CITY OF ALBUQUERQUE

Planning Department
Brennon Williams, Director

Mayor Timothy M. Keller

July 29, 2021

Jeremy Shell, P.E.
Respec
5971 Jefferson St. NE
Albuquerque, NM 8710

RE: Sonta Trails Unit 4 Apartments
Grading Plans and Drainage Report
Engineer's Stamp Date: 06/03/21
Hydrology File: C10D001A

Dear Mr. Shell:

Based upon the information provided in your submittal received 06/14/2021, the Grading Plans are approved **only for Foundation Permit**. Before Hydrology can approve the Grading Plans and Drainage Report for Building Permit and Grading Permit, the following comments need to be addressed for approval of the above referenced project:

1. Sheet C-107. Please remove the "Preliminary Not for Construction" note.
2. Sheet C-107 & C-109. Please ghost "Pond J" and add a note, "To be built under CPN 761284. Not part of the Building Permit."
3. Sheet C-107 & C-109. It appears that there will be some sort of fence or wall along Pond J on Universe. Please insure that this fence or wall is outside of the top of pond. One foot distance would be preferred.
4. Sheet C-112. Please remove sheet. Public Retention Pond is to be constructed under CPN 761284 and is not part of the Building Permit.

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.

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

Sincerely,

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

CITY OF ALBUQUERQUE

Planning Department
Brennon Williams, Director

Mayor Timothy M. Keller

Renée C. Brissette

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City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 11/2018)

Project Title: Sonata Trails Unit 4 Apartments Building Permit #: _____ Hydrology File #: C10-D001A

DRB#: 2020-003707 EPC#: _____ Work Order#: _____

Legal Description: Tracts 1, 2, and 3, The Trails Unit 4

City Address: N/A

Applicant: RESPEC Contact: Jeremy Shell

Address: 5971 Jefferson Street NE Suite 101 Albuquerque NM 87109

Phone#: (505) 253-9811 Fax#: _____ E-mail: Jeremy.shell@respec.com

Owner: Sonata Trails, LLC Contact: _____

Address: _____

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

TYPE OF SUBMITTAL: ____ PLAT (___# OF LOTS) ____ RESIDENCE _X_ DRB SITE ____ ADMIN SITE

IS THIS A RESUBMITTAL?: _____ Yes _X_ No

DEPARTMENT: ____ TRAFFIC/ 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 MASTER PLAN
____ DRAINAGE REPORT
____ FLOODPLAIN DEVELOPMENT PERMIT APPLIC
____ ELEVATION CERTIFICATE
____ CLOMR/LOMR
____ TRAFFIC CIRCULATION LAYOUT (TCL)
____ TRAFFIC IMPACT STUDY (TIS)
____ OTHER (SPECIFY) _____
____ PRE-DESIGN MEETING?

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

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

DATE SUBMITTED: June 10, 2021 By: Jeremy Shell

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: _____

FEE PAID: _____

DRAINAGE REPORT FOR

SONATA TRAILS UNIT 4 APARTMENTS

PREPARED FOR
City of Albuquerque, Planning Department
Development Review Services, Hydrology Section

PREPARED BY
RESPEC, Inc.
5971 Jefferson St. NE, Suite 101
Albuquerque, NM 87109
505.253.9718

JUNE 2021

RESPEC.COM

I, Jeremy Shell, do hereby certify that this report was duly prepared by me or under my direction and that I am a duly registered Professional Engineer under the laws of the State of New Mexico.

_____

Jeremy Shell, P.E.
NMPE No. 26341

6 / 8 / 2021

_____

Date

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1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this conceptual drainage report is to demonstrate that the proposed development of Sonata Trails Unit 4 Apartments safely conveys the peak 100-year storm runoff. The drainage intent for proposed conditions is to fully retain the 100-year, 10-day storm event.

The proposed development of Sonata Trails Unit 4 Apartments site is within the "Upper Piedras Marcadas Watershed Drainage and Water Quality Management Plan" (UPM DMP) by Wilson & Company dated April 2017. The project site ultimately drains into an Albuquerque Metropolitan Arroyo and Flood Control Authority (AMAFCA) facility, the Piedras Marcadas Dam. The proposed development impacts the existing surge pond J from the Trails Units 1, 2, and 3, Drainage Master Plan (DMP). The Amendment to the Trails Units 1, 2, and 3 DMP was completed by Thompson Engineering Consultants (TEC) in April 2014 and approved by the City Hydrologist in May 2014. All the Trails surge ponds were based on conservative assumptions when modeled initially by AHYMO but were later modeled using PCSWMM software to maximize the efficiency of the system while decreasing the footprint of Pond D. The Addendum to the Amendment to the DMP for the Trails Units 1, 2, and 3, was completed by TEC in February 2017. We have revised the Trails PCSWMM model due to the proposed confined footprint of Pond J and propose increasing the water surface elevation in Pond K, without changing the footprint of Pond K, and ultimately be at or below the allowable discharge of 62 cfs at the outfall of the Universe Boulevard storm drain system. All elevations mentioned in this report are based on the North American Vertical Datum of 1988 (NAVD 88). The PCSWMM model elevations differ from the elevations mentioned in this report because they were based on the National Geodetic Vertical Datum of 1929 (NGVD 29).

1.2 LOCATION AND DESCRIPTION

Sonata Trails Unit 4 Apartments is located southeast of Paseo Del Norte NW and Universe Boulevard NE intersection and consists of approximately 17.4 acres. See Figure 1.2.1 below. The legal description of the property is Tracts 1 and 2, The Trails Unit 4, on the plat entitled "Bulk land plat of The Trails Unit 4 within the Town of Alameda Grant in projected Section 15, Township 11 North, Range 2 East, New Mexico Principal Meridian, City of Albuquerque, Bernalillo County, New Mexico, October, 2007." The existing site includes surge pond J for the Trails Units 1, 2, and 3, but is otherwise undeveloped. The existing conditions are described in more detail in Section 3.1 and the proposed conditions are described in Section 3.2.

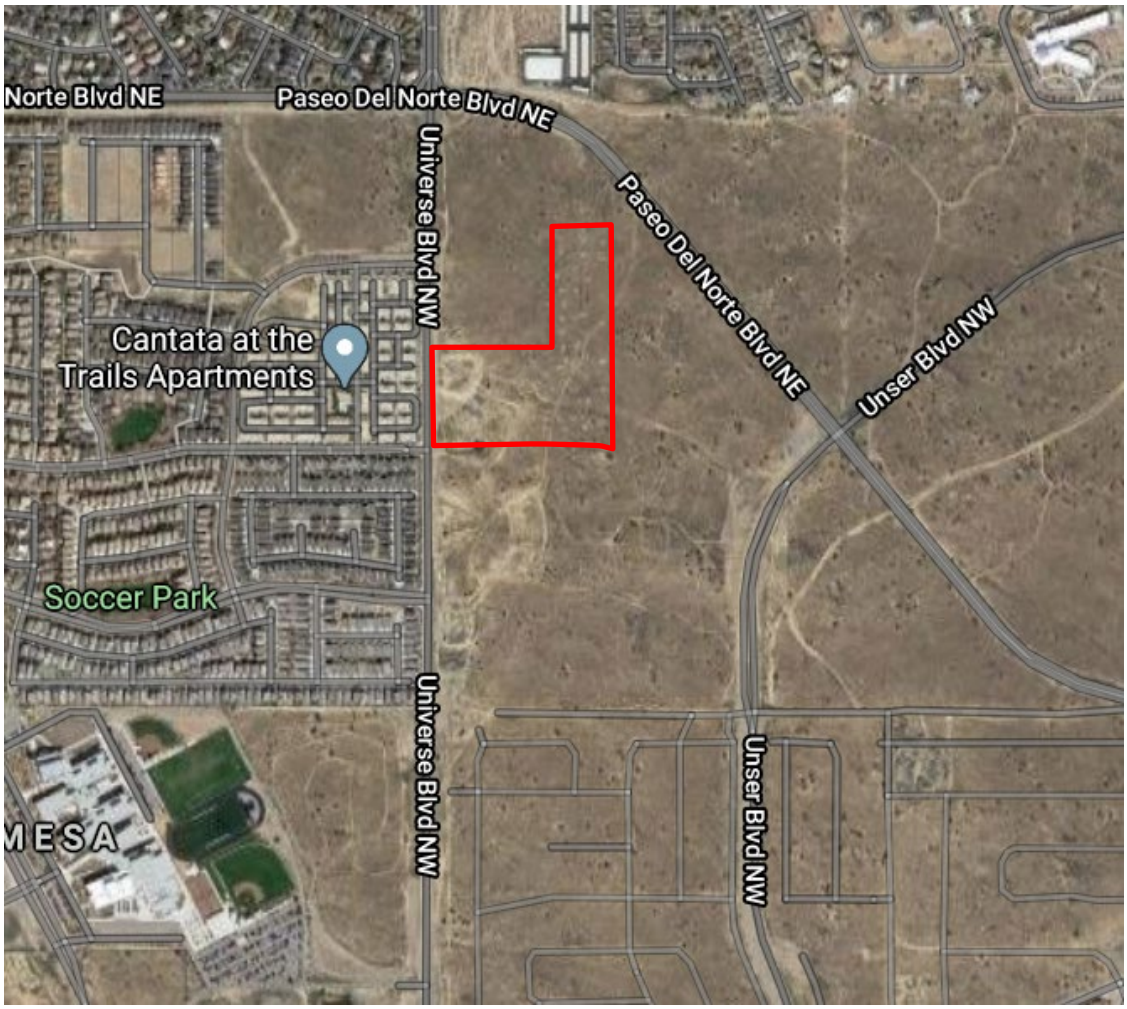


FIGURE 1.2.1 – PROJECT LOCATION

2.0 METHODOLOGY

The hydrologic analysis was performed for the site in accordance with the Albuquerque Development Process Manual (DPM) Section 22.2. AHYMO-S4 (April 2018) was used to develop peak flow rates for the 100-year, 24-hour design storm to ensure all flow paths are sufficient to carry flows. The temporary public retention pond, Pond A, was designed to fully retain the 100-year, 10-day storm. The required water quality volume was calculated by multiplying the onsite impervious area by the first flush runoff value of 0.34". All hydrologic and hydraulic calculations are included in this report.

3.0 HYDROLOGY

3.1 EXISTING CONDITIONS

The Sonata Trails Unit 4 Apartment receives offsite flows from the Trails Units 1, 2, and 3 and as well as the neighboring parcel to the northwest. The existing site is 100% pervious area and a portion of the site contains a surge pond, Pond J, which receives flows from the Trails Units 1, 2, and 3. The offsite

flows received from the Trails Units 1, 2, and 3 is received via storm drain and surges into Pond J while the neighboring property sheet flows across the northern portion of the site. The total flow generated by the property under existing conditions is 47.71 cfs. The existing site has been split into three sub-basins. Exhibit 1 shows the existing sub-basin boundaries for the site.

Basin A is located in the western corner of the site and is primarily made up of existing surge pond, Pond J, and undeveloped pervious area. In general, the basin slopes from north to south and south to north at varying slopes between 1%-20%. Under existing conditions, runoff from the Universe Blvd. storm drain system surges into Pond J and exits the surge pond back into the Universe Blvd. storm drain system or at the overflow weir at the northwest corner of the pond and discharges into Basin B and Basin C. The existing Pond J has a maximum water surface elevation of 5418.46 ft, maximum volume of 3.70 ac-ft, maximum inflow of 136.80 cfs, and maximum outflow of 26.65 cfs. Historically, before the berm and pond were built, the basin flowed northeast into Basins B and Basin C. Basin A generates 6.88 cfs.

Basin B consists of the southeast corner of the site and is undeveloped pervious area. In general, the basin slopes from south to north at varying slopes between 1-8%. After ponding a small amount, roughly 6", runoff exits this basin at the northern end of the basin and discharges into Basin C. Basin B generates 12.21 cfs.

Basin C consists of the north end of the site and offsite area west of the property boundary. The area contains undeveloped pervious area. In general, the basin slopes from southwest to northeast at varying slopes between 1-16%. Runoff exits this basin at the northern end of the basin. Basin C generates 28.63 cfs.

TABLE 3.1.1 – HYDROLOGIC DATA - EXISTING

HYDROLOGIC DATA - EXISTING							
SUB-BASIN	AREA (AC)	LAND USE PERCENTAGES				Q100 (CFS)	V100 (AC-FT)
		A	B	C	D		
A	5.14	100%	0%	0%	0%	6.88	0.188
B	9.14	100%	0%	0%	0%	12.21	0.335
C	21.44	100%	0%	0%	0%	28.63	0.785
TOTAL	**35.73**					**47.71**	**1.308**

3.2 PROPOSED CONDITIONS

The proposed site development for the Trails Unit 4 Apartments includes apartment buildings, parking lots, public and private streets, surge ponds, and landscaping. Under the proposed condition, approximately 80% of the site will consist of impervious area and 20% will be landscaped. The total flow generated by the proposed development is 82.34 cfs. There is no downstream infrastructure built for the watershed. Therefore, the drainage from the proposed conditions will be discharged into a temporary retention pond, Pond A, which will retain the 100-year, 10-day storm event. See Appendix A for the AHYMO input and output results, Pond A volume requirement calculations, and Pond A volume calculation. The proposed site has been split into nine proposed basins. Exhibit 2 shows the proposed private basin boundaries for the site.

3.2.1 PRIVATE DRAINAGE BASINS

Basin A consists of the edges of the property from the southwest corner to the northeast corner and is made up of apartment buildings, asphalt roads and parking, and landscaping. In general, the basin slopes from southwest to northeast at varying slopes between 0.5%-1%. Runoff is collected in proposed drop inlets in the new road which discharges into a storm drain that will connect to the public storm drain system, and ultimately discharge into the proposed Pond A. The proposed flow is 23.58 cfs.

Basin B consists of the center portion of the property and is made up of apartment buildings, asphalt roads and parking, and landscaping. In general, the basin slopes from west to east at varying slopes between 0.5%-1%. Runoff is collected in the new road which discharges into Basin A. The proposed flow is 11.40 cfs.

Basin C consists of the center portion of the property and is made up of apartment buildings, asphalt roads and parking, and landscaping. In general, the basin slopes from west to east at varying slopes between 0.5%-1%. Runoff is collected in the new road which discharges into Basin A. The proposed flow is 15.56 cfs.

Basin D is an undeveloped off-site basin to the west and north of the property. The basin also includes a proposed temporary public retention Pond A at the northeast corner of the basin. In general, the basin slopes from southwest to northeast at varying slopes between 3-5%. The southwestern portion of the basin discharges into the swale in Basin F. For a storm larger than the 100-year, 10-day event, runoff will exit Basin D at the overflow weir spillway in the proposed temporary retention Pond A and discharge to the northwest to match the historic discharge. We are proposing a wide spillway to best replicate the sheet flow that historically discharges to this point. The pond will retain the 100-year, 10-day storm event. The proposed temporary public retention Pond A has a maximum water surface elevation of 5411.40 ft, maximum inflow of 82.34 cfs, and no outflow. Basin D generates 16.41 cfs.

When this off-site basin is developed in the future the runoff will no longer be allowed to discharge into temporary public retention Pond A. The runoff from the future off-site developed area must be retained within their own site until adequate downstream public infrastructure has been provided to accept the flow, per City procedure for this area.

Basin F consists of the northwestern boundary of the property and is made up of landscaping and a swale. In general, the basin slopes east and then north at varying slopes between 0.5%-1%. Runoff is conveyed in a proposed swale. The primary purpose of the swale is to convey offsite drainage from Basin D to prevent the offsite drainage from affecting the proposed property. The proposed swale ultimately discharges into the ROW at the northwest corner of the property, into Basin D and then temporary public retention Pond A. The proposed flow is 0.84 cfs.

The hydrologic data table below depicts in further detail each private sub-basin and its characteristics.

TABLE 3.2.1 – HYDROLOGIC DATA – PROPOSED PRIVATE

HYDROLOGIC DATA - PROPOSED PRIVATE							
SUB-BASIN	AREA (AC)	LAND USE PERCENTAGES				Q100 (CFS)	V100 (AC-FT)
		A	B	C	D		
A	5.91	0%	10%	10%	80%	23.58	1.036
B	2.85	0%	10%	10%	80%	11.40	0.500
C	3.90	0%	10%	10%	80%	15.56	0.683
D	10.03	90%	0%	0%	10%	16.41	0.533
F	0.31	0%	45%	45%	10%	0.84	0.025
TOTAL	**22.99**					**67.79**	**2.777**

3.2.2 PUBLIC DRAINAGE BASINS

Basin E is an off-site basin and consists of the proposed public street, Oak Ridge Ave. In general, the basin slopes continuously from west to east at varying slopes between 0.5%-1%. Runoff is collected in storm drain in Oak Ridge and discharges into temporary public retention Pond A. The storm drain in Oak Ridge will be stubbed to the west for future connections as Oak Ridge expands to the west, see Exhibit 3. The proposed flow is 2.38 cfs.

Basin G is an off-site basin and consists primarily of the proposed public streets, Treeline Avenue and Chatsworth Drive but also includes small segments of on-site landscaping. The portion of on-site landscaping will discharge to the public right-of-way through sidewalk culverts and will not flow over the sidewalk. Treeline Ave is proposed as a full road width at the intersection of Treeline Ave and Universe Dr and transitions to half-road improvements at the Treeline Ave and Chatsworth Dr intersection. Chatsworth Dr is proposed as half-road improvements. In general, the basin slopes from west to east on Treeline Ave and south to north on Chatsworth Dr at varying slopes between 0.5%-1%. Chatsworth Dr will have a high point at the Treeline Ave and Chatsworth Dr intersection. Runoff north of Treeline Ave in Chatsworth Dr will flow north and future Chatsworth south of Treeline Ave will flow south. Runoff is collected in drop inlets which discharges into the proposed temporary public retention Pond A in Basin D via storm drain. There is a storm drain in Chatsworth that collects roadway flows from Treeline Ave and Chatsworth Dr as well as runoff from the private property. The proposed storm drain within Chatsworth Dr has been sized per the full developed road width. Exhibit 3 shows the proposed public and conceptual future public infrastructure. The proposed flow is 12.55 cfs.

Basin H is an off-site basin and consists of the half-street expansion of the proposed public street, Universe Boulevard. In general, the basin has a continuous slope from north to south at 0.5%. Runoff in Universe Boulevard continues south until it is collected in drop inlets immediately south of Woodmont Avenue which discharges directly into Pond K. There will be a high point in Treeline Ave at its intersection with Universe Boulevard to separate the runoff from those roadways. The proposed flow is 2.88 cfs. This flow has been accounted for in the existing PCSWMM model.

Basin I consists of the reconfiguration of Pond J and landscaping. In general, the basin slopes from north to south at varying slopes between 0.5%-1%. Runoff is collected in Pond J which discharges into the existing storm drain network paralleling Universe Blvd. The proposed flow in this basin is 2.00 cfs.

The hydrologic data table below depicts in further detail each public sub-basin and its characteristics.

TABLE 3.2.2 – HYDROLOGIC DATA – PROPOSED PUBLIC

HYDROLOGIC DATA - PROPOSED PUBLIC							
SUB-BASIN	AREA (AC)	LAND USE PERCENTAGES				Q100 (CFS)	V100 (AC-FT)
		A	B	C	D		
E	0.64	0%	17.5%	17.5%	65%	2.38	0.099
G	2.99	0%	5%	5%	90%	12.55	0.565
H	0.69	0%	5%	5%	90%	2.88	0.129
I	0.47	0%	5%	5%	90%	2.00	0.089
TOTAL	**4.79**					**19.81**	**0.882**

The pond data table in Appendix A depicts in further detail the characteristics and hydraulic results of the proposed temporary public retention Pond A. The existing flowrate for the site is 47.71 cfs, developed is 82.34, and 0.00 cfs is released from temporary public retention Pond A. The existing volume for the site is 1.308 ac-ft, developed is 3.441 ac-ft, and nothing is released. Temporary public retention Pond A is required to retain the 100-year, 10-day storm volume, 4.64 ac-ft. Temporary public retention Pond A has 4.71 ac-ft of retention volume, 1 foot of freeboard, 5.78 ac-ft of total volume and the spillway has capacity to pass the 100-year, 24-hour peak flow rate in an emergency situation. Additional calculations regarding temporary public retention Pond A are in Appendices A & B. Exhibit 4 provides detailed grading information for temporary public retention Pond A.

As the surrounding properties are developed, temporary public retention Pond A will ultimately discharge into the Upper Piedras Marcadas future 36" storm drain system within the Oak Ridge Ave extension crossing Paseo Del Norte Blvd NE. A copy of the Upper Piedras Marcadas Watershed Drainage map by Wilson & Company has been provided in Appendix A and shown conceptually on Exhibits 2 & 3. The proposed storm drain in Chatsworth and Oak Ridge discharges into temporary public retention Pond A in the interim condition. When the adjacent property to the northeast develops and builds the next portion of the downstream storm drain in Oak Ridge, the future developer will be responsible for retaining the runoff from their development, our proposed development, and all upstream basins, per City procedure, in this area. Once the adjacent property has been developed, the temporary public retention Pond A can be removed. Once downstream infrastructure is built to accept runoff from this area, a 48" storm drain will be extended east from the Chatsworth and Oak Ridge intersection in the future, see Exhibit 3. We anticipate that the storm drain crossing Paseo Del Norte Blvd NE will be a 48" pipe rather than 36" as shown on Exhibits 2 & 3 to accommodate flows that will contribute to this system.

The total first flush value of 0.34" required water quality volume for the site was calculated based on the total proposed onsite impervious area is13,064 cubic feet. The required stormwater quality volume has been provided in the proposed temporary public retention Pond A. More details regarding water quality will be provided at Building Permit review.

3.2.3 FUTURE PUBLIC/PRIVATE DRAINAGE BASINS

Future Basin D-1 is an undeveloped off-site private basin to the west and north of the property. In general, the basin slopes from southwest to northeast at varying slopes between 3-5%. For planning

purposes and conceptual future storm drain sizing, we have assumed this basin will be developed with 80% impervious area and discharge into a future storm drain in future Oak Ridge Ave. If there is not adequate downstream infrastructure available when this basin is developed, then this site must fully retain their runoff and cannot be discharged into temporary public retention Pond A. Basin D-1 generates 18.63 cfs.

Future Basin D-2 is an undeveloped off-site private basin to the west and north of the property. In general, the basin slopes from southwest to northeast at varying slopes between 3-5%. For planning purposes and conceptual future storm drain sizing, we have assumed this basin will be developed with 80% impervious area and discharge into a future storm drain in future Oak Ridge Ave. If there is not adequate downstream infrastructure available when this basin is developed, then this site must fully retain their runoff and cannot be discharged into temporary public retention Pond A. Future Basin D-2 generates 19.96 cfs.

Future Basin D-3 includes a proposed temporary public retention Pond A and undeveloped area around the pond. In general, the basin slopes from west to east at varying slopes between 1-5%. Runoff is retained within temporary public retention Pond A. Future Basin D-3 generates 5.17 cfs.

Future Basin G-2 is an off-site public basin and consists of the proposed public street, Chatsworth Drive. Chatsworth Dr is proposed as future half-road improvements. In general, the basin slopes from south to north at varying slopes between 0.5%-1%. Runoff is collected in future drop inlets which discharges into the proposed temporary public retention Pond A in Basin D via storm drain within Chatsworth Dr. Exhibit 3 shows the proposed public and conceptual future public infrastructure. The proposed flow is 5.37 cfs.

