

CITY OF ALBUQUERQUE

Planning Department
David Campbell, Director



Mayor Timothy M. Keller

November 9, 2018

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

RE: **Apartment Urban Living @ Nob Hill
Central and Montclair NE
Conceptual Grading Plan Stamp Date: 10/29/18
Drainage Report Stamp Date: 10/29/18
Hydrology File: K17D073**

Dear Mr. Arfman:

PO Box 1293

Based on the submittal received on 10/31/18, the above-referenced plan is approved for Plat. Prior to approval for Site Plan, the following need to be corrected:

Albuquerque

Prior to Site Plan:

NM 87103

www.cabq.gov

1. Storm water quality (SWQ) volume credit cannot be allowed for the volume stored in the pipes, unless those pipes are perforated and surrounded in gravel bedding for their respective lengths (a French drain). If you add gravel bedding, you can take credit for this pipe volume, plus the volume contained in the gravel voids using a porosity of 30% ($e=0.30$). Otherwise fee-in-lieu of the SWQ volume is required for the full amount of impervious area: ~83292sf.
2. Please note that because the initial application for this project was made prior to enacting the current drainage ordinance (Council Bill C/S O-18-2) Fee-in-Lieu of managing the stormwater quality volume may be accepted for this project as presented. Applications made after 10/2/18 are required to comply § 14-5-2-6 (H) of the new ordinance.
3. After reviewing the proposed channel on Copper in greater detail, we cannot allow in to be placed in the ROW; revise the plan and infrastructure list to just extend the sidewalk culverts out to the face-of-curb on Copper.
4. Be sure to remove the 18" sidewalk culvert on Central from the infrastructure list as well.
5. If only seeking Site Plan for Building Permit approval at this time, label the grading plan "Conceptual, Not For Construction" or similar and address the SPBP comments. If seeking SPBP and Building Permit simultaneously, forgo the conceptual markings and address all SPBP and Building Permit comments.

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Prior to Building Permit (For Information):

6. The Plat will need to be recorded (include a copy when submitting for BP approval).
7. Payment of Fee-in-Lieu (Amount, to be confirmed by Design Engineer) will be required; include a copy of the paid receipt with the building permit submittal.
8. Remove all "Conceptual" markings.
9. Provide Hydraulic Calculations per DPM 22.3 documenting:
 - a. Inlet and pipe capacities, including 2x capacity for inlets in sump condition or a suitably sized overland flow path and profiles and HGL calculations.
 - b. Pond rating curve and routing of the 100-yr event. Also show the 100-yr water surface on the grading plan.
 - c. The HGL calculations need to use the maximum water surface elevation above the bubble-up grate as the downstream starting EGL.
 - d. The HGL output table provided did not have any of the results.
10. This project requires an ESC Plan, submitted to the Stormwater Quality Engineer (Curtis Cherne PE, ccherne@cabq.gov or 924-3420).
11. Additional comments may be provided at Building Permit, based on final site layout and level of detail shown on plans.

Prior to Certificate of Occupancy (For Information):

12. A Bernalillo County Recorded [Private Facility Drainage Covenant](#) is required for the stormwater quality pipes/ gravel bedding. The original notarized form, exhibit A (legible on 8.5x11 paper), and recording fee (\$25, payable to Bernalillo County) must be turned into DRC (4th, Plaza del Sol) for routing. Please contact Charlotte LaBadie (clabadie@cabq.gov, 924-3996) or Madeline Carruthers (mtafoya@cabq.gov, 924-3997) regarding the routing and recording process for covenants. The routing and recording process for covenants can take a month or longer; Hydrology recommends beginning this process as soon as possible as to not delay approval for certificate of occupancy.
13. Engineer's Certification, per the DPM Chapter 22.7: *Engineer's Certification Checklist For Non-Subdivision* is required.
14. City acceptance and close-out of the public Work Order will be required, unless a financial guarantee has been posted.

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

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David Campbell, Director



Mayor Timothy M. Keller

If you have any questions, please contact me at 924-3695 or dpeterson@cabq.gov.

Sincerely,

A handwritten signature in dark ink, appearing to read 'D. Peterson', is written over a light gray circular background.

Dana Peterson, P.E.
Senior Engineer, Planning Dept.
Development Review Services

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov



August 29, 2018

James D. Hughes, P.E.
Principal Engineer, Planning Dept.
City of Albuquerque Development Review Services

RE: Apartment Urban Living @ Nob Hill (K17D073)

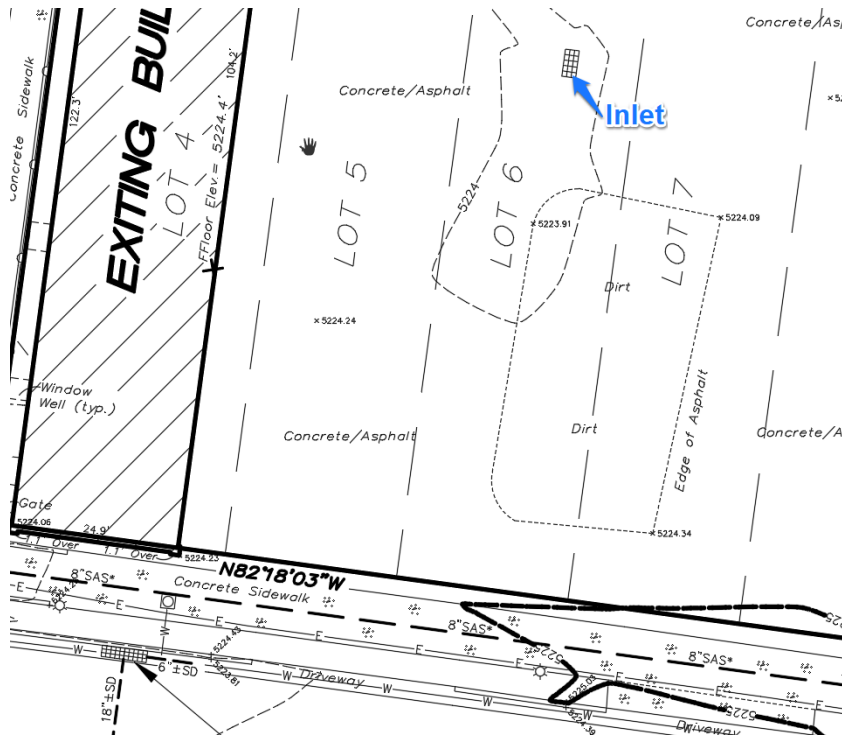
Dear Mr. Hughes,

Attached with this resubmittal is one copy of the proposed Grading and Drainage Plan and Supplemental Information Packet (SIP). Revisions include project progress revisions as well as revisions in response to your review comments dated August 29, 2018 as follows:

1. All properties are consolidated into one lot. No cross-lot drainage easements required.

PRIOR TO SITE PLAN comments:

2. Regarding First Flush, based on 85% impervious area, the first flush calculations are:
 $97,990.61 \text{ sf} * 85\% * 0.26'' \text{ in.per.sf} / 12 \text{ in/ft} = 1,805 \text{ cf}$. The majority of landscaping is too close to the proposed structures to provide stormwater retention. The proposed storm drain system with bubble-up outlet will retain 373 cf within portion of storm drain below the bubble-up rim elevation (see SIP). The property owners are requesting for Payment In-Lieu for the remainder of the required Stormwater Quality Volume. Based on \$8.00/cf, the fee to be remitted is $(1805 - 373) * \$8 = \$11,456$. If you would provide a treasury deposit slip with the required payment, the property owner will remit payment and a copy of the paid receipt will be provided for your files.
3. The basin in the NW corner of the property is located to accept the majority of the on-site stormwater (via curb openings and storm pipe bubble-up outlet). This basin is intended to accept the stormwater and release it to Copper Ave. via the proposed covered sidewalk culverts. There will be no retention / detention other than minor water harvesting.
4. See the revised SIP for an exhibit showing the areas of pervious / impervious cover to support the provided calculations.
5. The survey reflects current conditions (post ART).
6. The existing 6" storm drain to the existing double-C inlet in Central appears to be connected to an existing inlet located on the property (see image below). This connection will be rebuilt as part of the Public W/O to collect minor flow within the property Central frontage that is not able to drain to Central as surface flow.



Existing conditions:

7. The Infrastructure List identifies the items requested. These will be sized as part of the DRC submittal process (remove/replace double C inlet, storm drain to property, covered sidewalk culverts, concrete channel rundown, private storm drain stub to property).
8. Cross-sections are provided with the information requested.
9. Cross-section requirements - See #8.
10. Noted
11. to 13. To be finalized as part of Work Order submittal. Sidewalk culvert and concrete channel calculations are provided in SIP.
14. Noted
15. Payment-in-Lieu (\$11,456 per calculations provided in SIP) payment will be remitted by owner. Please provide confirmation of the required fee.
16. All 'conceptual' markings removed.
17. Bubble-up outlet detail provided.
18. Hydraulic calculations provided.
19. An ESC plan will be submitted to the Stormwater Quality Engineer.

Please don't hesitate to contact me or Fred Arfman, project engineer, with any questions or comments.

Sincerely,
Isaacson & Arfman, PA

Bryan J. Bobrick

Bryan J. Bobrick
Project Manager
CC: Fred Arfman, PE



City of Albuquerque

Planning Department
Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 6/2018)

Apartment Urban Living

Project Title: @ Nob Hill Building Permit #: _____ Hydrology File #: K17D073
DRB#: PR2018-001692 **EPC#:** _____ **Work Order#:** _____
Legal Description: Lots 1 thru 19 & Vacated Alley, Block 2, Mesa Grande Addition
City Address: _____

Applicant: Isaacson & Arfman, PA **Contact:** Fred C. Arfman or
Bryan J. Bobrick

Address: 128 Monroe Street NE - Albuquerque, NM 87108

Phone#: (505) 268-8828 **Fax#:** _____ **E-mail:** freda@iacivil.com
bryanb@iacivil.com

Other Contact: Surv-Tek, Inc. **Contact:** Russ P. Hugg

Address: 9384 Valley View Drive - Albuquerque, NM 87114

Phone#: (505) 897-3366 **Fax#:** _____ **E-mail:** _____

TYPE OF DEVELOPMENT: _____ PLAT (# of lots) _____ RESIDENCE ☒ DRB SITE _____ ADMIN SITE

IS THIS A RESUBMITTAL? ☒ Yes _____ No

DEPARTMENT _____ TRANSPORTATION ☒ HYDROLOGY/DRAINAGE

Check all that Apply:

TYPE OF SUBMITTAL:

- ☐ ENGINEER/ARCHITECT CERTIFICATION
☐ PAD CERTIFICATION
☐ CONCEPTUAL G & D PLAN
☒ GRADING PLAN
☐ DRAINAGE REPORT
☐ DRAINAGE MASTER PLAN
☐ FLOODPLAIN DEVELOPMENT PERMIT APPLIC
☐ ELEVATION CERTIFICATE
☐ CLOMR/LOMR
☐ TRAFFIC CIRCULATION LAYOUT (TCL)
☐ TRAFFIC IMPACT STUDY (TIS)
☐ STREET LIGHT LAYOUT
☒ OTHER (SPECIFY) Supplemental Drainage Calcs
☐ PRE-DESIGN MEETING?

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

- ☐ BUILDING PERMIT APPROVAL
☐ CERTIFICATE OF OCCUPANCY
☐ PRELIMINARY PLAT APPROVAL
☐ SITE PLAN FOR SUB'D APPROVAL
☒ SITE PLAN FOR BLDG. PERMIT APPROVAL
☐ FINAL PLAT APPROVAL
☐ SIA/ RELEASE OF FINANCIAL GUARANTEE
☐ FOUNDATION PERMIT APPROVAL
☒ GRADING PERMIT APPROVAL
☐ SO-19 APPROVAL
☐ PAVING PERMIT APPROVAL
☐ GRADING/ PAD CERTIFICATION
☐ WORK ORDER APPROVAL
☐ CLOMR/LOMR
☐ FLOODPLAIN DEVELOPMENT PERMIT
☐ OTHER (SPECIFY) _____

DATE SUBMITTED: October 30, 2018 **By:** Fred C. Arfman

COA STAFF:

ELECTRONIC SUBMITTAL RECEIVED: _____

FEE PAID: _____

October 29, 2018

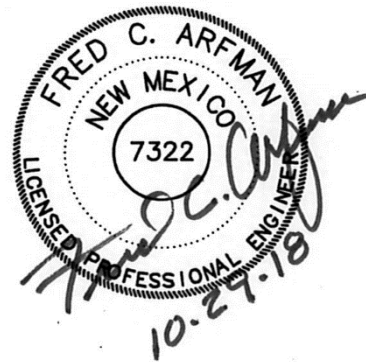
Supplemental Drainage Calculations

for

Apartment Urban Living @ Nob Hill

I&A Project 2240

Drainage Analysis



by



ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates

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

Project Information

PROPERTY: THE SITE IS A PREVIOUSLY FULLY DEVELOPED INFILL PROPERTY LOCATED WITHIN C.O.A. VICINITY MAP K-17. THE SITE IS BOUND TO THE EAST BY SIERRA DR NE, TO THE NORTH BY COPPER AVE NE, TO THE WEST BY MONTCLAIRE DR NE, AND THE SOUTH BY CENTRAL AVE NE.

PROPOSED IMPROVEMENTS: THE PROPOSED IMPROVEMENTS INCLUDE A MULTI-PHASED APARTMENT BUILDING WITH ASSOCIATED AMENITIES, ASPHALT PAVED ACCESS, PARKING AND LANDSCAPING.

LEGAL: LOTS 1 THRU 19 AND VACATED ALLEY BLOCK 2 MESA GRANDE ADDITION, ALBUQUERQUE, NM

BENCHMARK: VERTICAL DATUM IS BASED UPON ALBUQUERQUE CONTROL SURVEY MONUMENT "5-K17A", ELEVATION=5222.211 FEET (NAVD 88)

OFF-SITE FLOW: NO OFF-SITE DRAINAGE AFFECTS THIS PROPERTY.

FLOOD HAZARD: PER BERNALILLO COUNTY FIRM MAP #35001C0353H, THE SITE IS LOCATED WITHIN FLOODZONE 'X' DESIGNATED AS AREAS DETERMINED TO BE OUTSIDE 500-YEAR FLOODPLAIN.

