CITY OF ALBUQUERQUE

Planning Department
David Campbell, Director

Mayor Timothy M. Keller

November 16, 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 Montclaire NE
Conceptual Grading Plan Stamp Date: 11/12/18
Drainage Report Stamp Date: 10/29/18
Hydrology File: K17D073

Dear Mr. Arfman:

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Based on the submittal received on 11/13/18, the above-referenced plan is approved for Plat and Site Plan.

Prior to Building Permit (For Information):

1. Update the drainage report, *Stormwater Quality First Flush*, to reflect the addition of the gravel bedding and increased first flush retention.
2. The Plat will need to be recorded (include a copy when submitting for BP approval).
3. Payment of Fee-in-Lieu (Amount = 1175CF x $8/CF = $9400.00, per response to comments letter, dated 11/12/18) will be required; include a copy of the paid receipt with the building permit submittal. 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.
4. Remove all “Conceptual” markings.
5. 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.

6. This project requires an ESC Plan, submitted to the Stormwater Quality Engineer (Curtis Cherne PE, ccherne@cabq.gov or 924-3420).

7. 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):

8. 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.

9. Engineer's Certification, per the DPM Chapter 22.7: *Engineer's Certification Checklist For Non-Subdivision* is required.

10. City acceptance and close-out of the public Work Order will be required, unless a financial guarantee has been posted.

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

Sincerely,

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

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

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 __X__ DRB SITE ___ ADMIN SITE

IS THIS A RESUBMITTAL? __X__ Yes _____ No

DEPARTMENT ____ TRANSPORTATION __X__ HYDROLOGY/DRAINAGE

Check all that Apply:

TYPE OF SUBMITTAL:

____ ENGINEER/ARCHITECT CERTIFICATION
____ PAD CERTIFICATION
____ CONCEPTUAL G & D PLAN
__X__ 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) _____
____ PRE-DESIGN MEETING?

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

____ BUILDING PERMIT APPROVAL
____ CERTIFICATE OF OCCUPANCY

____ PRELIMINARY PLAT APPROVAL
____ SITE PLAN FOR SUB'D APPROVAL
__X__ SITE PLAN FOR BLDG. PERMIT APPROVAL
____ FINAL PLAT APPROVAL

____ SIA/ RELEASE OF FINANCIAL GUARANTEE
____ FOUNDATION PERMIT APPROVAL
__X__ GRADING PERMIT APPROVAL
____ SO-19 APPROVAL
____ PAVING PERMIT APPROVAL
____ GRADING/ PAD CERTIFICATION
____ WORK ORDER APPROVAL
____ CLOMR/LOMR
____ FLOODPLAIN DEVELOPMENT PERMIT
____ OTHER (SPECIFY) _____

DATE SUBMITTED: November 12, 2018 By: Fred C. Arfman

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: _____

FEE PAID: _____

ISAACSON & ARFMAN, P.A. *Consulting Engineering Associates*

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

November 12, 2018

Mr. Dana Peterson, PE
Senior Engineer, Planning Dept.
City of Albuquerque Development Review Services

RE: Apartment Urban Living @ Nob Hill (K17D073)

Dear Mr. Peterson,

Attached with this resubmittal for Site Plan review is one copy of the conceptual Grading and Drainage Plan. Revisions are in response to your 'PRIOR TO SITE PLAN' review comments dated November 9, 2018 as follows:

PRIOR TO SITE PLAN comments:

1. See sheet CG-501 for revised storm drain design including calculations for stormwater quality retention within perforated pipe. Per the calculations, the pipe and associated gravel bedding will accept 630 cf.

   Regarding First Flush, based on 85% impervious area, the first flush calculations are: 97,990.61 sf * 85% * 0.26"in.per.sf / 12 in/ft = 1,805 cf.

   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 – 630 = 1,175) * $8 = $9,400. 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.
2. Noted
3. Channel structure to Copper Ave. has been modified as requested. The sidewalk culverts will extend from the property line to the face of curb. The infrastructure list has also been updated.
4. The infrastructure list has been updated.
5. The grading plan has been labeled "Conceptual, Not for Construction." The comments relating to Building Permit will be addressed as part of the Building Permit submittal.

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

*128 Monroe St. N.E. * Albuquerque, NM 87108 * (505) 268-8828 * www.iacivil.com*

TREASURY DIVISION DAILY DEPOSIT

Transmittals for:
PROJECTS Only

Payment In-Lieu for Storm Water Quality Volume Requirement

CASH COUNT	AMOUNT	ACCOUNT NUMBER	FUND NUMBER	BUSINESS UNIT	PROJECT ID	ACTIVITY ID	AMOUNT
TOTAL CHECKS	$ 9,400.00	461615	305	PCDMD	24_MS4	7547210	$ 9,400.00
TOTAL AMOUNT						TOTAL DEPOSIT	**$9,400.00**

Hydrology#: K17D073 Name: Apt Urban Living @ Nob Hill, 54,215 sf imp
Payment In-Lieu For Storm Water Quality Volume Requirement

Address/Legal Description: Central and Sierra St NE
Lots 1-19 & Vacated Alley, Block 2, Mesa Grande Addition