Future Basin H-2 is an off-site basin and consists of the future half-street expansion of the proposed public street, Universe Blvd. In general, the basin slopes from north to south at 0.5%. Runoff in Universe Blvd continues south until it is collected in drop inlets immediately south of Woodmont Avenue which discharges directly into Pond K. The proposed flow is 1.81 cfs. This flow has been accounted for in the existing PCSWMM model.

The hydrologic data table below depicts in further detail each future public/private sub-basin and its characteristics.

TABLE 3.2.3 – HYDROLOGIC DATA – FUTURE PUBLIC/PRIVATE

HYDROLOGIC DATA – FUTURE PUBLIC/PRIVATE							
FUTURE SUB-BASIN	AREA (AC)	LAND USE PERCENTAGES				Q100 (CFS)	V100 (AC-FT)
		A	B	C	D		
D-1	4.67	0%	10%	10%	80%	18.63	0.818
D-2	5.00	0%	10%	10%	80%	19.96	0.876
D-3	1.29	0%	10%	10%	80%	5.17	0.227
G-2	1.28	0%	5%	5%	90%	5.37	0.242
H-2	**0.43**	0%	5%	5%	90%	1.81	0.081
TOTAL	**12.67**					**50.94**	**2.244**

3.2.4 PCSWMM MODEL REVISIONS

Per the (UPM DMP), Section 1.4. Boca Negra Diversion, the Universe Boulevard storm drain system is designed to convey 62 cfs from properties owned by the Trails Subdivision through existing ponds J & K. The design basis and requirement for this system is to limit the discharge to a maximum peak flow of 62 cfs. Due to Pond J losing volume, we propose sending more drainage into Pond K, raising the 100-yr water surface elevation 0.26 feet from 5407.86' to 5408.12'. Pond K will still have 2.18' of freeboard available with the increase in water surface elevation and a peak discharge of 42.81 cfs. We propose installing a 3.7' diameter orifice plate on the southern downstream outfall storm drain in storm drain manhole "SDMH-5A" and reducing the diameter of the existing orifice on the southern downstream outfall storm drain in manhole "ORF_K" from 2.72' to 2.61'. The proposed Pond J has a maximum stored volume of 0.53 ac-ft, maximum inflow of 44.23 cfs, and maximum outflow of 30.85 cfs. In order to keep the hydraulic grade line below the existing manhole rim elevations, we propose installing a 24" storm drain out of the next storm drain manhole to the south into Pond K and installing a 3.5' diameter orifice plate in the Pond J manhole on the southern downstream outfall storm drain "MH-1". The PCSWMM model included the offsite basin flows from Basin D discharging into Pond J, so we removed input hydrograph "12" from the model since the offsite flows do not discharge into Pond J they flow to proposed temporary public retention Pond A. Also, input hydrograph "88" was revised from 12.31 cfs to 2.00 cfs to match the peak flow in Basin I. Also, after a field investigation it was discovered a 30" pipe discharges into Pond K at storm drain manhole "SDMH-5A". The existing 60" storm drain connecting to Pond J has been reduced to 48" since it does not negatively impact the system and will be replaced during construction. Although the maximum outflow increased from Ponds J & K, due to the reduction of input hydrograph "88", the removal of input hydrograph "12", and the differences in the time to maximum HGL, the Universe Blvd. storm drain discharge improved from 61.88 cfs to 55.76 cfs and remains below the 62 cfs design capacity. Even though the flow discharging out of Pond K is increasing, the overall system is discharging less flow south to the Boca Negra Dam and, therefore, the rest of the system outside of Ponds J and K are not negatively impacted. The existing and proposed results for all of the ponds in the PCSWMM model, including Ponds J and K, an overview map of the PCSWMM model revisions, and an elevation comparison table are included in Appendix A. Exhibit 5 provides detailed grading information for Pond J.

4.0 HYDRAULICS

4.1 STREETS

Runoff flow rates and volumes for the hydraulic design of the Sonata Trails Unit 4 development are those calculated by the AHYMO model. Private street capacities were checked at certain locations throughout the roadways where flow runoff rates are critical. These include the proposed roadways in Basins A, B, and C. The proposed public street capacities were calculated as well for their typical cross sections.

The maximum street capacity was determined for a given street section using ManningSolver Version 1.019 to ensure the design criteria mentioned in Section 2.0 of this report were met. Calculations for street capacities are shown in Appendix B.

4.2 STORM INLETS AND STORM DRAINS

Flow intercepted by drainage inlets were determined using the orifice and weir equations based on the City of Albuquerque Type "D" inlets. Flow quantities intercepted by curb inlets were determined using the Albuquerque DPM grating capacities rating curves for the appropriate inlets. All proposed storm drain capacities were determined using ManningSolver Version 1.019. The storm drain piping beneath the proposed public roads, Treeline and Chatsworth, were sized based on the full road width. For further information on drainage inlet and storm drain capacity calculations see Appendix B.

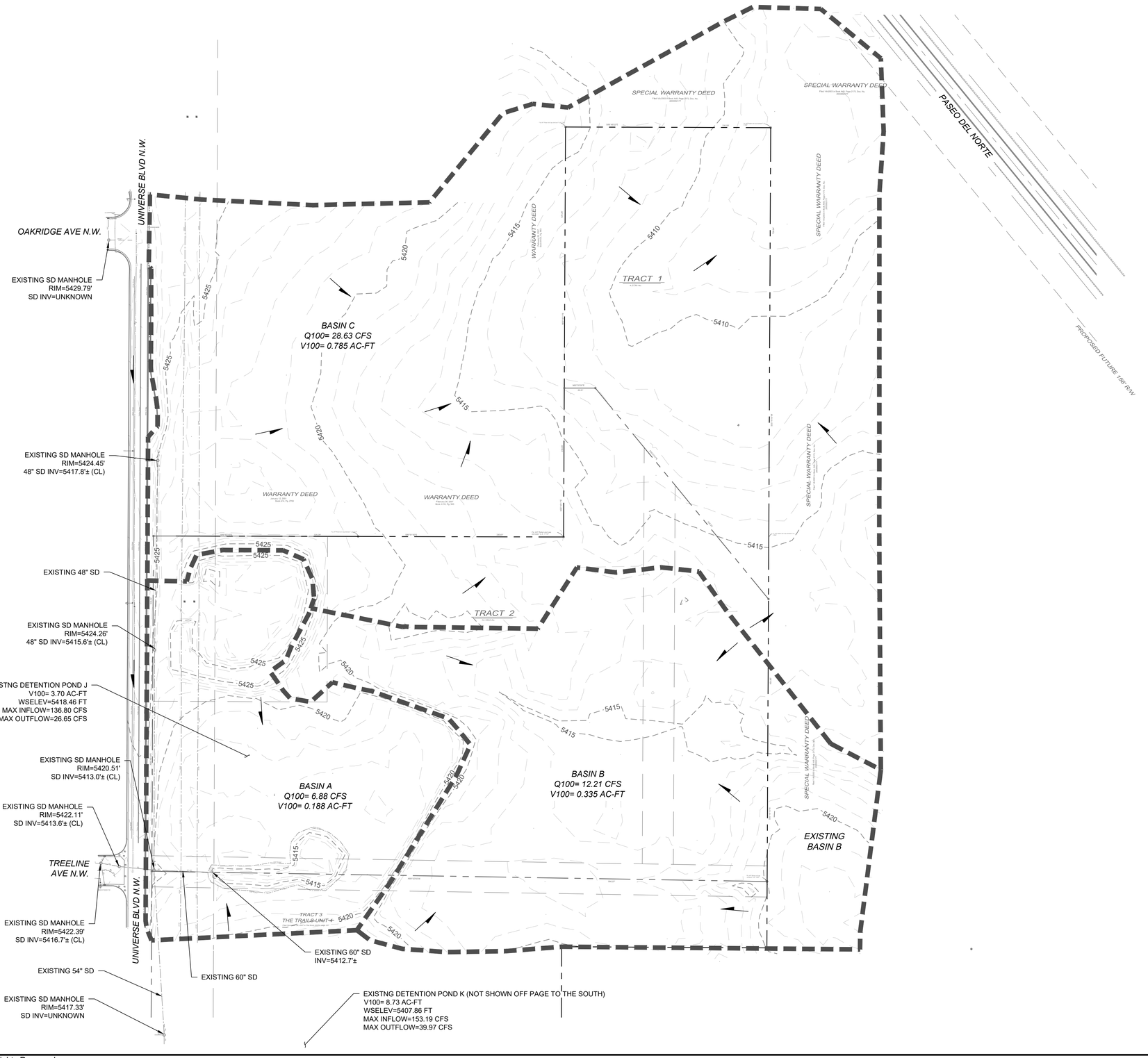
5.0 DRAINAGE MAINTENANCE COVENANTS

The existing Agreement and Covenants for ponds J & K will need to be modified to account for the revisions made to pond J and Universe storm drain system per Article 6-15 (C) of the DPM. The modified Agreement and Covenants will be provided before the building permit is approved. A new Agreement and Covenant for temporary public retention Pond A will need to be written and submitted before building permit approval.

6.0 CONCLUSION

This drainage report is prepared in support of the new development for Sonata Trails Unit 4 Apartments. The existing site is undeveloped and the new development will include apartments, parking, landscaping, public roadways, public Pond A, and revising existing Pond J. The existing surge Pond J will be redesigned to allow for the development of the apartment complex sending more drainage to existing Pond K. The 100-year water surface elevation in Pond K increases from 5407.86' to 5408.12', a 0.26' increase. Pond K will have 2.18' of remaining freeboard and a peak flow of 42.81 cfs after the proposed increase. The allowable peak discharge at the outfall of the Universe storm drain system is 62 cfs. The flow rate resulting from the proposed conditions of this development is 55.76 cfs, which is below the allowable rate. The proposed 100-year, 10-day storm event volume, 4.64 ac-ft is fully retained in proposed temporary public retention Pond A. The proposed spillway for temporary public retention Pond A is wide to best replicate the sheet flow that historically discharges out of Basin D. Water discharging over the spillway from temporary public retention Pond A will only occur in emergency situations when the 100-year, 10-day storm event is exceeded.

As the surrounding properties are developed and capacity is made available, temporary public retention Pond A will ultimately discharge into the Upper Piedras Marcadas future 36" storm drain system within the future Oak Ridge Ave extension crossing Paseo Del Norte Blvd NE. We anticipate that the storm drain crossing Paseo Del Norte Blvd NE will be a 48" pipe rather than 36" as shown on Exhibit 2 to accommodate flows that will contribute to this system. The hydrologic calculations are included in Appendix A. The hydraulic calculations are included in Appendix B.



LEGEND

- PROPERTY BOUNDARY
- BASIN BOUNDARY
- EXISTING STORM DRAIN
- FLOW ARROW
- EXISTING STORM DRAIN MANHOLE
- EXISTING STORM DRAIN INLET

N

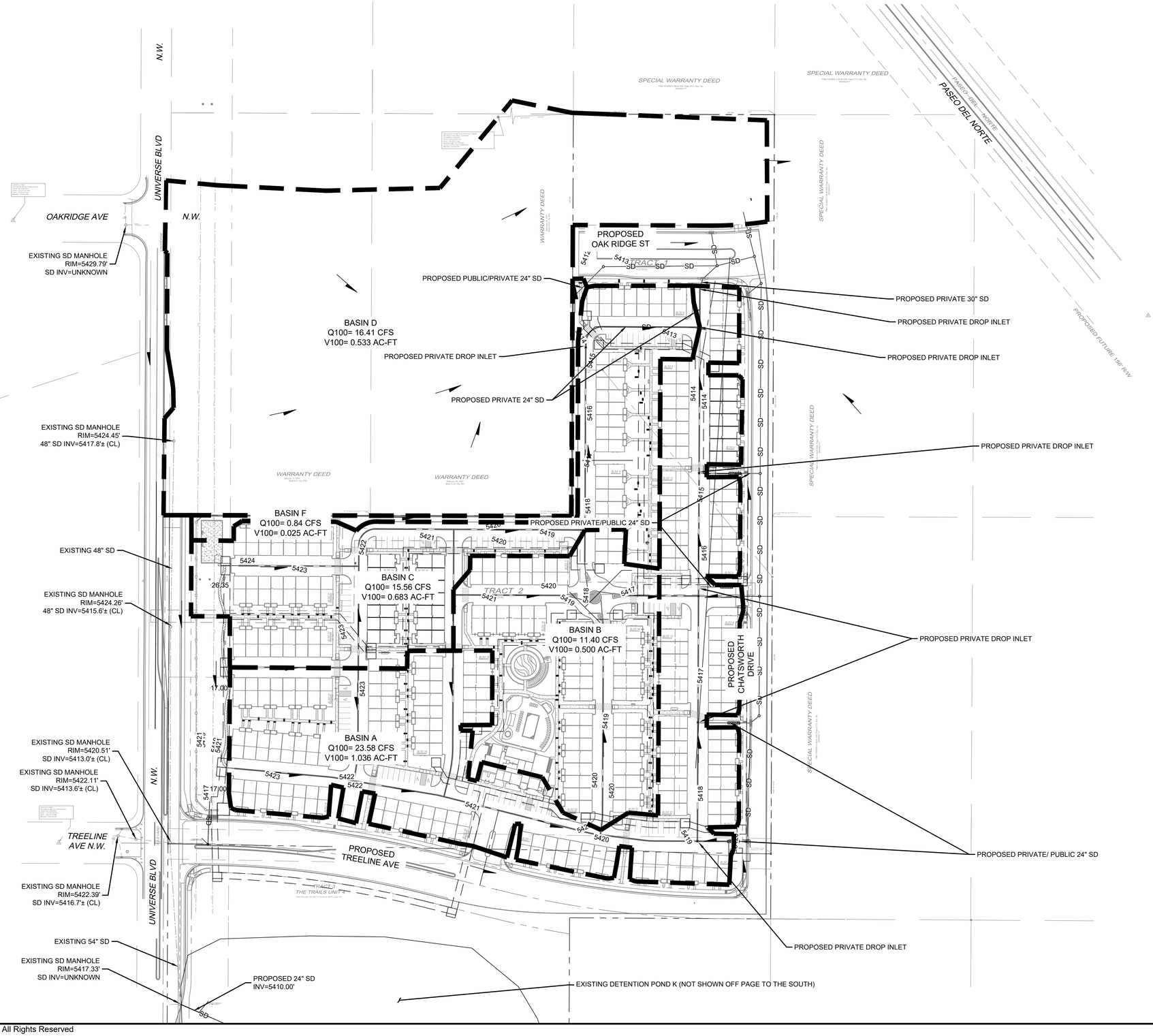
0 80 160
SCALE IN FEET

EXHIBIT 1 EXISTING BASINS

RESPEC
COMMUNITY DESIGN SOLUTIONS
5971 JEFFERSON STREET SUITE 101
ALBUQUERQUE, NEW MEXICO 87109
WWW.RESPEC.COM PHONE: (505)253-9718

NAME: L:\Active Projects\04022 Sonata Trails Unit 4 Apartments\3. DWG\Onsite Plan Set\Exhibits\04022 Drainage Existing Conditions.dwg PLOT DATE: May 29, 2020 1:59pm

NOTE:
RUNOFF FROM PRIVATE PROPERTY THAT DISCHARGES DIRECTLY INTO THE RIGHT-OF-WAY WILL BE EITHER SIDEWALK CULVERTS OR STORM DRAIN.



LEGEND

- PROPERTY BOUNDARY
- BASIN BOUNDARY
- EXISTING STORM DRAIN
- FLOW ARROW
- EXISTING STORM DRAIN MANHOLE
- EXISTING STORM DRAIN INLET
- PROPOSED STORM DRAIN MANHOLE
- PROPOSED STORM DRAIN INLET
- PROPOSED STORM DRAIN
- CONCEPTUAL FUTURE STORM DRAIN

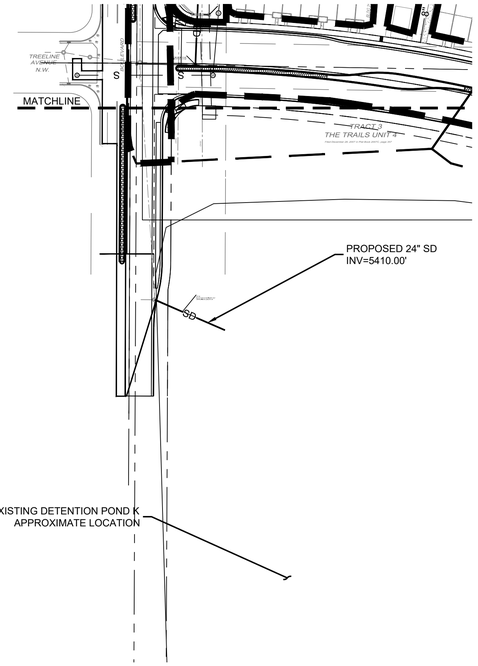
0 80 160
SCALE IN FEET

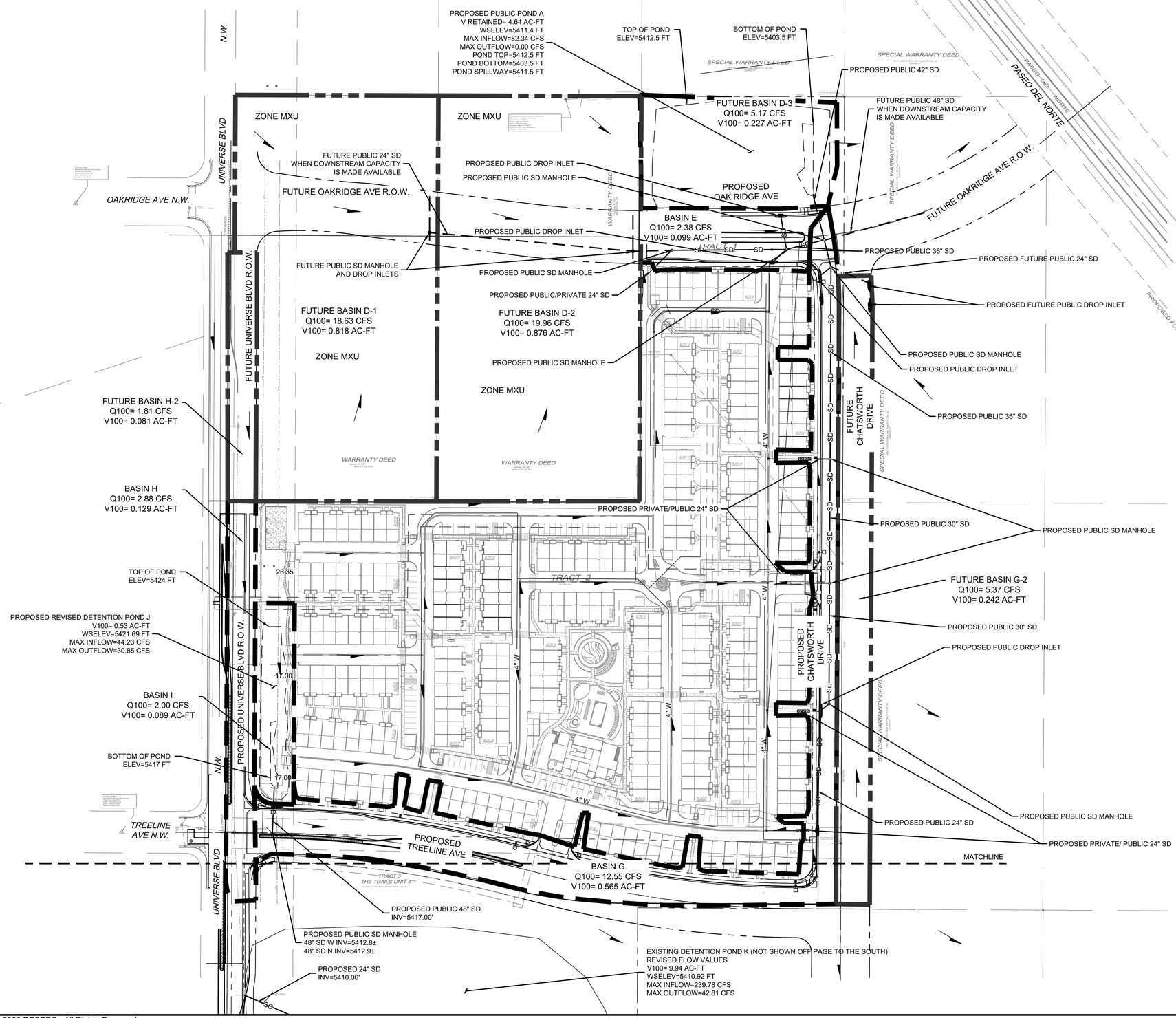
EXHIBIT 2 PROPOSED BASINS

RESPEC
COMMUNITY DESIGN SOLUTIONS
5971 JEFFERSON STREET SUITE 101
ALBUQUERQUE, NEW MEXICO 87109
WWW.RESPEC.COM PHONE: (505)253-9718

NAME: L:\Active Projects\04022 Sonata Trails Unit 4 Apartments\3. DWG\Onsite Plan Set\Exhibits\04022 Drainage Proposed Conditions.dwg PLOT DATE: Sep 02, 2020 11:31am

NOTE:
RUNOFF FROM PRIVATE PROPERTY THAT DISCHARGES DIRECTLY INTO THE RIGHT-OF-WAY WILL BE EITHER SIDEWALK CULVERTS OR STORM DRAIN.