DRAINAGE PLAN CONCEPT: THE MAJORITY OF THE SITE (BUILDING AND PAVEMENT) WILL FREE DISCHARGE AT THE NORTHWEST CORNER OF THE PROPERTY. THE REMAINDER CONSISTS OF PERIMETER LANDSCAPING AND PAVED ACCESS DRIVES DISCHARGING TO THE ADJACENT STREETS. STORMWATER QUALITY FIRST FLUSH PONDS WILL BE CONSTRUCTED WITHIN THE PARKING ISLANDS TO REDUCE THE 'IN-LIEU' FEE ANY ADDITIONAL RUNOFF WILL BE DIRECTED TO FIRST FLUSH PONDING.

ENGINEER: FRED C. ARFMAN: NMPE 7322
ISAACSON & ARFMAN, PA
128 MONROE NE 87108
505-268-8828

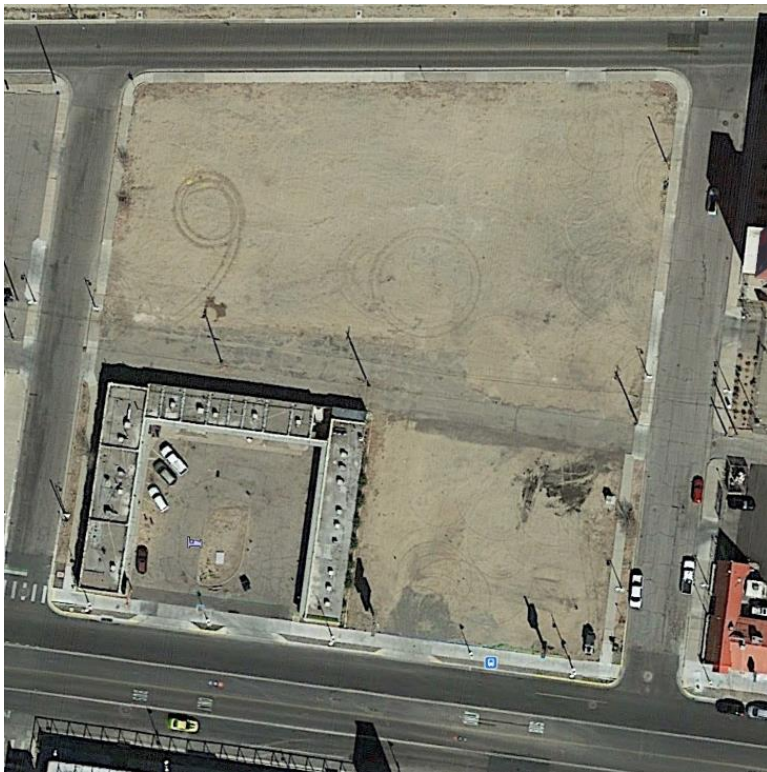
SURVEYOR: RUSS P. HUGG: NMPS NO. 9750
SURV-TEK, INC
9384 VALLEY VIEW DRIVE, NW 87114
505-897-3366

PREVIOUSLY FULLY DEVELOPED PROPERTY - HISTORIC IMAGERY:



Google Earth – 2002

The majority of previously constructed buildings and pavement have been demo'd over the past 15 years.



Google Earth – 2018

Based on a maximum proposed land treatment ration of 0%A : 7.5%B : 7.5%C : 85%D, Tract B will generate 9.9 cfs which represents a small reduction compared to the fully developed (2002) property.

CALCULATIONS: 2240 - Apt Urban Living @ Nob Hill : October 27, 2018

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

ON-SITE									
AREA OF SITE:		97990.61		SF	=	2.2			
100-year, 6-hour									
PREVIOUS DEVELOPED FLOWS:			DEVELOPED FLOWS:				EXCESS PRECIP:		
		Treatment SF	%			Treatment SF	%	Precip. Zone	2
Area A	=	0	0%	Area A	=	0	0%	E _A	= 0.53
Area B	=	4899.5	5%	Area B	=	7349	7.5%	E _B	= 0.78
Area C	=	9799.1	10%	Area C	=	7349	7.5%	E _C	= 1.13
Area D	=	83292.0	85%	Area D	=	83292	85%	E _D	= 2.12
Total Area	=	97990.61	100%	Total Area	=	97990.61	100%		

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	=	1.95 in.	Developed E	=	1.95 in.
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On-Site Volume of Runoff: $V_{360} = E \cdot A / 12$

Historic V_{360}	=	15956 CF	Developed V_{360}	=	15885 CF
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On-Site Peak Discharge Rate: $Q_p = Q_{pA} A_A + Q_{pB} A_B + Q_{pC} A_C + Q_{pD} A_D / 43,560$

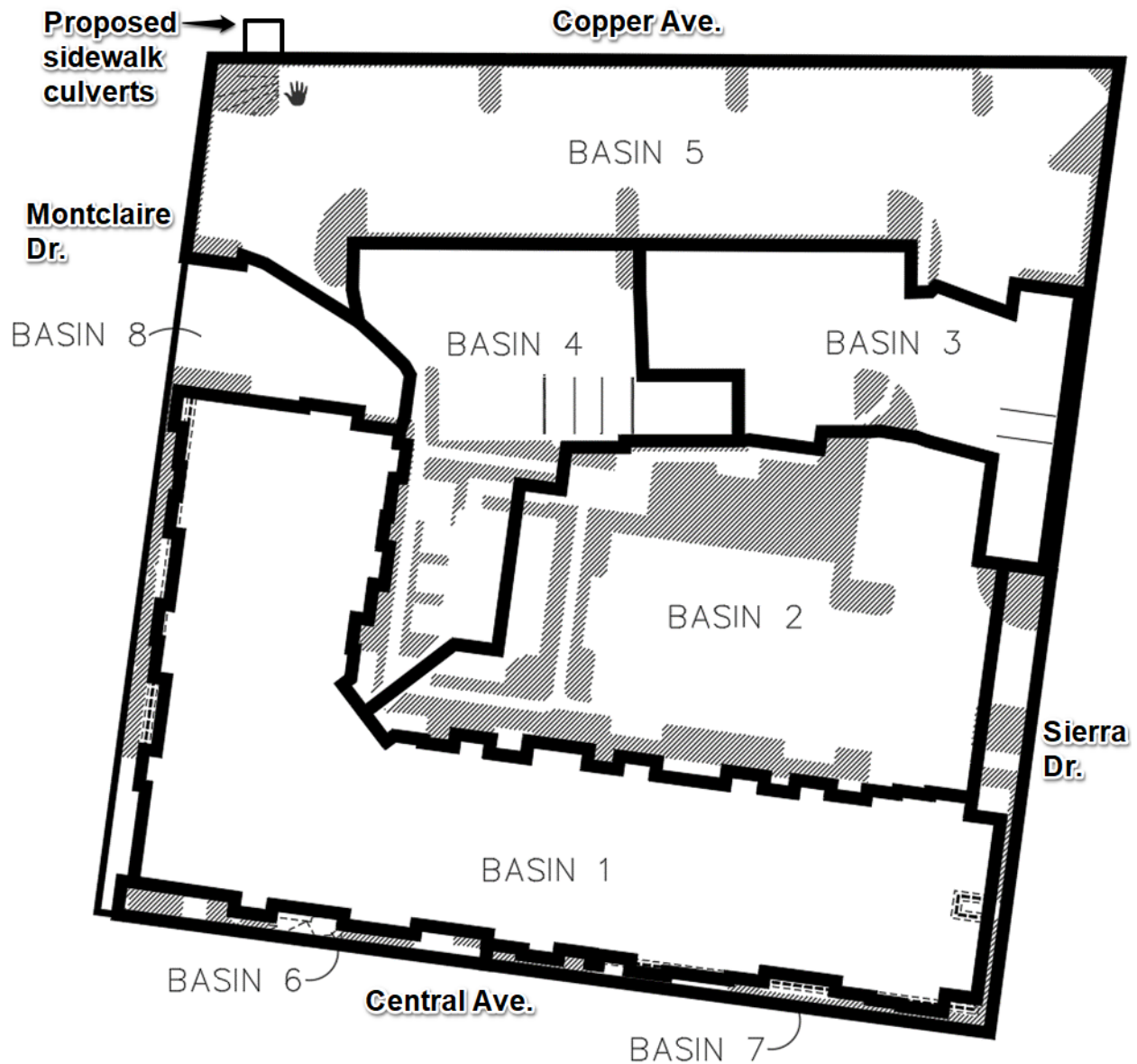
For Precipitation Zone 2

$$\begin{aligned} Q_{pA} &= 1.56 & Q_{pC} &= 3.14 \\ Q_{pB} &= 2.28 & Q_{pD} &= 4.70 \end{aligned}$$

Historic Q_p	=	9.9 CFS	Developed Q_p	=	9.9 CFS
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The property will free discharge to surrounding streets with the majority discharging to Copper Avenue at the NW corner.

Proposed Drainage Basins with pervious areas shaded



The majority of developed discharge (Basins 1, 2, 3, 4 and 5) will free discharge at the NW corner via covered sidewalk culverts.

The remaining basins (Basin 6) will free discharge directly to the existing public storm drain system in Central Ave. .

The remaining basins (Basins 7 and 8) will free discharge to their respective adjacent streets.

Total pervious area = 15579 sf, Total site = 97,991. Therefore, the site is 84.1% impervious.

BASIN NO.	1	DESCRIPTION	TOTAL ROOF AREA
Area of basin flows =	27223	SF	= 0.6 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 = 2.12 in.		B = 0%	
Sub-basin Volume of Runoff (see formula above)		C = 0%	
V ₃₆₀ = 4809 CF		D = 100%	
Sub-basin Peak Discharge Rate: (see formula above)			
Q _p = 2.9 cfs			

BASIN NO.	2	DESCRIPTION	BASIN TO PARKING LOT INLET 1
Area of basin flows =	19952	SF	= 0.5 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 = 1.75 in.		B = 16%	
Sub-basin Volume of Runoff (see formula above)		C = 16%	
V ₃₆₀ = 2905 CF		D = 68%	
Sub-basin Peak Discharge Rate: (see formula above)			
Q _p = 1.9 cfs			

BASIN NO.	3	DESCRIPTION	BASIN TO PARKING LOT INLET 2
Area of basin flows =	9249	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 = 2.07 in.		B = 2%	
Sub-basin Volume of Runoff (see formula above)		C = 2%	
V ₃₆₀ = 1598 CF		D = 96%	
Sub-basin Peak Discharge Rate: (see formula above)			
Q _p = 1.0 cfs			

BASIN NO.	4	DESCRIPTION	BASIN TO PARKING LOT INLET 3
Area of basin flows =	10684	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 = 1.94 in.		B = 8.0%	
Sub-basin Volume of Runoff (see formula above)		C = 7.0%	
V ₃₆₀ = 1730 CF		D = 85%	
Sub-basin Peak Discharge Rate: (see formula above)			
Q _p = 1.1 cfs			

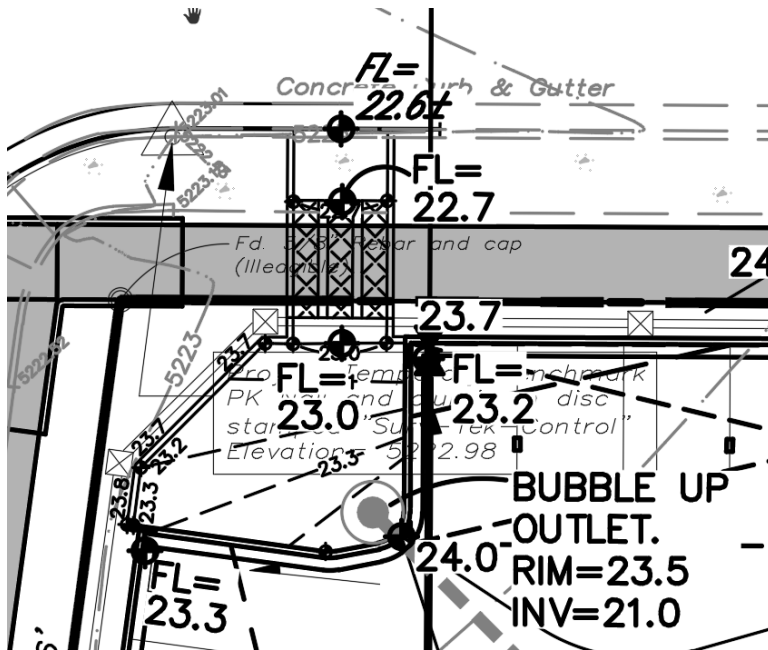
BASIN NO.	5	DESCRIPTION	BASIN SURFACE DRAINING TO NW CORNER
Area of basin flows =	21756	SF	= 0.5 Ac.
The following calculations are based on Treatment areas as shown in table to the right		LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)		A = 0%	
Weighted E = 1.89 in.		B = 10%	
Sub-basin Volume of Runoff (see formula above)		C = 10%	
V ₃₆₀ = 3421 CF		D = 80%	
Sub-basin Peak Discharge Rate: (see formula above)			
Q _p = 2.1 cfs			

BASIN NO.	6	DESCRIPTION	BASIN TO CENTRAL STORM DRAIN STUB
Area of basin flows =	1234	SF	= 0.0 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 = 1.51 in.		B = 26%	
Sub-basin Volume of Runoff (see formula above)		C = 26%	
V ₃₆₀ = 156 CF		D = 48%	
Sub-basin Peak Discharge Rate: (see formula above)			
Q _p = 0.1 cfs			

BASIN NO.	7	DESCRIPTION	PERIMETER TO SW TO STREET
Area of basin flows =	3094	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 = 1.99 in.		B = 6%	
Sub-basin Volume of Runoff (see formula above)		C = 5%	
V ₃₆₀ = 513 CF		D = 89%	
Sub-basin Peak Discharge Rate: (see formula above)			
Q _p = 0.3 cfs			

BASIN NO.	8	DESCRIPTION	DISCHARGE TO WEST STREET
Area of basin flows =	4799	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 = 1.85 in.		B = 12%	
Sub-basin Volume of Runoff (see formula above)		C = 11%	
V ₃₆₀ = 740 CF		D = 77%	
Sub-basin Peak Discharge Rate: (see formula above)			
Q _p = 0.5 cfs			

Basins 1 through 5 will drain to Copper Ave. via the proposed covered sidewalk culverts and concrete channel. Total Q100-6HR = 9.0 cfs. Per the orifice equation, the capacity of each 2' wide x 8" high covered sidewalk culvert = 3.7 cfs. Therefore, three covered sidewalk culverts will carry 11.1 cfs > 9.0 cfs (OK).



