CITY OF ALBUQUERQUE

PLANNING DEPARTMENT – Development Review Services

Richard J. Berry, Mayor

December 2, 2014

Fred C. Arfman, P.E.
Isaacson & Arfman, P.A.
128 Monroe St NE
Albuquerque, NM 87108

RE: **Morningstar at Palomas**
Grading and Drainage Plan with Supplemental Drainage Calculations
Engineer's Stamp Date 10-31-14 (File: D19D029)

Dear Mr. Arfman:

Based upon the information provided in your submittal received 11-7-14, the above referenced plan is approved for Building 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, Monica Ortiz

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

NOVEMBER 6, 2014

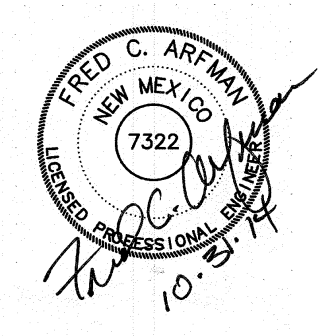
SUPPLEMENTAL INFORMATION

for

MORNINGSTAR of ALBUQUERQUE

GRADING AND DRAINAGE PLAN

by



ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates

Thomas O. Isaacson, PE(RET.) & LS(RET.)
Fred C. Arfman, PE
Åsa Nilsson-Weber, PE

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PROJECT INFORMATION

PROPERTY: The site is an undeveloped 2.3 acre property located within C.O.A. Vicinity Map D-19. The site is bound to the east by developed commercial, to the west by a 0.9± acre undeveloped property, to the north by Paseo Del Norte Blvd. R.O.W. and to the south by Palomas Blvd.

PROPOSED IMPROVEMENTS: the proposed improvements include an assisted living facility with associated asphalt paved access, parking and landscaping.

LEGAL: Portions of Lots 25, 26 and 27, 6, 7 And 8, Block 21 Tract A, Unit A, North Albuquerque Acres, Albuquerque, NM

BENCHMARK: Vertical datum is based upon Albuquerque control survey monument "heaven", elevation = 5378.235 feet (NAVD 88).

OFF-SITE: No off-site drainage will impact this property.

FLOOD HAZARD: per Bernalillo County Firm Map #35001c0141G, the site is located within Floodzone 'x' designated as areas determined to be outside 500-year floodplain.

DRAINAGE PLAN CONCEPT: Based on the *NORTH AND SOUTH DOMINGO BACA ARROYOS AND PASEO DEL NORTE (PDN) CORRIDOR DRAINAGE MANAGEMENT PLAN* prepared by Resource Technology, Inc. (1991) 100% of the site historically drains to PDN. In the developed condition, the site is permitted to continue to release historic rates (6.5 cfs as approved by NMDOT) to PDN either as surface flow or with a new storm drain connection to the existing public storm drain within the PDN R.O.W.

Discharge to Palomas Ave. Is unrestricted.

First flush retention ponds will be constructed at the NE, NW and SW ends of the property.

CALCULATIONS: 2033 - Palomas Assisted Living Facility : 09/26/2014

Based on Drainage Design Criteria for City of Albuquerque Section 22.2, DPM, Vol 2, dated Jan., 1993

ON-SITE

AREA OF SITE: 101312 SF = 2.3

100-year, 6-hour

HISTORIC FLOWS:

		Treatment SF	%
Area A	=	0	0%
Area B	=	75984	75%
Area C	=	25328	25%
Area D	=	0	0%
Total Area	=	101312	

DEVELOPED FLOWS:

		Treatment SF	%
Area A	=	0	0%
Area B	=	10131	10%
Area C	=	13171	13%
Area D	=	78010	77%
Total Area	=	101312	

EXCESS PRECIP:

Precip. Zone 3

E_A = 0.66

E_B = 0.92

E_C = 1.29

E_D = 2.36

On-Site Weighted Excess Precipitation (100-Year, 6-Hour Storm)

$$\text{Weighted E} = \frac{E_A A_A + E_B A_B + E_C A_C + E_D A_D}{A_A + A_B + A_C + A_D}$$

Historic E	=	1.01 in.	Developed E	=	2.08 in.

On-Site Volume of Runoff: V360 = E*A / 12

Historic V_{360}	=	8548 CF	Developed V_{360}	=	17535 CF

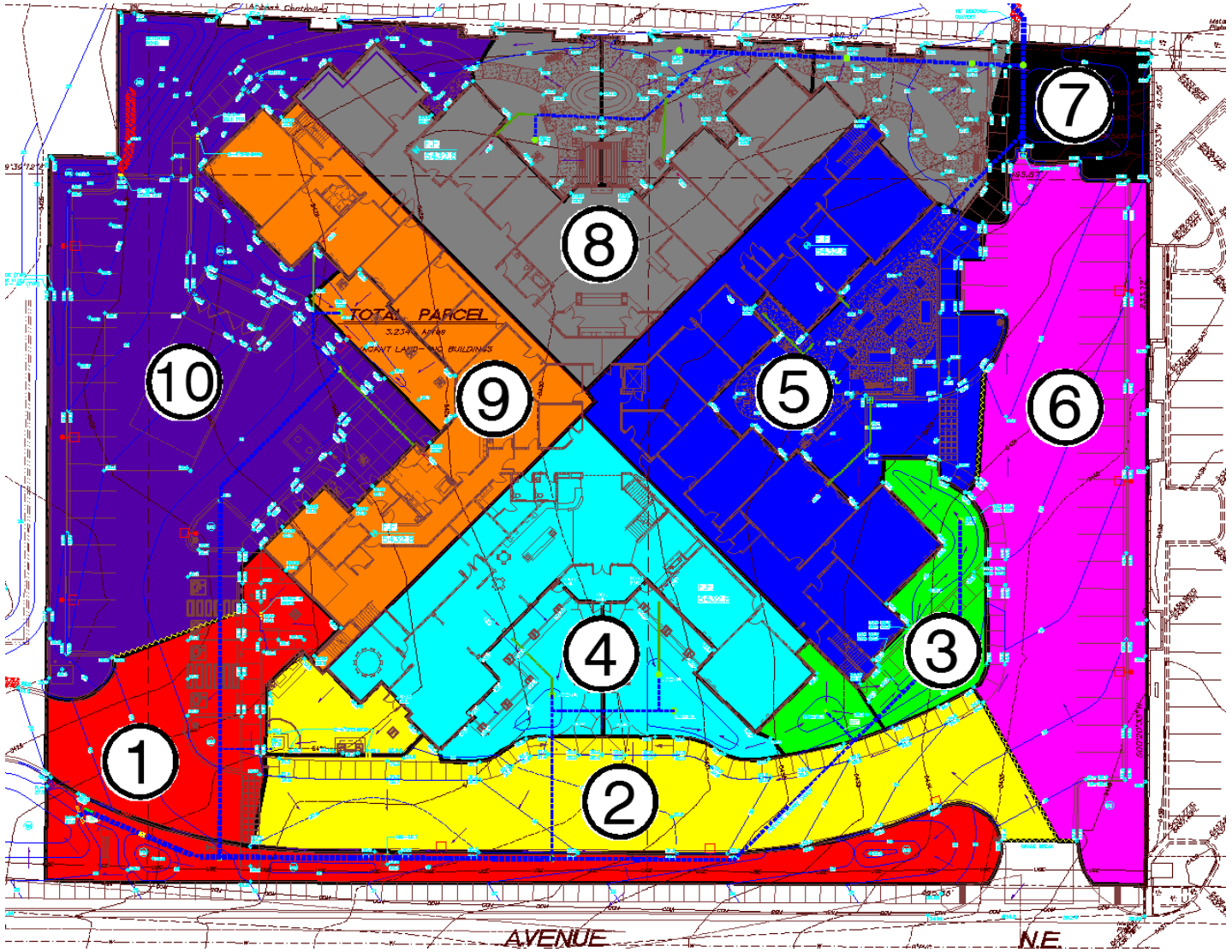
On-Site Peak Discharge Rate: $Qp = Q_{pA}A_A + Q_{pB}A_B + Q_{pC}A_C + Q_{pD}A_D / 43{,}560$

For Precipitation Zone 3

Q_{pA}	=	1.87	Q_{pC}	=	3.45
Q_{pB}	=	2.60	Q_{pD}	=	5.02

Historic Q_p	=	6.5 CFS	Developed Q_p	=	10.6 CFS

DRAINAGE BASINS



DRAINAGE BASIN CALCULATIONS WITH FIRST FLUSH REQUIRED VOLUME

BASIN NO. 1		DESCRIPTION			
Area of basin flows =	9260	SF	=	0.2	Ac.
The following calculations are based on Treatment areas as shown in table to the right				LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)				A =	0%
Weighted E =	1.73	in.		B =	25%
Sub-basin Volume of Runoff (see formula above)				C =	25%
V_{360} =	1337	CF		D =	50%
Sub-basin Peak Discharge Rate: (see formula above)				FIRST FLUSH VOL.	
Q_P =	0.9	cfs		131	CF

BASIN NO. 2		DESCRIPTION			
Area of basin flows =	9778	SF	=	0.2	Ac.
The following calculations are based on Treatment areas as shown in table to the right				LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)				A =	0%
Weighted E =	2.31	in.		B =	0%
Sub-basin Volume of Runoff (see formula above)				C =	5%
V_{360} =	1879	CF		D =	95%
Sub-basin Peak Discharge Rate: (see formula above)				FIRST FLUSH VOL.	
Q_P =	1.1	cfs		263	CF

BASIN NO. 3		DESCRIPTION			
Area of basin flows =	3008	SF	=	0.1	Ac.
The following calculations are based on Treatment areas as shown in table to the right				LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)				A =	0%
Weighted E =	1.48	in.		B =	35%
Sub-basin Volume of Runoff (see formula above)				C =	35%
V_{360} =	371	CF		D =	30%
Sub-basin Peak Discharge Rate: (see formula above)				FIRST FLUSH VOL.	
Q_P =	0.3	cfs		26	CF

BASIN NO. 4		DESCRIPTION			
Area of basin flows =	10360	SF	=	0.2	Ac.
The following calculations are based on Treatment areas as shown in table to the right				LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)				A =	0%
Weighted E =	1.98	in.		B =	15%
Sub-basin Volume of Runoff (see formula above)				C =	15%
V_{360} =	1712	CF		D =	70%
Sub-basin Peak Discharge Rate: (see formula above)				FIRST FLUSH VOL.	
Q_P =	1.1	cfs		205	CF

BASIN NO. 5		DESCRIPTION			
Area of basin flows =	13732	SF	=	0.3	Ac.
The following calculations are based on Treatment areas as shown in table to the right				LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)				A =	0%
Weighted E =	2.11	in.		B =	10%
Sub-basin Volume of Runoff (see formula above)				C =	10%
V_{360} =	2413	CF		D =	80%
Sub-basin Peak Discharge Rate: (see formula above)				FIRST FLUSH VOL.	
Q_P =	1.5	cfs		311	CF

BASIN NO. 6		DESCRIPTION			
Area of basin flows =	11636	SF	=	0.3	Ac.
The following calculations are based on Treatment areas as shown in table to the right				LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)				A =	0%
Weighted E =	2.20	in.		B =	0%
Sub-basin Volume of Runoff (see formula above)				C =	15%
V_{360} =	2133	CF		D =	85%
Sub-basin Peak Discharge Rate: (see formula above)				FIRST FLUSH VOL.	
Q_P =	1.3	cfs		280	CF

BASIN NO. 7		DESCRIPTION			
Area of basin flows =	2249	SF	=	0.1	Ac.
The following calculations are based on Treatment areas as shown in table to the right				LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)				A =	0%
Weighted E =	1.50	in.		B =	30%
Sub-basin Volume of Runoff (see formula above)				C =	40%
V_{360} =	281	CF		D =	30%
Sub-basin Peak Discharge Rate: (see formula above)				FIRST FLUSH VOL.	
Q_P =	0.2	cfs		19	CF

BASIN NO. 8		DESCRIPTION			
Area of basin flows =	13986	SF	=	0.3	Ac.
The following calculations are based on Treatment areas as shown in table to the right				LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)				A =	0%
Weighted E =	2.11	in.		B =	10%
Sub-basin Volume of Runoff (see formula above)				C =	10%
V_{360} =	2458	CF		D =	80%
Sub-basin Peak Discharge Rate: (see formula above)				FIRST FLUSH VOL.	
Q_P =	1.5	cfs		317	CF

BASIN NO. 9		DESCRIPTION			
Area of basin flows =	8570	SF	=	0.2	Ac.
The following calculations are based on Treatment areas as shown in table to the right				LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)				A =	0%
Weighted E =	2.25	in.		B =	0%
Sub-basin Volume of Runoff (see formula above)				C =	10%
V_{360} =	1609	CF		D =	90%
Sub-basin Peak Discharge Rate: (see formula above)				FIRST FLUSH VOL.	
Q_P =	1.0	cfs		219	CF

BASIN NO. 10		DESCRIPTION			
Area of basin flows =	17680	SF	=	0.4	Ac.
The following calculations are based on Treatment areas as shown in table to the right				LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)				A =	0%
Weighted E =	2.16	in.		B =	10%
Sub-basin Volume of Runoff (see formula above)				C =	5%
V_{360} =	3186	CF		D =	85%
Sub-basin Peak Discharge Rate: (see formula above)				FIRST FLUSH VOL.	
Q_P =	1.9	cfs		426	CF

FIRST FLUSH REQUIREMENTS:

Stormwater control measures are required to provide management of 'first flush' (defined as the 90th percentile storm event or 0.34" [0.44" less 0.1" for initial abstraction] of stormwater which discharges directly to a public storm drainage system).

The ponding volume required is 0.34" * Land Treatment 'D' area

The percentage of Land Treatment 'D' = 77% for this 2.3 ac property

0.34/12 * 0.77 * 2.3 ac * 43,560 = 2,186 cf

There are 'first flush' retention ponds located at the NE, SE and SW corners of the property. Surface storm water shall be directed to these ponds.

Basins draining to Palomas Ave.

Basins 1, 2, 3, 4 and 9
Total Area of Treatment D = 29,787 sf =
Total first flush basin area = 0.34/12 * 29,787 sf = 844 cf
Total retention provided = 879 cf OK

First Flush - Palomas Ave. Pond			
Contour	Area	Volume	
5427.10	916		
5426.00	433	742	CF
5425.60	250	137	CF
TOTAL VOL.		**879**	CF

Basins draining to Paseo del Norte – Northeast corner

Basins 5, 6, 7 and 8
Total Area of Treatment D = 32,740 sf =
Total first flush basin area = 0.34/12 * 32,740 sf = 928 cf
Total retention provided = 984 cf OK

First Flush - PdN NE Pond			
Contour	Area	Volume	
5430.70	1091		
5430.00	768	651	CF
5429.50	565	333	CF
TOTAL VOL.		**984**	CF

Basins draining to Paseo del Norte – Northwest corner

Basins 10
Total Area of Treatment D = 15,028 sf =
Total first flush basin area = 0.34/12 * 15,028 sf = 426 cf
Total retention provided = 500 cf OK

First Flush - PdN NW Pond			
Contour	Area	Volume	
5426.00	557		
5425.00	250	404	CF
5424.50	134	96	CF
TOTAL VOL.		**500**	CF

ALLOWABLE DISCHARGE to PASEO DEL NORTE R.O.W.:

NMDOT SUBMITTAL AND APPROVAL EMAILS ARE PROVIDED AT THE END OF THIS REPORT

Per the approved Conceptual Grading and Drainage Plan for this property (D19/D029) submitted 05-18-14, and approved by COA Hydrology and NMDOT's Tim Trujillo, P.E., the proposed development will discharge 6.5 cfs to the Paseo del Norte R.O.W. (PDN).

