CITY OF ALBUQUERQUE

Planning Department
Brennon Williams, Director

Mayor Timothy M. Keller

July 6, 2021

Ronald Bohannan, P.E.
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, NM, 87109

RE: San Roque / La Serena
441 & 457 Coors Blvd NW
Grading & Drainage Plan and Drainage Report
Engineer's Stamp Date: 06/10/21
Hydrology File: J10D049

Dear Mr. Bohannan:

PO Box 1293

Albuquerque

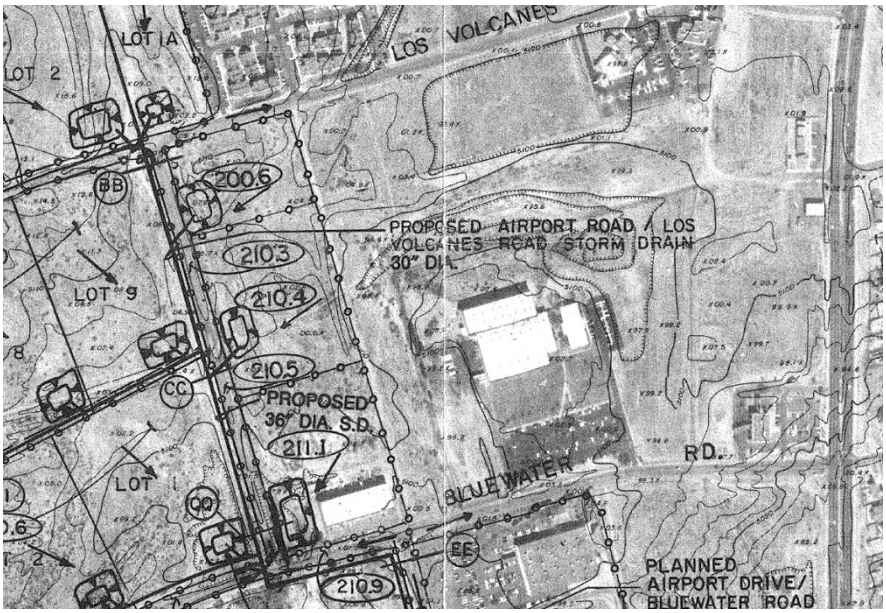
NM 87103

www.cabq.gov

Based upon the information provided in your submittal received 06/10/2021, the Grading & Drainage Plan and Drainage Report **are not** approved for Building Permit and action by the DRB on Preliminary Plat or Site Plan for Building Permit. The following comments need to be addressed for approval of the above referenced project:

Drainage Report

1. Under Existing Conditions, the report states, " This site lies within the Atrisco Business Park Master Plan…..". This is false, below is the basin map from the report and this site is not in the report area. However as noted, the existing 60-in public storm pipe stops on the project's site without any City's plans to extend the storm system. Therefore this site will be able to freely discharge into this existing 60-in with no problem since there is plenty of capacity. Please discharge into a revised stormwater quality pond prior to the connection to this existing pipe. (see below for the as-builts of that existing 60-in pipe)



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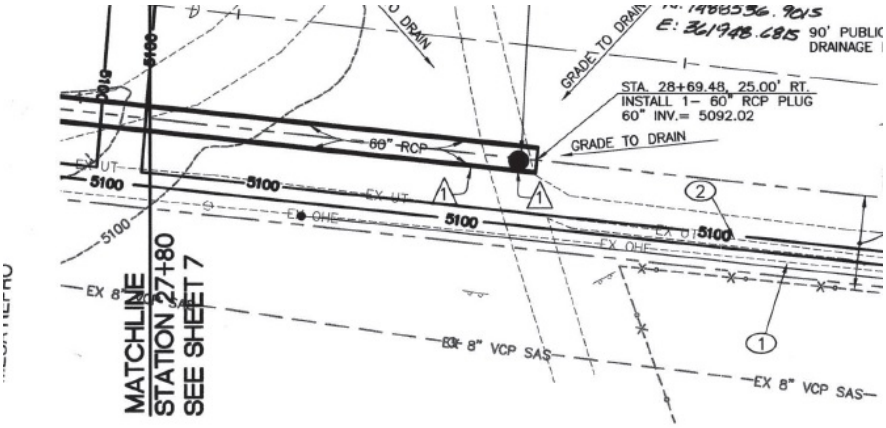

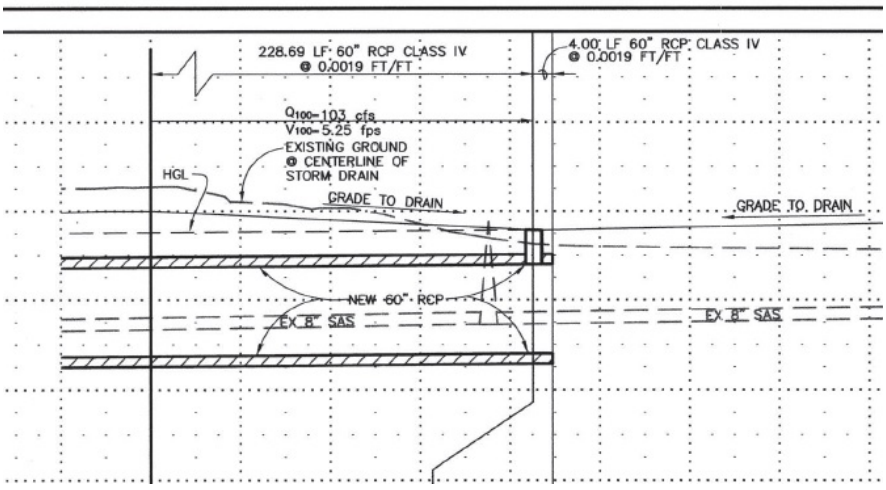

2. Since the site can freely discharge into the existing 60-in storm pipe, please remove and update all reference and calculation related to the detention ponds since they are no longer needed.

Grading & Drainage Plan

3. Since the site can freely discharge into the existing 60-in storm pipe, please remove and update all reference to the detention ponds since they are no longer needed. Also you may want to ask the architect if they wish to do something with this area since the detention ponds are not needed. Please remember to discharge into a revised stormwater quality ponds prior to the connection to this existing pipe.

4. Sheet 2.1 & 2.2. Please add what kind of spot elevations these are. (i.e. top of curb, flow line, or top of pavement).

5. Sheet 2.1& 2.2. Please add the top of grate elevation where there is a grate. It is hard to keep turning to the storm pipe sheet for that information.

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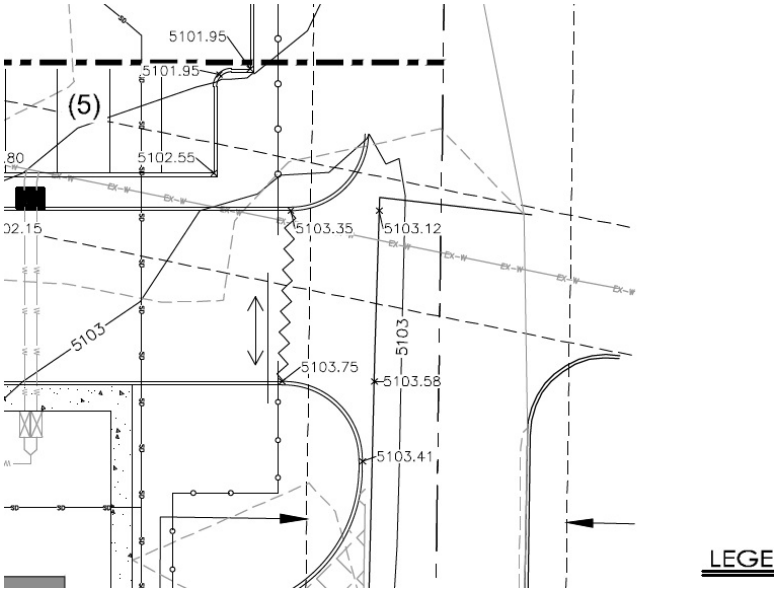
6. Sheet 2.1. I noticed that the existing asphalt is cracked and not completely straight as shown the photo below. Please show where there will be a saw cut on the existing pavement. Also please indicate the existing top of pavement along the saw cut. Since this work is also on the adjacent property, please provide a notarized letter stating that this work can be done by that property owner. Also please provided the top of curb information at the end of the radius on this drive entrance.

7. Sheet 2.2. I believe that the existing edge of the asphalt is partially shown but please show the entire edge of it as shown in the photo along with the top of curb for the other side of the adjacent entrance. Is there going to be some additional asphalt from the end of the proposed curb radius to the existing curb on the other side of the access drive? If so, then please provide the spot elevations needed to build this.



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8. Sheet 2.3. Depending on the new design, this storm pipe layout may change.

9. Sheet 2.4, 2.5, & 2.6. Please change the title from "Grading Details" to "Grading Enlarged Area". Also on Sheet 2.0, please show the these areas and label them to go to the correct sheet.

10. As a reminder, if the project total area of disturbance (including the staging area and any work within the adjacent Right-of-Way) is 1 acre or more, then an Erosion and Sediment Control (ESC) Plan and Owner's certified Notice of Intent (NOI) is required to be submitted to the Stormwater Quality Engineer (Doug Hughes, PE, jhughes@cabq.gov , 924-3420) 14 days prior to any earth disturbance.

11. Standard review fee of $300 (for DRB Site) will be required at the time of resubmittal.

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

Sincerely,

Renée C. Brissette

Renée C. Brissette, P.E. CFM
Senior Engineer, Hydrology
Planning Department

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)

Project Title: San Roque/ La Serena Building Permit #: _____ Hydrology File #: _____

DRB#: _____ EPC#: _____ Work Order#: _____

Legal Description: Tracts F-4-A & F-6-A-2 Atrisco Business Park Unit 3

City Address: 441 & 457 Coors Blvd NW

Applicant: Tierra West, LLC Contact: Vinny Perea

Address: 5571 Midway Park Place NE Albuquerque NM 87109

Phone#: 505-858-3100 Fax#: 505-858-1118 E-mail: vperea@tierrawestllc.com

Other Contact: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

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

IS THIS A RESUBMITTAL? _____ Yes __X__ 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
__X__ 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:

__X__ BUILDING PERMIT APPROVAL
____ CERTIFICATE OF OCCUPANCY

__X__ PRELIMINARY PLAT APPROVAL
____ SITE PLAN FOR SUB'D APPROVAL
__X__ SITE PLAN FOR BLDG. PERMIT APPROVAL
__X__ 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: 6/8/21 By: Vinny Perea

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: _____

FEE PAID: _____

DRAINAGE REPORT

San Roque & La Serena Developments
Albuquerque, NM

June 2021

Prepared by:
Tierra West, LLC
5571 Midway Park Place NE
Albuquerque, New Mexico 87109

Prepared for:
Thomas Development Co.
420 W. Main, Suite 300
Boise, Idaho 83702

I certify that this report was prepared under my supervision, and I am a registered professional engineer in the State of New Mexico in good standing.

06-10-21

Job No. 2017031

Table of Contents

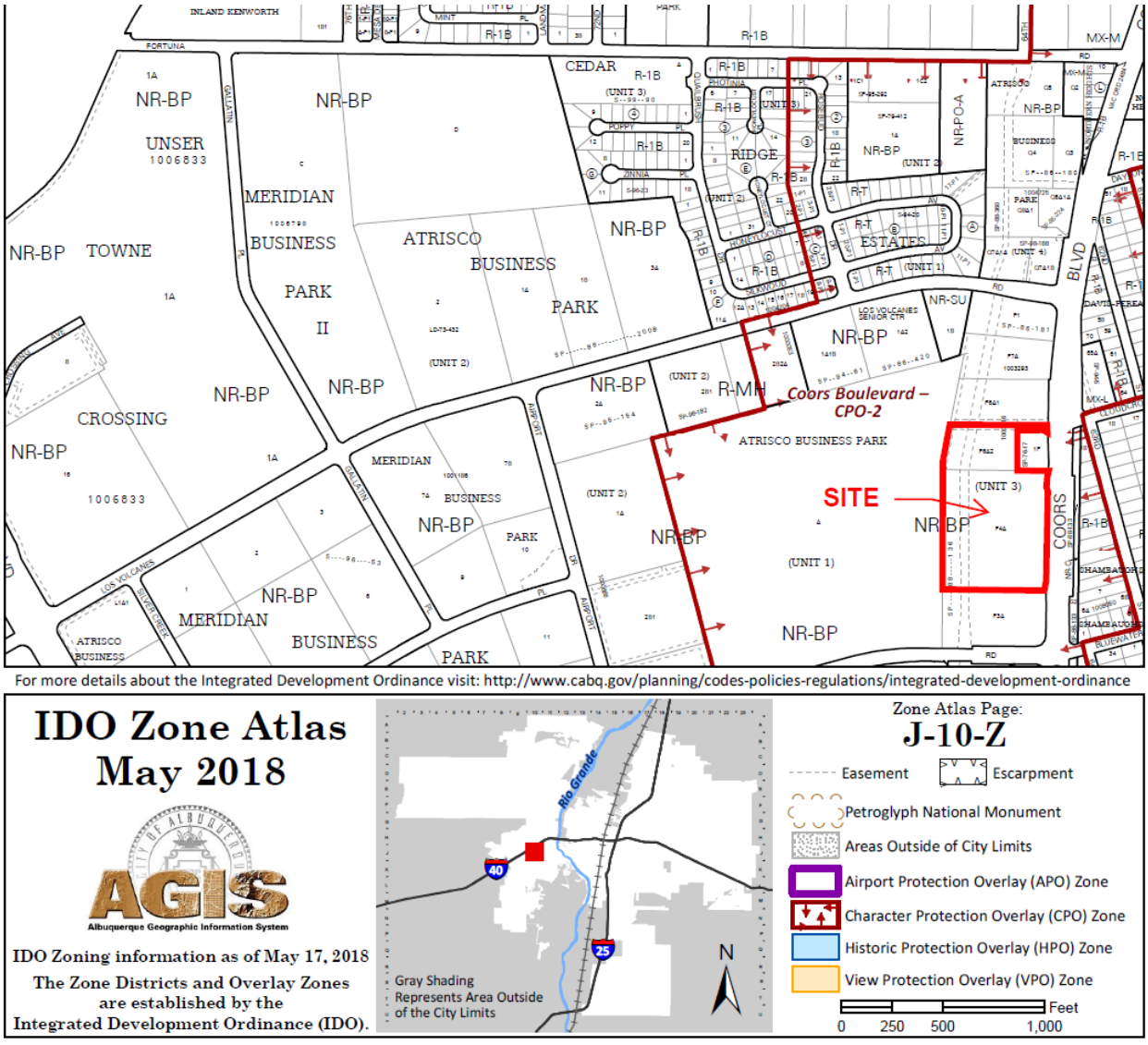
Appendices

1. Purpose & Project Background

The purpose of this report is to develop a Drainage Management Plan for two new developments known as San Roque and La Serena. San Roque is an affordable housing multi-family development consisting of a 4-story main resident building plus 7 garage loft buildings. La Serena is an affordable independent senior living development consisting of a 3-story main resident building plus 2 garage loft buildings. The two developments will share site access, parking and private drainage infrastructure (storm drains and ponds). The project will be heard by the Development Review Board for Site Plan for Building Permit, Replat for adjusting the lot line between two existing vacant lots, and Vacation of a 90'-Wide Public Drainage Easement along the west side of the site. Cross-lot private parking, drainage, and access easements will be granted for these two lots and developments during the replatting process with the DRB.

2. Location

The project site is located at the northwest corner of the Coors Blvd/Bluewater Rd intersection at 441 and 457 Coors Blvd NW. The two properties' legal descriptions are F-4-A and F-6-A 2 Atrisco Business Park Unit 3, totaling 8.95 acres in area. The site is bounded by The Bank of Albuquerque to the south, Thomas & Betts manufacturing warehouse to the west, Big Lots to the north, a gas station to the northeast, and Coors Blvd to the east. The site is currently vacant and undisturbed. As previously mentioned, the two existing vacant tracts of land will be replatted for properly placing the San Roque and La Serena buildings within legal property boundaries. Figure 1 and Figure 2 show the vicinity map as well as an aerial image of the site, respectively.



For more details about the Integrated Development Ordinance visit: http://www.cabq.gov/planning/codes-policies-regulations/integrated-development-ordinance

Figure 1: Vicinity Map

Figure 2: Site Aerial Image

3. Existing Conditions

The site is currently vacant and undeveloped with natural vegetation. The site is fairly flat with a majority of drainage runoff being retained onsite from various low points. There are various dirt roads used for vehicles traversing through the site and towards Bluewater Rd.

Basins E1 through E4 each have local low points within each basin for onsite runoff retention. Basin E1 and E4 include very small portions of the existing asphalt surface from the Bank of Albuquerque site. Basin E3 also contains a very small portion of existing asphalt from the drive aisle north of the site. Basin E5 slopes from NW to SE and surface flows 1.55 cfs into the Coors Blvd right-of-way. An existing drainage basin map and hydrology table can be found in Appendix A.

This site lies within the Atrisco Business park Master Plan, where developed runoff is limited to 0.1 cfs/acre. This is the discharge rate used for stormwater detention design of the development. There is an existing 90 ft-wide public drainage easement that runs along the west boundary of the site. The only existing public infrastructure within this easement is a manhole with beehive grate inlet located at the very NW corner of the site. This inlet is the most upstream end of a 60" RCP public storm drain from the "West Mesa Diversion Project Phase 2D" with engineering stamp date 11//15/2004. There is no other public infrastructure within this drainage easement and the City Department of Municipal Development has confirmed there are no future projects planned for utilizing this easement. This development therefore, will be moving forward with vacating this public drainage easement as part of the replatting process.

4. Flood Plain

The site is located on FIRM Map 35001C0329H. The map indicates that the site does not fall within any Special Flood Hazard Area. The site is considered an Area of Minimal Flood Hazard and will not require any flood insurance for the development. The FIRM Map for this area can be seen in Figure-3.

