVAL
- ____ S. DEV. FOR BLDG. PERMIT APPROVAL
- ____ SECTOR PLAN APPROVAL
- ____ FINAL PLAT APPROVAL
- ____ CERTIFICATE OF OCCUPANCY (PERM)
- ____ CERTIFICATE OF OCCUPANCY (TCL TEMP)
- ____ FOUNDATION PERMIT APPROVAL
- X BUILDING PERMIT APPROVAL
- X GRADING PERMIT APPROVAL
- ____ PAVING PERMIT APPROVAL
- ____ WORK ORDER APPROVAL
- ____ GRADING CERTIFICATION
- ____ SO-19 APPROVAL
- ____ ESC PERMIT APPROVAL
- ____ ESC CERT. ACCEPTANCE
- ____ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED: ____ Yes X No ____ Copy Provided

DATE SUBMITTED: July 3, 2014 By: Matt Satches

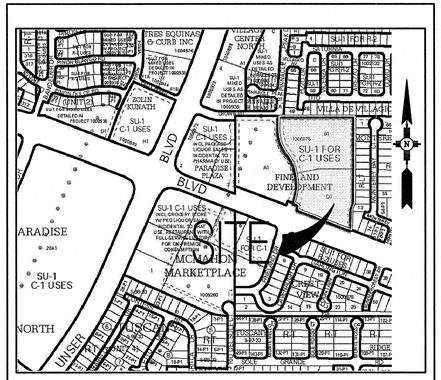
Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location, and scope to the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based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

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
4. **Erosion and Sediment Control Plan:** Required for any new development and redevelopment site with 1-acre or more of land disturbing area, including project less than 1-acre than are part of a larger common plan of development

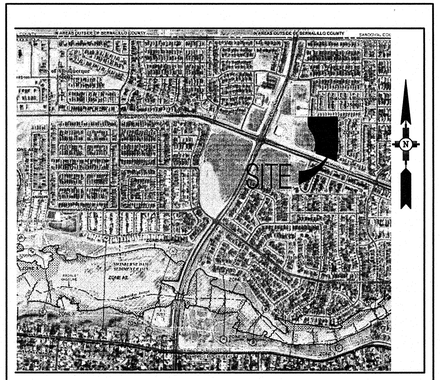


DRAINAGE MANAGEMENT PLAN

P:\20140292\CDP\Hydro\20140292DMP01.dwg
Thu, 3-Jul-2014 - 3:09:pm, Plotted by: MSATCHES



N.T.S. VICINITY MAP ZONE ATLAS A-11-Z



N.T.S. FIRM MAP NUMBER 35001C0104H

AFFINITY AT ALBUQUERQUE
Existing Conditions Basin Data Table

This table is based on the DPM Section 22.2, Zone: 1

Basin	Area	Area	Land Treatment Percentages				Q(100yr)	Q(100yr-6hr)	WT E	V(100yr-6hr)	V(100yr-10day)
ID	(SQ. FT)	(AC.)	A	B	C	D	(cfs/ac.)	(CFS)	(inches)	(CF)	CF
Existing											
1	288227	6.62	95.0%	0.0%	5.0%	0.0%	1.37	*9.06*	*0.47*	*11229*	*11229*
TOTAL	288227	6.62									*11228.844*

POND DATA

POND #1:

POND BOTTOM: 5283.0 FEET
POND VOLUME PROVIDED: 0.131 ACRE-FEET
POND VOLUME REQUIRED: 0.106 ACRE-FEET (PER AHYMO ANALYSIS)
MAX WATER SURFACE ELEVATION: 5287.0 FEET (PER AHYMO ANALYSIS) SPILL ELEVATION: 5287.5 FEET

POND #2:

POND BOTTOM: 5277.0 FEET
POND VOLUME PROVIDED: 0.342 ACRE-FEET
POND VOLUME REQUIRED: 0.308 ACRE-FEET (PER AHYMO ANALYSIS)
MAX WATER SURFACE ELEVATION: 5283.1 FEET (PER AHYMO ANALYSIS)
SPILL ELEVATION: 5283.5 FEET

POND #3:

POND BOTTOM: 5281.00 FEET
POND VOLUME REQUIRED: 0.0257 ACRE-FEET
POND VOLUME REQUIRED: 0.0239 ACRE-FEET (PER CHAPTER 22 DPM)
MAX WATER SURFACE ELEVATION: 5281.45 FEET (PER CHAPTER 22 DPM)
SPILL ELEVATION: 5281.50 FEET

INTRODUCTION:

THE PROJECT IS LOCATED NORTHWEST OF THE INTERSECTION OF MCMAHON BLVD AND UNSER BLVD. THIS SITE IS NOT WITHIN A DEFINED FLOOD ZONE AS SHOWN ON FIRM MAP NUMBER 35001C0104H (THIS SHEET). THE PURPOSE OF THIS SUBMITTAL IS TO PROVIDE A DRAINAGE MANAGEMENT PLAN FOR THE DEVELOPMENT OF AFFINITY AT ALBUQUERQUE SENIOR HOUSING AND REQUEST GRADING PERMIT AND BUILDING PERMIT APPROVAL.

EXISTING CONDITIONS:

THE 6.62 ACRE SITE IS CURRENTLY UNDEVELOPED. EXISTING FLOW IS APPROXIMATELY EQUAL TO 9.0 CFS. THE SITE SLOPES TO THE NORTH / NORTHWEST WHERE THE RUNOFF FLOWS INTO AN EXISTING 24"STORM DRAIN IN PINNACLE PEAK DRIVE.

BASED ON A DRAINAGE STUDY FOR VILLA DE VILLAGIO SUBDIVISION DATED FEBRUARY 10, 2003 (COA HYDRO FILE #A11/D9), ALLOWABLE PEAK DISCHARGE FROM THE SITE IS APPROXIMATELY 9.0 CFS.

METHODOLOGY:

THE HYDROLOGIC ANALYSIS PROVIDED WITH THIS DRAINAGE MANAGEMENT PLAN HAS BEEN PREPARED IN ACCORDANCE WITH SECTION 22.2 OF THE DPM. THE SITE IS LOCATED WEST OF THE RIO GRANDE WITHIN PRECIPITATION ZONE 1. ALTHOUGH THE SITE IS SMALL ENOUGH TO USE THE "SMALL WATERSHEDS" PROCEDURE GIVEN IN SECTION A.6, WE ELECTED TO USE AHYMO IN ORDER TO MODEL THE STORMWATER FLOWS THROUGH THE TWO PROPOSED PONDS ON THE SITE. LAND TREATMENT PERCENTAGES WERE CALCULATED BASED ON THE ACTUAL CONDITIONS IN EACH ONSITE BASIN AND ARE SUMMARIZED IN THE "DEVELOPED CONDITIONS BASIN DATA TABLE" ON SHEET C-101.

ALL ONSITE STORM DRAIN PIPES ARE BE SIZED BASED ON GRAVITY FLOW USING THE MANNING'S EQUATION. DETAILED CALCULATIONS FOR PIPES AND INLETS ARE PROVIDED ON SHEET C-101.

