

CITY OF ALBUQUERQUE



Richard J. Berry, Mayor

March 31, 2017

Rick Beltramo, P.E.
Respec
5971 Jefferson St. NE
Albuquerque, NM, 87109

**RE: Paseo Marketplace
Conceptual Grading Plan
Stamp Date: 3/2/17
Hydrology File: D18D056**

Dear Mr. Beltramo:

Based upon the information provided in your submittal received 3/3/2017, the Conceptual Grading Plan **is not** approved for Building Permit, Site Plan for Subdivision, Site Plan for Building Permit, Grading Permit, and SO-19. The following comments need to be addressed for approval of the above referenced project:

1. Discharge and connection into the 84-inch storm system needs the approval and a permit from New Mexico Department of Transportation prior to the City's approval. The contact information for District Three Engineer is Kenneth Murphy at 505-798-6630 and by email at kenneth.murphy@state.nm.us.
2. For your water quality pond for the subbasin 1, you are proposing a fire dept conn. for Bldg Major-2. Please shift this closer to the building and out of the water quality pond.
3. Under your Proposed Conditions, You make references to the 2015 FDS report and the historical runoff. This report references a RTI December 1991 Drainage Management Plan and a Wilson & Co. April 1991 Drainage Report. Both of these reports call for a future development of the undeveloped site (the above referenced project) as Treatment "D" 70% and Treatment "B" 30%. The Conceptual Grading Plan for the above referenced project shows Treatment "D" 89.5%, Treatment "B" 5.25%, and Treatment "C" 5.25%. I do not see any attempt to detain the difference in the treatment areas.
4. The proposed conditions section was a little hard to read. You might want to either add some space between the proposed subbasins or place all the information in a

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separate 8 1/2 x 11 drainage report. This could also allow you to bring the site to a 1"=30' scale which would also make the Conceptual Grading Plan more readable as well.

5. For the proposed truck ramp, you call out a 4" NDS grate. I'm concerned about clogging of this inlet. Typically for a truck ramp, one places a French drain which can be easily cleaned out and if partially clogged, it will still function. You might want to take another look at this.
6. In Proposed subbasin 6, you have one building listed as Food. Just a reminder that for the drainage from the dumpster for this building will need to drain into the sanitary sewer.

If you have any questions, please contact me at 924-3995 or rbrissette@cabq.gov.

PO Box 1293

Sincerely,

Renee C. Brissette

Albuquerque

Reneé C. Brissette, P.E.
Senior Engineer, Hydrology
Planning Department

New Mexico 87103

www.cabq.gov

Hydrology Calculations

The following calculations are based on Albuquerque's Development Process Manual, Seciton 22.2

Runoff Rate:

Treatment Type Areas

Subbasin	Area _a (ac)	Area _b (ac)	Area _c (ac)	Area _d (ac)	Total (ac)
Offsite Subbasin	1.98	0.00	1.32	0.00	3.30
Proposed Subbasin 1	0.00	0.04	0.04	0.14	0.21
Proposed Subbasin 2	0.00	0.06	0.06	0.40	0.51
Proposed Subbasin 3	0.00	0.06	0.06	2.25	2.37
Proposed Subbasin 4	0.00	0.03	0.03	0.16	0.23
Proposed Subbasin 5	0.00	0.00	0.00	0.14	0.14
Proposed Subbasin 6	0.00	0.14	0.14	2.54	2.82

Peak Discharge values based on Zone 3 from Table A-9

$$Q_a = 1.87 \text{ cfs/ac}$$

$$Q_b = 2.60 \text{ cfs/ac}$$

$$Q_c = 3.45 \text{ cfs/ac}$$

$$Q_d = 5.02 \text{ cfs/ac}$$

Peak Discharge calculation for a 100-yr, 24-hr storm event from equation A-10

Subbasin	Discharge (cfs)
Offsite Subbasin 1	8.3
Proposed Subbasin 1	0.9
Proposed Subbasin 2	2.3
Proposed Subbasin 3	11.7
Proposed Subbasin 4	1.0
Proposed Subbasin 5	0.7
Proposed Subbasin 6	13.6

Water Quality:

Required Water Quality volume for first flush of 0.34"

Subbasin	Volume (cu. ft.)
Proposed Subbasin 1	173
Proposed Subbasin 2	491
Proposed Subbasin 3	2779
Proposed Subbasin 4	202
Proposed Subbasin 5	173
Proposed Subbasin 6	3132
Total Required	6949