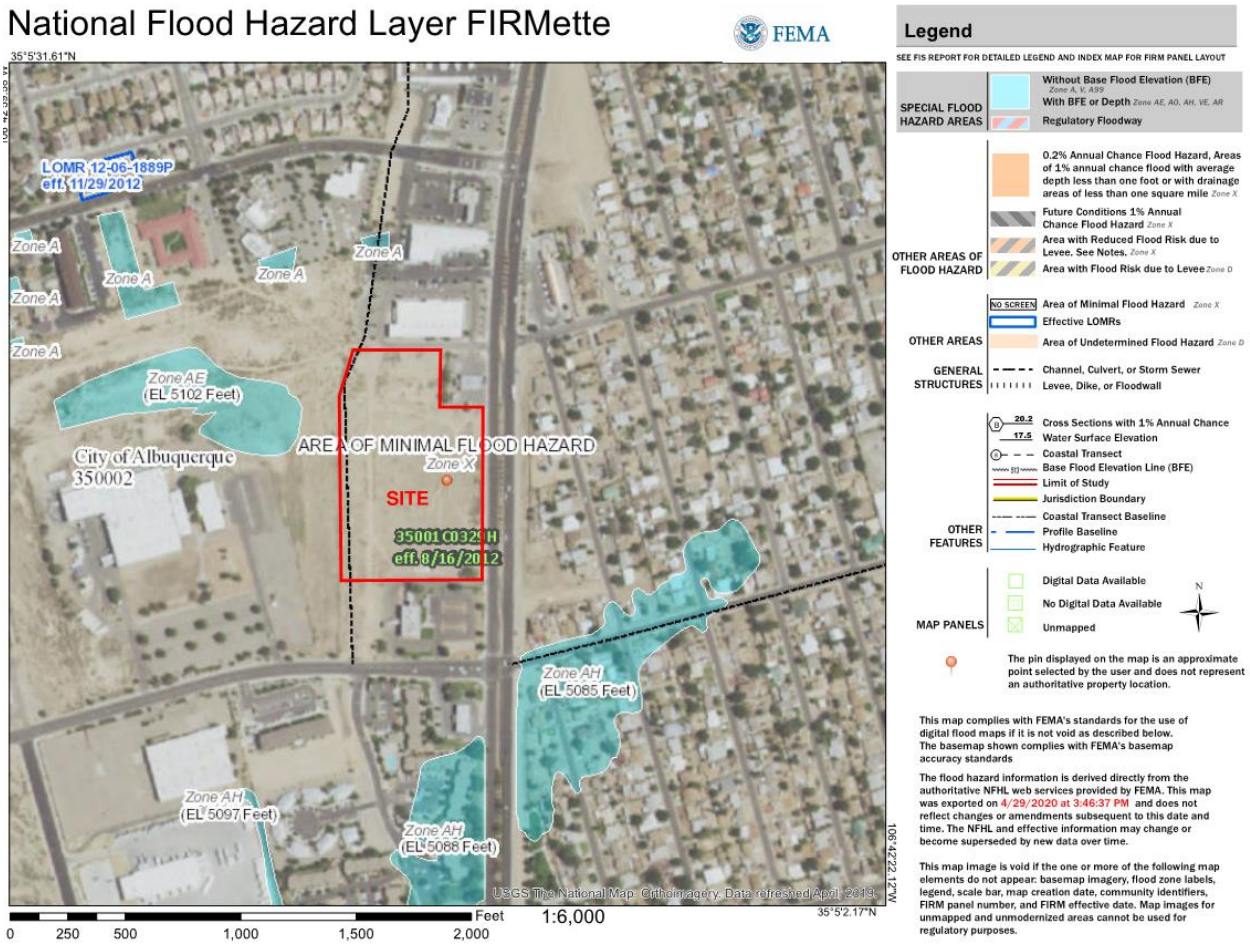


Figure 3: FEMA FIRM Map

5. Proposed Conditions

All improvements will be built out in their entirety. A phasing plan is being provided in the event that the San Roque development begins before La Serena. But the developer's intent is moving forward with building out both developments simultaneously. The grading and drainage plan is configured to accommodate the proposed buildings (3-story building, 4-story building, and 9 garage loft buildings), parking, drive aisles, sidewalks, and landscaping. A proposed drainage basin map and hydrology table can be found in Appendix B.

Basins P1 through P16 consist of a majority of the site improvements as well as roof drainage from the garage lofts. Each of these mentioned basins will convey runoff via surface flow towards a drainage inlet located within each respective basin private onsite storm drain network. Each of these private storm drain networks will then convey the received runoff towards an onsite private detention pond (Pond 3) that will be located along the western boundary of the site. The garage lofts' roof drainage is intended to have scuppers with downspouts that will daylight at finished grade and then surface flow to one of the

designated drainage inlets mentioned. Basins P11, P12, P14, P15 and P16 do not contain drainage inlets, but rather convey runoff via surface flow west towards the mentioned detention pond with a series of curb cuts along the westernmost parking spaces.

Basins RD1 through RD9 consist of the roof drainage for the San Roque main 4-story building. Basins RD10 through RD41 consist of the roof drainage for the La Serena main 3-story building. These roof drains will connect underground to the private onsite storm drain network and ultimately be conveyed to the west detention pond (Pond 3).

Basin P17 Consists of a portion of the southernmost garage loft roof drainage as well as the landscaping area adjacent to this garage loft. The landscaping area adjacent to this garage loft building will include a retention pond (Pond 1) for fully retaining this basin's runoff.

Basin P19 will be similar to P17, in the sense that the basin consist of a portion of the easternmost garage loft and the adjacent landscaping area. This landscaping area will also consist of a retention pond (Pond 2) for fully retaining this basin's runoff.

Basins P18 and P20 consist of the landscape areas east of the two main residential buildings. These two basins will convey runoff via surface flow east towards the Coors Blvd right-of way. The existing surface flow from this property that flows onto Coors is 1.55 cfs so these two developed basins will reduce this runoff amount to 0.37 cfs.

Basin P21 consists of the far west landscaping area onsite and detention pond (Pond 1). There is a proposed dog run area within this landscaping, so the detention pond is split into two and connected by an equalizing 24" culvert pipe to act as one single pond. The drainage collected in this pond will discharge towards the existing public drainage manhole at the NW corner of the site at a rate of 0.81 cfs, which is the allowable discharge per the Atrisco Business Park Master Plan (0.1 cfs/acre). The outfall of the pipe is raised from the bottom of the detention pond for stormwater quality retention and will control the flow rate through an orifice plate before reaching the existing public drainage manhole.

6. Stormwater Quality Management

The management of stormwater quality for this site intends to capture the "first flush" volume and retain onsite prior to any discharge off of the site. This volume was calculated per the COA drainage ordinance of new development projects as 0.44 inches over the total impervious areas of the site. Since the two onsite retention ponds (Pond 1 and 2) fully retain the runoff from their respective contributing basin (Basins P17 and P19), it is assumed that the stormwater quality of the impervious areas within these two basins are being handled appropriately.

The detention pond (Pond 3) will retain the stormwater quality for all the remaining basins with impervious area by raising the pond's outfall pipe to be above the bottom of the pond. This volume being

retained beneath the outfall invert elevation is 0.32 ac-ft, which is greater than the required stormwater quality retention volume of 0.21 ac-ft. The stormwater quality volume calculations for Pond 3 and stage-storage table showing the outfall pipe invert can be found in Appendix E.

7. Drainage Calculations

The Weighted E Method from Chapter 6 of the COA Development Process Manual dated June 8, 2020 was used to calculate the runoff and pond volumes for the site. The hydrology tables can be found in Appendices A and B.

Drainage capacities for the storm drain pipes were determined based on the 100-year, 6-hour storm event and using Bentley FlowMaster modeling software. A storm drain map along with a capacity table and modeling results can be found in Appendix C.

Drainage capacities for the storm drain inlets were determined based on the 100-year, 6-hour storm event and are based on drainage capacity charts for Nyloplast inlet grates, which are the intended grates and inlets to be used and called out specifically on the storm drain plan. This drainage inlet chart information can be found in Appendix D.

Volume requirements for the retention ponds were determined based on the 100-year, 10-day storm event. Pond stage-storage tables as well as the volume requirements calculations can be found in Appendix E.

Volume requirements for the detention ponds were determined based on the 100-year, 24-hour storm event. A stage-storage table was used for setting up the AHYMO modeling input information and the outfall discharge rate was determined based on that AHYMO modeling. The volume calculations, stage-storage table, and modeling output results can also be found in Appendix E.

8. Summary

The entire site will be graded and all proposed surface improvements and buildings will be built out in their entirety. The enclosed grading plan and storm drain plan shows the grades and drainage infrastructure for the entire project.

The proposed development consists of an affordable multi-family 4-story building, an independent senior living 3-story building, and 7 garage loft buildings. There are two onsite retentions ponds that will each hold runoff from two smaller onsite drainage basins while a larger detention pond will retain stormwater quality volume and attenuate runoff flow from the remaining onsite drainage basins. The allowable discharge rate from these detained basins is 0. 81 cfs, which is determined from the 0.1 cfs/acre rate

defined in the Atrisco Business Park Master Plan. This discharge rate will be controlled by an orifice plate on the outfall pipe in the detention pond and will connect to the existing public drainage manhole in the NW corner of the site.

APPENDIX A

HYDROLOGY TABLE AND DRAINAGE BASIN MAP – EXISTING CONDITIONS

DPM Weighted E Method

Precipitation Zone 1
NW Corner Coors/Bluewater
San Roque / La Serena Residential Living
TWLLC **VP** **Date** 5/3/2021

Existing Conditions

Basin Descriptions												100-Year, 6-Hr			10-Year, 6-Hr		
Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (in)	Volume (ac-ft)	Flow cfs	Weighted E (in)	Volume (ac-ft)	Flow cfs
E1	42,991.69	0.987	0.00154	100%	0.987	0%	0.000	0%	0.000	0%	0.000	0.440	0.036	1.27	0.080	0.007	0.24
E2	31,648.75	0.727	0.00114	100%	0.727	0%	0.000	0%	0.000	0%	0.000	0.440	0.027	0.94	0.080	0.005	0.17
E3	89,179.55	2.047	0.00320	97%	1.986	0%	0.000	0%	0.000	3%	0.061	0.486	0.083	2.83	0.115	0.020	0.65
E4	167,837.07	3.853	0.00602	98%	3.776	0%	0.000	0%	0.000	2%	0.077	0.471	0.151	5.21	0.103	0.033	1.13
E5	52468.83	1.205	0.00188	100%	1.205	0%	0.000	0%	0.000	0%	0.000	0.440	0.044	1.55	0.080	0.008	0.29
Total	**384,125.89**	**8.818**	**0.01378**		**8.680**		**0.000**		**0.000**		**0.138**		**0.341**	**11.80**		**0.072**	**2.48**

TRACT A
ATRISCO BUSINESS PARK, UNIT 1
FD. 10-31-1972, BK. D5, PG. 62

5104.000
5103.000
5105.000
5102.000
5104.000
5102.000
5103.000
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5101.000
5102.000
5101.000
5099.000
5097.000
5103.000
5100.000
5101.000
5104.000
5104.000

E1
0.987
1.27

E2
0.727
0.94

E3
2.047
2.83

E4
3.853
5.21

E5
1.205
1.55

LEGEND

BASIN ID
AREA (AC)
FLOW (CFS)

ASPHALT PAVEMENT
ASPHALT PAVEMENT
ASPHALT PAVEMENT
ASPHALT PAVEMENT
ASPHALT PAVEMENT
ASPHALT PAVEMENT

CURB
SIDEWALK
CURB
CURB
SIDEWALK
CURB

LOT 1-F
ATRISCO BUSINESS PARK, UNIT 1
FD. 1-30-1976, BK. C11, PG. 13

TRACT F-6-A-1
ATRISCO BUSINESS PARK, UNIT 3
FD. 12-15-2004, BK. 2004C, PG. 388

COORS BOULEVARD N.W.
120' PUBLIC R.O.W.

EXISTING BASIN MAP

APPENDIX B

HYDROLOGY TABLE AND DRAINAGE BASIN MAP – PROPOSED CONDITIONS

DPM Weighted E Method

Precipitation Zone 1
NW Corner Coors/Bluewater
San Roque / La Serena Residential Living
TWLLC **VP** **Date** 5/3/2021

Proposed Conditions

Basin Descriptions												100-Year, 6-Hr			10-Year, 6-Hr		
Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A %	Treatment A (acres)	Treatment B %	Treatment B (acres)	Treatment C %	Treatment C (acres)	Treatment D %	Treatment D (acres)	Weighted E (in)	Volume (ac-ft)	Flow cfs	Weighted E (in)	Volume (ac-ft)	Flow cfs
P1	7,691.19	0.177	0.00028	0%	0.000	10%	0.018	0%	0.000	90%	0.159	1.840	0.027	0.73	1.138	0.017	0.47
P2	16,278.42	0.374	0.00058	0%	0.000	18%	0.067	0%	0.000	82%	0.306	1.736	0.054	1.48	1.056	0.033	0.94
P3	14,794.54	0.340	0.00053	0%	0.000	17%	0.058	0%	0.000	83%	0.282	1.749	0.050	1.35	1.067	0.030	0.86
P4	14,483.42	0.332	0.00052	0%	0.000	13%	0.043	0%	0.000	87%	0.289	1.801	0.050	1.35	1.107	0.031	0.87
P5	7,383.32	0.169	0.00026	0%	0.000	11%	0.019	0%	0.000	89%	0.151	1.827	0.026	0.70	1.128	0.016	0.45
P6	12,052.54	0.277	0.00043	0%	0.000	21%	0.058	0%	0.000	79%	0.219	1.697	0.039	1.07	1.026	0.024	0.68
P7	5,575.24	0.128	0.00020	0%	0.000	28%	0.036	0%	0.000	72%	0.092	1.606	0.017	0.48	0.954	0.010	0.29
P8	9,042.76	0.208	0.00032	0%	0.000	13%	0.027	0%	0.000	87%	0.181	1.801	0.031	0.84	1.107	0.019	0.54
P9	14,114.99	0.324	0.00051	0%	0.000	15%	0.049	0%	0.000	85%	0.275	1.775	0.048	1.30	1.087	0.029	0.83
P10	8,028.43	0.184	0.00029	0%	0.000	15%	0.028	0%	0.000	85%	0.157	1.775	0.027	0.74	1.087	0.017	0.47
P11	28,719.66	0.659	0.00103	0%	0.000	16%	0.105	0%	0.000	84%	0.554	1.762	0.097	2.63	1.077	0.059	1.68
P12	8,739.13	0.201	0.00031	0%	0.000	36%	0.072	0%	0.000	64%	0.128	1.502	0.025	0.71	0.873	0.015	0.43
P13	28,375.07	0.651	0.00102	0%	0.000	39%	0.254	0%	0.000	61%	0.397	1.463	0.079	2.25	0.842	0.046	1.34
P14	10,531.23	0.242	0.00038	0%	0.000	11%	0.027	0%	0.000	89%	0.215	1.827	0.037	0.99	1.128	0.023	0.64
P15	15,577.30	0.358	0.00056	0%	0.000	8%	0.029	0%	0.000	92%	0.329	1.866	0.056	1.50	1.158	0.035	0.97
P16	15,688.64	0.360	0.00056	0%	0.000	13%	0.047	0%	0.000	87%	0.313	1.801	0.054	1.46	1.107	0.033	0.94
P17	3,600.95	0.083	0.00013	0%	0.000	75%	0.062	0%	0.000	25%	0.021	0.995	0.007	0.22	0.475	0.003	0.11
P18	3,967.36	0.091	0.00014	0%	0.000	100%	0.091	0%	0.000	0%	0.000	0.670	0.005	0.18	0.220	0.002	0.07
P19	13,683.90	0.314	0.00049	0%	0.000	85%	0.267	0%	0.000	15%	0.047	0.865	0.023	0.75	0.373	0.010	0.34
P20	3,457.80	0.079	0.00012	0%	0.000	86%	0.068	0%	0.000	14%	0.011	0.852	0.006	0.19	0.363	0.002	0.08
P21	49,968.23	1.147	0.00179	0%	0.000	75%	0.860	25%	0.287	0%	0.000	0.750	0.072	2.57	0.275	0.026	1.08
P22a	8,682.12	0.199	0.00031	0%	0.000	68%	0.136	0%	0.000	32%	0.064	1.086	0.018	0.55	0.546	0.009	0.29
P22b	11,632.81	0.267	0.00042	0%	0.000	68%	0.182	0%	0.000	32%	0.085	1.086	0.024	0.74	0.546	0.012	0.38
RD1	3,672.05	0.084	0.00013	0%	0.000	0%	0.000	0%	0.000	100%	0.084	1.970	0.014	0.37	1.240	0.009	0.24
RD2	4,315.67	0.099	0.00015	0%	0.000	0%	0.000	0%	0.000	100%	0.099	1.970	0.016	0.43	1.240	0.010	0.29
RD3	4,622.01	0.106	0.00017	0%	0.000	0%	0.000	0%	0.000	100%	0.106	1.970	0.017	0.46	1.240	0.011	0.31
RD4	4,997.38	0.115	0.00018	0%	0.000	0%	0.000	0%	0.000	100%	0.115	1.970	0.019	0.50	1.240	0.012	0.33
RD5	4,594.55	0.105	0.00016	0%	0.000	0%	0.000	0%	0.000	100%	0.105	1.970	0.017	0.46	1.240	0.011	0.30
RD6	4,674.24	0.107	0.00017	0%	0.000	0%	0.000	0%	0.000	100%	0.107	1.970	0.018	0.47	1.240	0.011	0.31
RD7	4,031.14	0.093	0.00014	0%	0.000	0%	0.000	0%	0.000	100%	0.093	1.970	0.015	0.40	1.240	0.010	0.27
RD8	4,427.19	0.102	0.00016	0%	0.000	0%	0.000	0%	0.000	100%	0.102	1.970	0.017	0.44	1.240	0.011	0.29
RD9	6,419.02	0.147	0.00023	0%	0.000	0%	0.000	0%	0.000	100%	0.147	1.970	0.024	0.64	1.240	0.015	0.43
RD10	193.26	0.004	0.00001	0%	0.000	0%	0.000	0%	0.000	100%	0.004	1.970	0.001	0.02	1.240	0.000	0.01
RD11	643.51	0.015	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.015	1.970	0.002	0.06	1.240	0.002	0.04
RD12	746.43	0.017	0.00003	0%	0.000	0%	0.000	0%	0.000	100%	0.017	1.970	0.003	0.07	1.240	0.002	0.05
RD13	734.18	0.017	0.00003	0%	0.000	0%	0.000	0%	0.000	100%	0.017	1.970	0.003	0.07	1.240	0.002	0.05
RD14	609.59	0.014	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.014	1.970	0.002	0.06	1.240	0.001	0.04
RD15	609.29	0.014	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.014	1.970	0.002	0.06	1.240	0.001	0.04
RD16	655.19	0.015	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.015	1.970	0.002	0.07	1.240	0.002	0.04