ORIFICE EQUATION - SIDEWALK CULVERT					
The Orifice Equation is used to calculate the Flow at the opening of a Channel					
$Q = C * A * (2 * g * h)^{0.5}$					
Where	Q	=	3.7	cfs	
	C	=	0.6		(indicating that the opening will function at 60% capacity)
	A	=	1.334	sq.ft.	
	g	=	32.2	ft/sec^2	
	h	=	0.333	ft	depth of flow at opening from the center of culvert
At a maximum depth of 8", three 2' wide (bottom width) sidewalk culverts have the ability to discharge 11.1 cfs.					

The associated concrete channel (width = 7.5') has capacity for 9.0 cfs at a depth of 0.24'.

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc.

Saturday, Oct 27 2018

2240 - Nob Hill Apartments

Rectangular

Bottom Width (ft) = 7.50
Total Depth (ft) = 0.67

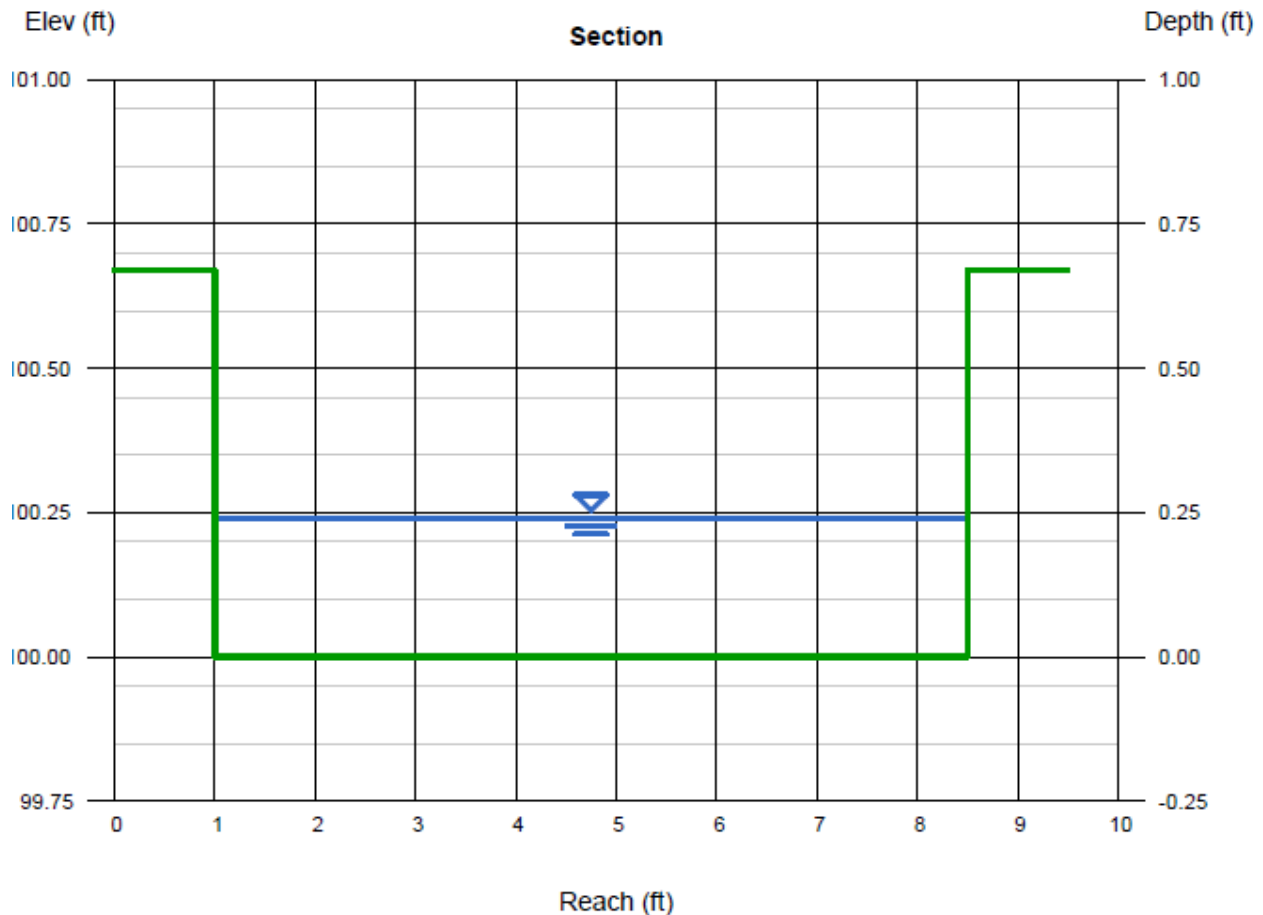
Invert Elev (ft) = 100.00
Slope (%) = 2.00
N-Value = 0.015

Calculations

Compute by: Known Q
Known Q (cfs) = 9.00

Highlighted

Depth (ft) = 0.24
Q (cfs) = 9.000
Area (sqft) = 1.80
Velocity (ft/s) = 5.00
Wetted Perim (ft) = 7.98
Crit Depth, Yc (ft) = 0.36
Top Width (ft) = 7.50
EGL (ft) = 0.63



STORMWATER QUALITY FIRST FLUSH

Stormwater quality control measures are required to provide management of 'first flush'. COA Hydrology currently has three categories relating to stormwater quality volume requirements:

- New Construction: Stormwater quality volume based on 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).
- Existing Construction: Existing impervious area to remain is exempt.

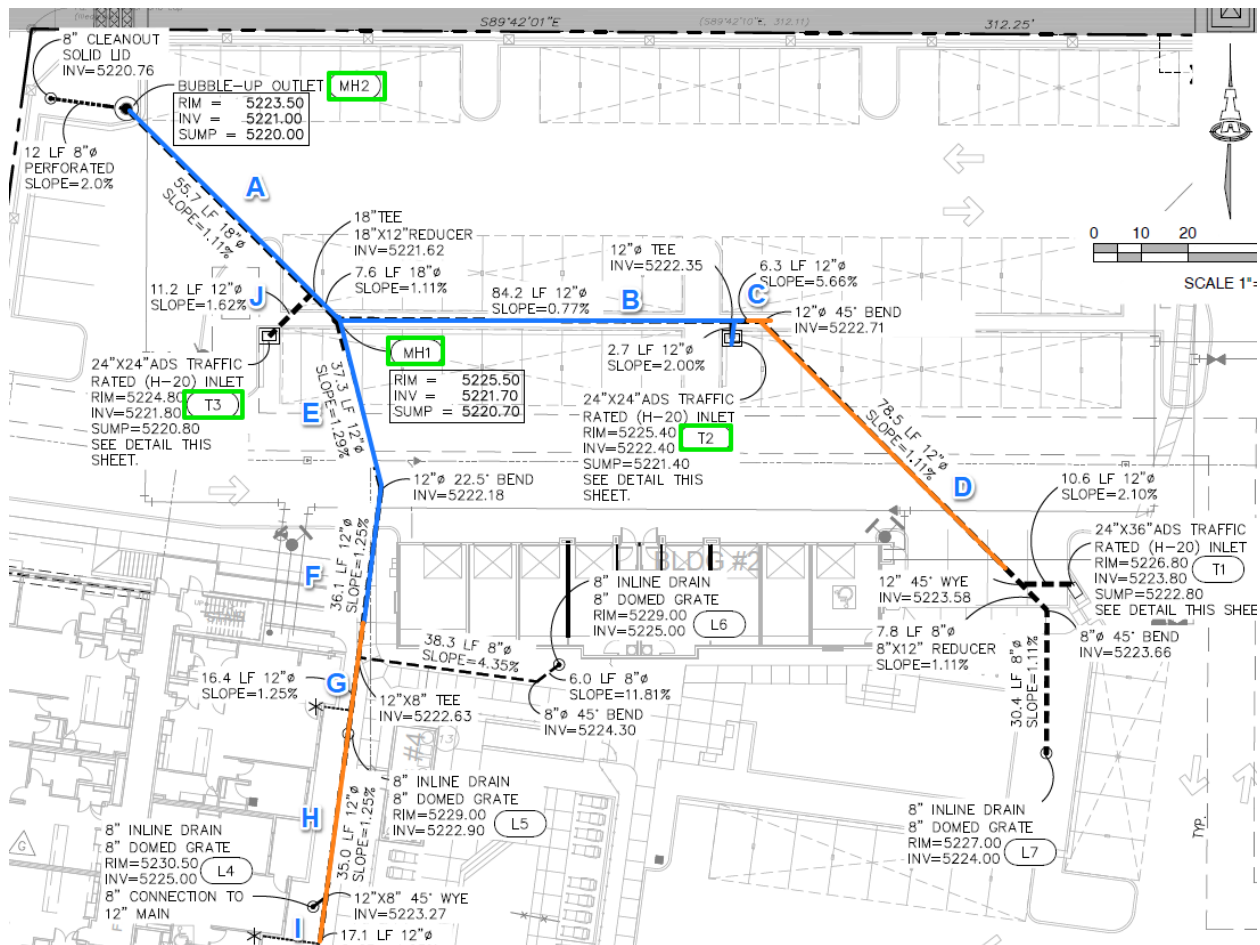
- | |
|---|
| <ul style="list-style-type: none">• Redevelopment: Existing impervious area that is being redeveloped (removed/replaced) is subject to a reduced rate of 0.26"/sf. |
|---|

The estimated impervious area for this property is calculated as 85% of total area. $(0.85 * 97,991) = 83,292$ sf.

Because this property was previously fully developed, the required first flush retention volume = $0.26" * \text{type 'd' area}$: $0.26/12 * (83,292 \text{ sf}) = 1,805$ cf.

The proposed storm drain system with bubble-up outlet will retain a volume of 304 cf within the portion of the system below the bubble-up rim elevation (see following sheet for calculations). Due to a lack of available landscape area, the owner requests to provide payment-in-lieu for the remaining 1,501 cf.

Prior to building permit approval, a "Payment In-Lieu for Stormwater Quality Volume Requirement" treasury deposit slip will be provided by C.O.A. Hydrology. The fee-in-lieu of \$8.00 / cf for the Stormwater Quality Volume ($\$8 * 1501 = \$12,008.00$) will be paid by the property owner as part of the Grading and Drainage Plan building permit review process. A copy of the paid receipt will be provided prior to building permit approval.



ID	LF	Pipe Dia.	%	Vol
A	55.7	18	100%	98.4
B	84.2	12	100%	66.1
C	6.3	12	80%	4.0
D	70	12	40%	22.0
E	37.3	12	100%	29.3
F	36.1	12	90%	25.5
G	16.4	12	60%	7.7
H	35	12	40%	11.0
I	17.1	12	20%	2.7
J	11.2	12	100%	8.8

ID	Dia	Height	Vol
MH2	24	3.5	11.0
MH1	24	2.8	8.8
T3	18	2.7	4.8
T2	18	2.1	3.7
TOTAL			303.8 CF

First flush volume retained within storm drain pipe system

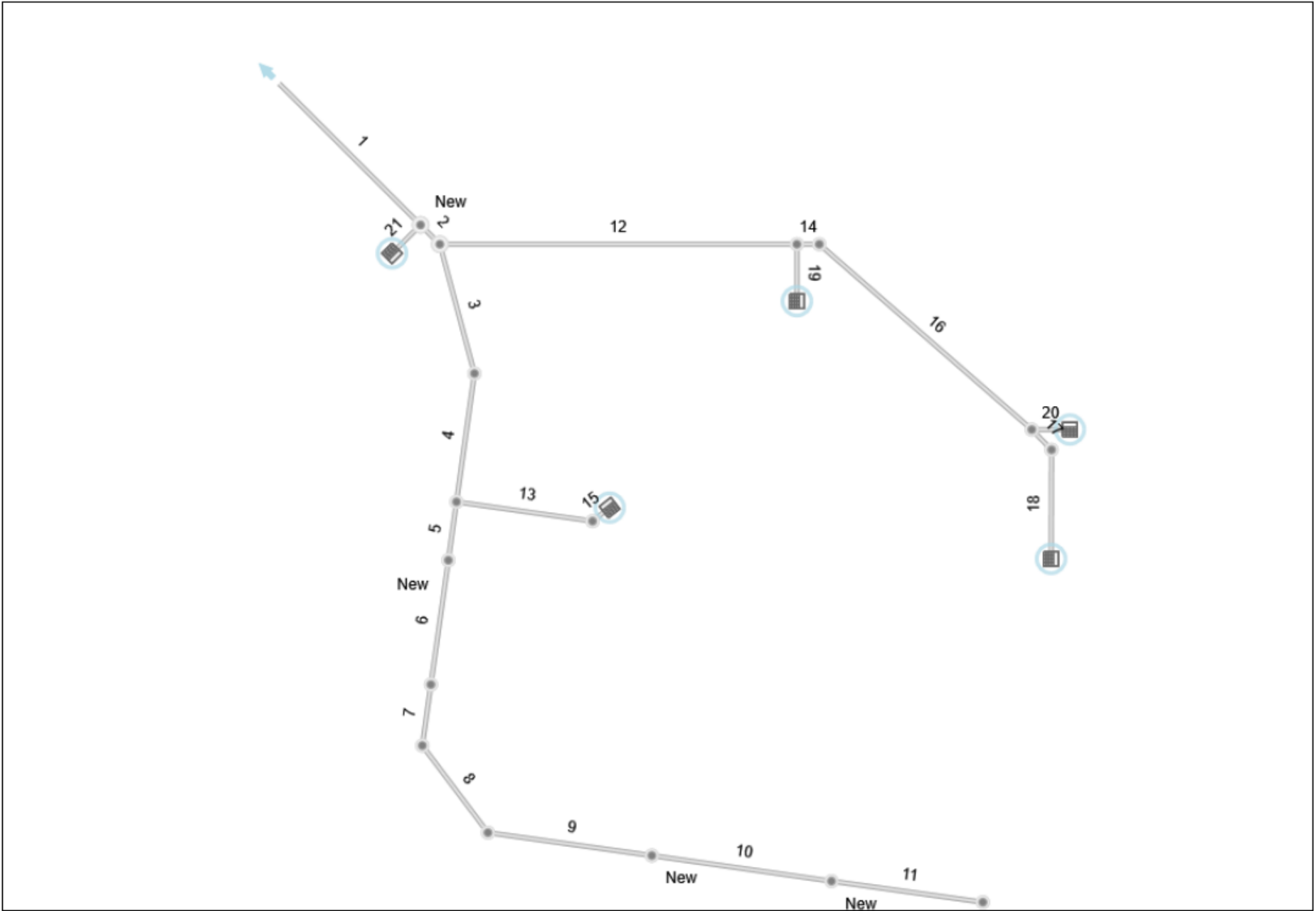
Chart at left provides calculations for each run x percentage of volume available below the bubble-up rim elevation

Plan View

Stormwater Studio 2018 v 2.0.0.61

Project Name: Enter Project Name...