18" HDPE Pipe Capacity

Circular Channel

Input

Flow	11.7 cfs
Slope	0.01 ft/ft
Manning's n	0.012
Diameter	18 in

Output

Depth	1.271 ft
Flow Area	1.60 sf
Velocity	7.33 fps
Velocity Head	0.834 ft
Top Width	1.08 ft
Froude Number	1.06
Critical Depth	1.302 ft
Critical Slope	0.00967 ft/ft

18" RCP Pipe Capacity

Circular Channel

Input

Flow	11.7 cfs
Slope	0.015 ft/ft
Manning's n	0.013
Diameter	18 in

Output

Depth	1.122 ft
Flow Area	1.42 sf
Velocity	8.25 fps
Velocity Head	1.06 ft
Top Width	1.30 ft
Froude Number	1.39
Critical Depth	1.302 ft
Critical Slope	0.0114 ft/ft

1' Sidewalk Culvert Capacity

Rectangular Channel

Input

Flow	0.9 cfs
Slope	0.02 ft/ft
Manning's n	0.013
Base Width	1 ft
Right Side Slope	0:1
Left Side Slope	0:1

Output

Depth	0.203 ft
Flow Area	0.203 sf
Velocity	4.44 fps
Velocity Head	0.307 ft
Top Width	1.00 ft
Froude Number	1.74
Critical Depth	0.293 ft
Critical Slope	0.00686 ft/ft

Water Quality Pond Rating Curves

Elev.	Area (Sq. Ft.)	Vol (Cu. Ft.)	Cum. (Cu. Ft.)
5254	361	0	0
5254.5	483	211	211

Elev.	Area (Sq. Ft.)	Vol (Cu. Ft.)	Cum. (Cu. Ft.)
5242.2	6	0	0
5243	56	25	25
5244	179	117	142
5244.2	211	39	181

Elev.	Area (Sq. Ft.)	Vol (Cu. Ft.)	Cum. (Cu. Ft.)
5254.34	32	0	0
5255	136	56	56
5255.34	205	58	114

Elev.	Area (Sq. Ft.)	Vol (Cu. Ft.)	Cum. (Cu. Ft.)
5247.37	19	0	0
5248	77	30	30
5248.87	217	128	158

24" HDPE Pipe Capacity

Circular Channel

Input

Flow	23.6 cfs
Slope	0.01 ft/ft
Manning's n	0.012
Diameter	24 in

Output

Depth	1.576 ft
Flow Area	2.86 sf
Velocity	8.88 fps
Velocity Head	1.23 ft
Top Width	1.63 ft
Froude Number	1.23
Critical Depth	1.724 ft
Critical Slope	0.00856 ft/ft

4" SDR 35 Pipe Capacity

Circular Channel

Input

Flow	0.13 cfs
Slope	0.005 ft/ft
Manning's n	0.012
Diameter	4 in

Output

Depth	0.245 ft
Flow Area	0.0688 sf
Velocity	1.89 fps
Velocity Head	0.0554 ft
Top Width	0.294 ft
Froude Number	0.688
Critical Depth	0.203 ft
Critical Slope	0.00847 ft/ft

Weir Calculation for 2' Curb Cut

Weir:

Head Water Depth (h):	0.5	ft
Discharge Coeff. (C _w):	3.367	
Length (L):	2	ft
Flow (Q) = C _w · L · h ^{1.5}		
Flow (Q) =	2.4	cfs

Weir Calculation for 1.5' Curb Cut

Weir:

Head Water Depth (h):	0.5	ft
Discharge Coeff. (C _w):	3.367	
Length (L):	1.5	ft
Flow (Q) = C _w · L · h ^{1.5}		
Flow (Q) =	1.8	cfs

