CITY OF ALBUQUERQUE

PLANNING DEPARTMENT – Development Review Services

Richard J. Berry, Mayor

September 24, 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 (9-5-14) File: D19D029

Dear Mr. Arfman:

Based upon the information provided in your submittal received 9-8-14, the above referenced plan cannot be approved for Building Permit until the following comments are addressed:

1. Calculations of NE Pond Outlet pipe to Paseo Del Norte use a 4" dia. pipe to restrict flow to 0.7 cfs, using a 3' head (pg.8). However, Plan Sheet CG-501 show a 8"dia. pipe, and the MH#7 detail shows a 12"dia pipe. Also, invert elevation (2425.52) and Pond WSEL elevation (2431') indicate a head of 5.3' should be used instead. Since 4" pipe is already pretty small, and head is already over, how can you meet the 0.7 max. cfs.
2. It appears you are grading on NMDOT ROW. I understand you had preliminary approval from the NMDOT for DRB approval. Please provide acceptance of grading and drainage of the new plan from NMDOT. Be sure that the approval letter includes the Engineer's stamp date of the approved plan.
3. Sheet CG-102, at the sidewalk behind the trash enclosure, the grade falls at more than a 2:1 slope (from 32' contour to 30.7 T.O. SW). At end of SW, the grade gets higher right before the water harvest pond. The inlet should be in a sump condition so that runoff does not bypass inlet and flow into Basin 10.
4. Along the same note, it seems that another roof drain is needed on the SW corner of the building so that all of Basin 9 (roof) does not discharge to Basin 10 and ultimately NMDOT ROW.
5. A SW culvert is needed at the private pedestrian walkway where it connects to the public sidewalk, allowing runoff to flow directly to pond.
6. On major ponds in NE, NW, and SW corners, label the WSEL, Pond Volume, and Emergency Overflow.
7. In the PROJECT DATA summary, the off-site flow is prevented by plugging up openings in adjacent wall. Show location and work to be done on the plans.
8. Provide pond calculations and hydrograph for pond in SW corner. It seems that the curb cut discharge should be based on the weir equation since it is at same elevation

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New Mexico 87103

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as the top of pond. Discharge from these curb cuts appears to flow into sidewalk ramp on opposite side of curb return.

9. Provide street capacity calculations of Palomas for the 4.4cfs discharge.

Please attach a copy of this approved plan in the construction sets when submitting for a building permit.

Since the disturbed area on this site exceeds 1.0 acre, an Erosion and Sediment Control (ESC) Plan, prepared by a NM PE and approved by the City's Stormwater Engineer, will be required for this site, prior to Hydrology approval of a Building Permit or Work Order.

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

SEPTEMBER 5, 2014

SUPPLEMENTAL INFORMATION

for

MORNINGSTAR of ALBUQUERQUE GRADING AND DRAINAGE PLAN

by

FRED C. ARFMAN
NEW MEXICO
7322
LICENSED PROFESSIONAL ENGINEER
09-05-14

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 (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 at approved rates.

CALCULATIONS: 2033 - Palomas Assisted Living Facility : 09/02/2014									
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	%	**DEVELOPED FLOWS:**		Treatment SF	%	**EXCESS PRECIP:**	
								Precip. Zone	3
Area A	=	50656	50%	Area A	=	0	0%	E_A = 0.66	
Area B	=	50656	50%	Area B	=	10131	10%	E_B = 0.92	
Area C	=	0	0%	Area C	=	13171	13%	E_C = 1.29	
Area D	=	0	0%	Area D	=	78010	77%	E_D = 2.36	
Total Area	=	101312		Total Area	=	101312			

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	=	0.79 in.	Developed E	=	2.08 in.

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

Historic V_{360}	=	6670	CF	Developed V_{360}	=	17535	CF

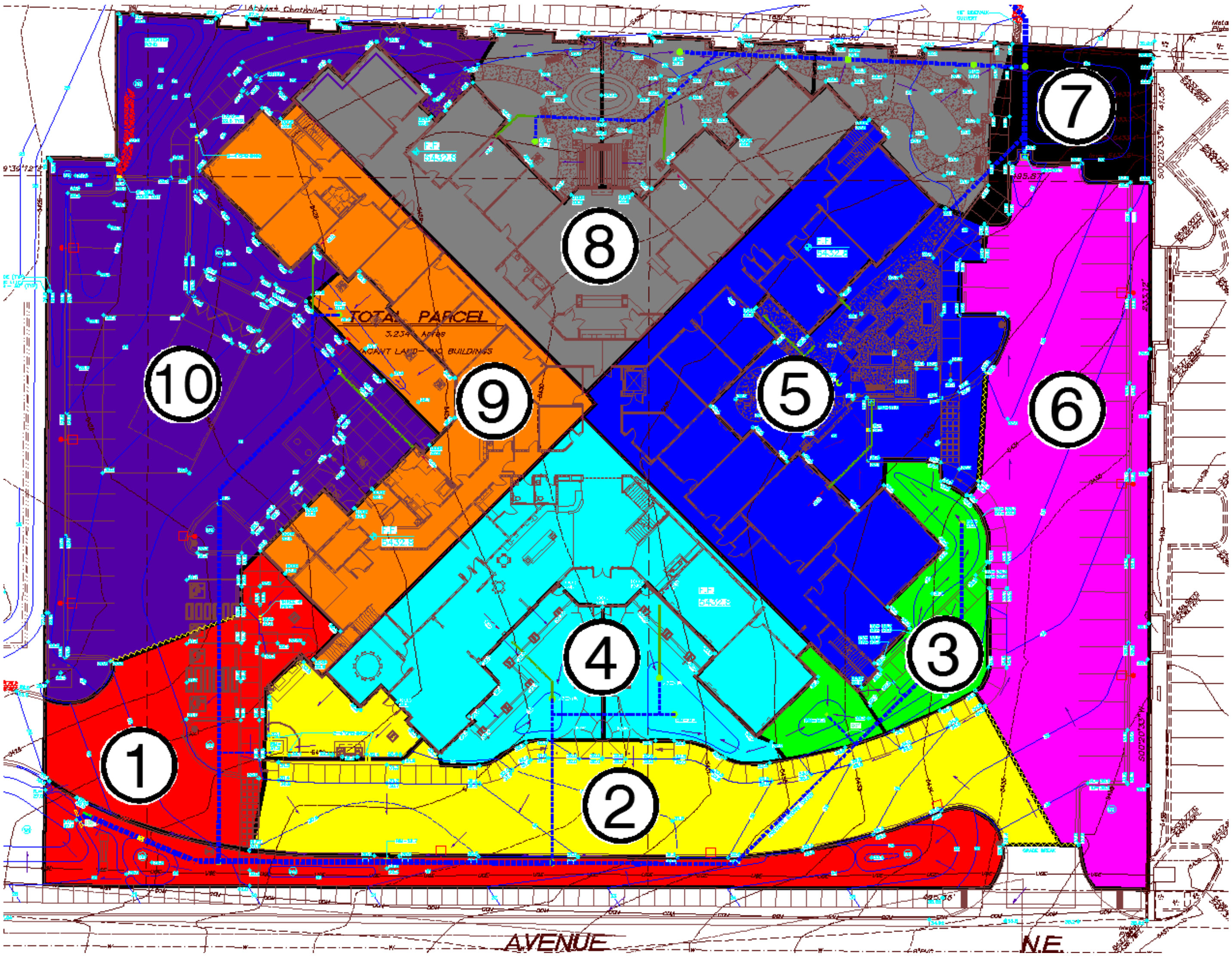
On-Site Peak Discharge Rate: $Qp = Q_{pA}A_A + Q_{pB}A_B + Q_{pC}A_C + Q_{pD}A_D / 43{,}560$

For Precipitation Zone 3

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

Historic Q_p	=	5.2	CFS	Developed Q_p	=	10.6	CFS

DRAINAGE BASINS



BASIN NO.	1	DESCRIPTION	To Palomas		
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)				
	Qp	=	0.9 cfs		

BASIN NO.	2	DESCRIPTION	NE Drainage to Paseo del Norte ROW		
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)				
	Qp	=	1.1 cfs		

BASIN NO.	3	DESCRIPTION	NW Drainage to Paseo del Norte ROW		
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)				
	Qp	=	0.3 cfs		

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)				
	Qp	=	1.1 cfs		

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)				
	Qp	=	1.5 cfs		

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

Sub-basin Weighted Excess Precipitation (see formula above)	
Weighted E =	2.20 in.
Sub-basin Volume of Runoff (see formula above)	
V_{360} =	2133 CF
Sub-basin Peak Discharge Rate: (see formula above)	
Qp =	1.3 cfs

LAND TREATMENT	
A =	0%
B =	0%
C =	15%
D =	85%

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

Sub-basin Weighted Excess Precipitation (see formula above)	
Weighted E =	1.50 in.
Sub-basin Volume of Runoff (see formula above)	
V_{360} =	281 CF
Sub-basin Peak Discharge Rate: (see formula above)	
Qp =	0.2 cfs

LAND TREATMENT	
A =	0%
B =	30%
C =	40%
D =	30%

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

Sub-basin Weighted Excess Precipitation (see formula above)	
Weighted E =	2.11 in.
Sub-basin Volume of Runoff (see formula above)	
V_{360} =	2458 CF
Sub-basin Peak Discharge Rate: (see formula above)	
Qp =	1.5 cfs

LAND TREATMENT	
A =	0%
B =	10%
C =	10%
D =	80%

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

Sub-basin Weighted Excess Precipitation (see formula above)	
Weighted E =	2.25 in.
Sub-basin Volume of Runoff (see formula above)	
V_{360} =	1609 CF
Sub-basin Peak Discharge Rate: (see formula above)	
Qp =	1.0 cfs

LAND TREATMENT	
A =	0%
B =	0%
C =	10%
D =	90%

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

Sub-basin Weighted Excess Precipitation (see formula above)	
Weighted E =	2.16 in.
Sub-basin Volume of Runoff (see formula above)	
V_{360} =	3186 CF
Sub-basin Peak Discharge Rate: (see formula above)	
Qp =	1.9 cfs

LAND TREATMENT	
A =	0%
B =	10%
C =	5%
D =	85%

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

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 5.2 cfs to the Paseo del Norte R.O.W. (PDN).

The 5.2 cfs discharge to PDN will be sub-divided as follows – see drainage basin map.

- Basin 10 (1.9 cfs) will discharge via covered sidewalk culvert to the PDN 'v' ditch at the NW corner of the property using orifice control to limit the release rate to **1.5** cfs.

- **3.0** cfs (basin 5 and basin 8) will discharge to the NE on-site storm drain system. This private system will then be extended to the existing NMDOT storm drain inlet near the NE end of the property.

- 1.5 cfs (basin 6 and basin 7) basins will surface discharge to the proposed detention pond at the NE corner of the property which will pass the final allowable **0.7** cfs to the NE storm drain system.

Total discharge to PDN = 1.5 (west sidewalk culvert) + 3.0 (storm drain) + 0.7 (east pond inlet) = 5.2 cfs.

The northeast detention pond will collect the stormwater from basins 6 and 7 (total 1.5 cfs) and will release 0.7 cfs into the private storm drain extending to the PDN NMDOT storm drain system.

Per the inflow / outflow hydrograph below, the pond volume required for detention will be 1283 cf.