PROPOSED CONDITIONS:

ALLOWABLE DISCHARGE (PER COA HYDRO FILE #A11/D9): 9.0 CFS
ALLOWABLE DISCHARGE WITH FINELAND DRIVE (BASIN 4): 7.1 CFS
PROPOSED DISCHARGE: 6.5 CFS
DIFFERENCE BETWEEN ALLOWABLE AND PROPOSED: .6 CFS

THE ALLOWABLE DISCHARGE FROM THE SITE WAS FOUND TO BE APPROXIMATELY 7.1 CFS WHEN CONSIDERING THE RUNOFF FROM FINELAND DRIVE (BASIN 4). WITH THE DEVELOPMENT OF THE SITE, THE PROPOSED FLOW IS APPROXIMATELY 6.5 CFS WHICH IS LESS THAN THE ALLOWABLE DISCHARGE.

TO MITIGATE PEAK FLOWS GENERATED WITH PROPOSED CONDITIONS, TWO PONDS HAVE BEEN DESIGNED ONSITE. BOTH PONDS WERE ANALYZED USING AHYMO. DISCHARGE FROM THE PONDS WAS CALCULATED USING THE ORIFICE EQUATION. SEE TABLE 2, SHEET C-101 FOR DETAILED CALCULATIONS.

POND 2 IS LOCATED AT THE NORTHWEST CORNER OF THE SITE. THE PRIMARY DISCHARGE POINT FOR POND 2 IS A NEW STORM DRAIN TO BE CONNECTED TO AN EXISTING PUBLIC STORM DRAIN MANHOLE AT THE INTERSECTION OF PINNACLE PEAK AND CROWN ROAD. IN THE EVENT THAT THE DISCHARGE PIPE IS PLUGGED, OR IN THE EVENT OF A STORM LARGER THAN THE 100 YEAR STORM, THE POND WILL OVERFLOW TO THE RIGHT-OF-WAY OF FINELAND DRIVE (AKA PINNACLE PEAK). UNDER EXISTING CONDITIONS, THE TOP OF CURB ELEVATION OF PINNACLE PEAK AT THE INTERSECTION WITH CROWN ROAD IS APPROXIMATELY 5283.78. THE EXISTING GRADE ALONG THE NORTH PROPERTY LINE OF THE SITE (DELINEATED WITH AN EXISTING CMU WALL) WHICH ADJOINS EXISTING RESIDENTIAL LOTS, VARIES BETWEEN 5281 AND 5282. THEREFORE, THE EXISTING GRADE ALONG MOST OF THE NORTH PROPERTY LINE IS ABOUT 2' LOWER THAN THE TOP OF CURB OF PINNACLE PEAK. IN ORDER TO ENSURE THAT ANY OVERFLOW FROM POND 2 DOES NOT IMPACT THE RESIDENTIAL LOTS TO THE NORTH, WE ARE PROVIDING A CAST-IN-PLACE CONCRETE WALL ALONG THE NORTH SIDE OF POND 2. THE WALL WILL BE APPROXIMATELY 3' TALL, WITH A TOP-OF-WALL ELEVATION OF 5285.0.

BASIN 5 CONSISTS OF SMALL LANDSCAPED AREAS BEHIND THE GARAGES ON THE NORTH SIDE OF THE SITE AND A SMALL PORTION OF THE EAST SIDE OF THE SITE. THERE IS NO IMPERVIOUS AREA WITHIN BASIN 5. ALL OF THE GARAGE ROOFS DRAIN TO THE PARKING LOTS AND DRIVEWAYS. FLOWS FROM BASIN 5 (PEAK DISCHARGE IS LESS THAN 1.0 CFS) WILL BE RETAINED IN A SHALLOW WATER HARVESTING AREA WITHIN THE LANDSCAPED AREA NEAR THE NORTH PROPERTY LINE. THE TOTAL VOLUME FOR THE 100 YR - 10 DAY STORM WAS CALCULATED TO BE APPROXIMATELY 1010 CF BASED ON THE CALCULATION METHOD GIVEN IN CHAPTER 22 SECTION A5 OF THE DPM.

V_{360} = (.29 ACRES X .99 INCHES) / 12 = .0239 AC-FT (APPROX 1042 CF)
A_5 = 0
THEREFORE: V_{10DAY} = .0239 AC-FT (APPROX 1042 CF)

THE WATER HARVESTING AREA WAS SIZED TO BE APPROXIMATELY 1120CF, APPROXIMATELY 10% LARGER THAN THE TOTAL VOLUME REQUIRED.

CONCLUSION:

THE PEAK DISCHARGE FROM THE SITE IS 6.5 CFS WHICH IS LESS THAN THE ALLOWABLE PEAK DISCHARGE RATE, THEREFORE WE ARE IN CONFORMANCE WITH CITY OF ALBUQUERQUE HYDROLOGY REQUIREMENTS AND REQUEST BUILDING PERMIT APPROVAL.

N

40 20 0 40
1"=40'