This property, although undeveloped, has been used annually for the sale of Christmas trees for many years. The historic discharge rate is based on land treatments of 75%B, 25%C.

The discharge to PdN will be sub-divided as follows – see drainage basin map.

NORTHWEST FIRST FLUSH RETENTION BASIN

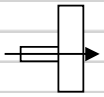
1.9 cfs (Basin 10) will surface drain to the 'first flush' retention pond at the NW corner of the property.

Required first flush volume = 426 cf

Provided volume = 500 cf

NORTHWEST DISCHARGE VIA SIDEWALK CULVERT TO PASEO DEL NORTE 'V' DITCH:

Once the first flush retention pond fills, the 100-yr 6-hour storm of 1.9 cfs will discharge through the proposed covered sidewalk culvert. Using the orifice equation for rectangular openings, the 18" x 6" covered sidewalk culvert with an invert elevation of 26.0 has a capacity of 1.9 cfs at a head of 0.27'. Thus, the MWSEL would be 26.52' for a 100-year 6-hour storm.

ORIFICE EQUATION - RECTANGULAR @ NW POND								
Rectangular Area		108	sq.in.	0.75	sq.ft.			
	Width	**18**	in	1.50	ft			
	Height	**6**	in	0.50	ft			
Headwater Elevation		**0.52**	feet	0.27	Actual H to centerline of culvert			
C		**0.6**		C values	Rounded	Sharp	Tube Out	Tube In
g		32.2	f/s^2		0.98	0.61	0.80	0.51
								
Q = C*A*((2*g*H)^0.5)		**=**	**1.9 cfs**	**for 0.75 sq.ft. orifice**				

An 18" wide wall opening is provided as an emergency overflow at elevation 27.0.

NORTHEAST FIRST FLUSH RETENTION BASIN

1.5 cfs (Basins 6 and 7) will surface drain to the 'first flush' retention pond at the NE corner of the property.

Required first flush volume = 299 cf

3.0 cfs (Basins 5 and 8) will discharge to a private storm drain system. This runoff consists of mostly roof and landscaping (no pavement other than pedestrian walks). The 3.0 cfs will be passed through a water quality manhole with a 4' deep sump and a pre-installed SNOUT system (a vented hood that can reduce floatable trash and debris, free oils and other solids from stormwater discharge).

Required first flush volume = 628 cf

Total first flush volume required = 928 cf

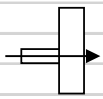
Provided volume = 984 cf

NORTHEAST DISCHARGE TO STORM DRAIN INLET WITH WATER QUALITY UNIT:

Once the first flush retention pond fills, the 100-yr 6-hour storm from Basins 5 and 8 (1.5 cfs) will discharge to the private storm drain system at the water quality inlet then to the existing PdN public storm drain system. APPROVED BY NMDOT.

NORTHEAST EMERGENCY OVERFLOW VIA SIDEWALK CULVERT TO PASEO DEL NORTE 'V' DITCH:

In the event the storm drain inlet doesn't function (in an emergency), flow will pass to PdN through the proposed covered sidewalk culvert. Using the orifice equation for rectangular openings, the 18" x 6" covered sidewalk culvert with an invert elevation of 31.0 has a capacity of 1.5 cfs at a head of 0.17'. Thus, the MWSEL would be 31.42 for a 100-year 6-hour storm.

ORIFICE EQUATION - RECTANGULAR @ NE POND								
Rectangular Area		108 sq.in.		0.75 sq.ft.				
	Width	**18**	in	1.50	ft			
	Height	**6**	in	0.50	ft			
Headwater Elevation		**0.42**	feet	0.17	Actual H to centerline of culvert			
C		**0.6**		C values	Rounded	Sharp	Tube Out	Tube In
g		32.2	f/s^2		0.98	0.61	0.80	0.51
								
Q = C*A*((2*g*H)^0.5)		**=**	**1.51 cfs**	**for 0.75 sq.ft. orifice**				

=

SOUTHWEST CURB OPENINGS TO PALOMAS AVE:

Per the approved Master Drainage Plan, North and South Domingo drainage study (COA File D19/026) prepared by Tierra West, Palomas Ave has capacity to accept free discharge from this entire property based on land treatment percentages of 10% B, 20% C and 70% D = 10.4 cfs.

Allowable discharge to Palomas Ave.					
Area of basin flows =	101312	SF	=	2.3	Ac.
The following calculations are based on Treatment areas as shown in table to the right				LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)				A =	0%
Weighted E =	2.00	in.		B =	10%
Sub-basin Volume of Runoff (see formula above)				C =	20%
V_{360} =	16902	CF		D =	70%
Sub-basin Peak Discharge Rate: (see formula above)					
Q_P =	10.4	cfs			

The total discharge to Palomas Ave. will consist of basins 1, 2, 3, 4 and 9 for a total of 4.2 cfs < 10.4 cfs.

Basin 1 will surface discharge to the water harvesting area. Basins 2, 3, 4 and 9 will drain to the south side storm drain system and discharge to the bubble-up inlet in the retention basin.

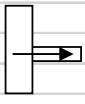
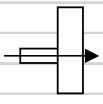
SOUTHWEST FIRST FLUSH RETENTION BASIN

4.2 cfs (Basins 1, 2, 3, 4 and 9) will drain to the 'first flush' retention basin at the SW corner of the property.

Required first flush volume = 844 cf

Provided volume = 879 cf

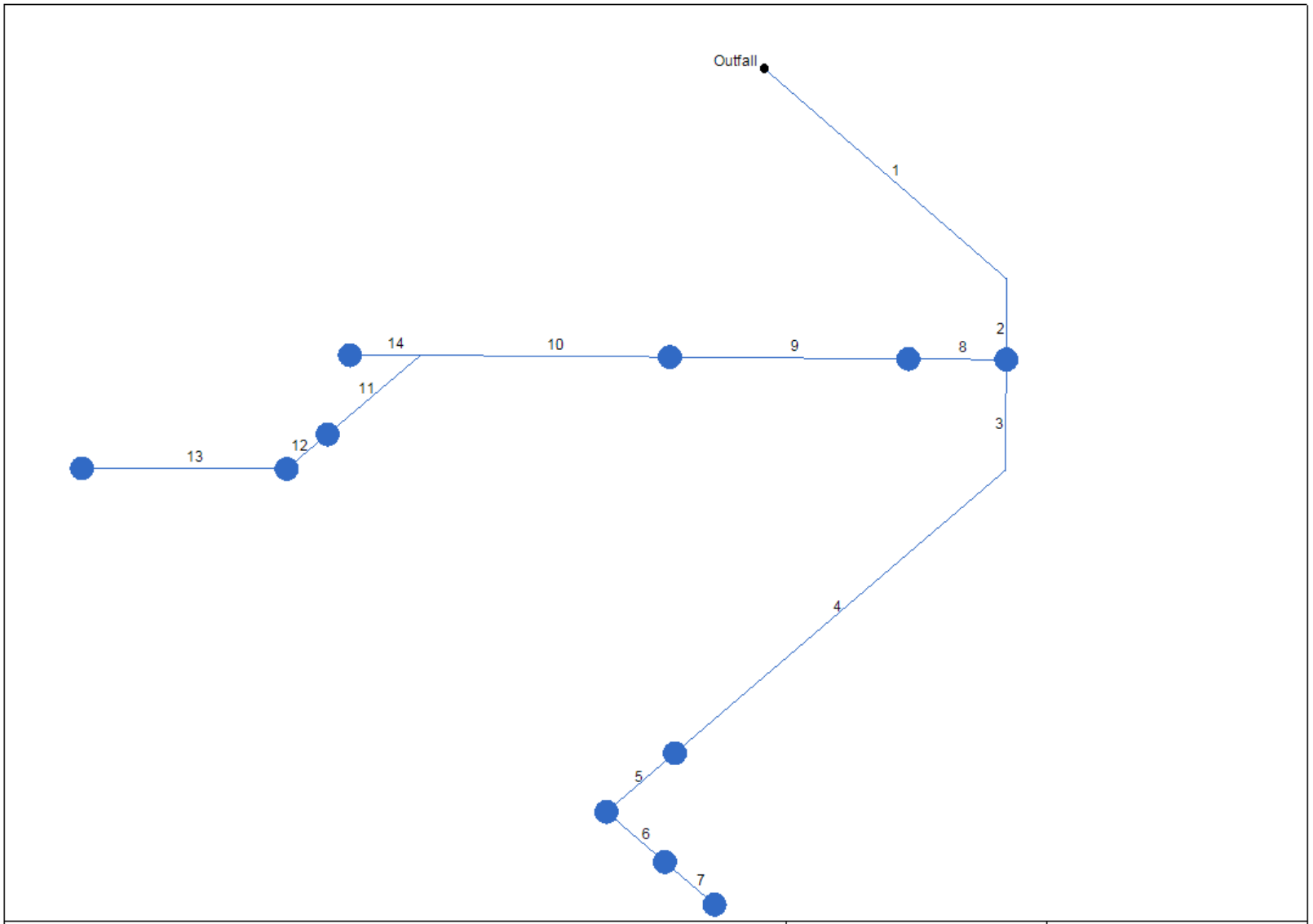
Once the first flush retention pond fills, the 100-yr 6-hour storm of 4.2 cfs will discharge through the proposed curb openings. Using the orifice equation for rectangular openings, each 12" x 6" curb opening with a flowline elevation of 27.1 has a capacity of 1.09 cfs at a head of 0.2'. Thus, the MWSEL would be 27.55 for a 100-year 6-hour storm with four curb openings constructed (1.09 x 4 = 4.36 cfs).

ORIFICE EQUATION - RECTANGULAR @ SW POND								
Rectangular Area	288	sq.in.	2.00	sq.ft.				
Width	48	in	4.00	ft				
Height	6	in	0.50	ft				
Headwater Elevation	0.52	feet	0.27	Actual H to centerline of culvert				
C	0.6		C values	Rounded	Sharp	Tube Out	Tube In	
g	32.2	f/s^2		0.98	0.61	0.80	0.51	
								
Q = C*A*((2*g*H)^0.5)	=	5.07 cfs	for 2 sq.ft. orifice		(Four 12" wide curb openings)			

In an emergency, the pond will overflow the curb.

NORTH SIDE
STORM DRAIN
ANALYSIS TO NMDOT
STORM SEWER

2033 SD 1


Outfall
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Project File: 2033 SD.stm
Number of lines: 14
Date: 10/30/2014
Storm Sewers v10.40

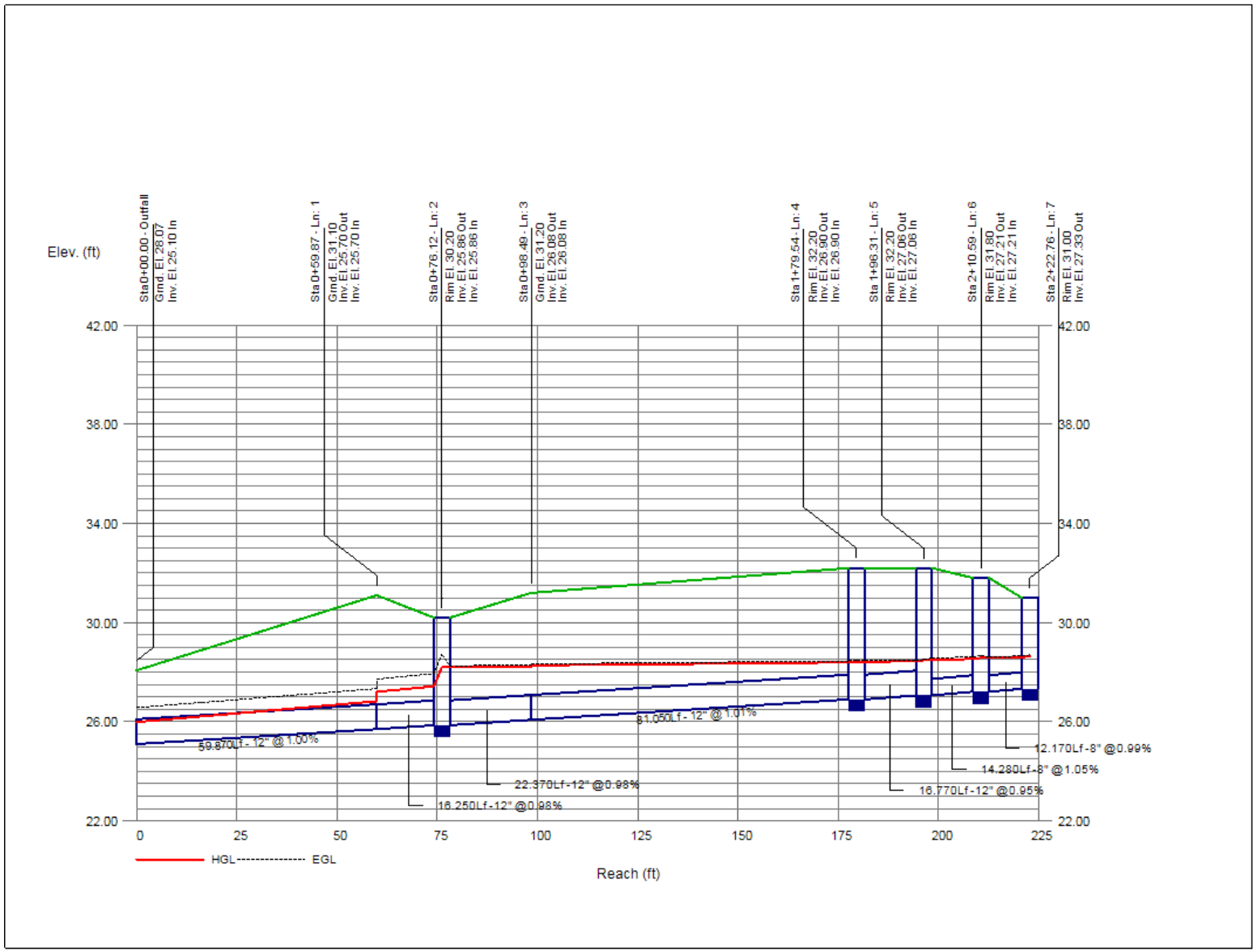
Line No.	Defl Ang (Deg)	Line Size (in)	Line Type	Line Length (ft)	Line Slope (%)	Junct Type	Known Q (cfs)	n-val Pipe	Flow Rate (cfs)	Capac Full (cfs)	EGL Dn (ft)	EGL Up (ft)	Energy Loss (ft)	Crit Depth (ft)	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)	HGL Dn (ft)	HGL Up (ft)	Invert Dn (ft)	Invert Up (ft)	
1	45.338	12	Cir	59.870	1.00	None	0.00	0.012	4.50	3.86	26.57	27.34	0.769	0.89	28.07	31.10	25.99	26.83	25.10	25.70	
2	45.103	12	Cir	16.250	0.98	Generic	1.50	0.012	4.50	3.83	27.72	27.94	0.221	0.89	31.10	30.20	27.21	27.43	25.70	25.86	
3	-0.121	12	Cir	22.370	0.98	None	0.00	0.012	1.50	3.83	28.25	28.29	0.034	0.52	30.20	31.20	28.20	28.23	25.86	26.08	
4	44.680	12	Cir	81.050	1.01	Generic	0.40	0.012	1.50	3.88	28.33	28.45	0.123	0.52	31.20	32.20	28.27	28.40	26.08	26.90	
5	0.000	12	Cir	16.770	0.95	Generic	0.30	0.012	1.10	3.77	28.45	28.47	0.014	0.44	32.20	32.20	28.42	28.44	26.90	27.06	
6	-90.000	8	Cir	14.280	1.05	Generic	0.20	0.012	0.80	1.34	28.56	28.62	0.053	0.42	32.20	31.80	28.48	28.54	27.06	27.21	
7	0.000	8	Cir	12.170	0.99	Generic	0.60	0.012	0.60	1.30	28.62	28.65	0.026	0.36	31.80	31.00	28.58	28.60	27.21	27.33	
8	90.000	12	Cir	16.960	1.53	Generic	0.30	0.012	1.50	4.78	28.25	28.28	0.026	0.52	30.20	31.00	28.20	28.22	25.86	26.12	
9	0.000	12	Cir	41.400	1.50	Generic	0.20	0.012	1.20	4.72	28.29	28.33	0.040	0.46	31.00	31.80	28.25	28.29	26.12	26.74	
10	0.000	12	Cir	43.220	1.48	None	0.00	0.012	1.00	4.69	28.33	28.36	0.027	0.42	31.80	31.70	28.31	28.34	26.74	27.38	
11	-45.062	8	Cir	22.720	1.67	Generic	0.20	0.012	0.80	1.69	28.44	28.51	0.084	0.42	31.70	32.20	28.35	28.43	27.38	27.76	
12	0.000	8	Cir	10.000	1.60	Generic	0.30	0.012	0.60	1.65	28.51	28.53	0.021	0.36	32.20	32.30	28.47	28.48	27.76	27.92	
13	44.952	8	Cir	35.500	1.63	Generic	0.30	0.012	0.30	1.67	28.64	28.85	0.000	0.25	32.30	31.90	28.54	28.75 j	27.92	28.50	
14	-0.201	8	Cir	12.300	1.54	Generic	0.20	0.012	0.20	1.63	28.36	28.36	0.003	0.21	31.70	31.50	28.35	28.36	27.38	27.57	