CALCULATIONS: 2033 - Palomas Assisted Living Facility : 09/02/2014

HYDROGRAPH FOR SMALL WATERSHED

DPM SECTION 22-2 * PAGE A-13/14

Base time, t_B, for a small watershed hydrograph is,

$tB = (2.107 * E * A / Q_p) - (0.25 * A_D / A)$

Where

E	=	2.08	inches
A	=	0.32	acres
A_D	=	0.24	acres
Q_p	=	1.47	cfs

t_B	=	0.76	hours

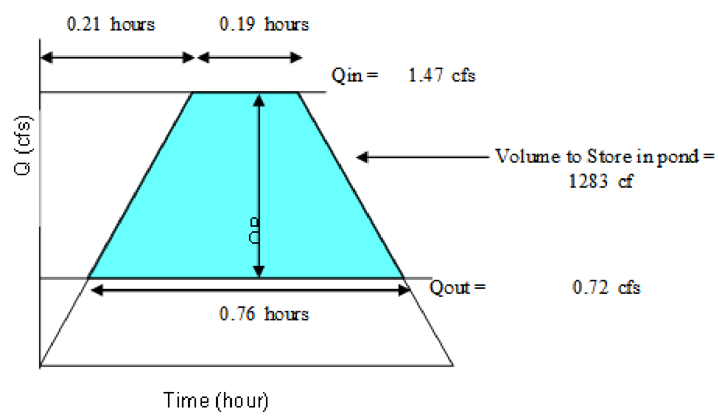
E is the excess precipitation in inches (from DPM TABLE A-8), Q_P is the peak flow, A_D is the area (acres) of treatment D, and A_T is the total area in acres. Using the time of concentration, t_C (hours), the time to peak in hours is:

$t_p = (0.7 * tC) + ((1.6 - (A_D / A)) / 12)$

Where t_C = 0.20 hours

t_p = 0.21 hours

Continue the peak for $0.25 * A_D / A_T$ hours. When A_D is zero, the hydrograph will be triangular. When A_D is not zero, the hyrograph will be trapezoidal. see the graph below:

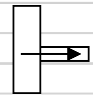
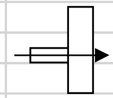


POND - EAST			
Contour	Area	Volume	
5431.00	1368		
5430.00	754	1061	CF
5429.50	373	282	CF
TOTAL VOL.		**1343**	CF

- 1283 CF OK

NORTHEAST POND OUTLET TO PASEO DEL NORTE STORM DRAIN:

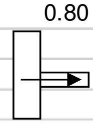
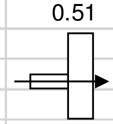
Using the orifice equation for circular openings, a 4” diameter outlet pipe with 2.83’ of head (based on an invert 3’ below the inlet rim) will pass 0.7 cfs.

Orifice Diameter		**4**	inches	0.33	feet			
Orifice Area		12.57	sq.in.	0.09	square feet			
Headwater Elevation		**3**	feet	2.83	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)		**=**	**0.72 cfs**	**for 4 in. diameter orifice**				

Therefore, the storm drain inlet located within the east pond will be constructed with a 4” diameter drain pipe with a starting invert 1.5’ below the pond bottom (for a total of 3’ head when the pond is full).

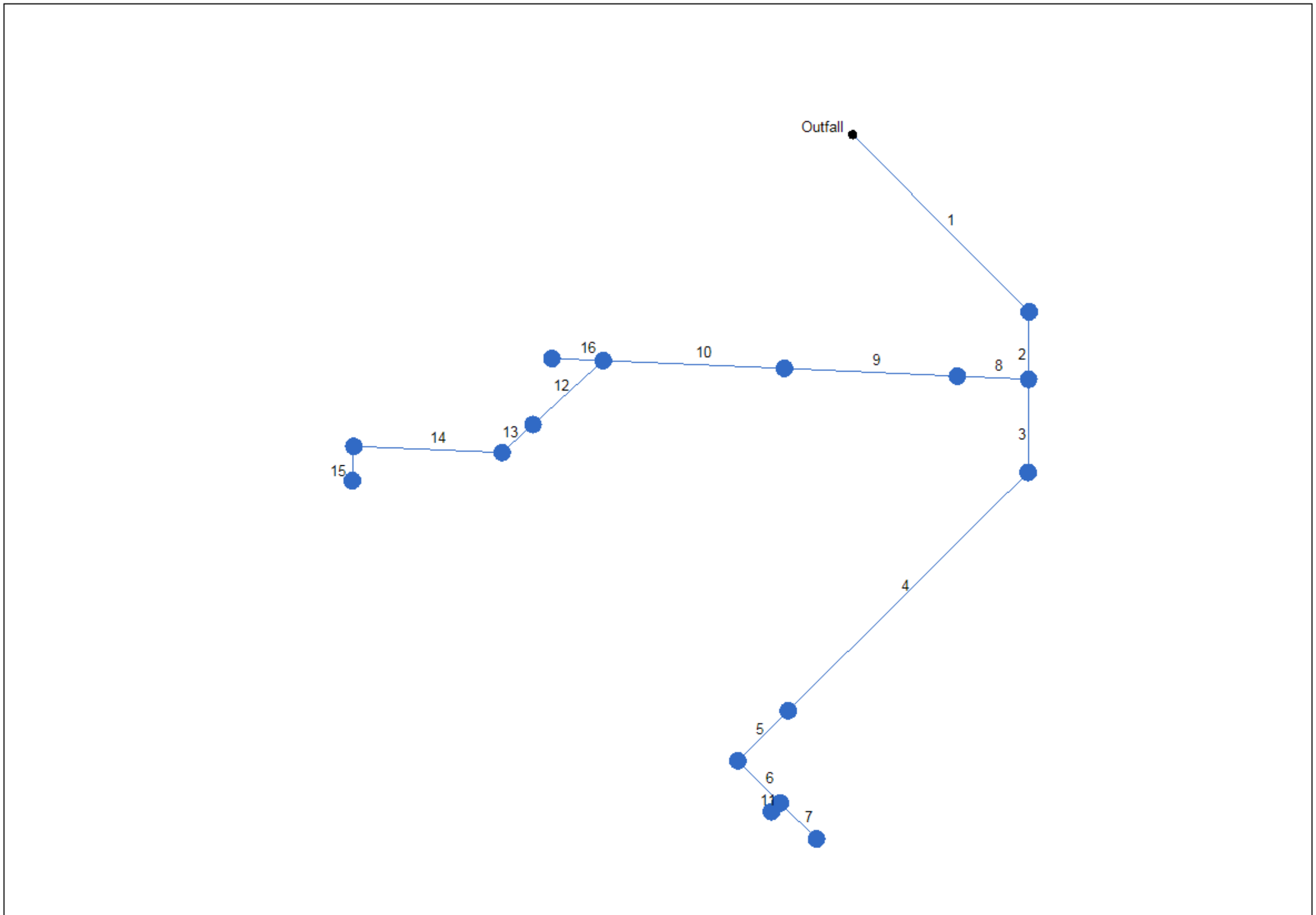
NORTHWEST POND OUTLET TO PASEO DEL NORTE ‘V’ DITCH:

Using the orifice equation for rectangular openings, the proposed 18” x 6” covered sidewalk culvert will pass 1.8 cfs to the PDN ‘v’ ditch.

ORIFICE EQUATION - RECTANGULAR								
Rectangular Area		108	sq.in.	0.75	sq.ft.			
	Width	**18**	in	1.50	ft			
	Height	**6**	in	0.50	ft			
Headwater Elevation		**0.5**	feet	0.25	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)		**=**	**1.83 cfs**	**for 0.75 sq.ft. orifice**				

NORTH SIDE
STORM DRAIN
ANALYSIS TO NMDOT
STORM SEWER

2033 SD 1



Project File: 2033 SD.stm	Number of lines: 16	Date: 9/5/2014

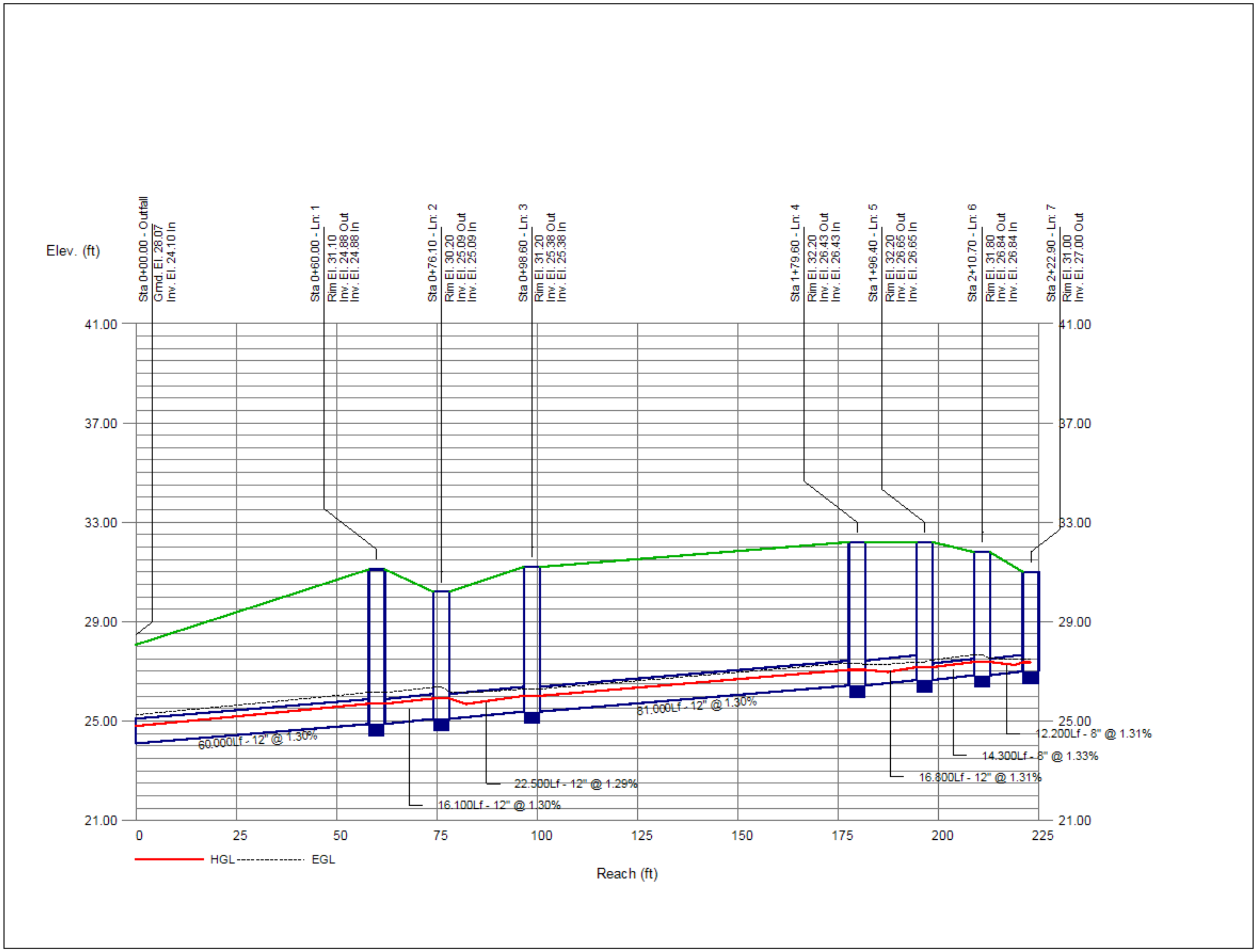
Line No.	Defl Ang (Deg)	Line Size (in)	Line Type	Line Length (ft)	Line Slope (%)	Junct Type	Known Q (cfs)	n-val Pipe	Flow Rate (cfs)	Capac Full (cfs)	EGL Dn (ft)	EGL Up (ft)	Energy Loss (ft)	Crit Depth (ft)	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)	HGL Dn (ft)	HGL Up (ft)	Invert Dn (ft)	Invert Up (ft)	
1	45.338	12	Cir	60.000	1.30	MH	0.00	0.012	3.70	4.40	25.25	26.15	0.000	0.82	28.07	31.10	24.80	25.70	24.10	24.88	
2	45.103	12	Cir	16.100	1.30	MH	0.00	0.012	3.70	4.41	26.15	26.36	0.000	0.82	31.10	30.20	25.70	25.91	24.88	25.09	
3	-0.121	12	Cir	22.500	1.29	MH	0.00	0.012	2.20	4.38	26.18	26.29	0.000	0.63	30.20	31.20	25.91	26.01 j	25.09	25.38	
4	44.680	12	Cir	81.000	1.30	MH	0.70	0.012	2.20	4.39	26.29	27.34	0.000	0.63	31.20	32.20	26.01	27.06	25.38	26.43	
5	0.000	12	Cir	16.800	1.31	MH	0.20	0.012	1.50	4.41	27.27	27.38	0.000	0.52	32.20	32.20	27.06	27.17 j	26.43	26.65	
6	-90.000	8	Cir	14.300	1.33	MH	0.50	0.012	1.30	1.51	27.46	27.67	0.000	0.54	32.20	31.80	27.17	27.38	26.65	26.84	
7	0.000	8	Cir	12.200	1.31	MH	0.60	0.012	0.60	1.50	27.53	27.51	0.000	0.36	31.80	31.00	27.38	27.36 j	26.84	27.00	
8	92.096	12	Cir	17.000	2.00	MH	0.00	0.012	1.50	5.46	26.12	26.16	0.000	0.52	30.20	31.00	25.91	25.95 j	25.09	25.43	
9	0.000	12	Cir	41.400	2.00	MH	0.10	0.012	1.50	5.46	26.16	26.99	0.000	0.52	31.00	31.80	25.95	26.78	25.43	26.26	
10	0.000	12	Cir	43.200	1.99	MH	0.10	0.012	1.40	5.44	26.98	27.82	0.000	0.50	31.80	31.70	26.78	27.62 j	26.26	27.12	
11	90.000	8	Cir	3.000	2.00	MH	0.20	0.012	0.20	1.85	27.45	27.18	0.000	0.21	31.80	31.70	27.38	27.11	26.84	26.90	
12	-45.062	8	Cir	22.700	1.98	MH	0.00	0.012	1.10	1.84	27.86	28.31	0.000	0.50	31.70	32.20	27.62	28.07 j	27.12	27.57	
13	0.000	8	Cir	10.000	2.00	MH	0.50	0.012	1.10	1.85	28.31	28.51	0.000	0.50	32.20	32.30	28.07	28.27	27.57	27.77	
14	44.952	8	Cir	35.500	2.00	MH	0.00	0.012	0.60	1.85	28.41	28.99	0.000	0.36	32.30	31.90	28.27	28.84 j	27.77	28.48	
15	-89.826	8	Cir	8.300	2.05	MH	0.60	0.012	0.60	1.87	28.99	29.16	0.000	0.36	31.90	31.70	28.84	29.01	28.48	28.65	
16	-0.201	8	Cir	12.300	2.03	MH	0.20	0.012	0.20	1.87	27.69	27.65	0.000	0.21	31.70	31.50	27.62	27.58	27.12	27.37	