PREPARED BY: 7/3/14
MATTHEW SATCHES

Bohannan Huston
800.877.5332
www.bhinc.com

PROJECT
AFFINITY AT ALBUQUERQUE
FINELAND & MCMAHON
ALBUQUERQUE, NEW MEXICO

SEAL
BRUCE J. STIDWORTHY
NEW MEXICO
14523
REGISTERED PROFESSIONAL ENGINEER
7/3/14

FILE
DATE
JULY 3, 2014

DRAWN
MS

REVISIONS

SHEET
C-100
DRAINAGE MANAGEMENT PLAN

AFFINITY AT ALBUQUERQUE SENIOR HOUSING											
Developed Conditions Basin Data Table											
This table is based on the DPM Section 22.2, Zone: 1											
Basin	Area	Area	Land Treatment Percentages				Q(100yr)	Q(100yr)	V(100yr)	V(100yr-6hr)	V(100yr-24hr)
ID	(SQ. FT)	(AC.)	A	B	C	D	(cfs/ac.)	(CFS)	(inches)	(CF)	(CF)
PROPOSED BASINS											
B1-A	43701	1.00	0.0%	0.0%	35.0%	65.0%	3.85	*3.86*	*1.63*	*5925*	*6872*
B1-B	9890	0.23	0.0%	0.0%	40.0%	60.0%	3.77	*0.86*	*1.58*	*1301*	*1498*
B1-C	3047	0.07	0.0%	0.0%	50.0%	50.0%	3.62	*0.25*	*1.48*	*376*	*427*
B1-D	7288	0.17	0.0%	0.0%	5.0%	95.0%	4.30	*0.72*	*1.92*	*1167*	*1397*
B1-E	8618	0.20	0.0%	0.0%	35.0%	65.0%	3.85	*0.76*	*1.63*	*1168*	*1355*
B1-F	32806	0.75	0.0%	0.0%	45.0%	55.0%	3.70	*2.78*	*1.53*	*4180*	*4781*
B1-G	4563	0.10	0.0%	0.0%	20.0%	80.0%	4.07	*0.43*	*1.77*	*675*	*796*
B1-H	12479	0.29	0.0%	0.0%	45.0%	55.0%	3.70	*1.06*	*1.53*	*1590*	*1819*
B1-I	4542	0.10	0.0%	0.0%	30.0%	70.0%	3.92	*0.41*	*1.68*	*634*	*740*
B1-J	1157	0.03	0.0%	0.0%	67.0%	33.0%	3.37	*0.09*	*1.31*	*127*	*139*
B1-K	10518	0.24	0.0%	0.0%	10.0%	90.0%	4.22	*1.02*	*1.87*	*1641*	*1956*
B1-L	7423	0.17	0.0%	0.0%	50.0%	50.0%	3.62	*0.62*	*1.48*	*916*	*1039*
B1-M	6715	0.15	0.0%	0.0%	0.0%	100.0%	4.37	*0.67*	*1.97*	*1102*	*1326*
B1-N	4930	0.11	0.0%	0.0%	15.0%	85.0%	4.15	*0.47*	*1.82*	*749*	*889*
B1-O	18750	0.43	0.0%	0.0%	17.0%	83.0%	4.12	*1.77*	*1.80*	*2818*	*3337*
B1-P	3095	0.07	0.0%	0.0%	0.0%	100.0%	4.37	*0.31*	*1.97*	*508*	*611*
B1-Q	7219	0.17	0.0%	0.0%	100.0%	0.0%	2.87	*0.48*	*0.99*	*596*	*596*
BASIN 1 TOTAL:	**186741**	**4.29**						***16.55***			
B2-A	10156	0.23	0.0%	0.0%	50.0%	50.0%	3.62	*0.84*	*1.48*	*1253*	*1422*
B2-B	4084	0.09	0.0%	0.0%	5.0%	95.0%	4.30	*0.40*	*1.92*	*654*	*783*
B2-C	5273	0.12	0.0%	0.0%	33.0%	67.0%	3.88	*0.47*	*1.65*	*724*	*841*
B2-D	6326	0.15	0.0%	0.0%	5.0%	95.0%	4.30	*0.62*	*1.92*	*1013*	*1213*
B2-E	1474	0.03	0.0%	0.0%	0.0%	100.0%	4.37	*0.15*	*1.97*	*242*	*291*
B2-F	5979	0.14	0.0%	0.0%	100.0%	0.0%	2.87	*0.39*	*0.99*	*493*	*493*
BASIN 2 TOTAL:	**33292**	**0.76**						***2.88***			
B3-A	7187	0.16	0.0%	0.0%	25.0%	75.0%	4.00	*0.66*	*1.73*	*1033*	*1213*
B3-B	23277	0.53	0.0%	0.0%	10.0%	90.0%	4.22	*2.26*	*1.87*	*3631*	*4330*
B3-C	4694	0.11	0.0%	0.0%	100.0%	0.0%	2.87	*0.31*	*0.99*	*387*	*387*
BASIN 3 TOTAL:	**35158**	**0.81**						***3.22***			
B4	20305	0.47	0.0%	0.0%	25.0%	75.0%	4.00	*1.86*	*1.73*	*2919*	*3426*
BASIN 4 TOTAL:	**20305**	**0.47**						***1.86***			
B5	12659	0.29	0.0%	0.0%	100.0%	0.0%	2.87	*0.83*	*0.99*	*1044*	*1044*
BASIN 5 TOTAL:	**12659**	**0.29**						***0.83***			
TOTAL	**288155**	**6.62**	-	-	-	-	-	***25.35***	-	***38864***	***45024***

TABLE 1: BASIN & SUB-BASIN DATA

AHYMO PROGRAM SUMMARY TABLE (AHYMO-S4) - Ver. S4.01a, Rel: 01a RUN DATE (MON/DAY/YR) =07/03/2014

INPUT FILE = P:\20140292\CDP\Hydro\AHYMO\100YR 6-10-2014.HYM USER NO.= AHYMO_Temp_User:20122010

		FROM		TO		PEAK	RUNOFF		TIME TO	CFS		PAGE	=	1	
	HYDROGRAPH	ID		ID	AREA	DISCHARGE	VOLUME	RUNOFF	PEAK	PER					
COMMAND	IDENTIFICATION	NO.		NO.	(SQ MI)	(CFS)	(AC-FT)	(INCHES)	(HOURS)	ACRE		NOTATION			
*S AHYMO FILE FOR AFFINITY AT ALBUQUERQUE - ALBUQUERQUE,NM , BH PROJ # 20140292															
*S 100 YEAR - 6 HOUR STORM															
*S															
*S INPUT FILE -- P:\20140292\CDP\HYDRO\AHYMO\100YR 6-10-2014.HYM															
*S OUTPUT FILE -- P:\20140292\CDP\HYDRO\AHYMO\100YR-NP1-SMALL.OUT															
START	TIME= 0														
LOCATION	ALBUQUERQUE														
RAINFALL TYPE= 1 NOAA 14															
*S**********															
*S	----------														
S COMPUTE BASIN DEVELOPED CONDITIONS															
*S	----------														
*S BASIN 1															
COMPUTE NM HYD		B1	-	2	0.00669	17.23	0.592	1.66018	1.5	4.023 PER IMP= 66.00					
*S BASIN 2															
COMPUTE NM HYD		B2	-	3	0.0012	3.04	0.103	1.60797	1.5	3.962 PER IMP= 60.00					
*S BASIN 3															
COMPUTE NM HYD		B3	-	4	0.00126	3.35	0.117	1.73849	1.5	4.159 PER IMP= 75.00					
*S BASIN 4															
COMPUTE NM HYD		B4	-	5	0.00073	1.95	0.068	1.73849	1.5	4.175 PER IMP= 75.00					
*S BASIN 5															
COMPUTE NM HYD		B5	-	6	0.00045	0.91	0.026	1.08591	1.5	3.168 PER IMP= 0.00					
*S**********															
*S ADDITION OF BASIN 2 TO BASIN 3															
ADD HYD		B2B3	-	20	0.00246	6.4	0.220	1.67459	1.5						
*S ROUTE BASIN B2 & B3 TO POND 1. OUTFLOW BASED ON 6" ORIFICE = SD 41															
ROUTE RESERVOIR		POND1	-	11	0.00246	1.9	0.220	1.67459	1.8	MAX VOLUME = 0.106 AC-FT					
*S ADDITION OF POND1 TO BASIN 1															
ADD HYD		P1B1	-	21	0.00915	18.73	0.812	1.66401	1.5						
*S ROUTE BASIN B1 TO POND 2. OUTFLOW BASED ON 10" ORIFICE = SD 42															
ROUTE RESERVOIR		POND2	-	12	0.00915	6.49	0.812	1.66401	1.8	MAX VOLUME = 0.308 AC-FT					