LEGEND

- PROPERTY BOUNDARY
- BASIN BOUNDARY
- FUTURE BASIN BOUNDARY
- EXISTING STORM DRAIN
- FLOW ARROW
- EXISTING STORM DRAIN MANHOLE
- EXISTING STORM DRAIN INLET
- PROPOSED STORM DRAIN MANHOLE
- PROPOSED STORM DRAIN INLET
- PROPOSED STORM DRAIN
- CONCEPTUAL FUTURE STORM DRAIN

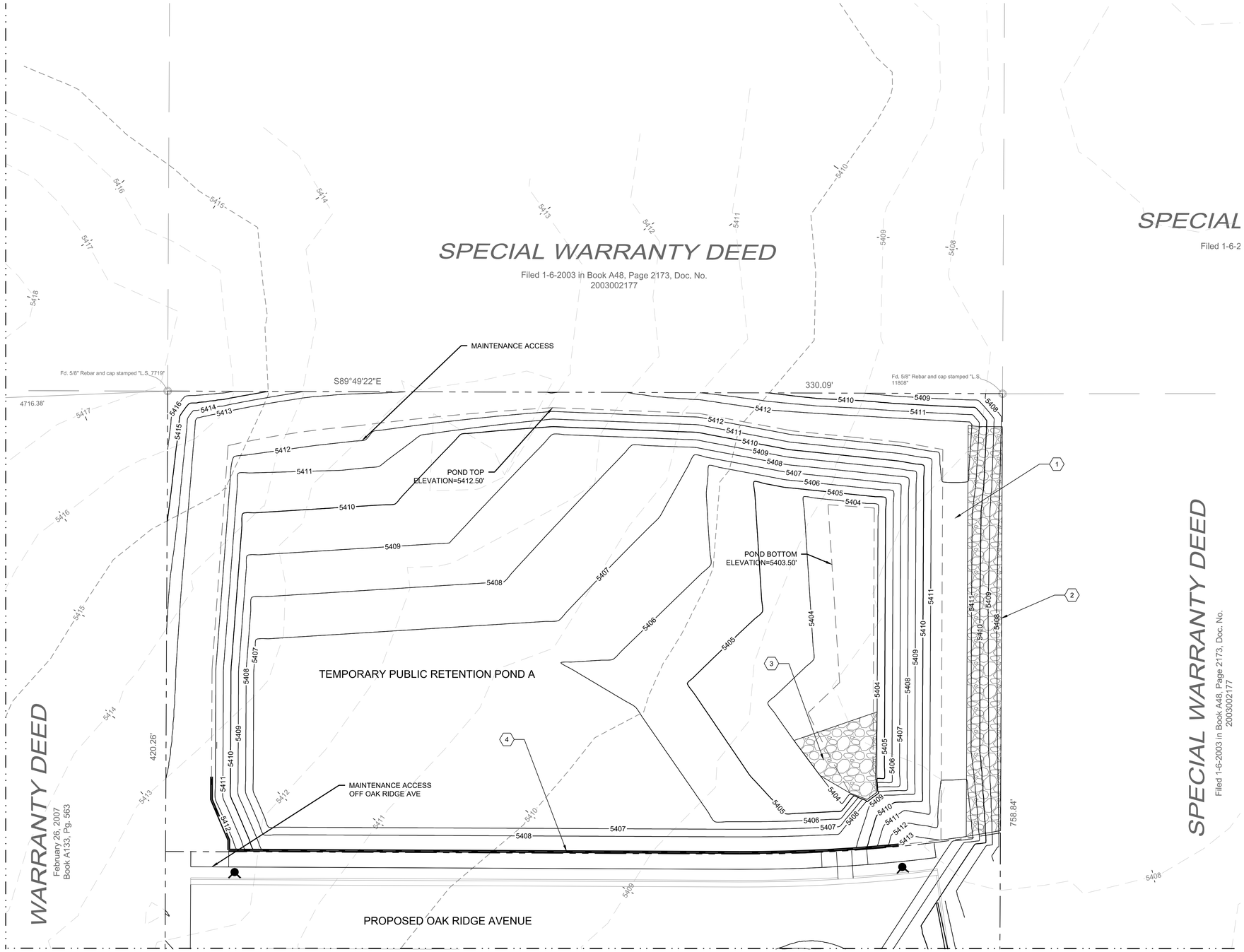
N

0 80 160
SCALE IN FEET

EXHIBIT 3 PROPOSED PUBLIC/FUTURE INFRASTRUCTURE

RESPEC
COMMUNITY DESIGN SOLUTIONS
5971 JEFFERSON STREET SUITE 101
ALBUQUERQUE, NEW MEXICO 87109
WWW.RESPEC.COM PHONE: (505)253-9718

NAME: N:\Projects\04022 Sonata Trails Unit 4 Apartments\3. DWG\Onsite Plan Set\Exhibits\04022 Drainage Proposed Public Conditions.dwg PLOT DATE: Oct 13, 2020 11:22am



LEGEND

MAJOR CONTOUR	4985
MINOR CONTOUR	
EXISTING MAJOR CONTOUR	4985
EXISTING MINOR CONTOUR	
MATCHLINE	
SLOPE ARROW	1.5% 51.2%
SIDEWALK CULVERT	

KEYED NOTES

I.D.#	DESCRIPTION
1	1' OVERFLOW WEIR. TOP OF POND ELEVATION = 5412.50'. TOP OF WEIR ELEVATION = 5411.50'.
2	RIP RAP D50=8" DOWNSTREAM OF OVERFLOW WEIR.
3	RIP RAP D50=8" POND RUNDOWN.
4	WATERPROOF CMU RETAINING WALL. RETAINING WALL HEIGHT VARIES FROM 0'-6'.

0 20 40
SCALE: 1" = 20'

EXHIBIT 4 TEMPORARY PUBLIC RETENTION POND A

RESPEC
COMMUNITY DESIGN SOLUTIONS
5971 JEFFERSON STREET SUITE 101
ALBUQUERQUE, NEW MEXICO 87109
WWW.RESPEC.COM PHONE: (505)253-9718

NAME: L:\Active Projects\04022 Sonata Trails Unit 4 Apartments\3. DWG\Onsite Plan Set\Exhibits\04022 POND A.dwg PLOT DATE: Sep 03, 2020 2:33pm

MAINTENANCE ACCESS
OFF UNIVERSE BLVD

MAINTENANCE ACCESS

POND J

POND TOP
ELEVATION=5424.00'

POND BOTTOM
ELEVATION=5417.00'

BLDG 22

BLDG 23

BLDG 24

BLDG 25

TOP POND

N.W.

PROPOSED TREELINE AVENUE

TREELINE

LEGEND

MAJOR CONTOUR	4985
MINOR CONTOUR	
EXISTING MAJOR CONTOUR	4985
EXISTING MINOR CONTOUR	
MATCHLINE	
SLOPE ARROW	-1.5% -51.2%
SIDEWALK CULVERT	

0 20 40
SCALE: 1" = 20'

EXHIBIT 5 POND J

RESPEC
COMMUNITY DESIGN SOLUTIONS
5971 JEFFERSON STREET SUITE 101
ALBUQUERQUE, NEW MEXICO 87109
WWW.RESPEC.COM PHONE: (505)253-9718

NAME: L:\Active Projects\04022 Sonata Trails Unit 4 Apartments\3. DWG\Onsite Plan Set\Exhibits\04022 POND J.dwg PLOT DATE: Sep 03, 2020 2:57pm

APPENDIX A

HYDROLOGIC CALCULATIONS

Water Quality:

Required Water Quality volume for first flush of 0.34"

Basin	Volume (cu. ft.)	Volume Provided (cu. ft.)
Total Onsite Impervious Area	13,064	122,383

PCSWMM MODEL VS CURRENT SURVEY/DESIGN ELEVATION COMPARISON		
PCSWMM JUNCTION	MODEL ELEVATION (NGVD 29)	SURVEY/DESIGN ELEVATION (NAVD 88)
	FT	FT
MH-1	5418.91	5421.71
SDMH-4A	5414.70	5417.33
PondJ	5414.20	5417.00

Link38 - Revised the 5' diameter storm drain into Pond J to 4' diameter

Pond J - Revised the storage capacity of Pond J

Revised the demand Time Series ID-88 to match new area of Pond J

Removed Node J - offsite flows do not drain to Pond J

MH-1

SDMH-4A

SDMH-5A

OR2 - Added 3.70' diameter orifice to the southern downstream outfall storm drain.

OR1 - Changed orifice plate diameter from 2.03' to 3.50'. The orifice location has not changed, still on the southern downstream outfall storm drain

Pond K - no revisions to the physical storage capacity, but are sending more flow to this pond due to revised storage capacity of Pond K. Discharge of out Pond K is 42.81 cfs.

Link64 - Added 24" diameter storm drain pipe to discharge into Pond K

Link63 - Added 30" diameter storm drain pipe to discharge into Pond K based on field inspection of the system

ORF_K - Changed orifice plate diameter from 2.72' to 2.61'. The orifice location has not changed, still on the southern downstream outfall storm drain

Legend

- Junctions
- Outfalls
- Storages
- Conduits
- Orifices

PCSWMM MODEL REVISIONS

N

1000 ft

Pond Summary				
Pond	Inflow (cfs)	Outflow (cfs)	Volume Prvd (ac-ft)	Peak Volume (ac-ft)
Pond 202B	400.7	197.8	13.40	13.28
Pond 209	63.9	19.2	3.00	1.95
Pond 10	196.3	19.9	7.00	6.9
Sundance Pond	101.7	32.6	2.80	2.76
Unser Pond	166.1	119.3	7.70	7.68
Pond 2	652.6	446.3	16.00	15.9

Proposed Basin Summary Data (100 yr - 24 hr)			
Basin ID	Area (ac)	Peak Flow (cfs)	Volume (ac-ft)
B202A	44.3	130	7.9
B202B	37.1	132	6.5
B202C	32.3	116	6.0
B203A	46.5	133	8.5
B203B	37.4	119	6.4
B204A	53.6	196	9.7
B204B	27.7	104	5.1
B205A	20.6	76	3.7
B205B	21.9	79	3.9
B206A	87.0	258	16.3
B206B	73.2	241	13.0
B206C	46.2	130	8.2
B206D	26.4	97	4.8
B206E	24.3	80	4.0
B207	249.0	72	6.9
B208	111.9	67	5.1
B209	32.9	64	3.5
B210	22.0	66	3.6
Sundance	40.3	102	5.5

Analysis Point Summary (100-yr, 24- hr)			
Analysis Point	Area ac	Peak Flow cfs	Volume ac-ft
AP-1	356.6	570	63.4
AP-2	468.5	612	68.5
AP-3	506.6	157	40.2
AP-4	997.1	730	112.2
AP-5	37.4	119	6.4
AP-6	0.0	47	6.6
AP-7	44.3	130	7.9
AP-8	160.2	198	27.9
AP-9	160.2	402	28.5
AP-10	78.8	226	14.5
AP-11	184.4	119	24.5
AP-12	160.2	473	29.2
AP-13	186.6	537	34.0
AP-14	232.8	653	42.2
AP-15	53.6	196	9.7
AP-16	101.9	177	17.8
AP-17	32.9	19	3.4
AP-18	81.3	110	14.1

GRAPHIC SCALE
600 0 300 600 1200 2400
(IN FEET)
1 inch = 600 ft.

UPPER PIEDRAS MARCADAS WATERSHED DRAINAGE AND WATER QUALITY MANAGEMENT PLAN
PLATE 3 - ALTERNATIVE 3

AMAFCA
WILSON & COMPANY
4900 LANG AVE. NE
ALBUQUERQUE, NM 87109
PHONE: 505-348-4000
www.wilsonco.com

Hydrology Calculations

The following calcualtions are based on Albuquerque's Development Process Manual, Section 22.2 (OLD DPM)

Runoff Rate:

Treatment Type Areas

Subbasin	$Area_A$ (ac)	$Area_B$ (ac)	$Area_C$ (ac)	$Area_D$ (ac)	Total (ac)
Proposed Basin A	0.00	0.59	0.59	4.72	5.91
Proposed Basin B	0.00	0.29	0.29	2.28	2.85
Proposed Basin C	0.00	0.39	0.39	3.12	3.90
Proposed Basin D	9.03	0.00	0.00	1.00	10.03
Proposed Basin E	0.00	0.11	0.11	0.41	0.64
Proposed Basin F	0.00	0.15	0.15	0.00	0.31
Proposed Basin G	0.00	0.15	0.15	2.70	2.99
Proposed Basin H	0.00	0.03	0.03	0.62	0.69
Proposed Basin I	0.00	0.02	0.02	0.43	0.47
Total	9.03	1.74	1.74	15.28	27.78
Pond A Total	9.03	1.68	1.68	14.23	26.62

Peak Discharge values based on Zone 1 from Table A-9

Q_A = 1.29 cfs/ac Q_B = 2.03 cfs/ac Q_C = 2.87 cfs/ac Q_D = 4.37 cfs/ac

Peak Discharge values FOR THE 10-YR STORM EVENT based on Zone 1 from Table A-9

Q_A = 0.24 cfs/ac Q_B = 0.76 cfs/ac Q_C = 1.49 cfs/ac Q_D = 2.89 cfs/ac

Peak Discharge calculation for a 100-yr, 24-hr storm event from equation A-10

Subbasin	Discharge (cfs)
Proposed Basin A	23.5
Proposed Basin B	11.4
Proposed Basin C	15.5
Proposed Basin D	16.0
Proposed Basin E	2.4
Proposed Basin F	0.8
Proposed Basin G	12.5
Proposed Basin H	2.9
Proposed Basin I	2.0
Total	82.1

Subbasin	Q10 (cfs)
Proposed Basin A	15.0
Proposed Basin B	7.2
Proposed Basin C	9.9
Proposed Basin D	5.1
Proposed Basin E	1.4
Proposed Basin F	0.3
Proposed Basin G	8.1
Proposed Basin H	1.9
Proposed Basin I	1.3
Total	47.1

Excess Precipitation values for 100-yr, 6hr storm based on Zone 1 from Table A-8

E_A = 0.44 in E_B = 0.67 in E_C = 0.99 in E_D = 1.97 in

EXCESS PRECIPITATION

Weighted E (in)	V_{360} (ac-ft)	V_{10days} (ac-ft)
1.307	2.90	4.64

TEMPORARY PUBLIC RETENTION POND A - PROPOSED												
NAME	Q100-24HR EXISTING DISCHARGE	Q100-10DAY WEIR DISCHARGE	V100-24HR EXISTING VOLUME	V100-10DAY WEIR DISCHARGE	Q100-24HR MAX INFLOW	V100-10DAY MAX INFLOW VOLUME	VOLUME RETAINED	MAX WATER SURFACE ELEVATION	RETENTION VOLUME PROVIDED	TOP OF POND ELEVATION	SPILLWAY ELEVATION	BOTTOM OF POND ELEVATION
	CFS	CFS	AC-FT	AC-FT	CFS	AC-FT	AC-FT	FT	AC-FT	FT	FT	FT
POND-A	47.71	0.00	1.31	0.00	82.34	4.64	4.64	5411.40	4.71	5412.50	5411.50	5403.50

TEMPORARY PUBLIC RETENTION POND A				
Elevation	Area (Sq.Ft)	V (Cu.Ft)	Cum (Cu.Ft)	Cum (Ac.Ft)
5403.50	1918	0	0	0.00
5404.00	3421	1335	1335	0.03
5405.00	7164	5293	6627	0.15
5406.00	11749	9457	16084	0.37
5407.00	26579	19164	35248	0.81
5408.00	32142	29361	64608	1.48
5409.00	37959	35051	99659	2.29
5410.00	41815	39887	139546	3.20
5411.50	45504	65489	205035	4.71
5412.50	48297	46901	251936	5.78

EXISTING PCSWMM STORAGE SUMMARY											
NAME	POND BOTTOM	TOP OF POND	EMERGENCY SPILLWAY ELEVATION	DEPTH TO EMERGENCY SPILLWAY	MAX WATER SURFACE DEPTH	MAX HGL	TIME MAX HGL	MAX TOTAL INFLOW	FREEBOARD TO EMERGENCY SPILLWAY	MAX STORED VOLUME	MAX OUTFLOW
	FT	FT	FT	FT	FT	FT	H:M	CFS	FT	AC-FT	CFS
POND-D	5423.30	5432.30	5431.30	8.00	7.98	5431.28	6:58	159.24	0.02	6.42	14.80
POND-F	5415.08	5426.80	5424.33	9.25	8.16	5423.24	3:32	215.08	1.09	9.87	9.09
POND-F5	5419.30	5426.80	5426.30	7.00	6.91	5426.21	1:48	123.32	0.09	2.71	46.43
POND-G	5415.67	5424.00	5422.50	6.83	6.63	5422.30	14:01	117.66	0.20	6.88	15.80
POND-H	5418.65	5423.00	5422.00	3.35	3.28	5421.93	2:28	110.67	0.07	2.96	24.71
POND-J	5414.00	5418.00	5417.00	3.00	1.66	5415.66	2:03	136.06	1.34	3.70	26.64
POND-K	5404.85	5412.00	5410.30	5.45	3.01	5407.86	4:01	153.19	2.44	8.73	39.97

PROPOSED PCSWMM STORAGE SUMMARY											
NAME	POND BOTTOM	TOP OF POND	EMERGENCY SPILLWAY ELEVATION	DEPTH TO EMERGENCY SPILLWAY	MAX WATER SURFACE DEPTH	MAX HGL	TIME MAX HGL	MAX TOTAL INFLOW	FREEBOARD TO EMERGENCY SPILLWAY	MAX STORED VOLUME	MAX OUTFLOW
	FT	FT	FT	FT	FT	FT	H:M	CFS	FT	AC-FT	CFS
POND-D	5423.30	5432.30	5431.30	8.00	7.98	5431.28	6:58	159.24	0.02	6.42	14.80
POND-F	5415.08	5426.80	5424.33	9.25	8.16	5423.24	3:32	215.33	1.09	9.87	9.09
POND-F5	5419.30	5426.80	5426.30	7.00	6.91	5426.21	1:48	123.31	0.09	2.71	46.43
POND-G	5415.67	5424.00	5422.50	6.83	6.63	5422.30	14:00	117.19	0.20	6.88	15.80
POND-H	5418.65	5423.00	5422.00	3.35	3.28	5421.93	2:28	110.67	0.07	2.96	24.71
POND-J	5414.20	5421.20	5420.20	6.00	4.69	5418.89	1:36	44.23	1.31	0.53	30.85
POND-K	5404.85	5412.00	5410.30	5.45	3.27	5408.12	2:26	239.78	2.18	9.94	42.81

```
*  100 YEAR RAINFALL TABLE
RAINFALL              TYPE=13  RAIN QUARTER=0 IN
                     RAIN ONE=1.87 IN  RAIN SIX=2.20 IN
                     RAIN DAY=2.66 IN  DT=0.033 HR
************************************************************
*S EXISTING CONDITIONS

*S  COMPUTE HYD EXISTING BASIN A
COMPUTE NM HYD      ID=1  HYDNO=101  DA=0.00804SQ MI
                    PER A=100  PER B=0   PER C=0  PER D=0
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=1  CODE=10

*S  COMPUTE HYD EXISTING BASIN B
COMPUTE NM HYD      ID=2  HYDNO=102  DA=0.01428SQ MI
                    PER A=100  PER B=0   PER C=0  PER D=0
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=2  CODE=10

*S  COMPUTE HYD EXISTING BASIN C
COMPUTE NM HYD      ID=3  HYDNO=103  DA=0.03350SQ MI
                    PER A=100  PER B=0   PER C=0  PER D=0
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=3  CODE=10

ADD HYD           ID=4 HYD=101TO102 ID I=1 II=2
PRINT HYD                 ID=4 CODE=10

ADD HYD           ID=5 HYD=COMBINED101-102TO103 ID I=3 II=4
PRINT HYD                 ID=5 CODE=10

************************************************************
*S PROPOSED CONDITIONS

*S  COMPUTE HYD PROPOSED BASIN A
COMPUTE NM HYD      ID=6  HYDNO=104  DA=0.00923SQ MI
                    PER A=0  PER B=10   PER C=10   PER D=80
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=6  CODE=10

*S  COMPUTE HYD PROPOSED BASIN B
COMPUTE NM HYD      ID=7  HYDNO=105  DA=0.00446SQ MI
                    PER A=0  PER B=10   PER C=10   PER D=80
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=7  CODE=10

*S  COMPUTE HYD PROPOSED BASIN C
COMPUTE NM HYD      ID=8  HYDNO=106  DA=0.00609SQ MI
                    PER A=0  PER B=10   PER C=10   PER D=80
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=8  CODE=10
```

```
ADD HYD           ID=10 HYD=BTOA ID I=6 II=7
PRINT HYD                ID=10 CODE=10

ADD HYD           ID=11 HYD=B-CTOA ID I=8 II=10
PRINT HYD                ID=11 CODE=10

*S  COMPUTE HYD PROPOSED BASIN D
COMPUTE NM HYD      ID=12  HYDNO=107  DA=0.01567SQ MI
                    PER A=90  PER B=0   PER C=0   PER D=10
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=12  CODE=10

*S  COMPUTE HYD PROPOSED BASIN E
COMPUTE NM HYD      ID=13  HYDNO=108  DA=0.00100SQ MI
                    PER A=0  PER B=17.5   PER C=17.5   PER D=65
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=13  CODE=10

*S  COMPUTE HYD PROPOSED BASIN F
COMPUTE NM HYD      ID=14  HYDNO=109  DA=0.00048SQ MI
                    PER A=0  PER B=45   PER C=45   PER D=10
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=14  CODE=10

ADD HYD           ID=15 HYD=DTOF ID I=12 II=14
PRINT HYD                ID=15 CODE=10

ADD HYD           ID=16 HYD=ETOF-D ID I=13 II=15
PRINT HYD                ID=16 CODE=10

*S  COMPUTE HYD PROPOSED BASIN G
COMPUTE NM HYD      ID=17  HYDNO=110  DA=0.00468SQ MI
                    PER A=0  PER B=5   PER C=5   PER D=90
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=17  CODE=10

*S  COMPUTE HYD PROPOSED BASIN H
COMPUTE NM HYD      ID=18  HYDNO=111  DA=0.00107SQ MI
                    PER A=0  PER B=5   PER C=5   PER D=90
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=18  CODE=10

*S  COMPUTE HYD PROPOSED BASIN I
COMPUTE NM HYD      ID=19  HYDNO=112  DA=0.00074SQ MI
                    PER A=0  PER B=5   PER C=5   PER D=90
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=19  CODE=10

ADD HYD           ID=20 HYD=HTOI ID I=18 II=19
PRINT HYD                ID=20 CODE=10
```

```
ADD HYD           ID=21 HYD=A-CTOG ID I=11 II=17
PRINT HYD                ID=21 CODE=10

ADD HYD           ID=22 HYD=D-FTOA-DTOG ID I=16 II=21
PRINT HYD                ID=22 CODE=10

************************************************************
*S FUTURE CONDITIONS

*S  COMPUTE HYD FUTURE BASIN D-1
COMPUTE NM HYD      ID=23  HYDNO=113  DA=0.00729SQ MI
                    PER A=0  PER B=10   PER C=10   PER D=80
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=23  CODE=10

*S  COMPUTE HYD FUTURE BASIN D-2
COMPUTE NM HYD      ID=24  HYDNO=114  DA=0.00781SQ MI
                    PER A=0  PER B=10   PER C=10   PER D=80
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=24  CODE=10

*S  COMPUTE HYD FUTURE BASIN D-3
COMPUTE NM HYD      ID=25  HYDNO=115  DA=0.00202SQ MI
                    PER A=0  PER B=10   PER C=10   PER D=80
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=25  CODE=10

*S  COMPUTE HYD FUTURE BASIN G-2
COMPUTE NM HYD      ID=26  HYDNO=116  DA=0.00200SQ MI
                    PER A=0  PER B=5   PER C=5   PER D=90
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=26  CODE=10

*S  COMPUTE HYD FUTURE BASIN H-2
COMPUTE NM HYD      ID=27  HYDNO=117  DA=0.00067SQ MI
                    PER A=0  PER B=5   PER C=5   PER D=90
                    TP=-0.13   RAIN=-1
PRINT HYD           ID=27  CODE=10


ADD HYD           ID=28 HYD=FULLROADWIDTH ID I=17 II=26
PRINT HYD                ID=28 CODE=10



FINISH
```

AHYMO PROGRAM (AHYMO-S4) - Version: S4.02a - Rel: 02a

RUN DATE (MON/DAY/YR) = 09/01/2020

START TIME (HR:MIN:SEC) = 15:00:23 USER NO.= AHYMO-S4TempUser05901704

INPUT FILE = y\ENG Tools\ahymo-s4-r2\ahymo-s4-r2\DISK1\program files\AHYMO-S4\04022 Input.HMI

* 100 YEAR RAINFALL TABLE

RAINFALL TYPE=13 RAIN QUARTER=0 IN

RAIN ONE=1.87 IN RAIN SIX=2.20 IN

RAIN DAY=2.66 IN DT=0.033 HR

COMPUTED 24-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.