2033 SD 1	Number of lines: 14	Date: 10/30/2014
NOTES: ** Critical depth		

Storm Sewers

Storm Sewer Profile

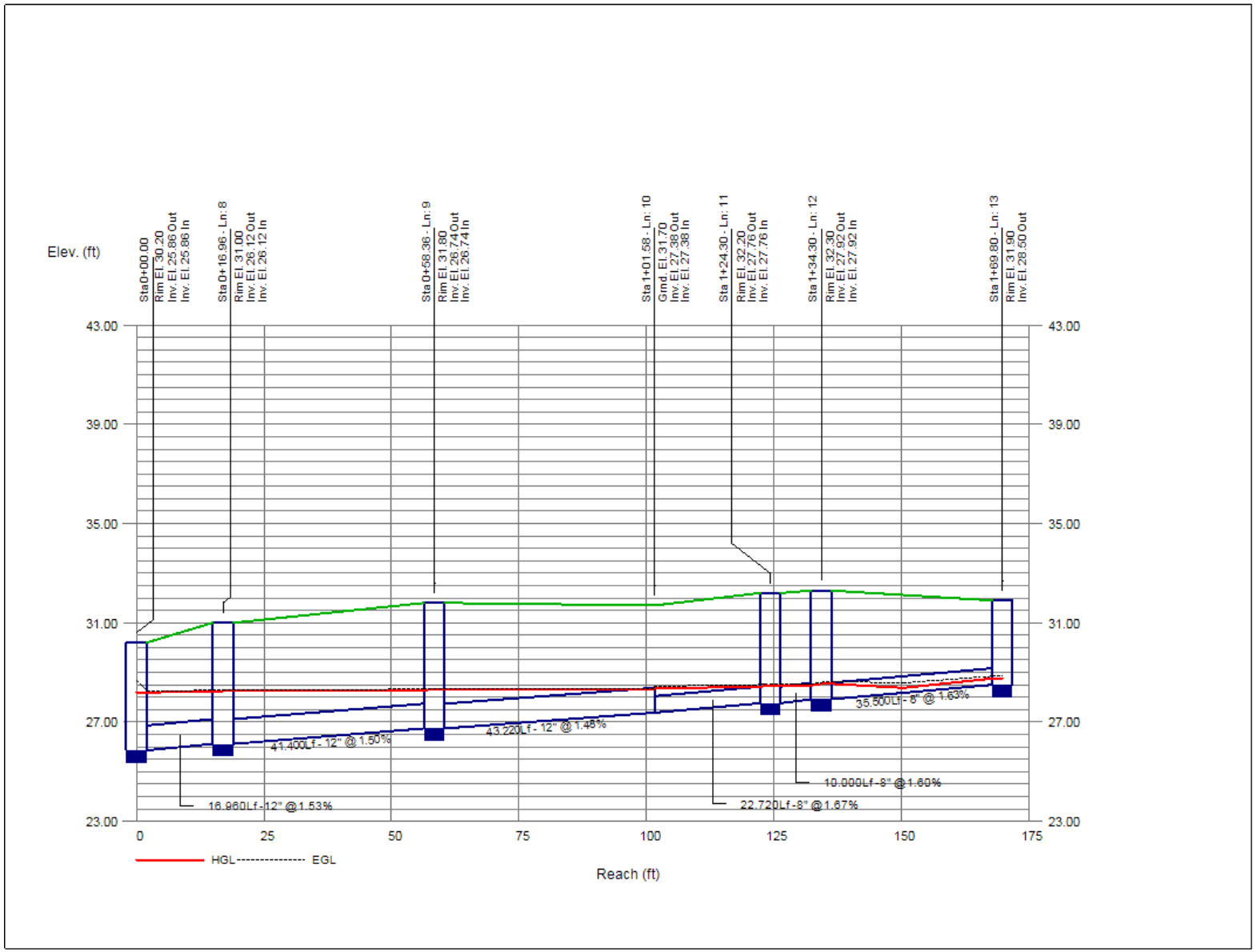
Proj. file: 2033 SD.stm



Storm Sewers

Storm Sewer Profile

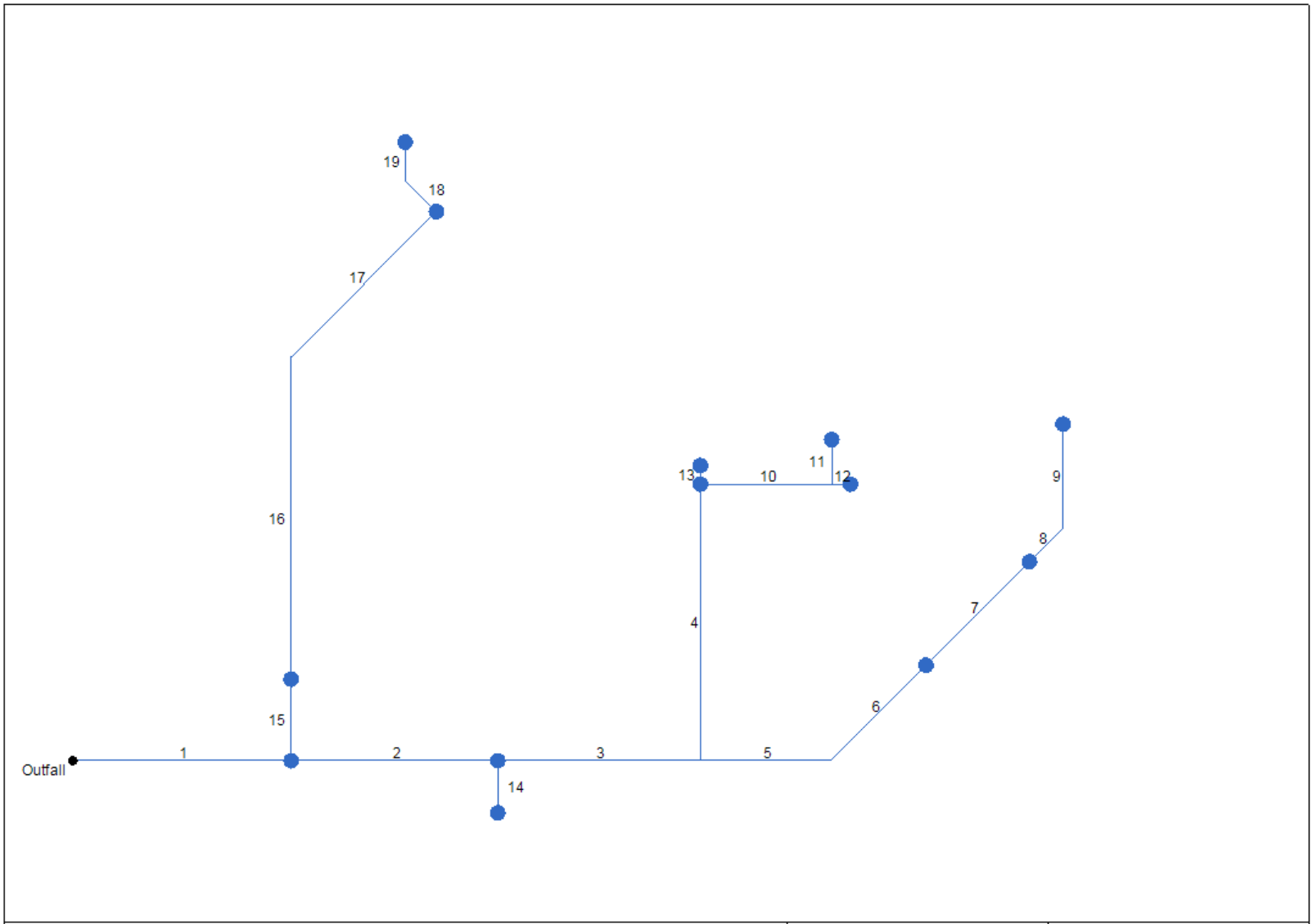
Proj. file: 2033 SD.stm



Storm Sewers

SOUTH SIDE
STORM DRAIN MAIN
ANALYSIS TO SW POND
OVERFLOWING TO PALOMAS AVE

Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Project File: 2033 South SD.stm	Number of lines: 19	Date: 10/30/2014

Storm Sewers v10.40

Line No.	Defl Ang (Deg)	Line Size (in)	Line Type	Line Length (ft)	Line Slope (%)	Junct Type	Known Q (cfs)	n-val Pipe	Flow Rate (cfs)	Capac Full (cfs)	EGL Dn (ft)	EGL Up (ft)	Energy Loss (ft)	Crit Depth (ft)	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)	HGL Dn (ft)	HGL Up (ft)	Invert Dn (ft)	Invert Up (ft)	
1	0.000	18	Cir	58.700	1.24	MH	0.00	0.012	3.50	12.69	5427.56	5427.62	0.056	0.71	5427.00	5430.30	5427.50	5427.56	5424.00	5424.73	
2	0.000	12	Cir	55.500	1.26	MH	0.00	0.012	2.50	4.33	5427.77	5428.01	0.233	0.68	5430.30	5430.40	5427.62	5427.85	5424.73	5425.43	
3	0.000	12	Cir	54.440	1.25	MH	0.00	0.012	1.40	4.31	5428.06	5428.13	0.072	0.50	5430.40	5431.20	5428.01	5428.08	5425.43	5426.11	
4	-90.000	12	Cir	35.000	3.00	Generic	0.00	0.012	1.10	6.68	5428.16	5428.19	0.028	0.44	5431.20	5432.00	5428.13	5428.16	5426.11	5427.16	
5	0.000	8	Cir	74.300	1.25	None	0.00	0.012	0.30	1.46	5428.14	5428.18	0.039	0.25	5431.20	5432.40	5428.13	5428.17	5426.11	5427.04	
6	-45.000	8	Cir	36.260	1.27	Generic	0.10	0.012	0.30	1.47	5428.19	5428.21	0.019	0.25	5432.40	5433.70	5428.18	5428.20	5427.04	5427.50	
7	0.000	8	Cir	39.280	1.25	Generic	0.10	0.012	0.20	1.46	5428.21	5428.28	0.071	0.21	5433.70	5431.70	5428.20	5428.22	5427.50	5427.99	
8	0.000	8	Cir	12.800	1.25	None	0.00	0.012	0.10	1.46	5428.30	5428.34	0.000	0.14	5431.70	5433.00	5428.25	5428.29 j	5427.99	5428.15	
9	-45.000	8	Cir	27.910	1.25	Generic	0.10	0.012	0.10	1.47	5428.34	5428.69	0.000	0.14	5433.00	5431.50	5428.29	5428.64	5428.15	5428.50	
10	90.000	8	Cir	35.300	3.00	None	0.00	0.012	0.60	2.27	5428.25	5428.73	0.148	0.36	5432.00	5431.70	5428.20	5428.58 j	5427.16	5428.22	
11	-90.000	8	Cir	11.930	3.02	Generic	0.50	0.012	0.50	2.27	5428.71	5429.04	0.000	0.33	5431.70	5431.70	5428.58	5428.91 j	5428.22	5428.58	
12	0.000	8	Cir	5.000	3.00	Generic	0.10	0.009	0.10	3.02	5428.63	5428.56	0.000	0.14	5431.70	5431.50	5428.58	5428.51	5428.22	5428.37	
13	0.000	8	Cir	5.000	3.00	Generic	0.50	0.012	0.50	2.27	5428.23	5428.24	0.007	0.33	5432.00	5431.70	5428.20	5428.21	5427.16	5427.31	
14	90.000	12	Cir	14.000	3.00	Generic	1.10	0.012	1.10	6.68	5428.04	5428.05	0.011	0.44	5430.40	5429.80	5428.01	5428.02	5425.43	5425.85	
15	-90.000	12	Cir	21.900	1.64	Generic	0.00	0.012	1.00	4.95	5427.64	5427.66	0.015	0.42	5430.30	5431.50	5427.62	5427.63	5424.74	5425.10	
16	0.000	12	Cir	86.500	1.69	None	0.00	0.012	1.00	5.01	5427.67	5427.73	0.058	0.42	5431.50	5431.30	5427.64	5427.70	5425.10	5426.56	
17	45.000	12	Cir	55.200	1.67	Generic	0.50	0.012	1.00	4.98	5427.75	5428.06	0.156	0.42	5431.30	5431.60	5427.72	5427.90 j	5426.56	5427.48	
18	-90.000	8	Cir	11.900	1.68	None	0.00	0.012	0.50	1.70	5428.03	5428.14	0.000	0.33	5431.60	5431.40	5427.90	5428.01 j	5427.48	5427.68	
19	45.000	8	Cir	10.200	1.67	Generic	0.50	0.012	0.50	1.69	5428.14	5428.31	0.000	0.33	5431.40	5431.70	5428.01	5428.18	5427.68	5427.85	