TABLE 2: AHYMO ANALYSIS SUMMARY TABLE

STORM DRAIN PIPE TABLE					
PIPE #	INLET/SD/BASIN	Size	Slope	Capacity*	ACTUAL FLOW
		in.		cfs	cfs
SD1	IN1	8	0.60%	0.94	0.17
SD2	IN2, SD1	8	0.60%	0.94	0.34
SD3	IN3, SD2	8	0.60%	0.94	0.51
SD4	IN4, SD3	8	0.60%	0.94	0.68
SD5	IN5, SD4	8	0.60%	0.94	0.86
SD6	IN6, SD5	18	0.60%	8.14	4.71
SD7	IN7, SD8, SD9, SD6	18	0.60%	8.14	5.69
SD8	IN8	6	7.00%	1.48	0.13
SD9	IN9	6	7.45%	1.53	0.13
SD10	IN10, SD7	18	0.60%	8.14	6.45
SD11	SD10	18	0.60%	8.14	6.45
SD12	IN12, SD11	18	0.60%	8.14	7.50
SD13	IN13, SD12, SD24	24	0.60%	17.52	10.59
SD14	IN22, SD13	24	0.60%	17.52	11.10
SD15	IN23, SD14	24	0.60%	17.52	11.61
SD16	IN26, SD15, SD44	24	0.60%	17.52	12.90
SD17	IN27, SD16	24	0.60%	17.52	13.37
SD18	IN14	8	0.60%	0.94	0.31
SD19	IN15, SD18	8	0.60%	0.94	0.62
SD20	IN16, SD19	8	0.60%	0.94	0.93
SD21	IN17, SD20	8	0.60%	0.94	1.24
SD22	IN18, SD21	8	0.60%	0.94	1.55
SD23	IN19, SD22	8	0.60%	0.94	1.86
SD24	IN20, SD23, SD25	8	0.60%	0.94	2.67
SD25	IN21	6	9.75%	1.75	0.51
SD26	IN24	6	0.60%	0.43	0.15
SD27	IN25, SD26	6	0.60%	0.43	0.31
SD28	IN28, SD17	24	12.35%	79.52	15.14
SD29	IN29	6	1.00%	0.56	0.21
SD30	IN30, SD29	6	1.00%	0.56	0.42
SD31	IN32	6	1.00%	0.56	0.21
SD32	IN31, SD30, SD31	8	1.00%	1.21	0.84
SD33	IN34, SD35	8	1.00%	1.21	0.47
SD34	IN36	6	1.00%	0.56	0.16
SD35	IN35, SD34	6	1.00%	0.56	0.31
SD36	IN33, SD32, SD33	10	1.50%	2.68	1.72
SD37	IN38	6	1.00%	0.56	0.22
SD38	IN39, SD37	6	1.00%	0.56	0.44
SD39	IN40, SD38	10	1.00%	2.19	0.66
SD40	IN37, SD36, SD39	10	2.20%	3.25	3.54
SD41	B3, B2	6	6.60%	SEE AHYMO ANALYSIS	
SD42	IN7, SD5, SD6	10	3.00%	SEE AHYMO ANALYSIS	
SD43	IN41, SD27	6	0.60%	0.43	0.46
SD44	IN42, SD43	6	0.60%	0.43	0.62
Capacity Based on Manning's Eq w/ n=0.013					

TABLE 3: STORM DRAIN SIZING

INLET TABLE					
Inlet #	Inlet Type	Basin	Actual Flow	Avail Head ft	Capacity* CFS
IN1	8" NYLOPLAST DOME	B1-B (1/5)	0.17	0.50	0.71
IN2	8" NYLOPLAST DOME	B1-B (1/5)	0.17	0.50	0.71
IN3	8" NYLOPLAST DOME	B1-B (1/5)	0.17	0.50	0.71
IN4	8" NYLOPLAST DOME	B1-B (1/5)	0.17	0.50	0.71
IN5	8" NYLOPLAST DOME	B1-B (1/5)	0.17	0.50	0.71
IN6	18" NYLOPAST	B1-A	3.86	0.70	2.37
IN7	18" NYLOPAST	B1-D	0.72	0.70	2.37
IN8	8" NYLOPLAST DOME	B1-C (1/2)	0.13	0.50	0.71
IN9	8" NYLOPLAST DOME	B1-C (1/2)	0.13	0.50	0.71
IN10	18" NYLOPAST	B1-E	0.76	0.50	2.00
IN12	18" NYLOPAST	B1-H	1.06	0.50	2.00
IN13	18" NYLOPAST	B1-I	0.41	0.50	2.00
IN14	8" NYLOPLAST CIRCULAR	B1-F (1/7)	0.31	0.50	0.44
IN15	8" NYLOPLAST CIRCULAR	B1-F (1/7)	0.31	0.50	0.44
IN16	8" NYLOPLAST CIRCULAR	B1-F (1/7)	0.31	0.50	0.44
IN17	8" NYLOPLAST CIRCULAR	B1-F (1/7)	0.31	0.50	0.44
IN18	8" NYLOPLAST CIRCULAR	B1-F (1/7)	0.31	0.50	0.44
IN19	8" NYLOPLAST CIRCULAR	B1-F (1/7)	0.31	0.50	0.44
IN20	8" NYLOPLAST CIRCULAR	B1-F (1/7)	0.31	0.50	0.44
IN21	8" NYLOPLAST DOME	B1-J	0.09	0.50	0.71
IN22	18" NYLOPAST	B1-K (1/2)	0.51	0.50	2.00
IN23	18" NYLOPAST	B1-K (1/2)	0.51	0.50	2.00
IN24	8" NYLOPLAST DOME	B1-L (1/4)	0.15	0.50	0.71
IN25	8" NYLOPLAST DOME	B1-L (1/4)	0.15	0.50	0.71
IN26	18" NYLOPAST	B1-M	0.67	0.50	2.00
IN27	18" NYLOPAST	B1-N	0.47	0.50	2.00
IN28	18" NYLOPAST	B1-O	1.77	0.50	2.00
IN29	8" NYLOPLAST DOME	B2-A (1/4)	0.21	0.50	0.71
IN30	8" NYLOPLAST DOME	B2-A (1/4)	0.21	0.50	0.71
IN31	8" NYLOPLAST DOME	B2-A (1/4)	0.21	0.50	0.71
IN32	8" NYLOPLAST DOME	B2-A (1/4)	0.21	0.50	0.71
IN33	18" NYLOPAST	B2-B	0.40	0.50	2.00
IN34	8" NYLOPLAST DOME	B2-C (1/3)	0.16	0.50	0.71
IN35	8" NYLOPLAST DOME	B2-C (1/3)	0.16	0.50	0.71
IN36	8" NYLOPLAST DOME	B2-C (1/3)	0.16	0.50	0.71
IN37	18" NYLOPAST	B2-D,E,F	1.17	0.50	2.00
IN38	8" NYLOPLAST DOME	B3-A (1/3)	0.22	0.50	0.71
IN39	8" NYLOPLAST DOME	B3-A (1/3)	0.22	0.50	0.71
IN40	8" NYLOPLAST DOME	B3-A (1/3)	0.22	0.50	0.71
IN41	8" NYLOPLAST DOME	B1-L (1/4)	0.15	0.50	0.71
IN42	8" NYLOPLAST DOME	B1-L (1/4)	0.15	0.50	0.71

*-NYLOPLAST INLET CAPACITIES BASED ON MANUFACTURER NOMOGRAPHS AND STANDARD DETAILS

TABLE 4: INLET SIZING

BASIN AND SUB-BASIN HYDROLOGIC ANALYSIS (TABLE 1):

THE HYDROLOGIC ANALYSIS PROVIDED WITH THIS DRAINAGE MANAGEMENT PLAN HAS BEEN PREPARED IN ACCORDANCE WITH SECTION 22.2 OF THE DPM. BASIN AND SUB-BASIN BOUNDARIES DELINEATED PER SHEET C-100. BASIN AND SUB-BASINS WERE DEFINED FOR ANALYSIS OF SECONDARY OR UPSTREAM REACHES OF STORM DRAINS AND INLETS. AREAS, LAND TREATMENTS, AND FLOWS CAN BE SEEN IN TABLE 1, THIS SHEET.

AHYMO ANALYSIS (TABLE 2):

SEE NARRATIVE SHEET C-100.

STORM DRAIN SIZING (TABLE 3):

STORM DRAINS WERE SIZED BASED ON MANNING'S EQUATION AND GRAVITY FLOW. SIZE OF STORM DRAINS RANGE FROM 6" (FOR SMALL AREA DRAINS) TO 24" (FOR DOWNSTREAM END OF COLLECTION SYSTEM). SEE TABLE 3 (THIS SHEET) FOR STORM DRAIN REACH ANALYSIS. BASIN AND SUB-BASIN FLOWS CAN BE SEEN ON TABLE 1 (THIS SHEET).