DT = 0.033000 HOURS END TIME = 23.990999 HOURS

0.0000	0.0016	0.0033	0.0049	0.0066	0.0084	0.0102
0.0120	0.0139	0.0158	0.0178	0.0198	0.0219	0.0240
0.0262	0.0285	0.0308	0.0332	0.0357	0.0383	0.0409
0.0437	0.0465	0.0495	0.0526	0.0558	0.0592	0.0627
0.0664	0.0704	0.0745	0.0793	0.0847	0.0904	0.0983
0.1220	0.1595	0.2144	0.2903	0.3910	0.5206	0.6830
0.8823	1.1227	1.2303	1.3056	1.3716	1.4312	1.4859
1.5365	1.5836	1.6278	1.6693	1.7085	1.7455	1.7805
1.8136	1.8451	1.8749	1.9032	1.9301	1.9482	1.9541
1.9597	1.9650	1.9700	1.9749	1.9795	1.9840	1.9883
1.9925	1.9965	2.0004	2.0041	2.0078	2.0114	2.0148
2.0182	2.0215	2.0247	2.0278	2.0309	2.0339	2.0368
2.0396	2.0425	2.0452	2.0479	2.0506	2.0532	2.0557
2.0582	2.0607	2.0631	2.0655	2.0678	2.0702	2.0724
2.0747	2.0769	2.0791	2.0812	2.0833	2.0854	2.0875
2.0895	2.0915	2.0935	2.0955	2.0974	2.0993	2.1012
2.1031	2.1049	2.1067	2.1086	2.1103	2.1121	2.1139
2.1156	2.1173	2.1190	2.1207	2.1223	2.1240	2.1256
2.1272	2.1288	2.1304	2.1320	2.1335	2.1351	2.1366
2.1381	2.1396	2.1411	2.1426	2.1440	2.1455	2.1469
2.1484	2.1498	2.1512	2.1526	2.1540	2.1553	2.1567
2.1581	2.1594	2.1607	2.1621	2.1634	2.1647	2.1660
2.1673	2.1686	2.1698	2.1711	2.1723	2.1736	2.1748
2.1761	2.1773	2.1785	2.1797	2.1809	2.1821	2.1833
2.1844	2.1856	2.1868	2.1879	2.1891	2.1902	2.1913
2.1925	2.1936	2.1947	2.1958	2.1969	2.1980	2.1991
2.2002	2.2015	2.2028	2.2041	2.2054	2.2067	2.2080
2.2092	2.2105	2.2118	2.2130	2.2143	2.2156	2.2168
2.2181	2.2193	2.2206	2.2218	2.2231	2.2243	2.2255
2.2268	2.2280	2.2292	2.2305	2.2317	2.2329	2.2341

2.2354	2.2366	2.2378	2.2390	2.2402	2.2414	2.2426
2.2438	2.2450	2.2462	2.2474	2.2486	2.2497	2.2509
2.2521	2.2533	2.2545	2.2556	2.2568	2.2580	2.2591
2.2603	2.2615	2.2626	2.2638	2.2649	2.2661	2.2672
2.2684	2.2695	2.2706	2.2718	2.2729	2.2741	2.2752
2.2763	2.2774	2.2786	2.2797	2.2808	2.2819	2.2830
2.2842	2.2853	2.2864	2.2875	2.2886	2.2897	2.2908
2.2919	2.2930	2.2941	2.2952	2.2963	2.2974	2.2984
2.2995	2.3006	2.3017	2.3028	2.3038	2.3049	2.3060
2.3071	2.3081	2.3092	2.3103	2.3113	2.3124	2.3134
2.3145	2.3155	2.3166	2.3176	2.3187	2.3197	2.3208
2.3218	2.3229	2.3239	2.3249	2.3260	2.3270	2.3280
2.3291	2.3301	2.3311	2.3321	2.3331	2.3342	2.3352
2.3362	2.3372	2.3382	2.3392	2.3402	2.3413	2.3423
2.3433	2.3443	2.3453	2.3463	2.3473	2.3482	2.3492
2.3502	2.3512	2.3522	2.3532	2.3542	2.3552	2.3561
2.3571	2.3581	2.3591	2.3600	2.3610	2.3620	2.3630
2.3639	2.3649	2.3659	2.3668	2.3678	2.3687	2.3697
2.3706	2.3716	2.3726	2.3735	2.3745	2.3754	2.3763
2.3773	2.3782	2.3792	2.3801	2.3811	2.3820	2.3829
2.3839	2.3848	2.3857	2.3867	2.3876	2.3885	2.3894
2.3904	2.3913	2.3922	2.3931	2.3940	2.3950	2.3959
2.3968	2.3977	2.3986	2.3995	2.4004	2.4013	2.4022
2.4031	2.4040	2.4049	2.4058	2.4067	2.4076	2.4085
2.4094	2.4103	2.4112	2.4121	2.4130	2.4139	2.4148
2.4156	2.4165	2.4174	2.4183	2.4192	2.4200	2.4209
2.4218	2.4227	2.4235	2.4244	2.4253	2.4261	2.4270
2.4279	2.4287	2.4296	2.4305	2.4313	2.4322	2.4330
2.4339	2.4348	2.4356	2.4365	2.4373	2.4382	2.4390
2.4399	2.4407	2.4416	2.4424	2.4432	2.4441	2.4449
2.4458	2.4466	2.4474	2.4483	2.4491	2.4499	2.4508
2.4516	2.4524	2.4533	2.4541	2.4549	2.4557	2.4566
2.4574	2.4582	2.4590	2.4599	2.4607	2.4615	2.4623
2.4631	2.4639	2.4647	2.4656	2.4664	2.4672	2.4680
2.4688	2.4696	2.4704	2.4712	2.4720	2.4728	2.4736
2.4744	2.4752	2.4760	2.4768	2.4776	2.4784	2.4792
2.4800	2.4808	2.4816	2.4823	2.4831	2.4839	2.4847
2.4855	2.4863	2.4871	2.4878	2.4886	2.4894	2.4902
2.4910	2.4917	2.4925	2.4933	2.4941	2.4948	2.4956
2.4964	2.4971	2.4979	2.4987	2.4994	2.5002	2.5010
2.5017	2.5025	2.5033	2.5040	2.5048	2.5055	2.5063
2.5070	2.5078	2.5086	2.5093	2.5101	2.5108	2.5116
2.5123	2.5131	2.5138	2.5146	2.5153	2.5161	2.5168
2.5175	2.5183	2.5190	2.5198	2.5205	2.5212	2.5220
2.5227	2.5235	2.5242	2.5249	2.5257	2.5264	2.5271
2.5279	2.5286	2.5293	2.5300	2.5308	2.5315	2.5322
2.5329	2.5337	2.5344	2.5351	2.5358	2.5366	2.5373
2.5380	2.5387	2.5394	2.5401	2.5409	2.5416	2.5423
2.5430	2.5437	2.5444	2.5451	2.5458	2.5465	2.5472
2.5480	2.5487	2.5494	2.5501	2.5508	2.5515	2.5522
2.5529	2.5536	2.5543	2.5550	2.5557	2.5564	2.5571

2.5578	2.5585	2.5591	2.5598	2.5605	2.5612	2.5619
2.5626	2.5633	2.5640	2.5647	2.5654	2.5660	2.5667
2.5674	2.5681	2.5688	2.5695	2.5701	2.5708	2.5715
2.5722	2.5729	2.5735	2.5742	2.5749	2.5756	2.5762
2.5769	2.5776	2.5782	2.5789	2.5796	2.5803	2.5809
2.5816	2.5823	2.5829	2.5836	2.5843	2.5849	2.5856
2.5863	2.5869	2.5876	2.5882	2.5889	2.5896	2.5902
2.5909	2.5915	2.5922	2.5928	2.5935	2.5942	2.5948
2.5955	2.5961	2.5968	2.5974	2.5981	2.5987	2.5994
2.6000	2.6007	2.6013	2.6020	2.6026	2.6032	2.6039
2.6045	2.6052	2.6058	2.6065	2.6071	2.6077	2.6084
2.6090	2.6097	2.6103	2.6109	2.6116	2.6122	2.6128
2.6135	2.6141	2.6147	2.6154	2.6160	2.6166	2.6173
2.6179	2.6185	2.6191	2.6198	2.6204	2.6210	2.6217
2.6223	2.6229	2.6235	2.6241	2.6248	2.6254	2.6260
2.6266	2.6273	2.6279	2.6285	2.6291	2.6297	2.6303
2.6310	2.6316	2.6322	2.6328	2.6334	2.6340	2.6346
2.6353	2.6359	2.6365	2.6371	2.6377	2.6383	2.6389
2.6395	2.6401	2.6407	2.6413	2.6420	2.6426	2.6432
2.6438	2.6444	2.6450	2.6456	2.6462	2.6468	2.6474
2.6480	2.6486	2.6492	2.6498	2.6504	2.6510	2.6516
2.6522	2.6527	2.6533	2.6539	2.6545	2.6551	2.6557
2.6563	2.6569	2.6575	2.6581	2.6587	2.6593	2.6598

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**********************************************************

*S EXISTING CONDITIONS


*S  COMPUTE HYD EXISTING BASIN A

COMPUTE NM HYD      ID=1  HYDNO=101  DA=0.00804SQ MI

                    PER A=100  PER B=0   PER C=0  PER D=0

                    TP=-0.13   RAIN=-1


        K =  0.159632HR    TP =  0.130000HR    K/TP RATIO =  1.227936
SHAPE CONSTANT, N =  2.899626
        UNIT PEAK =   16.917    CFS   UNIT VOLUME =   0.9988       B =
273.54      P60 = 1.8700
        AREA =     0.008040 SQ MI    IA =   0.65000 INCHES    INF =
1.67000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT =  0.033000

    PRINT HYD           ID=1  CODE=10
```

PARTIAL HYDROGRAPH 101.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.990	0.0	1.980	0.7
2.970	0.1	3.960	0.0		
0.330	0.0	1.320	0.0	2.310	0.3
3.300	0.0	4.290	0.0		
0.660	0.0	1.650	4.1	2.640	0.2
3.630	0.0				

RUNOFF VOLUME = 0.43934 INCHES = 0.1884 ACRE-FEET
PEAK DISCHARGE RATE = 6.88 CFS AT 1.518 HOURS BASIN AREA = 0.0080 SQ. MI.

*S COMPUTE HYD EXISTING BASIN B

COMPUTE NM HYD ID=2 HYDNO=102 DA=0.01428SQ MI

PER A=100 PER B=0 PER C=0 PER D=0

TP=-0.13 RAIN=-1

K = 0.159632HR TP = 0.130000HR K/TP RATIO = 1.227936
SHAPE CONSTANT, N = 2.899626
UNIT PEAK = 30.047 CFS UNIT VOLUME = 0.9991 B = 273.54 P60 = 1.8700
AREA = 0.014280 SQ MI IA = 0.65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

PRINT HYD ID=2 CODE=10

PARTIAL HYDROGRAPH 102.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.990	0.0	1.980	1.2
2.970	0.1	3.960	0.0		
0.330	0.0	1.320	0.0	2.310	0.6

```
     3.300       0.1          4.290       0.0
        0.660       0.0          1.650       7.3          2.640       0.3
     3.630       0.0          4.620       0.0

       RUNOFF VOLUME =     0.43934 INCHES     =       0.3346 ACRE-FEET
       PEAK DISCHARGE RATE =      12.21 CFS  AT   1.518 HOURS   BASIN AREA =
0.0143 SQ. MI.




   *S  COMPUTE HYD EXISTING BASIN C

   COMPUTE NM HYD      ID=3  HYDNO=103  DA=0.03350SQ MI

                       PER A=100  PER B=0   PER C=0  PER D=0

                       TP=-0.13   RAIN=-1


        K =  0.159632HR    TP =  0.130000HR    K/TP RATIO =  1.227936
SHAPE CONSTANT, N =  2.899626
        UNIT PEAK =   70.489    CFS   UNIT VOLUME =   0.9994       B =
273.54      P60 = 1.8700
        AREA =     0.033500 SQ MI    IA =   0.65000 INCHES    INF =
1.67000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT =  0.033000

   PRINT HYD           ID=3  CODE=10


                                    PARTIAL HYDROGRAPH   103.00

        TIME      FLOW           TIME      FLOW           TIME      FLOW
     TIME      FLOW           TIME      FLOW
         HRS       CFS            HRS       CFS            HRS       CFS
      HRS       CFS            HRS       CFS
        0.000       0.0          1.320       0.0          2.640       0.7
     3.960       0.0
        0.330       0.0          1.650      17.1          2.970       0.3
     4.290       0.0
        0.660       0.0          1.980       2.7          3.300       0.2
     4.620       0.0
        0.990       0.0          2.310       1.3          3.630       0.1
     4.950       0.0

       RUNOFF VOLUME =     0.43934 INCHES     =       0.7850 ACRE-FEET
       PEAK DISCHARGE RATE =      28.63 CFS  AT   1.518 HOURS   BASIN AREA =
0.0335 SQ. MI.
```

ADD HYD ID=4 HYD=101TO102 ID I=1 II=2

PRINT HYD ID=4 CODE=10

HYDROGRAPH FROM AREA 101TO102

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.990	0.0	1.980	1.8
2.970	0.2	3.960	0.0		
0.330	0.0	1.320	0.0	2.310	0.9
3.300	0.1	4.290	0.0		
0.660	0.0	1.650	11.4	2.640	0.4
3.630	0.1	4.620	0.0		

RUNOFF VOLUME = 0.43933 INCHES = 0.5230 ACRE-FEET
PEAK DISCHARGE RATE = 19.08 CFS AT 1.518 HOURS BASIN AREA = 0.0223 SQ. MI.

ADD HYD ID=5 HYD=COMBINED101-102TO103 ID I=3 II=4

PRINT HYD ID=5 CODE=10

HYDROGRAPH FROM AREA COMBINED101-102TO103

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.320	0.0	2.640	1.1
3.960	0.1				
0.330	0.0	1.650	28.5	2.970	0.6
4.290	0.0				
0.660	0.0	1.980	4.5	3.300	0.3
4.620	0.0				
0.990	0.0	2.310	2.2	3.630	0.1

```
     4.950       0.0

       RUNOFF VOLUME =     0.43934 INCHES     =       1.3079 ACRE-FEET
       PEAK DISCHARGE RATE =      47.71 CFS  AT   1.518 HOURS   BASIN AREA =
0.0558 SQ. MI.




   ************************************************************

   *S PROPOSED CONDITIONS



   *S  COMPUTE HYD PROPOSED BASIN A

   COMPUTE NM HYD      ID=6  HYDNO=104  DA=0.00923SQ MI

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

                       TP=-0.13   RAIN=-1


         K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000
SHAPE CONSTANT, N =  7.106428
         UNIT PEAK =   29.892    CFS   UNIT VOLUME =   0.9994       B =
526.28      P60 = 1.8700
         AREA =     0.007384 SQ MI    IA =   0.10000 INCHES    INF =
0.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT =  0.033000


         K =  0.115497HR    TP =  0.130000HR    K/TP RATIO =  0.888442
SHAPE CONSTANT, N =  3.992344
         UNIT PEAK =   5.0362    CFS   UNIT VOLUME =   0.9977       B =
354.66      P60 = 1.8700
         AREA =     0.001846 SQ MI    IA =   0.42500 INCHES    INF =
1.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT =  0.033000

   PRINT HYD           ID=6  CODE=10


                                     PARTIAL HYDROGRAPH   104.00

         TIME      FLOW           TIME      FLOW           TIME      FLOW
      TIME      FLOW           TIME      FLOW
```

HRS	CFS	HRS	CFS	HRS	CFS
0.000	0.0	5.280	0.1	10.560	0.1
15.840	0.1	21.120	0.1		
0.330	0.0	5.610	0.1	10.890	0.1
16.170	0.1	21.450	0.1		
0.660	0.0	5.940	0.1	11.220	0.1
16.500	0.1	21.780	0.1		
0.990	0.0	6.270	0.2	11.550	0.1
16.830	0.1	22.110	0.1		
1.320	5.7	6.600	0.2	11.880	0.1
17.160	0.1	22.440	0.1		
1.650	12.6	6.930	0.2	12.210	0.1
17.490	0.1	22.770	0.1		
1.980	5.6	7.260	0.2	12.540	0.1
17.820	0.1	23.100	0.1		
2.310	1.2	7.590	0.2	12.870	0.1
18.150	0.1	23.430	0.1		
2.640	0.5	7.920	0.2	13.200	0.1
18.480	0.1	23.760	0.1		
2.970	0.3	8.250	0.2	13.530	0.1
18.810	0.1	24.090	0.1		
3.300	0.2	8.580	0.2	13.860	0.1
19.140	0.1	24.420	0.0		
3.630	0.1	8.910	0.2	14.190	0.1
19.470	0.1	24.750	0.0		
3.960	0.1	9.240	0.2	14.520	0.1
19.800	0.1				
4.290	0.1	9.570	0.2	14.850	0.1
20.130	0.1				
4.620	0.1	9.900	0.1	15.180	0.1
20.460	0.1				
4.950	0.1	10.230	0.1	15.510	0.1
20.790	0.1				

RUNOFF VOLUME = 2.10390 INCHES = 1.0357 ACRE-FEET
PEAK DISCHARGE RATE = 23.58 CFS AT 1.485 HOURS BASIN AREA = 0.0092 SQ. MI.

*S COMPUTE HYD PROPOSED BASIN B

COMPUTE NM HYD ID=7 HYDNO=105 DA=0.00446SQ MI

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

TP=-0.13 RAIN=-1

K = 0.070850HR TP = 0.130000HR K/TP RATIO = 0.545000
SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 14.444 CFS UNIT VOLUME = 0.9991 B = 526.28 P60 = 1.8700
AREA = 0.003568 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

K = 0.115497HR TP = 0.130000HR K/TP RATIO = 0.888442
SHAPE CONSTANT, N = 3.992344
UNIT PEAK = 2.4335 CFS UNIT VOLUME = 0.9951 B = 354.66 P60 = 1.8700
AREA = 0.000892 SQ MI IA = 0.42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

PRINT HYD ID=7 CODE=10

PARTIAL HYDROGRAPH 105.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.1	9.900	0.1
14.850	0.1	19.800	0.0		
0.330	0.0	5.280	0.1	10.230	0.1
15.180	0.1	20.130	0.0		
0.660	0.0	5.610	0.1	10.560	0.1
15.510	0.1	20.460	0.0		
0.990	0.0	5.940	0.1	10.890	0.1
15.840	0.1	20.790	0.0		
1.320	2.8	6.270	0.1	11.220	0.1
16.170	0.1	21.120	0.0		
1.650	6.1	6.600	0.1	11.550	0.1
16.500	0.1	21.450	0.0		
1.980	2.7	6.930	0.1	11.880	0.1
16.830	0.1	21.780	0.0		
2.310	0.6	7.260	0.1	12.210	0.1
17.160	0.1	22.110	0.0		
2.640	0.2	7.590	0.1	12.540	0.1
17.490	0.1	22.440	0.0		
2.970	0.1	7.920	0.1	12.870	0.1
17.820	0.1	22.770	0.0		
3.300	0.1	8.250	0.1	13.200	0.1
18.150	0.0	23.100	0.0		

```
        3.630       0.1          8.580       0.1         13.530       0.1
     18.480       0.0          23.430       0.0
        3.960       0.1          8.910       0.1         13.860       0.1
     18.810       0.0          23.760       0.0
        4.290       0.1          9.240       0.1         14.190       0.1
     19.140       0.0          24.090       0.0
        4.620       0.1          9.570       0.1         14.520       0.1
     19.470       0.0          24.420       0.0

       RUNOFF VOLUME =     2.10390 INCHES     =       0.5004 ACRE-FEET
       PEAK DISCHARGE RATE =      11.40 CFS  AT   1.485 HOURS   BASIN AREA =
 0.0045 SQ. MI.




    *S  COMPUTE HYD PROPOSED BASIN C

    COMPUTE NM HYD      ID=8  HYDNO=106  DA=0.00609SQ MI

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

                        TP=-0.13   RAIN=-1


         K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000
SHAPE CONSTANT, N =  7.106428
         UNIT PEAK =   19.723    CFS   UNIT VOLUME =   0.9993       B =
526.28      P60 = 1.8700
         AREA =     0.004872 SQ MI    IA =   0.10000 INCHES    INF =
0.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT =  0.033000


         K =  0.115497HR    TP =  0.130000HR    K/TP RATIO =  0.888442
SHAPE CONSTANT, N =  3.992344
         UNIT PEAK =   3.3229    CFS   UNIT VOLUME =   0.9964       B =
354.66      P60 = 1.8700
         AREA =     0.001218 SQ MI    IA =   0.42500 INCHES    INF =
1.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT =  0.033000

    PRINT HYD           ID=8  CODE=10


                                      PARTIAL HYDROGRAPH   106.00

         TIME      FLOW           TIME      FLOW           TIME      FLOW
```

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.1	9.900	0.1
14.850	0.1	19.800	0.1		
0.330	0.0	5.280	0.1	10.230	0.1
15.180	0.1	20.130	0.1		
0.660	0.0	5.610	0.1	10.560	0.1
15.510	0.1	20.460	0.1		
0.990	0.0	5.940	0.1	10.890	0.1
15.840	0.1	20.790	0.1		
1.320	3.8	6.270	0.1	11.220	0.1
16.170	0.1	21.120	0.1		
1.650	8.3	6.600	0.1	11.550	0.1
16.500	0.1	21.450	0.1		
1.980	3.7	6.930	0.1	11.880	0.1
16.830	0.1	21.780	0.1		
2.310	0.8	7.260	0.1	12.210	0.1
17.160	0.1	22.110	0.1		
2.640	0.3	7.590	0.1	12.540	0.1
17.490	0.1	22.440	0.1		
2.970	0.2	7.920	0.1	12.870	0.1
17.820	0.1	22.770	0.1		
3.300	0.1	8.250	0.1	13.200	0.1
18.150	0.1	23.100	0.1		
3.630	0.1	8.580	0.1	13.530	0.1
18.480	0.1	23.430	0.1		
3.960	0.1	8.910	0.1	13.860	0.1
18.810	0.1	23.760	0.1		
4.290	0.1	9.240	0.1	14.190	0.1
19.140	0.1	24.090	0.0		
4.620	0.1	9.570	0.1	14.520	0.1
19.470	0.1	24.420	0.0		

RUNOFF VOLUME = 2.10390 INCHES = 0.6833 ACRE-FEET
PEAK DISCHARGE RATE = 15.56 CFS AT 1.485 HOURS BASIN AREA = 0.0061 SQ. MI.

ADD HYD ID=10 HYD=BTOA ID I=6 II=7

PRINT HYD ID=10 CODE=10

HYDROGRAPH FROM AREA BTOA

TIME	FLOW	TIME	FLOW	TIME	FLOW

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	5.280	0.2	10.560	0.2
15.840	0.2	21.120	0.1		
0.330	0.0	5.610	0.2	10.890	0.2
16.170	0.2	21.450	0.1		
0.660	0.0	5.940	0.2	11.220	0.2
16.500	0.2	21.780	0.1		
0.990	0.0	6.270	0.3	11.550	0.2
16.830	0.2	22.110	0.1		
1.320	8.5	6.600	0.3	11.880	0.2
17.160	0.2	22.440	0.1		
1.650	18.7	6.930	0.3	12.210	0.2
17.490	0.2	22.770	0.1		
1.980	8.3	7.260	0.3	12.540	0.2
17.820	0.2	23.100	0.1		
2.310	1.8	7.590	0.3	12.870	0.2
18.150	0.2	23.430	0.1		
2.640	0.7	7.920	0.2	13.200	0.2
18.480	0.2	23.760	0.1		
2.970	0.4	8.250	0.2	13.530	0.2
18.810	0.1	24.090	0.1		
3.300	0.2	8.580	0.2	13.860	0.2
19.140	0.1	24.420	0.0		
3.630	0.2	8.910	0.2	14.190	0.2
19.470	0.1	24.750	0.0		
3.960	0.2	9.240	0.2	14.520	0.2
19.800	0.1				
4.290	0.2	9.570	0.2	14.850	0.2
20.130	0.1				
4.620	0.2	9.900	0.2	15.180	0.2
20.460	0.1				
4.950	0.2	10.230	0.2	15.510	0.2
20.790	0.1				

RUNOFF VOLUME = 2.10386 INCHES = 1.5361 ACRE-FEET
PEAK DISCHARGE RATE = 34.98 CFS AT 1.485 HOURS BASIN AREA = 0.0137 SQ. MI.