Basin Descriptions												100-Year, 6-Hr			10-Year, 6-Hr		
Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (in)	Volume (ac-ft)	Flow cfs	Weighted E (in)	Volume (ac-ft)	Flow cfs
				%	(acres)	%	(acres)	%	(acres)	%	(acres)						
RD17	735.41	0.017	0.00003	0%	0.000	0%	0.000	0%	0.000	100%	0.017	1.970	0.003	0.07	1.240	0.002	0.05
RD18	487.38	0.011	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.011	1.970	0.002	0.05	1.240	0.001	0.03
RD19	487.35	0.011	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.011	1.970	0.002	0.05	1.240	0.001	0.03
RD20	600.71	0.014	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.014	1.970	0.002	0.06	1.240	0.001	0.04
RD21	643.47	0.015	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.015	1.970	0.002	0.06	1.240	0.002	0.04
RD22	598.36	0.014	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.014	1.970	0.002	0.06	1.240	0.001	0.04
RD23	598.36	0.014	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.014	1.970	0.002	0.06	1.240	0.001	0.04
RD24	597.16	0.014	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.014	1.970	0.002	0.06	1.240	0.001	0.04
RD25	597.16	0.014	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.014	1.970	0.002	0.06	1.240	0.001	0.04
RD26	643.44	0.015	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.015	1.970	0.002	0.06	1.240	0.002	0.04
RD27	201.07	0.005	0.00001	0%	0.000	0%	0.000	0%	0.000	100%	0.005	1.970	0.001	0.02	1.240	0.000	0.01
RD28	2,111.66	0.048	0.00008	0%	0.000	0%	0.000	0%	0.000	100%	0.048	1.970	0.008	0.21	1.240	0.005	0.14
RD29	714.85	0.016	0.00003	0%	0.000	0%	0.000	0%	0.000	100%	0.016	1.970	0.003	0.07	1.240	0.002	0.05
RD30	2,421.40	0.056	0.00009	0%	0.000	0%	0.000	0%	0.000	100%	0.056	1.970	0.009	0.24	1.240	0.006	0.16
RD31	594.34	0.014	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.014	1.970	0.002	0.06	1.240	0.001	0.04
RD32	594.34	0.014	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.014	1.970	0.002	0.06	1.240	0.001	0.04
RD33	2,697.24	0.062	0.00010	0%	0.000	0%	0.000	0%	0.000	100%	0.062	1.970	0.010	0.27	1.240	0.006	0.18
RD34	2,843.06	0.065	0.00010	0%	0.000	0%	0.000	0%	0.000	100%	0.065	1.970	0.011	0.29	1.240	0.007	0.19
RD35	594.68	0.014	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.014	1.970	0.002	0.06	1.240	0.001	0.04
RD36	593.81	0.014	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.014	1.970	0.002	0.06	1.240	0.001	0.04
RD37	2,419.29	0.056	0.00009	0%	0.000	0%	0.000	0%	0.000	100%	0.056	1.970	0.009	0.24	1.240	0.006	0.16
RD38	593.85	0.014	0.00002	0%	0.000	0%	0.000	0%	0.000	100%	0.014	1.970	0.002	0.06	1.240	0.001	0.04
RD39	1,788.58	0.041	0.00006	0%	0.000	0%	0.000	0%	0.000	100%	0.041	1.970	0.007	0.18	1.240	0.004	0.12
RD40	200.87	0.005	0.00001	0%	0.000	0%	0.000	0%	0.000	100%	0.005	1.970	0.001	0.02	1.240	0.000	0.01
RD41	179.78	0.004	0.00001	0%	0.000	0%	0.000	0%	0.000	100%	0.004	1.970	0.001	0.02	1.240	0.000	0.01
Total	**382,551.37**	**8.782**	**0.01372**		**0.000**		**2.601**		**0.287**		**5.894**		**1.137**	**31.86**		**0.667**	**19.44**

TRACT A
ATRISCO BUSINESS PARK, UNIT 1
FD. 10-31-1972, BK. D5, PG. 62

P21 1.147 2.57

P16 0.360 1.46

P15 0.358 1.50

P14 0.242 0.99

P11 0.659 2.63

P3 0.340 1.35

P4 0.332 1.35

P10 0.184 0.74

P9 0.324 1.30

P12 0.201 0.71

P17 0.083 0.22

RD4 0.115 0.50

P22b 0.267 0.74

RD5 0.105 0.46

P5 0.169 0.70

RD3 0.106 0.46

RD6 0.107 0.47

P8 0.208 0.84

P13 0.651 2.25

P2 0.374 1.48

P6 0.277 1.07

RD2 0.099 0.43

P22a 0.199 0.55

RD7 0.093 0.40

P7 0.128 0.48

P1 0.177 0.73

RD1 0.084 0.37

RD9 0.147 0.64

RD8 0.102 0.44

P19 0.314 0.75

P18 0.091 0.18

P20 0.079 0.19

RD41 0.004 0.02
RD20 0.014 0.06
RD21 0.015 0.06
RD22 0.014 0.06
RD23 0.014 0.06
RD24 0.014 0.06
RD25 0.014 0.06
RD26 0.015 0.06
RD19 0.011 0.05
RD32 0.056 0.24
RD38 0.041 0.18
RD18 0.011 0.05
RD34 0.085 0.29
RD33 0.014 0.06
RD36 0.014 0.06
RD35 0.014 0.06
RD40 0.005 0.02
RD17 0.017 0.07
RD43 0.082 0.27
RD16 0.015 0.07
RD15 0.014 0.06
RD37 0.014 0.06
RD14 0.014 0.06
RD31 0.014 0.06
RD13 0.017 0.07
R30 0.056 0.24
RD12 0.017 0.07
RD29 0.016 0.07
RD11 0.015 0.06
R28 0.043 0.21
RD10 0.004 0.02
RD27 0.005 0.02

VAN VAN

NVA

T

ASPHALT PAVEMENT

CURB

SIDEWALK

COORS BOULEVARD N.W.
120' PUBLIC R.O.W.

LOT 1-F
ATRISCO BUSINESS PARK, UNIT 1
FD. 1-30-1976, BK. C11, PG. 13

TRACT F-6-A-1
ATRISCO BUSINESS PARK, UNIT 3
FD. 12-15-2004, BK. 2004C, PG. 38B

LEGEND

BASIN ID
AREA (AC)
FLOW (CFS)

PROPOSED BASIN MAP

APPENDIX C

STORM DRAIN MAP AND HYDRAULICS CALCULATIONS

TRACT A
ATRISCO BUSINESS PARK, UNIT 1
FD. 10-31-1972, BK. D5, PG. 62

Ex. SD Manhole

6" Pipe Outfall

24" Pond Equalizing Pipe

Ex. 60" RCP SD

SD-1 SD-2 SD-3 SD-4 SD-5 SD-6 SD-7 SD-8 SD-9 SD-10 SD-11 SD-12 SD-13 SD-14 SD-15 SD-16 SD-17 SD-18 SD-19 SD-20 SD-21a SD-21b SD-21c SD-21d SD-22 SD-23 SD-24 SD-25 SD-26 SD-27 SD-28 SD-29 SD-30 SD-31 SD-32 SD-33 SD-34 SD-35 SD-36 SD-37 SD-38 SD-39 SD-40 SD-41 SD-42 SD-43 SD-44 SD-45 SD-46 SD-47 SD-48 SD-49 SD-50 SD-51 SD-52 SD-53 SD-54 SD-55 SD-56 SD-57 SD-58 SD-59 SD-60 SD-61 SD-62 SD-63 SD-64 SD-65 SD-66 SD-67 SD-68 SD-69 SD-70 SD-71 SD-72 SD-73 SD-74 SD-75 SD-76 SD-77 SD-78 SD-79 SD-80 SD-81 SD-82 SD-83a SD-83b SD-84 SD-85 SD-86 SD-87 SD-88

ASPHALT PAVEMENT

CURB

SIDEWALK

ATRISCO BUSINESS PARK, UNIT 3
FD. 12-15-2004, BK. 2004C, PG. 388

LOT 1-F
ATRISCO BUSINESS PARK, UNIT 1
FD. 1-30-1976, BK. C11, PG. 13

COORS BOULEVARD N.W.
120' PUBLIC R.O.W.

STORM DRAIN MAP

Storm Drain Information Table						
Storm Drain ID	**Contributing Basin(s)**	**Contributing Flow (cfs)**	**Pipe Slope (%)**	**Pipe Material**	**Pipe Diameter (in.)**	**Pipe Capacity (cfs)**
SD-1	RD1	0.37	1.1	PVC	6	0.82
SD-2	P1, RD1	1.10	0.4	HDPE	12	3.15
SD-3	RD2	0.43	1.9	PVC	6	1.08
SD-4	P1, RD1-RD2	1.53	0.4	HDPE	12	3.15
SD-5	RD3	0.46	3.4	PVC	6	1.45
SD-6	P1, RD1-RD3	1.99	0.4	HDPE	12	3.15
SD-7	P1-P2, RD1-RD3	3.47	0.6	HDPE	12	3.86
SD-8	RD4	0.50	8.0	PVC	6	2.22
SD-9	P1-P2, RD1-RD4	3.97	0.8	HDPE	12	4.46
SD-10	P1-P3, RD1-RD4	5.32	1.2	HDPE	12	5.46
SD-11	RD8	0.44	1.5	PVC	6	0.96
SD-12	RD7	0.40	8.4	PVC	6	2.27
SD-13	RD7-RD8	0.84	1.5	HDPE	6	0.96
SD-14	P7	0.48	4.0	HDPE	12	9.96
SD-15	P7, RD7-RD8	1.32	0.4	HDPE	12	3.15
SD-16	RD6	0.47	4.7	PVC	6	1.70
SD-17	P6-P7, RD6-RD8	2.86	0.5	HDPE	12	3.52
SD-18	RD5	0.46	5.5	PVC	6	1.84
SD-19	P6-P7, RD5-RD8	3.32	0.5	HDPE	12	3.52
SD-20	P5-P7, RD5-RD8	4.02	0.8	HDPE	12	4.46
SD-21.a	RD9	0.64	1.44	HDPE	6	0.94
SD-21.b	P22A, RD9	1.19	1.44	HDPE	12	5.98
SD-21.c	P22A-P22B, RD9	1.93	1.44	HDPE	12	5.98
SD-21.d	P4-P7, P22, RD5-RD9	7.31	0.4	HDPE	18	9.29
SD-22	P8	0.84	0.4	HDPE	12	3.15
SD-23	P8-P9	2.14	0.4	HDPE	12	3.15
SD-24	P10	0.74	4.0	HDPE	12	9.96
SD-25	P8-P10	2.88	0.4	HDPE	12	3.15
SD-26	RD10	0.02	0.5	PVC	3	0.09
SD-27	RD11	0.06	1.6	PVC	3	0.16
SD-28	RD10-RD11	0.08	0.5	PVC	3	0.09

Storm Drain Information Table						
Storm Drain ID	Contributing Basin(s)	Contributing Flow (cfs)	Pipe Slope (%)	Pipe Material	Pipe Diameter (in.)	Pipe Capacity (cfs)
SD-29	RD12	0.07	2.8	PVC	3	0.21
SD-30	RD10-RD12	0.15	0.5	PVC	4	0.19
SD-31	RD13	0.07	3.9	PVC	3	0.24
SD-32	RD10-RD13	0.22	0.5	PVC	6	0.55
SD-33	RD14	0.06	5.2	PVC	3	0.28
SD-34	RD10-RD14	0.28	0.5	PVC	6	0.55
SD-35	RD15	0.06	5.8	PVC	3	0.30
SD-36	RD10-RD15	0.34	0.5	PVC	6	0.55
SD-37	RD16	0.07	7.0	PVC	3	0.33
SD-38	RD10-RD16	0.41	0.5	PVC	6	0.55
SD-39	RD17	0.07	4.6	PVC	3	0.27
SD-40	RD10-RD17	0.48	0.5	PVC	6	0.55
SD-41	RD18	0.05	24.7	PVC	3	0.61
SD-42	RD10-RD18	0.53	0.5	PVC	6	0.55
SD-43	RD19	0.05	29.5	PVC	3	0.67
SD-44	RD10-RD19	0.58	0.5	PVC	8	1.19
SD-45	RD20	0.06	7.5	PVC	3	0.34
SD-46	RD10-RD20	0.64	0.5	PVC	8	1.19
SD-47	RD21	0.06	14.1	PVC	3	0.46
SD-48	RD10-RD21	0.70	0.5	PVC	8	1.19
SD-49	RD22	0.06	15.4	PVC	3	0.48
SD-50	RD10-RD22	0.76	0.5	PVC	8	1.19
SD-51	RD23	0.06	16.0	PVC	3	0.49
SD-52	RD10-RD23	0.82	0.5	PVC	8	1.19
SD-53	RD24	0.06	17.3	PVC	3	0.51
SD-54	RD10-RD24	0.88	0.5	PVC	8	1.19
SD-55	RD25	0.06	17.9	PVC	3	0.52
SD-56	RD10-RD25	0.94	0.5	PVC	8	1.19
SD-57	RD26	0.06	19.2	PVC	3	0.54
SD-58	RD10-RD26	1.00	9.56	PVC	8	5.22
SD-59	RD27	0.02	0.50	PVC	3	0.08

Storm Drain Information Table						
Storm Drain ID	Contributing Basin(s)	Contributing Flow (cfs)	Pipe Slope (%)	Pipe Material	Pipe Diameter (in.)	Pipe Capacity (cfs)
SD-60	RD28	0.21	1.70	PVC	6	1.02
SD-61	RD27-RD28	0.23	0.54	PVC	6	0.55
SD-62	RD29	0.07	2.70	PVC	3	0.20
SD-63	RD27-RD29	0.30	0.54	PVC	6	0.55
SD-64	RD30	0.24	3.50	PVC	6	1.47
SD-65	RD27-RD30	0.54	0.54	PVC	6	0.55
SD-66	RD31	0.06	4.50	PVC	3	0.26
SD-67	RD27-RD31	0.60	0.54	PVC	8	1.19
SD-68	RD32	0.06	4.99	PVC	3	0.28
SD-69	RD27-RD32	0.66	0.54	PVC	8	1.19
SD-70	RD33	0.27	6.00	PVC	6	1.92
SD-71	RD27-RD33	0.93	0.54	PVC	8	1.19
SD-72	RD34	0.29	7.20	PVC	6	2.11
SD-73	RD27-RD34	1.22	0.54	PVC	12	3.52
SD-74	RD35	0.06	8.20	PVC	3	0.35
SD-75	RD27-RD35	1.28	0.54	PVC	12	3.52
SD-76	RD36	0.06	8.60	PVC	3	0.36
SD-77	RD27-RD36	1.34	0.54	PVC	12	3.52
SD-78	RD37	0.24	9.70	PVC	6	2.44
SD-79	RD27-RD37	1.58	0.54	PVC	12	3.52
SD-80	RD38	0.06	10.20	PVC	3	0.39
SD-81	RD27-RD38	1.64	0.54	PVC	12	3.52
SD-82	RD39	0.18	11.30	PVC	6	2.64
SD-83.a	RD27-RD39	1.82	9.44	PVC	12	15.31
SD-83.b	P13, RD27-39	4.07	0.70	HDPE	12	4.17
SD-84	RD40	0.02	37.50	PVC	3	0.76
SD-85	P13, RD27-RD40	4.09	0.70	HDPE	12	4.17
SD-86	RD41	0.02	39.10	PVC	3	0.77
SD-87	P13, RD27-RD41	4.11	0.70	HDPE	12	4.17
SD-88	P13, RD10-RD41	4.13	0.70	HDPE	12	4.17

Worksheet for 3" PVC Roof Drain @ 0.5% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.010	
Channel Slope	0.005 ft/ft	Min. Slope of all 3" Roof Drains
Diameter	3.0 in	
Discharge	0.08 cfs	Max. Contributing Flow of all 3" Roof Drains

Results	
Normal Depth	2.4 in
Flow Area	0.0 ft²
Wetted Perimeter	0.6 ft
Hydraulic Radius	0.9 in
Top Width	0.20 ft
Critical Depth	2.1 in
Percent Full	80.7 %
Critical Slope	0.007 ft/ft
Velocity	1.88 ft/s
Velocity Head	0.06 ft
Specific Energy	0.26 ft
Froude Number	0.716
Maximum Discharge	0.09 cfs
Discharge Full	0.08 cfs
Slope Full	0.005 ft/ft
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	0.0 %
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	2.4 in
Critical Depth	2.1 in
Channel Slope	0.005 ft/ft
Critical Slope	0.007 ft/ft

Worksheet for 4" PVC Roof Drain @ 0.5% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.005 ft/ft
Diameter	4.0 in
Discharge	0.15 cfs

Results	
Normal Depth	2.9 in
Flow Area	0.1 ft²
Wetted Perimeter	0.7 ft
Hydraulic Radius	1.2 in
Top Width	0.30 ft
Critical Depth	2.6 in
Percent Full	71.3 %
Critical Slope	0.006 ft/ft
Velocity	2.25 ft/s
Velocity Head	0.08 ft
Specific Energy	0.32 ft
Froude Number	0.845
Maximum Discharge	0.19 cfs
Discharge Full	0.17 cfs
Slope Full	0.004 ft/ft
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	0.0 %
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	2.9 in
Critical Depth	2.6 in
Channel Slope	0.005 ft/ft
Critical Slope	0.006 ft/ft

Worksheet for 6" PVC Roof Drain @ 0.5% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.005 ft/ft
Diameter	6.0 in
Discharge	0.53 cfs

Max. Contributing Flow at this pipe diameter and slope

Results	
Normal Depth	5.1 in
Flow Area	0.2 ft²
Wetted Perimeter	1.2 ft
Hydraulic Radius	1.8 in
Top Width	0.36 ft
Critical Depth	4.5 in
Percent Full	84.6 %
Critical Slope	0.007 ft/ft
Velocity	2.99 ft/s
Velocity Head	0.14 ft
Specific Energy	0.56 ft
Froude Number	0.752
Maximum Discharge	0.55 cfs
Discharge Full	0.52 cfs
Slope Full	0.005 ft/ft
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	36.9 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	5.1 in
Critical Depth	4.5 in
Channel Slope	0.005 ft/ft
Critical Slope	0.007 ft/ft

Worksheet for 6" PVC Roof Drain @ 0.54% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.010	
Channel Slope	0.005	ft/ft
Diameter	6.0	in
Discharge	0.54	cfs

Max. Contributing Flow at this pipe diameter and slope

Results		
Normal Depth	5.0	in
Flow Area	0.2	ft²
Wetted Perimeter	1.1	ft
Hydraulic Radius	1.8	in
Top Width	0.38	ft
Critical Depth	4.5	in
Percent Full	82.7	%
Critical Slope	0.007	ft/ft
Velocity	3.11	ft/s
Velocity Head	0.15	ft
Specific Energy	0.56	ft
Froude Number	0.810	
Maximum Discharge	0.58	cfs
Discharge Full	0.54	cfs
Slope Full	0.005	ft/ft
Flow Type	Subcritical	

GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.0	%
Normal Depth Over Rise	36.9	%
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	5.0	in
Critical Depth	4.5	in
Channel Slope	0.005	ft/ft
Critical Slope	0.007	ft/ft

Worksheet for 6" PVC Roof Drain @ 1.10% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.011 ft/ft
Diameter	6.0 in
Discharge	0.54 cfs

Results	
Normal Depth	3.7 in
Flow Area	0.1 ft²
Wetted Perimeter	0.9 ft
Hydraulic Radius	1.7 in
Top Width	0.49 ft
Critical Depth	4.5 in
Percent Full	62.0 %
Critical Slope	0.007 ft/ft
Velocity	4.22 ft/s
Velocity Head	0.28 ft
Specific Energy	0.59 ft
Froude Number	1.450
Maximum Discharge	0.82 cfs
Discharge Full	0.76 cfs
Slope Full	0.005 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	62.0 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.7 in
Critical Depth	4.5 in
Channel Slope	0.011 ft/ft
Critical Slope	0.007 ft/ft

Worksheet for 6" PVC Roof Drain @ 1.44% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.014 ft/ft
Diameter	6.0 in
Discharge	0.64 cfs

Results	
Normal Depth	3.8 in
Flow Area	0.1 ft²
Wetted Perimeter	0.9 ft
Hydraulic Radius	1.7 in
Top Width	0.48 ft
Critical Depth	4.9 in
Percent Full	63.5 %
Critical Slope	0.008 ft/ft
Velocity	4.87 ft/s
Velocity Head	0.37 ft
Specific Energy	0.69 ft
Froude Number	1.641
Maximum Discharge	0.94 cfs
Discharge Full	0.88 cfs
Slope Full	0.008 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	63.5 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.8 in
Critical Depth	4.9 in
Channel Slope	0.014 ft/ft
Critical Slope	0.008 ft/ft

Worksheet for 6" PVC Roof Drain @ 1.50% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.010	
Channel Slope	0.015	ft/ft
Diameter	6.0	in
Discharge	0.84	cfs