Project File: 2033 South SD.stm | Number of lines: 19 | Date: 10/30/2014

NOTES: ** Critical depth

Storm Sewers

Storm Sewer Profile

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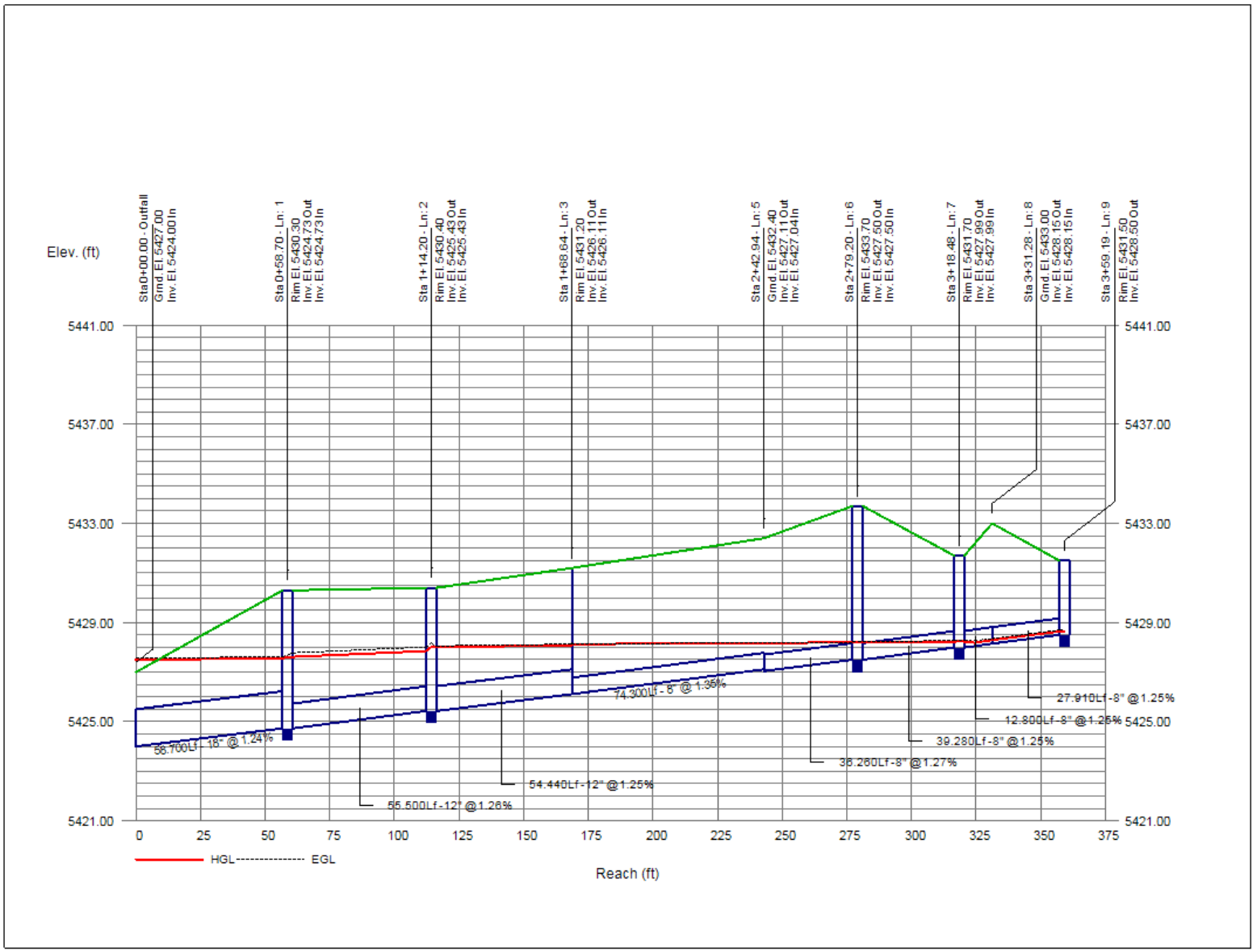

Storm Sewers

Storm Sewer Profile

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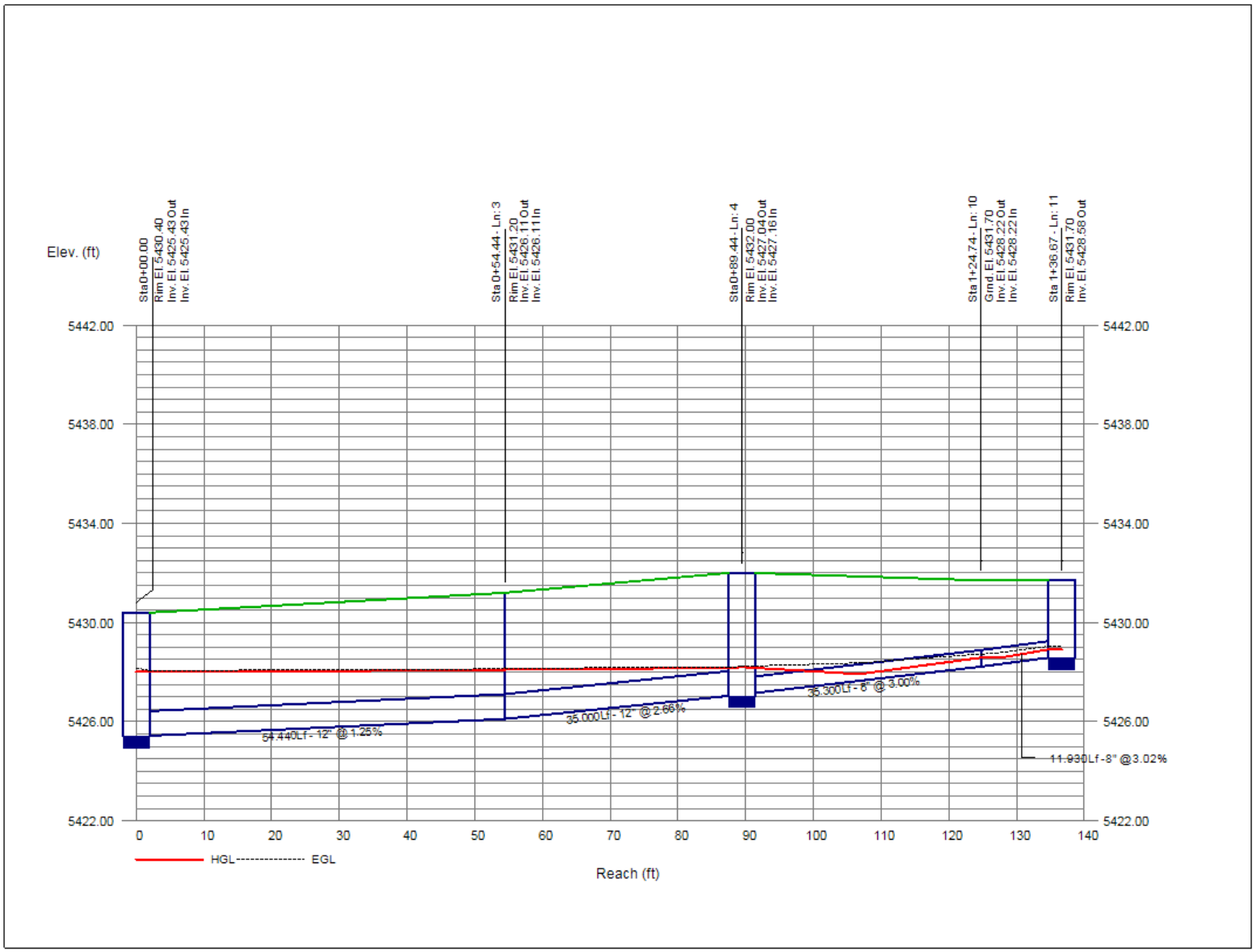

Storm Sewers

Storm Sewer Profile

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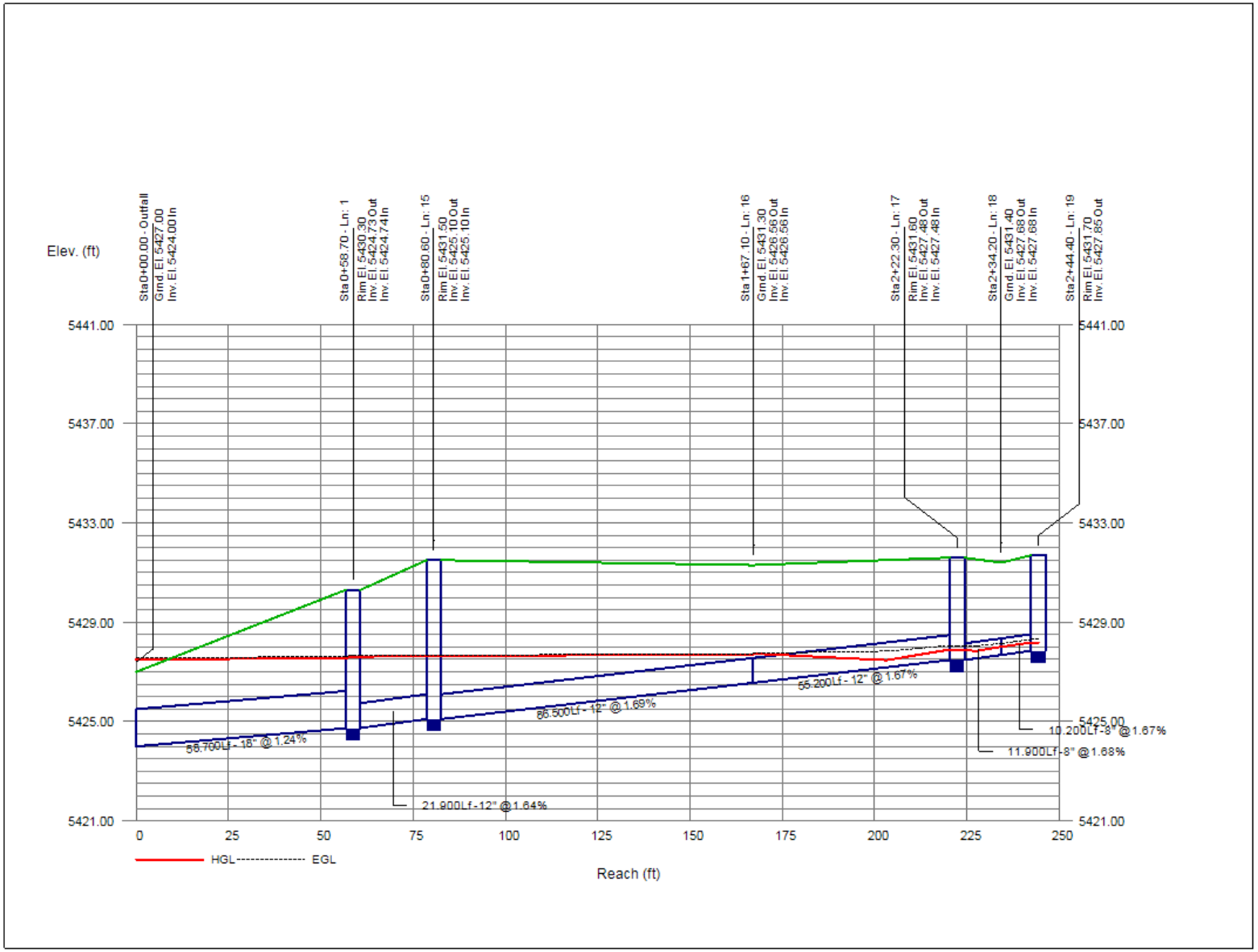
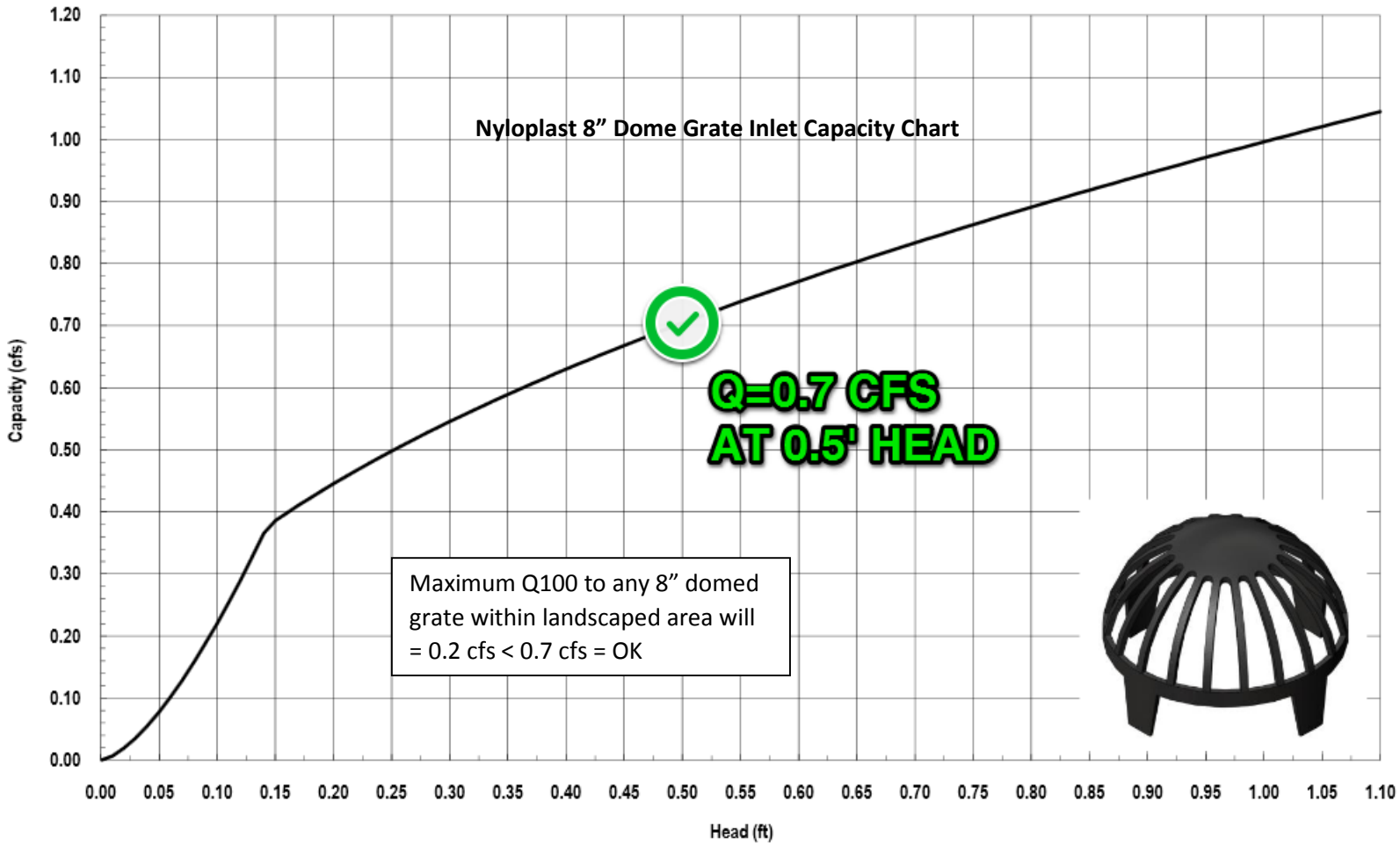