10-30-2018



Energy Grade Line Calculations*

Project Name: Enter Project Name...

Stormwater Studio 2018 v 2.0.0.61

10-30-2018

Line No	Line Size (in)	Q (cfs)	Downstream							Length (ft)	Upstream							Pipe		Junction		
			Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)		Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)	n Value	Enrgy Loss (ft)	HGLa Elev (ft)	EGLa Elev (ft)	Enrgy Loss (ft)
1	18	0.00	5221.00	0.00	0.00	0.00	0.00	0.00	0.00	55.70	5221.62	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
2	18	0.00	5221.62	0.00	0.00	0.00	0.00	0.00	0.00	7.60	5221.70	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
3	12	0.00	5221.70	0.00	0.00	0.00	0.00	0.00	0.00	37.30	5222.18	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
4	12	0.00	5222.18	0.00	0.00	0.00	0.00	0.00	0.00	36.10	5222.63	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
5	12	0.00	5222.63	0.00	0.00	0.00	0.00	0.00	0.00	16.40	5222.90	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
6	12	0.00	5222.90	0.00	0.00	0.00	0.00	0.00	0.00	35.00	5223.34	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
7	12	0.00	5223.27	0.00	0.00	0.00	0.00	0.00	0.00	17.10	5223.49	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
8	12	0.00	5223.49	0.00	0.00	0.00	0.00	0.00	0.00	30.40	5223.87	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
9	12	0.00	5223.87	0.00	0.00	0.00	0.00	0.00	0.00	46.00	5224.44	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
10	12	0.00	5224.44	0.00	0.00	0.00	0.00	0.00	0.00	50.50	5225.07	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
11	12	0.00	5225.07	0.00	0.00	0.00	0.00	0.00	0.00	42.60	5225.60	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
12	12	0.00	5221.70	0.00	0.00	0.00	0.00	0.00	0.00	99.35	5222.35	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
13	8	0.00	5222.63	0.00	0.00	0.00	0.00	0.00	0.00	38.30	5224.30	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
14	12	0.00	5222.35	0.00	0.00	0.00	0.00	0.00	0.00	6.30	5222.71	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
15	8	0.00	5224.30	0.00	0.00	0.00	0.00	0.00	0.00	6.00	5225.00	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
16	12	0.00	5222.71	0.00	0.00	0.00	0.00	0.00	0.00	78.50	5223.58	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
17	8	0.00	5223.58	0.00	0.00	0.00	0.00	0.00	0.00	7.80	5223.66	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
18	8	0.00	5223.66	0.00	0.00	0.00	0.00	0.00	0.00	30.40	5224.00	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
19	8	0.00	5222.35	0.00	0.00	0.00	0.00	0.00	0.00	15.92	5222.40	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
20	12	0.00	5223.58	0.00	0.00	0.00	0.00	0.00	0.00	10.60	5223.80	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00
21	12	0.00	5221.62	0.00	0.00	0.00	0.00	0.00	0.00	11.20	5221.80	0.00	0.00	0.00	0.00	0.00	0.00	0.012	0.000	0.00	0.00	0.00

Results are NOT current with inputs.

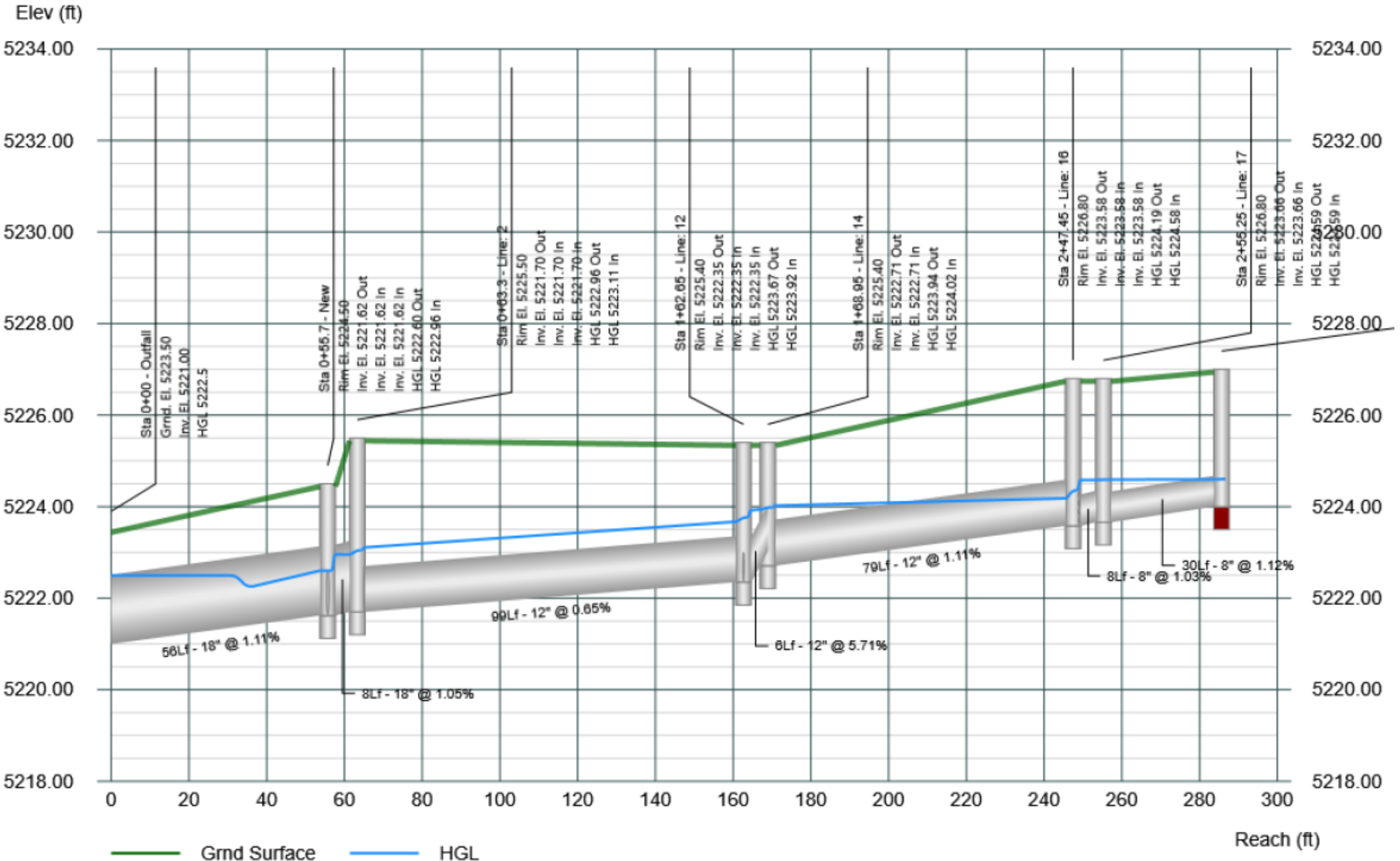
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Profile View

Stormwater Studio 2018 v 2.0.0.61

Project Name: Enter Project Name...

10-30-2018

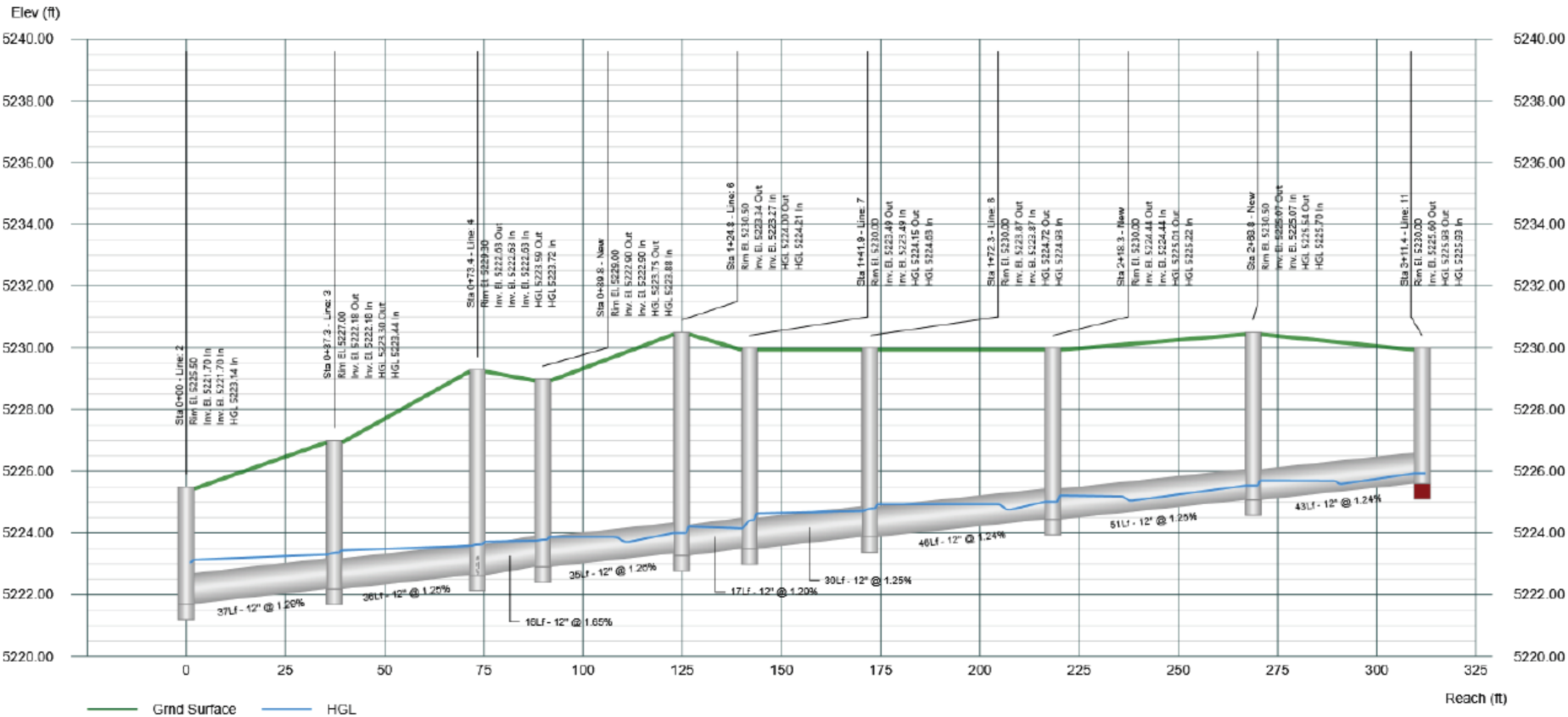


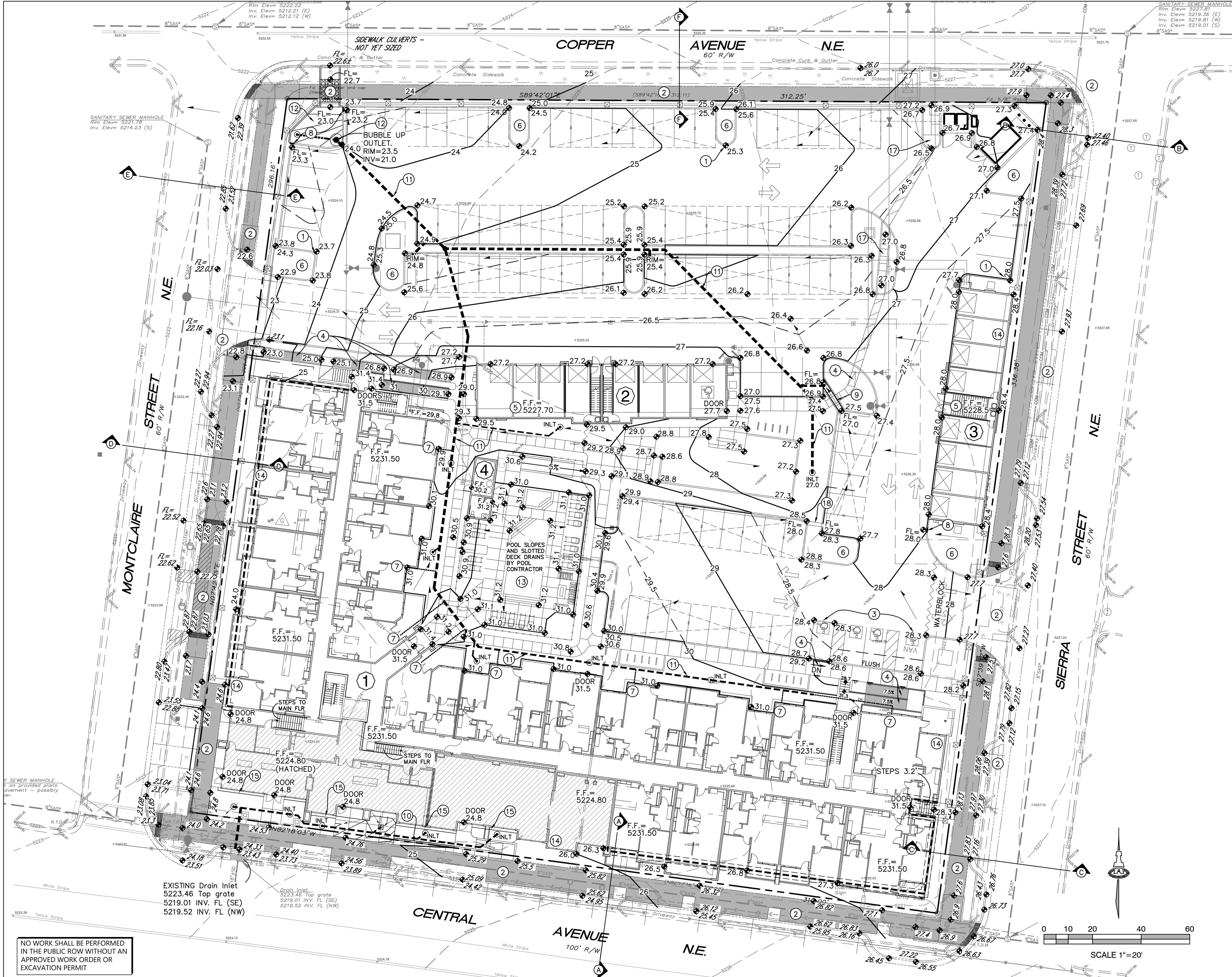
Profile View

Stormwater Studio 2018 v 2.0.0.61

Project Name: Enter Project Name...