Max. Contributing Flow at this pipe diameter and slope

Results		
Normal Depth	4.6	in
Flow Area	0.2	ft²
Wetted Perimeter	1.1	ft
Hydraulic Radius	1.8	in
Top Width	0.42	ft
Critical Depth	5.4	in
Percent Full	77.1	%
Critical Slope	0.012	ft/ft
Velocity	5.17	ft/s
Velocity Head	0.42	ft
Specific Energy	0.80	ft
Froude Number	1.468	
Maximum Discharge	0.96	cfs
Discharge Full	0.89	cfs
Slope Full	0.013	ft/ft
Flow Type	Supercritical	

GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.0	%
Normal Depth Over Rise	77.1	%
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	4.6	in
Critical Depth	5.4	in
Channel Slope	0.015	ft/ft
Critical Slope	0.012	ft/ft

Worksheet for 6" PVC Roof Drain @ 1.70% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.017 ft/ft
Diameter	6.0 in
Discharge	0.21 cfs

Results	
Normal Depth	1.9 in
Flow Area	0.1 ft²
Wetted Perimeter	0.6 ft
Hydraulic Radius	1.1 in
Top Width	0.47 ft
Critical Depth	2.8 in
Percent Full	31.9 %
Critical Slope	0.004 ft/ft
Velocity	3.90 ft/s
Velocity Head	0.24 ft
Specific Energy	0.40 ft
Froude Number	2.020
Maximum Discharge	1.02 cfs
Discharge Full	0.95 cfs
Slope Full	0.001 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	31.9 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	1.9 in
Critical Depth	2.8 in
Channel Slope	0.017 ft/ft
Critical Slope	0.004 ft/ft

Worksheet for 6" PVC Roof Drain @ 1.90% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.019 ft/ft
Diameter	6.0 in
Discharge	0.43 cfs

Results	
Normal Depth	2.7 in
Flow Area	0.1 ft²
Wetted Perimeter	0.7 ft
Hydraulic Radius	1.4 in
Top Width	0.50 ft
Critical Depth	4.0 in
Percent Full	45.7 %
Critical Slope	0.006 ft/ft
Velocity	4.92 ft/s
Velocity Head	0.38 ft
Specific Energy	0.61 ft
Froude Number	2.073
Maximum Discharge	1.08 cfs
Discharge Full	1.01 cfs
Slope Full	0.003 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	45.7 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	2.7 in
Critical Depth	4.0 in
Channel Slope	0.019 ft/ft
Critical Slope	0.006 ft/ft

Worksheet for 8" PVC Roof Drain @ 0.5% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.005 ft/ft
Diameter	8.0 in
Discharge	0.94 cfs

Max. Contributing Flow at this pipe diameter and slope

Results	
Normal Depth	5.6 in
Flow Area	0.3 ft²
Wetted Perimeter	1.3 ft
Hydraulic Radius	2.4 in
Top Width	0.61 ft
Critical Depth	5.5 in
Percent Full	70.6 %
Critical Slope	0.005 ft/ft
Velocity	3.57 ft/s
Velocity Head	0.20 ft
Specific Energy	0.67 ft
Froude Number	0.956
Maximum Discharge	1.19 cfs
Discharge Full	1.11 cfs
Slope Full	0.004 ft/ft
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	43.2 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	5.6 in
Critical Depth	5.5 in
Channel Slope	0.005 ft/ft
Critical Slope	0.005 ft/ft

Worksheet for 8" PVC Roof Drain @ 0.54% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.010	
Channel Slope	0.005	ft/ft
Diameter	8.0	in
Discharge	0.93	cfs

Max. Contributing Flow at this pipe diameter and slope

Results		
Normal Depth	5.4	in
Flow Area	0.3	ft²
Wetted Perimeter	1.3	ft
Hydraulic Radius	2.3	in
Top Width	0.62	ft
Critical Depth	5.5	in
Percent Full	68.0	%
Critical Slope	0.005	ft/ft
Velocity	3.68	ft/s
Velocity Head	0.21	ft
Specific Energy	0.66	ft
Froude Number	1.016	
Maximum Discharge	1.24	cfs
Discharge Full	1.15	cfs
Slope Full	0.004	ft/ft
Flow Type	Supercritical	

GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.0	%
Normal Depth Over Rise	68.0	%
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	5.4	in
Critical Depth	5.5	in
Channel Slope	0.005	ft/ft
Critical Slope	0.005	ft/ft

Worksheet for 12" HDPE @ 0.4% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.004 ft/ft
Diameter	12.0 in
Discharge	2.88 cfs

Max. Contributing Flow at this pipe diameter and slope

Results	
Normal Depth	9.7 in
Flow Area	0.7 ft²
Wetted Perimeter	2.2 ft
Hydraulic Radius	3.7 in
Top Width	0.79 ft
Critical Depth	8.7 in
Percent Full	80.5 %
Critical Slope	0.005 ft/ft
Velocity	4.25 ft/s
Velocity Head	0.28 ft
Specific Energy	1.09 ft
Froude Number	0.811
Maximum Discharge	3.15 cfs
Discharge Full	2.93 cfs
Slope Full	0.004 ft/ft
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	38.7 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	9.7 in
Critical Depth	8.7 in
Channel Slope	0.004 ft/ft
Critical Slope	0.005 ft/ft

Worksheet for 12" HDPE @ 0.5% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.005 ft/ft
Diameter	12.0 in
Discharge	3.32 cfs

Max. Contributing Flow at this pipe diameter and slope

Results	
Normal Depth	10.0 in
Flow Area	0.7 ft²
Wetted Perimeter	2.3 ft
Hydraulic Radius	3.6 in
Top Width	0.75 ft
Critical Depth	9.4 in
Percent Full	83.3 %
Critical Slope	0.006 ft/ft
Velocity	4.75 ft/s
Velocity Head	0.35 ft
Specific Energy	1.18 ft
Froude Number	0.866
Maximum Discharge	3.52 cfs
Discharge Full	3.27 cfs
Slope Full	0.005 ft/ft
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	72.8 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	10.0 in
Critical Depth	9.4 in
Channel Slope	0.005 ft/ft
Critical Slope	0.006 ft/ft

Worksheet for 12" HDPE @ 0.54% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.005 ft/ft
Diameter	12.0 in
Discharge	1.64 cfs

Max. Contributing Flow at this pipe diameter and slope

Results	
Normal Depth	5.9 in
Flow Area	0.4 ft²
Wetted Perimeter	1.5 ft
Hydraulic Radius	3.0 in
Top Width	1.00 ft
Critical Depth	6.5 in
Percent Full	48.9 %
Critical Slope	0.004 ft/ft
Velocity	4.30 ft/s
Velocity Head	0.29 ft
Specific Energy	0.78 ft
Froude Number	1.225
Maximum Discharge	3.66 cfs
Discharge Full	3.40 cfs
Slope Full	0.001 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	48.9 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	5.9 in
Critical Depth	6.5 in
Channel Slope	0.005 ft/ft
Critical Slope	0.004 ft/ft

Worksheet for 12" HDPE @ 0.6% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.006 ft/ft
Diameter	12.0 in
Discharge	3.47 cfs

Results	
Normal Depth	9.5 in
Flow Area	0.7 ft²
Wetted Perimeter	2.2 ft
Hydraulic Radius	3.6 in
Top Width	0.81 ft
Critical Depth	9.6 in
Percent Full	79.2 %
Critical Slope	0.006 ft/ft
Velocity	5.20 ft/s
Velocity Head	0.42 ft
Specific Energy	1.21 ft
Froude Number	1.013
Maximum Discharge	3.86 cfs
Discharge Full	3.59 cfs
Slope Full	0.006 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	79.2 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	9.5 in
Critical Depth	9.6 in
Channel Slope	0.006 ft/ft
Critical Slope	0.006 ft/ft

Worksheet for 12" HDPE @ 0.7% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.010	
Channel Slope	0.007	ft/ft
Diameter	12.0	in
Discharge	4.13	cfs

Max. Contributing Flow at this pipe diameter and slope

Results		
Normal Depth	10.8	in
Flow Area	0.7	ft²
Wetted Perimeter	2.5	ft
Hydraulic Radius	3.6	in
Top Width	0.60	ft
Critical Depth	10.3	in
Percent Full	90.0	%
Critical Slope	0.007	ft/ft
Velocity	5.55	ft/s
Velocity Head	0.48	ft
Specific Energy	1.38	ft
Froude Number	0.878	
Maximum Discharge	4.17	cfs
Discharge Full	3.87	cfs
Slope Full	0.008	ft/ft
Flow Type	Subcritical	

GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.0	%
Normal Depth Over Rise	73.9	%
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	10.8	in
Critical Depth	10.3	in
Channel Slope	0.007	ft/ft
Critical Slope	0.007	ft/ft

Worksheet for 12" HDPE @ 0.8% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.008 ft/ft
Diameter	12.0 in
Discharge	4.02 cfs

Max. Contributing Flow at this pipe diameter and slope

Results	
Normal Depth	9.5 in
Flow Area	0.7 ft²
Wetted Perimeter	2.2 ft
Hydraulic Radius	3.6 in
Top Width	0.81 ft
Critical Depth	10.2 in
Percent Full	79.4 %
Critical Slope	0.007 ft/ft
Velocity	6.01 ft/s
Velocity Head	0.56 ft
Specific Energy	1.36 ft
Froude Number	1.164
Maximum Discharge	4.46 cfs
Discharge Full	4.14 cfs
Slope Full	0.008 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	79.4 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	9.5 in
Critical Depth	10.2 in
Channel Slope	0.008 ft/ft
Critical Slope	0.007 ft/ft

Worksheet for 12" HDPE @ 1.2% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.012 ft/ft
Diameter	12.0 in
Discharge	5.32 cfs

Results	
Normal Depth	10.5 in
Flow Area	0.7 ft²
Wetted Perimeter	2.4 ft
Hydraulic Radius	3.6 in
Top Width	0.67 ft
Critical Depth	11.2 in
Percent Full	87.2 %
Critical Slope	0.011 ft/ft
Velocity	7.32 ft/s
Velocity Head	0.83 ft
Specific Energy	1.70 ft
Froude Number	1.238
Maximum Discharge	5.46 cfs
Discharge Full	5.07 cfs
Slope Full	0.013 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	87.2 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	10.5 in
Critical Depth	11.2 in
Channel Slope	0.012 ft/ft
Critical Slope	0.011 ft/ft

Worksheet for 12" HDPE @ 1.44% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.014 ft/ft
Diameter	12.0 in
Discharge	1.93 cfs

Max. Contributing Flow at this pipe diameter and slope

Results	
Normal Depth	4.9 in
Flow Area	0.3 ft²
Wetted Perimeter	1.4 ft
Hydraulic Radius	2.6 in
Top Width	0.98 ft
Critical Depth	7.1 in
Percent Full	40.7 %
Critical Slope	0.004 ft/ft
Velocity	6.43 ft/s
Velocity Head	0.64 ft
Specific Energy	1.05 ft
Froude Number	2.052
Maximum Discharge	5.98 cfs
Discharge Full	5.56 cfs
Slope Full	0.002 ft/ft
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	40.7 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	4.9 in
Critical Depth	7.1 in
Channel Slope	0.014 ft/ft
Critical Slope	0.004 ft/ft

Worksheet for 18" HDPE @ 0.4% Slope

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.010
Channel Slope	0.004 ft/ft
Diameter	18.0 in
Discharge	7.31 cfs

Results	
Normal Depth	12.7 in
Flow Area	1.3 ft²
Wetted Perimeter	3.0 ft
Hydraulic Radius	5.3 in
Top Width	1.37 ft
Critical Depth	12.6 in
Percent Full	70.6 %
Critical Slope	0.004 ft/ft
Velocity	5.48 ft/s
Velocity Head	0.47 ft
Specific Energy	1.53 ft
Froude Number	0.978
Maximum Discharge	9.29 cfs
Discharge Full	8.64 cfs
Slope Full	0.003 ft/ft
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.0 %
Normal Depth Over Rise	32.1 %
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	12.7 in
Critical Depth	12.6 in
Channel Slope	0.004 ft/ft
Critical Slope	0.004 ft/ft

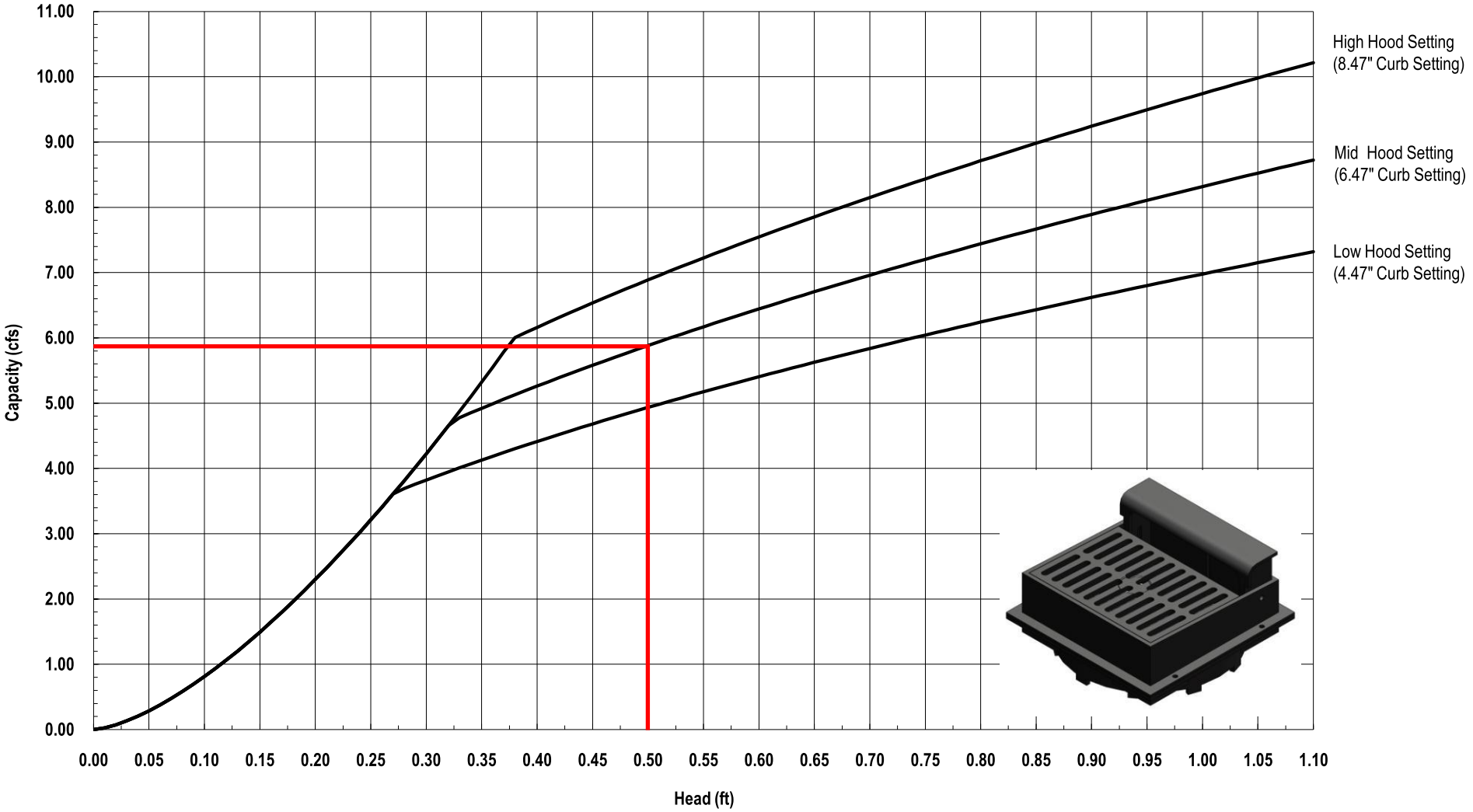
APPENDIX D

NYLOPLAST STORM INLETS TABLE AND CAPACITY CHARTS

Inlet Information Table					
Inlet ID	**Contributing Basin(s)**	**Contributing Flow (cfs)**	**Inlet/Grate Type***	**Inlet Capacity* (cfs)**	**50% Clogging Factor Inlet Capacity (cfs)**
1	P1	0.73	2'x2' Curb Inlet Standard Grate (Mid Hood)	5.95	2.97
2	P2	1.48	2'x2' Curb Inlet Standard Grate (Mid Hood)	5.95	2.97
3	P3	1.35	2'x2' Road & Highway Grate	6.50	3.25
4	P7	0.48	2'x2' Road & Highway Grate	6.50	3.25
5	P6	1.07	2'x2' Road & Highway Grate	6.50	3.25
6	P5	0.7	2'x2' Road & Highway Grate	6.50	3.25
7	P4	1.35	2'x2' Road & Highway Grate	6.50	3.25
8	P8	0.84	2'x2' Road & Highway Grate	6.50	3.25
9	P9	1.30	2'x2' Road & Highway Grate	6.50	3.25
10	P10	0.74	2'x2' Road & Highway Grate	6.50	3.25
11	P22b	0.74	12" Dome Grate	1.65	0.82
12	P22a	0.55	12" Dome Grate	1.65	0.82
13	P13	2.25	2'x2' Road & Highway Grate	6.50	3.25

*Based on Nyloplast Inlet Basin Information

Nyloplast 2' x 2' Curb Inlet Standard Grate Inlet Capacity Chart



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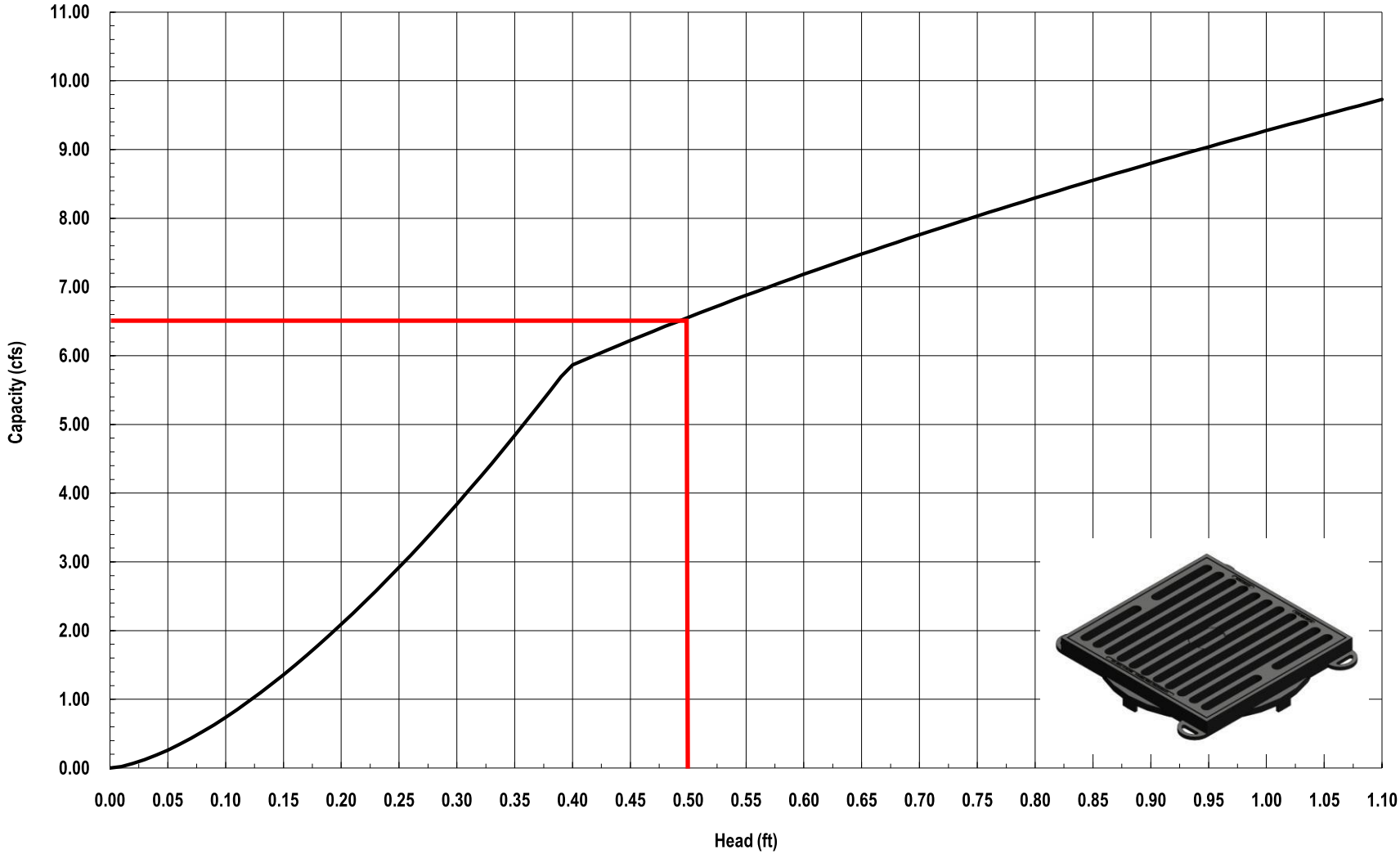
Nyloplast 2' x 2' Road & Highway Grate Inlet Capacity Chart