```
   ADD HYD                      ID=11 HYD=B-CTOA ID I=8 II=10

   PRINT HYD                    ID=11 CODE=10
```

HYDROGRAPH FROM AREA B-CTOA

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	5.280	0.3	10.560	0.3
15.840	0.2	21.120	0.2		
0.330	0.0	5.610	0.3	10.890	0.3
16.170	0.2	21.450	0.2		
0.660	0.0	5.940	0.3	11.220	0.3
16.500	0.2	21.780	0.2		
0.990	0.0	6.270	0.4	11.550	0.3
16.830	0.2	22.110	0.2		
1.320	12.3	6.600	0.4	11.880	0.3
17.160	0.2	22.440	0.2		
1.650	27.0	6.930	0.4	12.210	0.3
17.490	0.2	22.770	0.2		
1.980	11.9	7.260	0.4	12.540	0.3
17.820	0.2	23.100	0.2		
2.310	2.6	7.590	0.4	12.870	0.3
18.150	0.2	23.430	0.2		
2.640	1.1	7.920	0.4	13.200	0.3
18.480	0.2	23.760	0.2		
2.970	0.5	8.250	0.4	13.530	0.3
18.810	0.2	24.090	0.1		
3.300	0.4	8.580	0.3	13.860	0.3
19.140	0.2	24.420	0.0		
3.630	0.3	8.910	0.3	14.190	0.3
19.470	0.2	24.750	0.0		
3.960	0.3	9.240	0.3	14.520	0.3
19.800	0.2				
4.290	0.3	9.570	0.3	14.850	0.3
20.130	0.2				
4.620	0.3	9.900	0.3	15.180	0.2
20.460	0.2				
4.950	0.3	10.230	0.3	15.510	0.2
20.790	0.2				

RUNOFF VOLUME = 2.10386 INCHES = 2.2194 ACRE-FEET
PEAK DISCHARGE RATE = 50.55 CFS AT 1.485 HOURS BASIN AREA = 0.0198 SQ. MI.

*S COMPUTE HYD PROPOSED BASIN D

COMPUTE NM HYD ID=12 HYDNO=107 DA=0.01567SQ MI

PER A=90 PER B=0 PER C=0 PER D=10

TP=-0.13 RAIN=-1

K = 0.070850HR TP = 0.130000HR K/TP RATIO = 0.545000
SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 6.3436 CFS UNIT VOLUME = 0.9979 B = 526.28 P60 = 1.8700
AREA = 0.001567 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

K = 0.159632HR TP = 0.130000HR K/TP RATIO = 1.227936
SHAPE CONSTANT, N = 2.899626
UNIT PEAK = 29.675 CFS UNIT VOLUME = 0.9991 B = 273.54 P60 = 1.8700
AREA = 0.014103 SQ MI IA = 0.65000 INCHES INF = 1.67000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

PRINT HYD ID=12 CODE=10

PARTIAL HYDROGRAPH 107.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.0	9.900	0.0	14.850	0.0
0.330	0.0	5.280	0.0	10.230	0.0	15.180	0.0
0.660	0.0	5.610	0.0	10.560	0.0	15.510	0.0
0.990	0.0	5.940	0.0	10.890	0.0	15.840	0.0
1.320	1.2	6.270	0.0	11.220	0.0	16.170	0.0
1.650	9.5	6.600	0.0	11.550	0.0	16.500	0.0
1.980	2.3	6.930	0.0	11.880	0.0	16.830	0.0
2.310	0.8	7.260	0.0	12.210	0.0	17.160	0.0
2.640	0.4	7.590	0.0	12.540	0.0	17.490	0.0
2.970	0.2	7.920	0.0	12.870	0.0		

```
    17.820       0.0         22.770       0.0
        3.300       0.1          8.250       0.0         13.200       0.0
    18.150       0.0         23.100       0.0
        3.630       0.1          8.580       0.0         13.530       0.0
    18.480       0.0         23.430       0.0
        3.960       0.0          8.910       0.0         13.860       0.0
    18.810       0.0         23.760       0.0
        4.290       0.0          9.240       0.0         14.190       0.0
    19.140       0.0         24.090       0.0
        4.620       0.0          9.570       0.0         14.520       0.0
    19.470       0.0         24.420       0.0

       RUNOFF VOLUME =     0.63801 INCHES     =       0.5332 ACRE-FEET
       PEAK DISCHARGE RATE =      16.41 CFS  AT   1.518 HOURS   BASIN AREA =
 0.0157 SQ. MI.




   *S  COMPUTE HYD PROPOSED BASIN E

   COMPUTE NM HYD      ID=13  HYDNO=108  DA=0.00100SQ MI

                       PER A=0  PER B=17.5   PER C=17.5   PER D=65

                       TP=-0.13   RAIN=-1


         K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000
SHAPE CONSTANT, N =  7.106428
         UNIT PEAK =   2.6314    CFS   UNIT VOLUME =   0.9956       B =
526.28      P60 = 1.8700
         AREA =     0.000650 SQ MI    IA =   0.10000 INCHES    INF =
0.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT =  0.033000


         K =  0.115497HR    TP =  0.130000HR    K/TP RATIO =  0.888442
SHAPE CONSTANT, N =  3.992344
         UNIT PEAK =  0.95486    CFS   UNIT VOLUME =   0.9868       B =
354.66      P60 = 1.8700
         AREA =     0.000350 SQ MI    IA =   0.42500 INCHES    INF =
1.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT =  0.033000

   PRINT HYD           ID=13  CODE=10
```

PARTIAL HYDROGRAPH 108.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.0	9.900	0.0
14.850	0.0	19.800	0.0		
0.330	0.0	5.280	0.0	10.230	0.0
15.180	0.0	20.130	0.0		
0.660	0.0	5.610	0.0	10.560	0.0
15.510	0.0	20.460	0.0		
0.990	0.0	5.940	0.0	10.890	0.0
15.840	0.0	20.790	0.0		
1.320	0.5	6.270	0.0	11.220	0.0
16.170	0.0	21.120	0.0		
1.650	1.3	6.600	0.0	11.550	0.0
16.500	0.0	21.450	0.0		
1.980	0.5	6.930	0.0	11.880	0.0
16.830	0.0	21.780	0.0		
2.310	0.1	7.260	0.0	12.210	0.0
17.160	0.0	22.110	0.0		
2.640	0.0	7.590	0.0	12.540	0.0
17.490	0.0	22.440	0.0		
2.970	0.0	7.920	0.0	12.870	0.0
17.820	0.0	22.770	0.0		
3.300	0.0	8.250	0.0	13.200	0.0
18.150	0.0	23.100	0.0		
3.630	0.0	8.580	0.0	13.530	0.0
18.480	0.0	23.430	0.0		
3.960	0.0	8.910	0.0	13.860	0.0
18.810	0.0	23.760	0.0		
4.290	0.0	9.240	0.0	14.190	0.0
19.140	0.0	24.090	0.0		
4.620	0.0	9.570	0.0	14.520	0.0
19.470	0.0				

RUNOFF VOLUME = 1.86230 INCHES = 0.0993 ACRE-FEET
PEAK DISCHARGE RATE = 2.38 CFS AT 1.485 HOURS BASIN AREA = 0.0010 SQ. MI.

*S COMPUTE HYD PROPOSED BASIN F

COMPUTE NM HYD ID=14 HYDNO=109 DA=0.00048SQ MI

PER A=0 PER B=45 PER C=45 PER D=10

K = 0.070850HR TP = 0.130000HR K/TP RATIO = 0.545000
SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 0.19432 CFS UNIT VOLUME = 0.9411 B = 526.28 P60 = 1.8700
AREA = 0.000048 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

K = 0.115497HR TP = 0.130000HR K/TP RATIO = 0.888442
SHAPE CONSTANT, N = 3.992344
UNIT PEAK = 1.1786 CFS UNIT VOLUME = 0.9891 B = 354.66 P60 = 1.8700
AREA = 0.000432 SQ MI IA = 0.42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

PRINT HYD ID=14 CODE=10

PARTIAL HYDROGRAPH 109.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.980	0.1	3.960	0.0
0.330	0.0	2.310	0.0	4.290	0.0
0.660	0.0	2.640	0.0	4.620	0.0
0.990	0.0	2.970	0.0	4.950	0.0
1.320	0.1	3.300	0.0	5.280	0.0
1.650	0.5	3.630	0.0	5.610	0.0

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
5.940	0.0	7.920	0.0
6.270	0.0	8.250	0.0
6.600	0.0	8.580	0.0
6.930	0.0	8.910	0.0
7.260	0.0		
7.590	0.0		

RUNOFF VOLUME = 0.97645 INCHES = 0.0250 ACRE-FEET
PEAK DISCHARGE RATE = 0.84 CFS AT 1.518 HOURS BASIN AREA = 0.0005 SQ. MI.

ADD HYD ID=15 HYD=DTOF ID I=12 II=14

PRINT HYD ID=15 CODE=10

HYDROGRAPH FROM AREA DTOF

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.0	9.900	0.0
14.850	0.0	19.800	0.0		
0.330	0.0	5.280	0.0	10.230	0.0
15.180	0.0	20.130	0.0		
0.660	0.0	5.610	0.0	10.560	0.0
15.510	0.0	20.460	0.0		
0.990	0.0	5.940	0.0	10.890	0.0
15.840	0.0	20.790	0.0		
1.320	1.3	6.270	0.0	11.220	0.0
16.170	0.0	21.120	0.0		
1.650	10.0	6.600	0.0	11.550	0.0
16.500	0.0	21.450	0.0		
1.980	2.4	6.930	0.0	11.880	0.0
16.830	0.0	21.780	0.0		
2.310	0.8	7.260	0.0	12.210	0.0
17.160	0.0	22.110	0.0		
2.640	0.4	7.590	0.0	12.540	0.0
17.490	0.0	22.440	0.0		
2.970	0.2	7.920	0.0	12.870	0.0
17.820	0.0	22.770	0.0		
3.300	0.1	8.250	0.0	13.200	0.0
18.150	0.0	23.100	0.0		
3.630	0.1	8.580	0.0	13.530	0.0
18.480	0.0	23.430	0.0		
3.960	0.0	8.910	0.0	13.860	0.0
18.810	0.0	23.760	0.0		
4.290	0.0	9.240	0.0	14.190	0.0
19.140	0.0	24.090	0.0		
4.620	0.0	9.570	0.0	14.520	0.0
19.470	0.0	24.420	0.0		

RUNOFF VOLUME = 0.64701 INCHES = 0.5573 ACRE-FEET
PEAK DISCHARGE RATE = 17.25 CFS AT 1.518 HOURS BASIN AREA = 0.0162 SQ. MI.

ADD HYD ID=16 HYD=ETOF-D ID I=13 II=15

PRINT HYD ID=16 CODE=10

HYDROGRAPH FROM AREA ETOF-D

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.0	9.900	0.0
14.850	0.0	19.800	0.0		
0.330	0.0	5.280	0.0	10.230	0.0
15.180	0.0	20.130	0.0		
0.660	0.0	5.610	0.0	10.560	0.0
15.510	0.0	20.460	0.0		
0.990	0.0	5.940	0.0	10.890	0.0
15.840	0.0	20.790	0.0		
1.320	1.8	6.270	0.1	11.220	0.0
16.170	0.0	21.120	0.0		
1.650	11.3	6.600	0.1	11.550	0.0
16.500	0.0	21.450	0.0		
1.980	2.9	6.930	0.1	11.880	0.0
16.830	0.0	21.780	0.0		
2.310	0.9	7.260	0.1	12.210	0.0
17.160	0.0	22.110	0.0		
2.640	0.4	7.590	0.1	12.540	0.0
17.490	0.0	22.440	0.0		
2.970	0.2	7.920	0.1	12.870	0.0
17.820	0.0	22.770	0.0		
3.300	0.1	8.250	0.1	13.200	0.0
18.150	0.0	23.100	0.0		
3.630	0.1	8.580	0.0	13.530	0.0
18.480	0.0	23.430	0.0		
3.960	0.1	8.910	0.0	13.860	0.0
18.810	0.0	23.760	0.0		
4.290	0.0	9.240	0.0	14.190	0.0
19.140	0.0	24.090	0.0		
4.620	0.0	9.570	0.0	14.520	0.0
19.470	0.0	24.420	0.0		

RUNOFF VOLUME = 0.71786 INCHES = 0.6566 ACRE-FEET
PEAK DISCHARGE RATE = 19.63 CFS AT 1.518 HOURS BASIN AREA = 0.0172 SQ. MI.

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    *S  COMPUTE HYD PROPOSED BASIN G

    COMPUTE NM HYD      ID=17  HYDNO=110  DA=0.00468SQ MI

                        PER A=0  PER B=5   PER C=5   PER D=90

                        TP=-0.13   RAIN=-1


         K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000
SHAPE CONSTANT, N =  7.106428
         UNIT PEAK =   17.051    CFS   UNIT VOLUME =   0.9992       B =
526.28      P60 = 1.8700
         AREA =     0.004212 SQ MI    IA =   0.10000 INCHES    INF =
0.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT =  0.033000


         K =  0.115497HR    TP =  0.130000HR    K/TP RATIO =  0.888442
SHAPE CONSTANT, N =  3.992344
         UNIT PEAK =   1.2768    CFS   UNIT VOLUME =   0.9902       B =
354.66      P60 = 1.8700
         AREA =     0.000468 SQ MI    IA =   0.42500 INCHES    INF =
1.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT =  0.033000

    PRINT HYD           ID=17  CODE=10


                                      PARTIAL HYDROGRAPH   110.00

        TIME      FLOW           TIME      FLOW           TIME      FLOW
      TIME      FLOW           TIME      FLOW
         HRS       CFS            HRS       CFS            HRS       CFS
       HRS       CFS            HRS       CFS
        0.000       0.0          4.950       0.1          9.900       0.1
     14.850       0.1         19.800       0.1
        0.330       0.0          5.280       0.1         10.230       0.1
     15.180       0.1         20.130       0.1
        0.660       0.0          5.610       0.1         10.560       0.1
     15.510       0.1         20.460       0.1
        0.990       0.0          5.940       0.1         10.890       0.1
     15.840       0.1         20.790       0.1
        1.320       3.3          6.270       0.1         11.220       0.1
     16.170       0.1         21.120       0.1
        1.650       6.7          6.600       0.1         11.550       0.1
     16.500       0.1         21.450       0.1
        1.980       3.1          6.930       0.1         11.880       0.1
```

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    16.830       0.1         21.780       0.1
        2.310       0.7          7.260       0.1         12.210       0.1
    17.160       0.1         22.110       0.1
        2.640       0.3          7.590       0.1         12.540       0.1
    17.490       0.1         22.440       0.1
        2.970       0.1          7.920       0.1         12.870       0.1
    17.820       0.1         22.770       0.1
        3.300       0.1          8.250       0.1         13.200       0.1
    18.150       0.1         23.100       0.1
        3.630       0.1          8.580       0.1         13.530       0.1
    18.480       0.1         23.430       0.0
        3.960       0.1          8.910       0.1         13.860       0.1
    18.810       0.1         23.760       0.0
        4.290       0.1          9.240       0.1         14.190       0.1
    19.140       0.1         24.090       0.0
        4.620       0.1          9.570       0.1         14.520       0.1
    19.470       0.1         24.420       0.0

       RUNOFF VOLUME =     2.26496 INCHES     =       0.5653 ACRE-FEET
       PEAK DISCHARGE RATE =      12.55 CFS  AT   1.485 HOURS   BASIN AREA =
 0.0047 SQ. MI.




   *S  COMPUTE HYD PROPOSED BASIN H

   COMPUTE NM HYD      ID=18  HYDNO=111  DA=0.00107SQ MI

                       PER A=0  PER B=5   PER C=5   PER D=90

                       TP=-0.13   RAIN=-1


         K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000
SHAPE CONSTANT, N =  7.106428
         UNIT PEAK =   3.8985    CFS   UNIT VOLUME =   0.9967       B =
526.28      P60 = 1.8700
         AREA =     0.000963 SQ MI    IA =   0.10000 INCHES    INF =
0.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT =  0.033000


         K =  0.115497HR    TP =  0.130000HR    K/TP RATIO =  0.888442
SHAPE CONSTANT, N =  3.992344
         UNIT PEAK =  0.29192    CFS   UNIT VOLUME =   0.9534       B =
354.66      P60 = 1.8700
         AREA =     0.000107 SQ MI    IA =   0.42500 INCHES    INF =
1.04000 INCHES PER HOUR
```

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

PRINT HYD ID=18 CODE=10

PARTIAL HYDROGRAPH 111.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.0	9.900	0.0
14.850	0.0	19.800	0.0		
0.330	0.0	5.280	0.0	10.230	0.0
15.180	0.0	20.130	0.0		
0.660	0.0	5.610	0.0	10.560	0.0
15.510	0.0	20.460	0.0		
0.990	0.0	5.940	0.0	10.890	0.0
15.840	0.0	20.790	0.0		
1.320	0.7	6.270	0.0	11.220	0.0
16.170	0.0	21.120	0.0		
1.650	1.5	6.600	0.0	11.550	0.0
16.500	0.0	21.450	0.0		
1.980	0.7	6.930	0.0	11.880	0.0
16.830	0.0	21.780	0.0		
2.310	0.1	7.260	0.0	12.210	0.0
17.160	0.0	22.110	0.0		
2.640	0.1	7.590	0.0	12.540	0.0
17.490	0.0	22.440	0.0		
2.970	0.0	7.920	0.0	12.870	0.0
17.820	0.0	22.770	0.0		
3.300	0.0	8.250	0.0	13.200	0.0
18.150	0.0	23.100	0.0		
3.630	0.0	8.580	0.0	13.530	0.0
18.480	0.0	23.430	0.0		
3.960	0.0	8.910	0.0	13.860	0.0
18.810	0.0	23.760	0.0		
4.290	0.0	9.240	0.0	14.190	0.0
19.140	0.0	24.090	0.0		
4.620	0.0	9.570	0.0	14.520	0.0
19.470	0.0				

RUNOFF VOLUME = 2.26496 INCHES = 0.1293 ACRE-FEET
PEAK DISCHARGE RATE = 2.88 CFS AT 1.485 HOURS BASIN AREA = 0.0011 SQ. MI.

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    *S  COMPUTE HYD PROPOSED BASIN I

    COMPUTE NM HYD      ID=19  HYDNO=112  DA=0.00074SQ MI

                        PER A=0  PER B=5   PER C=5   PER D=90

                        TP=-0.13   RAIN=-1


         K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000
SHAPE CONSTANT, N =  7.106428
         UNIT PEAK =   2.6961    CFS   UNIT VOLUME =   0.9956       B =
526.28      P60 = 1.8700
         AREA =     0.000666 SQ MI    IA =   0.10000 INCHES    INF =
0.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT =  0.033000


         K =  0.115497HR    TP =  0.130000HR    K/TP RATIO =  0.888442
SHAPE CONSTANT, N =  3.992344
         UNIT PEAK =  0.20189    CFS   UNIT VOLUME =   0.9316       B =
354.66      P60 = 1.8700
         AREA =     0.000074 SQ MI    IA =   0.42500 INCHES    INF =
1.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT =  0.033000

    PRINT HYD           ID=19  CODE=10


                                      PARTIAL HYDROGRAPH   112.00

         TIME      FLOW           TIME      FLOW           TIME      FLOW
       TIME      FLOW           TIME      FLOW
          HRS       CFS            HRS       CFS            HRS       CFS
        HRS       CFS            HRS       CFS
         0.000       0.0          4.950       0.0          9.900       0.0
     14.850       0.0         19.800       0.0
         0.330       0.0          5.280       0.0         10.230       0.0
     15.180       0.0         20.130       0.0
         0.660       0.0          5.610       0.0         10.560       0.0
     15.510       0.0         20.460       0.0
         0.990       0.0          5.940       0.0         10.890       0.0
     15.840       0.0         20.790       0.0
         1.320       0.5          6.270       0.0         11.220       0.0
     16.170       0.0         21.120       0.0
         1.650       1.1          6.600       0.0         11.550       0.0
     16.500       0.0         21.450       0.0
         1.980       0.5          6.930       0.0         11.880       0.0
     16.830       0.0         21.780       0.0
```

2.310	0.1	7.260	0.0	12.210	0.0
17.160	0.0	22.110	0.0		
2.640	0.0	7.590	0.0	12.540	0.0
17.490	0.0	22.440	0.0		
2.970	0.0	7.920	0.0	12.870	0.0
17.820	0.0	22.770	0.0		
3.300	0.0	8.250	0.0	13.200	0.0
18.150	0.0	23.100	0.0		
3.630	0.0	8.580	0.0	13.530	0.0
18.480	0.0	23.430	0.0		
3.960	0.0	8.910	0.0	13.860	0.0
18.810	0.0	23.760	0.0		
4.290	0.0	9.240	0.0	14.190	0.0
19.140	0.0	24.090	0.0		
4.620	0.0	9.570	0.0	14.520	0.0
19.470	0.0				

RUNOFF VOLUME = 2.26496 INCHES = 0.0894 ACRE-FEET
PEAK DISCHARGE RATE = 2.00 CFS AT 1.485 HOURS BASIN AREA = 0.0007 SQ. MI.

ADD HYD ID=20 HYD=HTOI ID I=18 II=19

PRINT HYD ID=20 CODE=10

HYDROGRAPH FROM AREA HTOI

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.0	9.900	0.0
14.850	0.0	19.800	0.0		
0.330	0.0	5.280	0.0	10.230	0.0
15.180	0.0	20.130	0.0		
0.660	0.0	5.610	0.0	10.560	0.0
15.510	0.0	20.460	0.0		
0.990	0.0	5.940	0.0	10.890	0.0
15.840	0.0	20.790	0.0		
1.320	1.3	6.270	0.0	11.220	0.0
16.170	0.0	21.120	0.0		
1.650	2.6	6.600	0.0	11.550	0.0
16.500	0.0	21.450	0.0		
1.980	1.2	6.930	0.0	11.880	0.0
16.830	0.0	21.780	0.0		

2.310	0.2	7.260	0.0	12.210	0.0
17.160	0.0	22.110	0.0		
2.640	0.1	7.590	0.0	12.540	0.0
17.490	0.0	22.440	0.0		
2.970	0.1	7.920	0.0	12.870	0.0
17.820	0.0	22.770	0.0		
3.300	0.0	8.250	0.0	13.200	0.0
18.150	0.0	23.100	0.0		
3.630	0.0	8.580	0.0	13.530	0.0
18.480	0.0	23.430	0.0		
3.960	0.0	8.910	0.0	13.860	0.0
18.810	0.0	23.760	0.0		
4.290	0.0	9.240	0.0	14.190	0.0
19.140	0.0	24.090	0.0		
4.620	0.0	9.570	0.0	14.520	0.0
19.470	0.0				

RUNOFF VOLUME = 2.26462 INCHES = 0.2186 ACRE-FEET
PEAK DISCHARGE RATE = 4.88 CFS AT 1.485 HOURS BASIN AREA = 0.0018 SQ. MI.