INLET SIZING (TABLE 4):

STORM DRAIN INLETS HAVE BEEN DESIGNED IN SUMP CONDITION. TRAFFIC RATED NYLOPLAST INLETS ARE PROVIDED IN DRIVEWAYS. NON-TRAFFIC RATED NYLOPLAST DOME INLETS ARE PROVIDED IN LANDSCAPED AREAS. INLET CAPACITIES ARE BASED ON NOMOGRAPHS PROVIDED BY THE MANUFACTURER. TABLE 4 SHOWS INLET CAPACITIES AND ACTUAL FLOW TO THE INLET.

INLET 6 IS UNDERSIZED FOR THE SUB-BASIN IT IS INTENDED TO CONTAIN. ONCE CAPACITY IS REACHED, EXCESS FLOW WILL CONTINUE NORTH TO INLET 7 WHICH HAS ENOUGH CAPACITY TO ACCEPT THE ADDITIONAL FLOWS.

RUNDOWN SIZING (TABLE 5):

CONCRETE RUNDOWNS HAVE BEEN DESIGNED USING MANNING'S EQUATION AND THE WEIR EQUATION (PROVIDED IN TABLE 5). RUNDOWNS R1 & R2 OUTFALL INTO A WATER HARVESTING AREA ON THE WEST PORTION OF THE PROPERTY. RUNDOWN R3 OUTFALLS INTO POND #1.

CONCRETE RUNDOWN TABLE								
Rundown #	Basin ID	Rundown Type	Actual Flow	Min Weir** Length ft	Channel Width ft	Channel Height ft	Minimum Slope	Capacity* CFS
Pond Rundowns								
R1	B2-D	Rectang	0.62	1.00	2.00	0.50	30.00%	30.10
R2	B2-E	Rectang	0.15	1.00	2.00	0.50	30.00%	30.10
R3	B3-B	Rectang	2.26	2.00	2.00	0.50	30.00%	30.10
			Weir Eq: Q=3.3L(h^1.5) - **		Capacity Based on Manning's Eq w/ n=0.013 - *			

TABLE 5: RUNDOWN SIZING

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PREPARED BY: 7/3/14
MATTHEW SATCHES

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DATE
JULY 3, 2014
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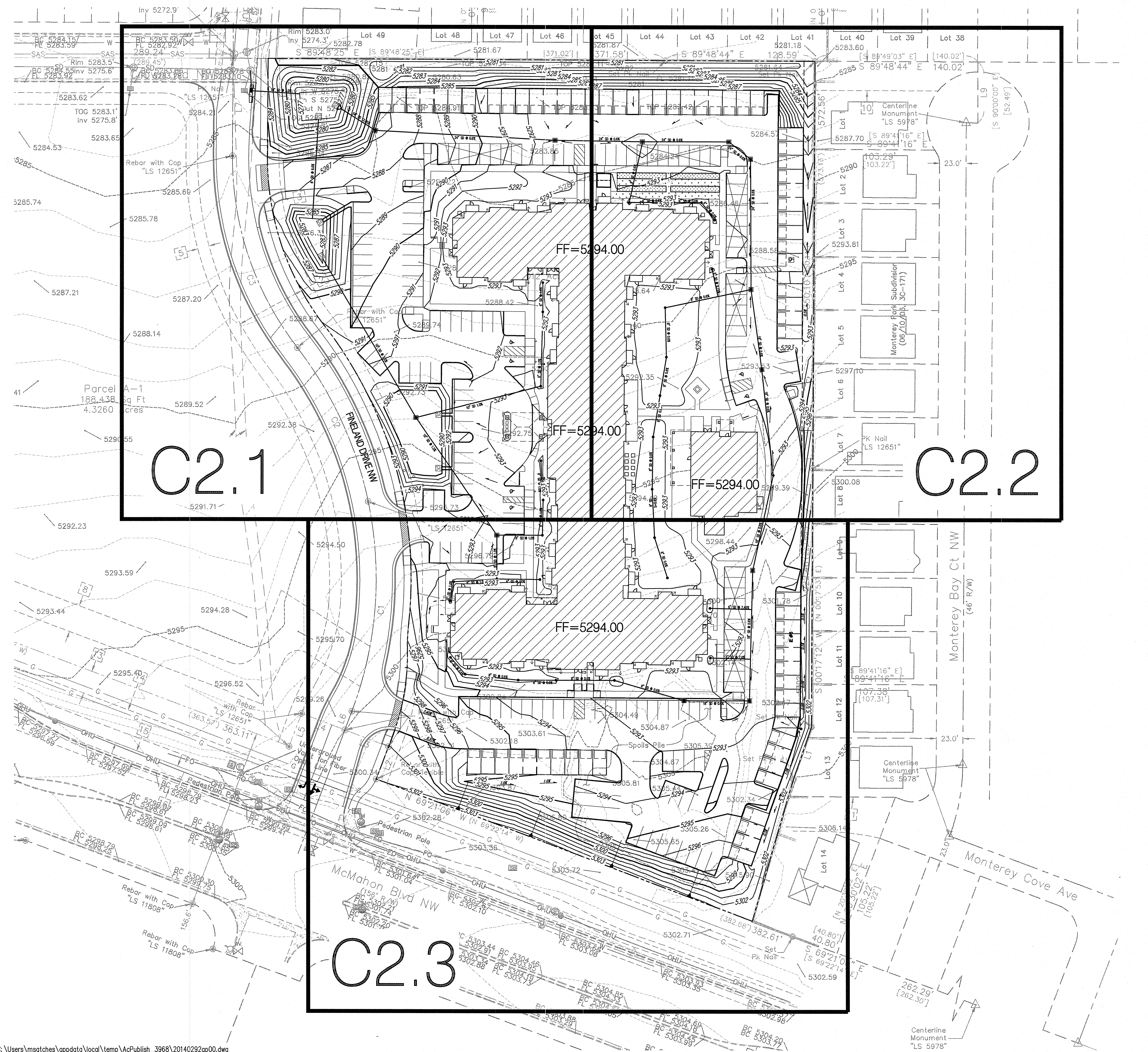
REVISIONS

SHEET
C-101
DRAINAGE MANAGEMENT PLAN



GRADING NOTES

1. EXCEPT AS PROVIDED HEREIN, GRADING SHALL BE PERFORMED AT THE ELEVATIONS AND IN ACCORDANCE WITH THE DETAILS SHOWN ON THIS PLAN.

2. THE COST FOR REQUIRED CONSTRUCTION DUST AND EROSION CONTROL MEASURES SHALL BE INCIDENTAL TO THE PROJECT COST.

3. ALL WORK RELATIVE TO FOUNDATION CONSTRUCTION, SITE PREPARATION, AND PAVEMENT INSTALLATION, AS SHOWN ON THIS PLAN, SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE "GEOTECHNICAL INVESTIGATION". ALL OTHER WORK SHALL, UNLESS OTHERWISE STATED OR PROVIDED FOR HEREON, BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT, (FIRST PRIORITY) SPECIFICATIONS, AND/OR THE CITY OF ALBUQUERQUE (COA) STANDARD SPECIFICATIONS FOR PUBLIC WORKS (SECOND PRIORITY).

4. EARTH SLOPES SHALL NOT EXCEED 3 HORIZONTAL TO 1 VERTICAL UNLESS SHOWN OTHERWISE.

5. IT IS THE INTENT OF THESE PLANS THAT THIS CONTRACTOR SHALL NOT PERFORM ANY WORK OUTSIDE OF THE PROPERTY BOUNDARIES EXCEPT AS REQUIRED BY THIS PLAN.