Storm Sewers



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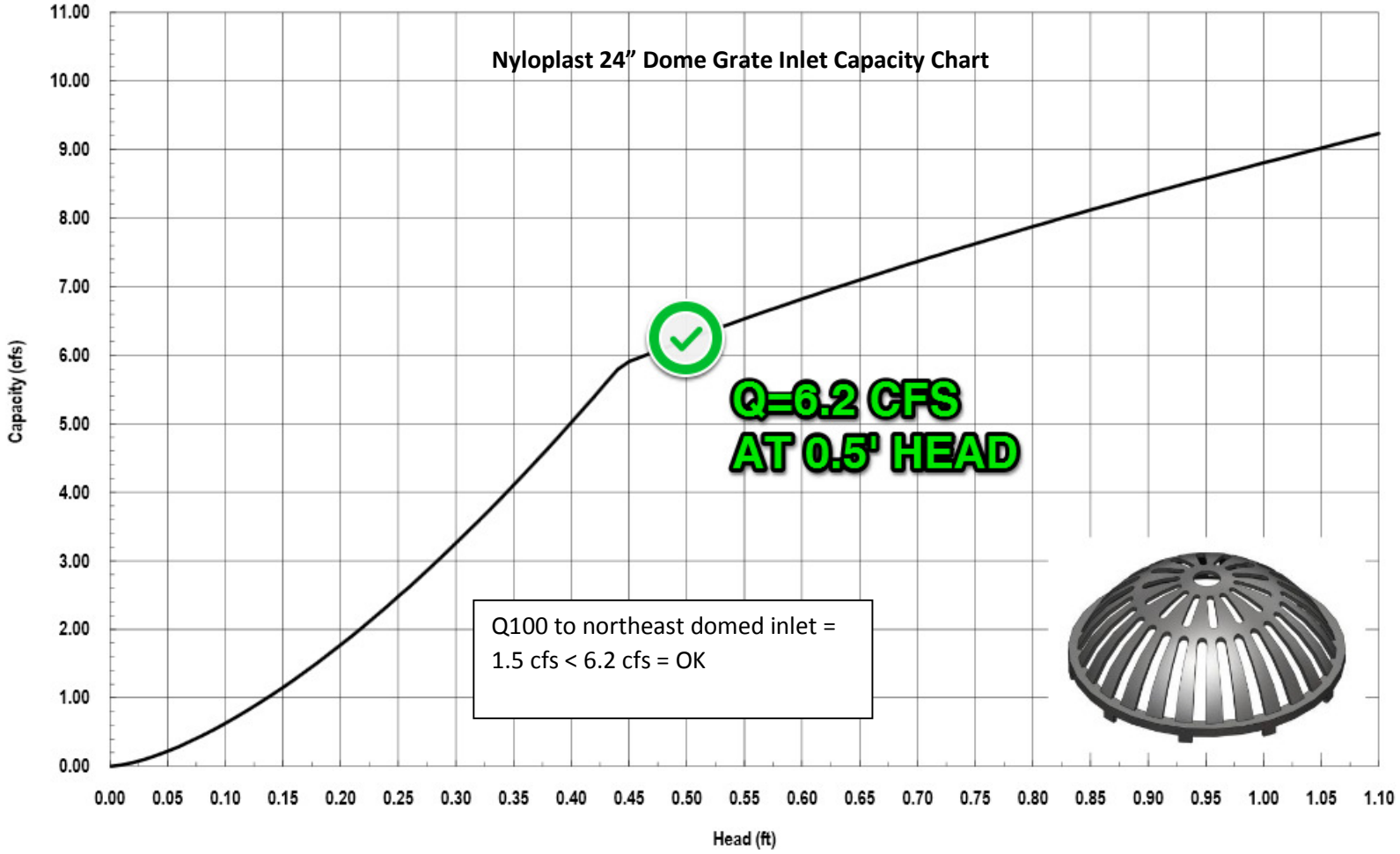

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EVIDENCE OF OLD SILT FENCE. POSSIBLE BURIED DRAINAGE INLET. UNABLE TO VERIFY. POT HOLING MAY BE REQUIRED.

Albuquerque Control Survey Monument "HEAVEN"
New Mexico State Plane Coordinates
(Central Zone, NAD 83)
Northing= 1,518,799.515 feet
Easting= 1,542,297.145 feet
Elevation= 5378.235 feet (NAVD 1988)
Delta Alpha= -00°10'46.22"
Ground To Grid Factor= 0.999655810

PASEO DEL NORTE

MATCHLINE

MATCHLINE

PALOMAS AVE.

FUTURE PAD ELEVATION
5426.0±

PROPOSED SHARED ACCESS / DRAINAGE EASEMENT

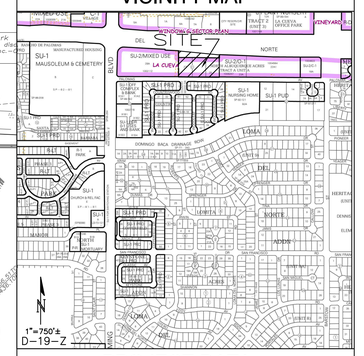
Storm Inlet Top Grate=5426.07
Inv= 5421.07 Bottom of Vault
Inv= 5419.87 FL
Concrete Vault with possible 48" RCP running immediately North of the Vault and flowline appears to be 1.2' below the bottom of the vault. Depth of the actual pipe may be required for actual Flowline elevation and pipe size.

Project Benchmark
PK Nail and aluminum disc stamped "Surv-Tec, Inc." Elevation= 5432.62

F.F. 5432.8

SCALE 1"=20'

VICINITY MAP



PROJECT DATA

PROPERTY: THE SITE IS AN UNDEVELOPED 2.3 ACRE PROPERTY (TO BE REPLATTED INTO A SINGLE LOT) LOCATED WITHIN C.O.A. VICINITY MAP D-19. THE SITE IS BOUND TO THE EAST BY DEVELOPED COMMERCIAL, TO THE WEST BY A 0.9± ACRE UNDEVELOPED PROPERTY (TO BE CREATED AS PART OF REPLAT), TO THE NORTH BY PASEO DEL NORTE BLVD. R.O.W. AND TO THE SOUTH BY PALOMAS BLVD.

PROPOSED IMPROVEMENTS: THE PROPOSED IMPROVEMENTS INCLUDE AN ASSISTED LIVING FACILITY WITH ASSOCIATED ASPHALT PAVED ACCESS, PARKING AND LANDSCAPING.

LEGAL: PORTIONS OF LOTS 25, 26 AND 27, 6, 7 AND 8, BLOCK 21 TRACT A, UNIT A, NORTH ALBUQUERQUE ACRES, ALBUQUERQUE, NM

BENCHMARK: VERTICAL DATUM IS BASED UPON ALBUQUERQUE CONTROL SURVEY MONUMENT "HEAVEN", ELEVATION = 5378.235 FEET (NAVD 88).

OFF-SITE: NO OFF-SITE DRAINAGE WILL IMPACT THIS PROPERTY. EXISTING UNGROUTED JOINTS BETWEEN BLOCKS AND SMALL DIAMETER PIPES IN EXISTING ADJACENT PROPERTY WALL AT NE END OF PROPERTY WILL BE PLUGGED TO PREVENT DISCHARGE INTO THIS PROPERTY.

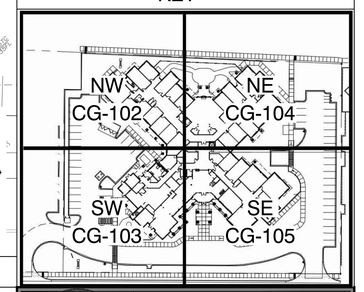
FLOOD HAZARD: PER BERNALILLO COUNTY FIRM MAP #35001C0141G, THE SITE IS LOCATED WITHIN FLOODZONE 'X' DESIGNATED AS AREAS DETERMINED TO BE OUTSIDE 500-YEAR FLOODPLAIN.

DRAINAGE PLAN CONCEPT: BASED ON THE NORTH AND SOUTH DOMINGO BACA ARROYOS AND PASEO DEL NORTE (PDN) CORRIDOR DRAINAGE MANAGEMENT PLAN PREPARED BY RESOURCE TECHNOLOGY, INC. (1991) 100% OF THE SITE HISTORICALLY DRAINS TO PDN. IN THE DEVELOPED CONDITION, THE SITE IS PERMITTED TO CONTINUE TO RELEASE HISTORIC RATES TO PDN EITHER AS SURFACE FLOW OR WITH A NEW STORM DRAIN CONNECTION TO THE EXISTING PUBLIC STORM DRAIN INLET WITHIN THE PDN R.O.W. DISCHARGE TO PALOMAS AVE. IS UNRESTRICTED. DETENTION POND(S) WILL BE CONSTRUCTED ALONG THE NORTH END OF THE PROPERTY TO CONTROL DISCHARGE TO HISTORIC RATES.

ENGINEER:
FRED C. ARFMAN: NMPE NO. 7322
ISAACSON & ARFMAN, PA
128 MONROE N.E.
ALBUQUERQUE, NEW MEXICO 87108

SURVEYOR:
RUSS P. HUGG: NMPS NO. 9750
SURV-TEC, INC.
9384 VALLEY VIEW DRIVE, N.W.
ALBUQUERQUE, NEW MEXICO 87114

KEY



GENERAL NOTES

A. ALL WORK DETAILED ON THESE PLANS AND PERFORMED UNDER THIS CONTRACT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT GEOTECHNICAL REPORT. WHERE APPLICABLE, CITY OF ALBUQUERQUE AND NMDOT STANDARDS APPLY

B. THE CONTRACTOR SHALL ABIDE BY ALL STATE, LOCAL, AND FEDERAL LAWS, CODES, RULES AND REGULATIONS WHICH APPLY TO THE CONSTRUCTION OF THESE IMPROVEMENTS, INCLUDING EPA AND ADA REQUIREMENTS.

C. ALL SUBGRADE, OVEREXCAVATION, BACKFILL, AND FILL SHALL BE PLACED AND / OR COMPACTED PER THE GEOTECHNICAL REPORT AND CITY OF ALBUQUERQUE SPECIFICATIONS.

D. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS FOR THE PROJECT PRIOR TO COMMENCING CONSTRUCTION, AND PRIOR TO OCCUPANCY, AS APPROPRIATE.

E. COORDINATE WORK WITH SITE PLAN, UTILITY PLAN,, AND LANDSCAPE PLAN.

F. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING OBSTRUCTIONS, AND CONDITION OF ALL EXISTING INFRASTRUCTURE PRIOR TO CONSTRUCTION. REPORT ALL DISCREPANCIES TO THE ARCHITECT / ENGINEER AND VERIFY THE ARCHITECT / ENGINEER'S INTENT BEFORE PROCEEDING.

G. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SITE SAFETY.

H. THE CONTRACTOR SHALL MAINTAIN RECORD DRAWINGS ON SITE AT ALL TIMES. THE CONTRACTOR SHALL NOT SCALE DRAWINGS. ONLY WRITTEN DIMENSIONS OR KEYED NOTES SHALL BE USED.

I. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED INSPECTIONS OF THE WORK. CONTRACTOR SHALL REGULARLY UPDATE OWNER REGARDING THE STATUS OF THE INSPECTIONS.

J. CONSTRUCTION ACTIVITY SHALL BE LIMITED TO THE PROPERTY AND/OR PROJECT LIMITS. ANY DAMAGE TO ADJACENT STRUCTURES RESULTING FROM THE CONSTRUCTION PROCESS SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL BE RESPONSIBLE FOR DOCUMENTING EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

K. PAVEMENT GRADES IN MARKED HANDICAPPED PARKING AREAS SHALL NOT EXCEED 2.0% IN ANY DIRECTION. FOR ALL ACCESSIBLE ROUTES, MAXIMUM ALLOWABLE CROSS SLOPE IS 2.0% AND MAXIMUM LONGITUDINAL SLOPE WITHOUT RAMP IS 5.0%. FOLLOW ALL ADA ACCESSIBILITY GUIDELINES OR CITY CODES, WHICHEVER IS MORE STRINGENT.

L. ALL TRASH, DEBRIS, & SURFACE VEGETATION SHALL BE CLEARED AND LEGALLY DISPOSED OF OFFSITE.

M. PROPOSED SPOT AND CONTOUR ELEVATIONS SHOWN REPRESENT TOP OF FINISH MATERIAL (I.E. TOP OF CONCRETE, TOP OF CONCRETE BUILDING PAD, TOP OF PAVEMENT MATERIAL, TOP OF LANDSCAPING MATERIAL, ETC.). CONTRACTOR SHALL GRADE, COMPACT SUBGRADE AND DETERMINE EARTHWORK ESTIMATES BASED ON ELEVATIONS SHOWN MINUS FINISH MATERIAL THICKNESSES.

N. IF FIELD GRADE ADJUSTMENTS ARE REQUIRED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

O. MAXIMUM UNPROTECTED SLOPES SHALL BE 4:1.

P. EXISTING UTILITY LINES ARE SHOWN IN AN APPROXIMATE MANNER ONLY AND MAY BE INCOMPLETE OR OBSOLETE. SUCH LINES MAY OR MAY NOT EXIST WHERE SHOWN OR NOT SHOWN. CONTRACTOR SHALL CONTACT NM-811 FOR UTILITY LINE SPOTS TWO WORKING DAYS PRIOR TO CONDUCTING SITE FIELD WORK. CONTRACTOR SHALL FIELD VERIFY AND LOCATE ALL UTILITIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE CAUSED BY ITS FAILURE TO LOCATE, IDENTIFY AND PRESERVE ANY AND ALL EXISTING UTILITIES, PIPELINES, AND UNDERGROUND UTILITY LINES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF NECESSARY DRY UTILITY ADJUSTMENTS.