2033 SD 1 | Number of lines: 16 | Date: 9/5/2014

NOTES: ** Critical depth

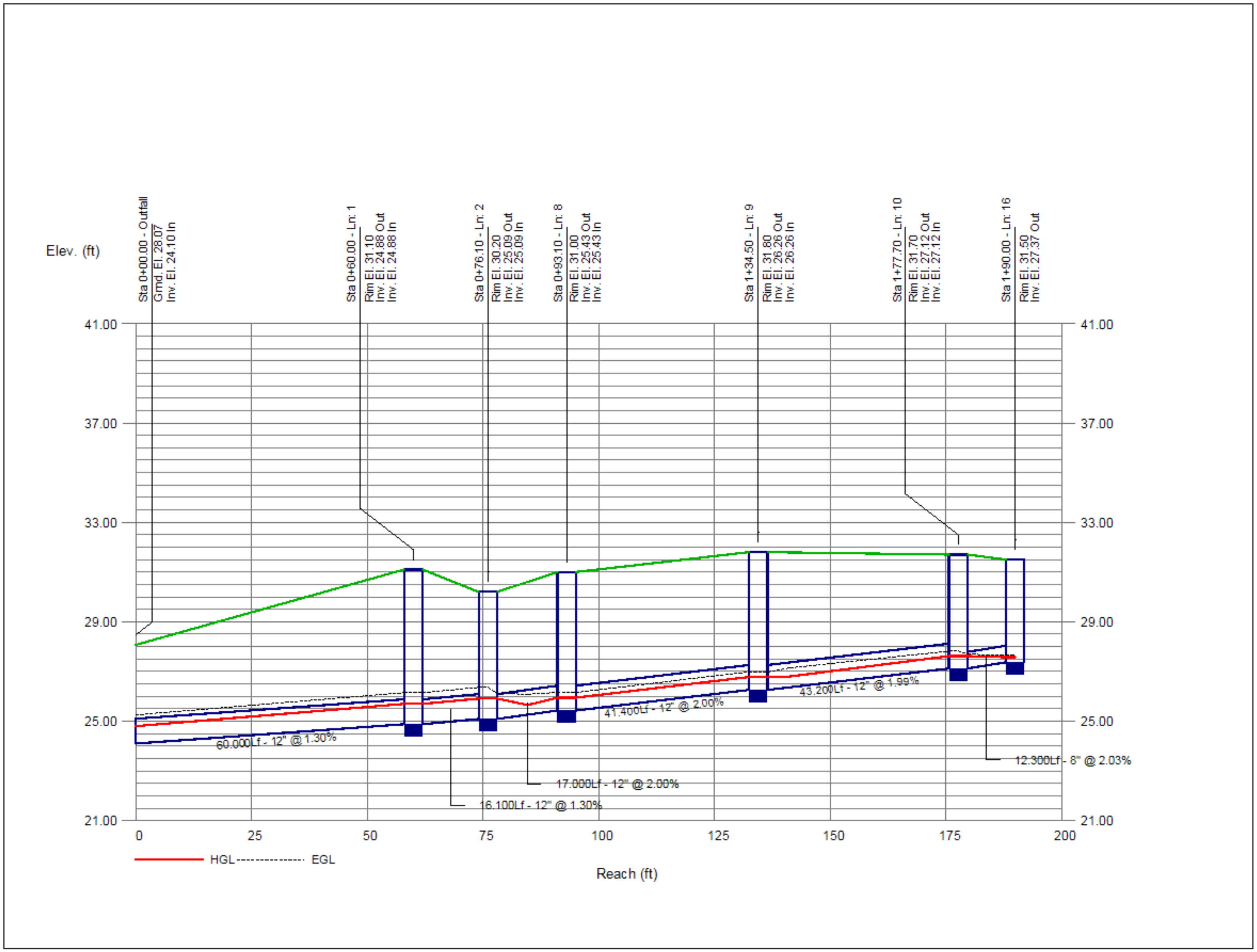
Storm Sewer Profile

Proj. file: 2033 SD.stm



Storm Sewer Profile

Proj. file: 2033 SD.stm



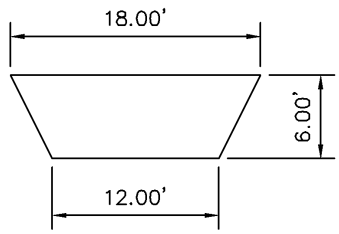
ALLOWABLE DISCHARGE to PALOMAS AVE. NE:

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.

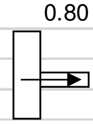
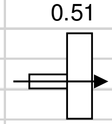
Allowable discharge to Palomas Ave.							
Area of basin flows =	101312	SF	=		2.3	Ac.	
The following calculations are based on Treatment areas as shown in table to the right						LAND TREATMENT	
	Sub-basin Weighted Excess Precipitation (see formula above)					A =	0%
	Weighted E	=	2.00	in.		B =	10%
	Sub-basin 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 4.4 cfs < 10.4 cfs. See drainage basin map.

Basin 1 will surface discharge to the water harvesting area at the southwest end of the property. Basins 2, 3, 4 and 9 will drain to the south side storm drain system and discharge to the bubble-up inlet in the water harvesting basin. Once the basin fills, excess flow will pass (free discharge) to Palomas Ave. via the proposed access drive curb cuts.

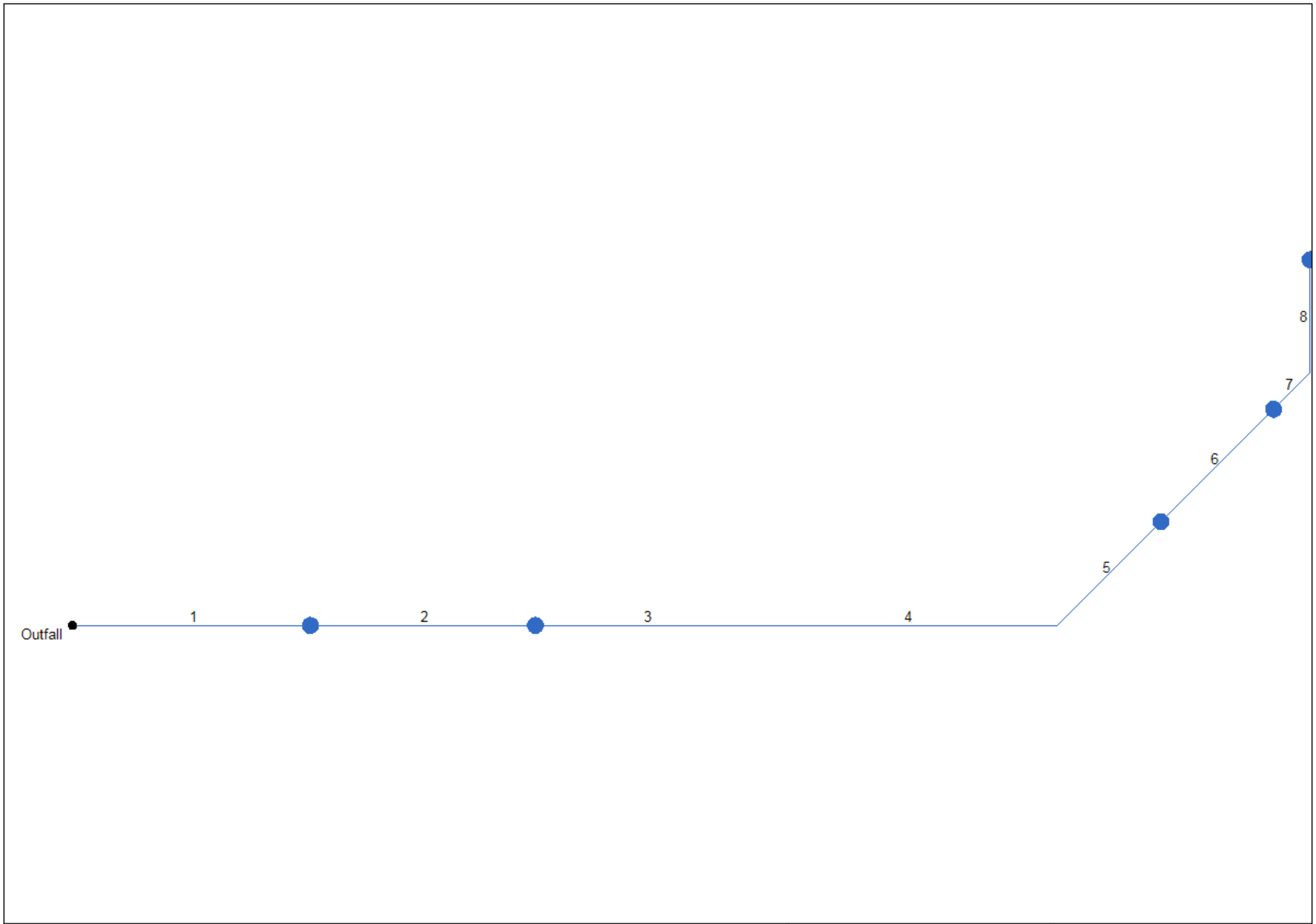


Three curb openings will each release 1.5 cfs for a total of 4.5 cfs < 4.4 cfs. OK

ORIFICE EQUATION - RECTANGULAR								
Rectangular Area		90	sq.in.	0.63 sq.ft.				
	Width	**15**	in	1.25	ft			
	Height	**6**	in	0.50	ft			
Headwater Elevation		**0.5**	feet	0.25	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)		**=**	**1.52 cfs**	**for 0.63 sq.ft. orifice**				