10-30-2018





PROJECT INFORMATION

PROPERTY: THE SITE IS FULLY DEVELOPED (RECENTLY DEMOLISHED) PROPERTY LOCATED WITHIN C.O.A. VICINITY MAP K-17. THE SITE IS BOUND TO THE EAST BY SIERRA DR NE, TO THE NORTH BY COPPER AVE NE, TO THE WEST BY MONTCLAIRE DR NE, AND THE SOUTH BY CENTRAL AVE NE.

PROPOSED IMPROVEMENTS: THE PROPOSED IMPROVEMENTS INCLUDE A MULTI-PHASED APARTMENT BUILDING WITH ASSOCIATED ASPHALT PAVED ACCESS, PARKING AND LANDSCAPING.

LEGAL: LOTS 1 THRU 19 AND VACATED ALLEY BLOCK 2 MESA GRANDE ADDITION, ALBUQUERQUE, NM

BENCHMARK: VERTICAL DATUM IS BASED UPON ALBUQUERQUE CONTROL SURVEY MONUMENT "5-K17A", ELEVATION=5222.211 FEET (NAVD 88)

OFF-SITE FLOW: NO OFF-SITE DRAINAGE AFFECTS THIS PROPERTY.

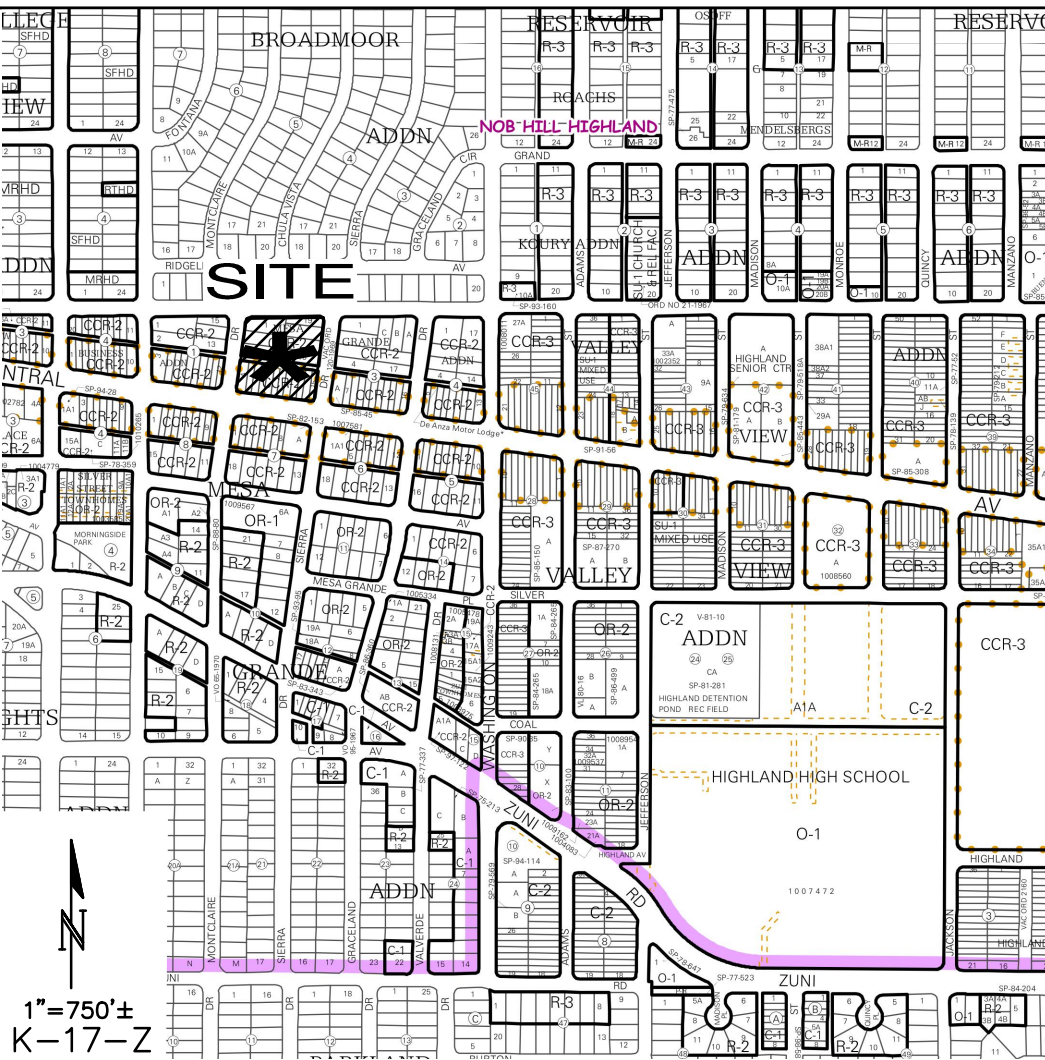
FLOOD HAZARD: PER BERNALILLO COUNTY FIRM MAP #35001C0353H, THE SITE IS LOCATED WITHIN FLOODZONE 'X' DESIGNATED AS AREAS DETERMINED TO BE OUTSIDE 500-YEAR FLOODPLAIN.

DRAINAGE PLAN CONCEPT: THE MAJORITY OF THE SITE WILL FREE DISCHARGE TO COPPER AVENUE AT THE NORTHWEST CORNER OF THE PROPERTY. THE REMAINING BASINS WILL DISCHARGE TO THE ADJACENT STREETS. STORMWATER QUALITY BASINS MAY BE PROVIDED WITHIN THE LANDSCAPED PARKING ISLANDS TO REDUCE THE 'IN-LIEU' FEE.

ENGINEER: FRED C. ARFMAN: NMPE 7322
ISAACSON & ARFMAN, PA
128 MONROE NE 87108;
268-8828

SURVEYOR: RUSS P. HUGG: NMPS NO. 9750
SURV-TEK, INC
9384 VALLEY VIEW DR., NW 87114;
897-3366

VICINITY MAP



KEYED NOTES

- SPOT ELEVATION LABELS WITHIN GUTTER AREA REPRESENT FLOWLINE UNLESS NOTED. ADD 0.5' TYPICAL FOR TOP OF CURB / TOP OF ADJACENT WALK ELEVATIONS.
- SEE PUBLIC WORK ORDER DRAWINGS FOR CONSTRUCTION WITHIN R.O.W. INCLUDING NEW ACCESS DRIVES, PARKING, HANDICAP RAMPS, PUBLIC SIDEWALKS, COVERED SIDEWALK CULVERTS, ETC. GRADES SHOWN FOR INFORMATION ONLY. NO WORK SHALL BE PERFORMED IN THE PUBLIC ROW WITHOUT AN APPROVED WORK ORDER OR EXCAVATION PERMIT.
- SLOPES WITHIN HANDICAP PARKING AREAS TO MEET ADA REQUIREMENTS. MAX. SLOPE = 2% IN ANY DIRECTION.
- CONSTRUCT 1:12 MAX. HANDICAP ACCESS RAMP PER ADA.
- GARAGE F.F. ELEVATION REFERENCES TOP OF CONCRETE STEP AT BACK OF EACH GARAGE UNIT. GRADE AT OVERHEAD DOOR TO BE 6" BELOW F.F. TO ACCOMMODATE 4" STEP AND 1/4" FT PAD SLOPE.
- DEPRESS LANDSCAPING WITHIN PARKING ISLANDS TO CONTAIN STORMWATER.
- BUILDING ROOF DISCHARGE TO BE PIPED DIRECTLY TO STORM DRAIN.
- PROVIDE 24" WIDE OPENING IN CURB TO PASS FLOW. SEE CG-102 FOR DETAIL.
- CONSTRUCT 2' WIDE COVERED CONCRETE SIDEWALK CULVERT. SEE CG-102 FOR DETAIL.
- CONSTRUCT HEADER CURB. SEE CG-102 FOR DETAIL.
- CONSTRUCT PRIVATE STORM DRAIN SYSTEM. SEE SHEET CG-501 FOR SIZES / SLOPES / INLET INFORMATION / MATERIALS.
- CONSTRUCT BUBBLE UP OUTLET. SEE CG-501 FOR DETAIL.
- POOL AREA GRADES SHOWN FOR GENERAL INFORMATION ONLY. POOL CONTRACTOR TO PROVIDE FINAL DESIGN GRADES / DECK DRAINS ETC.
- FINISH GRADES ADJACENT TO BUILDING WILL REQUIRE BUILDING STEMWALL TO RETAIN / EXTEND TO ACHIEVE GRADES SHOWN ON ALL SIDES. SEE ARCHITECTURAL / STRUCTURAL PLANS.
- CONSTRUCT 12" WIDE CONCRETE APRON ALONG BUILDING THIS AREA. TOP OF CONC. AT BUILDING = 0.1' BELOW F.F., SLOPE @ 2%.
- INSTALL FRACTURED FACE ROCK EROSION PROTECTION TO LIMITS HATCHED. SEE CG-102 FOR DETAIL.
- CONSTRUCT PCC SIDEWALK; SEE DETAIL SHEET A1.21.
- CONSTRUCT U-CHANNEL. SEE CP-501 FOR DETAIL.

CONSTRUCT ALL BUILDINGS, PAVING, CURBS, WALKS TO ELEVATIONS SHOWN. SEE PAVING PLAN, PAVING DETAILS AND ARCHITECTURAL SITE DETAILS FOR ADDITIONAL INFORMATION. NOTE THAT PAVEMENT SLOPES AND CROSS-SLOPES VARY THROUGHOUT TO ACHIEVE GRADES NECESSARY TO ACHIEVE PEDESTRIAN ACCESS, BASIN DELINEATION, WATERBLOCKS, PIPE COVERAGE, ETC.

LEGEND

- EXISTING SPOT ELEVATION
- EXISTING CONTOUR
- PROPOSED CONTOUR (1' INCREMENT)
- PROPOSED CONTOUR (0.5' INCREMENT)
- PROPOSED SPOT ELEVATION
- FLOW ARROW
- BUILDING NUMBER
- CROSS SECTION (SEE CG-500)

Contractor must verify all dimensions at project before proceeding with this work.
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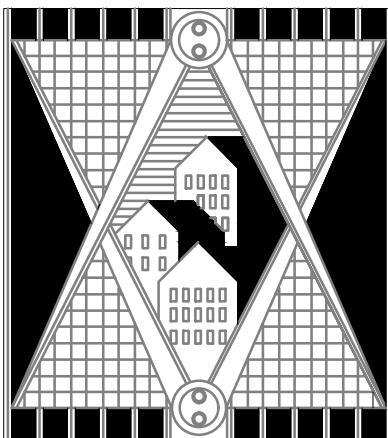
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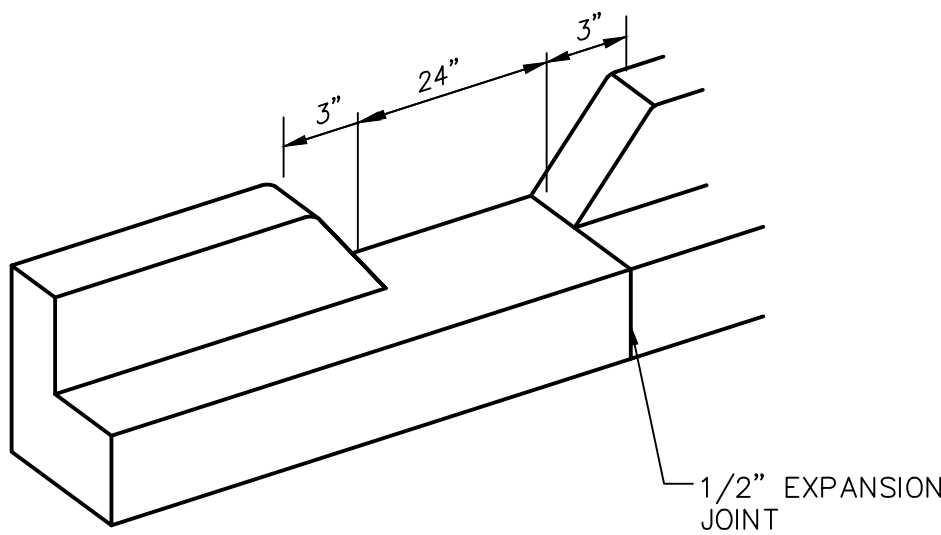
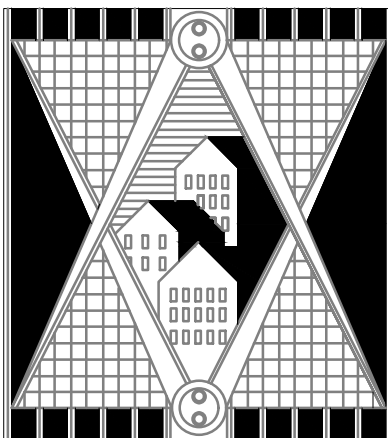
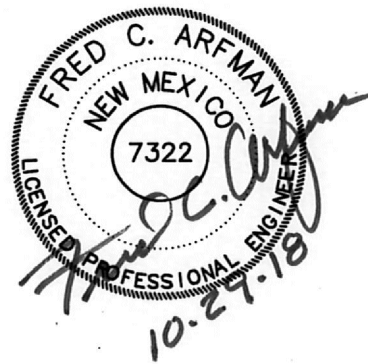


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GRADING AND DRAINAGE PLAN

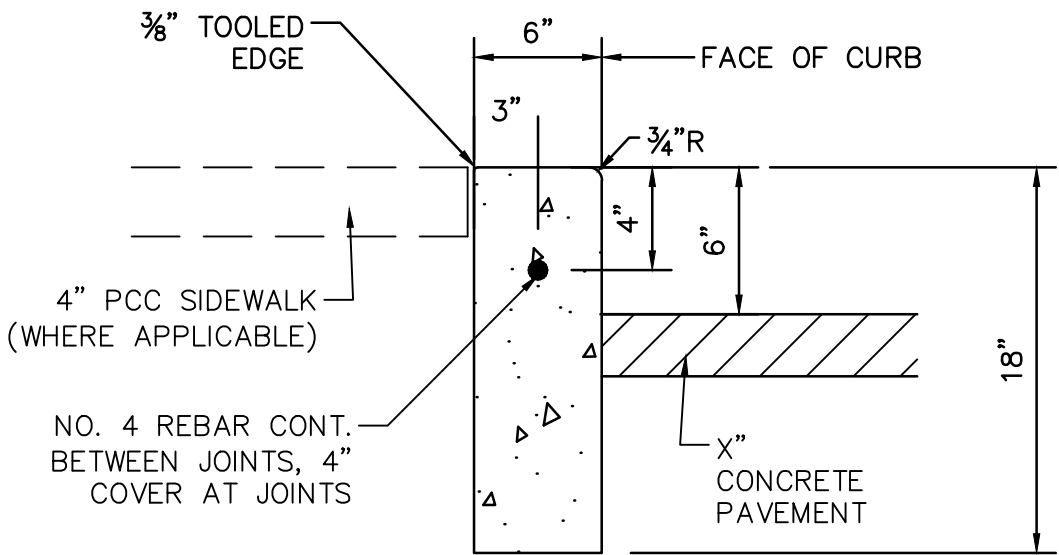


GENERAL NOTES

- EDGES NOT SPECIFICALLY DIMENSIONED SHALL BE SHAPED WITH A 3/8" EDGING TOOL.