DEPARTMENT NAME: Planning Department/Development Review Services, Hydrology

PREPARED BY Dana Peterson PHONE 924-3695

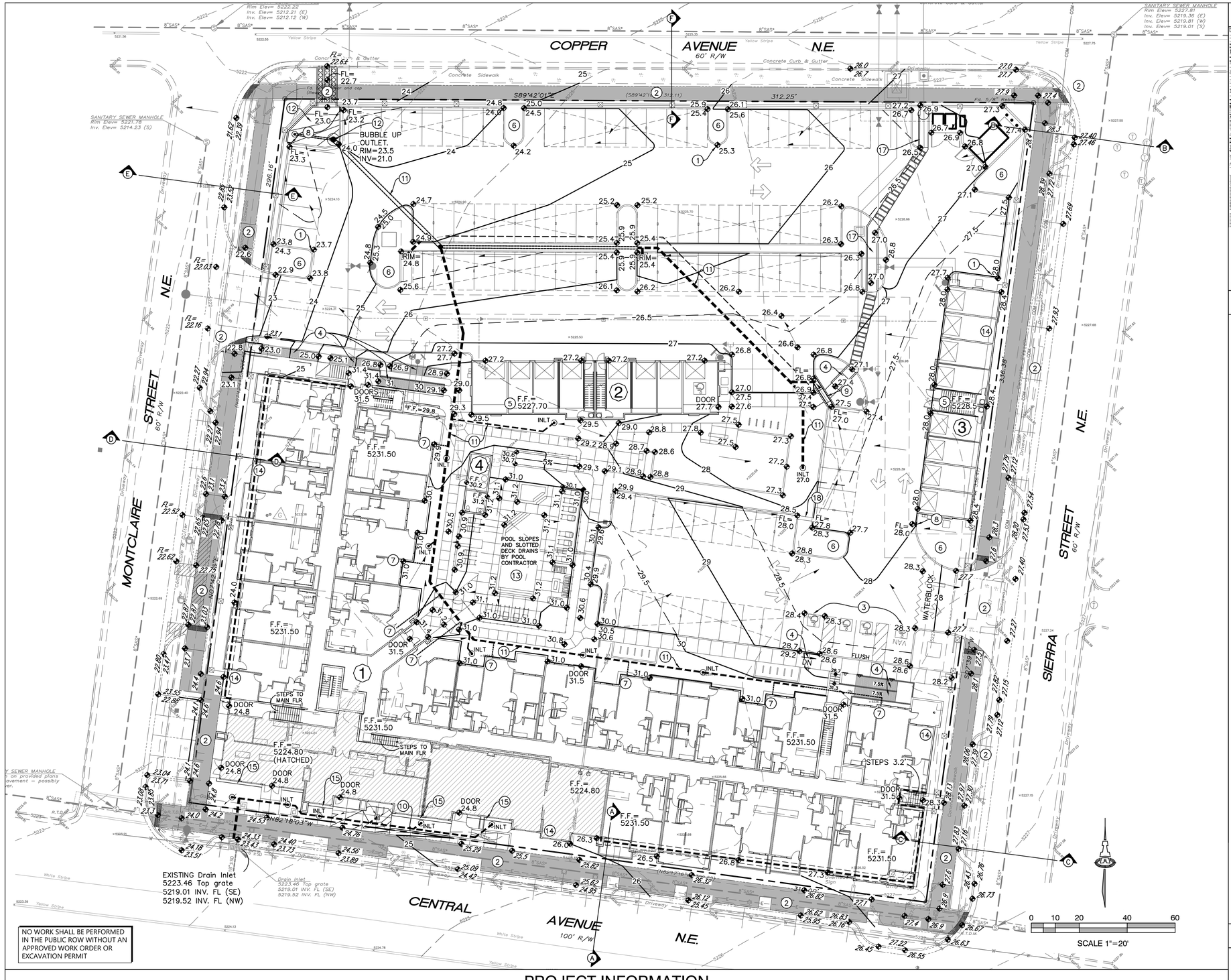
BUSINESS DATE 11/16/18

DUAL VERIFICATION OF DEPOSIT _____
EMPLOYEE SIGNATURE

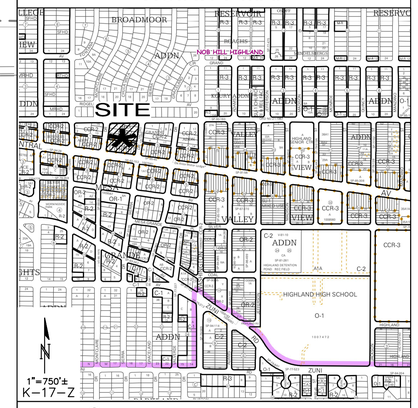
AND BY _____
EMPLOYEE SIGNATURE

REMITTER: _____
AMOUNT: _____
BANK: _____
CHECK #: _____ DATE ON CHECK: _____

The Payment-in-Lieu can be paid at the Plaza del Sol Treasury, 600 2nd St. NW. **Bring two copies of this invoice to the Treasury** and provide a copy of the receipt to Hydrology, Suite 201, 600 2nd St. NW, or e-mail with the Hydrology submittal to PLNDRS@cabq.gov.



VICINITY MAP



KEYED NOTES

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. 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.
3. SLOPES WITHIN HANDICAP PARKING AREAS TO MEET ADA REQUIREMENTS. MAX. SLOPE = 2% IN ANY DIRECTION.
4. CONSTRUCT 1:12 MAX. HANDICAP ACCESS RAMP PER ADA.
5. 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 ¾"/FT PAD SLOPE.
6. DEPRESS LANDSCAPING WITHIN PARKING ISLANDS TO CONTAIN STORMWATER.
7. BUILDING ROOF DISCHARGE TO BE PIPED DIRECTLY TO STORM DRAIN.
8. PROVIDE 24" WIDE OPENING IN CURB TO PASS FLOW. SEE CG-102 FOR DETAIL.
9. CONSTRUCT 2' WIDE COVERED CONCRETE SIDEWALK CULVERT. SEE CG-102 FOR DETAIL.
10. CONSTRUCT HEADER CURB. SEE CG-102 FOR DETAIL.
11. CONSTRUCT PRIVATE STORM DRAIN SYSTEM. SEE SHEET CG-501 FOR SIZES / SLOPES / INLET INFORMATION / MATERIALS.
12. CONSTRUCT BUBBLE UP OUTLET. SEE CG-501 FOR DETAIL.
13. POOL AREA GRADES SHOWN FOR GENERAL INFORMATION ONLY. POOL CONTRACTOR TO PROVIDE FINAL DESIGN GRADES / DECK DRAINS ETC.
14. FINISH GRADES ADJACENT TO BUILDING WILL REQUIRE BUILDING STEMWALL TO RETAIN / EXTEND TO ACHIEVE GRADES SHOWN ON ALL SIDES. SEE ARCHITECTURAL / STRUCTURAL PLANS.
15. CONSTRUCT 12" WIDE CONCRETE APRON ALONG BUILDING THIS AREA. TOP OF CONC. AT BUILDING = 0.1' BELOW F.F., SLOPE @ 2%.
16. INSTALL FRACTURED FACE ROCK EROSION PROTECTION TO LIMITS HATCHED. SEE CG-102 FOR DETAIL.
17. CONSTRUCT PCC SIDEWALK; SEE DETAIL SHEET A1.21.
18. 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

×5038.91	EXISTING SPOT ELEVATION
—5045—	EXISTING CONTOUR
40	PROPOSED CONTOUR (1' INCREMENT)
40.5	PROPOSED CONTOUR (0.5' INCREMENT)
39.5	PROPOSED SPOT ELEVATION
	FLOW ARROW
X	BUILDING NUMBER
C	CROSS SECTION (SEE CG-500)

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

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2240 CG-101.dwg Nov 12,2018

TITAN DEVELOPMENT

ALLIANCE RESIDENTIAL COMPANY

CONCEPTUAL
NOV. 12, 2018

FRED C. ARFMAN NEW MEXICO 7322 REGISTERED ENGINEER

NOT FOR CONSTRUCTION

REVISION SCHEDULE

WHITNEYBELL PERRY INC
1102 East Missouri Avenue
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575 W Chandler Blvd, Suite 123
Chandler, Arizona 85224
(602) 265-1891

ARCHITECTURE AND PLANNING

CG-101

GRADING AND DRAINAGE PLAN

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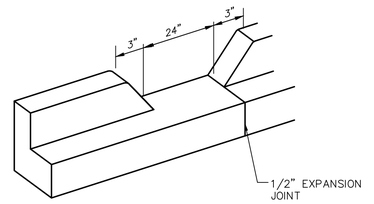
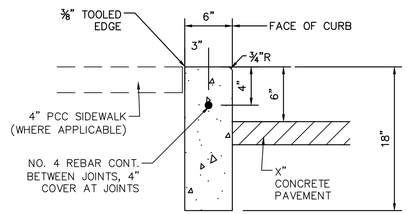


GENERAL NOTES

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

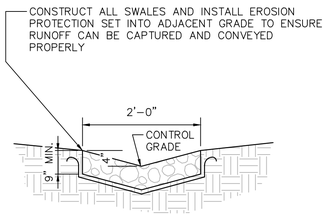
CURB OPENING

SCALE: N.T.S.



HEADER CURB

SCALE: N.T.S.