ADD HYD ID=21 HYD=A-CTOG ID I=11 II=17

PRINT HYD ID=21 CODE=10

HYDROGRAPH FROM AREA A-CTOG

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	5.280	0.4	10.560	0.4
15.840	0.3	21.120	0.3		
0.330	0.0	5.610	0.4	10.890	0.4
16.170	0.3	21.450	0.2		
0.660	0.0	5.940	0.4	11.220	0.4
16.500	0.3	21.780	0.2		
0.990	0.0	6.270	0.5	11.550	0.4
16.830	0.3	22.110	0.2		
1.320	15.6	6.600	0.5	11.880	0.4
17.160	0.3	22.440	0.2		
1.650	33.7	6.930	0.5	12.210	0.4
17.490	0.3	22.770	0.2		

1.980	15.0	7.260	0.5	12.540	0.4
17.820	0.3	23.100	0.2		
2.310	3.3	7.590	0.5	12.870	0.3
18.150	0.3	23.430	0.2		
2.640	1.3	7.920	0.5	13.200	0.3
18.480	0.3	23.760	0.2		
2.970	0.7	8.250	0.4	13.530	0.3
18.810	0.3	24.090	0.2		
3.300	0.5	8.580	0.4	13.860	0.3
19.140	0.3	24.420	0.0		
3.630	0.4	8.910	0.4	14.190	0.3
19.470	0.3	24.750	0.0		
3.960	0.3	9.240	0.4	14.520	0.3
19.800	0.3				
4.290	0.3	9.570	0.4	14.850	0.3
20.130	0.3				
4.620	0.3	9.900	0.4	15.180	0.3
20.460	0.3				
4.950	0.3	10.230	0.4	15.510	0.3
20.790	0.3				

RUNOFF VOLUME = 2.13467 INCHES = 2.7847 ACRE-FEET
PEAK DISCHARGE RATE = 63.10 CFS AT 1.485 HOURS BASIN AREA = 0.0245 SQ. MI.

ADD HYD ID=22 HYD=D-FTOA-DTOG ID I=16 II=21

PRINT HYD ID=22 CODE=10

HYDROGRAPH FROM AREA D-FTOA-DTOG

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	5.280	0.4	10.560	0.4
15.840	0.3	21.120	0.3		
0.330	0.0	5.610	0.4	10.890	0.4
16.170	0.3	21.450	0.3		
0.660	0.0	5.940	0.5	11.220	0.4
16.500	0.3	21.780	0.3		
0.990	0.0	6.270	0.5	11.550	0.4
16.830	0.3	22.110	0.3		
1.320	17.3	6.600	0.5	11.880	0.4
17.160	0.3	22.440	0.3		

```
     1.650      45.0          6.930       0.5         12.210       0.4
    17.490       0.3         22.770       0.3
     1.980      17.9          7.260       0.5         12.540       0.4
    17.820       0.3         23.100       0.3
     2.310       4.2          7.590       0.5         12.870       0.4
    18.150       0.3         23.430       0.3
     2.640       1.8          7.920       0.5         13.200       0.4
    18.480       0.3         23.760       0.3
     2.970       0.9          8.250       0.5         13.530       0.4
    18.810       0.3         24.090       0.2
     3.300       0.6          8.580       0.5         13.860       0.4
    19.140       0.3         24.420       0.0
     3.630       0.5          8.910       0.5         14.190       0.4
    19.470       0.3         24.750       0.0
     3.960       0.4          9.240       0.5         14.520       0.4
    19.800       0.3
     4.290       0.4          9.570       0.5         14.850       0.4
    20.130       0.3
     4.620       0.4          9.900       0.4         15.180       0.3
    20.460       0.3
     4.950       0.4         10.230       0.4         15.510       0.3
    20.790       0.3

        RUNOFF VOLUME =     1.55071 INCHES     =       3.4413 ACRE-FEET
        PEAK DISCHARGE RATE =      82.34 CFS  AT   1.518 HOURS   BASIN AREA =
 0.0416 SQ. MI.




    ************************************************************

    *S FUTURE CONDITIONS



    *S  COMPUTE HYD FUTURE BASIN D-1

    COMPUTE NM HYD      ID=23  HYDNO=113  DA=0.00729SQ MI

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

                        TP=-0.13   RAIN=-1


         K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000
SHAPE CONSTANT, N =  7.106428
         UNIT PEAK =   23.610    CFS   UNIT VOLUME =   0.9993       B =
526.28      P60 = 1.8700
         AREA =     0.005832 SQ MI    IA =   0.10000 INCHES    INF =
```

0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT = 0.033000

K = 0.115497HR TP = 0.130000HR K/TP RATIO = 0.888442
SHAPE CONSTANT, N = 3.992344
UNIT PEAK = 3.9777 CFS UNIT VOLUME = 0.9971 B =
354.66 P60 = 1.8700
AREA = 0.001458 SQ MI IA = 0.42500 INCHES INF =
1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
DT = 0.033000

PRINT HYD ID=23 CODE=10

PARTIAL HYDROGRAPH 113.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.1	9.900	0.1
14.850	0.1	19.800	0.1		
0.330	0.0	5.280	0.1	10.230	0.1
15.180	0.1	20.130	0.1		
0.660	0.0	5.610	0.1	10.560	0.1
15.510	0.1	20.460	0.1		
0.990	0.0	5.940	0.1	10.890	0.1
15.840	0.1	20.790	0.1		
1.320	4.5	6.270	0.1	11.220	0.1
16.170	0.1	21.120	0.1		
1.650	10.0	6.600	0.1	11.550	0.1
16.500	0.1	21.450	0.1		
1.980	4.4	6.930	0.1	11.880	0.1
16.830	0.1	21.780	0.1		
2.310	1.0	7.260	0.1	12.210	0.1
17.160	0.1	22.110	0.1		
2.640	0.4	7.590	0.1	12.540	0.1
17.490	0.1	22.440	0.1		
2.970	0.2	7.920	0.1	12.870	0.1
17.820	0.1	22.770	0.1		
3.300	0.1	8.250	0.1	13.200	0.1
18.150	0.1	23.100	0.1		
3.630	0.1	8.580	0.1	13.530	0.1
18.480	0.1	23.430	0.1		
3.960	0.1	8.910	0.1	13.860	0.1
18.810	0.1	23.760	0.1		
4.290	0.1	9.240	0.1	14.190	0.1
19.140	0.1	24.090	0.0		

4.620 0.1 9.570 0.1 14.520 0.1
19.470 0.1 24.420 0.0

RUNOFF VOLUME = 2.10390 INCHES = 0.8180 ACRE-FEET
PEAK DISCHARGE RATE = 18.63 CFS AT 1.485 HOURS BASIN AREA = 0.0073 SQ. MI.

*S COMPUTE HYD FUTURE BASIN D-2

COMPUTE NM HYD ID=24 HYDNO=114 DA=0.00781SQ MI

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

TP=-0.13 RAIN=-1

K = 0.070850HR TP = 0.130000HR K/TP RATIO = 0.545000
SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 25.294 CFS UNIT VOLUME = 0.9993 B = 526.28 P60 = 1.8700
AREA = 0.006248 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

K = 0.115497HR TP = 0.130000HR K/TP RATIO = 0.888442
SHAPE CONSTANT, N = 3.992344
UNIT PEAK = 4.2614 CFS UNIT VOLUME = 0.9971 B = 354.66 P60 = 1.8700
AREA = 0.001562 SQ MI IA = 0.42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

PRINT HYD ID=24 CODE=10

PARTIAL HYDROGRAPH 114.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.1	9.900	0.1	14.850	0.1
19.800	0.1						
0.330	0.0	5.280	0.1	10.230	0.1		

15.180	0.1	20.130	0.1		
0.660	0.0	5.610	0.1	10.560	0.1
15.510	0.1	20.460	0.1		
0.990	0.0	5.940	0.1	10.890	0.1
15.840	0.1	20.790	0.1		
1.320	4.9	6.270	0.2	11.220	0.1
16.170	0.1	21.120	0.1		
1.650	10.7	6.600	0.2	11.550	0.1
16.500	0.1	21.450	0.1		
1.980	4.7	6.930	0.1	11.880	0.1
16.830	0.1	21.780	0.1		
2.310	1.0	7.260	0.1	12.210	0.1
17.160	0.1	22.110	0.1		
2.640	0.4	7.590	0.1	12.540	0.1
17.490	0.1	22.440	0.1		
2.970	0.2	7.920	0.1	12.870	0.1
17.820	0.1	22.770	0.1		
3.300	0.1	8.250	0.1	13.200	0.1
18.150	0.1	23.100	0.1		
3.630	0.1	8.580	0.1	13.530	0.1
18.480	0.1	23.430	0.1		
3.960	0.1	8.910	0.1	13.860	0.1
18.810	0.1	23.760	0.1		
4.290	0.1	9.240	0.1	14.190	0.1
19.140	0.1	24.090	0.1		
4.620	0.1	9.570	0.1	14.520	0.1
19.470	0.1	24.420	0.0		

RUNOFF VOLUME = 2.10390 INCHES = 0.8763 ACRE-FEET
PEAK DISCHARGE RATE = 19.96 CFS AT 1.485 HOURS BASIN AREA = 0.0078 SQ. MI.

*S COMPUTE HYD FUTURE BASIN D-3

COMPUTE NM HYD ID=25 HYDNO=115 DA=0.00202SQ MI

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

TP=-0.13 RAIN=-1

K = 0.070850HR TP = 0.130000HR K/TP RATIO = 0.545000
SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 6.5420 CFS UNIT VOLUME = 0.9982 B = 526.28 P60 = 1.8700
AREA = 0.001616 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

K = 0.115497HR TP = 0.130000HR K/TP RATIO = 0.888442 SHAPE CONSTANT, N = 3.992344
UNIT PEAK = 1.1022 CFS UNIT VOLUME = 0.9880 B = 354.66 P60 = 1.8700
AREA = 0.000404 SQ MI IA = 0.42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

PRINT HYD ID=25 CODE=10

PARTIAL HYDROGRAPH 115.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.0	9.900	0.0
14.850	0.0	19.800	0.0		
0.330	0.0	5.280	0.0	10.230	0.0
15.180	0.0	20.130	0.0		
0.660	0.0	5.610	0.0	10.560	0.0
15.510	0.0	20.460	0.0		
0.990	0.0	5.940	0.0	10.890	0.0
15.840	0.0	20.790	0.0		
1.320	1.3	6.270	0.0	11.220	0.0
16.170	0.0	21.120	0.0		
1.650	2.8	6.600	0.0	11.550	0.0
16.500	0.0	21.450	0.0		
1.980	1.2	6.930	0.0	11.880	0.0
16.830	0.0	21.780	0.0		
2.310	0.3	7.260	0.0	12.210	0.0
17.160	0.0	22.110	0.0		
2.640	0.1	7.590	0.0	12.540	0.0
17.490	0.0	22.440	0.0		
2.970	0.1	7.920	0.0	12.870	0.0
17.820	0.0	22.770	0.0		
3.300	0.0	8.250	0.0	13.200	0.0
18.150	0.0	23.100	0.0		
3.630	0.0	8.580	0.0	13.530	0.0
18.480	0.0	23.430	0.0		
3.960	0.0	8.910	0.0	13.860	0.0
18.810	0.0	23.760	0.0		
4.290	0.0	9.240	0.0	14.190	0.0
19.140	0.0	24.090	0.0		
4.620	0.0	9.570	0.0	14.520	0.0

19.470 0.0 24.420 0.0

RUNOFF VOLUME = 2.10390 INCHES = 0.2267 ACRE-FEET
PEAK DISCHARGE RATE = 5.17 CFS AT 1.485 HOURS BASIN AREA = 0.0020 SQ. MI.

*S COMPUTE HYD FUTURE BASIN G-2

COMPUTE NM HYD ID=26 HYDNO=116 DA=0.00200SQ MI

PER A=0 PER B=5 PER C=5 PER D=90

TP=-0.13 RAIN=-1

K = 0.070850HR TP = 0.130000HR K/TP RATIO = 0.545000
SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 7.2869 CFS UNIT VOLUME = 0.9982 B = 526.28 P60 = 1.8700
AREA = 0.001800 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

K = 0.115497HR TP = 0.130000HR K/TP RATIO = 0.888442
SHAPE CONSTANT, N = 3.992344
UNIT PEAK = 0.54564 CFS UNIT VOLUME = 0.9763 B = 354.66 P60 = 1.8700
AREA = 0.000200 SQ MI IA = 0.42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

PRINT HYD ID=26 CODE=10

PARTIAL HYDROGRAPH 116.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.0	9.900	0.0	14.850	0.0
0.330	0.0	5.280	0.0	10.230	0.0	15.180	0.0
19.800	0.0	20.130	0.0				

```
     0.660       0.0          5.610       0.0         10.560       0.0
    15.510       0.0         20.460       0.0
     0.990       0.0          5.940       0.0         10.890       0.0
    15.840       0.0         20.790       0.0
     1.320       1.4          6.270       0.0         11.220       0.0
    16.170       0.0         21.120       0.0
     1.650       2.9          6.600       0.0         11.550       0.0
    16.500       0.0         21.450       0.0
     1.980       1.3          6.930       0.0         11.880       0.0
    16.830       0.0         21.780       0.0
     2.310       0.3          7.260       0.0         12.210       0.0
    17.160       0.0         22.110       0.0
     2.640       0.1          7.590       0.0         12.540       0.0
    17.490       0.0         22.440       0.0
     2.970       0.1          7.920       0.0         12.870       0.0
    17.820       0.0         22.770       0.0
     3.300       0.0          8.250       0.0         13.200       0.0
    18.150       0.0         23.100       0.0
     3.630       0.0          8.580       0.0         13.530       0.0
    18.480       0.0         23.430       0.0
     3.960       0.0          8.910       0.0         13.860       0.0
    18.810       0.0         23.760       0.0
     4.290       0.0          9.240       0.0         14.190       0.0
    19.140       0.0         24.090       0.0
     4.620       0.0          9.570       0.0         14.520       0.0
    19.470       0.0         24.420       0.0

       RUNOFF VOLUME =     2.26496 INCHES     =       0.2416 ACRE-FEET
       PEAK DISCHARGE RATE =       5.37 CFS  AT   1.485 HOURS   BASIN AREA =
 0.0020 SQ. MI.




   *S  COMPUTE HYD FUTURE BASIN H-2

   COMPUTE NM HYD      ID=27  HYDNO=117  DA=0.00067SQ MI

                       PER A=0  PER B=5   PER C=5   PER D=90

                       TP=-0.13   RAIN=-1


         K =  0.070850HR    TP =  0.130000HR    K/TP RATIO =  0.545000
SHAPE CONSTANT, N =  7.106428
         UNIT PEAK =   2.4411    CFS   UNIT VOLUME =   0.9949       B =
526.28      P60 = 1.8700
         AREA =     0.000603 SQ MI    IA =   0.10000 INCHES    INF =
0.04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD -
```

DT = 0.033000

K = 0.115497HR TP = 0.130000HR K/TP RATIO = 0.888442
SHAPE CONSTANT, N = 3.992344
UNIT PEAK = 0.18279 CFS UNIT VOLUME = 0.9248 B = 354.66 P60 = 1.8700
AREA = 0.000067 SQ MI IA = 0.42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033000

PRINT HYD ID=27 CODE=10

PARTIAL HYDROGRAPH 117.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.0	9.900	0.0	14.850	0.0
0.330	0.0	5.280	0.0	10.230	0.0	15.180	0.0
0.660	0.0	5.610	0.0	10.560	0.0	15.510	0.0
0.990	0.0	5.940	0.0	10.890	0.0	15.840	0.0
1.320	0.5	6.270	0.0	11.220	0.0	16.170	0.0
1.650	1.0	6.600	0.0	11.550	0.0	16.500	0.0
1.980	0.4	6.930	0.0	11.880	0.0	16.830	0.0
2.310	0.1	7.260	0.0	12.210	0.0	17.160	0.0
2.640	0.0	7.590	0.0	12.540	0.0	17.490	0.0
2.970	0.0	7.920	0.0	12.870	0.0	17.820	0.0
3.300	0.0	8.250	0.0	13.200	0.0	18.150	0.0
3.630	0.0	8.580	0.0	13.530	0.0	18.480	0.0
3.960	0.0	8.910	0.0	13.860	0.0	18.810	0.0
4.290	0.0	9.240	0.0	14.190	0.0	19.140	0.0
4.620	0.0	9.570	0.0	14.520	0.0	19.470	0.0

RUNOFF VOLUME = 2.26496 INCHES = 0.0809 ACRE-FEET
PEAK DISCHARGE RATE = 1.81 CFS AT 1.485 HOURS BASIN AREA = 0.0007 SQ. MI.

ADD HYD ID=28 HYD=FULLROADWIDTH ID I=17 II=26

PRINT HYD ID=28 CODE=10

HYDROGRAPH FROM AREA FULLROADWIDTH

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.1	9.900	0.1
14.850	0.1	19.800	0.1		
0.330	0.0	5.280	0.1	10.230	0.1
15.180	0.1	20.130	0.1		
0.660	0.0	5.610	0.1	10.560	0.1
15.510	0.1	20.460	0.1		
0.990	0.0	5.940	0.1	10.890	0.1
15.840	0.1	20.790	0.1		
1.320	4.7	6.270	0.1	11.220	0.1
16.170	0.1	21.120	0.1		
1.650	9.5	6.600	0.1	11.550	0.1
16.500	0.1	21.450	0.1		
1.980	4.4	6.930	0.1	11.880	0.1
16.830	0.1	21.780	0.1		
2.310	1.0	7.260	0.1	12.210	0.1
17.160	0.1	22.110	0.1		
2.640	0.4	7.590	0.1	12.540	0.1
17.490	0.1	22.440	0.1		
2.970	0.2	7.920	0.1	12.870	0.1
17.820	0.1	22.770	0.1		
3.300	0.1	8.250	0.1	13.200	0.1
18.150	0.1	23.100	0.1		
3.630	0.1	8.580	0.1	13.530	0.1
18.480	0.1	23.430	0.1		
3.960	0.1	8.910	0.1	13.860	0.1
18.810	0.1	23.760	0.1		
4.290	0.1	9.240	0.1	14.190	0.1
19.140	0.1	24.090	0.1		

```
     4.620       0.1          9.570       0.1         14.520       0.1
    19.470       0.1         24.420       0.0

       RUNOFF VOLUME =     2.26487 INCHES     =       0.8069 ACRE-FEET
       PEAK DISCHARGE RATE =      17.92 CFS  AT   1.485 HOURS   BASIN AREA =
0.0067 SQ. MI.




   FINISH


       NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 15:00:27
```

AHYMO PROGRAM SUMMARY TABLE (AHYMO-S4) - Ver. S4.02a, Rel: 02a RUN DATE (MON/DAY/YR) =09/01/2020
INPUT FILE = G Tools\ahymo-s4-r2\ahymo-s4-r2\DISK1\program files\AHYMO-S4\04022 Input.HMI USER NO.= AHYMO-S4TempUser05901704

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 1 NOTATION
RAINFALL TYPE=13										RAIN24= 2.660
*S EXISTING CONDITIONS										
*S COMPUTE HYD EXISTING BASIN A										
COMPUTE NM HYD	101.00	-	1	0.00804	6.88	0.188	0.43934	1.518	1.336	PER IMP= 0.00
*S COMPUTE HYD EXISTING BASIN B										
COMPUTE NM HYD	102.00	-	2	0.01428	12.21	0.335	0.43934	1.518	1.336	PER IMP= 0.00
*S COMPUTE HYD EXISTING BASIN C										
COMPUTE NM HYD	103.00	-	3	0.03350	28.63	0.785	0.43934	1.518	1.335	PER IMP= 0.00
ADD HYD	101TO102	1& 2	4	0.02232	19.08	0.523	0.43933	1.518	1.336	
ADD HYD	COMBINED101-	3& 4	5	0.05582	47.71	1.308	0.43934	1.518	1.336	
*S PROPOSED CONDITIONS										
*S COMPUTE HYD PROPOSED BASIN A										
COMPUTE NM HYD	104.00	-	6	0.00923	23.58	1.036	2.10390	1.485	3.992	PER IMP= 80.00
*S COMPUTE HYD PROPOSED BASIN B										
COMPUTE NM HYD	105.00	-	7	0.00446	11.40	0.500	2.10390	1.485	3.995	PER IMP= 80.00
*S COMPUTE HYD PROPOSED BASIN C										
COMPUTE NM HYD	106.00	-	8	0.00609	15.56	0.683	2.10390	1.485	3.993	PER IMP= 80.00
ADD HYD	BTOA	6& 7	10	0.01369	34.98	1.536	2.10386	1.485	3.993	
ADD HYD	B-CTOA	8&10	11	0.01978	50.55	2.219	2.10386	1.485	3.993	
*S COMPUTE HYD PROPOSED BASIN D										
COMPUTE NM HYD	107.00	-	12	0.01567	16.41	0.533	0.63801	1.518	1.637	PER IMP= 10.00
*S COMPUTE HYD PROPOSED BASIN E										
COMPUTE NM HYD	108.00	-	13	0.00100	2.38	0.099	1.86230	1.485	3.719	PER IMP= 65.00
*S COMPUTE HYD PROPOSED BASIN F										
COMPUTE NM HYD	109.00	-	14	0.00048	0.84	0.025	0.97645	1.518	2.727	PER IMP= 10.00
ADD HYD	DTOF	12&14	15	0.01615	17.25	0.557	0.64701	1.518	1.669	
ADD HYD	ETOF-D	13&15	16	0.01715	19.63	0.657	0.71786	1.518	1.788	
*S COMPUTE HYD PROPOSED BASIN G										
COMPUTE NM HYD	110.00	-	17	0.00468	12.55	0.565	2.26496	1.485	4.191	PER IMP= 90.00
*S COMPUTE HYD PROPOSED BASIN H										
COMPUTE NM HYD	111.00	-	18	0.00107	2.88	0.129	2.26496	1.485	4.210	PER IMP= 90.00
*S COMPUTE HYD PROPOSED BASIN I										
COMPUTE NM HYD	112.00	-	19	0.00074	2.00	0.089	2.26496	1.485	4.220	PER IMP= 90.00
ADD HYD	HTOI	18&19	20	0.00181	4.88	0.219	2.26462	1.485	4.214	
ADD HYD	A-CTOG	11&17	21	0.02446	63.10	2.785	2.13467	1.485	4.031	
ADD HYD	D-FTOA-DTOG	16&21	22	0.04161	82.34	3.441	1.55071	1.518	3.092	
*S FUTURE CONDITIONS										
*S COMPUTE HYD FUTURE BASIN D-1										
COMPUTE NM HYD	113.00	-	23	0.00729	18.63	0.818	2.10390	1.485	3.993	PER IMP= 80.00
*S COMPUTE HYD FUTURE BASIN D-2										
COMPUTE NM HYD	114.00	-	24	0.00781	19.96	0.876	2.10390	1.485	3.993	PER IMP= 80.00
*S COMPUTE HYD FUTURE BASIN D-3										
COMPUTE NM HYD	115.00	-	25	0.00202	5.17	0.227	2.10390	1.485	4.001	PER IMP= 80.00
*S COMPUTE HYD FUTURE BASIN G-2										

```
                                                                AHYMO.SUM
COMPUTE NM HYD        116.00   -    26       0.00200         5.37       0.242      2.26496    1.485    4.198 PER IMP=  90.00
*S  COMPUTE HYD FUTURE BASIN H-2
COMPUTE NM HYD        117.00   -    27       0.00067         1.81       0.081      2.26496    1.485    4.225 PER IMP=  90.00
ADD HYD         FULLROADWIDT 17&26  28       0.00668        17.92       0.807      2.26487    1.485    4.193
FINISH
```