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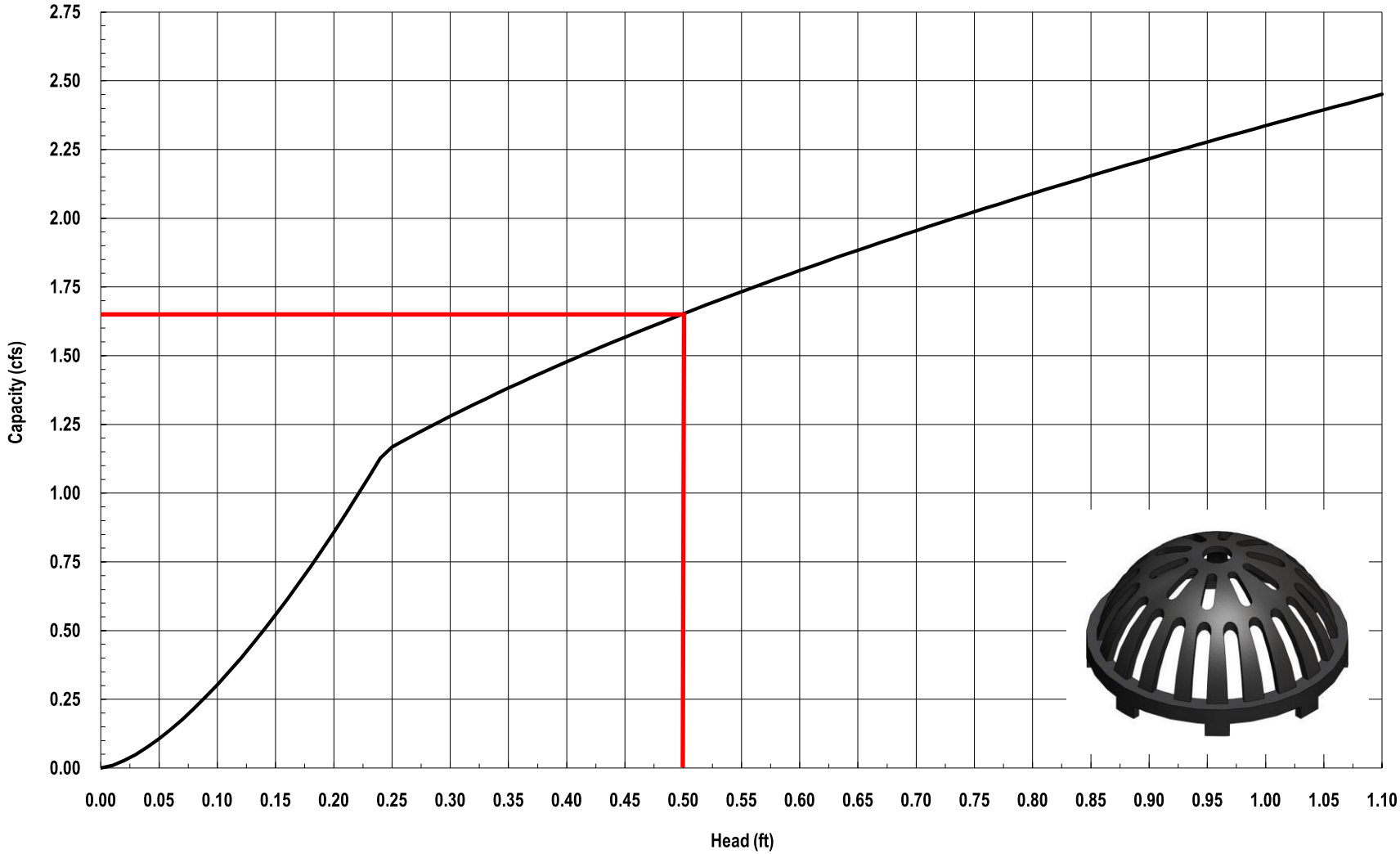
Nyloplast 12" Dome Grate Inlet Capacity Chart



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APPENDIX E

POND VOLUMES AND AHYMO MODELING

POND 1 (Full Retention)

Contributing Basins = P17

Contributing Basin Area = 0.083 acres

Land Treatment = 75% B, 25% D

V_{360} = Weighted E * Basin Area = 0.995 * 0.083 = 0.083 ac-in = 0.007 ac-ft

$V_{10Days} = V_{360} + A_D * (P_{10DAYS} - P_{360}) / 12$

$= 0.007 + .021 * (3.900 - 2.170) / 12 =$ **0.01 ac-ft = 435.60 ft^3**

Pond Volume Calculations

A_b - Bottom Of The Pond Surface Area

A_t - Top Of The Pond Surface Area

D - Water Depth

D_t - Total Pond Depth

C - Change In Surface Area / Water Depth

Volume = $A_b * D + 0.5 * C * D^2$

$C = (A_t - A_b) / D_t$

A_b = 326.00 ft^2

A_t = 1,088.00 ft^2

D_t = 2.00 ft

C = 381.00

ACTUAL ELEVATION	DEPTH (ft)	VOLUME (ac-ft)	Q (cfs)	Note
96.75	0.00	0.0000	0.0000	BOP
97.25	0.50	0.0048	0.0000	
97.75	1.00	0.0119	0.0000	MWSE
98.25	1.50	0.0211	0.0000	
98.75	2.00	0.0325	0.0000	TOP (1' Freeboard)

POND 2 (Full Retention)

Contributing Basins = P19 & P20

Contributing Basin Area = 0.394 acres

Land Treatment = 85% B, 15% D

V_{360} = Weighted E * Basin Area = 0.371 * 0.394 = 0.146 ac-in = 0.012 ac-ft

$V_{10Days} = V_{360} + A_D * (P_{10DAYS} - P_{360}) / 12$

= 0.012 + .058 * (3.900 - 2.170) / 12 = **0.02 ac-ft = 871.2 ft^3**

Pond Volume Calculations

A_b - Bottom Of The Pond Surface Area

A_t - Top Of The Pond Surface Area

D - Water Depth

D_t - Total Pond Depth

C - Change In Surface Area / Water Depth

Volume = $A_b * D + 0.5 * C * D^2$

$C = (A_t - A_b) / D_t$

A_b = 1,990.00 ft^2

A_t = 3,071.00 ft^2

D_t = 1.50 ft

C = 720.67

ACTUAL ELEVATION	DEPTH (ft)	VOLUME (ac-ft)	Q (cfs)	Note
99.25	0.00	0.0000	0.0000	BOP
99.75	0.50	0.0249	0.0000	MWSE
0.25	1.00	0.0540	0.0000	
0.75	1.50	0.0871	0.0000	TOP (1' Freeboard)

POND 3 (Detention)

Contributing Basins = P1-P16, P21, RD1-RD41

Contributing Basin Area = 8.215 acres = 0.01284 sq. miles

Land Treatment = 26% B, 3% C, 71% D

Maximum Outfall Discharge = 0.1 cfs/acre (Atrisco Business Park Master Plan)

= 0.1 * 8.215 = **0.8215 cfs**

Water Quality Volume = 0.42 in x Impervious Area

= 0.42 in x 5.85 ac =2.457 ac-in = **0.2048 ac-ft**

Pond Volume Calculations

A_b - Bottom Of The Pond Surface Area

A_t - Top Of The Pond Surface Area

D - Water Depth

D_t - Total Pond Depth

C - Change In Surface Area / Water Depth

Volume = $A_b * D + 0.5 * C * D^2$

$C = (A_t - A_b) / D_t$

A_b =	335.00	ft^2
A_t =	15,844.00	ft^2
D_t =	5.40	ft
C =	2872.04	

ACTUAL ELEVATION	DEPTH (ft)	VOLUME (ac-ft)	Q (cfs)	Note
92.50	0.00	0.0000	0.0000	BOP
93.00	0.50	0.0121	0.0000	
93.50	1.00	0.0407	0.0000	
94.00	1.50	0.0857	0.0000	
94.50	2.00	0.1472	0.0000	
95.00	2.50	0.2253	0.0000	
95.50	3.00	0.3198	0.0000	Outfall Invert
96.00	3.50	0.4308	0.3235	
96.50	4.00	0.5582	0.5114	
97.00	4.50	0.7022	0.6469	
97.50	5.00	0.8626	0.7586	
97.90	5.40	1.0143	0.8373	TOP

Orifice Equation

$Q = CA(2gH)^{1/2}$

C =	0.8
Diameter (in)	4
Area (ft^2)=	0.087
g =	32.2
H (ft) =	Depth of water above center of orifice
Q (cfs)=	Flow

POND 3 HYDRAULIC MODELING

```
        AHYMO PROGRAM (AHYMO-S4)                    - Version: S4.01a - Rel: 01a
             RUN DATE (MON/DAY/YR) = 06/04/2021
             START TIME (HR:MIN:SEC) = 13:06:55     USER NO.=
AHYMO_Temp_User:20122010
             INPUT FILE = \2020\2020010 Coors and Bluewater Zone
Change\Drainage\2020010 hymo 21-06-03.txt

    ************************************************************
    *              SAN ROQUE & LA SERENA, ALBUQUERQUE, NM      *
    ************************************************************
    *  100-YEAR 24-HR STORM (UNDER PROPOSED CONDITIONS) W/ ROUTING  *
    ************************************************************
    START               TIME=0.0
    *
    *
    RAINFALL            TYPE=2 RAIN QUARTER=0.0 IN
                        RAIN ONE=1.69 IN RAIN SIX=2.17 IN
                        RAIN DAY=2.49 IN DT=0.05 HR

                    24-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE
AREAS (NM & AZ) - D1
                    DT =   0.050000 HOURS       END TIME =    24.000002 HOURS
                      0.0000  0.0032  0.0065  0.0100  0.0138  0.0178  0.0222
                      0.0285  0.0385  0.0492  0.0603  0.0723  0.0845  0.0971
                      0.1101  0.1233  0.1379  0.1531  0.1696  0.1914  0.2158
                      0.2486  0.2857  0.3315  0.3926  0.4614  0.5802  0.7649
                      1.0813  1.3037  1.4791  1.5672  1.6444  1.6999  1.7441
                      1.7826  1.8108  1.8366  1.8580  1.8754  1.8909  1.9048
                      1.9178  1.9294  1.9403  1.9510  1.9613  1.9698  1.9746
                      1.9793  1.9839  1.9882  1.9925  1.9967  2.0008  2.0048
                      2.0087  2.0124  2.0162  2.0198  2.0234  2.0269  2.0303
                      2.0336  2.0369  2.0402  2.0433  2.0464  2.0495  2.0525
                      2.0555  2.0584  2.0613  2.0642  2.0670  2.0698  2.0725
                      2.0753  2.0780  2.0806  2.0833  2.0859  2.0884  2.0910
                      2.0935  2.0960  2.0985  2.1009  2.1033  2.1057  2.1081
                      2.1104  2.1128  2.1151  2.1173  2.1196  2.1218  2.1240
                      2.1262  2.1284  2.1306  2.1327  2.1348  2.1369  2.1390
                      2.1410  2.1431  2.1451  2.1471  2.1491  2.1511  2.1530
                      2.1550  2.1569  2.1588  2.1607  2.1626  2.1645  2.1663
                      2.1682  2.1700  2.1709  2.1718  2.1727  2.1736  2.1744
                      2.1753  2.1762  2.1771  2.1780  2.1789  2.1798  2.1807
                      2.1816  2.1824  2.1833  2.1842  2.1851  2.1860  2.1869
                      2.1878  2.1887  2.1896  2.1904  2.1913  2.1922  2.1931
                      2.1940  2.1949  2.1958  2.1967  2.1976  2.1984  2.1993
                      2.2002  2.2011  2.2020  2.2029  2.2038  2.2047  2.2056
                      2.2064  2.2073  2.2082  2.2091  2.2100  2.2109  2.2118
                      2.2127  2.2136  2.2144  2.2153  2.2162  2.2171  2.2180
                      2.2189  2.2198  2.2207  2.2216  2.2224  2.2233  2.2242
                      2.2251  2.2260  2.2269  2.2278  2.2287  2.2296  2.2304
```

```
                    2.2313  2.2322  2.2331  2.2340  2.2349  2.2358  2.2367
                    2.2376  2.2384  2.2393  2.2402  2.2411  2.2420  2.2429
                    2.2438  2.2447  2.2456  2.2464  2.2473  2.2482  2.2491
                    2.2500  2.2509  2.2518  2.2527  2.2536  2.2544  2.2553
                    2.2562  2.2571  2.2580  2.2589  2.2598  2.2607  2.2616
                    2.2624  2.2633  2.2642  2.2651  2.2660  2.2669  2.2678
                    2.2687  2.2696  2.2704  2.2713  2.2722  2.2731  2.2740
                    2.2749  2.2758  2.2767  2.2776  2.2784  2.2793  2.2802
                    2.2811  2.2820  2.2829  2.2838  2.2847  2.2856  2.2864
                    2.2873  2.2882  2.2891  2.2900  2.2909  2.2918  2.2927
                    2.2936  2.2944  2.2953  2.2962  2.2971  2.2980  2.2989
                    2.2998  2.3007  2.3016  2.3024  2.3033  2.3042  2.3051
                    2.3060  2.3069  2.3078  2.3087  2.3096  2.3104  2.3113
                    2.3122  2.3131  2.3140  2.3149  2.3158  2.3167  2.3176
                    2.3185  2.3193  2.3202  2.3211  2.3220  2.3229  2.3238
                    2.3247  2.3256  2.3265  2.3273  2.3282  2.3291  2.3300
                    2.3309  2.3318  2.3327  2.3336  2.3345  2.3353  2.3362
                    2.3371  2.3380  2.3389  2.3398  2.3407  2.3416  2.3425
                    2.3433  2.3442  2.3451  2.3460  2.3469  2.3478  2.3487
                    2.3496  2.3505  2.3513  2.3522  2.3531  2.3540  2.3549
                    2.3558  2.3567  2.3576  2.3585  2.3593  2.3602  2.3611
                    2.3620  2.3629  2.3638  2.3647  2.3656  2.3665  2.3673
                    2.3682  2.3691  2.3700  2.3709  2.3718  2.3727  2.3736
                    2.3745  2.3753  2.3762  2.3771  2.3780  2.3789  2.3798
                    2.3807  2.3816  2.3825  2.3833  2.3842  2.3851  2.3860
                    2.3869  2.3878  2.3887  2.3896  2.3905  2.3913  2.3922
                    2.3931  2.3940  2.3949  2.3958  2.3967  2.3976  2.3985
                    2.3993  2.4002  2.4011  2.4020  2.4029  2.4038  2.4047
                    2.4056  2.4065  2.4073  2.4082  2.4091  2.4100  2.4109
                    2.4118  2.4127  2.4136  2.4145  2.4153  2.4162  2.4171
                    2.4180  2.4189  2.4198  2.4207  2.4216  2.4225  2.4233
                    2.4242  2.4251  2.4260  2.4269  2.4278  2.4287  2.4296
                    2.4305  2.4313  2.4322  2.4331  2.4340  2.4349  2.4358
                    2.4367  2.4376  2.4385  2.4393  2.4402  2.4411  2.4420
                    2.4429  2.4438  2.4447  2.4456  2.4465  2.4473  2.4482
                    2.4491  2.4500  2.4509  2.4518  2.4527  2.4536  2.4545
                    2.4553  2.4562  2.4571  2.4580  2.4589  2.4598  2.4607
                    2.4616  2.4625  2.4633  2.4642  2.4651  2.4660  2.4669
                    2.4678  2.4687  2.4696  2.4705  2.4713  2.4722  2.4731
                    2.4740  2.4749  2.4758  2.4767  2.4776  2.4785  2.4793
                    2.4802  2.4811  2.4820  2.4829  2.4838  2.4847  2.4856
                    2.4865  2.4873  2.4882  2.4891  2.4900

*
*BASINS P1-P16, P2, & RD1-RD41
*
COMPUTE NM HYD      ID=1 HYD NO=100.1 AREA=0.01284 SQ MI
                    PER A=0.0 PER B=26.00 PER C=3.00 PER D=71.0
                    TP=-0.1333 HR MASS RAINFALL=-1
```

```
         K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
         UNIT PEAK =   35.992    CFS   UNIT VOLUME =   0.9988       B =   526.28
 P60 = 1.6900
         AREA =     0.009116 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


         K =  0.131022HR    TP =  0.133300HR    K/TP RATIO =  0.982913     SHAPE
CONSTANT, N =  3.592450
         UNIT PEAK =   9.1350    CFS   UNIT VOLUME =   0.9997       B =   327.02
 P60 = 1.6900
         AREA =     0.003724 SQ MI    IA =   0.48448 INCHES    INF =   1.20655
INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD           ID=1 CODE=1

                                      PARTIAL HYDROGRAPH   100.10


        RUNOFF VOLUME =     1.80706 INCHES     =       1.2375 ACRE-FEET
        PEAK DISCHARGE RATE =      28.77 CFS  AT   1.500 HOURS   BASIN AREA =
0.0128 SQ. MI.



    *
    *
    *ROUTE COMBINED BASINS TO POND 3
    *
    ROUTE RESERVOIR     ID=11 HYD NO=101.1 INFLOW ID=1 CODE=24
                        OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
                        00.0000      0.0000         5092.50
                        00.0100      0.0121         5093.00
                        00.0101      0.0407         5093.50
                        00.0102      0.0857         5094.00
                        00.0103      0.1472         5094.50
                        00.0104      0.2253         5095.00
                        00.0105      0.3198         5095.50
                        00.3235      0.4308         5096.00
                        00.5114      0.5582         5096.50
                        00.6469      0.7022         5097.00
                        00.7586      0.8626         5097.50
                        00.8373      1.0143         5097.90

      *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
```