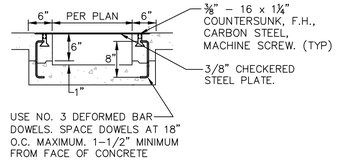
- VARY ANGULAR FACE ROCK SIZE BETWEEN 4" AND 8" DIA. (AVG.=6")
- PLACE GEOTEX 501 NON-WOVEN GEOTEXTILE (O.E.) BENEATH ALL EROSION PROTECTION

TYPICAL EROSON CONTROL

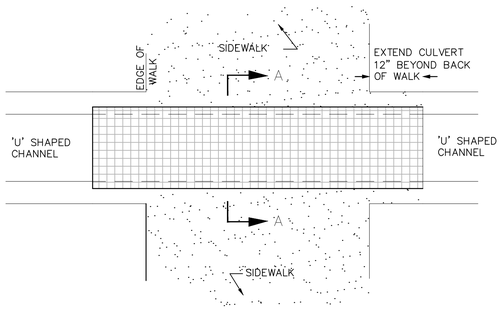
SCALE: N.T.S.

WELD ⅛" THICK, ⅝" 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.



SECTION A-A



PLAN

SIDEWALK CULVERT

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

SCALE: N.T.S.

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
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TITAN DEVELOPMENT

ALLIANCE RESIDENTIAL COMPANY

CONCEPTUAL
NOV. 12, 2018

FRED C. ARFMAN NEW MEXICO 7322 REGISTERED ENGINEER

NOT FOR CONSTRUCTION

REVISION SCHEDULE

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1102 East Missouri Avenue
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(602) 265-1891

ARCHITECTURE AND PLANNING

CG-102

GRADING & DRAINAGE DETAILS

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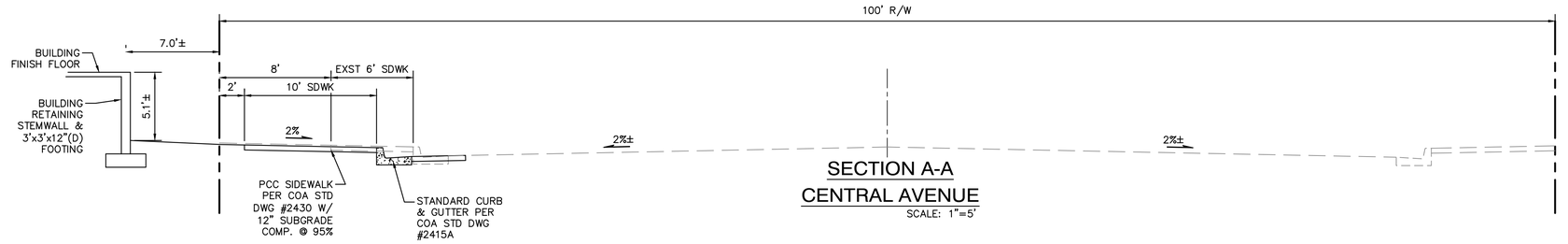
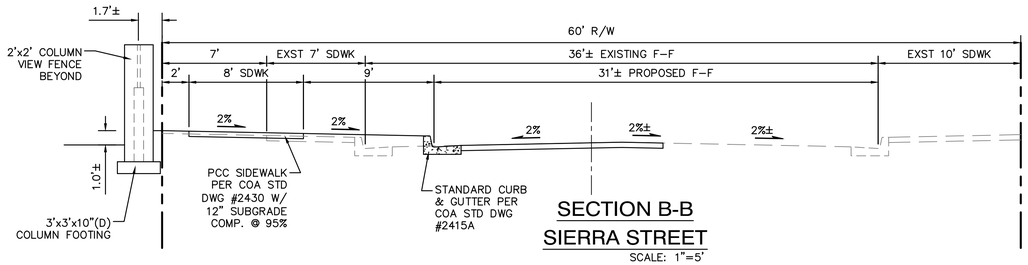
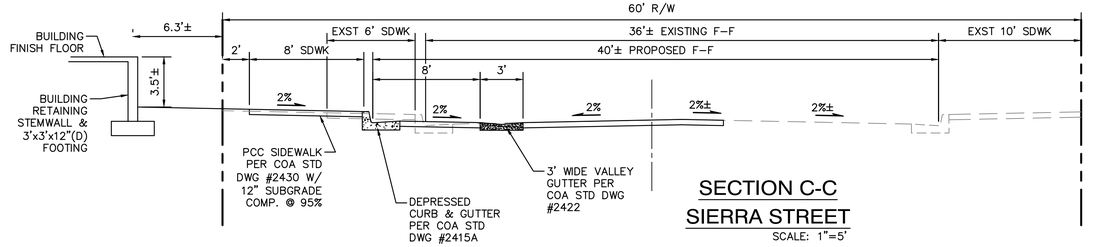


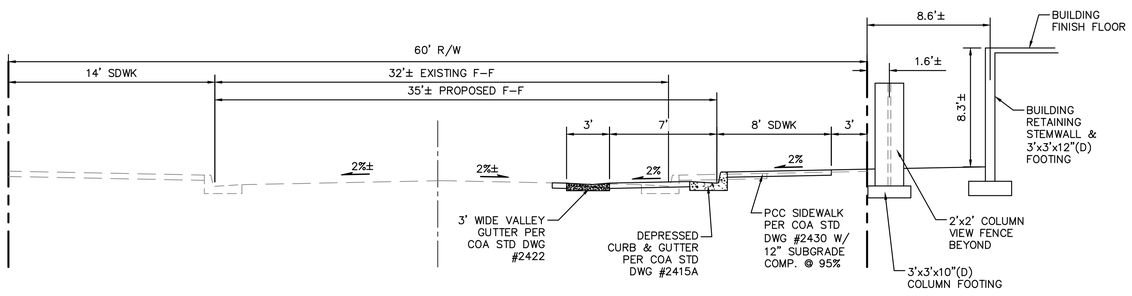
SECTION A-A
CENTRAL AVENUE
SCALE: 1"=5'



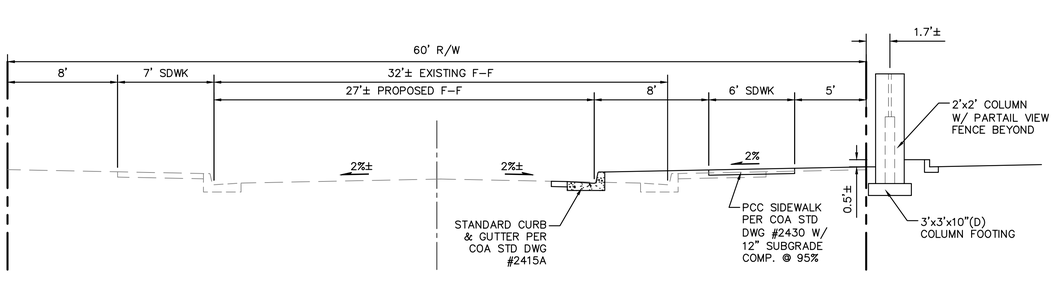
SECTION B-B
SIERRA STREET
SCALE: 1"=5'