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: 8	Date: 9/4/2014

Storm Sewers v10.40

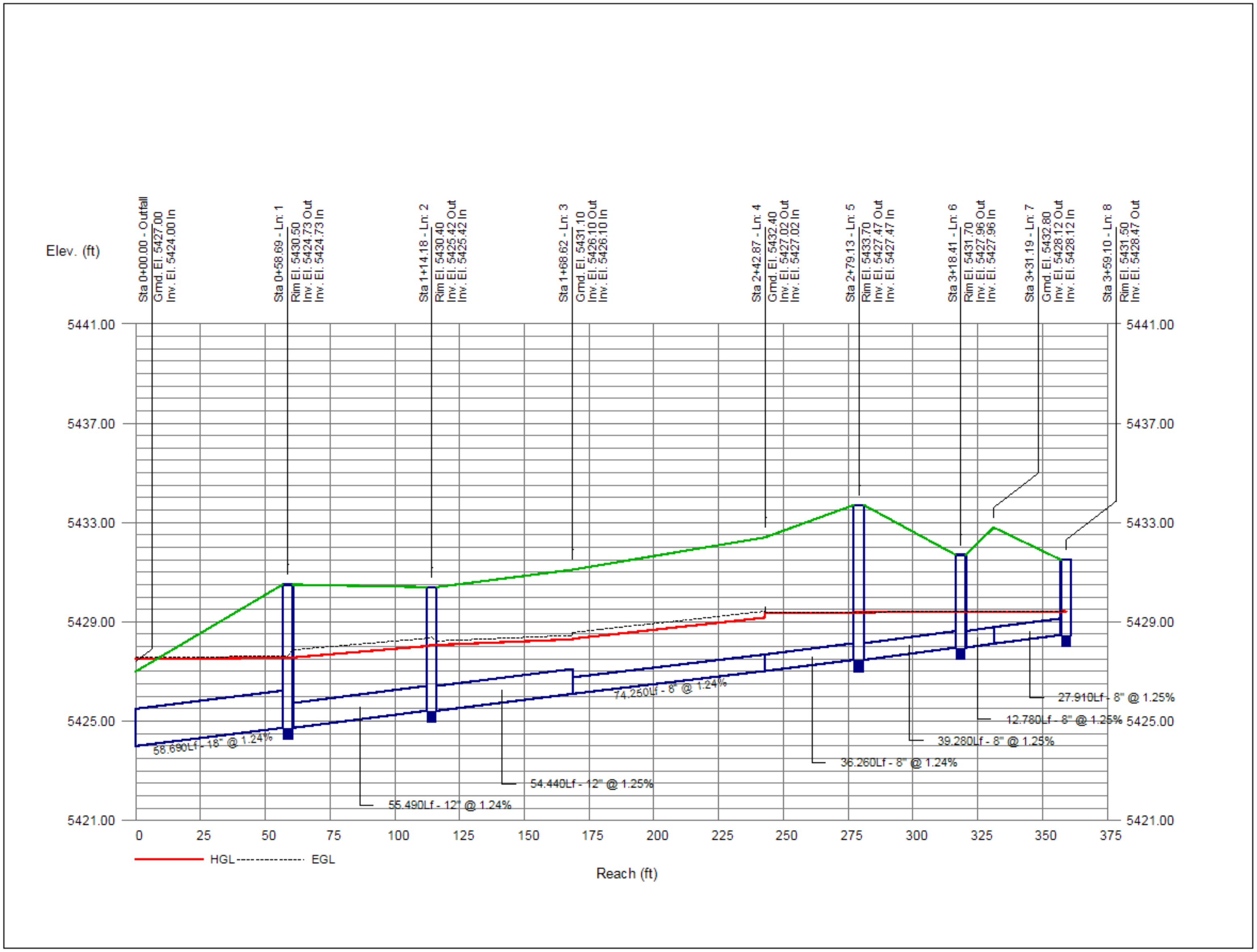
Line No.	Defl Ang (Deg)	Line Size (in)	Line Type	Line Length (ft)	Line Slope (%)	Junct Type	Known Q (cfs)	n-val Pipe	Flow Rate (cfs)	Capac Full (cfs)	EGL Dn (ft)	EGL Up (ft)	Energy Loss (ft)	Crit Depth (ft)	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)	HGL Dn (ft)	HGL Up (ft)	Invert Dn (ft)	Invert Up (ft)
1	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	5430.50	5427.50	5427.56	5424.00	5424.73
2	0.000	12	Cir	55.500	1.24	MH	1.00	0.012	3.50	4.30	5427.87	5428.33	0.457	0.80	5430.50	5430.40	5427.57	5428.02	5424.73	5425.42
3	0.000	12	Cir	54.400	1.25	None	1.10	0.012	2.50	4.31	5428.23	5428.46	0.228	0.68	5430.40	5431.10	5428.07	5428.30	5425.42	5426.10
4	0.000	8	Cir	74.300	1.24	Grate	1.10	0.012	1.40	1.46	5428.57	5429.42	0.851	0.56	5431.10	5432.40	5428.32	5429.17	5426.10	5427.02
5	-45.000	8	Cir	36.300	1.24	Grate	0.00	0.012	0.30	1.46	5429.47	5429.49	0.019	0.25	5432.40	5433.70	5429.46	5429.47	5427.02	5427.47
6	0.000	8	Cir	39.300	1.25	Grate	0.10	0.012	0.30	1.46	5429.49	5429.51	0.021	0.25	5433.70	5431.70	5429.48	5429.50	5427.47	5427.96
7	0.000	8	Cir	12.800	1.25	None	0.10	0.012	0.20	1.46	5429.51	5429.51	0.003	0.21	5431.70	5432.80	5429.51	5429.51	5427.96	5428.12
8	-45.000	8	Cir	27.900	1.25	Grate	0.10	0.012	0.10	1.47	5429.51	5429.52	0.002	0.14	5432.80	5431.50	5429.51	5429.51	5428.12	5428.47

Project File: 2033 South SD.stm | Number of lines: 8 | Date: 9/5/2014

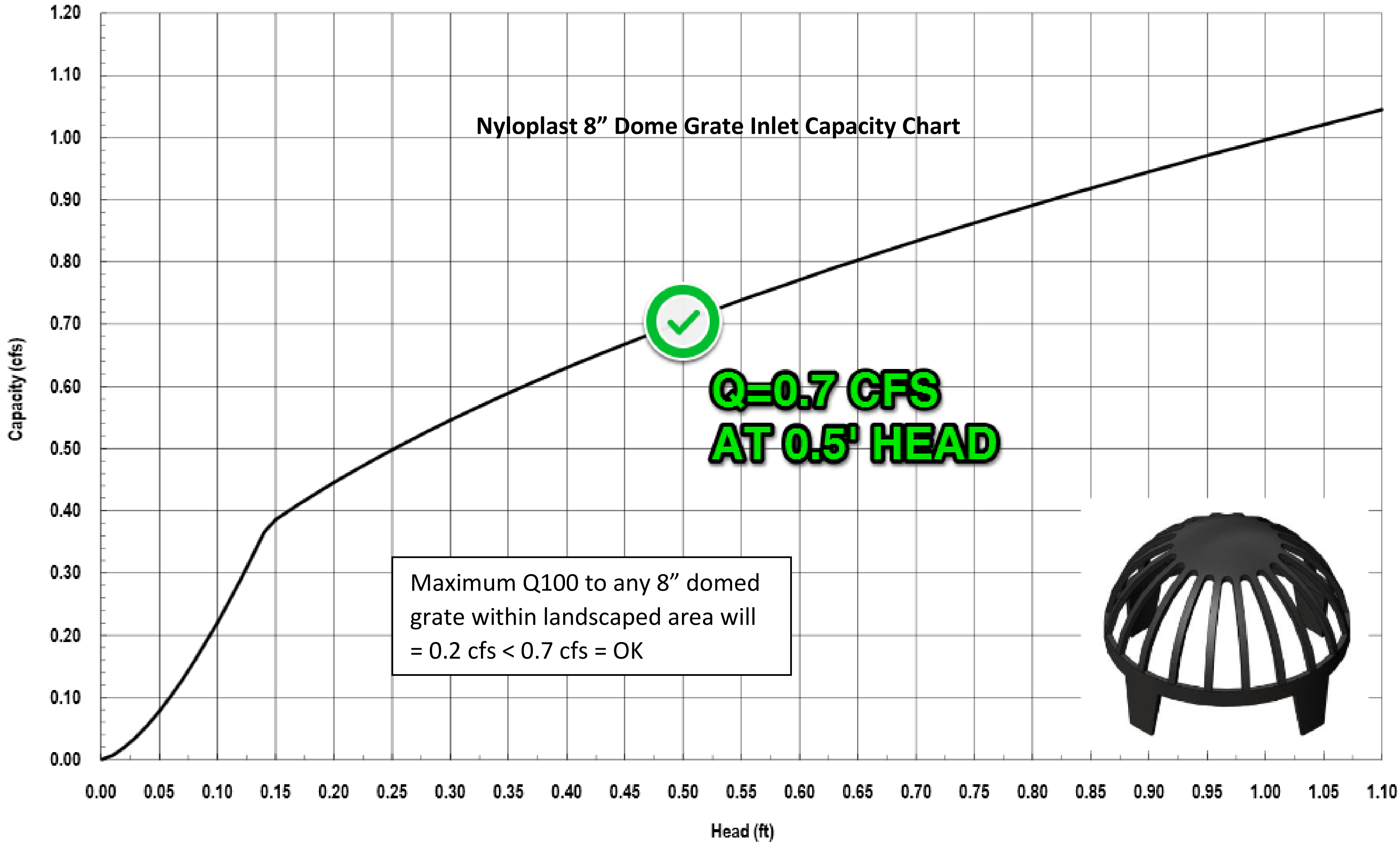
NOTES: ** Critical depth

Storm Sewer Profile

Proj. file: 2033 South SD.stm



Storm Sewers



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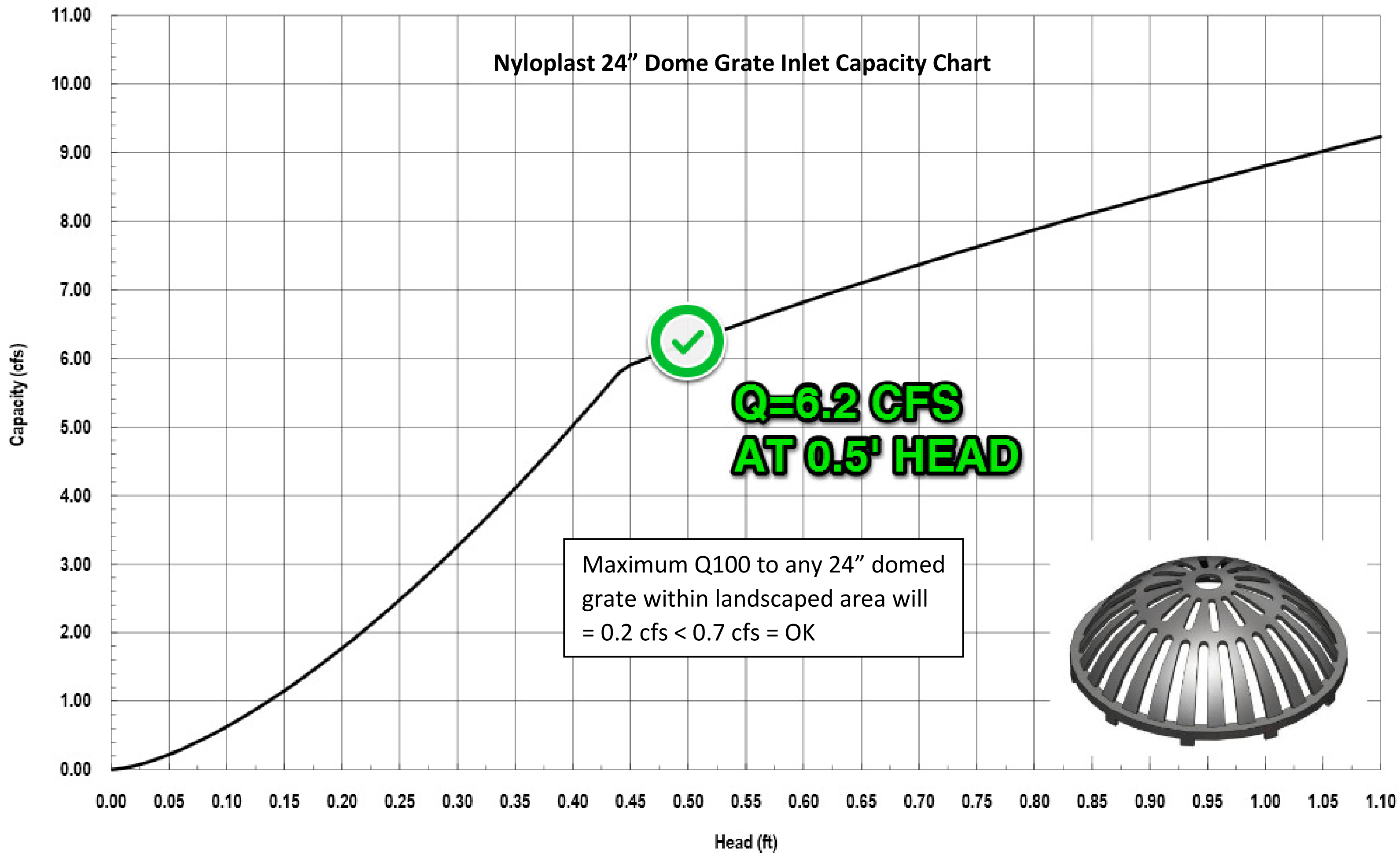