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	5092.50	0.000	0.00
1.20	3.79	5093.76	0.064	0.01
2.40	1.39	5097.73	0.951	0.80
3.60	0.17	5097.63	0.911	0.78
4.80	0.17	5097.46	0.851	0.75
6.00	0.21	5097.30	0.797	0.71
7.20	0.10	5097.12	0.741	0.67
8.40	0.11	5096.94	0.686	0.63
9.60	0.10	5096.77	0.636	0.58
10.80	0.10	5096.61	0.591	0.54
12.00	0.11	5096.46	0.549	0.50
13.20	0.10	5096.32	0.513	0.44
14.40	0.11	5096.20	0.482	0.40
15.60	0.11	5096.09	0.454	0.36
16.80	0.10	5096.00	0.431	0.32
18.00	0.11	5095.92	0.412	0.27
19.20	0.11	5095.85	0.398	0.23
20.40	0.10	5095.80	0.387	0.20
21.60	0.11	5095.76	0.379	0.18
22.80	0.11	5095.74	0.372	0.16
24.00	0.10	5095.72	0.368	0.15
25.20	0.00	5095.66	0.356	0.11
26.40	0.00	5095.62	0.346	0.09
27.60	0.00	5095.59	0.339	0.06
28.80	0.00	5095.56	0.333	0.05
30.00	0.00	5095.54	0.329	0.04
31.20	0.00	5095.53	0.326	0.03
32.40	0.00	5095.52	0.324	0.02
33.60	0.00	5095.51	0.322	0.02
34.80	0.00	5095.50	0.320	0.01
36.00	0.00	5095.50	0.319	0.01
37.20	0.00	5095.49	0.318	0.01
38.40	0.00	5095.49	0.317	0.01
39.60	0.00	5095.48	0.316	0.01
40.80	0.00	5095.48	0.315	0.01
42.00	0.00	5095.47	0.314	0.01
43.20	0.00	5095.46	0.313	0.01
44.40	0.00	5095.46	0.312	0.01
45.60	0.00	5095.45	0.311	0.01
46.80	0.00	5095.45	0.310	0.01
48.00	0.00	5095.44	0.309	0.01
49.20	0.00	5095.44	0.308	0.01
50.40	0.00	5095.43	0.307	0.01
51.60	0.00	5095.43	0.306	0.01
52.80	0.00	5095.42	0.305	0.01
54.00	0.00	5095.41	0.304	0.01

55.20	0.00	5095.41	0.303	0.01
56.40	0.00	5095.40	0.302	0.01
57.60	0.00	5095.40	0.301	0.01
58.80	0.00	5095.39	0.300	0.01
60.00	0.00	5095.39	0.298	0.01
61.20	0.00	5095.38	0.297	0.01
62.40	0.00	5095.38	0.296	0.01
63.60	0.00	5095.37	0.295	0.01
64.80	0.00	5095.37	0.294	0.01
66.00	0.00	5095.36	0.293	0.01

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
67.20	0.00	5095.35	0.292	0.01
68.40	0.00	5095.35	0.291	0.01
69.60	0.00	5095.34	0.290	0.01
70.80	0.00	5095.34	0.289	0.01
72.00	0.00	5095.33	0.288	0.01
73.20	0.00	5095.33	0.287	0.01
74.40	0.00	5095.32	0.286	0.01
75.60	0.00	5095.32	0.285	0.01
76.80	0.00	5095.31	0.284	0.01
78.00	0.00	5095.30	0.283	0.01
79.20	0.00	5095.30	0.282	0.01
80.40	0.00	5095.29	0.281	0.01
81.60	0.00	5095.29	0.280	0.01
82.80	0.00	5095.28	0.279	0.01
84.00	0.00	5095.28	0.278	0.01
85.20	0.00	5095.27	0.277	0.01
86.40	0.00	5095.27	0.276	0.01
87.60	0.00	5095.26	0.275	0.01
88.80	0.00	5095.26	0.274	0.01
90.00	0.00	5095.25	0.273	0.01
91.20	0.00	5095.24	0.272	0.01
92.40	0.00	5095.24	0.270	0.01
93.60	0.00	5095.23	0.269	0.01
94.80	0.00	5095.23	0.268	0.01
96.00	0.00	5095.22	0.267	0.01
97.20	0.00	5095.22	0.266	0.01
98.40	0.00	5095.21	0.265	0.01
99.60	0.00	5095.21	0.264	0.01
100.80	0.00	5095.20	0.263	0.01
102.00	0.00	5095.20	0.262	0.01
103.20	0.00	5095.19	0.261	0.01
104.40	0.00	5095.18	0.260	0.01
105.60	0.00	5095.18	0.259	0.01
106.80	0.00	5095.17	0.258	0.01
108.00	0.00	5095.17	0.257	0.01
109.20	0.00	5095.16	0.256	0.01

110.40	0.00	5095.16	0.255	0.01
111.60	0.00	5095.15	0.254	0.01
112.80	0.00	5095.15	0.253	0.01
114.00	0.00	5095.14	0.252	0.01
115.20	0.00	5095.13	0.251	0.01
116.40	0.00	5095.13	0.250	0.01
117.60	0.00	5095.12	0.249	0.01
118.80	0.00	5095.12	0.248	0.01
120.00	0.00	5095.11	0.247	0.01
121.20	0.00	5095.11	0.246	0.01
122.40	0.00	5095.10	0.245	0.01
123.60	0.00	5095.10	0.244	0.01
124.80	0.00	5095.09	0.243	0.01
126.00	0.00	5095.09	0.242	0.01
127.20	0.00	5095.08	0.240	0.01
128.40	0.00	5095.07	0.239	0.01
129.60	0.00	5095.07	0.238	0.01
130.80	0.00	5095.06	0.237	0.01
132.00	0.00	5095.06	0.236	0.01
133.20	0.00	5095.05	0.235	0.01