Q. SOIL TESTING AND INSPECTION SERVICES DURING EARTHWORK OPERATIONS ARE REQUIRED. CONTRACTOR SHALL ALLOW TESTING LABS TO INSPECT AND APPROVE COMPACTED SUBGRADES, BACKFILL, AND FILL LAYERS BEFORE FURTHER CONSTRUCTION WORK IS DONE. SHOULD COMPACTION TESTS INDICATE INADEQUATE DENSITY, CONTRACTOR SHALL PROVIDE ADDITIONAL COMPACTION AND TESTING AT THE CONTRACTOR'S SOLE EXPENSE.

R. CONTRACTOR SHALL PROVIDE ALL OTHER CONSTRUCTION STAKING. CONTRACTOR SHALL LOCATE AND PRESERVE ALL BOUNDARY CORNERS AND REPLACE ANY LOST OR DISTURBED CORNERS AT CONTRACTOR'S SOLE EXPENSE. PROPERTY CORNERS SHALL ONLY BE RESET BY A REGISTERED LAND SURVEYOR.

S. A CURRENT STORMWATER CONTROL PERMIT, INCLUDING AN EROSION SEDIMENT CONTROL PLAN (E.S.C.) FOR EROSION AND SEDIMENT CONTROL IS REQUIRED FOR ALL CONSTRUCTION, DEMOLITION CLEARING, AND GRADING OPERATIONS THAT DISTURB THE SOIL ON ONE ACRE OR MORE OF LAND. OWNER WILL COORDINATE.

T. POST-CONSTRUCTION MAINTENANCE FOR PRIVATE STORMWATER FACILITIES WILL BE THE RESPONSIBILITY OF THE FACILITIES OWNER. PERIODIC INSPECTION AND CERTIFICATIONS OF THE FACILITIES MAY BE REQUIRED BY THE CITY ENGINEER.

U. STORMWATER CONTROL MEASURES SHOWN ON THIS PLAN ARE REQUIRED TO PROVIDE MANAGEMENT OF 'FIRST FLUSH' (DEFINED AS THE 90TH PERCENTILE STORM EVENT OR 0.44" OF STORMWATER WHICH DISCHARGES DIRECTLY TO A PUBLIC STORM DRAINAGE SYSTEM).

V. ADJUST ANY RIMS OF EXISTING UTILITY FEATURES AS NECESSARY TO MATCH NEW GRADES. UTILITIES IN PAVED AREAS SHALL BE HS-25 TRAFFIC RATED.

W. ALL NEW PAVEMENT SURFACES SHALL BE CONSTRUCTED WITH POSITIVE SLOPE AWAY FROM BUILDINGS AND POSITIVE SLOPE TOWARD EXISTING AND/OR PROPOSED DRAINAGE PATHS. PAVING AND ROADWAY GRADES SHALL BE ±0.1' FROM PLAN ELEVATIONS. BUILDING PAD ELEVATION SHALL BE ±0.05' FROM PLAN ELEVATION.

X. WHERE GRADES BETWEEN NEW AND EXISTING ARE SHOWN AS 'MATCH' OR '±', TRANSITIONS SHALL BE SMOOTH.

Y. ALL EROSION CONTROL TO BE FRACTURED FACE ROCK (F.F. ROCK) : 6" AVG. DIA. ANGULAR FACED ROCK PLACED OVER GEOTEX 501 NON-WOVEN GEOTEXTILE (O.E.). NOTE: PERMANENT TURF REINFORCEMENT MATERIAL (LANDLOK TRM 450 O.E.) MAY BE SUBSTITUTED AT ALL AREAS REFERENCING F.F. ROCK EROSION PROTECTION.

Z. CONTRACTOR SHALL COMPLY WITH LOCAL REGULATIONS FOR RESEEDING OF DISTURBED AREAS.

AA. POND DESIGN PARAMETERS (TOP OF POND, BOTTOM OF POND, SIZE OF ORIFICE, AREA OF POND, ETC.) TO BE STRICTLY ADHERED TO FOR CERTIFICATION PURPOSES.

AB. AREAS OF EROSION CONTROL MATERIAL NOTED ON PLAN ARE INTENDED TO PROTECT AREAS MOST LIKELY TO EXPERIENCE EROSION. ENGINEER RECOMMENDS THAT OWNER MAINTAIN EROSION PROTECTION ELEMENTS. ENGINEER RECOMMENDS THAT OWNER INSPECT SITE YEARLY AND AFTER EACH RAINFALL TO IDENTIFY NEW AREAS OF EROSION AND INSTALL ADDITIONAL EROSION PROTECTION AS NEEDED BASED ON ACTUAL OCCURRENCES.

AC. MEASURES REQUIRED FOR EROSION AND SEDIMENT CONTROL SHALL BE INCIDENTAL TO THE PROJECT COST.

AD. IF THE SITE IS SMALL ENOUGH NOT TO REQUIRE A SWPPP/NPDES PERMIT (LESS THAN ONE ACRE), THE CONTRACTOR SHALL STILL BE RESPONSIBLE FOR USING EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMP'S) TO ENSURE THAT NO SOIL ERODES FROM THE SITE ONTO ADJACENT PUBLIC RIGHT-OF-WAY.

FIRST FLUSH REQUIREMENT

STORMWATER CONTROL MEASURES ARE REQUIRED TO PROVIDE MANAGEMENT OF 'FIRST FLUSH' (DEFINED AS THE 90TH PERCENTILE STORM EVENT OR 0.34" [0.44" LESS 0.1" FOR INITIAL ABSTRACTION] OF STORMWATER WHICH DISCHARGES DIRECTLY TO A PUBLIC STORM DRAINAGE SYSTEM).

THE PONDING VOLUME REQUIRED IS 0.34" * TYPE 'D' AREA:

PALOMAS SW POND:
0.34/12 * 29787 SF (TREATMENT D) = 844 CF

PASEO DEL NORTE NW POND:
0.34/12 * 32740 SF (TREATMENT D) = 928 CF

PASEO DEL NORTE NE POND:
0.34/12 * 15028 SF (TREATMENT D) = 426 CF

THE 'FIRST FLUSH' RETENTION PONDS ARE SHOWN HATCHED. STORM WATER FROM THE IMPERVIOUS AREAS SHALL BE DIRECTED TO THESE BASINS. INLETS THAT ARE PLACED IN THE BASINS SHALL HAVE THE TOP OF GRATE LOCATED AT THE 'FIRST FLUSH' WATER SURFACE ELEVATION.

THE 'FIRST FLUSH' RETENTION PONDS MUST BE CONSTRUCTED TO THE VOLUMES AND ELEVATIONS AS SHOWN IN ORDER TO OBTAIN C.O.A. APPROVAL FOR CERTIFICATE OF OCCUPATION.

FRED C. ARFMAN NEW MEXICO 7322 LICENSED PROFESSIONAL ENGINEER 10-31-14

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque, New Mexico 87108
Ph. 505-268-8828 www.iacivil.com

2033 CG-101.dwg Nov 06,2014

MorningStar of Albuquerque

GRADING & DRAINAGE PLAN

Date:	No.	Revision:	Date:	Job No.
10-31-14				IA: 2033
Drawn By: BJB				CG-101
Ckd By: FCA				SH. OF

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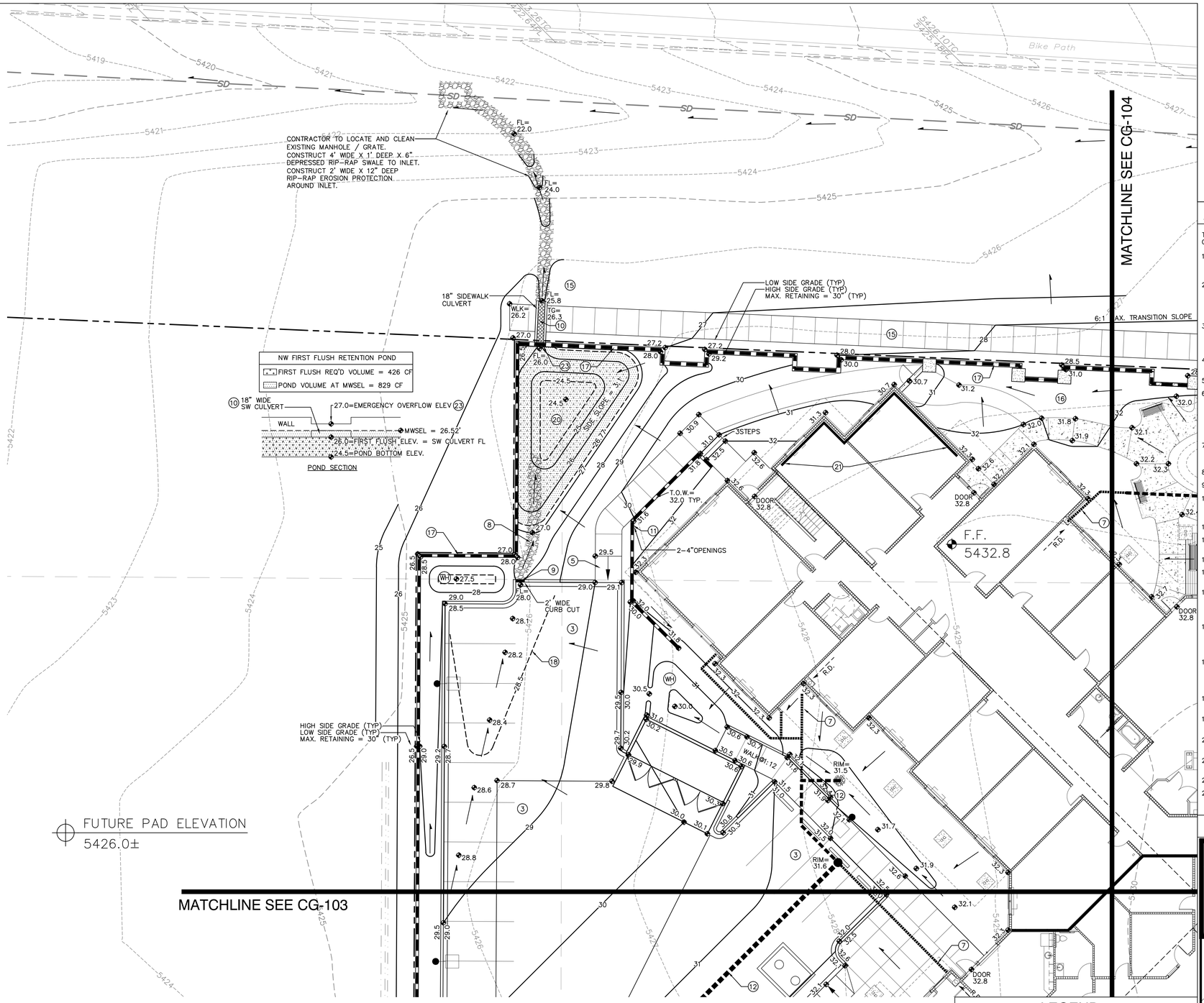


KEYED NOTES

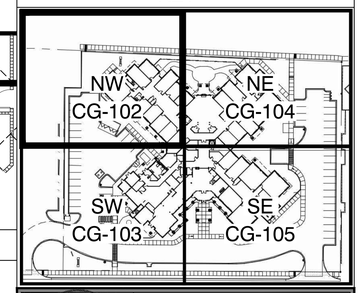
THESE NOTES ARE REFERENCED ON SHEETS CG-102, CG-103, CG-104 AND CG-105. NOT ALL NOTES ARE USED ON EACH SHEET.

1. SPOT ELEVATION LABELS WITHIN GUTTER AREA REPRESENT FLOWLINE UNLESS NOTED. ADD 0.5' TYPICAL FOR TOP OF CURB / TOP OF ADJACENT WALK ELEVATIONS.
2. GRADES WITHIN R.O.W. SHOWN FOR INFORMATION ONLY. SEE PUBLIC WORK ORDER DRAWINGS FOR CONSTRUCTION WITHIN R.O.W. INCLUDING NEW ACCESS DRIVES WITH CONCRETE VALLEY GUTTER, HANDICAP RAMPS, PUBLIC SIDEWALKS, CURB OPENINGS ETC.
3. CONSTRUCT PAVING AT ELEVATIONS SHOWN. NOTE THAT PAVEMENT SLOPES AND CROSS-SLOPES VARY THROUGHOUT TO ACHIEVE GRADES NECESSARY FOR ADA COMPLIANCE, PIPE COVERAGE, ETC.
4. SLOPES WITHIN HANDICAP PARKING AREAS TO MEET ADA REQUIREMENTS (MAX. SLOPE = 2% IN ANY DIRECTION).
5. CONSTRUCT HANDICAP ACCESS RAMP TO ADA STANDARDS.
6. TRANSITION LANDSCAPING TO 6" MIN. DEPRESSION TO STORE STORMWATER. FLOW IN EXCESS OF AREA CAPACITY WILL OVERFLOW AT LOW POINT. NOTE: DO NOT DEPRESS LANDSCAPING OR HOLD STORMWATER WITHIN 10' OF BUILDING.

DEPRESSION

7. EXTEND BUILDING ROOF DISCHARGE PIPE TO ON-SITE STORM DRAIN SYSTEM. MAKE WATERTIGHT CONNECTION USING FITTINGS AS REQUIRED. SEE MECHANICAL PLAN FOR CONTINUATION.
8. CONSTRUCT ROCK SWALE. SEE CG-501 FOR DETAIL.
9. PROVIDE OPENING(S) IN CURB TO PASS FLOW.
10. CONSTRUCT 18" BOTTOM WIDTH COVERED SIDEWALK CULVERT (3 LOCATIONS) PER C.O.A. STD. DTL. 2236. SEE CP-501 FOR ADDITIONAL INFORMATION.
11. PROVIDE TWO 4"" PIPES TO PASS FLOW.
12. CONSTRUCT PRIVATE STORM DRAIN SYSTEM. SEE DETAIL SHEET CG-501 FOR DETAILED DESIGN.
13. CONSTRUCT BUBBLE-UP INLET. SEE CG-501 FOR DETAIL.
14. PROVIDE WATERTIGHT CONNECTION TO PUBLIC STORM SEWER. SEE CG-501 FOR ADDITIONAL INFORMATION.
15. G.C. TO OBTAIN PERMIT(S) FROM N.M.D.O.T. FOR CONSTRUCTION WITHIN THE PASEO DEL NORTE R.O.W. INCLUDING PUBLIC SIDEWALK, COVERED SIDEWALK CULVERTS, EROSION PROTECTION AND GRADING.
16. GRADES WITHIN PRIVATE AREA ARE PROVIDED TO INDICATE POSITIVE DRAINAGE AWAY FROM BUILDING TO PROPOSED INLETS / WATER HARVESTING AREAS. COORDINATE WITH LANDSCAPE ARCHITECT.
17. CONSTRUCT PRIVACY / SECURITY WALL WITH 30" MAX. RETAINING TO ACHIEVE GRADE TRANSITIONS SHOWN (SEE PLAN FOR TOP OF FINISHED GRADE EACH SIDE). SEE ARCHITECTURAL FOR DETAILS.
18. 0.5' CONTOURS SHOWN DASHED WHERE NECESSARY TO CLARIFY DRAINAGE CONCEPT.
19. INSTALL 2' WIDE X 1' DEEP TEMPORARY EROSION CONTROL. SEE CG-101, GENERAL NOTE 'Y'.
20. CONSTRUCT ON-SITE WATER HARVESTING POND TO ELEVATIONS AND EXTENTS SHOWN. SEE CG-101, GENERAL NOTE 'M'.
21. EXTENDED STEMWALL THIS AREA TO ACHIEVE GRADES SHOWN. SEE ARCHITECTURAL.
22. DRAINAGE RUNDOWN SEE CG-501.
23. PROVIDE 18" WIDE NOTCH IN WALL FOR EMERGENCY OVERFLOW AT ELEVATION SHOWN.