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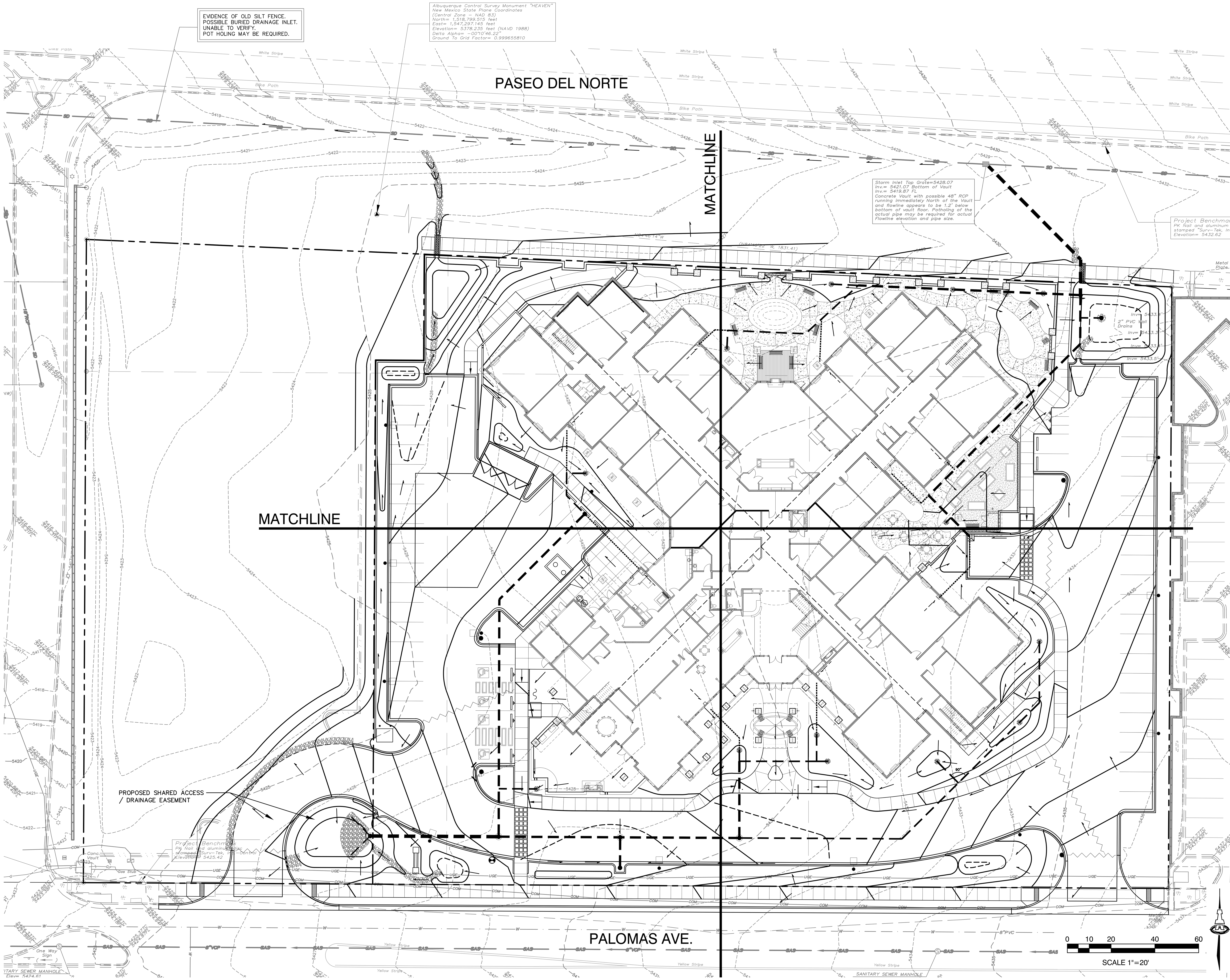
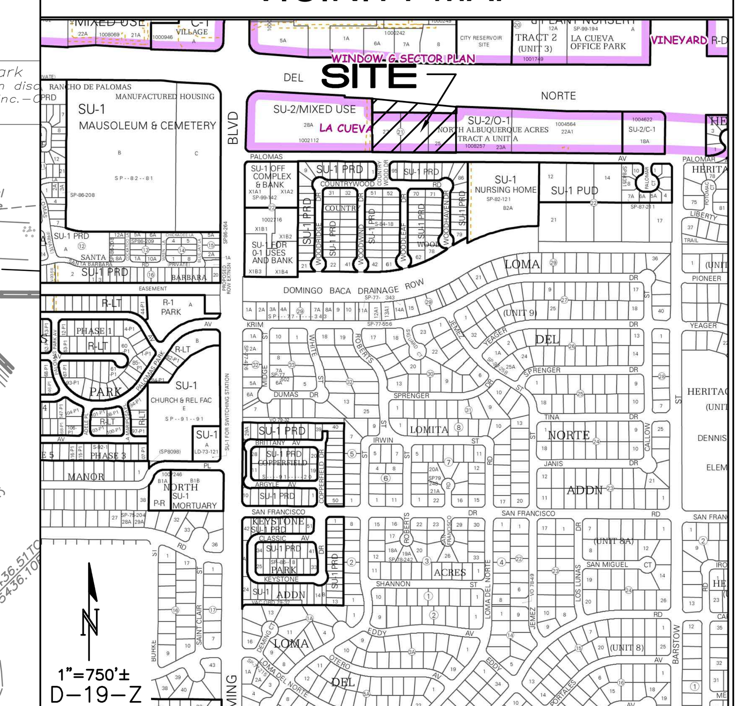


VICINITY MAP



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.

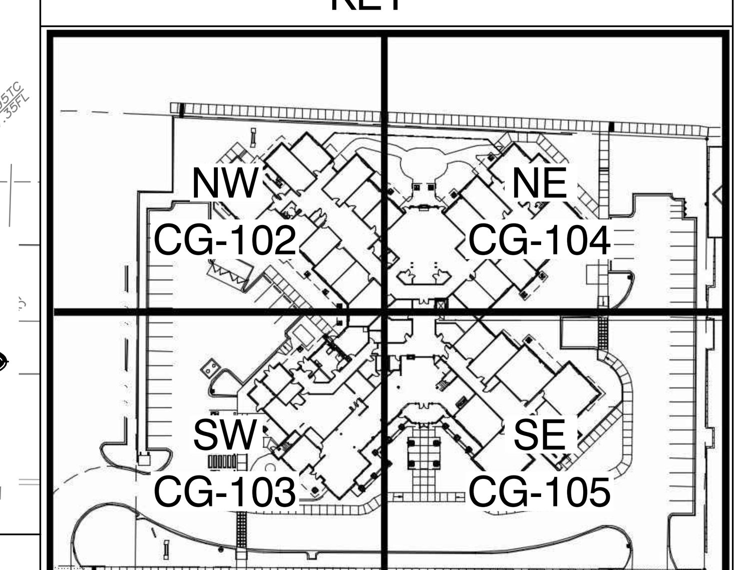
FLOOD HAZARD: PER BERNALILLO COUNTY FIRM MAP #35001C0141G, THE SITE IS LOCATED WITHIN FLOODZONE 'X' DESIGNATED AS AREAS DETERMINED TO BE OUTSIDE 500–YEAR FLOODPLAIN.

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 RESPONSIBLITY 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.

FRED C. ARFMAN
NEW MEXICO
7322
LICENSED PROFESSIONAL ENGINEER
09-05-14

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GRADING & DRAINAGE PLAN

Date: 08–29–14	No.	Revision:	Date:	Job No. IA: 2033
Drawn By: BJB				CG-101
Ckd By: FCA				SH. OF

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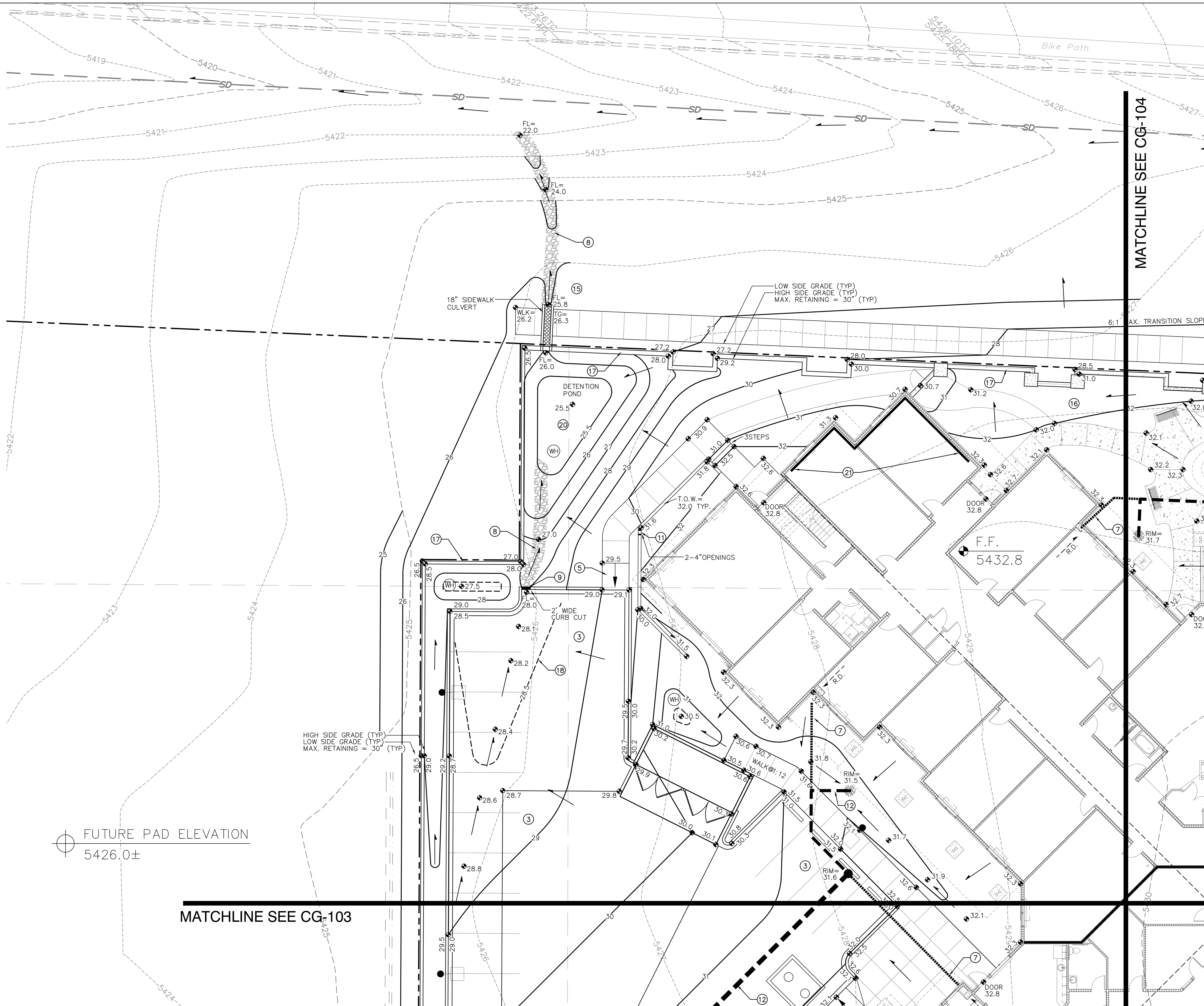