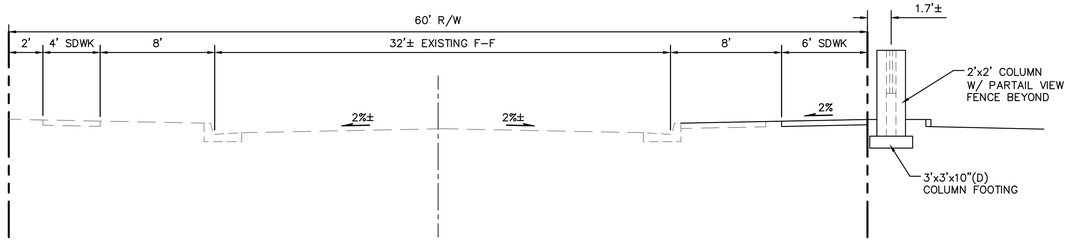
SECTION C-C
SIERRA STREET
SCALE: 1"=5'



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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TITAN DEVELOPMENT
ALLIANCE RESIDENTIAL COMPANY

REVISION SCHEDULE

FRED C. ARFMAN NEW MEXICO 7322 LICENSED PROFESSIONAL ENGINEER
10-24-18

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(602) 265-1891

ARCHITECTURE AND PLANNING

CG-500

CROSS-SECTIONS

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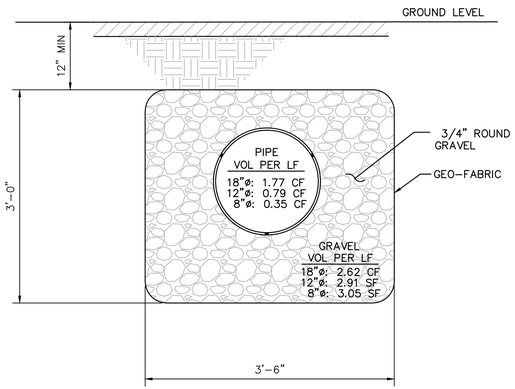


STORM WATER QUALITY VOLUME CALCULATION:

PIPE DIA.	PIPE VOL/LF — GRAVEL VOL/LF — TOTAL VOL/LF
18"	1.77 CF/LF + 2.62 CF/LF = 4.39 CF/LF 63.3 LF * 4.39 CF/LF = 277.7 CF
12"	0.79 CF/LF + 2.91 CF/LF = 3.70 CF/LF 84.2 LF * 3.70 CF/LF = 311.50 CF
8"	0.35 CF/LF + 3.05 CF/LF = 3.39 CF/LF 12 LF * 3.39 CF/LF = 40.7 CF

TOTAL CUBIC VOL.= 277.7 CF + 311.50 CF + 40.7 CF = 630.0 CF STORAGE

STORMWATER QUALITY RETENTION WITHIN PERFORATED PIPE SYSTEM

LEGEND

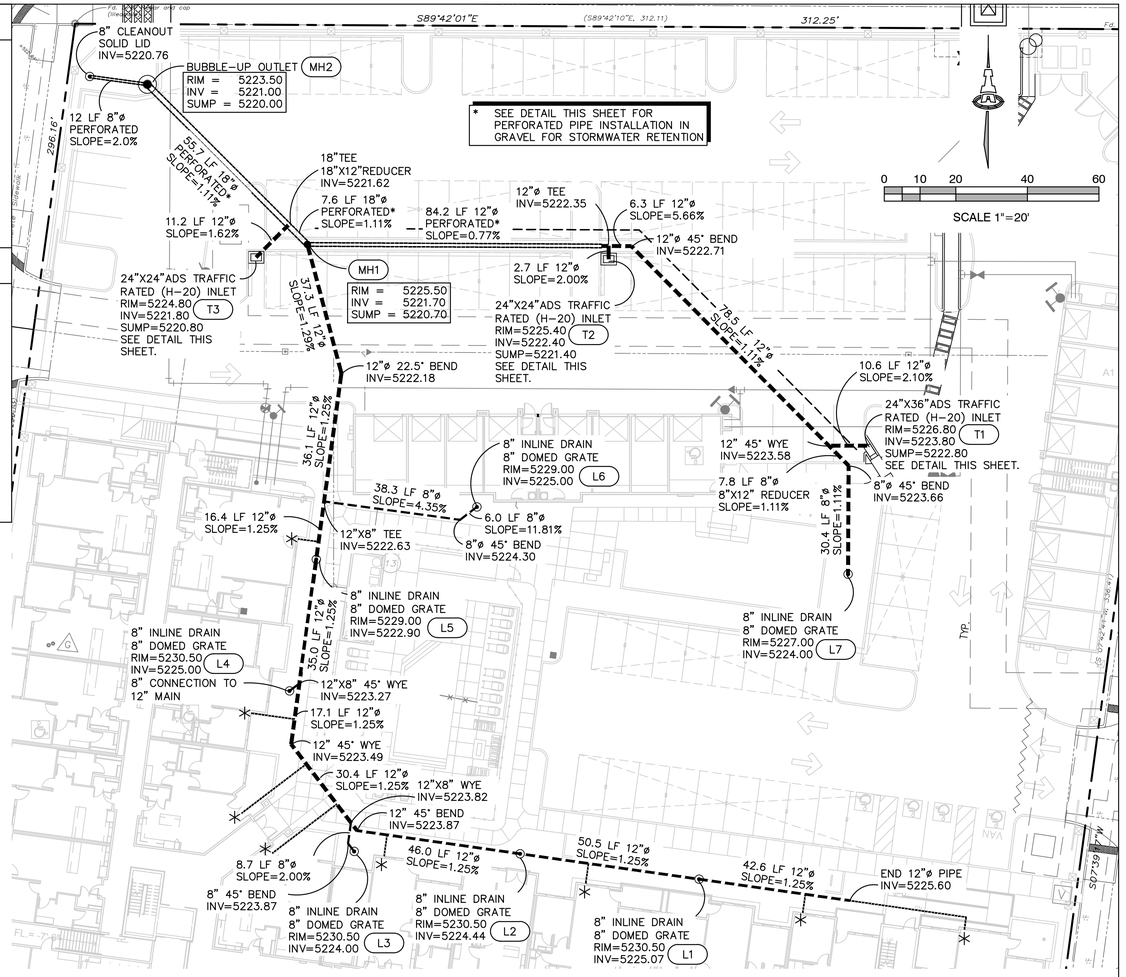
- (T#) 18" DIA. NYLOPLAST BASIN WITH TRAFFIC RATED (H-20) NYLOPOLAST INLET.
- (L#) LANDSCAPE AREA INLET. 8" DIA. ADS INLINE DRAIN WITH 8" DOMED GRATE. EXTEND TO STORM DRAIN USING TEE'S SIZED AS REQUIRED.
- (MH#) NYLOPLAST BASIN. SEE DETAIL: ADS NYLOPLAST BASIN MANHOLES THIS SHEET FOR SIZES, PIPE INVERT(S),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

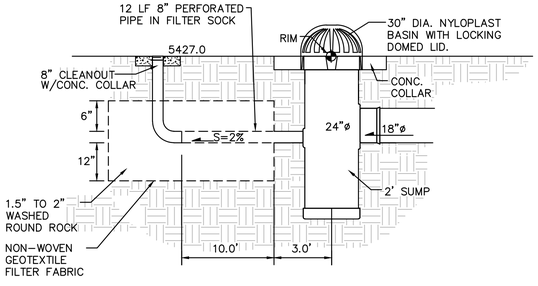
GENERAL NOTES

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.