APPENDIX B

HYDRAULIC CALCULATIONS

Manning Formula: Proposed 24" SD Max Flow

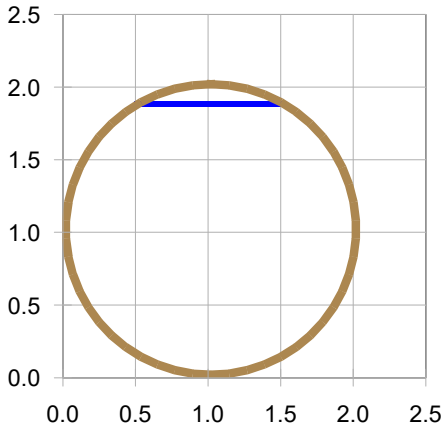
Circular Channel

Input

Flow	17.20 cfs
Slope	0.005 ft/ft
Manning's n	0.013
Diameter	24 in

Output

Depth	1.862 ft
Flow Area	3.05 sf
Velocity	5.65 fps
Velocity Head	0.495 ft
Top Width	1.01 ft
Froude Number	0.574
Critical Depth	1.495 ft
Critical Slope	0.00701 ft/ft



Manning Formula: Proposed 30" SD Max Flow

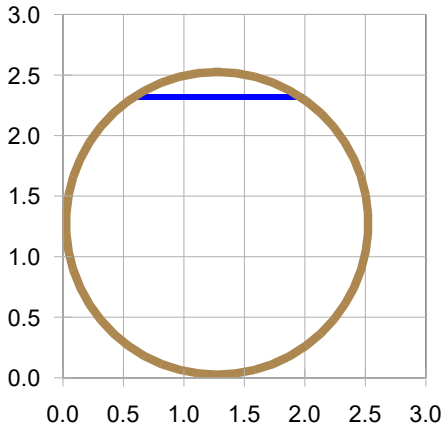
Circular Channel

Input

Flow	31.1 cfs
Slope	0.005 ft/ft
Manning's n	0.013
Diameter	30 in

Output

Depth	2.292 ft
Flow Area	4.71 sf
Velocity	6.60 fps
Velocity Head	0.677 ft
Top Width	1.38 ft
Froude Number	0.630
Critical Depth	1.900 ft
Critical Slope	0.00670 ft/ft



Manning Formula: Proposed 36" SD Max Flow

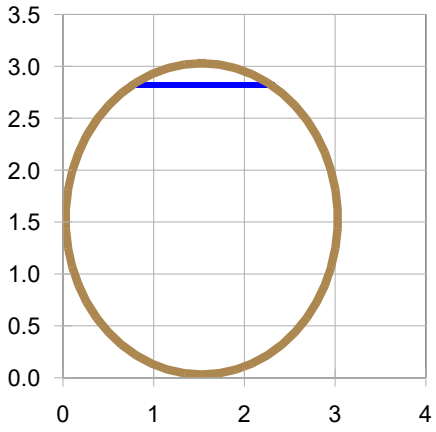
Circular Channel

Input

Flow	50.7 cfs
Slope	0.005 ft/ft
Manning's n	0.013
Diameter	36 in

Output

Depth	2.787 ft
Flow Area	6.85 sf
Velocity	7.41 fps
Velocity Head	0.852 ft
Top Width	1.54 ft
Froude Number	0.619
Critical Depth	2.317 ft
Critical Slope	0.00651 ft/ft



Manning Formula: Proposed 42" SD Max Flow

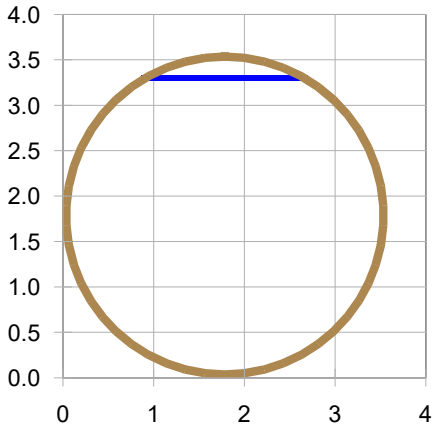
Circular Channel

Input

Flow	76.5 cfs
Slope	0.005 ft/ft
Manning's n	0.013
Diameter	42 in

Output

Depth	3.261 ft
Flow Area	9.34 sf
Velocity	8.19 fps
Velocity Head	1.04 ft
Top Width	1.77 ft
Froude Number	0.628
Critical Depth	2.737 ft
Critical Slope	0.00634 ft/ft



Manning Formula: Proposed 54" SD Max Flow

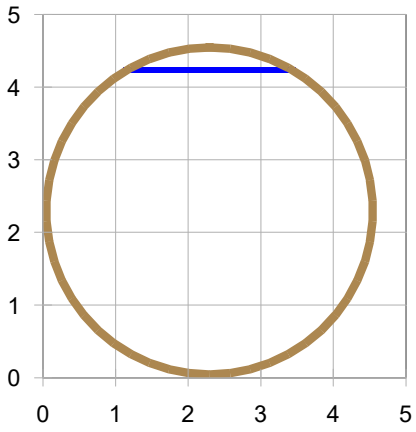
Circular Channel

Input

Flow	149.5 cfs
Slope	0.005 ft/ft
Manning's n	0.013
Diameter	54 in

Output

Depth	4.185 ft
Flow Area	15.4 sf
Velocity	9.70 fps
Velocity Head	1.46 ft
Top Width	2.30 ft
Froude Number	0.660
Critical Depth	3.588 ft
Critical Slope	0.00609 ft/ft



Manning Formula: Proposed 60" SD Max Flow

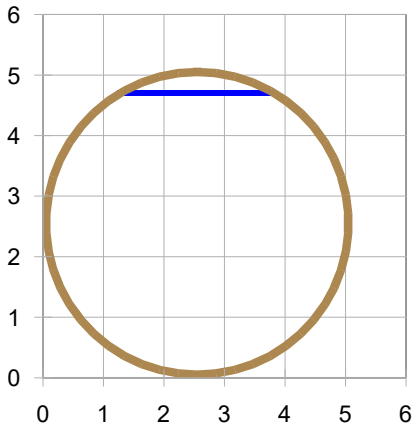
Circular Channel

Input

Flow	198.0 cfs
Slope	0.005 ft/ft
Manning's n	0.013
Diameter	60 in

Output

Depth	4.651 ft
Flow Area	19.0 sf
Velocity	10.4 fps
Velocity Head	1.68 ft
Top Width	2.55 ft
Froude Number	0.671
Critical Depth	4.019 ft
Critical Slope	0.00599 ft/ft



Basin A Type D Inlet Calculation

Orifice (Unknown Q)

Head Water Depth (h):	0.5	ft	User Enter Desired Value
Discharge Coeff. (C_d):	0.6		
Open Area (A):	4.6900	ft^2	
Gravity (g):	32.2	ft/s^2	

Flow (Q) = C · A · (2 · g · h) ^ (0.5)

Flow (Q) = 16.0 cfs

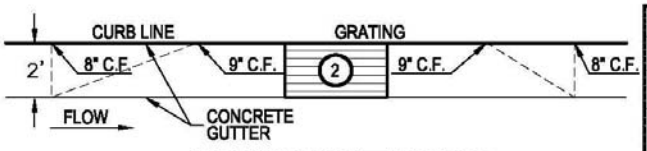
Weir (Unknown Q):

Discharge Coeff. (C_w):	3.367	
Length (L):	10.67	ft

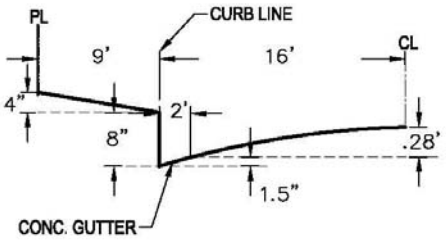
Flow (Q) = C_w · L · h ^ (1.5)

Flow (Q) = 12.7 cfs

GRATING CAPACITIES FOR TYPE "A", "C" AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

PLATE 22.3 D-5

GRATING CAPACITIES FOR TYPE "A", "C" AND "D"

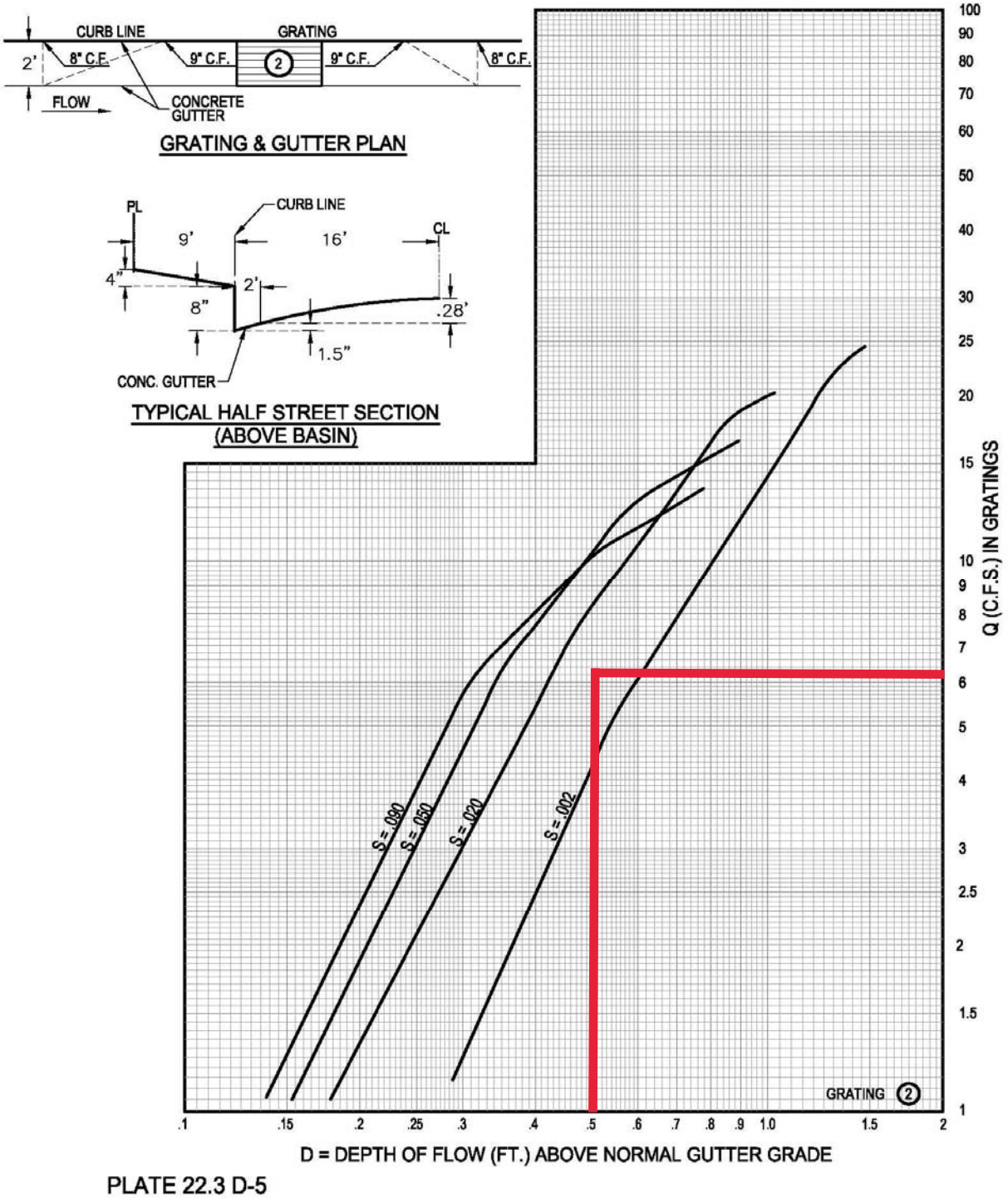
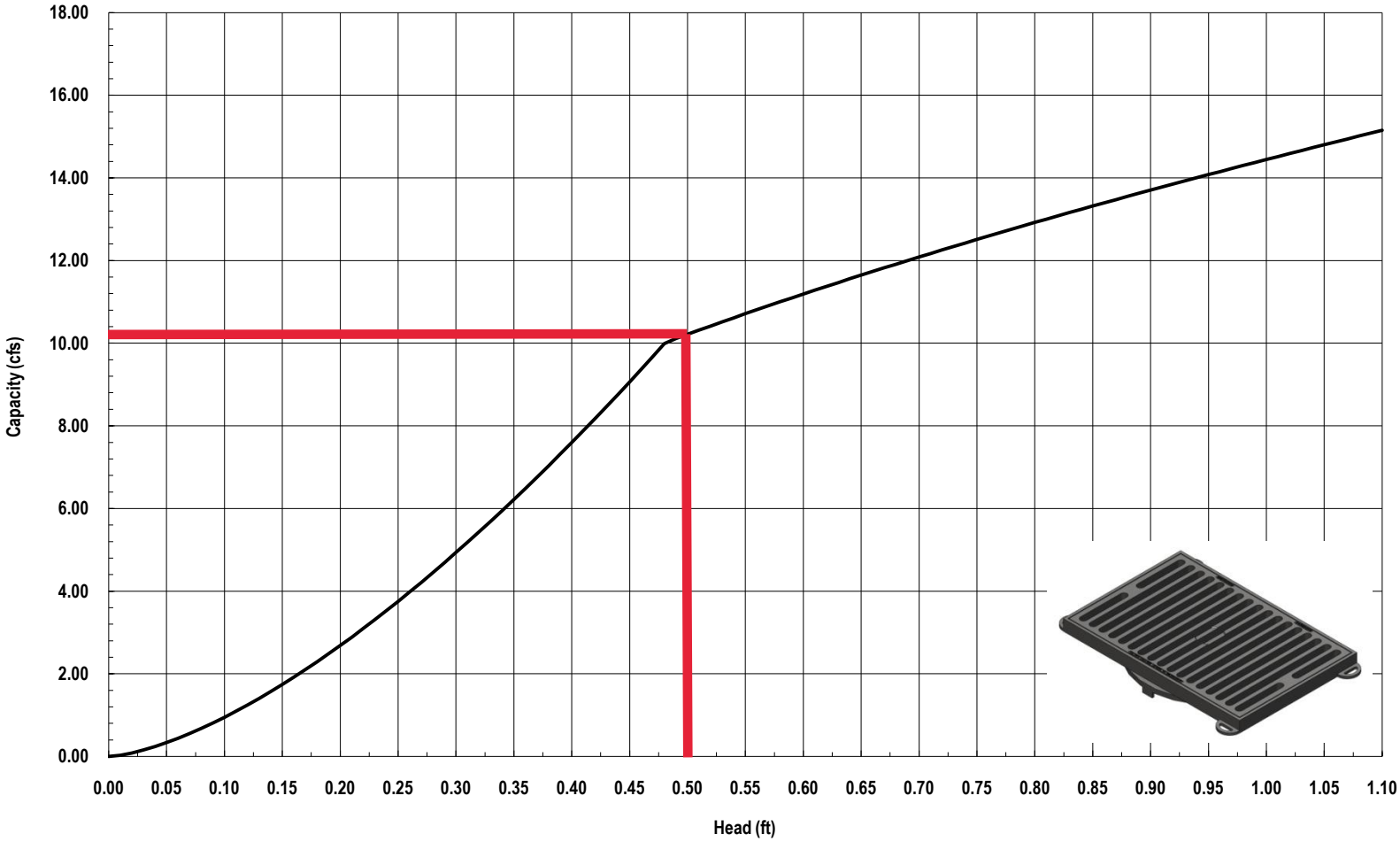


PLATE 22.3 D-5

Nyloplast 2' x 3' Road & Highway Grate Inlet Capacity Chart



Nyloplast®
3130 Verona Avenue • Buford, GA 30518
(866) 888-8479 / (770) 932-2443 • Fax: (770) 932-2490

Manning Formula: Typical Public Half-Road Section

Irregular Section

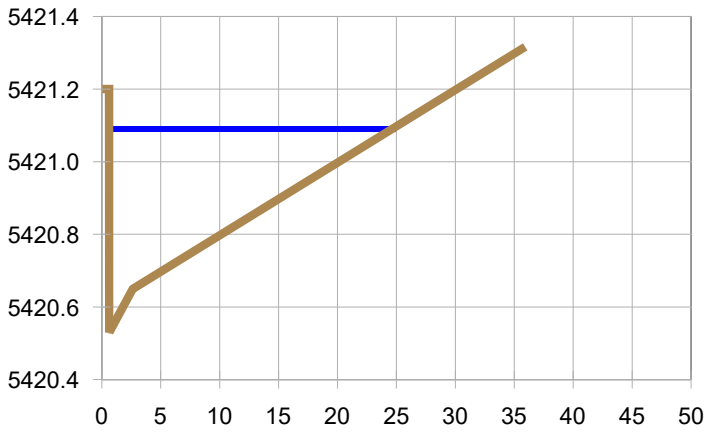
Input

Flow	14.88 cfs
Slope	0.005 ft/ft

Sta	Elev	n	Sta	Elev	n	Sta	Elev	n	Sta	Elev	n
0	5421.20	0.017	0.62	5421.20	0.017	0.63	5420.53	0.017	2.63	5420.65	0.017
35.63	5421.31	0.017	68.63	5420.65	0.017	70.63	5420.53	0.017	70.64	5421.20	0.017

Output

WSElev	5,421.091 ft
Flow Area	5.87 sf
Velocity	2.53 fps
Velocity Head	0.0999 ft
Top Width	24.1 ft
Froude Number	0.905
Critical WSElev	5,421.072 ft
Critical Slope	ft/ft



Manning Formula: Typical Public Road Section

Irregular Section

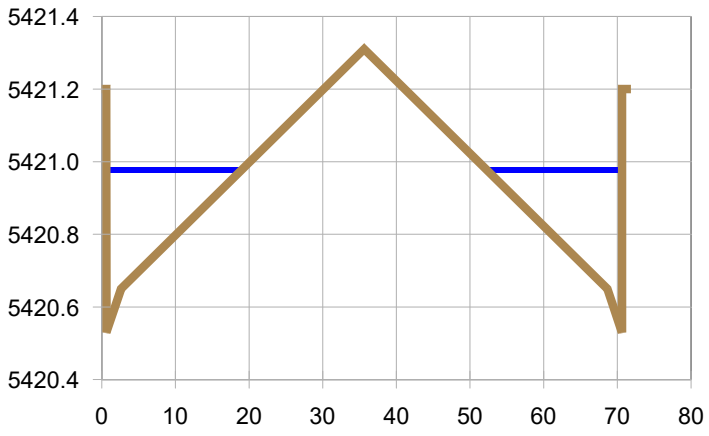
Input

Flow	14.88 cfs
Slope	0.005 ft/ft

Sta	Elev	n	Sta	Elev	n	Sta	Elev	n	Sta	Elev	n
0	5421.20	0.017	0.62	5421.20	0.017	0.63	5420.53	0.017	2.63	5420.65	0.017
35.63	5421.31	0.017	68.63	5420.65	0.017	70.63	5420.53	0.017	70.64	5421.20	0.017
71.26	5421.20	0.017									

Output

WSElev	5,420.976 ft
Flow Area	6.87 sf
Velocity	2.17 fps
Velocity Head	0.0729 ft
Top Width	36.6 ft
Froude Number	0.882
Critical WSElev	5,420.958 ft
Critical Slope	ft/ft



Manning Formula: Proposed Internal Roadway Max Flow

Irregular Section

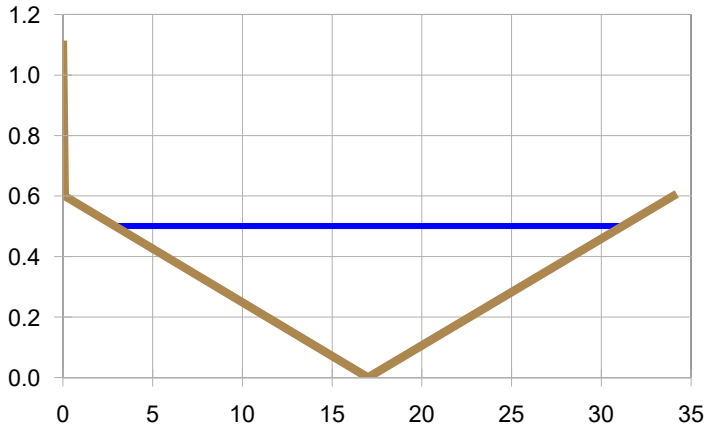
Input

Flow	17.3 cfs
Slope	0.005 ft/ft

Sta	Elev	n	Sta	Elev	n	Sta	Elev	n	Sta	Elev	n
0	1.1	0.017	0.1	0.6	0.017	17	0	0.017	34	0.6	0.017

Output

WSElev	0.500 ft
Flow Area	7.06 sf
Velocity	2.45 fps
Velocity Head	0.0934 ft
Top Width	28.2 ft
Froude Number	0.864
Critical WSElev	0.472 ft
Critical Slope	ft/ft



Temporary Public Retention Pond A Weir Calculation

Head Water Depth (h):	1	ft	User Enter Desired Value

Weir (Unknown Q):