0 5 10 20 30

SCALE 1"=10'

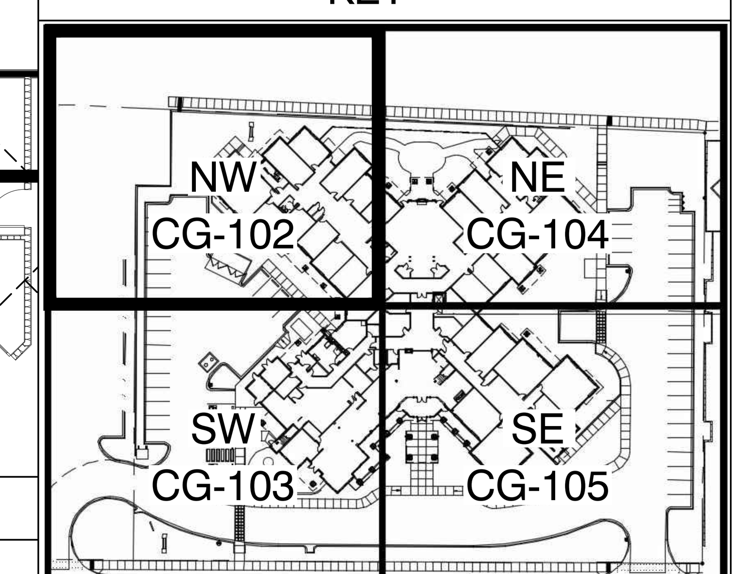
KEYED NOTES

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 FRACTURED FACE ROCK LINED SWALE. SEE CG-501 FOR DETAIL.
9. PROVIDE OPENING IN CURB TO PASS FLOW. SEE CG-501 FOR DETAIL.
10. CONSTRUCT 18" BOTTOM WIDTH COVERED SIDEWALK CULVERT (2 LOCATIONS) PER C.O.A. STD. DTL. 2236. SEE CP-501 FOR ADDITIONAL INFORMATION.
11. PROVIDE OPENINGS OR PIPES THROUGH WALL 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 DETENTION 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.

KEY



LEGEND

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

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GRADING & DRAINAGE PLAN-NW

Date:	No.	Revision:	Date:	Job No.
08-29-14				IA: 2033
Drawn By: BJB				CG-102
Ckd By: FCA				SH. OF

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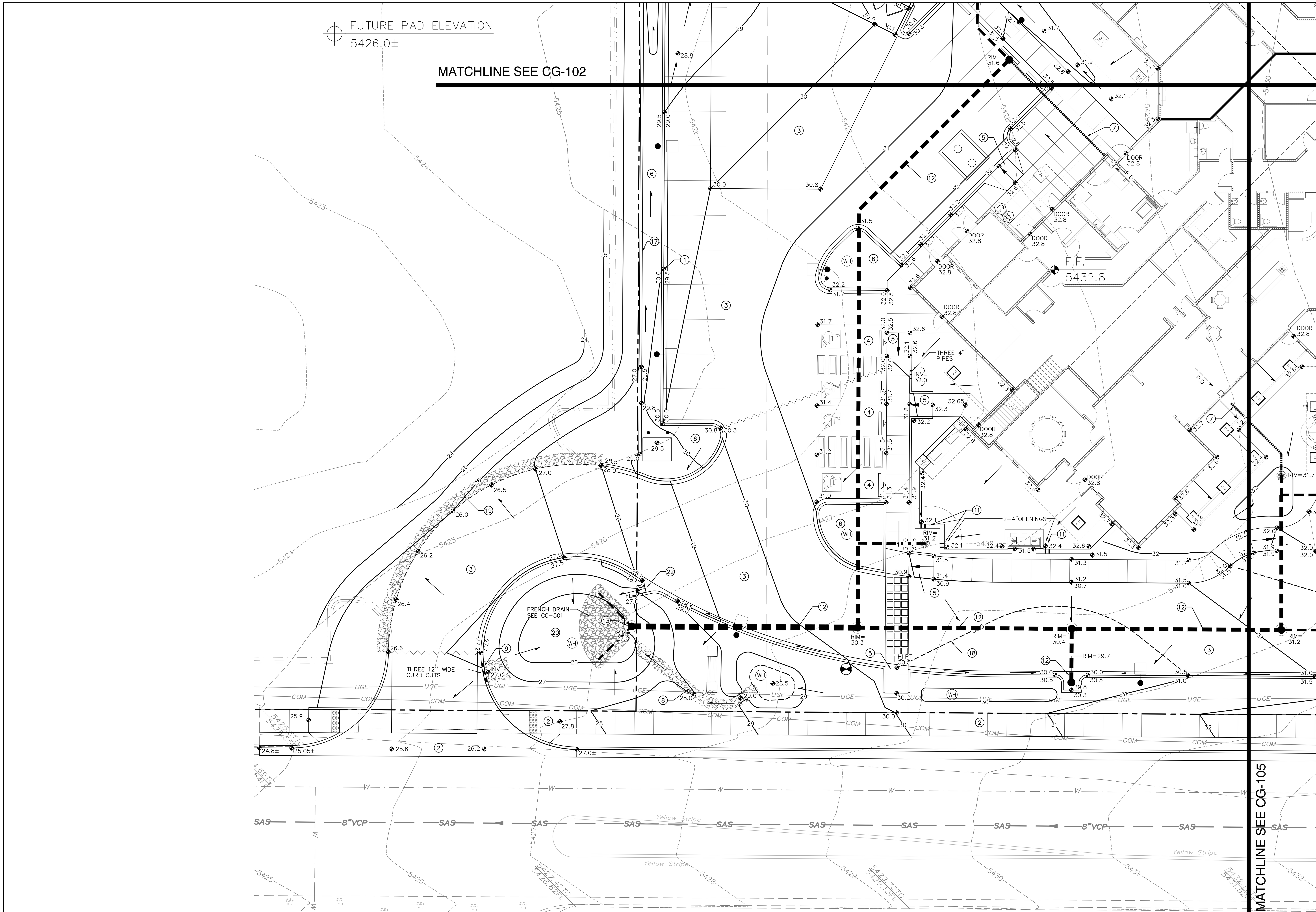

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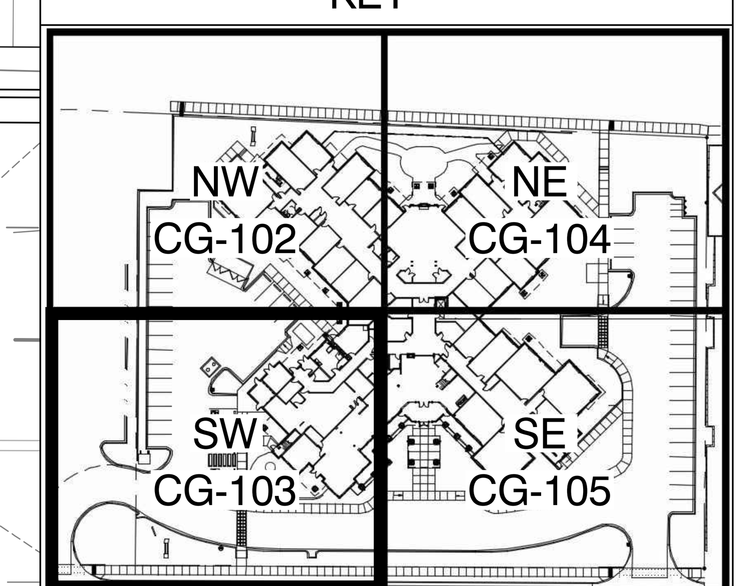
11. PROVIDE OPENINGS OR PIPES THROUGH WALL TO PASS FLOW.
12. CONSTRUCT PRIVATE STORM DRAIN SYSTEM. SEE DETAIL SHEET CG-501 FOR DETAILED DESIGN.
13. CONSTRUCT BUBBLE-UP INLET. SEE CG-501 FOR DETAIL.
14. PROVIDE WATERTIGHT CONNECTION TO PUBLIC STORM SEWER. SEE CG-501 FOR ADDITIONAL INFORMATION.
15. G.C. 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 DETENTION 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.

KEY



LEGEND

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

0 5 10 20 30

SCALE 1"=10'

FRED C. ARFMAN NEW MEXICO 7322 LICENSED PROFESSIONAL ENGINEER

ISAACSON & ARFMAN, P.A.
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2033 CG-101.dwg Sep 05,2014

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GRADING & DRAINAGE PLAN-SW

Date: 08-29-14	No.	Revision:	Date:	Job No. IA: 2033
Drawn By: BJB				CG-103
Ckd By: FCA				SH. OF

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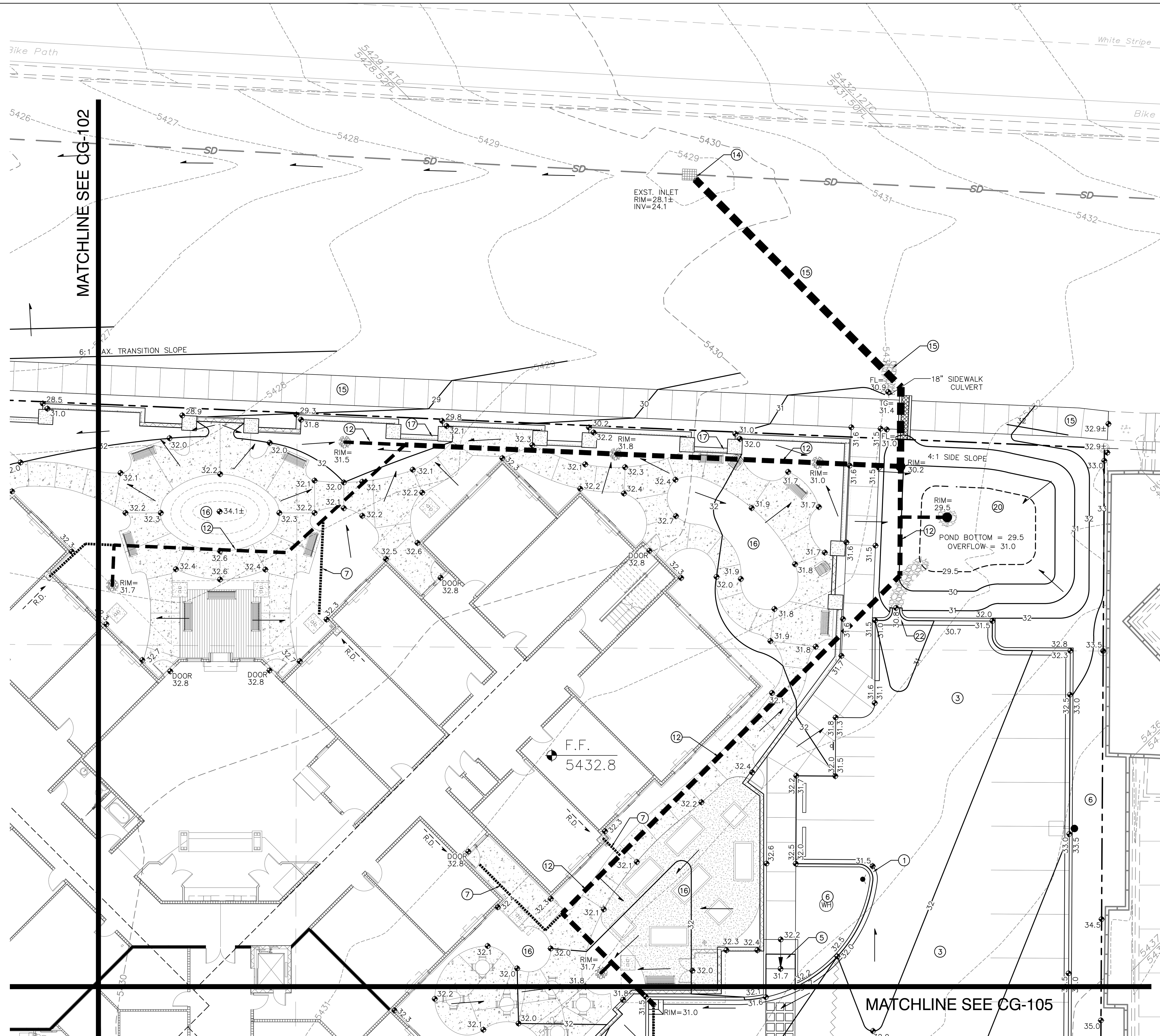