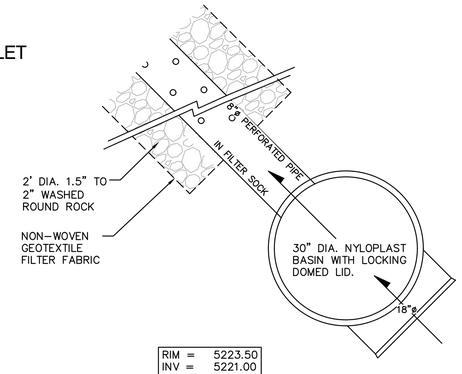
C. STORM DRAIN SYSTEM WILL REQUIRE REGULAR MAINTENANCE TO ENSURE PROPER FUNCTIONING DURING STORM EVENTS. ENGINEER RECOMMENDS THAT PROPERTY OWNER PUT IN PLACE INSPECTION AND MAINTENANCE CRITERIA SCHEDULED TO ON A REGULAR BASIS AND AFTER EACH STORM EVENT.





BUBBLE-UP OUTLET

(MH2)



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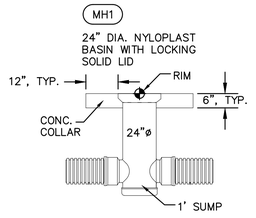
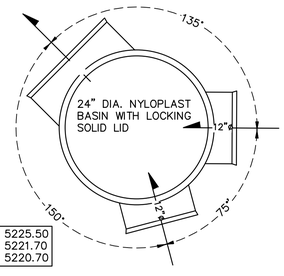
SUMP = 5219.00





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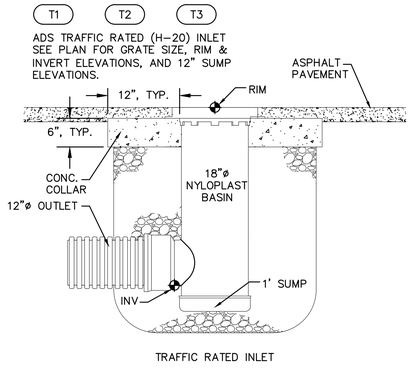
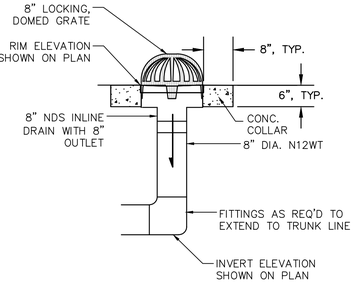
SUMP = 5220.70



TRAFFIC RATED INLET



NYLOPLAST BASINS (MH#) (T#)

SCALE: N.T.S.

IN-LINE DRAIN (L#)

SCALE: N.T.S.

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque, New Mexico 87108
Ph. 505-268-8828 www.iacivil.com
2240 CG-101.dwg Nov 12,2018

TITAN DEVELOPMENT

ALLIANCE RESIDENTIAL COMPANY

CONCEPTUAL
NOV. 12, 2018

FRED C. ARFMAN NEW MEXICO 7322 REGISTERED ENGINEER

NOT FOR CONSTRUCTION

REVISION SCHEDULE

WHITNEYBELL PERRY INC
1102 East Missouri Avenue
Phoenix, Arizona 85014
575 W Chandler Blvd, Suite 123
Chandler, Arizona 85224
(602) 265-1891

ARCHITECTURE AND PLANNING

CG-501

STORM DRAIN DETAILS

4/14/2017 11:53 AM 2240 CG-101.dwg

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.

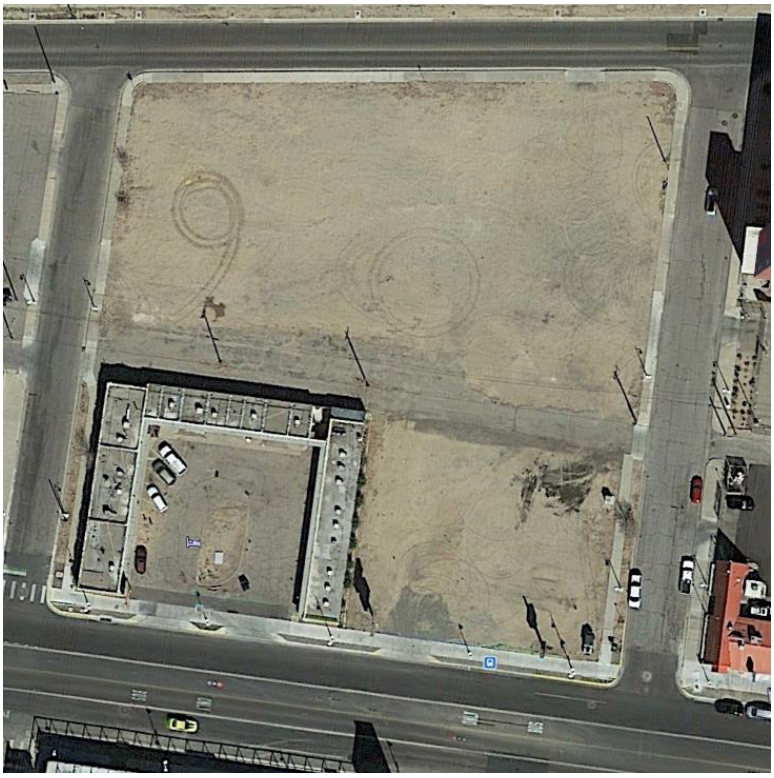
ENGINEER: FRED C. ARFMAN: NMPE 7322
ISAACSON & ARFMAN, PA
128 MONROE NE 87108
505-268-8828

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.	