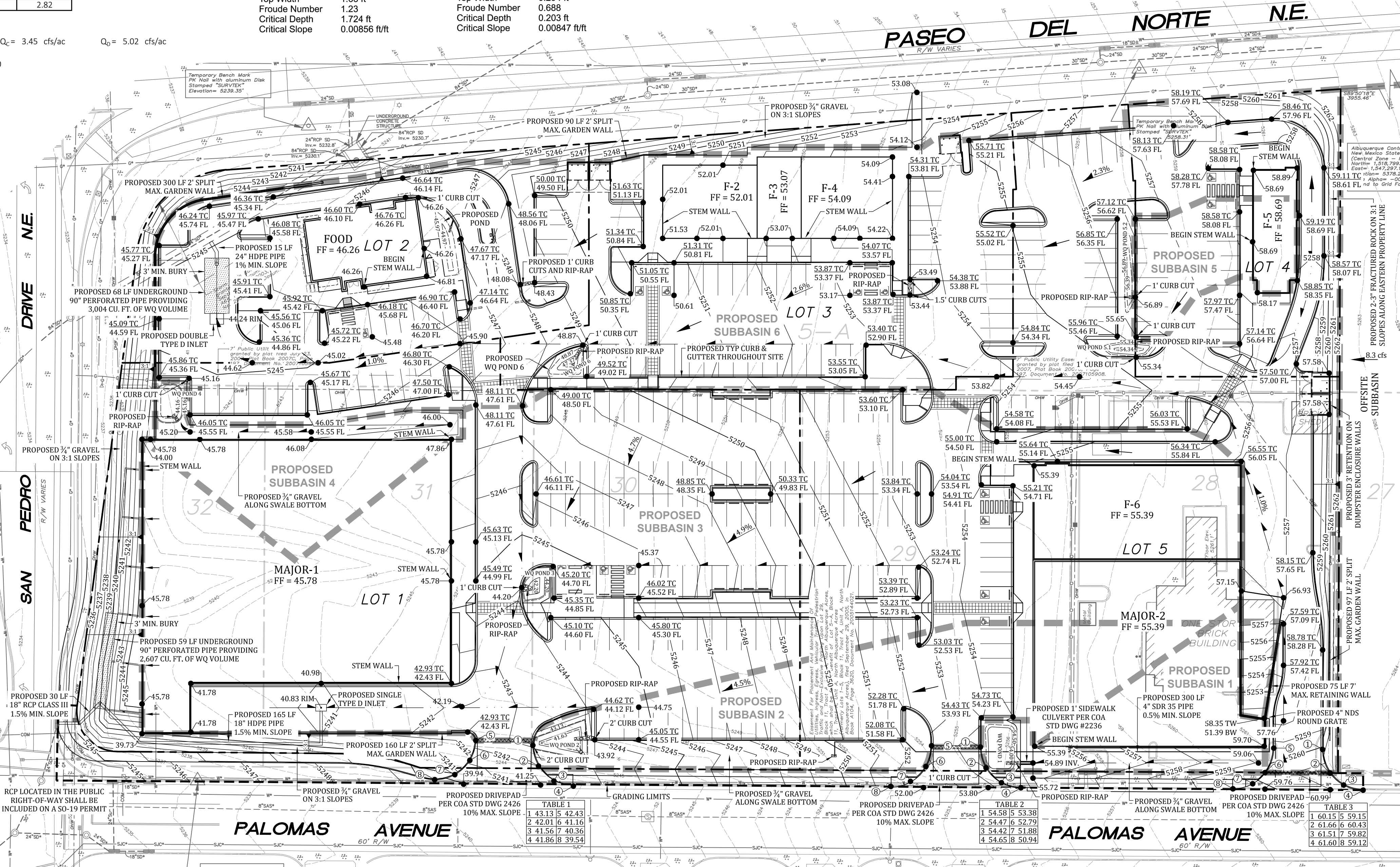
Weir Calculation for 1' Curb Cut

Weir:

Head Water Depth (h):	0.5	ft
Discharge Coeff. (C _w):	3.367	
Length (L):	1	ft
Flow (Q) = C _w · L · h ^{1.5}		
Flow (Q) =	1.2	cfs

¾" GRATE OPENING
3.85 SQ. IN. OPEN AREA

NDS 4" ROUND GRATE DETAIL



LEGEND

- EXISTING PROPERTY BOUNDARY
- - - PROPOSED PROPERTY BOUNDARY
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED SPOT ELEVATION
- PROPOSED FLOW LINE
- EXISTING WATER LINE
- PROPOSED WATER LINE
- EXISTING SAS LINE
- PROPOSED SAS LINE
- PROPOSED GRADING LIMITS

Building Major-2 Truck Ramp Calculations

The following calculations are based on Albuquerque's DPM, Section 22.2

100-yr, 24-hr Flow Rate:

Area _a =	1095	ft ²
Q _a =	5.02	cfs/ac
Q =	0.13	cfs

Orifice:

Head Water Depth (h):	1	ft
Discharge Coeff. (C _d):	0.6	
Open Area (A):	3.85	in ²
Gravity (g):	32.2	ft/sec ²
Flow (Q) = C _d · A · (2 · g · h) ^{0.5}		
Flow (Q) =	0.13	cfs

Orifice & Weir Calculation for a Double Type D Inlet

Orifice:

Head Water Depth (h):	0.85	ft
Discharge Coeff. (C _d):	0.6	
Open Area (A):	9.12	ft ²
Gravity (g):	32.2	ft/s ²
Flow (Q) = C _d · A · (2 · g · h) ^{0.5}		
Flow (Q) =	40.5	cfs

Weir:

Discharge Coeff. (C _w):	3.367	
Length (L):	15	ft
Flow (Q) = C _w · L · h ^{1.5}		
Flow (Q) =	39.6	cfs

Orifice & Weir Calculation for a Single Type D Inlet

Orifice:

Head Water Depth (h):	0.65	ft
Discharge Coeff. (C _d):	0.6	
Open Area (A):	4.56	ft ²
Gravity (g):	32.2	ft/s ²
Flow (Q) = C _d · A · (2 · g · h) ^{0.5}		
Flow (Q) =	17.7	cfs

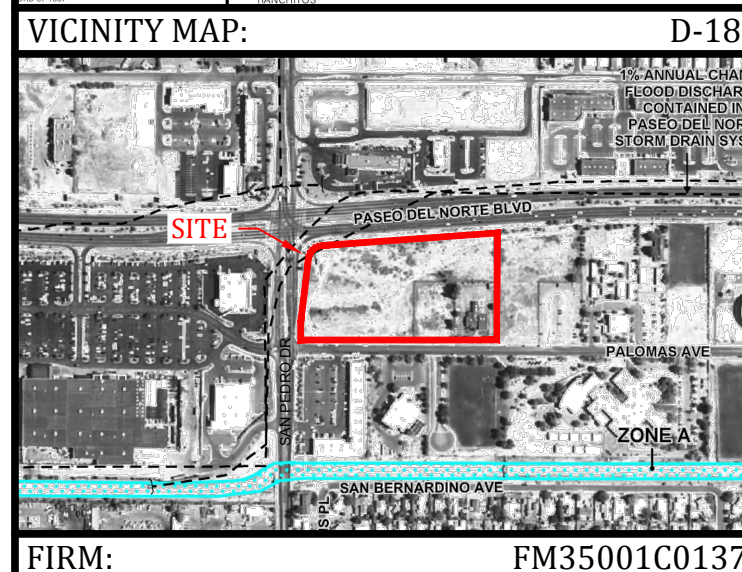
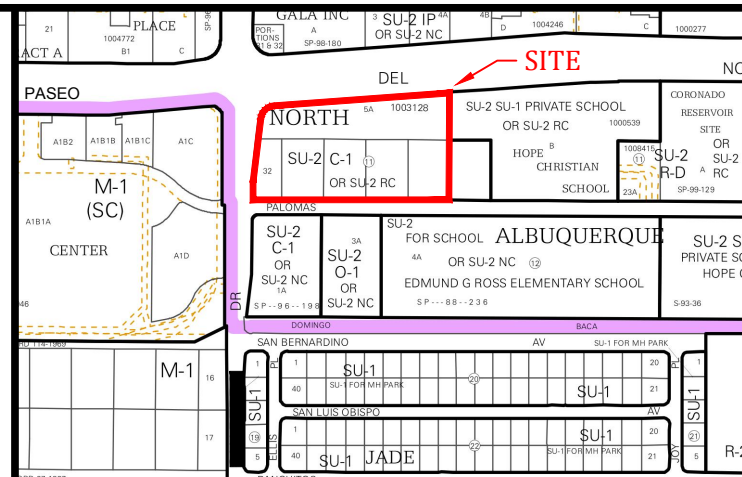
Weir:

Discharge Coeff. (C _w):	3.367	
Length (L):	10.83	ft
Flow (Q) = C _w · L · h ^{1.5}		
Flow (Q) =	19.1	cfs