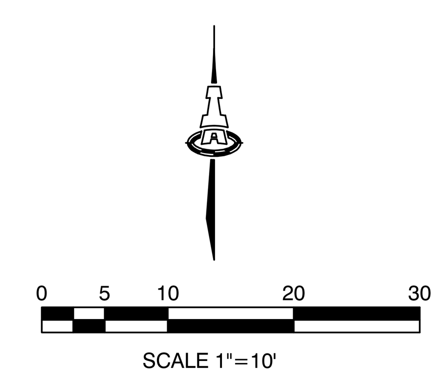

KEYED NOTES

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 FRACTURED FACE ROCK LINED SWALE. SEE CG-501 FOR DETAIL.
9. PROVIDE OPENING IN CURB TO PASS FLOW. SEE CG-501 FOR DETAIL.
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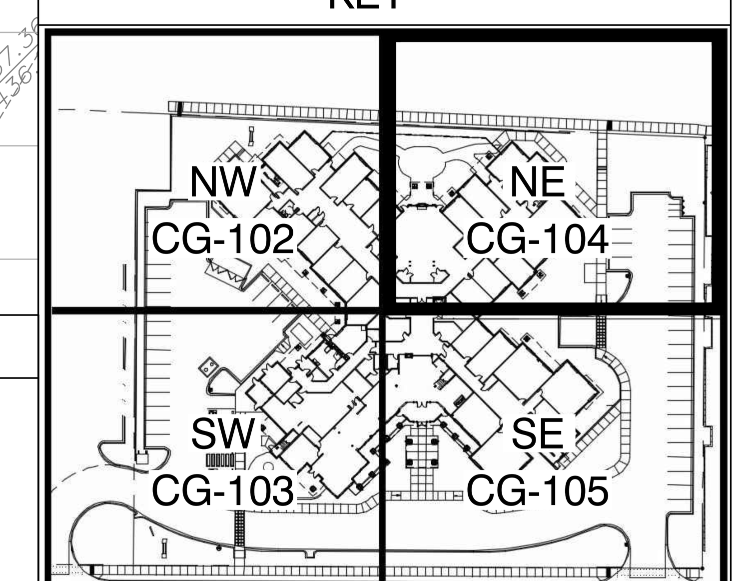
21. EXTENDED STEMWALL THIS AREA TO ACHIEVE GRADES SHOWN. SEE ARCHITECTURAL.
22. DRAINAGE RUNDOWN SEE CG-501.

KEY



LEGEND

5428	EXISTING CONTOUR
	PROPOSED FLOW DIRECTION
F.F.=	PROPOSED FINISH FLOOR ELEVATION
31	PROPOSED CONTOUR
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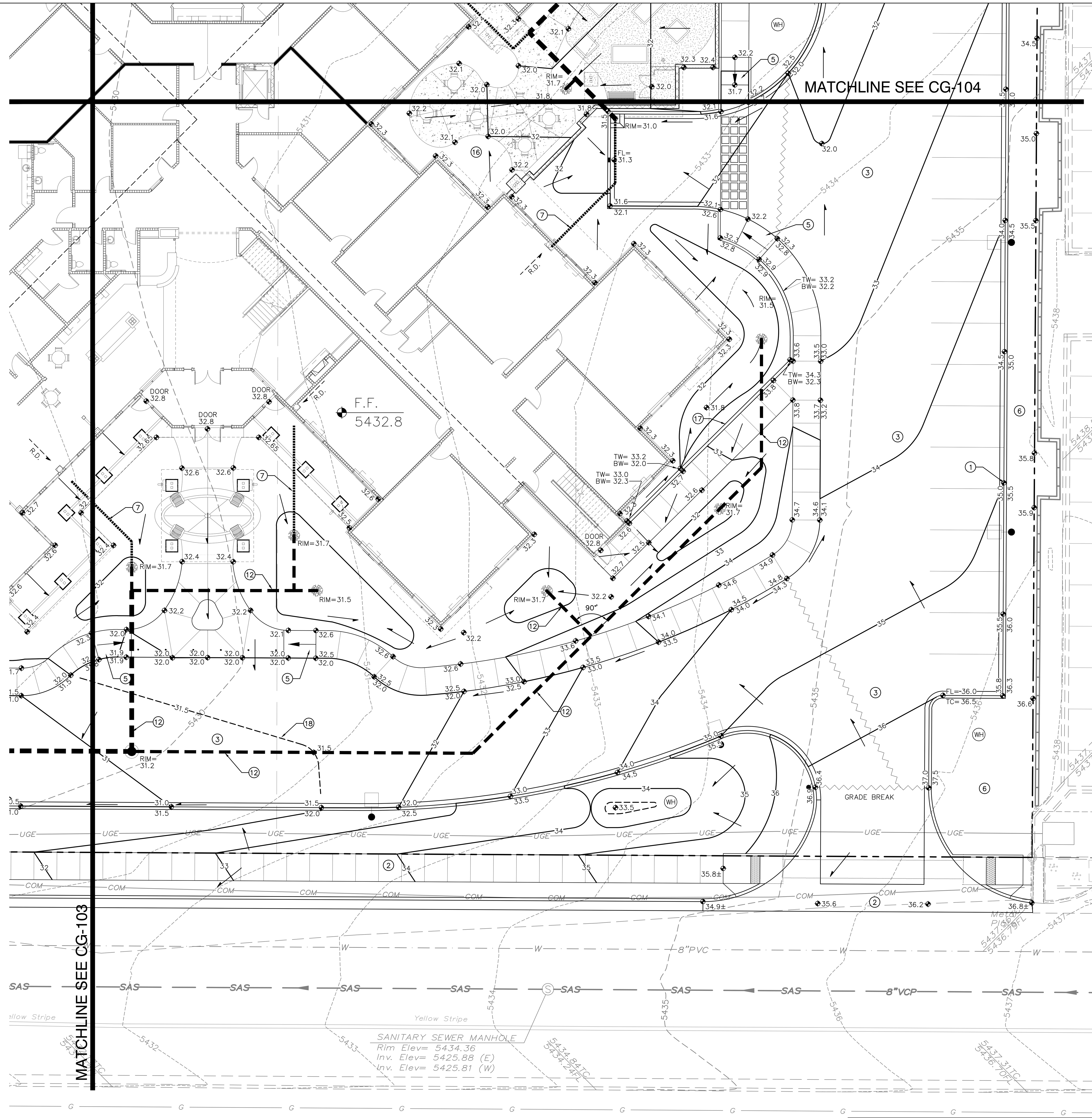
GRADING & DRAINAGE PLAN-NE

Date: 08-29-14	No.	Revision:	Date:	Job No. IA: 2033
Drawn By: BJB				CG-104
Ckd By: FCA				SH. OF



0 5 10 20 30

SCALE 1"=10'

KEYED NOTES

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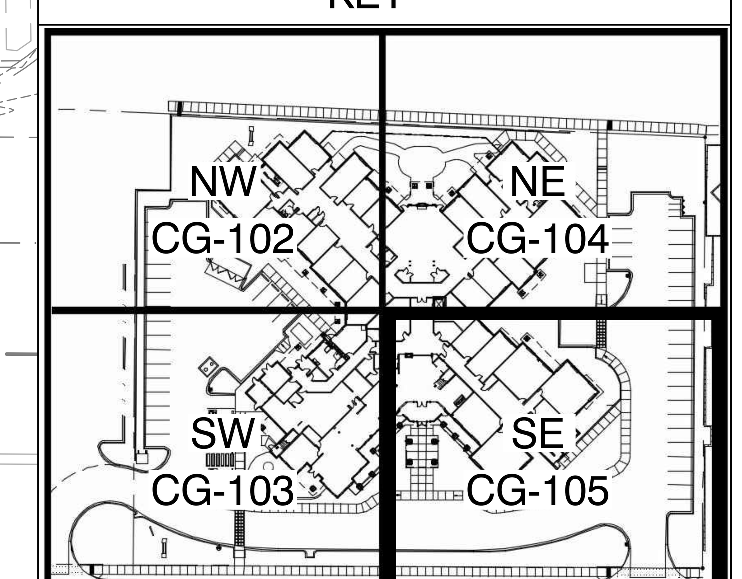
22. DRAINAGE RUNDOWN SEE CG-501.

KEY



LEGEND

5428	EXISTING CONTOUR
←	PROPOSED FLOW DIRECTION
F.F.=	PROPOSED FINISH FLOOR ELEVATION
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FRED C. ARFMAN NEW MEXICO 7322 LICENSED PROFESSIONAL ENGINEER

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MorningStar
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GRADING & DRAINAGE PLAN-SE

Date:	No.	Revision:	Date:	Job No. IA: 2033
08-29-14				CG-105
Drawn By: BJB				
Ckd By: FCA				SH. OF