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

Historic V_{360}	=	15956	CF	Developed V_{360}	=	15885 CF

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

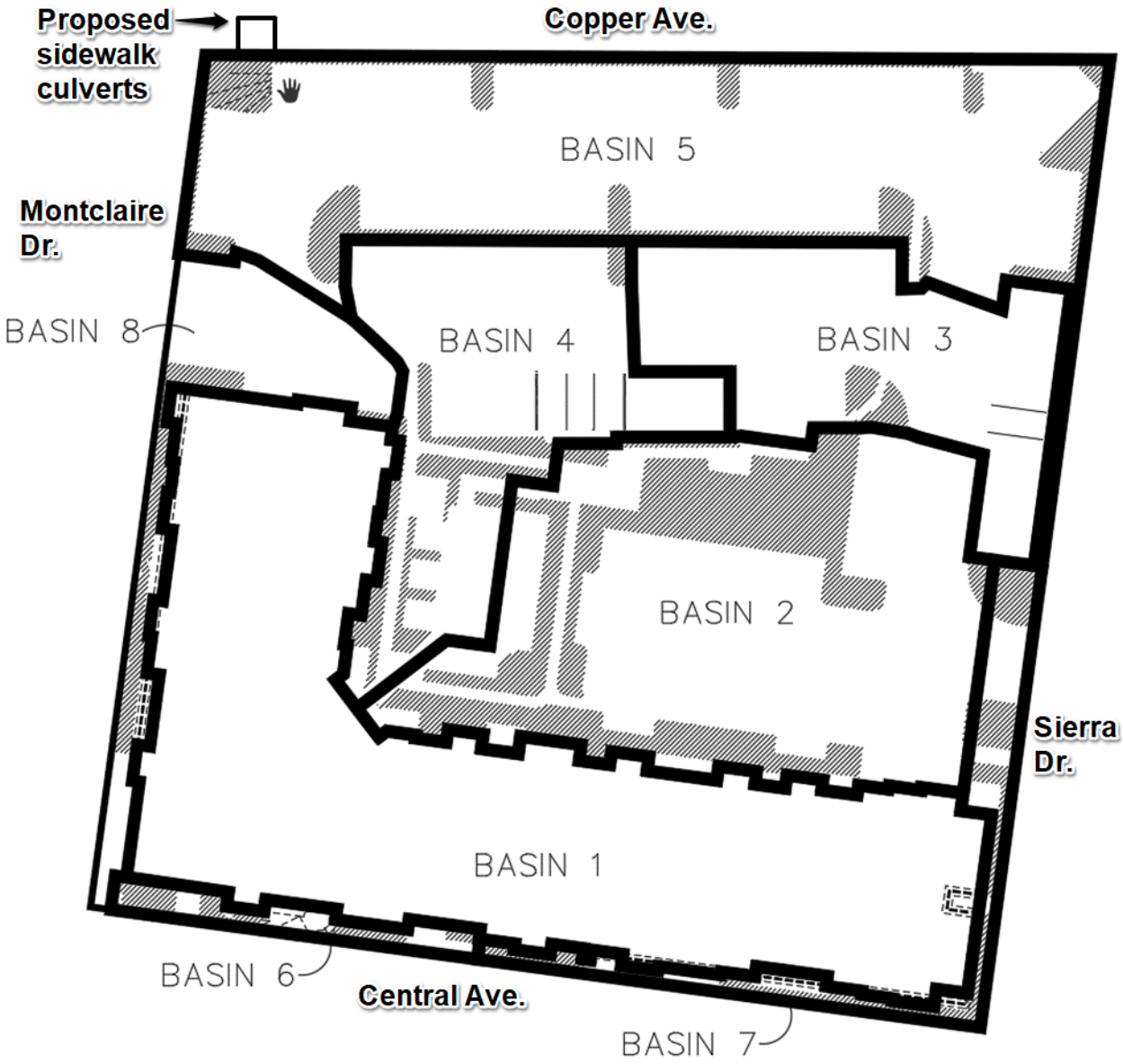
For Precipitation Zone 2

Q_{pA}	=	1.56	Q_{pC}	=	3.14
Q_{pB}	=	2.28	Q_{pD}	=	4.70

Historic Q_p	=	9.9	CFS	Developed Q_p	=	9.9 CFS

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

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 2.12 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 4809 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 2.9 cfs

LAND TREATMENT	
A =	0%
B =	0%
C =	0%
D =	100%

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

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.75 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 2905 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 1.9 cfs

LAND TREATMENT	
A =	0%
B =	16%
C =	16%
D =	68%

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

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 2.07 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 1598 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 1.0 cfs

LAND TREATMENT	
A =	0%
B =	2%
C =	2%
D =	96%

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

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.94 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 1730 CF

Sub-basin Peak Discharge Rate: (see formula above)

Q_P = 1.1 cfs

LAND TREATMENT	
A =	0%
B =	8.0%
C =	7.0%
D =	85%

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

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.89 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 3421 CF

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	
A =	0%
B =	26%
C =	26%
D =	48%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.51 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 156 CF

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	
A =	0%
B =	6%
C =	5%
D =	89%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.99 in.

Sub-basin Volume of Runoff (see formula above)

V_{360} = 513 CF

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	
A =	0%
B =	12%
C =	11%
D =	77%

Sub-basin Weighted Excess Precipitation (see formula above)

Weighted E = 1.85 in.

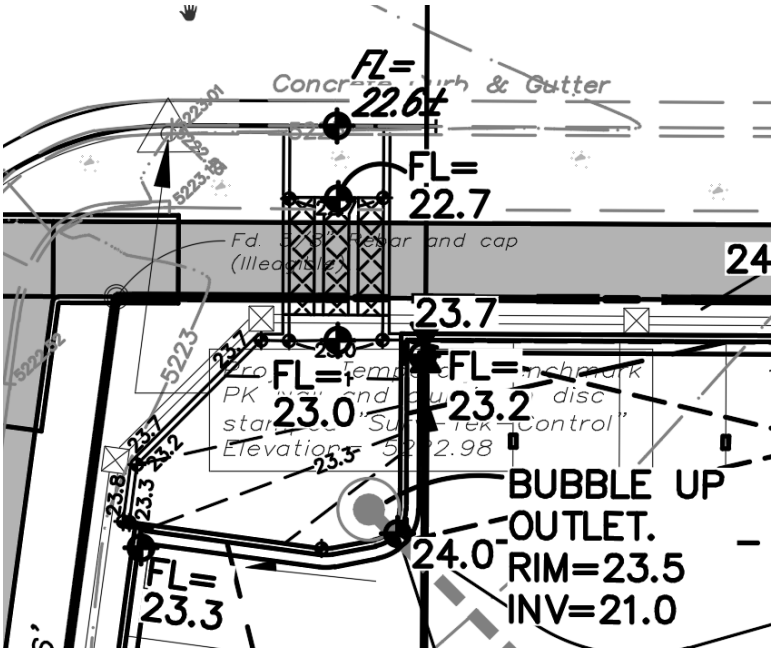
Sub-basin Volume of Runoff (see formula above)

V_{360} = 740 CF

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 maxium deption 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