6. THE CONTRACTOR IS TO ENSURE THAT NO SOIL ERODES FROM THE SITE ONTO ADJACENT PROPERTY OR PUBLIC RIGHT-OF-WAY.

7. A DISPOSAL SITE FOR ANY & ALL EXCESS EXCAVATION MATERIAL, AND UNSUITABLE MATERIAL AND/OR A BORROW SITE CONTAINING ACCEPTABLE FILL MATERIAL SHALL BE OBTAINED BY THE CONTRACTOR IN COMPLIANCE WITH APPLICABLE ENVIRONMENTAL REGULATIONS AND APPROVED BY THE OBSERVER. ALL COSTS INCURRED IN OBTAINING A DISPOSAL OR BORROW SITE AND HAUL TO OR FROM SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE.

8. PAVING AND ROADWAY GRADES SHALL BE +/- 0.1' FROM PLAN ELEVATIONS. PAD ELEVATION SHALL BE +/- 0.05' FROM BUILDING PLAN ELEVATION.

9. ALL PROPOSED CONTOURS REFLECT TOP OF PAVEMENT ELEVATIONS IN THE PARKING AREA AND MUST BE ADJUSTED FOR MEDIANS AND ISLANDS.

10. VERIFY ALL ELEVATIONS SHOWN ON PLAN FROM BASIS OF ELEVATION CONTROL STATION PRIOR TO BEGINNING CONSTRUCTION.

PROJECT BENCH MARK

ACS Monument "9_A11"
NAD 1983 CENTRAL ZONE
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Y=1533206.142
Z=5301.647 (NAVD 1988)
G-G=0.999670857
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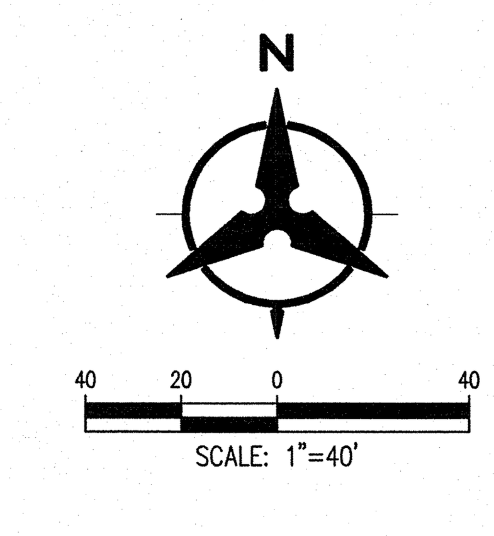

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PERMIT SET
6-6-2014

SEAL

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NEW MEXICO
14525
REGISTERED PROFESSIONAL ENGINEER

FILE

DATE
JULY 3, 2014

XXXXXXXXX

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REVISIONS

SHEET

C2.0

OVERALL GRADING &
DRAINAGE PLAN

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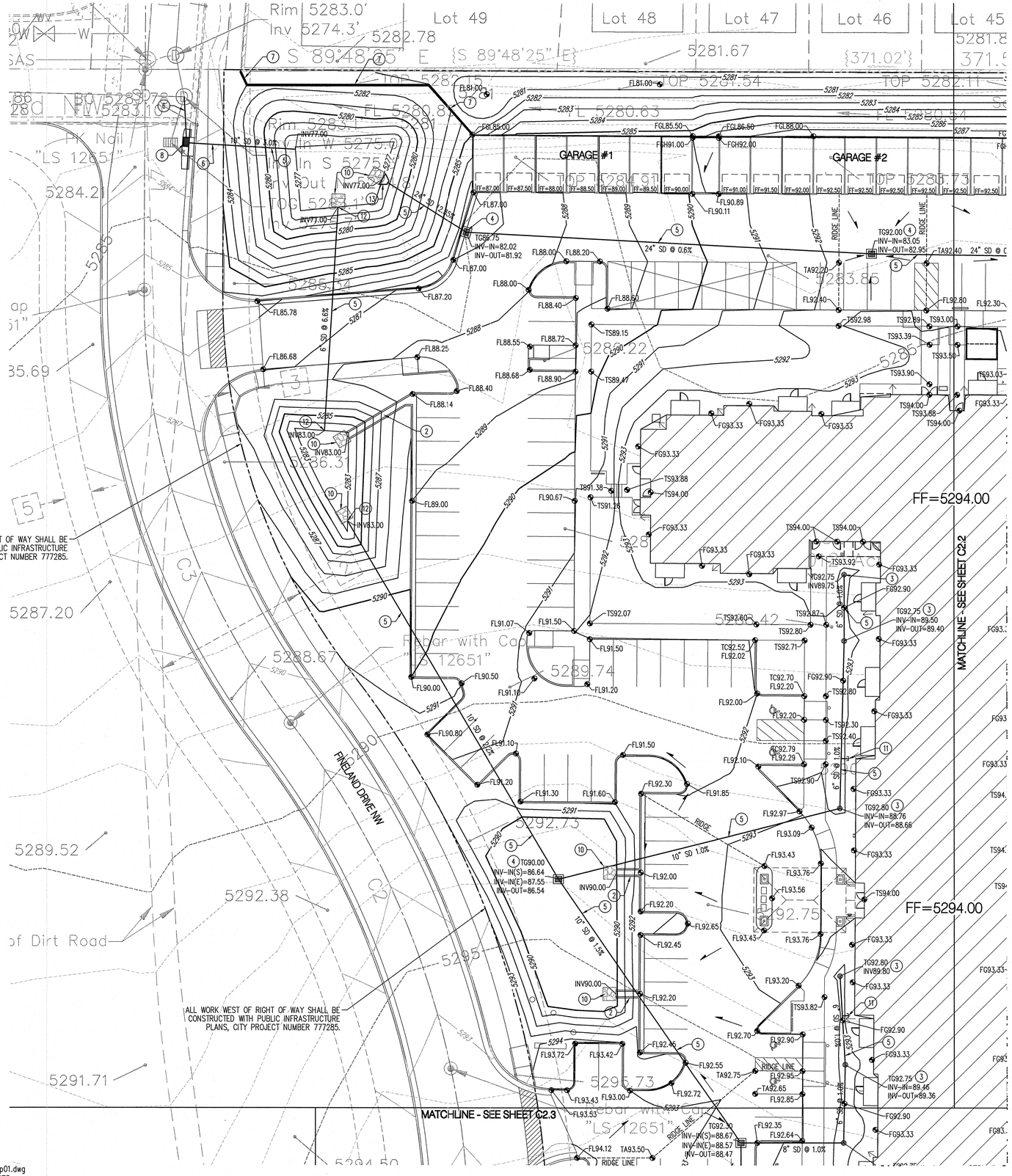
Thu, 3-Jul-2014 - 3:11:pm, Plotted by: MSATCHES