CURB OPENING

SCALE: N.T.S.

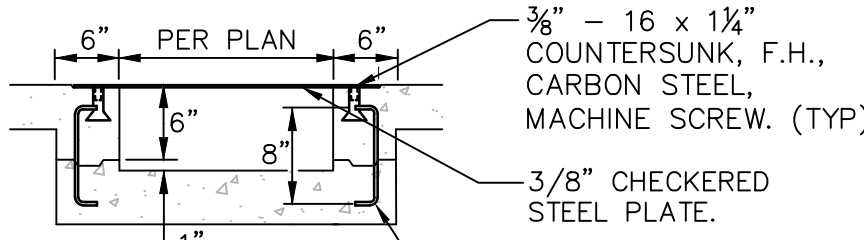


HEADER CURB

SCALE: N.T.S.

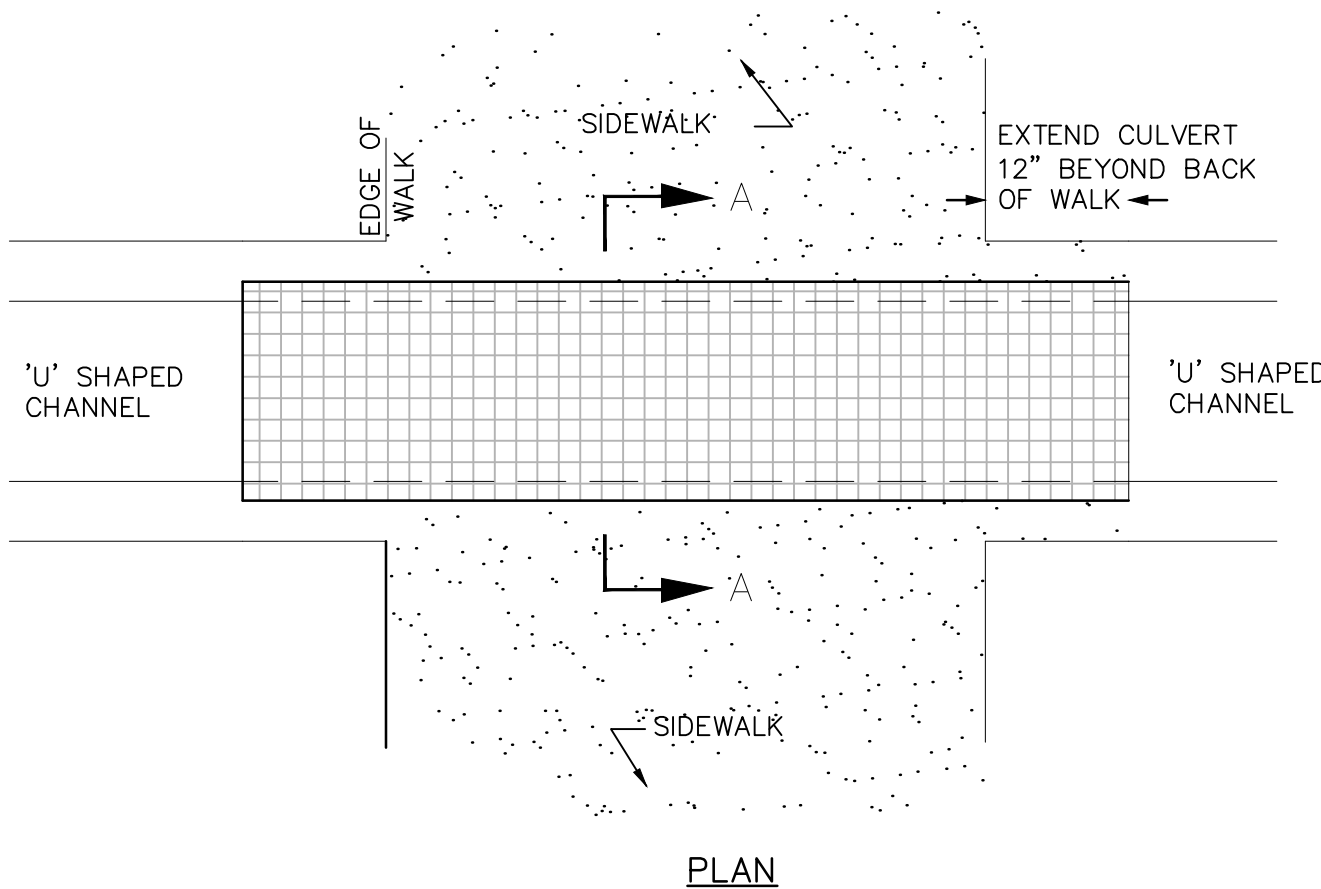
WELD 1/8" THICK, 3/8" MIN. DIAMETER OVER ALL SCREWS. COMPLETELY COVER SCREW HEADS. GRIND EDGES SMOOTH.

FOR SECURING PLATE USE 1"x5" S.S. ROD ANCHOR, "RED HEAD MULTI-SET II SRM-38 ANCHOR" OR APPROVED EQUAL. INSTALL PER MANUFACTURER'S INSTRUCTIONS AT MAX. 24" O.C., A MINIMUM OF 2 PER SIDE AND ONE WITHIN 6" OF EACH END.



USE NO. 3 DEFORMED BAR DOWELS. SPACE DOWELS AT 18" O.C. MAXIMUM. 1-1/2" MINIMUM FROM FACE OF CONCRETE

SECTION A-A



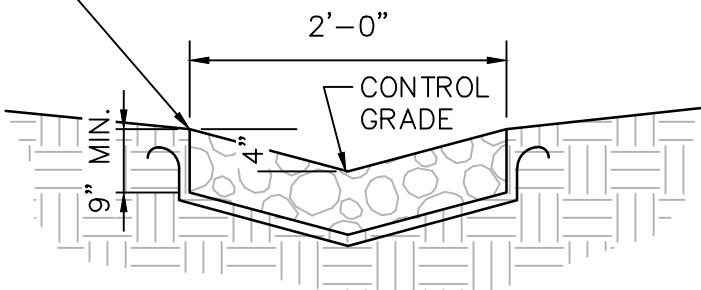
PLAN

SIDEWALK CULVERT

CONSTRUCT PER COA STD. DWG 2236 WITH MODIFICATIONS PER THIS DETAIL

SCALE: N.T.S.

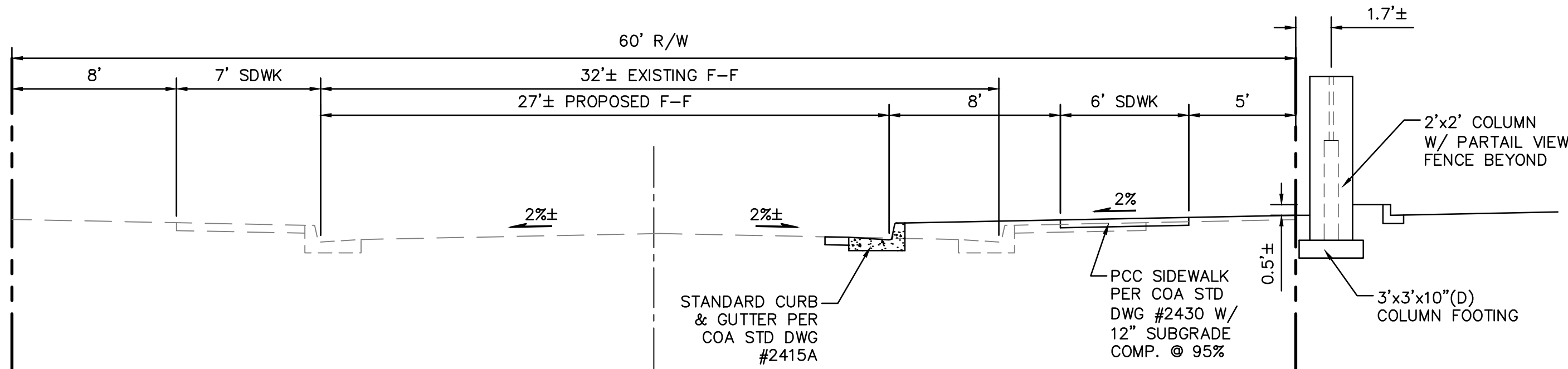
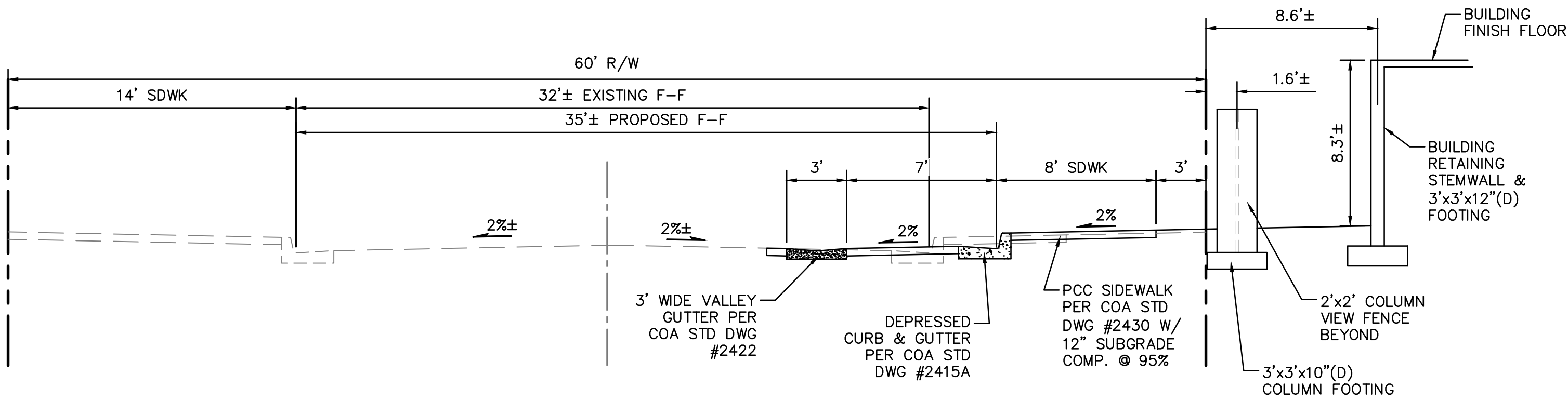
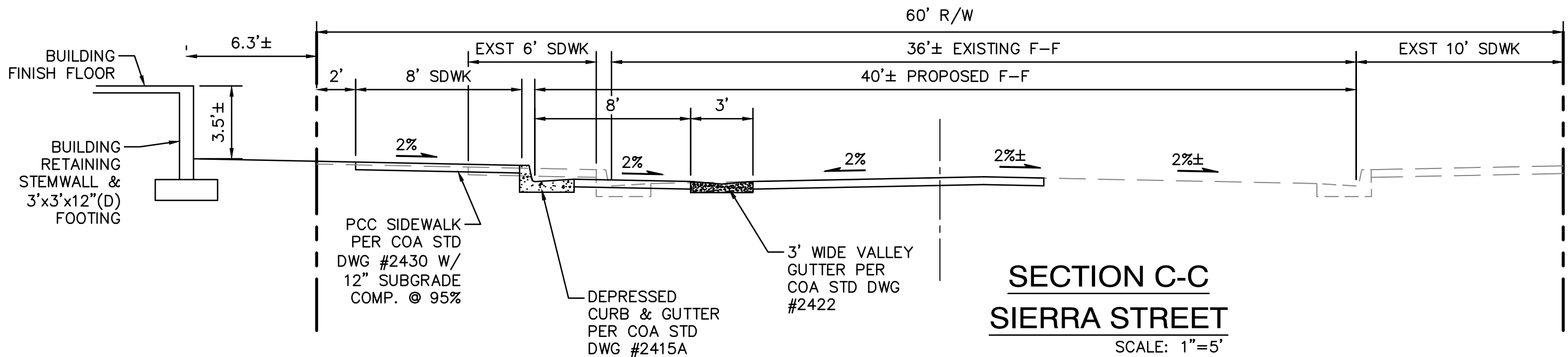
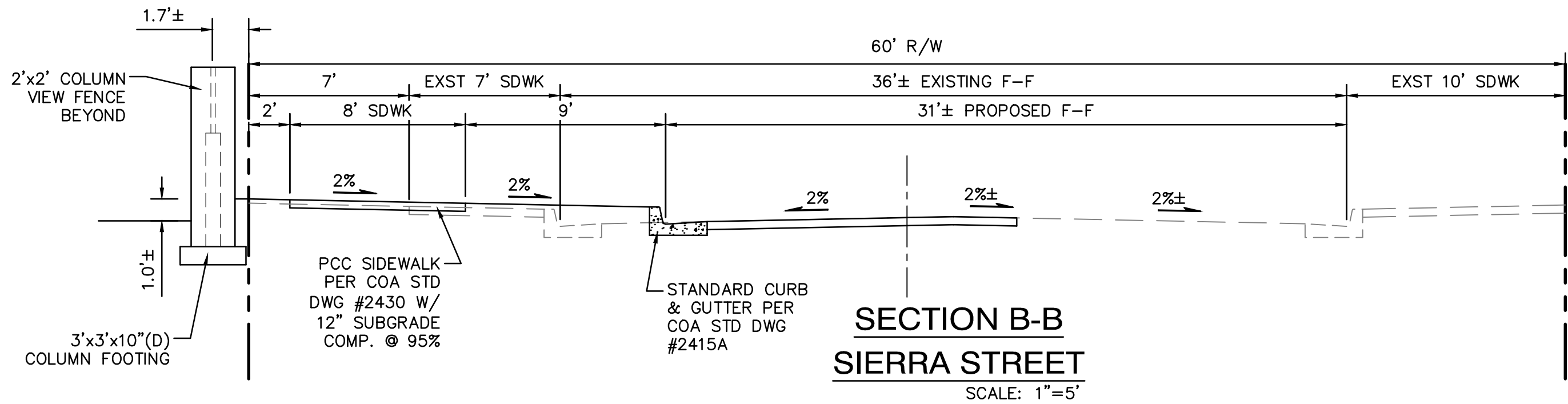
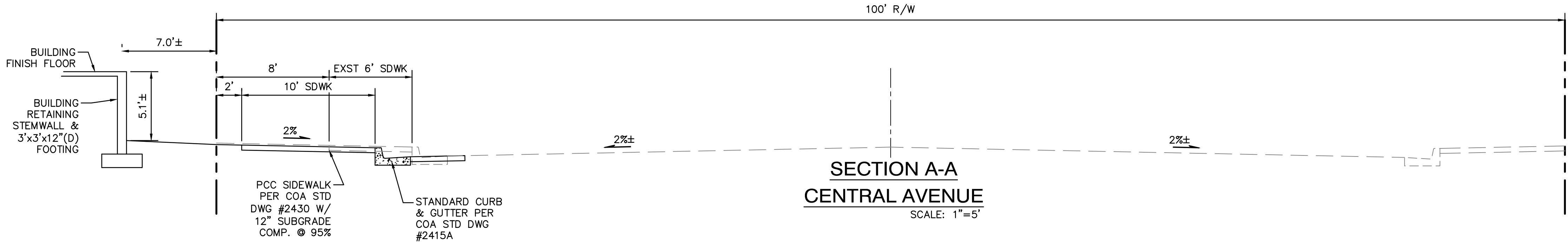
CONSTRUCT ALL SWALES AND INSTALL EROSION PROTECTION SET INTO ADJACENT GRADE TO ENSURE RUNOFF CAN BE CAPTURED AND CONVEYED PROPERLY