KEY



LEGEND

- EXISTING CONTOUR (5428)
- PROPOSED FLOW DIRECTION
- F.F.= PROPOSED FINISH FLOOR ELEVATION
- PROPOSED CONTOUR (31)
- PROPOSED SPOT ELEVATION (32.3)
- STORM DRAIN PIPE AND INLET
- RIM= STORM DRAIN INLET RIM ELEVATION
- INV= INVERT ELEVATION
- GRADE BREAK
- EROSION CONTROL
- (WH) WATER HARVESTING WITHIN LANDSCAPE
- GRADE TRANSITION WALL

0 5 10 20 30

SCALE 1"=10'

FRED C. ARFMAN NEW MEXICO 7322 LICENSED PROFESSIONAL ENGINEER

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2033 CG-101.dwg Nov 06,2014

MorningStar of Albuquerque

GRADING & DRAINAGE PLAN-NW

Date:	No.	Revision:	Date:	Job No.
10-31-14				1A: 2033
Drawn By: BJB				CG-102
Ckd By: FCA				SH. OF

FUTURE PAD ELEVATION
5426.0±

MATCHLINE SEE CG-102

MATCHLINE SEE CG-105

F.F.
5432.8

SW FIRST FLUSH RETENTION POND
FIRST FLUSH REQ'D VOLUME = 879 CF
POND VOLUME AT MWSEL = 1291 CF

FOUR 12" WIDE CURB OPENINGS
FL = 27.1

27.55=EMERGENCY OVERFLOW ELEV
MWSEL = 27.55'
27.1=FIRST FLUSH ELEV. = CURB OPENING FL
25.6=POND BOTTOM ELEV.
POND SECTION

FOUR 12" WIDE CURB CUTS
INV= 27.1

BERM
FRENCH DRAIN SEE CG-501
SIDE SLOPE = 4:1
FF 27.0
TOP OF BERM 27.7

THREE 4" PIPES
INV= 32.0

RIM= 31.6
RIM= 31.2
RIM= 30.3
RIM= 30.4
RIM= 29.7
RIM= 31.7
RIM= 31.2

HI PT. 30.5

DOOR 32.8

R.D.

DEPRESSION

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4. SLOPES WITHIN HANDICAP PARKING AREAS TO MEET ADA REQUIREMENTS (MAX. SLOPE = 2% IN ANY DIRECTION).
5. CONSTRUCT HANDICAP ACCESS RAMP TO ADA STANDARDS.
6. TRANSITION LANDSCAPING TO 6" MIN. DEPRESSION TO STORE STORMWATER. FLOW IN EXCESS OF AREA CAPACITY WILL OVERFLOW AT LOW POINT. NOTE: DO NOT DEPRESS LANDSCAPING OR HOLD STORMWATER WITHIN 10' OF BUILDING.
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9. PROVIDE OPENING(S) IN CURB TO PASS FLOW.
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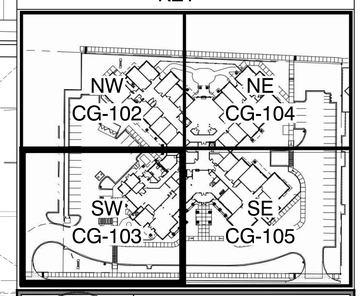

LEGEND

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	GRADE BREAK
	EROSION CONTROL
WH	WATER HARVESTING WITHIN LANDSCAPE
	GRADE TRANSITION WALL

SCALE 1"=10'

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2033 CG-101.dwg Nov 06,2014

MorningStar of Albuquerque

GRADING & DRAINAGE PLAN-SW

Date:	No.	Revision:	Date:	Job No.
10-31-14				IA: 2033
Drawn By: BJB				CG-103
Ckd By: FCA				SH. OF

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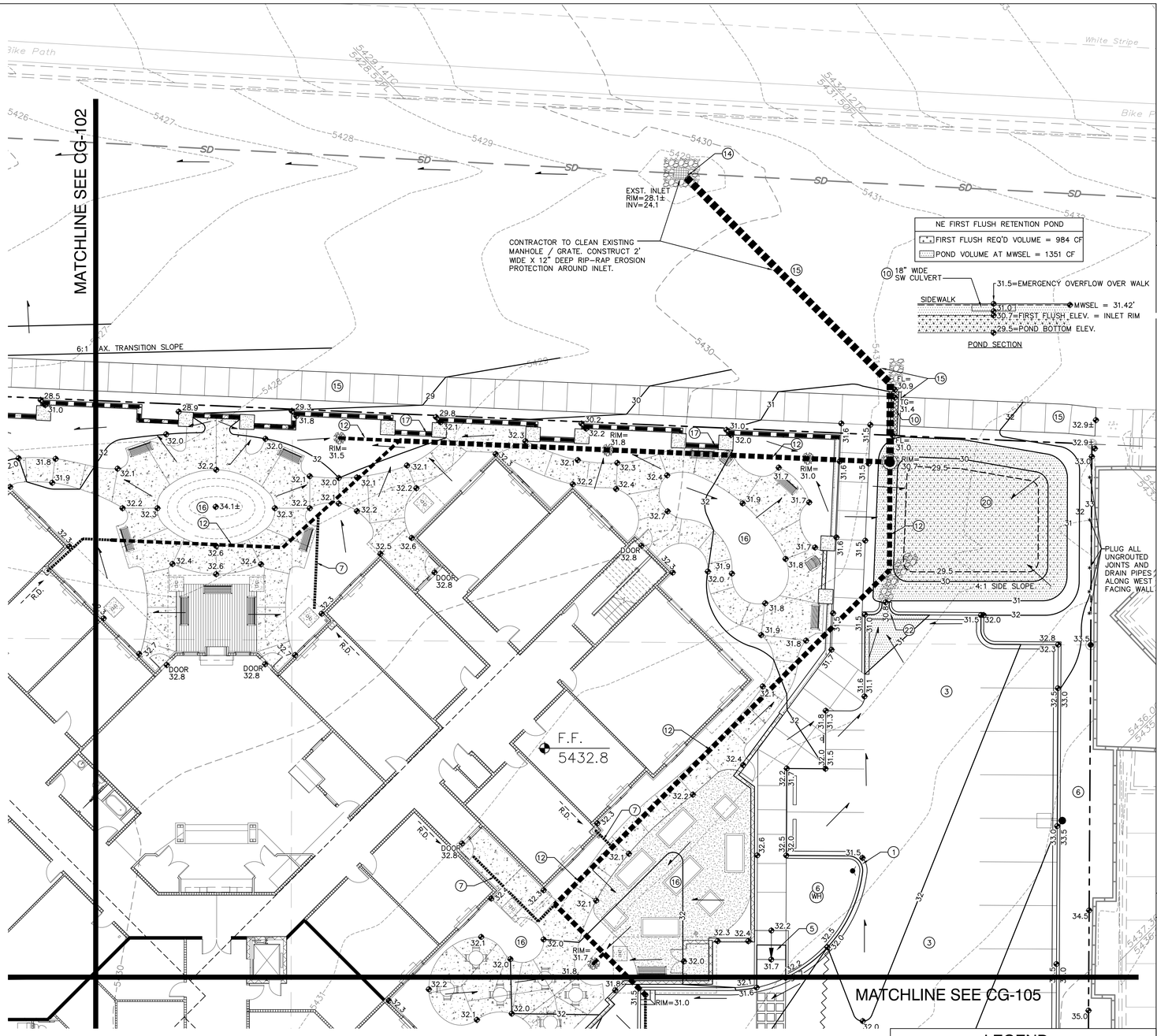

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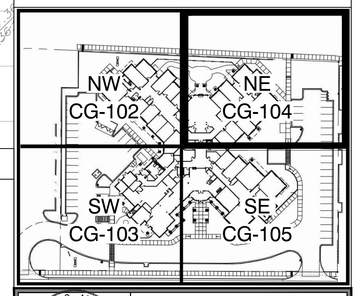

LEGEND

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2033 CG-101.dwg Nov 06,2014

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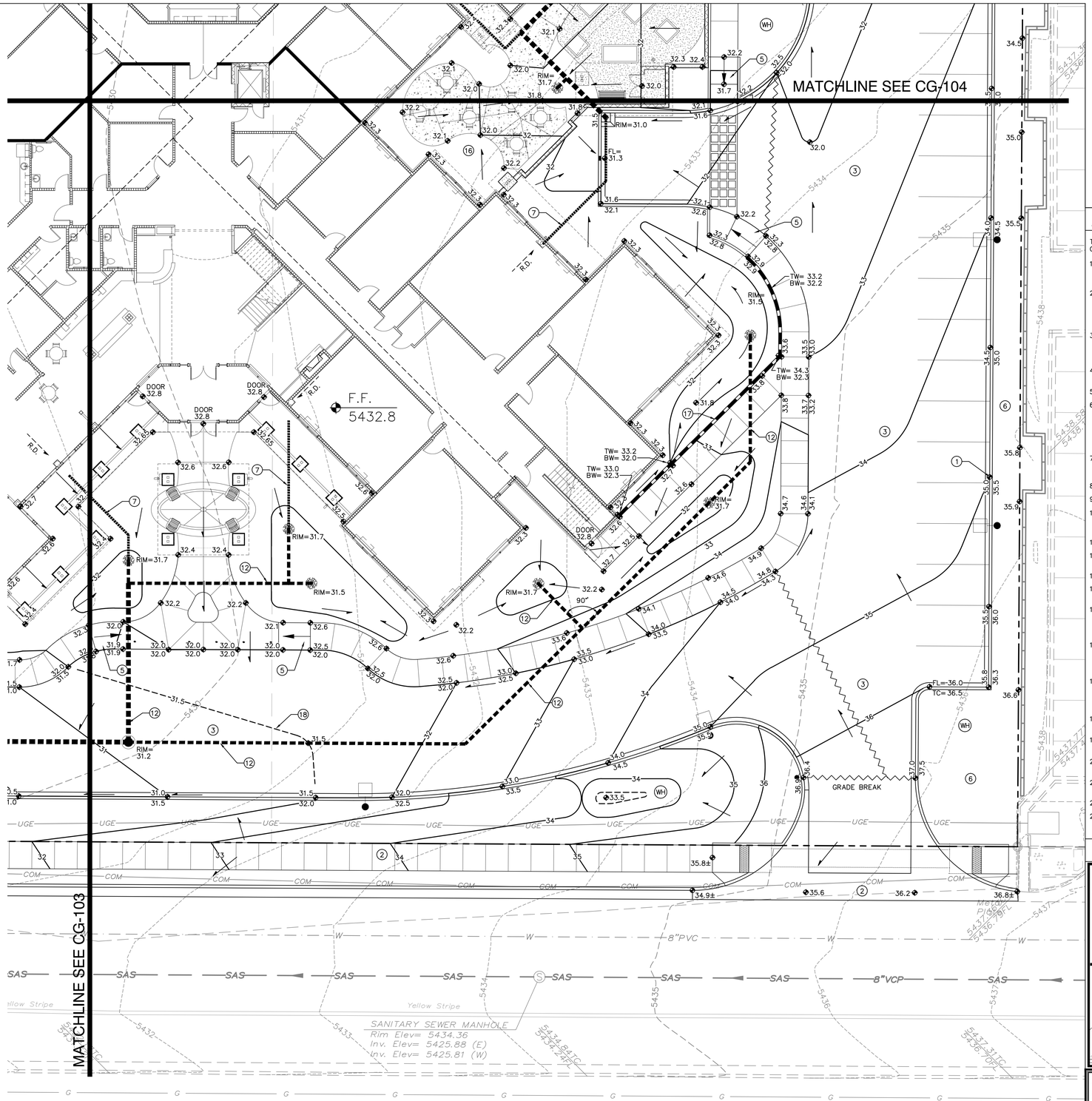
GRADING & DRAINAGE PLAN-NE

Date:	No.	Revision:	Date:	Job No.
10-31-14				IA: 2033
Drawn By: BJB				CG-104
Ckd By: FCA				SH. OF



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DEPRESSION

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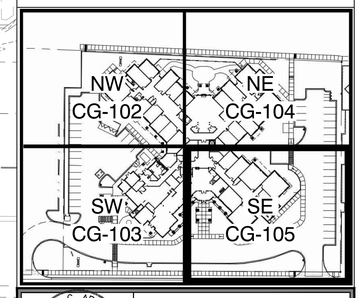