GENERAL NOTES

1. FOR TYPICAL GRADING AT STEPPED GARAGES SEE 1/C2.1.
2. FOR TYPICAL GRADING AT PATIOS SEE 1/C2.2.

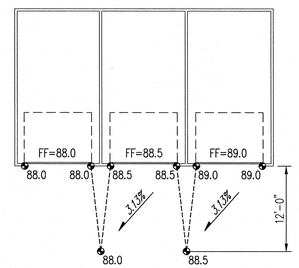
○ GRADING KEYED NOTES

1. CONSTRUCT 12" WIDE CURB OPENING FOR DRAINAGE.
2. CONSTRUCT 24" WIDE CONCRETE RIBBON CHANNEL PER 5/C4.0.
3. INSTALL NYLOPLAST DRAIN BASIN WITH 8" DOME GRATE OR APPROVED EQUAL.
4. INSTALL NYLOPLAST DRAIN BASIN WITH 18"x18" TRAFFIC RATED GRATE OR APPROVED EQUAL.
5. INSTALL STORM DRAIN PIPE. SEE PLAN FOR SIZE & SLOPE.
6. PUBLIC STORM DRAIN TO BE CONSTRUCTED WITH PUBLIC INFRASTRUCTURE PLANS, CITY PROJECT NUMBER 777285.
7. CAST-IN-PLACE CONCRETE WALL. TOP OF WALL ELEVATION = 85.0 SEE STRUCTURAL PLANS FOR DETAILS.
8. NEW PUBLIC TYPE 'A' STORM DRAIN INLET TO BE CONSTRUCTED WITH PUBLIC INFRASTRUCTURE PLANS, CITY PROJECT NUMBER 777285.
9. CONSTRUCT LANDSCAPE TIMBER RETAINING WALL PER 10/C4.0.
10. INSTALL 5' X 5' RIPRAP BLANKET. ROCK SHALL BE 4" – 6" ANGULAR ROCK PLACED 10" THICK OVER GEOTEXTILE FABRIC.
11. CONNECT TO ROOF DRAIN STORM DRAIN. SEE PLUMBING PLAN FOR CONTINUATION.
12. DAYLIGHT STORM DRAIN, SEE DETAIL 11/C4.0.
13. INSTALL 24" END SECTION.
14. INSTALL NYLOPLAST DRAIN BASIN WITH TRAFFIC RATED SOLID COVER.

NOTE: NOT ALL KEYED NOTES MAY APPLY TO THIS SHEET.

LEGEND

- PROPERTY LINE
- 5301 — EXISTING CONTOURS
- 36.90 — PROPOSED SPOT ELEVATION
  TC=TOP OF CURB, FL=FLOW LINE
  TS=TOP OF SIDEWALK, TA=TOP OF ASPHALT
  EX=EXISTING, FG=FINISHED GRADE
  FGH=FINISHED GRADE HIGH
  FGL=FINISHED GRADE LOW
  TG=TOP OF GRATE
- S=2.0% — PROPOSED DIRECTION OF FLOW
- WATER BLOCK/RIDGE OR HIGH POINT
- PROPOSED RETAINING WALL
- 5305 — PROPOSED INDEX CONTOURS
- PROPOSED INTER CONTOURS
- SD — PROPOSED STORM DRAIN LINE
- PROPOSED STORM DRAIN MANHOLE
- PROPOSED STORM DRAIN INLET
- DOWNSPOUT LOCATION



1 TYPICAL GRADING @ STEPPED GARAGES
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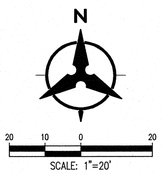

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DATE
JULY 3, 2014

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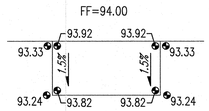
C2.1

GRADING & DRAINAGE PLAN

NOTE: THIS GRADING IS TYPICAL FOR ALL GROUND FLOOR PATIOS EXCEPT FOR THE GROUND FLOOR HC UNIT (#105). FOR THAT UNIT, THE FOUR SPOT ELEVATIONS SHOWN ON THE PATIO SHALL BE 1" HIGHER.



1 TYPICAL PATIO GRADING
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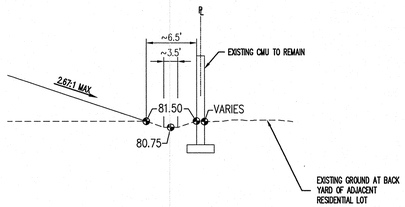
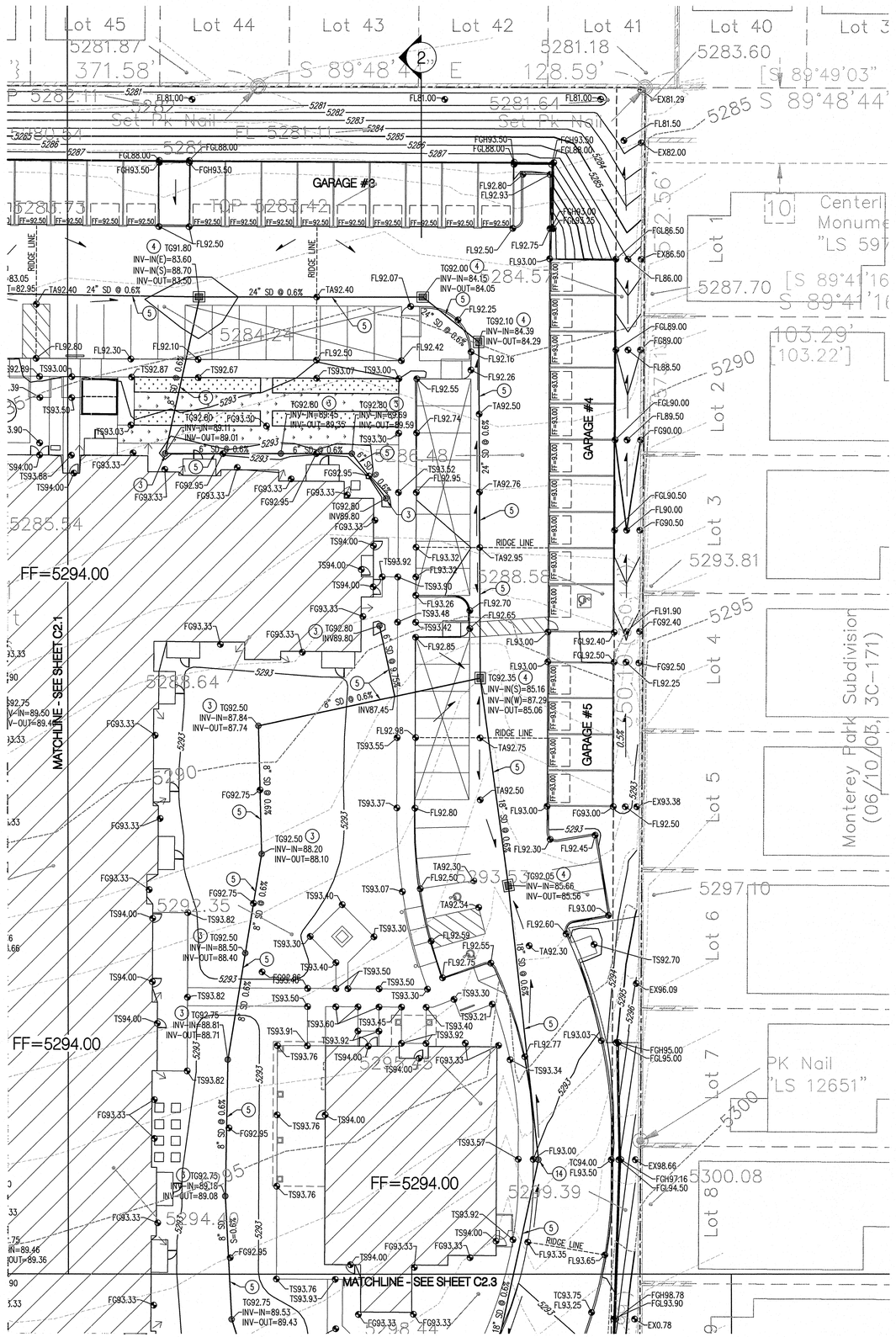


2 WATER HARVESTING AREA TYP.
NTS

NOTE: THIS WATER HARVESTING AREA IS TYPICAL FOR THE NORTH PROPERTY LINE.