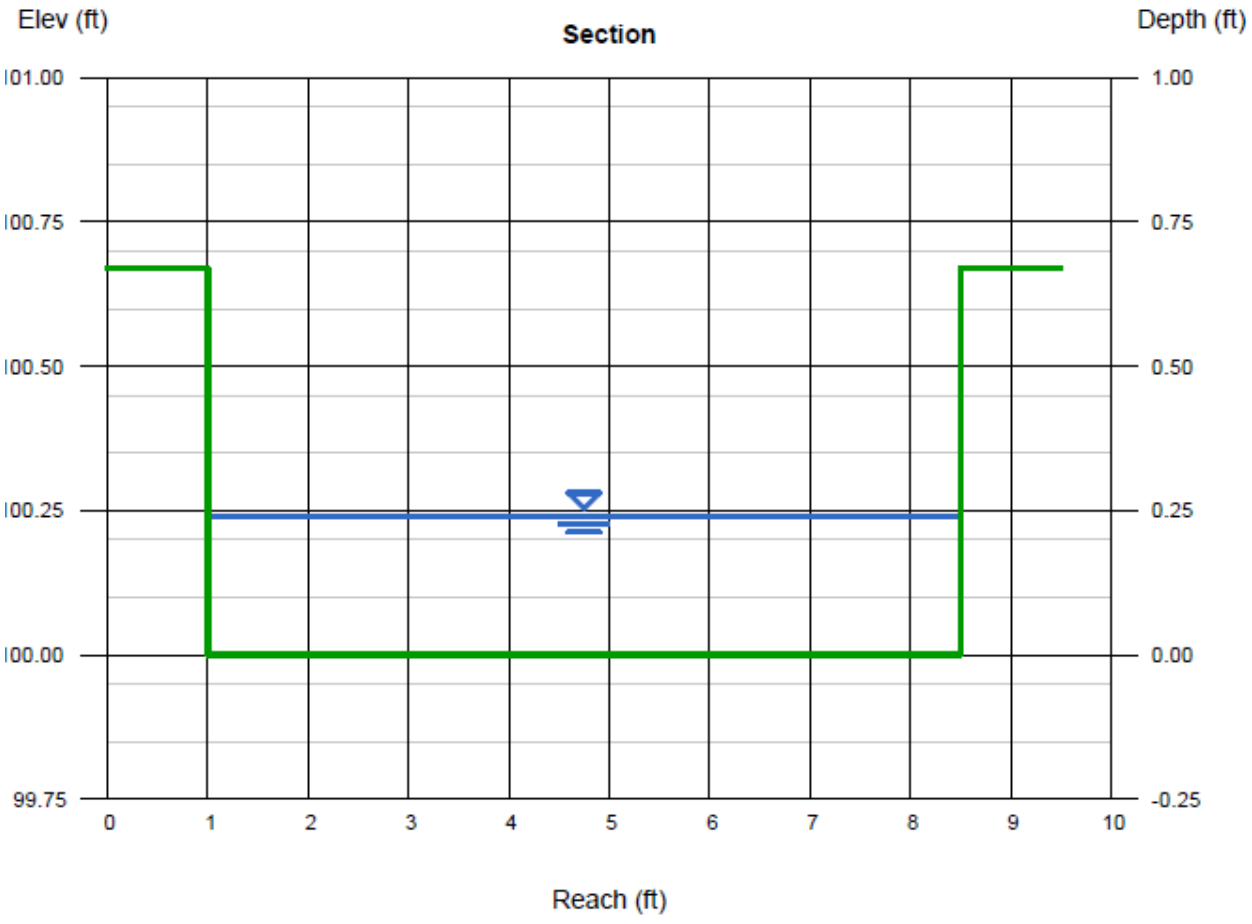
Bottom Width (ft)	= 7.50
Total Depth (ft)	= 0.67
Invert Elev (ft)	= 100.00
Slope (%)	= 2.00
N-Value	= 0.015

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 excempt.

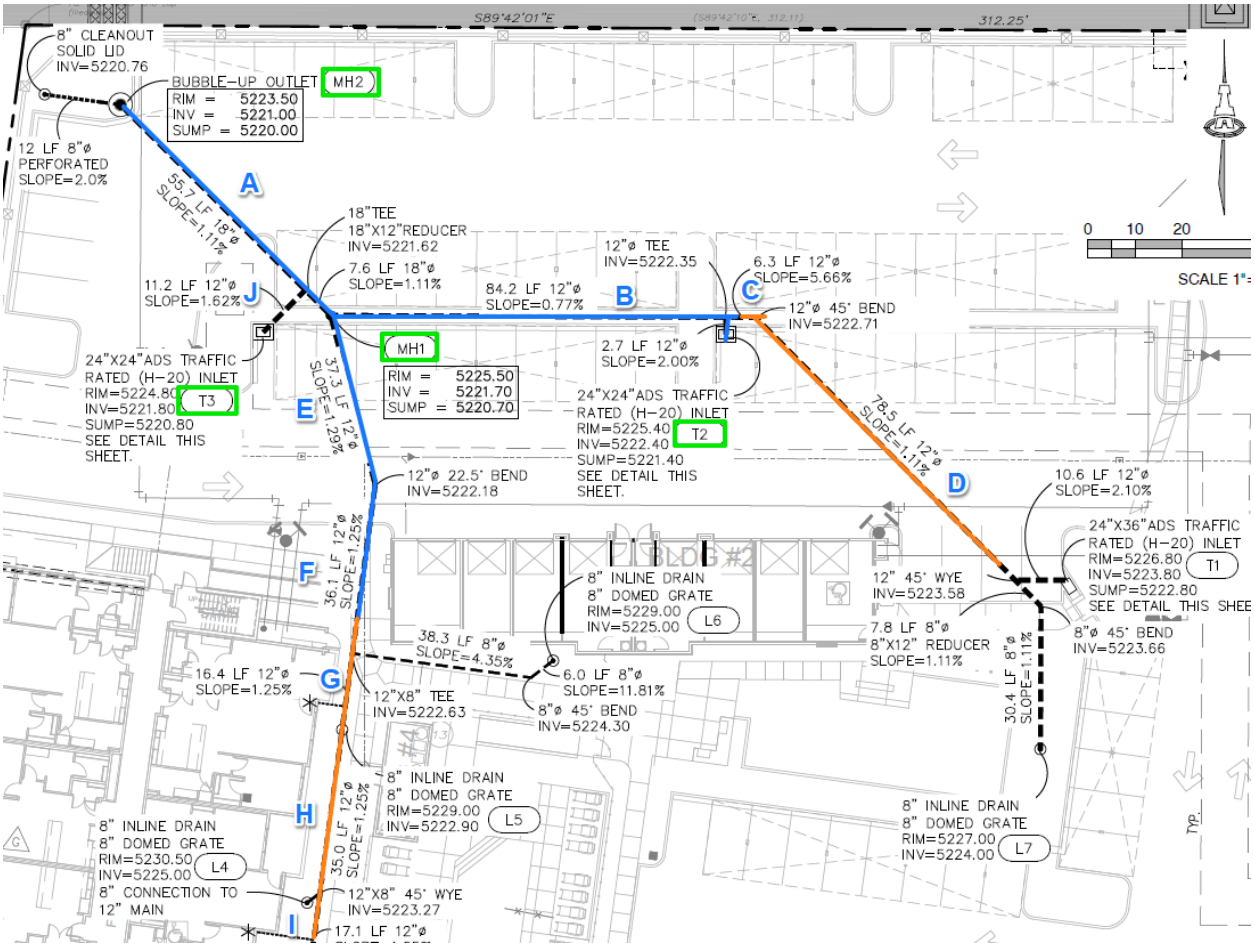
- **Redevelopment: Existing impervious area that is being redeveloped (removed/replaced) is subject to a reduced rate of 0.26"/sf.**

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" * type 'd' area: 0.26/12 * (83,292 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