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
134.40	0.00	5095.05	0.234	0.01
135.60	0.00	5095.04	0.233	0.01
136.80	0.00	5095.04	0.232	0.01
138.00	0.00	5095.03	0.231	0.01
139.20	0.00	5095.03	0.230	0.01
140.40	0.00	5095.02	0.229	0.01
141.60	0.00	5095.01	0.228	0.01
142.80	0.00	5095.01	0.227	0.01
144.00	0.00	5095.00	0.226	0.01
145.20	0.00	5095.00	0.225	0.01
146.40	0.00	5094.99	0.224	0.01
147.60	0.00	5094.98	0.223	0.01
148.80	0.00	5094.98	0.222	0.01
150.00	0.00	5094.97	0.221	0.01
151.20	0.00	5094.96	0.220	0.01
152.40	0.00	5094.96	0.219	0.01
153.60	0.00	5094.95	0.218	0.01
154.80	0.00	5094.95	0.217	0.01
156.00	0.00	5094.94	0.216	0.01
157.20	0.00	5094.93	0.215	0.01
158.40	0.00	5094.93	0.214	0.01
159.60	0.00	5094.92	0.213	0.01
160.80	0.00	5094.91	0.212	0.01
162.00	0.00	5094.91	0.211	0.01
163.20	0.00	5094.90	0.210	0.01
164.40	0.00	5094.89	0.209	0.01

```
      165.60       0.00   5094.89      0.207      0.01
      166.80       0.00   5094.88      0.206      0.01
      168.00       0.00   5094.87      0.205      0.01
      169.20       0.00   5094.87      0.204      0.01
      170.40       0.00   5094.86      0.203      0.01
      171.60       0.00   5094.85      0.202      0.01
      172.80       0.00   5094.85      0.201      0.01
      174.00       0.00   5094.84      0.200      0.01
      175.20       0.00   5094.83      0.199      0.01
      176.40       0.00   5094.83      0.198      0.01
      177.60       0.00   5094.82      0.197      0.01
      178.80       0.00   5094.81      0.196      0.01
      180.00       0.00   5094.81      0.195      0.01
      181.20       0.00   5094.80      0.194      0.01
      182.40       0.00   5094.79      0.193      0.01
      183.60       0.00   5094.79      0.192      0.01
      184.80       0.00   5094.78      0.191      0.01
      186.00       0.00   5094.77      0.190      0.01
      187.20       0.00   5094.77      0.189      0.01
      188.40       0.00   5094.76      0.188      0.01
      189.60       0.00   5094.75      0.187      0.01
      190.80       0.00   5094.75      0.186      0.01
      192.00       0.00   5094.74      0.185      0.01
      193.20       0.00   5094.73      0.184      0.01
      194.40       0.00   5094.73      0.183      0.01
      195.60       0.00   5094.72      0.182      0.01
      196.80       0.00   5094.71      0.181      0.01
      198.00       0.00   5094.71      0.180      0.01
      199.20       0.00   5094.70      0.179      0.01
    PEAK DISCHARGE =         0.806 CFS - PEAK OCCURS AT HOUR    2.55
    MAXIMUM WATER SURFACE ELEVATION =     5097.740
    MAXIMUM STORAGE =         0.9536 AC-FT      INCREMENTAL TIME=    0.050000HRS

   *
   PRINT HYD           ID=11 CODE=1

                                      PARTIAL HYDROGRAPH   101.10


       RUNOFF VOLUME =     1.54705 INCHES     =       1.0594 ACRE-FEET
       PEAK DISCHARGE RATE =       0.81 CFS  AT   2.550 HOURS   BASIN AREA =
0.0128 SQ. MI.



   *
   FINISH

       NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 13:06:55
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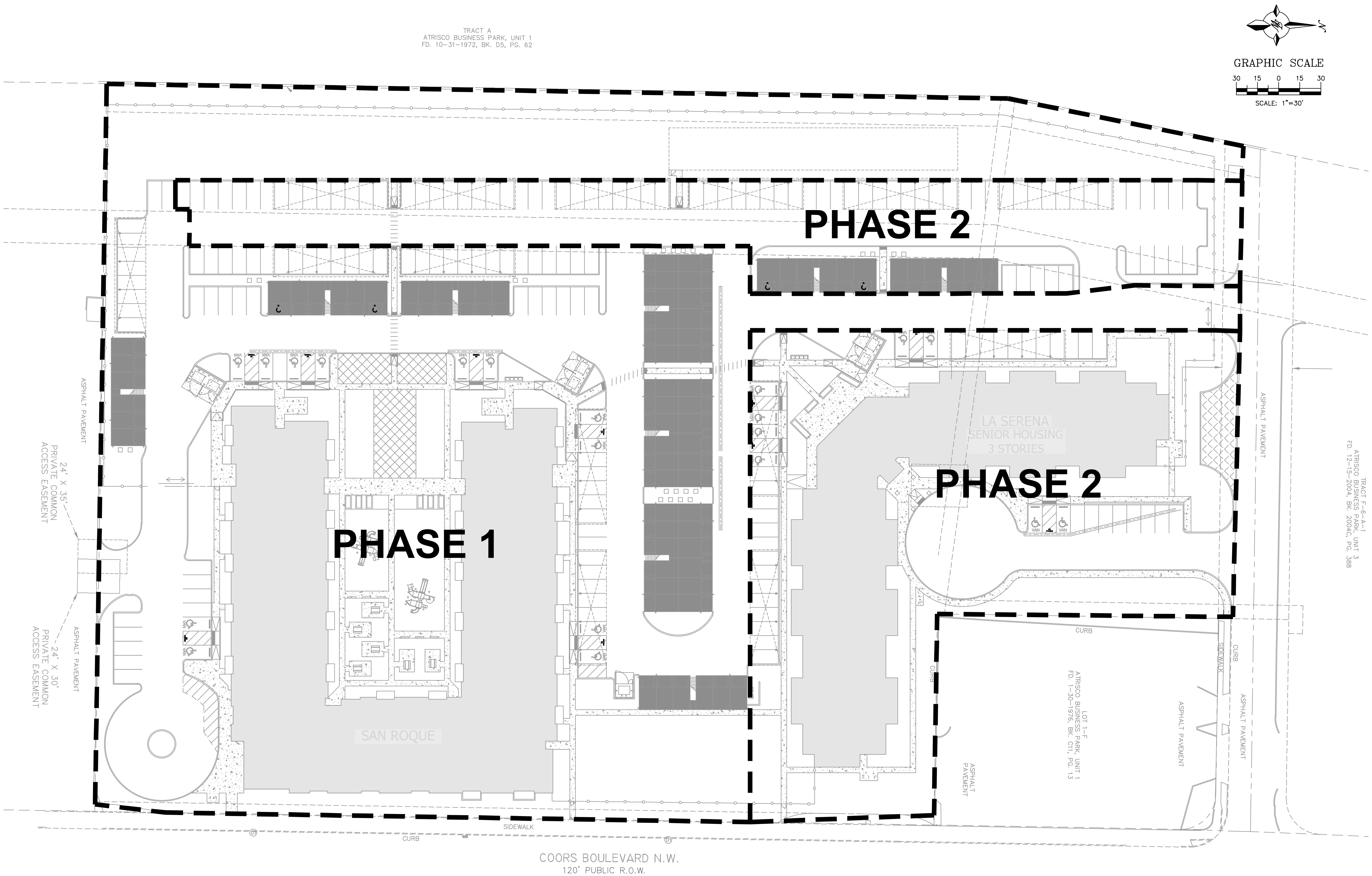

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revision:

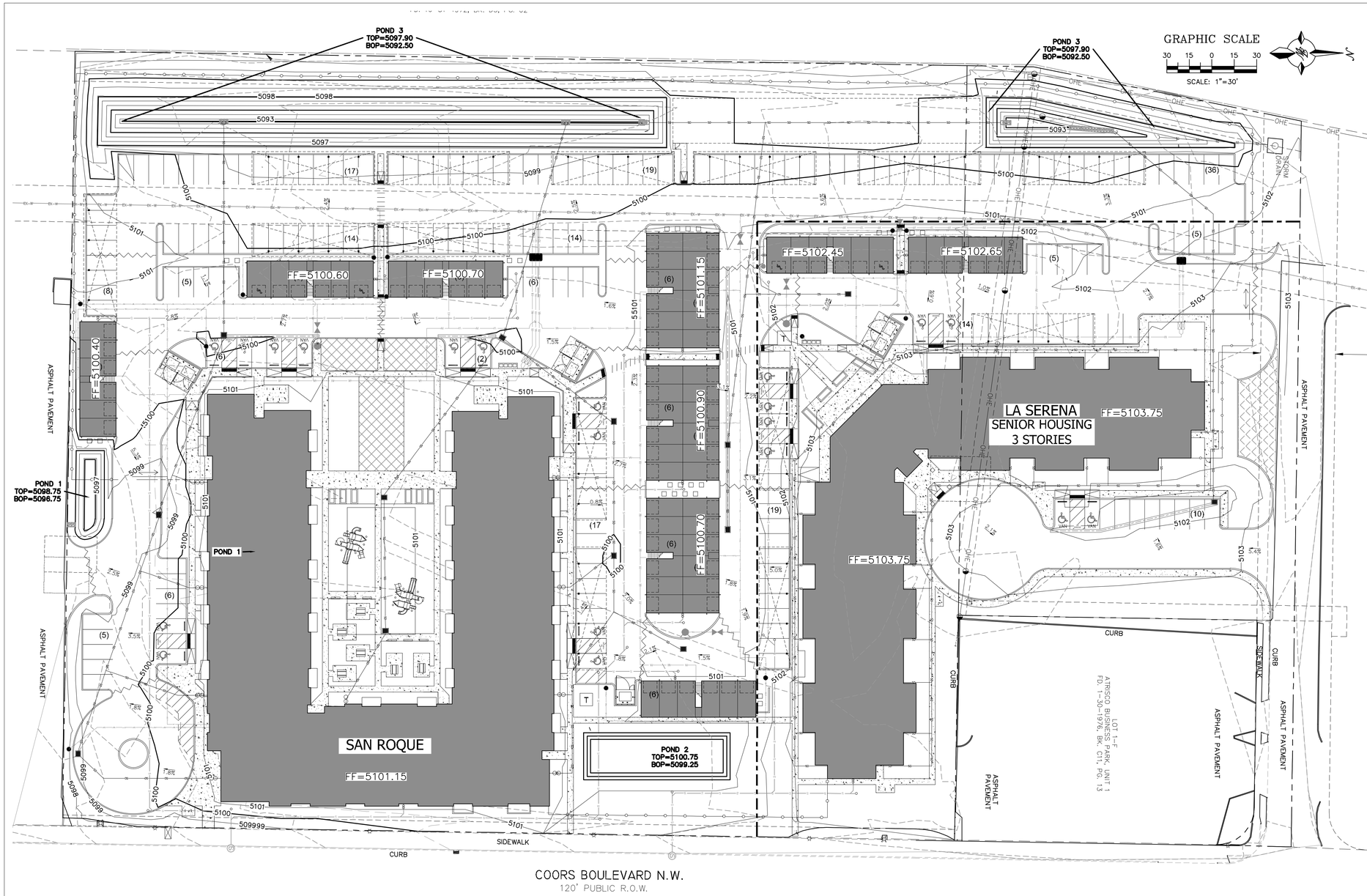
no.	desc.	date

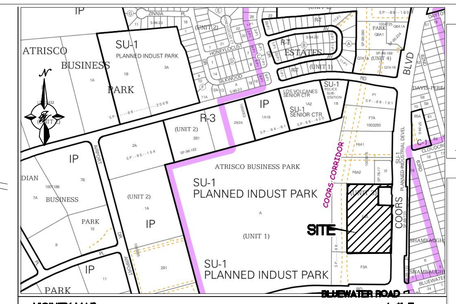
project: 2020010
date: 05.10.2021
drawn: vp,bf
checked: vp

Permit Set

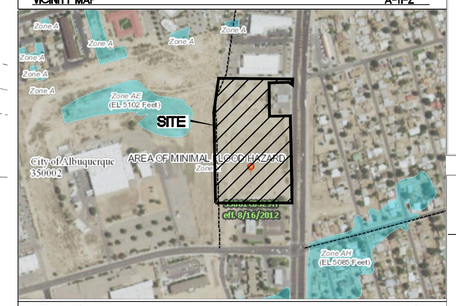
PHASING PLAN

c1.2





VICINITY MAP A-11-Z



FIRM MAP 35001C0329H

LEGEND

- HEADER CURB
- BOUNDARY LINE
- RIGHT-OF-WAY
- BUILDING
- SIDEWALK
- STORM DRAIN
- WATER LINE
- FIRE LINE
- SANITARY SEWER
- WATER BLOCK
- 5010 CONTOUR MAJOR
- 5011 CONTOUR MINOR
- x 5048.25 SPOT ELEVATION
- FLOW ARROW
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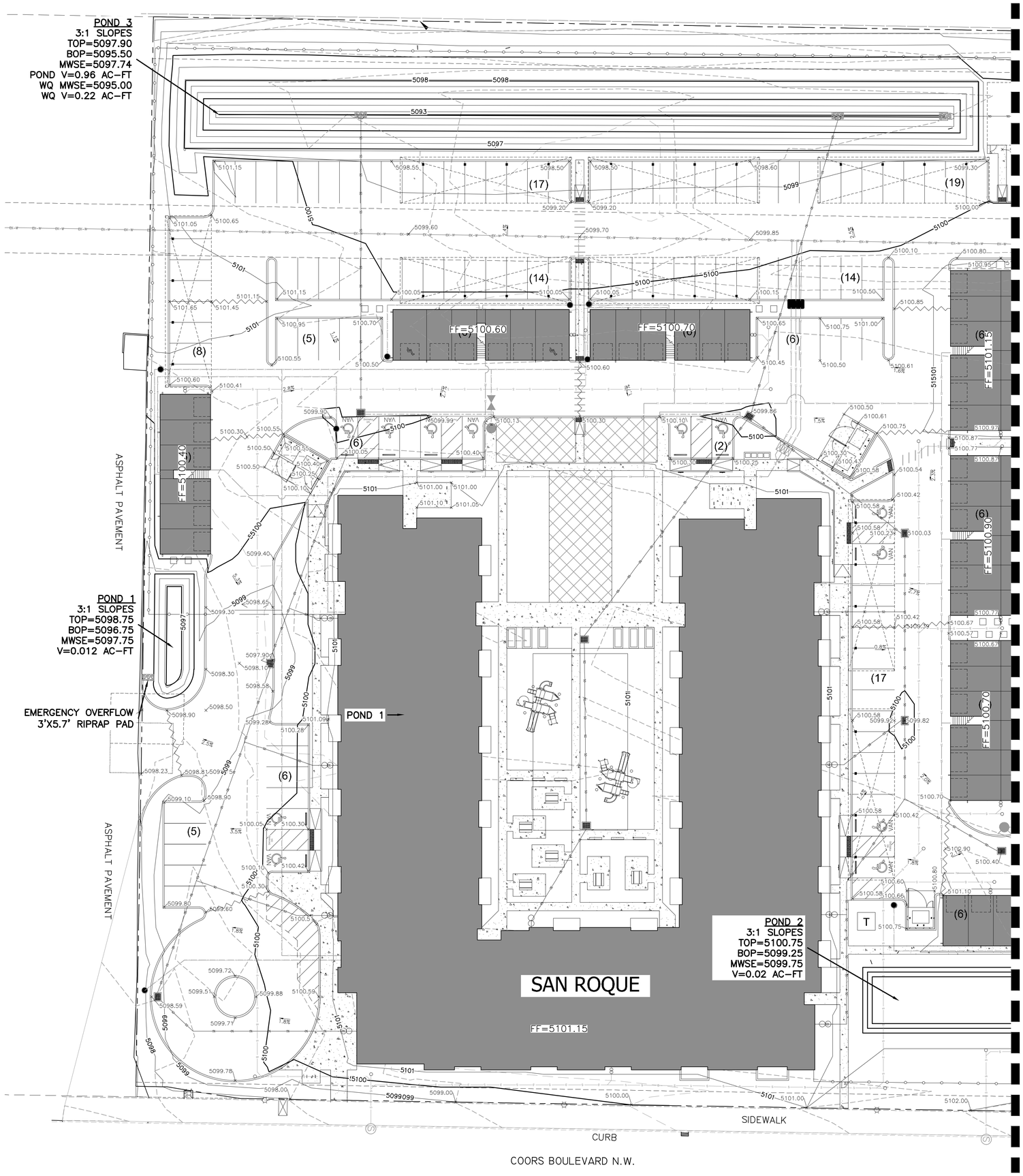
revision:
no. desc. date

project: 2020010
date: 05.10.2021
drawn: vp,bf
checked: vp

Permit Set

Overall Grading & Drainage Plan

c2.0



GRAPHIC SCALE

20 10 0 10 20

SCALE: 1"=20'

LEGEND

- HEADER CURB
- BOUNDARY LINE
- RIGHT-OF-WAY
- BUILDING
- SIDEWALK
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revision:

no.	desc.	date

project: 2020010
date: 05.10.2021
drawn: vp,bf
checked: vp

Permit Set

Grading & Drainage Plan

c2.1

POND 3
3:1 SLOPES
TOP=5097.90
BOP=5095.50
MWSE=5097.74
POND V=0.96 AC-FT
WQ MWSE=5095.00
WQ V=0.22 AC-FT

POND 2
3:1 SLOPES
TOP=5100.75
BOP=5099.25
MWSE=5099.75
V=0.02 AC-FT

LA SERENA
SENIOR HOUSING
3 STORIES
FF=5103.75

FF=5102.45
FF=5102.65
FF=5101.15
FF=5100.90
FF=5100.70
FF=5101.10

(36) (5) (5) (14) (19) (10)

MATCHLINE

MATCHLINE

ASPHALT PAVEMENT

CURB

SIDEWALK

CURB

ASPHALT PAVEMENT

ASPHALT PAVEMENT

CURB

LOT 1-F
ATRISCO BUSINESS PARK, UNIT 1
FD. 1-30-1976, BK. C11, PG. 13

COORS BOULEVARD N.W.

STORM DRAIN

OHE

GRAPHIC SCALE
20 10 0 10 20
SCALE: 1"=20'

LEGEND

- HEADER CURB
- BOUNDARY LINE
- RIGHT-OF-WAY
- BUILDING
- SIDEWALK
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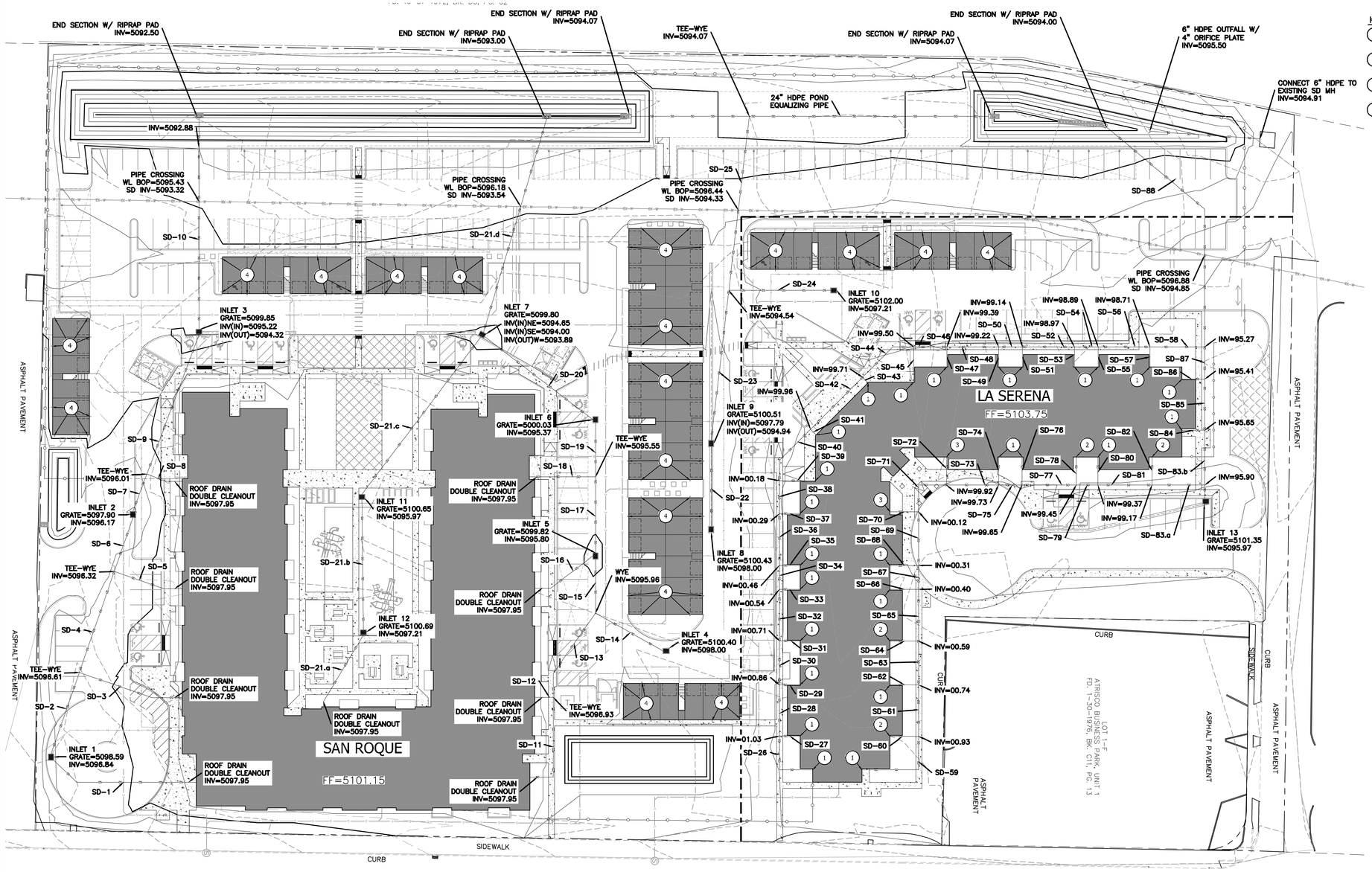
c2.2



KEYED NOTES

1. 3" ROOF DRAIN LEADER FROM 3" SHEET METAL DOWNSPOUT W/ DBL CLEANOUT (SEE PLUMBING PLANS FOR CONTINUATION) INV=5101.25
2. 6" ROOF DRAIN LEADER, WYE-CONNECTION FROM 4" ROOF DRAIN & 3" SHEET METAL DOWNSPOUT W/ DBL CLEANOUT (SEE PLUMBING PLANS FOR CONTINUATION) INV= 5101.25
3. 6" ROOF DRAIN LEADER, WYE-CONNECTION FROM 3" ROOF DRAIN & 3" SHEET METAL DOWNSPOUT W/ DBL CLEANOUT (SEE PLUMBING PLANS FOR CONTINUATION) INV=5101.25
4. GARAGE LOFT DOWNSPOUT – DAYLIGHT ABOVE FINISHED GRADE TO SURFACE FLOW AWAY FROM BLDG

LEGEND

- HEADER CURB
- BOUNDARY LINE
- RIGHT-OF-WAY
- BUILDING
- SIDEWALK
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GRAPHIC SCALE
30 15 0 15 30
SCALE: 1"=30'

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Storm Drain Information Table

Storm Drain ID	Contributing Basin(s)	Contributing Flow (cfs)	Pipe Slope (%)	Pipe Material	Pipe Diameter (in.)	Pipe Capacity (cfs)
SD-1	RD1	0.37	1.1	PVC	6	0.82
SD-2	P1, RD1	1.10	0.4	HDPE	12	3.15
SD-3	RD2	0.43	1.9	PVC	6	1.08
SD-4	P1, RD1-RD2	1.53	0.4	HDPE	12	3.15
SD-5	RD3	0.46	3.4	PVC	6	1.45
SD-6	P1, RD1-RD3	1.99	0.4	HDPE	12	3.15
SD-7	P1-P2, RD1-RD3	3.47	0.6	HDPE	12	3.86
SD-8	RD4	0.50	8.0	PVC	6	2.22
SD-9	P1-P2, RD1-RD4	3.97	0.8	HDPE	12	4.46
SD-10	P1-P3, RD1-RD4	5.32	1.2	HDPE	12	5.46
SD-11	RD8	0.44	1.5	PVC	6	0.96
SD-12	RD7	0.40	8.4	PVC	6	2.27
SD-13	RD7-RD8	0.84	1.5	HDPE	6	0.96
SD-14	P7	0.48	4.0	HDPE	12	9.96
SD-15	P7, RD7-RD8	1.32	0.4	HDPE	12	3.15
SD-16	RD6	0.47	4.7	PVC	6	1.70
SD-17	P6-P7, RD6-RD8	2.86	0.5	HDPE	12	3.52
SD-18	RD5	0.46	5.5	PVC	6	1.84
SD-19	P6-P7, RD5-RD8	3.32	0.5	HDPE	12	3.52
SD-20	P5-P7, RD5-RD8	4.02	0.8	HDPE	12	4.46
SD-21.a	RD9	0.64	1.44	HDPE	6	0.94
SD-21.b	P22A, RD9	1.19	1.44	HDPE	12	5.98
SD-21.c	P22A-P22B, RD9	1.93	1.44	HDPE	12	5.98
SD-21.d	P4-P7, P22, RD5-RD9	7.31	0.4	HDPE	18	9.29
SD-22	P8	0.84	0.4	HDPE	12	3.15
SD-23	P8-P9	2.14	0.4	HDPE	12	3.15
SD-24	P10	0.74	4.0	HDPE	12	9.96
SD-25	P8-P10	2.88	0.4	HDPE	12	3.15
SD-26	RD10	0.02	0.5	PVC	3	0.09
SD-27	RD11	0.06	1.6	PVC	3	0.16
SD-28	RD10-RD11	0.08	0.5	PVC	3	0.09

Storm Drain Information Table

Storm Drain ID	Contributing Basin(s)	Contributing Flow (cfs)	Pipe Slope (%)	Pipe Material	Pipe Diameter (in.)	Pipe Capacity (cfs)
SD-29	RD12	0.07	2.8	PVC	3	0.21
SD-30	RD10-RD12	0.15	0.5	PVC	4	0.19
SD-31	RD13	0.07	3.9	PVC	3	0.24
SD-32	RD10-RD13	0.22	0.5	PVC	6	0.55
SD-33	RD14	0.06	5.2	PVC	3	0.28
SD-34	RD10-RD14	0.28	0.5	PVC	6	0.55
SD-35	RD15	0.06	5.8	PVC	3	0.30
SD-36	RD10-RD15	0.34	0.5	PVC	6	0.55
SD-37	RD16	0.07	7.0	PVC	3	0.33