GENERAL NOTES

1. FOR TYPICAL GRADING AT STEPPED GARAGES SEE 1/C2.1.
2. FOR TYPICAL GRADING AT PATIOS SEE 1/C2.2.

○ GRADING KEYED NOTES

1. CONSTRUCT 12" WIDE CURB OPENING FOR DRAINAGE.
2. CONSTRUCT 24" WIDE CONCRETE RIBBON CHANNEL PER 5/C4.0.
3. INSTALL NYLOPLAST DRAIN BASIN WITH 8" DOME GRATE OR APPROVED EQUAL.
4. INSTALL NYLOPLAST DRAIN BASIN WITH 18"x18" TRAFFIC RATED GRATE OR APPROVED EQUAL.
5. INSTALL STORM DRAIN PIPE. SEE PLAN FOR SIZE & SLOPE.
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11. CONNECT TO ROOF DRAIN STORM DRAIN. SEE PLUMBING PLAN FOR CONTINUATION.
12. DAYLIGHT STORM DRAIN, SEE DETAIL 11/C4.0.
13. INSTALL 24" END SECTION.
14. INSTALL NYLOPLAST DRAIN BASIN WITH TRAFFIC RATED SOLID COVER.

NOTE: NOT ALL KEYED NOTES MAY APPLY TO THIS SHEET.

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GRADING & DRAINAGE PLAN

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GENERAL NOTES

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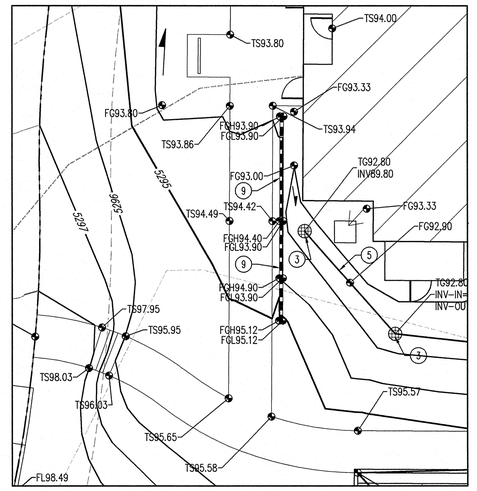

ENLARGED GRADING PLAN
1"=10'

N

20 10 0 20
SCALE: 1"=20'

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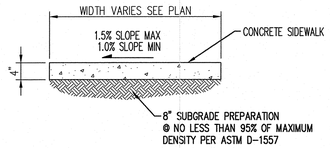
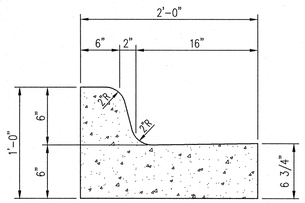
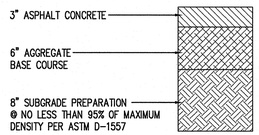
GRADING & DRAINAGE PLAN



1 CONCRETE SIDEWALK
NTS



2 CONCRETE CURB & GUTTER
NTS



3 ASPHALT PAVEMENT SECTION
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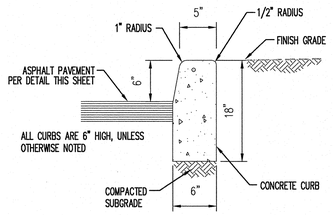

4 CONCRETE HEADER CURB
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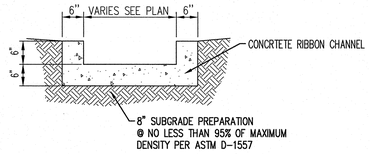
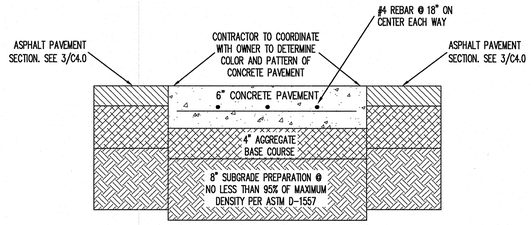
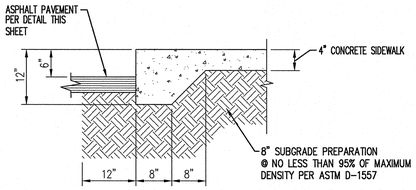


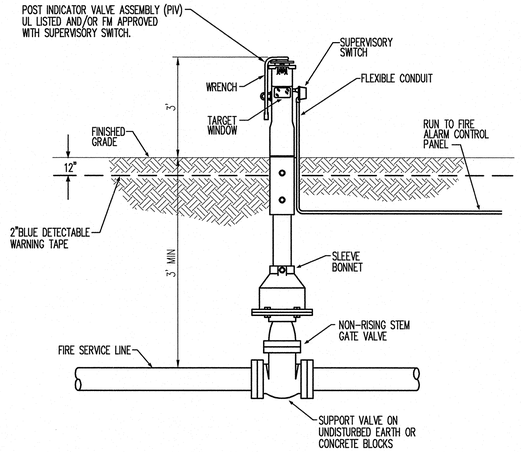
5 CONCRETE RIBBON CHANNEL
NTS



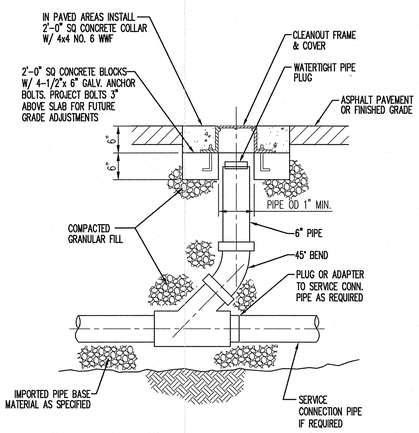
6 COLORED/TEXTURE CONCRETE PAVEMENT SECTION
NTS

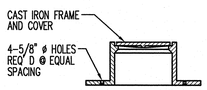


7 TURN DOWN SIDEWALK DETAIL
NTS



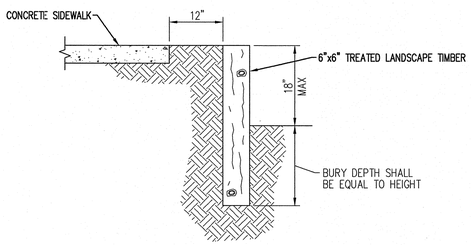
8 POST INDICATOR VALVE
NTS



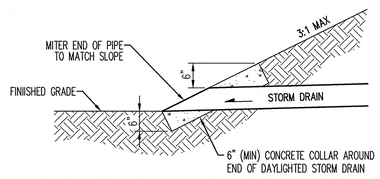


CLEANOUT
FRAME & COVER

9 CLEANOUT
NTS



10 LANDSCAPE TIMBER RETAINING WALL
NTS



11 DAYLIGHT STORM DRAIN
NTS

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BRUCE J. STIDWORTHY
NEW MEXICO
14523
REGISTERED PROFESSIONAL ENGINEER

FILE

DATE
JULY 3, 2014

DRAWN
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REVISIONS

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CIVIL DETAILS