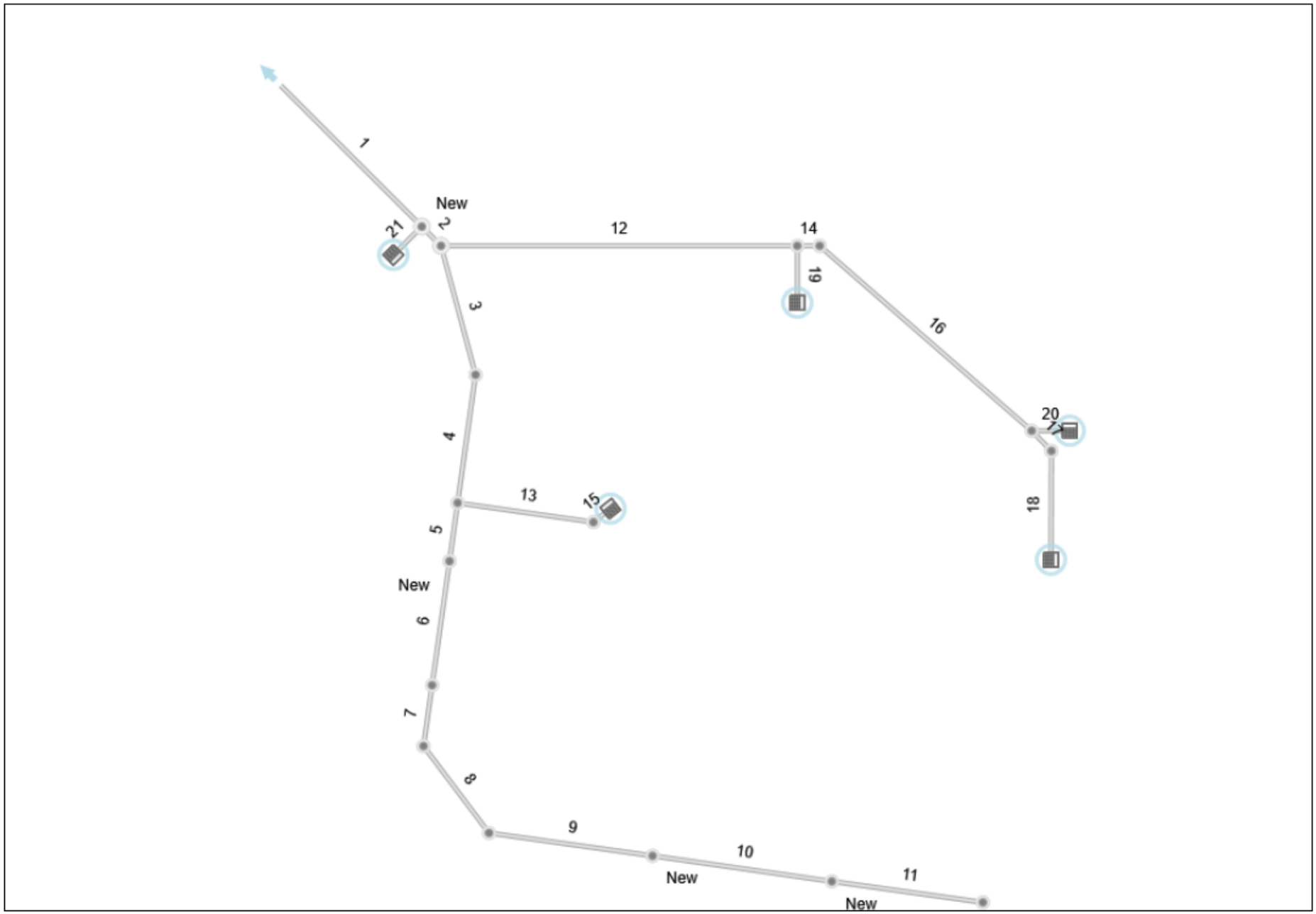
Chart at left provides calculations for each run x percentage of volume available below the bubble-up rim elevation

Plan View

Stormwater Studio 2018 v 2.0.0.61

Project Name: Enter Project Name...

10-30-2018



Project File: 2240 SD STUDY.sws

Energy Grade Line Calculations*

Project Name: Enter Project Name...

Stormwater Studio 2018 v 2.0.0.61

10-30-2018

Line No	Line Size	Q	Downstream							Length	Upstream							Pipe		Junction		
			Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev		Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev	n Value	Enrgy Loss	HGLa Elev	EGLa Elev	Enrgy Loss
	(in)	(cfs)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)		(ft)	(ft)	(ft)	(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.

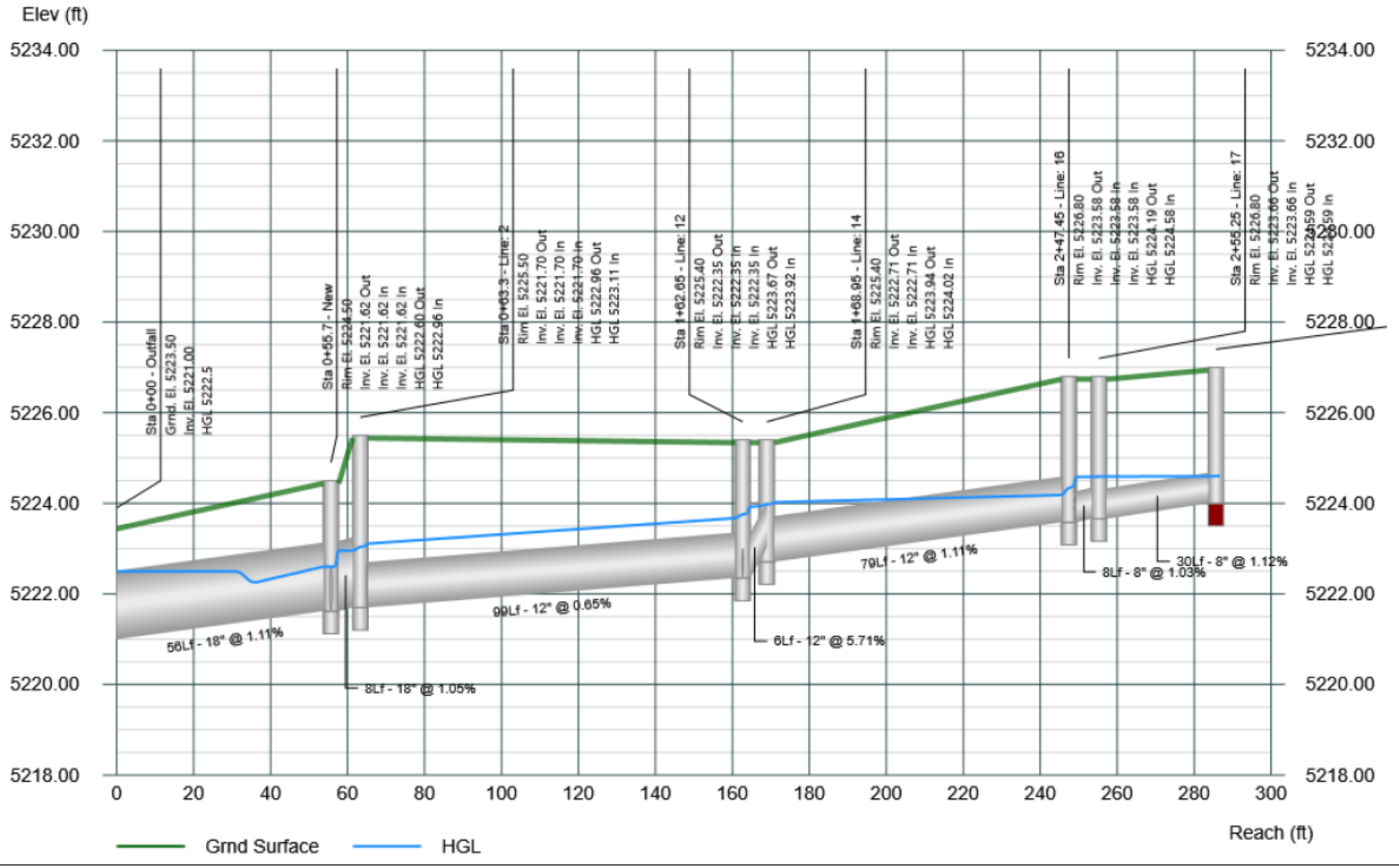
Project File: 2240 SD STUDY.sws

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