- VARY ANGULAR FACE ROCK SIZE BETWEEN 4" AND 8" DIA. (AVG.=6")
- PLACE GEOTEX 501 NON-WOVEN GEOTEXTILE (O.E.) BENEATH ALL EROSION PROTECTION

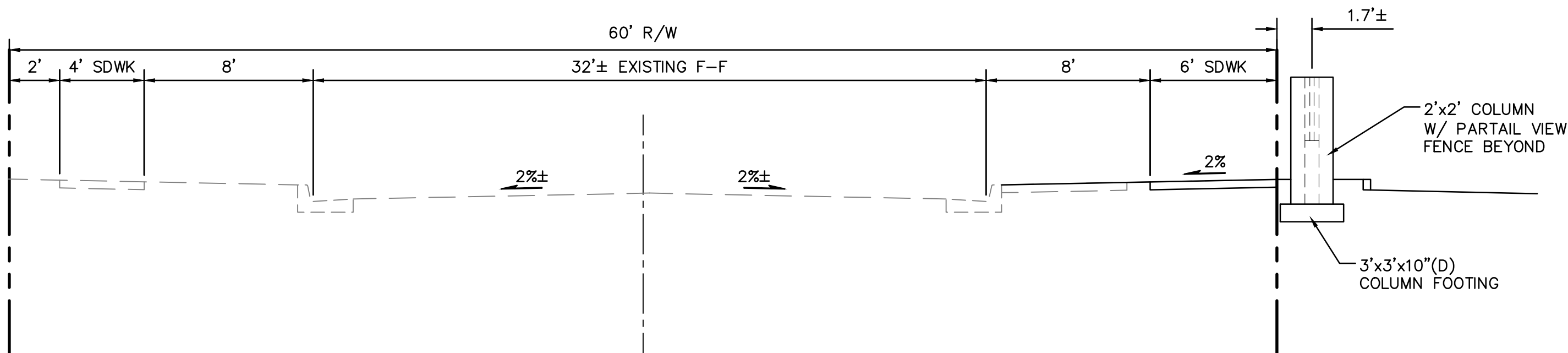
TYPICAL EROSON CONTROL

SCALE: N.T.S.



SECTION D-D
MONTCLAIRE STREET
SCALE: 1"=5'

SECTION E-E
MONTCLAIRE STREET
SCALE: 1"=5'



SECTION F-F
COPPER AVENUE
SCALE: 1"=5'

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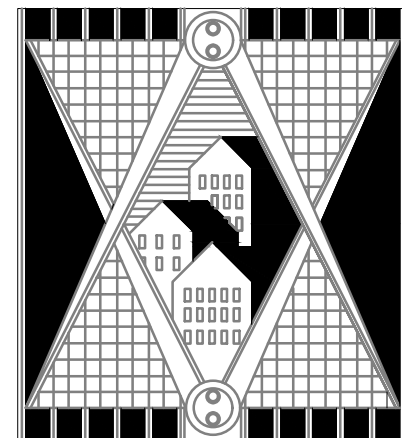
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CROSS-SECTIONS

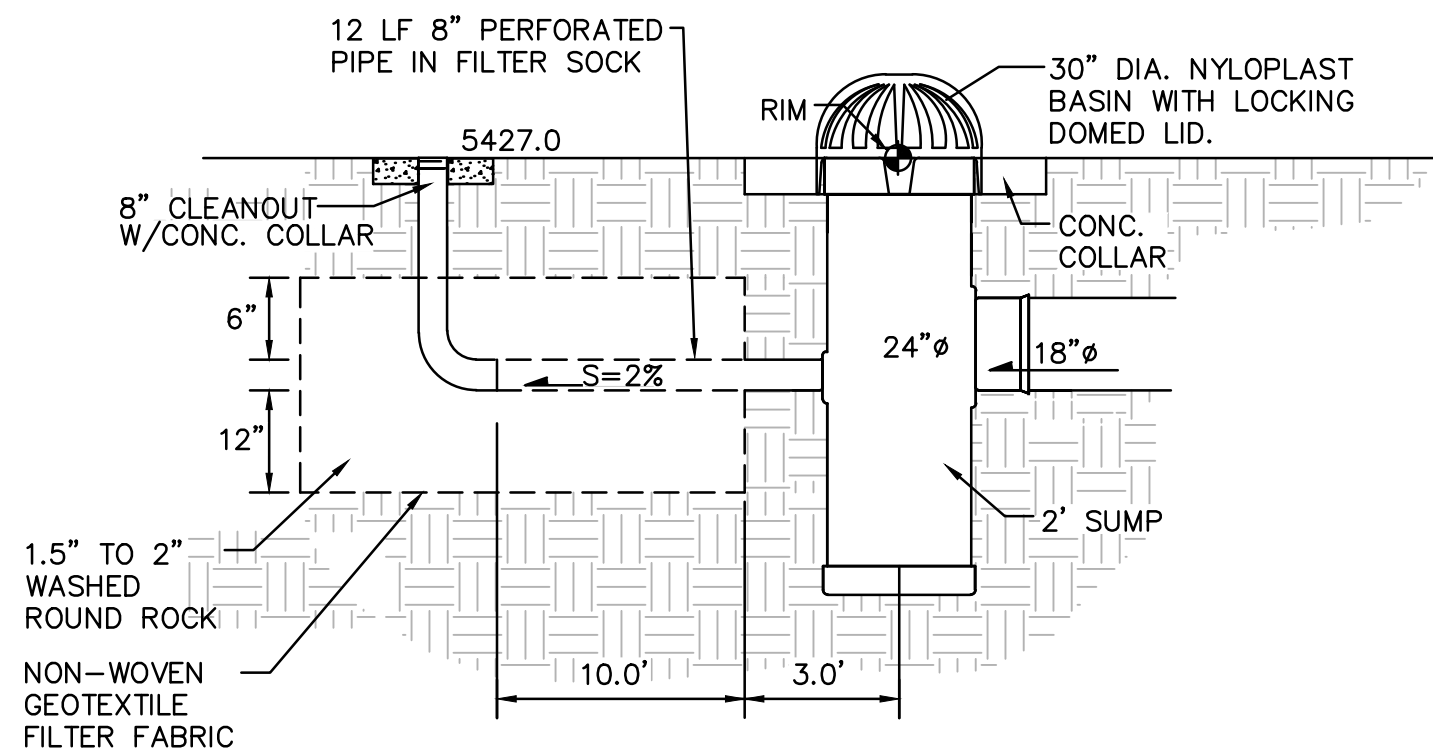
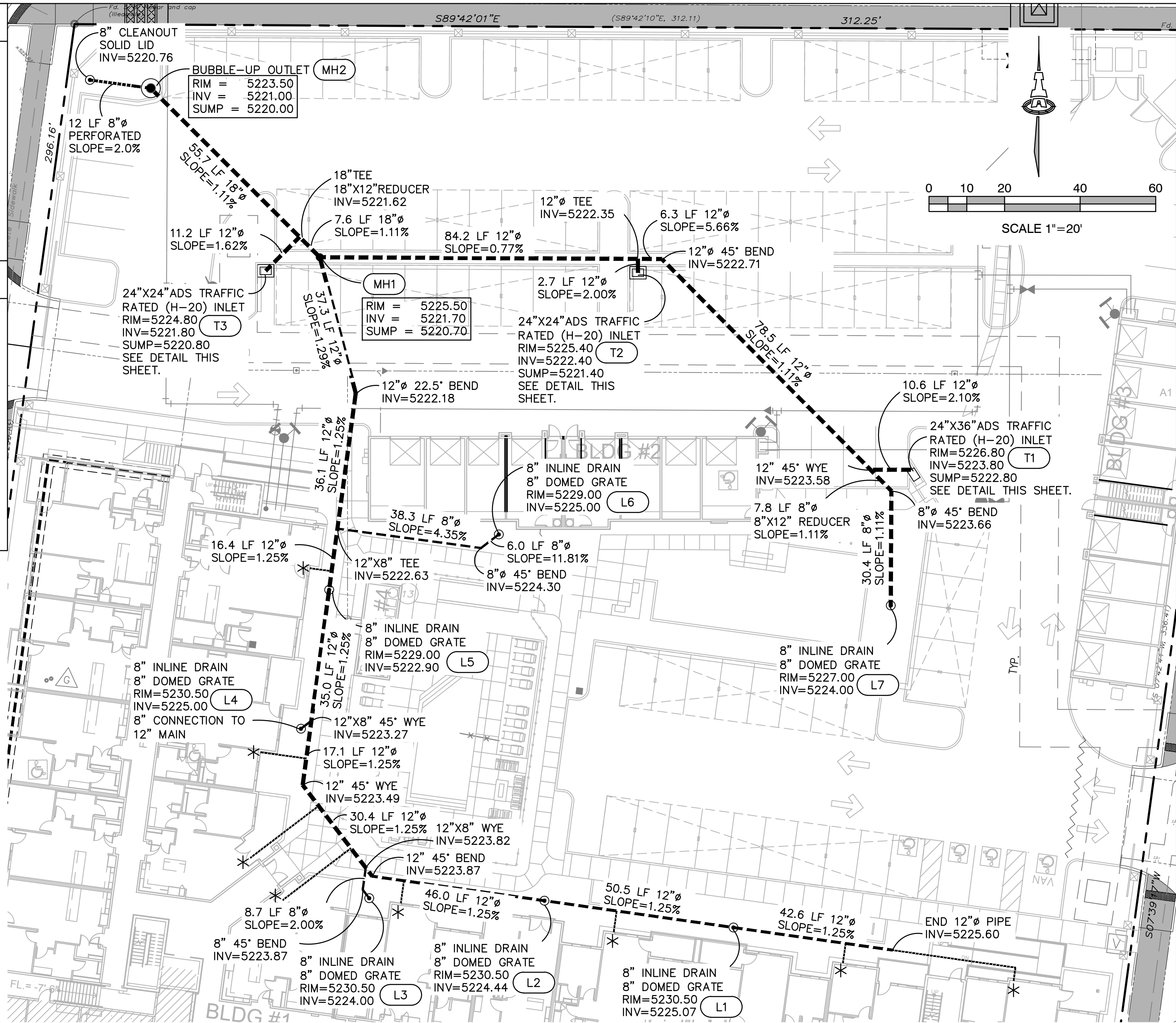
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LEGEND

- T#** 18" DIA. NYLOPLAST BASIN WITH TRAFFIC RATED (H-20) NYLOPLAST INLET.
- L#** LANDSCAPE AREA INLET. 8" DIA. ADS INLINE DRAIN WITH 8" DOMED GRATE. EXTEND TO STORM DRAIN USING TEE'S SIZED AS REQUIRED.
- MH#** NYLOPLAST BASIN. SEE DETAIL: ADS NYLOPLAST BASIN MANHOLES THIS SHEET FOR SIZES, PIPE INVERT(S), SUMP INVERT, GRATE TYPE, ETC.
- *** EXTEND ROOF DRAIN TO 12" MAIN. WATERTIGHT CONNECTION WITH FITTINGS AS REQ'D.