SD-38	RD10-RD16	0.41	0.5	PVC	6	0.55
SD-39	RD17	0.07	4.6	PVC	3	0.27
SD-40	RD10-RD17	0.48	0.5	PVC	6	0.55
SD-41	RD18	0.05	24.7	PVC	3	0.61
SD-42	RD10-RD18	0.53	0.5	PVC	6	0.55
SD-43	RD19	0.05	29.5	PVC	3	0.67
SD-44	RD10-RD19	0.58	0.5	PVC	8	1.19
SD-45	RD20	0.06	7.5	PVC	3	0.34
SD-46	RD10-RD20	0.64	0.5	PVC	8	1.19
SD-47	RD21	0.06	14.1	PVC	3	0.46
SD-48	RD10-RD21	0.70	0.5	PVC	8	1.19
SD-49	RD22	0.06	15.4	PVC	3	0.48
SD-50	RD10-RD22	0.76	0.5	PVC	8	1.19
SD-51	RD23	0.06	16.0	PVC	3	0.49
SD-52	RD10-RD23	0.82	0.5	PVC	8	1.19
SD-53	RD24	0.06	17.3	PVC	3	0.51
SD-54	RD10-RD24	0.88	0.5	PVC	8	1.19
SD-55	RD25	0.06	17.9	PVC	3	0.52
SD-56	RD10-RD25	0.94	0.5	PVC	8	1.19
SD-57	RD26	0.06	19.2	PVC	3	0.54
SD-58	RD10-RD26	1.00	9.56	PVC	8	5.22
SD-59	RD27	0.02	0.50	PVC	3	0.08

Storm Drain Information Table

Storm Drain ID	Contributing Basin(s)	Contributing Flow (cfs)	Pipe Slope (%)	Pipe Material	Pipe Diameter (in.)	Pipe Capacity (cfs)
SD-60	RD28	0.21	1.70	PVC	6	1.02
SD-61	RD27-RD28	0.23	0.54	PVC	6	0.55
SD-62	RD29	0.07	2.70	PVC	3	0.20
SD-63	RD27-RD29	0.30	0.54	PVC	6	0.55
SD-64	RD30	0.24	3.50	PVC	6	1.47
SD-65	RD27-RD30	0.54	0.54	PVC	6	0.55
SD-66	RD31	0.06	4.50	PVC	3	0.26
SD-67	RD27-RD31	0.60	0.54	PVC	8	1.19
SD-68	RD32	0.06	4.99	PVC	3	0.28
SD-69	RD27-RD32	0.66	0.54	PVC	8	1.19
SD-70	RD33	0.27	6.00	PVC	6	1.92
SD-71	RD27-RD33	0.93	0.54	PVC	8	1.19
SD-72	RD34	0.29	7.20	PVC	6	2.11
SD-73	RD27-RD34	1.22	0.54	PVC	12	3.52
SD-74	RD35	0.06	8.20	PVC	3	0.35
SD-75	RD27-RD35	1.28	0.54	PVC	12	3.52
SD-76	RD36	0.06	8.60	PVC	3	0.36
SD-77	RD27-RD36	1.34	0.54	PVC	12	3.52
SD-78	RD37	0.24	9.70	PVC	6	2.44
SD-79	RD27-RD37	1.58	0.54	PVC	12	3.52
SD-80	RD38	0.06	10.20	PVC	3	0.39
SD-81	RD27-RD38	1.64	0.54	PVC	12	3.52
SD-82	RD39	0.18	11.30	PVC	6	2.64
SD-83.a	RD27-RD39	1.82	9.44	PVC	12	15.31
SD-83.b	P13, RD27-39	4.07	0.70	HDPE	12	4.17
SD-84	RD40	0.02	37.50	PVC	3	0.76
SD-85	P13, RD27-RD40	4.09	0.70	HDPE	12	4.17
SD-86	RD41	0.02	39.10	PVC	3	0.77
SD-87	P13, RD27-RD41	4.11	0.70	HDPE	12	4.17
SD-88	P13, RD10-RD41	4.13	0.70	HDPE	12	4.17

Inlet Information Table

Inlet ID	Contributing Basin(s)	Contributing Flow (cfs)	Inlet/Grate Type*	Inlet Capacity* (cfs)	50% Clogging Factor Inlet Capacity (cfs)
1	P1	0.73	2'x2' Curb Inlet Standard Grate (Mid Hood)	5.95	2.97
2	P2	1.48	2'x2' Curb Inlet Standard Grate (Mid Hood)	5.95	2.97
3	P3	1.35	2'x2' Road & Highway Grate	6.50	3.25
4	P7	0.48	2'x2' Road & Highway Grate	6.50	3.25
5	P6	1.07	2'x2' Road & Highway Grate	6.50	3.25
6	P5	0.7	2'x2' Road & Highway Grate	6.50	3.25
7	P4	1.35	2'x2' Road & Highway Grate	6.50	3.25
8	P8	0.84	2'x2' Road & Highway Grate	6.50	3.25
9	P9	1.30	2'x2' Road & Highway Grate	6.50	3.25
10	P10	0.74	2'x2' Road & Highway Grate	6.50	3.25
11	P22b	0.74	12" Dome Grate	1.65	0.82
12	P22a	0.55	12" Dome Grate	1.65	0.82
13	P13	2.25	2'x2' Road & Highway Grate	6.50	3.25

*Based on Nyloplast Inlet Basin Information

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457 coors blvd. nw
albuquerque, new mexico 87121

revision:
no. desc. date

project: 2020010
date: 05.10.2021
drawn: vp,bf
checked: vp

Permit Set

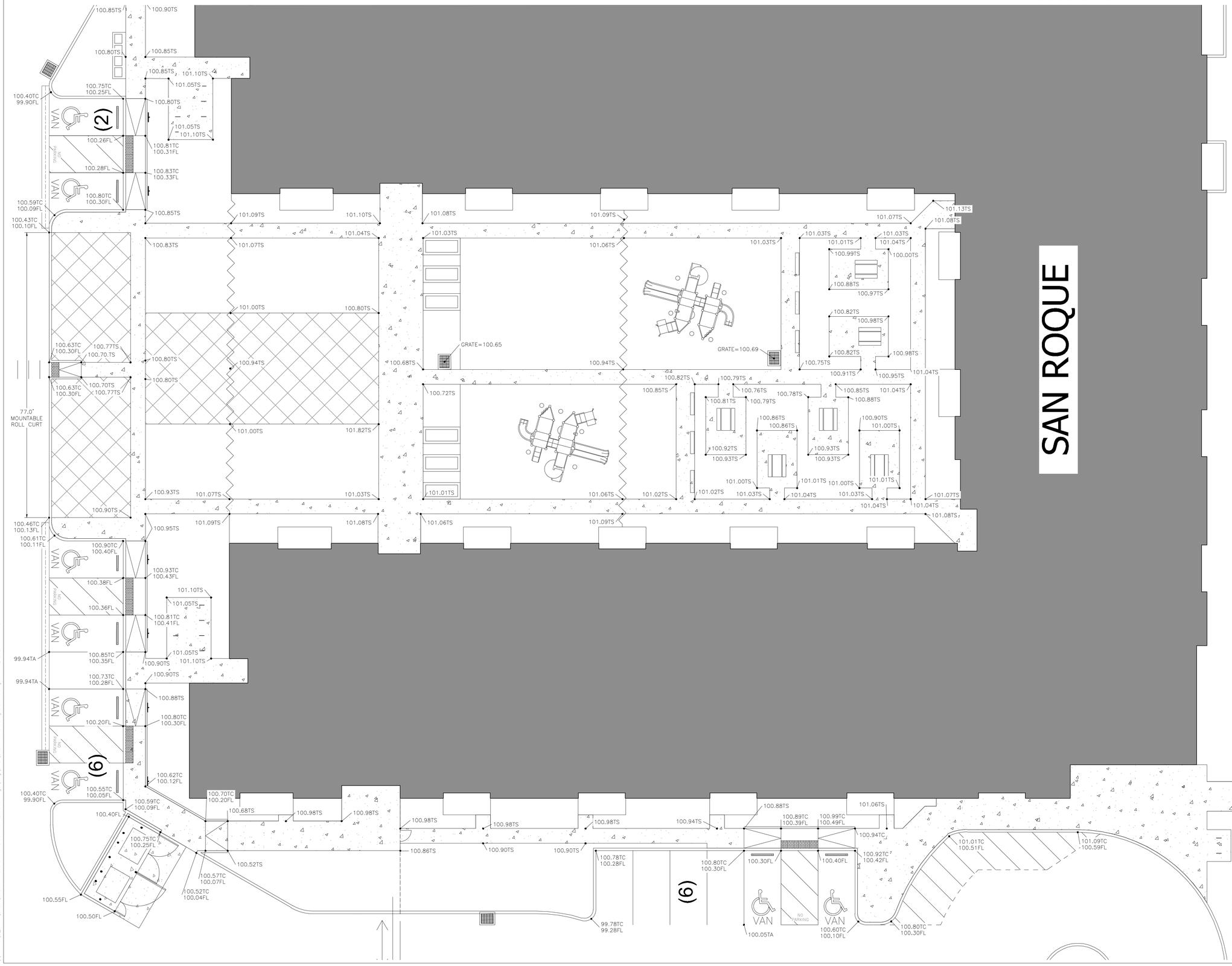
Storm Drain Plan

c2.3

LEGEND

- HEADER CURB
- BOUNDARY LINE
- RIGHT-OF-WAY
- BUILDING
- SIDEWALK
- PROPOSED STORM DRAIN
- 5010 CONTOUR MAJOR
- 5011 CONTOUR MINOR
- x 5048.25 SPOT ELEVATION
- FLOW ARROW
- EXISTING CURB & GUTTER
- EXISTING BOUNDARY LINE
- 5010 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR

SPOT ELEVATION LEGEND
TC = TOP OF CURB
FL = FLOWLINE
TS = TOP OF SIDEWALK
TA = TOP OF ASPHALT



GRAPHIC SCALE
10 5 0 5 10
SCALE: 1"=10'

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Permit Set

Grading Details

c2.4

LEGEND

- HEADER CURB
- BOUNDARY LINE
- RIGHT-OF-WAY
- BUILDING
- SIDEWALK
- PROPOSED STORM DRAIN
- 5010 CONTOUR MAJOR
- 5011 CONTOUR MINOR
- x 5048.25 SPOT ELEVATION
- FLOW ARROW
- EXISTING CURB & GUTTER
- EXISTING BOUNDARY LINE
- 5010 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR

SPOT ELEVATION LEGEND
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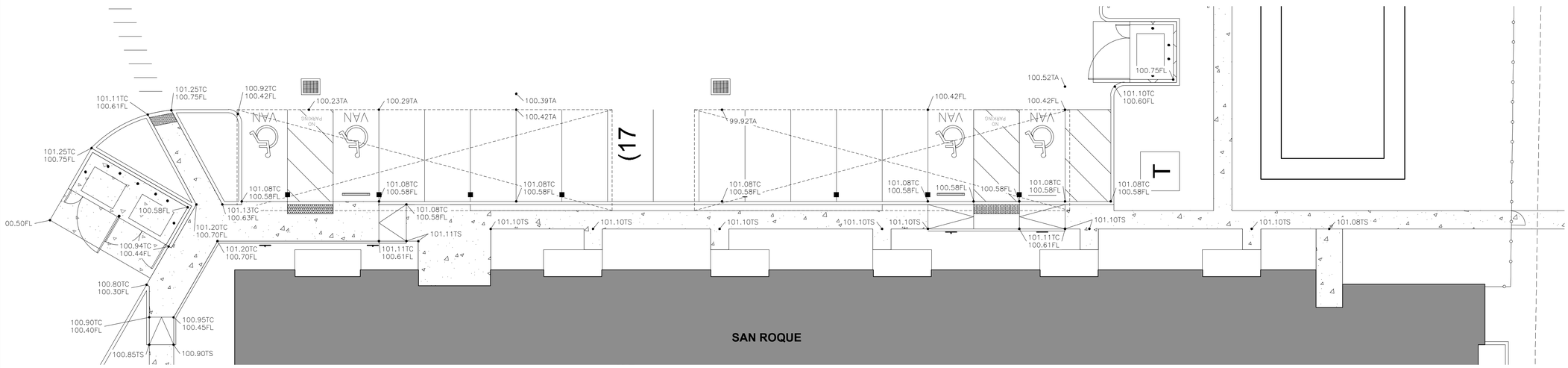

GRAPHIC SCALE
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SCALE: 1"=10'

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revision:
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project: 2020010
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checked: vp

Permit Set

Grading Details

c2.5

LEGEND

- HEADER CURB
- BOUNDARY LINE
- RIGHT-OF-WAY
- BUILDING
- SIDEWALK
- PROPOSED STORM DRAIN
- 5010 CONTOUR MAJOR
- 5011 CONTOUR MINOR
- x 5048.25 SPOT ELEVATION
- FLOW ARROW
- EXISTING CURB & GUTTER
- EXISTING BOUNDARY LINE
- 5010 EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR

SPOT ELEVATION LEGEND
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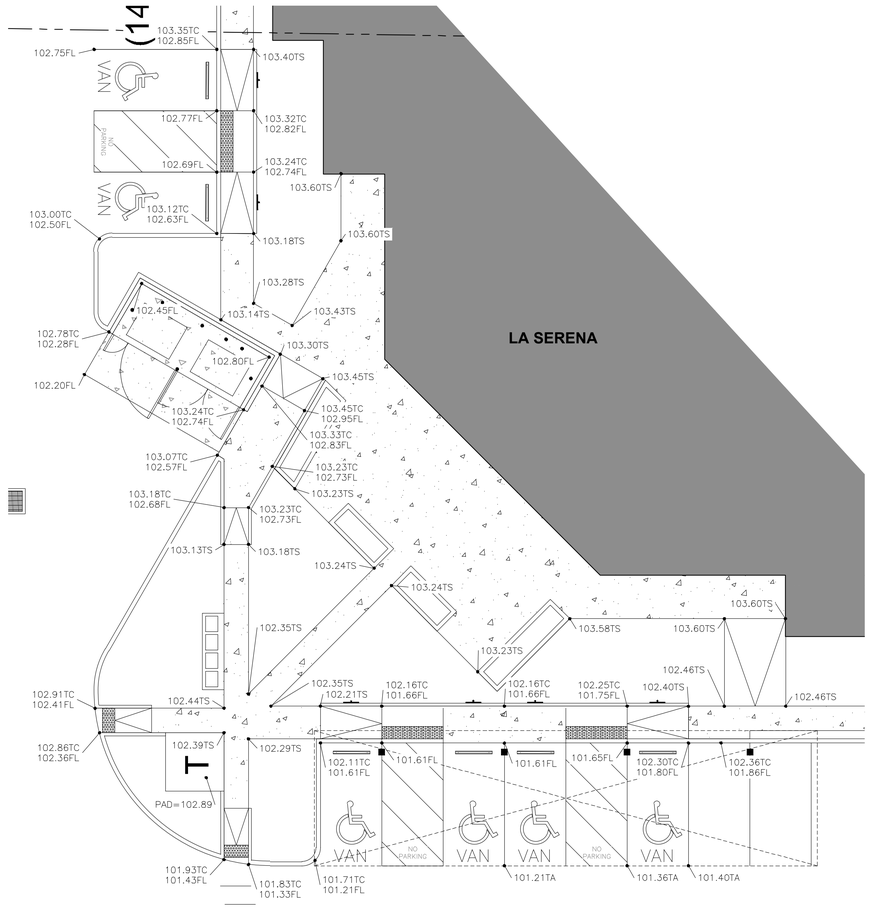

N

GRAPHIC SCALE
10 5 0 5 10
SCALE: 1"=10'

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revision:

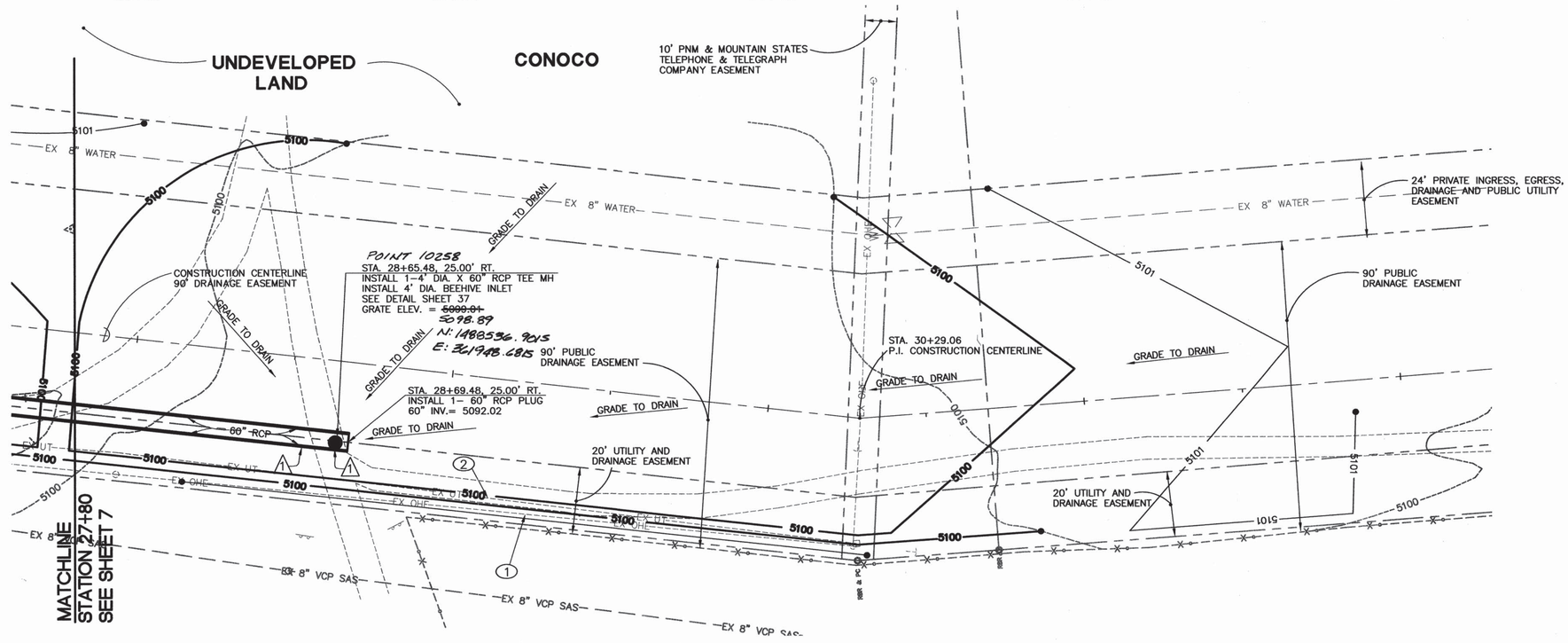
no.	desc.	date

project: 2020010
date: 05.10.2021
drawn: vp,bf
checked: vp

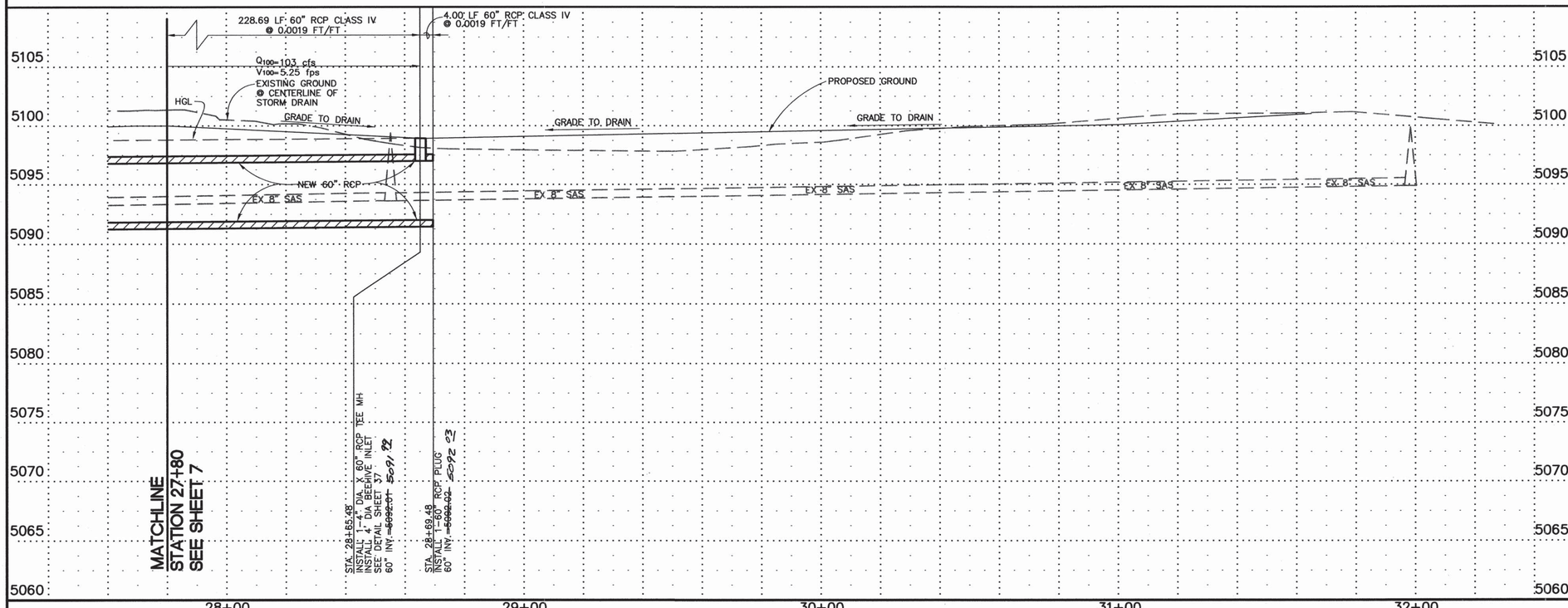
Permit Set

Grading Details

c2.6



90' DRAINAGE EASEMENT



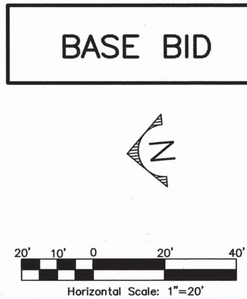
⬭ KEYED NOTES:

1. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH PNM–ELECTRIC (RICK MONTOYA (505) 241–3403).
   NOTE: PNM-ELECTRIC REQUIRES 4 WEEKS TO SCHEDULE CREWS TO PERFORM ANY WORK.
2. PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR SHALL COORDINATE WITH QWEST (MARY ANN JOJOLA (505) 245–6587)
   NOTE: QWEST REQUIRES 4 WEEKS TO SCHEDULE CREWS TO PERFORM ANY WORK.

GENERAL NOTES

1. ALL CONSTRUCTION MUST TAKE PLACE WITHIN CITY OF ALBUQUERQUE RIGHT OF WAY. THE CONTRACTOR SHALL USE SHORING, TRENCH BOXES, ETC. DURING THE TRENCHING AND BACKFILLING PROCESS SO AS NOT TO DAMAGE ANY FACILITIES, UTILITIES, FENCES, WALLS, PAVEMENT, ETC. THAT EXIST ON PRIVATE PROPERTY. ANY DAMAGE TO ITEMS LOCATED ON PRIVATE PROPERTY WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE AT NO ADDITIONAL COST TO THE OWNER.
2. ALL GRADING SHOWN ON THIS SHEET WILL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO ADDITIONAL PAYMENT WILL BE MADE FOR THE GRADING SHOWN ON THIS SHEET.

BASE BID



196105D
Smith Engineering Company
A Full Service Engineering Company
6400 Uptown Boulevard, N.E. Suite 500E Albuquerque, New Mexico 87110

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

TITLE: WEST MESA DIVERSION PROJECT PHASE 2D

STORM DRAIN P & P: 90' DRAINAGE EASEMENT: STA 27+80 TO 29+54.57

Design Review Committee	City Engineer Approval	Last Design Update	No. / Day / Yr.	No. / Day / Yr.

City Project No.	Zone Map No.	Sheet	Of
538105	J-10	8	50

AS BUILT INFORMATION
CONTRACTOR Sales Scrivner DATE 8/05
WORK STAKED BY Blue Sky DATE 8/05
STAKING ACCEPTANCE BY Blue Sky DATE 8/05
FIELD VERIFICATION BY BLUE SKY DATE 8/05
DRAWINGS CORRECTED BY BLUE SKY DATE 8/05
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

BENCH MARKS
I-40-18 NMSHC/ACS ELEV. 5103.98 FEET (SLD 1929)
STATION IS LOCATED 3.5 MILES NW OF DOWNTOWN ALBUQUERQUE, AT THE HIGHWAY I-40 AND STATE ROAD 448 (COORS RD., NW) INTERCHANGE. STATION MARK IS A STANDARD NMSHC BRASS TABLET, STAMPED "STA I-40-18", SET IN TOP OF A CONCRETE POST FLUSH WITH THE GROUND. (N 1494859.08, E 364150.93)

SURVEY INFORMATION
FIELD NOTES
NO. BY DATE

ENGINEERS SEAL
DONALD L. ANDREWS NEW MEXICO 11771 REGISTERED PROFESSIONAL ENGINEER
11-15-04

STORM DRAIN PIPE REALIGNMENT

NO.	DATE	REMARKS	BY
		REVISIONS	DLA
1	11/5/04	DESIGN	DLA

DESIGNED BY DLA DATE 06/04
DRAWN BY DLA,LL DATE 06/04
CHECKED BY DLA DATE 06/04