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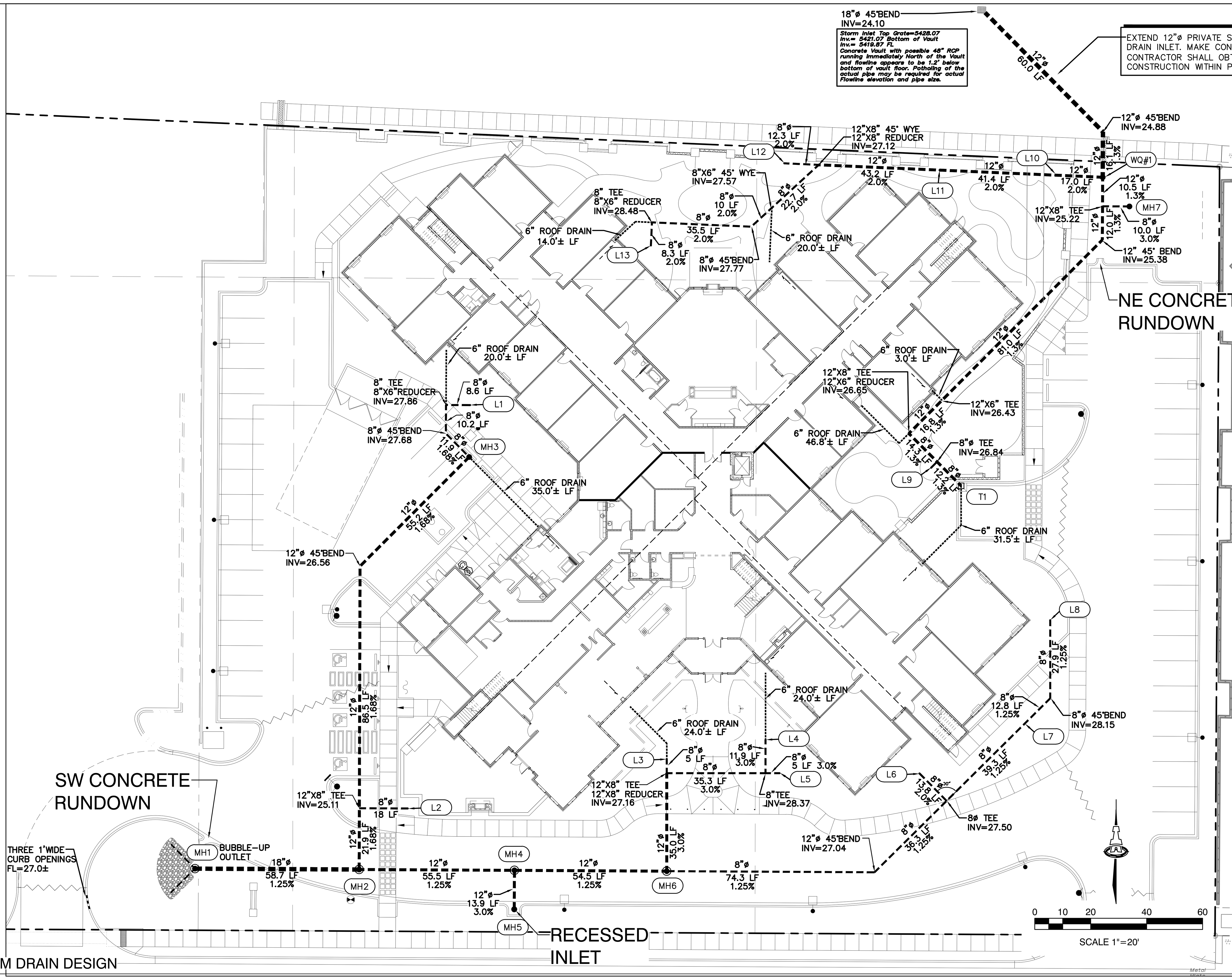
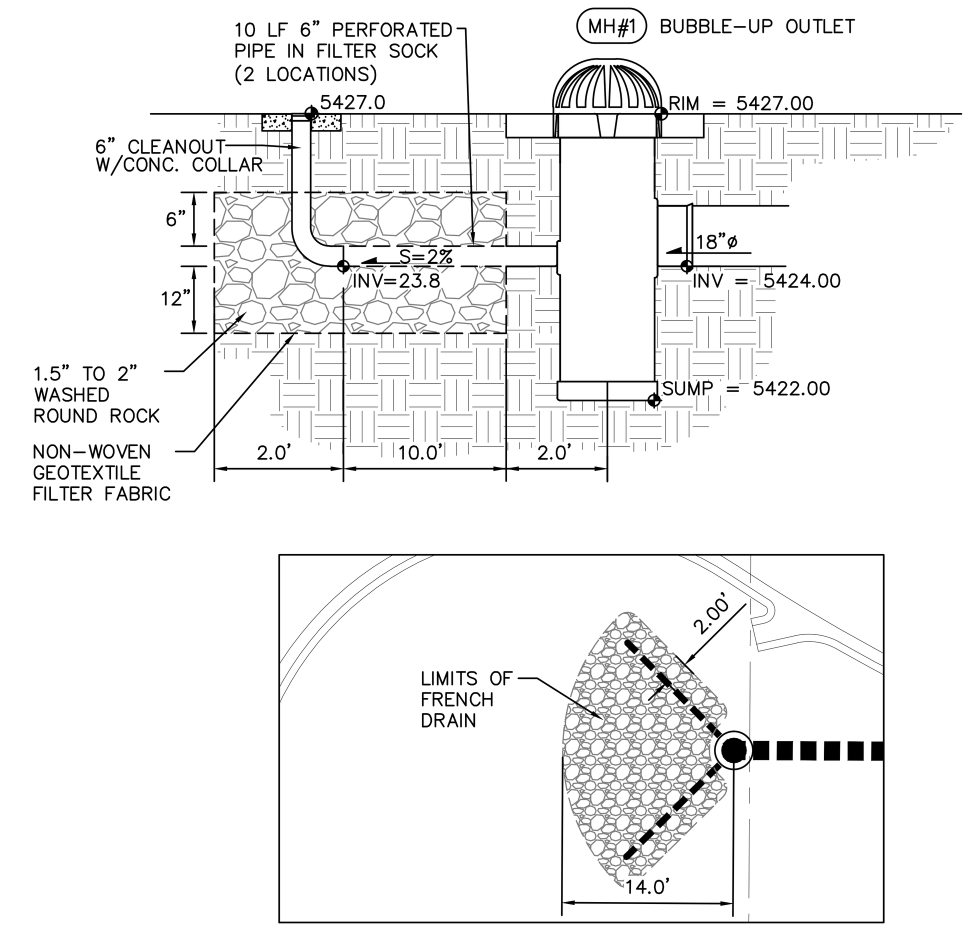


STORM DRAIN DESIGN



SW FRENCH DRAIN

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
  - 6" 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.

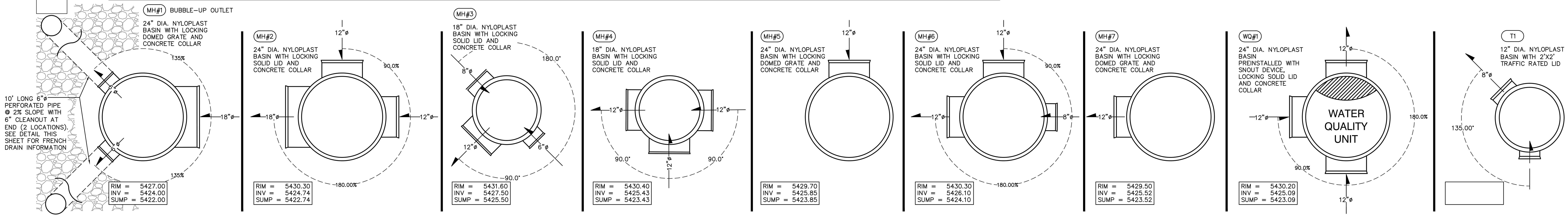
D. PROPOSED STORM DRAIN HORIZONTAL LAYOUT AND INVERT ELEVATIONS SHOWN HAVE BEEN COORDINATED WITH PROPOSED WATER AND SANITARY SEWER CROSSINGS. NOTIFY ENGINEER OF ANY CONFLICTS ENCOUNTERED DURING CONSTRUCTION.

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	25.43
L11	31.8	26.26
L12	31.5	27.37
L13	31.7	28.65

LANDSCAPE INLET RIM / INVERT TABLE

SEE STORM DRAIN EXHIBIT (L#)

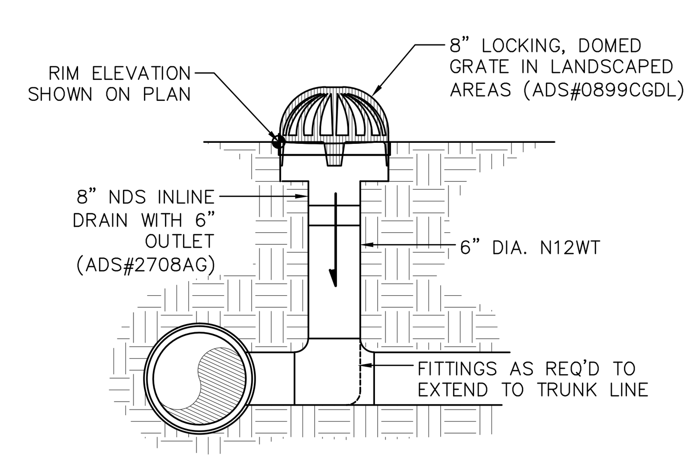
SCALE: N.T.S.



NYLOPLAST BASIN DESIGN INFORMATION

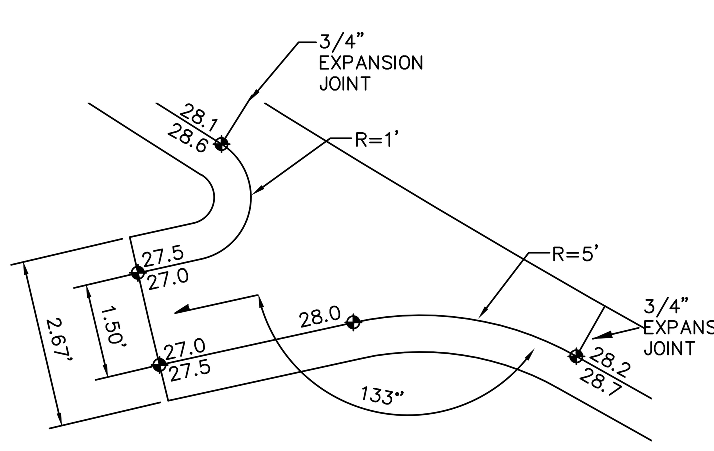
(MH'S) (WQ'S) (T'S)

SCALE: N.T.S.



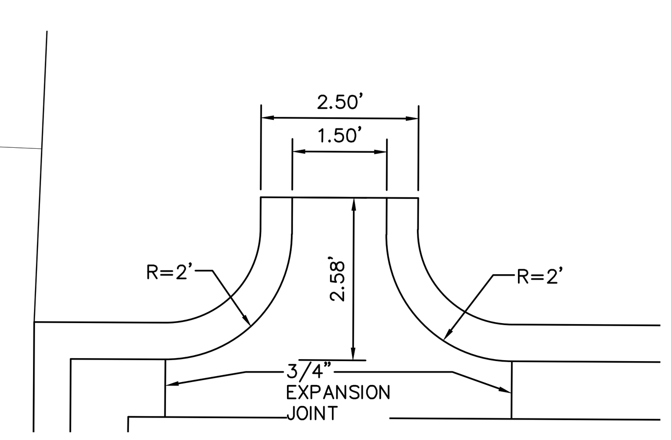
IN-LINE DRAIN

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



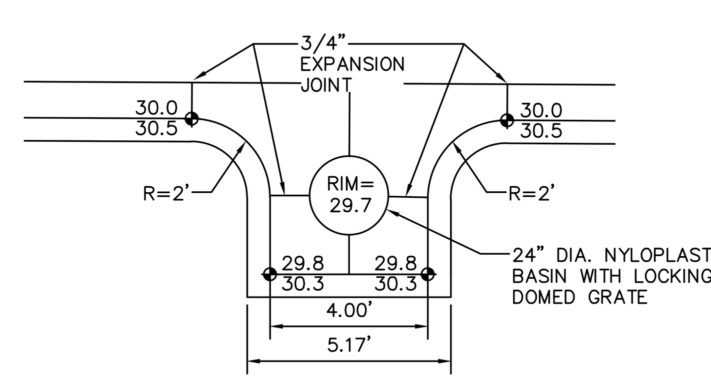
SW CONCRETE RUNDOWN

SCALE: N.T.S.



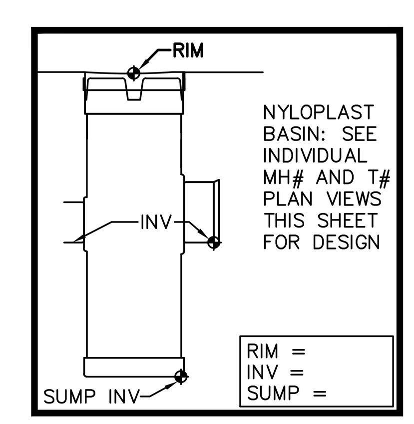
NE CONCRETE RUNDOWN

SCALE: N.T.S.



RECESSED INLET

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



TYPICAL NYLOPLAST BASIN SECTION

TYPICAL NYLOPLAST BASIN SECTION

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

FRED C. ARFMAN NEW MEXICO 7322 LICENSED PROFESSIONAL ENGINEER 09-05-14

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2033 CG-501.dwg Sep 05,2014

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GRADING & DRAINAGE DETAILS

Date: 08-29-14	No.	Revision:	Date:	Job No. IA:2033
Drawn By: BJB				CG-501
Ckd By: FCA				SH. OF

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