Elev.	Area (Sq. Ft.)	Vol (Cu. Ft.)	Cum. (Cu. Ft.)
5241.63	168	0	0
5242	243	76	76
5243	496	369	445
5243.13	534	67	512

Elev.	Area (Sq. Ft.)	Vol (Cu. Ft.)	Cum. (Cu. Ft.)
5244.16	177	0	0
5245	326	211	211
5245.16	358	55	266

Elev.	Area (Sq. Ft.)	Vol (Cu. Ft.)	Cum. (Cu. Ft.)
5256.39	89	0	0
5256.89	242	83	83



Background

Lots 1 thru 5 account for approximately 6.7 acres in Block 11, Tract A, Unit A, of North Albuquerque Acres in Bernalillo County, New Mexico. This property is located at the southeast corner of the intersection of Paseo Del Norte and San Pedro Drive. The site is mostly undeveloped with an existing one-story brick building located at the southeast corner of the property. The site receives offsite flows from the undeveloped properties located to the east. The historic flow rate from these properties is accounted for in the runoff calculations. There is no floodplain on the site. This property has an approved drainage report completed by Floyd Development Services (FDS) in December, 2015 (D18D056) and should be referenced for general background information. Per this report, the site is allowed free discharge into the 84" storm drain crossing the northwest portion of the property.

Methodology

Hydrology calculations for the site are performed in accordance with the Albuquerque Development Process Manual (DPM) Section 22.2 using the Rational Method to calculate peak flow rates in order to ensure all flow paths are sufficient to carry flows to the water quality ponds located on-site. The water quality ponding volume required was calculated by multiplying the impervious area by the first flush runoff value of 0.34". All hydrologic and hydraulic calculations can be found on this sheet.

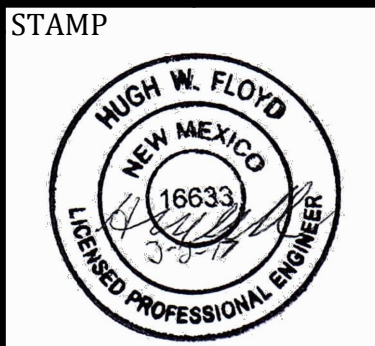
Existing Conditions

The existing property slopes from east to west at approximately 3%. Therefore, the site has historically drained west into San Pedro Drive with a smaller portion draining to Palomas Avenue. Runoff entering San Pedro Drive either enters a 24" storm drain through an inlet located on the eastern curb near the intersection with Palomas Avenue or through a slot drain located in the median, which discharges directly into the 84" storm drain. Water entering Palomas Avenue flows west along the northern curb and eventually arrives at two inlets near the intersection with San Pedro Drive. This 24" storm drain converges with a 30" storm drain that discharges to an 8'x10' concrete box channel near the southwest corner of the intersection of Palomas Avenue and San Pedro Drive. This channel is also where the 84" storm drain discharges.