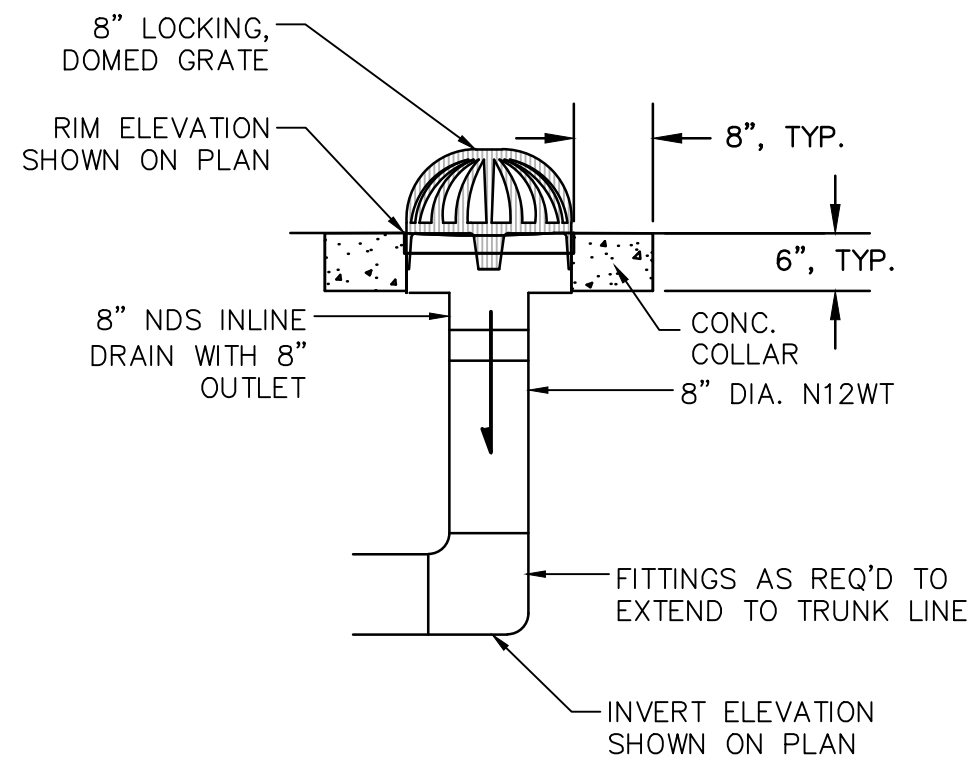
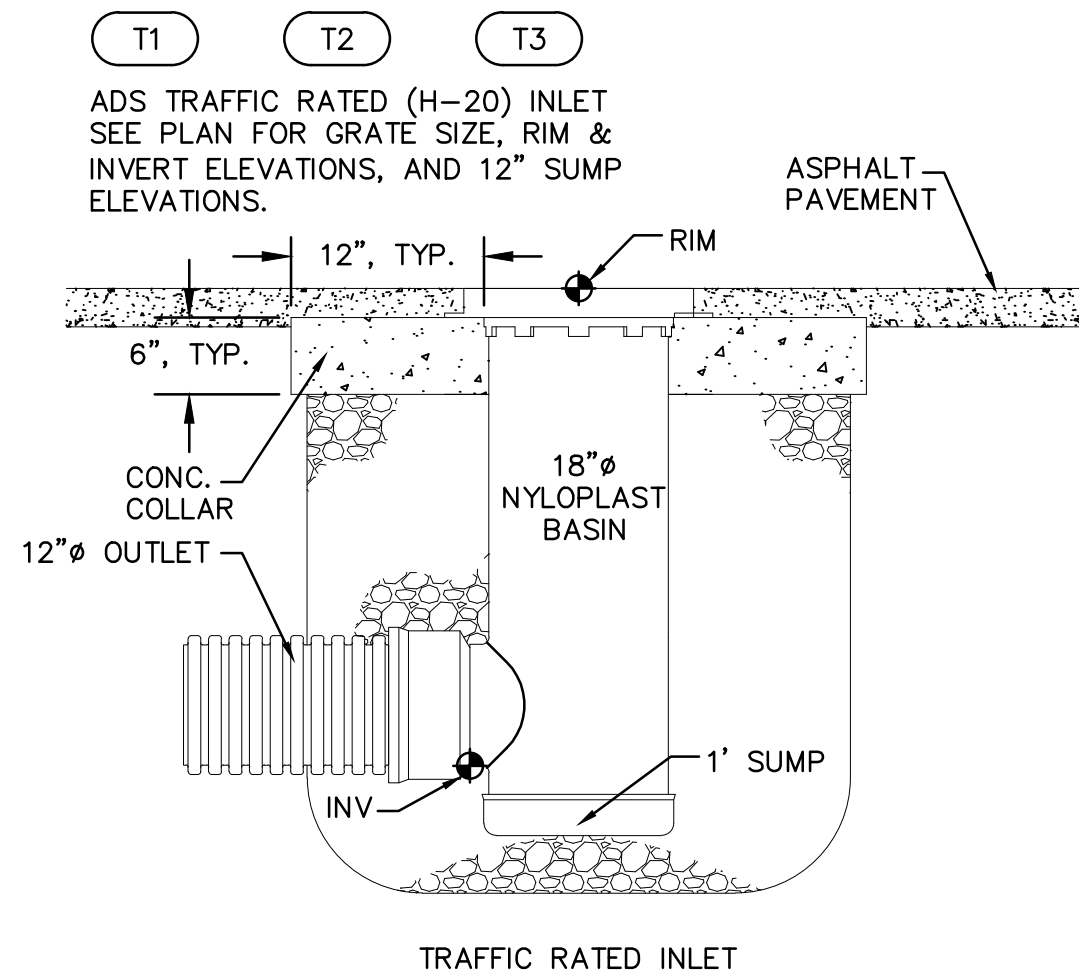
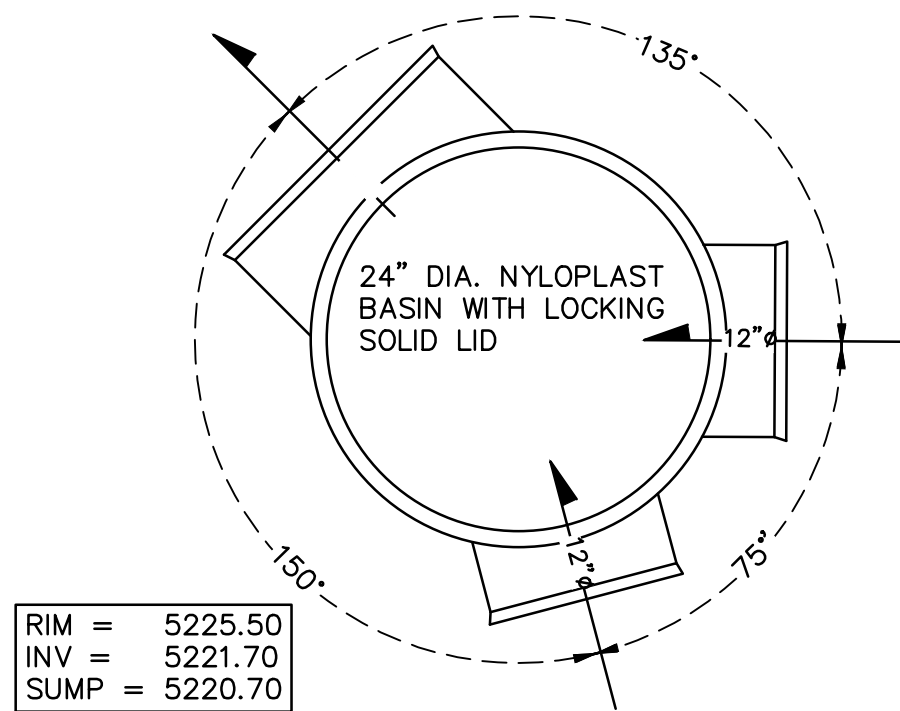
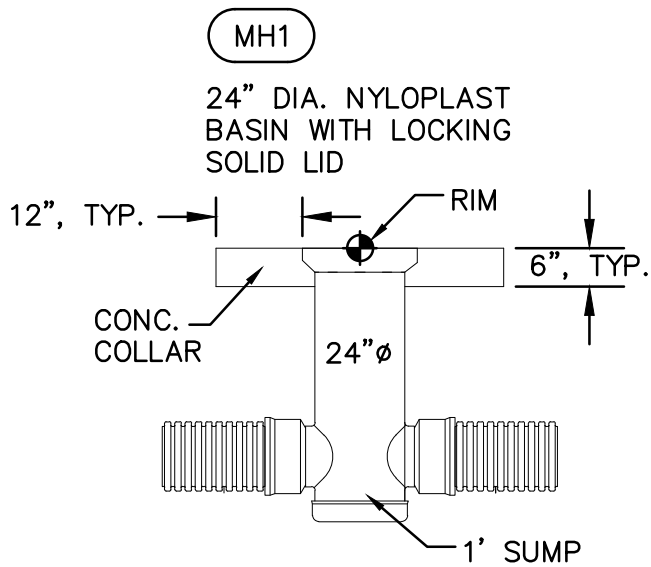
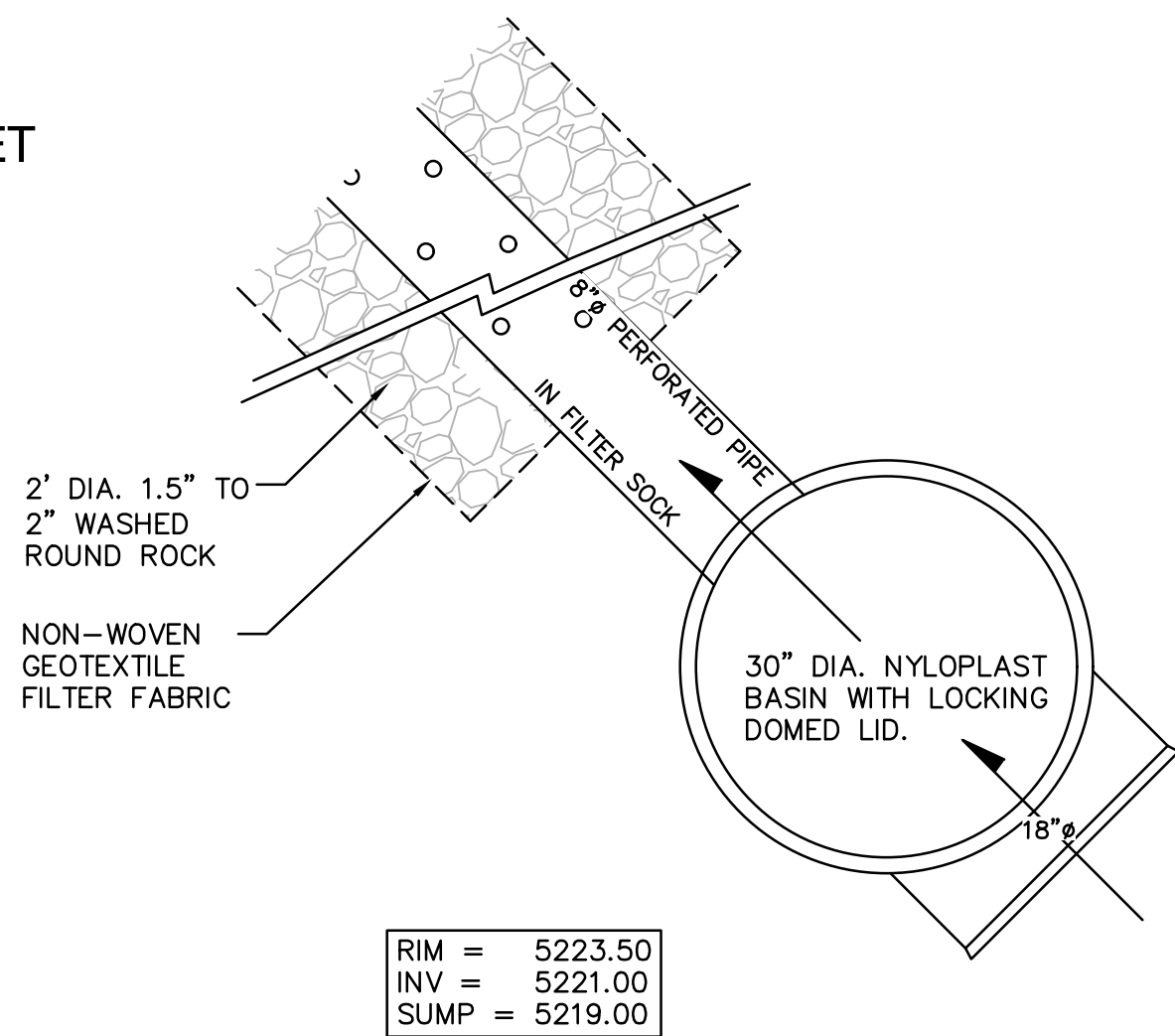
GENERAL NOTES

- A. INSTALL ALL STORM DRAIN INLETS AND PIPE PER MANUFACTURER'S SPECIFICATIONS.
- B. ALL STORM DRAIN LINES AND FITTINGS TO BE ADS N-12WT WATERTIGHT.
- C. STORM DRAIN SYSTEM WILL REQUIRE REGULAR MAINTENANCE TO ENSURE PROPER FUNCTIONING DURING STORM EVENTS. ENGINEER RECOMMENDS THAT PROPERTY OWNER PUT IN PLACE INSPECTION AND MAINTENANCE CRITERIA SCHEDULED TO ON A REGULAR BASIS AND AFTER EACH STORM EVENT.



BUBBLE-UP OUTLET

MH2



NYLOPLAST BASINS

MH#

T#

IN-LINE DRAIN

L#

SCALE: N.T.S.

SCALE: N.T.S.

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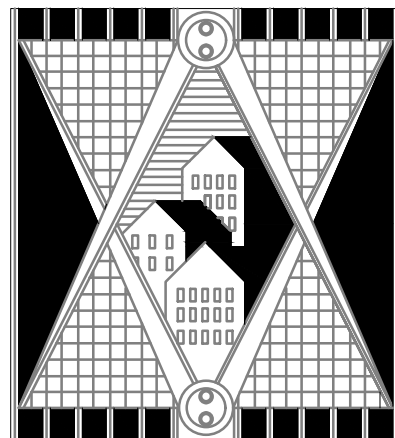
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