LEGEND

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GRADING & DRAINAGE PLAN-SE

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10-31-14				IA: 2033
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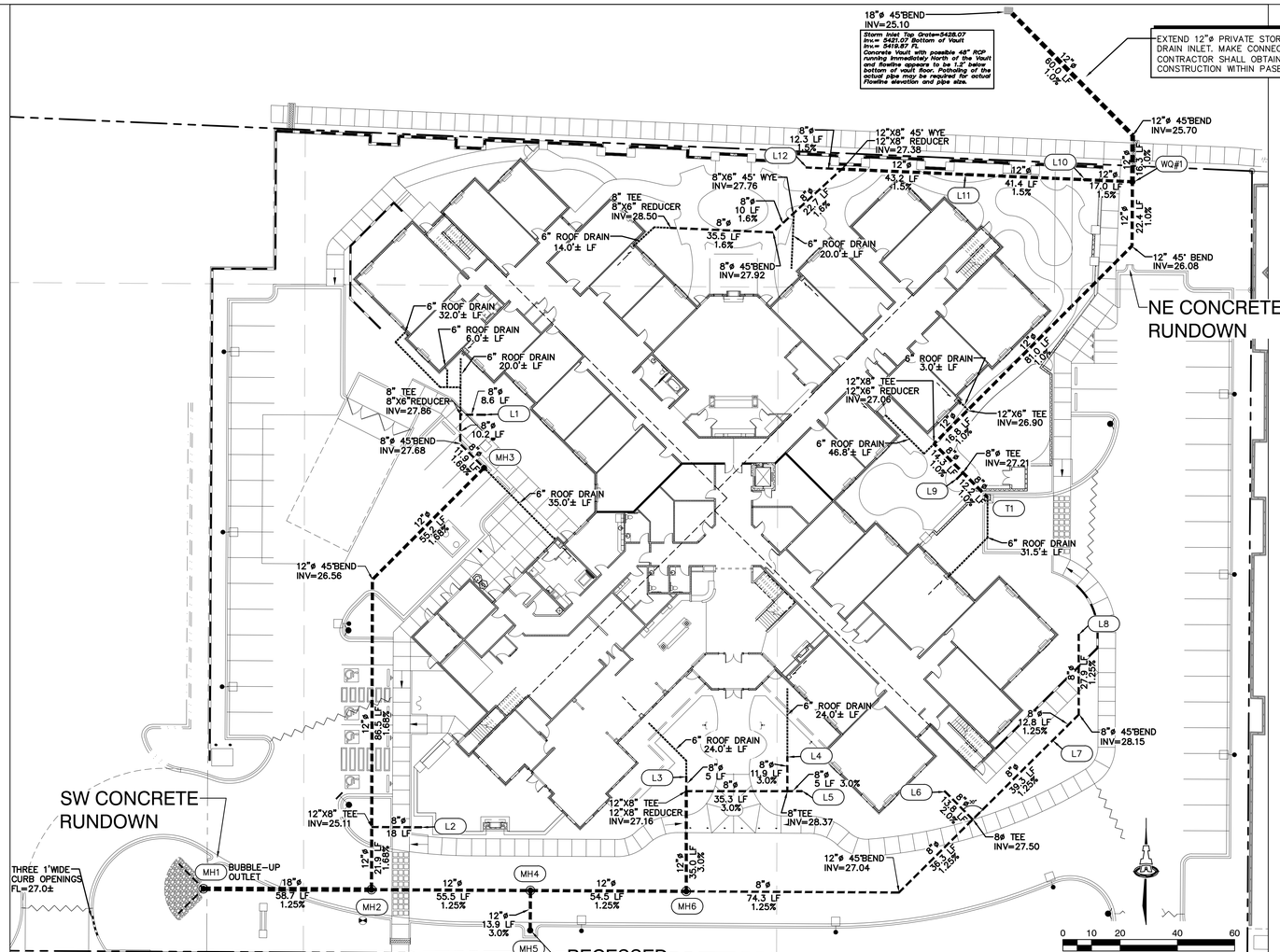
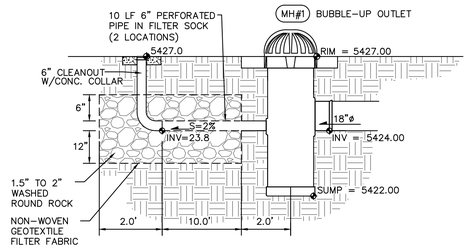
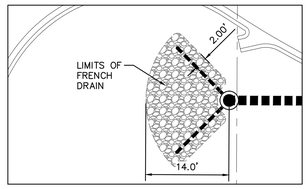
Ckd By: FCA				SH. OF



STORM DRAIN DESIGN





SW FRENCH DRAIN

SCALE: N.T.S.

LANDSCAPE INLET	RIM	INVERT
L1	31.5	28.00
L2	31.2	25.30
L3	31.7	27.31
L4	31.7	28.58
L5	31.5	28.37
L6	31.7	27.07
L7	31.7	27.99
L8	31.5	28.50
L9	31.5	26.90
L10	31.0	26.12
L11	31.8	26.74
L12	31.5	27.57

LANDSCAPE INLET RIM / INVERT TABLE

SEE STORM DRAIN EXHIBIT (L#)

SCALE: N.T.S.

STORM DRAIN LEGEND

- (MH#) NYLOPLAST MANHOLE (SEE INDIVIDUAL BASIN DESIGNS THIS SHEET)
- (WQ#) NYLOPLAST MANHOLE WITH WATER QUALITY SNOUT UNIT (SEE INDIVIDUAL BASIN DESIGNS THIS SHEET)
- (L#) LANDSCAPE AREA INLINE DRAIN INLET
  - ALL L# INLETS:
    - 8" DIAMETER ADS INLINE DRAIN WITH 6" OUTLET
    - 8"ø LOCKING DOMED GRATE
    - 8" WIDE X 6" DEEP CONCRETE COLLAR
- (T#) TRAFFIC RATED DRAIN INLET (SEE INDIVIDUAL BASIN DESIGNS THIS SHEET)
  - ALL T# INLETS:
    - 12" DIAMETER ADS ROAD & HIGHWAY STRUCTURE WITH LOCKING 2' X 2' GRATE
    - 8" WIDE X 6" DEEP CONCRETE COLLAR

GENERAL NOTES

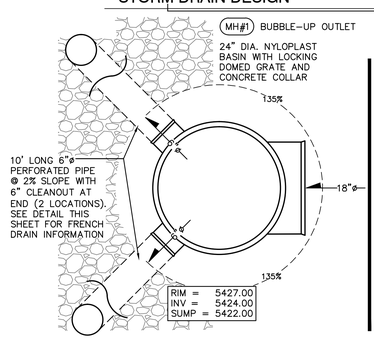
A. ALL PRIVATE STORM DRAIN LINES AND FITTINGS TO BE ADS N-12WT (WATERTIGHT) UNLESS NOTED.

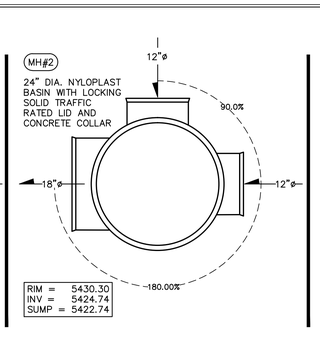
B. INSTALL ALL STORM DRAIN INLETS AND PIPE PER MANUFACTURER'S SPECIFICATIONS AND DETAILS.

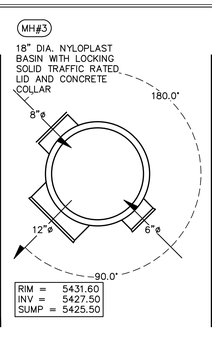
C. STORM DRAIN SYSTEM WILL REQUIRE REGULAR MAINTENANCE TO ENSURE PROPER FUNCTIONING DURING STORM EVENTS. ENGINEER RECOMMENDS THAT OWNER PUT IN PLACE INSPECTION AND MAINTENANCE REQUIREMENTS SCHEDULED TO OCCUR MONTHLY AND AFTER EACH STORM EVENT.

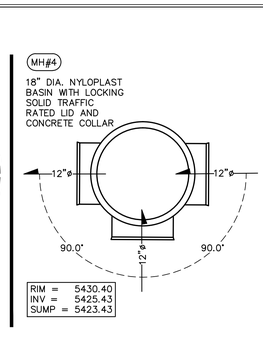
D. PROPOSED STORM DRAIN HORIZONTAL LAYOUT AND INVERT ELEVATIONS SHOWN HAVE BEEN COORDINATED WITH PROPOSED WATER AND SANITARY SEWER CROSSINGS. NOTIFY ENGINEER OF ANY CONFLICTS ENCOUNTERED DURING CONSTRUCTION.

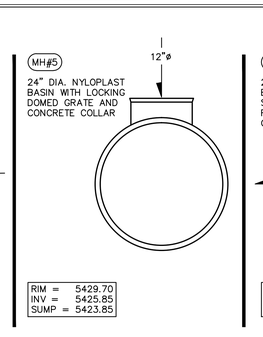
E. ALL CONCRETE COLLARS PER COA STD DWG #2461.

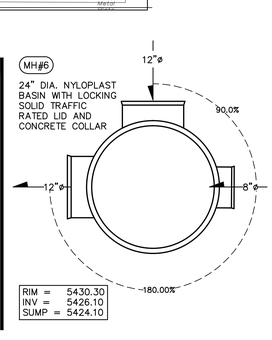


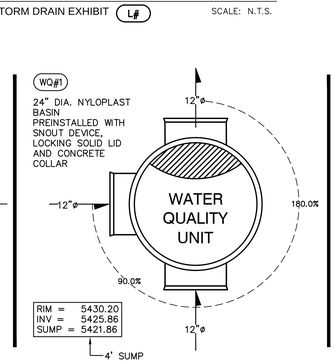


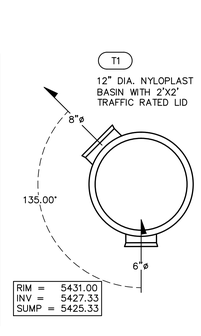








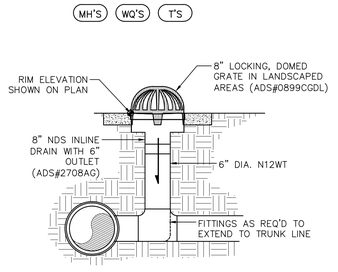




NYLOPLAST BASIN DESIGN INFORMATION

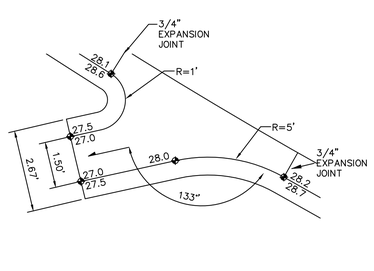
SCALE: N.T.S.

(MH'S) (WQ'S) (T'S)



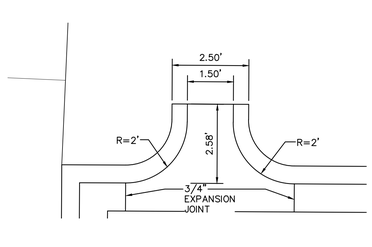
IN-LINE DRAIN

SEE STORM DRAIN EXHIBIT (L#) SCALE: N.T.S.



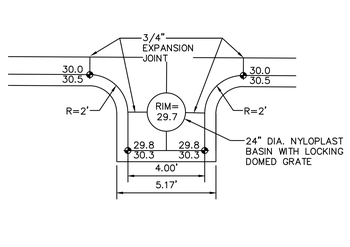
SW CONCRETE RUNDOWN

SCALE: N.T.S.



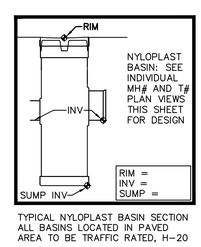
NE CONCRETE RUNDOWN

SCALE: N.T.S.



RECESSED INLET

SEE (MH5) SCALE: N.T.S.



TYPICAL NYLOPLAST BASIN SECTION
ALL BASINS LOCATED IN PAVED AREA TO BE TRAFFIC RATED, H-20

TYPICAL NYLOPLAST BASIN SECTION

(MH'S) (WQ'S) (T'S) SCALE: N.T.S.

FRED C. ARFMAN NEW MEXICO 7322 LICENSED PROFESSIONAL ENGINEER

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque, New Mexico 87108
Ph. 505-268-8828 www.iacivil.com

2033 CG-501.dwg Nov 06,2014

MorningStar of Albuquerque

GRADING & DRAINAGE DETAILS

Date:	No.	Revision:	Date:	Job No.
10-31-14				IA: 2033
Drawn By: BJB				CG-501
Ckd By: FCA				SH. OF

M:\PROJECTS\2000-2099\2033\DWG\2033 CG-501.dwg, 11/6/2014 2:30:53 PM, thor

From: Cherne, Curtis
To: Harmon Rita T.; Niese, Amy
Subject: FW: MorningStar @ Palomas
Date: Monday, October 06, 2014 3:56:27 PM

For someone's info.

cc

From: Trujillo, Timothy R, NMDOT [mailto:TimothyR.Trujillo@state.nm.us]
Sent: Friday, October 03, 2014 2:54 PM
To: 'Fred Arfman'
Cc: Cherne, Curtis
Subject: RE: MorningStar @ Palomas

Fred,

I have reviewed all the deliverables and I approve of the Morningstar Development. Let me know if you have any further questions.

Thanks,

Tim Trujillo, PE
NMDOT, D3 Drainage
505-798-6690

From: Fred Arfman [mailto:freda@iacivil.com]
Sent: Monday, September 29, 2014 2:45 PM
To: Trujillo, Timothy R, NMDOT
Subject: MorningStar @ Palomas

This message contains attachments delivered via ShareFile.

- 2014 09-29 Supplemental Information for Submittal SIGNED.pdf (1007.7 kB)
- 2033 - Calculations - revised 2014 08-29100 yr 6 hr.pdf (19.7 kB)
- 2033 C-701 NMDOT STORM DRAIN-Layout1.pdf (856.6 kB)
- 2033 CG-101 THRU CG-501 SIGNED 09-29-14.pdf (4.6 MB)
- PDN As Built Sheet 3-20.pdf (668.8 kB)

Download the attachments by clicking here.

Tim,

Here attached is a NMDOT Drainage Exhibit combining the as-built locations of the 78" RCP Storm Drain and the two manholes/grated inlets fronting the subject property and that portion of our G&D Plan for the subject project. In addition, we are providing Sheet 3- 20 from the Paseo del Norte Construction set (NM Project No. TPU – 4054(2), CN 2662) that has the manhole/grate as-built information incorporated onto the sheet. The three other attached files are updated plans and report and the newly prepared Supplemental Information based on the NMDOT As-

Built Drawings.

On the revised Grading & Drainage Plan for the project are additional notes for the contractor to expose the subject manhole/grate and to extend the rip-rap surface swale to and around the inlet. Based on the following:

> Based on the long-term usage of the property for annual Christmas tree sales, we have adjusted the historic calculations to reflect this usage (75% Treatment B and 25% Treatment C). The maximum Q100-6hr discharge to the Paseo del Norte storm drain system will be 6.4 cfs (1.9 cfs within a surface swale to the existing west PdN inlet, 4.5 cfs within a storm drain system extended to the existing east PdN inlet).

The allowable discharge should be acceptable as shown on the plan. The westerly MH was designed to have 12 cfs of storm water flow accepted per the inlet table found on Sheet 3-20. Our rate matches the historical discharge flow rate from our site at 2 cfs. The other 10 cfs are assumed to be generated within that portion of PdN.

Thanks for your patience on this project and hopefully we are positioned to go forward. If all looks acceptable, he City of Albuquerque – Hydrology is requested NMDOT approval of the Grading & Drainage within the NMDOT right-of-way of PdN.

Fred

Fred C. Arfman, P.E.
Principal/ President
Isaacson & Arfman, P.A.
Consulting Engineering Associates
128 Monroe St. N.E.
Albuquerque, NM 87108
Phone: (505)268-8828
Fax: (505)268-2632
freda@iacivil.com

From: Justin Simenson [mailto:thors@iacivil.com]
Sent: Monday, September 29, 2014 10:10 AM
To: Fred C. Arfman
Subject: morning star

Attached are the pdfs you requested.

Justin Thor Simenson
Isaacson & Arfman, P.A.
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128 Monroe St. N.E.

Albuquerque, NM 87108
Phone: (505)268-8828

Click here to send me files that are too large to attach to an email.