Proposed Conditions

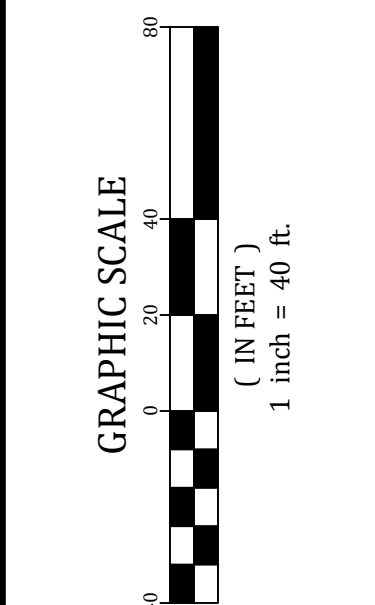
It is proposed that the site, in general, drains from east to west as it has done historically. The property has been split into six subbasins. See the Hydrology Calculations in the top left corner of this sheet for peak flow rates and required water quality volumes. **Subbasin 1** is 0.21 acres and generates 0.9 cfs. Runoff generated by this subbasin is collected in a swale running west along the southern property line. The water enters a 1' sidewalk culvert that discharges into WQ Pond 1. The Manning's calculation for the sidewalk culvert is shown on the left side of this sheet. The required water quality pond volume for this subbasin is 173 cubic feet. WQ Pond 1 provides a total of 211 cubic feet. See the Water Quality Pond Rating Curves in the bottom left corner of this sheet. Once runoff is routed through the pond, it discharges through a 1' curb cut into the driveway and enters Palomas Avenue. A weir calculation for a 1' curb cut is included at the top of this sheet. **Subbasin 2** is 0.53 acres and generates 2.4 cfs. The truck ramp located east of building Major-2 is included in this subbasin. See the truck ramp calculations at the bottom of this sheet. Runoff from the truck ramp enters a 4" SDR 35 pipe and discharges into a swale located along the southern property line. The orifice and Manning's calculations for this pipe are included on this sheet. This basin is collected in WQ Pond 2 through a 2' curb opening. A weir calculation for a 2' curb cut is included at the top of this sheet. The required water quality pond volume for Subbasin 2 is 510 cubic feet. WQ Pond 2 provides a total of 512 cubic feet. Once full, runoff discharges through a 2' curb cut into the driveway and enters Palomas Avenue on the northern curb and the inlets on the driveway and Palomas Avenue at the northeast corner of the intersection with San Pedro Drive historically receives 9.4 cfs. The combined flow rate from Subbasins 1 & 2 is 3.2 cfs, which is less than historic. **Subbasin 3** is 2.37 acres and generates 11.7 cfs. In general, water flows southwest across this basin and is collected by a single type D inlet. The orifice and weir calculation for a single type D inlet is included at the bottom of this sheet. From there water flows through a 18" HDPE pipe and discharges to an underground 90" perforated pipe located west of building Major-1. The Manning's calculation for the 18" HDPE pipe is shown on the left side of this sheet. The required water quality pond volume for Subbasin 3 is 2,779 cubic feet. WQ Pond 3 accounts for 181 cubic feet and the underground pipe provides 2,607 cubic feet, which is a total of 2,788 cubic feet. Once the underground storage is full, water flows through a 18" reinforced concrete pipe (RCP) and discharges into the back of the inlet located on the eastern curb of San Pedro Drive near the northeast corner of the intersection with Palomas Avenue. The Manning's calculation for the 18" RCP is provided on the left side of this sheet. Per the 2015 FDS report, this inlet historically receives 13.2 cfs, which is greater than the proposed 11.7 cfs. **Subbasin 4** is 0.23 acres and generates 1.0 cfs. Runoff is collected in a swale on the north side of building Major-1 and discharges into WQ Pond 4. The required water quality volume for this basin is 202 cubic feet, and WQ Pond 4 provides 266 cubic feet. From there, water discharges through a 1' curb cut into the parking lot. **Subbasin 5** is 0.14 acres and generates 0.7 cfs. Runoff is collected in WQ Pond 5.1 and WQ Pond 5.2 through two 1' curb cuts. The required water quality volume for subbasin 5 is 173 cubic feet. The combined volume for both ponds is 197 cubic feet. Both ponds discharge through a 1' curb opening into the parking lot. **Subbasin 6** is 2.80 acres and generates 13.5 cfs. This basin also receives the offsite flows from the east, which is 8.3 cfs, as well as Subbasins 4 and 5. Therefore, the peak flow rate for Subbasin 6 is 23.5 cfs. Runoff generated both onsite and offsite flows west in the northern portion of the property until eventually reaching the double type D inlet located in the parking lot in the northwest corner of the site. The orifice and weir calculation for a double type D inlet is included at the bottom of this sheet. Storm water is then collected in an underground 90" perforated pipe. The required water quality volume for this subbasin is 3,110 cubic feet. WQ Pond 6 accounts for 158 cubic feet and the underground storage provides 3,004 cubic feet, which is a total of 3,162 cubic feet. After the pipe fills, excess water discharges through a 24" HDPE pipe and into the 84" storm drain. The Manning's calculation for the 24" pipe is shown at the top of this sheet. The total water quality volume provided for the site is 7,136 cubic feet.

REVISION	DATE	BY	CHKD	DATE
DESIGNED		RLE		
DRAWN		JWS		
CHECKED		HWF		
DATE	3-2-17			



EXISTING LEGAL DESCRIPTION:
LOTS 5A, 27 THRU 31 AND THE
REMAINING PORTION OF LOT 32,
BLOCK 11, TRACT A, UNIT A, NORTH
ALBUQUERQUE ACRES

PASEO MARKETPLACE
CONCEPTUAL GRADING & DRAINAGE PLAN



SHEET NUMBER:

C-1