Discharge Coeff. (C_w):	3.33	
Length (L):	24.70	ft

Flow (Q) = $C_w \cdot L \cdot h \wedge (1.5)$

Flow (Q) = 82.3 cfs

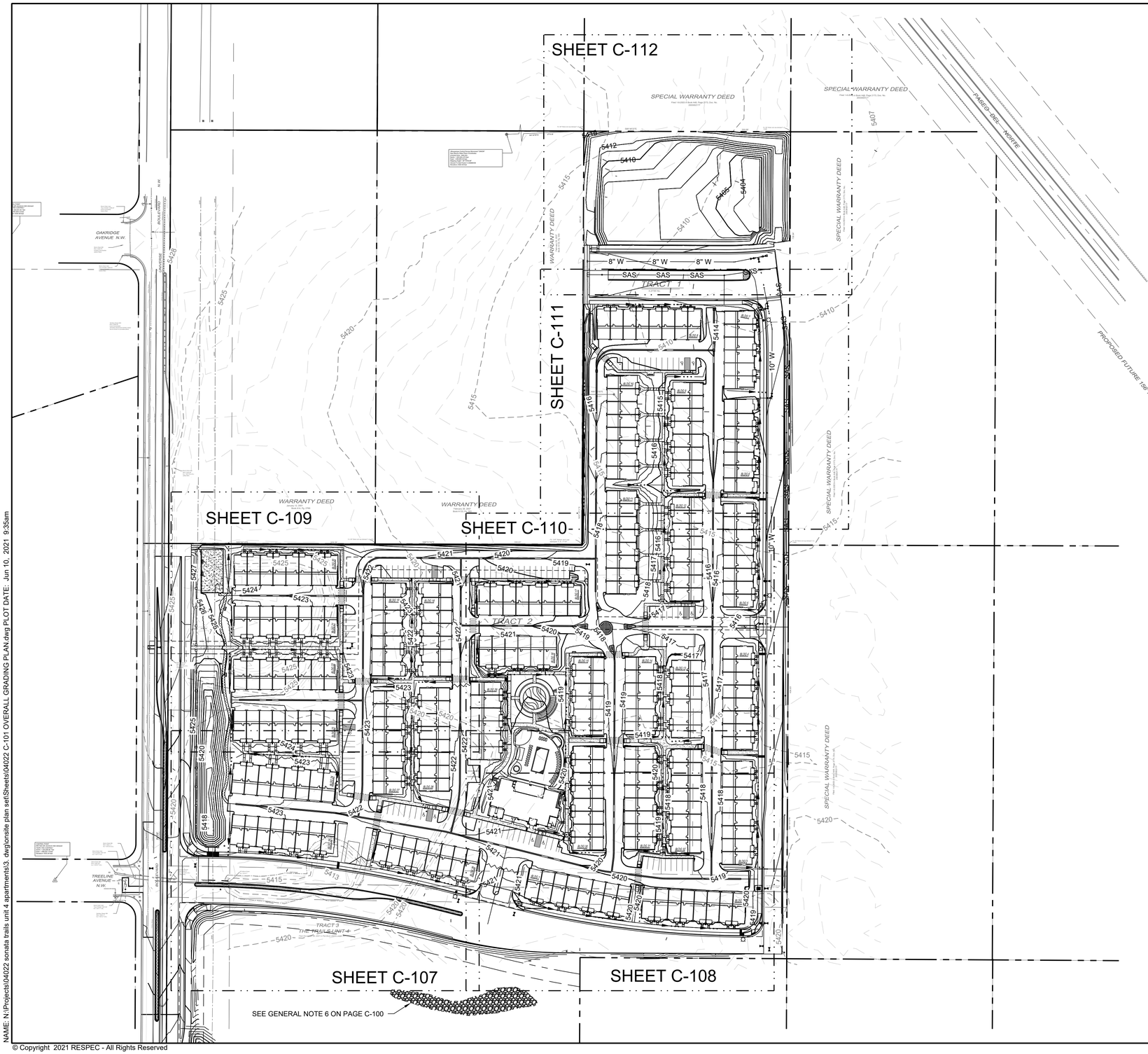
Head Water Depth (h):	0.5	ft

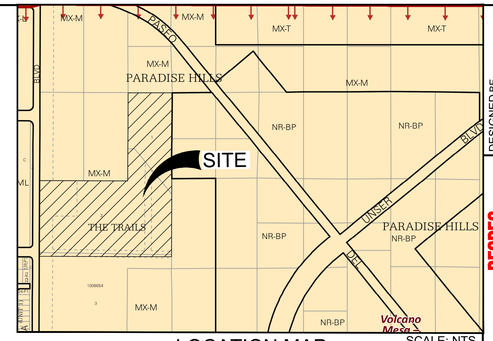
Weir (Unknown Q):

Discharge Coeff. (C_w):	3.33	
Length (L):	24.70	ft

Flow (Q) = $C_w \cdot L \cdot h \wedge (1.5)$

Flow (Q) = 29.1 cfs





LOCATION MAP
ZONE ATLAS MAP C-10-Z

SCALE: NTS

GRADING NOTES

1. CONTRACTOR TO FIELD VERIFY LOCATION AND ELEVATION OF ALL EXISTING DRY AND WET UTILITIES PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY ISSUES. UTILITY RELOCATION MAY BE REQUIRED.
2. FINISH GRADE OF SOIL EDGES ALONG PAVEMENT TO BE 1/2" BELOW EDGE OF PAVEMENT.
3. STRIP AND STOCKPILE TOPSOIL FROM GRADING AREAS. USE STOCKPILED TOPSOIL AND IMPORTED TOPSOIL AS NECESSARY FOR SURFACE RESTORATION.
4. GRADES SHOWN ARE FINAL SURFACE GRADES AFTER COMPLETION OF SURFACE IMPROVEMENTS AND PLACEMENT OF TOPSOIL.
5. GRADE AREAS AT SITE PERIMETER TO MATCH GRADES OF ADJACENT PARCELS.
6. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF PROPERLY IN ACCORDANCE WITH APPLICABLE REGULATIONS.
7. PROVIDE TEMPORARY GRADING FEATURES SUCH AS BERMS, SWALES, SUMPS AND BASINS TO MANAGE INTERIM STORM WATER RUNOFF DURING CONSTRUCTION PROCESS. STORM WATER RUNOFF LEAVING THE SITE SHALL MEET ALL FEDERAL, STATE AND LOCAL QUALITY REQUIREMENTS.
8. ALL DISTURBED AREAS TO BE RE-SEEDED PER LANDSCAPE PLAN PROVIDED BY OTHERS.
9. ALL INFRASTRUCTURE CONSTRUCTION WITHIN PUBLIC RIGHT-OF-WAY SHALL BE BUILT WITH PUBLIC WORK ORDER PLANS.
10. FINAL GRADES FOR ADJACENT ROADWAYS TO BE ESTABLISHED WITH WORK ORDER PLANS.
11. GRADING SHALL NOT ENCROACH ON ADJACENT PROPERTIES.

PNM NOTE

1. CONTRACTOR TO COORDINATE A SITE WALKTHROUGH WITH PNM PRIOR TO CONSTRUCTION. CONTRACTOR TO KEEP ALL EQUIPMENT A MINIMUM OF 15 FEET AWAY FROM ALL PNM POWER LINES.

LEGEND

GRADING LIMITS	
MAJOR CONTOUR	4985
MINOR CONTOUR	
EXISTING MAJOR CONTOUR	4985
EXISTING MINOR CONTOUR	
MATCHLINE	
SLOPE ARROW	-1.5% -51.2%
SIDEWALK CULVERT	

0 80 160
SCALE: 1" = 80'

DESIGNED BE
DRAWN BE
CHECKED SG
DATE 6.03.2021

REVISION

RESPEC
COMMUNITY DESIGN SOLUTIONS
6001 MARBLE AVENUE NE, SUITE 100
ALBUQUERQUE, NEW MEXICO 87109
WWW.RESPEC.COM PHONE: (505)343-9718

STAMP

JEREMY W SHELL
NEW MEXICO
26341
PROFESSIONAL ENGINEER
6/03/2021

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nm811 Know what's below. Call before you dig.

PROJECT NAME: SONATA TRAILS UNIT 4 APARTMENTS

SHEET TITLE: OVERALL GRADING PLAN

SUBMITTED FOR: CONSTRUCTION

SHEET NUMBER: C-106

NAME: N:\Projects\04022 sonata trails unit 4 apartments\3. dwg\onsite plan set\Sheets\04022 C-101 OVERALL GRADING PLAN.dwg PLOT DATE: Jun 10, 2021 9:35am

SHEET C-109

SHEET C-110

SHEET C-108

TRACT 3
THE TRAILS UNIT 4
Filed December 28, 2007 in Plat Book 2007C, page 357

TYPICAL WHERE SHOWN

BLDG 24 BLDG 25 BLDG 26 BLDG 27 BLDG 28

STA. 12+00.00, 0.00' Treeline Avenue FL=5422.94
STA. 12+50.00, 0.00' Treeline Avenue FL=5422.44
STA. 13+00.00, 0.00' Treeline Avenue FL=5421.96
STA. 13+50.00, 0.00' Treeline Avenue FL=5421.94
STA. 14+00.00, 0.00' Treeline Avenue FL=5421.74
STA. 14+50.00, 0.00' Treeline Avenue FL=5421.09
STA. 15+00.00, 0.00' Treeline Avenue FL=5420.84
STA. 15+50.00, 0.00' Treeline Avenue FL=5420.59

STA. 13+58.13, 82.75' LT FL=5422.32

N89°02'55"W

Storm Drain MH Rim= 5420.51' Inv.= 5413.0'± (CL) (Offset MH)

60"±Storm Drain Inv.= 5412.7'

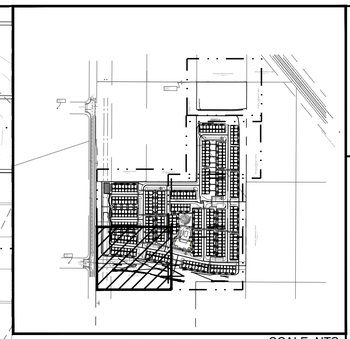
TOP POND

OHW

SD

KEY MAP

SCALE: NTS



LEGEND

- GRADING LIMITS
- MAJOR CONTOUR — 4985
- MINOR CONTOUR
- EXISTING MAJOR CONTOUR — 4985
- EXISTING MINOR CONTOUR
- MATCHLINE
- SLOPE ARROW -1.5% -51.2%
- SIDEWALK CULVERT

SPOT ELEVATION SYMBOLS

1. ALL SPOT ELEVATIONS ARE AT FLOWLINE UNLESS OTHERWISE NOTED IN THE PLANS.
   - 20.00 FLOWLINE
   - 20.00± MATCH EX. GRADE ELEV. (APPROXIMATE)
   - BW 20.00 BOTTOM WALL
   - TW 20.00 TOP WALL
   - SW 20.00 SIDEWALK
   - FG 20.00 FINISHED GROUND
   - BS 20.00 BOTTOM STEP
   - TS 20.00 TOP STEP

KEYED NOTES

I.D.#	DESCRIPTION
1	NDS 5" PRO SERIES CHANNEL DRAIN W/ GALVANIZED METAL GRATE TYP.
2	WARP ASPHALT BETWEEN GARAGES/UNITS AS NECESSARY TYP.
3	6" CONCRETE STEP TYP UNLESS SHOWN OTHERWISE. NUMBER OF STEPS SHOWN PER PLAN.
4	1' CURB OPENING. SEE DETAIL SHEET C-500.
5	CONCRETE SPLASH BLOCK. SEE DETAIL SHEET C-501.
6	5" CONCRETE STEP. NUMBER OF STEPS SHOWN PER PLAN.
7	7" CONCRETE STEP. NUMBER OF STEPS SHOWN PER PLAN.

0 20 40
SCALE: 1" = 20'

REVISION

DESIGNED	BE	
DRAWN	BE	
CHECKED	SG	
DATE	6.03.2021	

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COMMUNITY DESIGN SOLUTIONS
6001 UNSER BLVD NE, SUITE B
ALBUQUERQUE, NEW MEXICO 87109
WWW.RESPEC.COM PHONE: (505)253-9718

STAMP

JEREMY W SHELL NEW MEXICO 26341 PROFESSIONAL ENGINEER

PRELIMINARY NOT FOR CONSTRUCTION 6/03/2021

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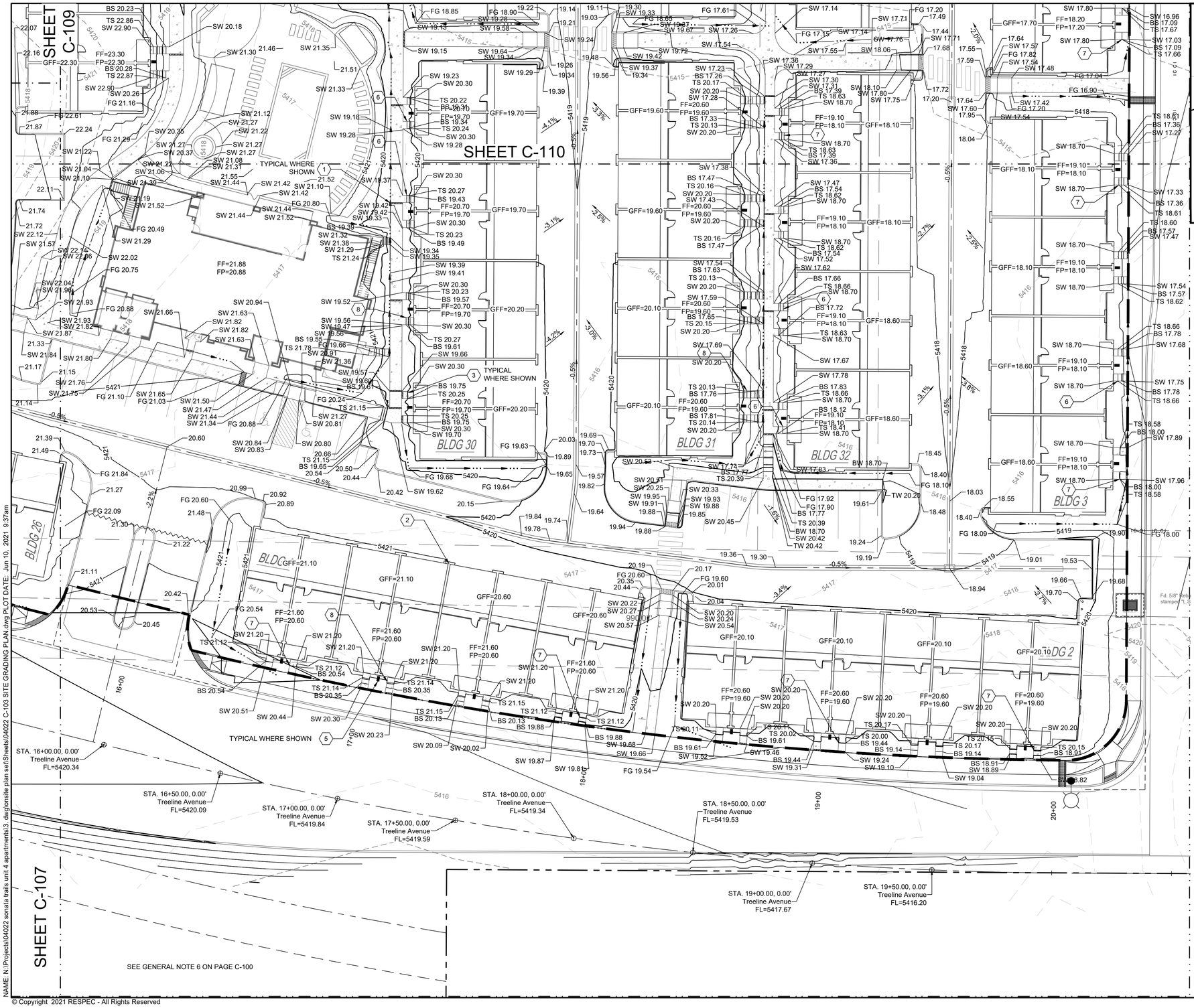
PROJECT NAME: SONATA TRAILS UNIT 4 APARTMENTS

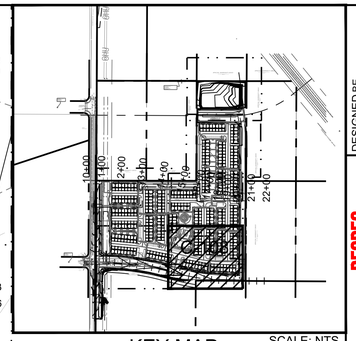
SHEET TITLE: SITE GRADING PLAN

SUBMITTED FOR: CONSTRUCTION DRB SITE PLAN

SHEET NUMBER: C-107

NAME: N:\Projects\04022 sonata trails unit 4 apartments\3. dwg\onsite plan set\Sheets\04022 C-102 SITE GRADING PLAN.dwg PLOT DATE: Jun 10, 2021 9:36am





LEGEND

GRADING LIMITS	
MAJOR CONTOUR	4985
MINOR CONTOUR	
EXISTING MAJOR CONTOUR	4985
EXISTING MINOR CONTOUR	
MATCHLINE	
SLOPE ARROW	-1.5% -51.2%
SIDEWALK CULVERT	

- 20.00 FLOWLINE
- 20.00± MATCH EX. GRADE ELEV. (APPROXIMATE)
- BW 20.00 BOTTOM WALL
- TW 20.00 TOP WALL
- SW 20.00 SIDEWALK
- FG 20.00 FINISHED GROUND
- BS 20.00 BOTTOM STEP
- TS 20.00 TOP STEP

KEYED NOTES

I.D.#	DESCRIPTION
1	NDS 5" PRO SERIES CHANNEL DRAIN W/ GALVANIZED METAL GRATE TYP.
2	WARP ASPHALT BETWEEN GARAGES/UNITS AS NECESSARY TYP.
3	6" CONCRETE STEP TYP UNLESS SHOWN OTHERWISE. NUMBER OF STEPS SHOWN PER PLAN.
4	1' CURB OPENING. SEE DETAIL SHEET C-500.
5	CONCRETE SPLASH BLOCK. SEE DETAIL SHEET C-501.
6	5" CONCRETE STEP. NUMBER OF STEPS SHOWN PER PLAN.
7	7" CONCRETE STEP. NUMBER OF STEPS SHOWN PER PLAN.
8	4" CONCRETE STEP. NUMBER OF STEPS SHOWN PER PLAN.

GENERAL NOTES

1. FINAL GRADES FOR ADJACENT ROADWAYS TO BE ESTABLISHED WITH WORK ORDER PLANS.
2. GRADING SHALL NOT ENCROACH ON ADJACENT PROPERTIES.

0 20 40
SCALE: 1" = 20'

DESIGNED BE
DRAWN BE
CHECKED SG
DATE 6.03.2021

REVISION

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5971 JEFFERSON ST NE, SUITE C
ALBUQUERQUE, NEW MEXICO 87109
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STAMP

JEREMY W SHELL
NEW MEXICO
26341
PROFESSIONAL ENGINEER
6/03/2021

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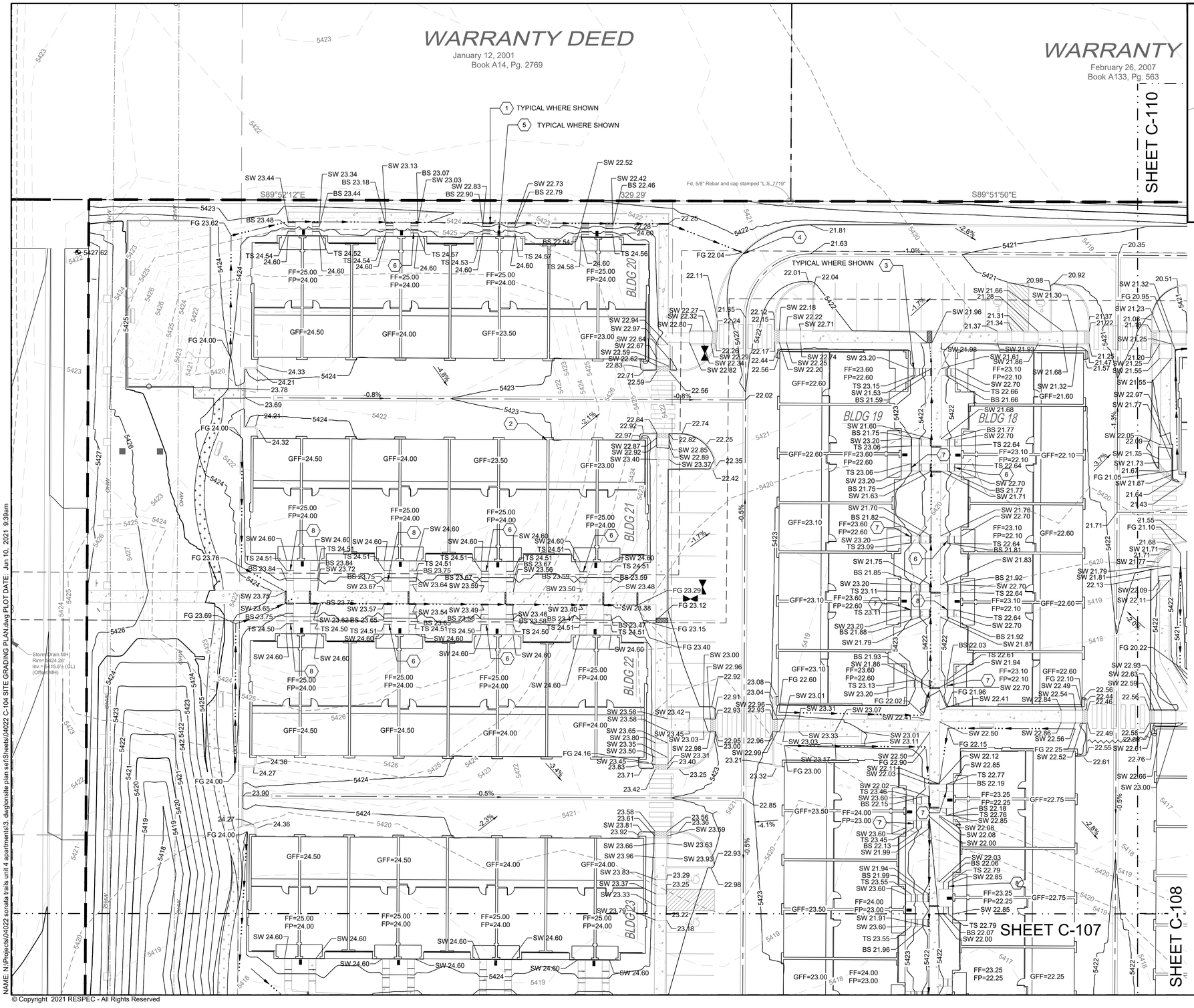
PROJECT NAME: SONATA TRAILS UNIT 4 APARTMENTS

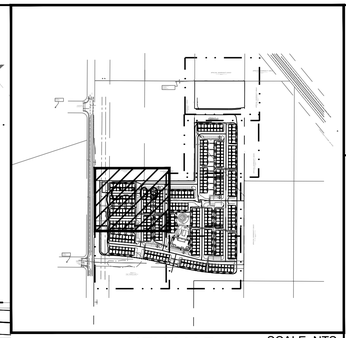
SHEET TITLE: SITE GRADING PLAN

SUBMITTED FOR: CONSTRUCTION

SHEET NUMBER: C-108

NAME: N:\Projects\04022 sonata trails unit 4 apartments\3. dwg\onsite plan set\Sheets\04022 C-103 SITE GRADING PLAN.dwg PLOT DATE: Jun 10, 2021 9:37am





KEY MAP

SCALE: NTS

LEGEND

GRADING LIMITS	
MAJOR CONTOUR	4985
MINOR CONTOUR	
EXISTING MAJOR CONTOUR	4985
EXISTING MINOR CONTOUR	
MATCHLINE	
SLOPE ARROW	-1.5% -51.2%
SIDEWALK CULVERT	

SPOT ELEVATION SYMBOLS

1. ALL SPOT ELEVATIONS ARE AT FLOWLINE UNLESS OTHERWISE NOTED IN THE PLANS.
   - 20.00 FLOWLINE
   - 20.00± MATCH EX. GRADE ELEV. (APPROXIMATE)
   - BW 20.00 BOTTOM WALL
   - TW 20.00 TOP WALL
   - SW 20.00 SIDEWALK
   - FG 20.00 FINISHED GROUND
   - BS 20.00 BOTTOM STEP
   - TS 20.00 TOP STEP

KEYED NOTES

I.D.#	DESCRIPTION
1	NDS 5" PRO SERIES CHANNEL DRAIN W/ GALVANIZED METAL GRATE TYP.
2	WARP ASPHALT BETWEEN GARAGES/UNITS AS NECESSARY TYP.
3	6" CONCRETE STEP TYP UNLESS SHOWN OTHERWISE. NUMBER OF STEPS SHOWN PER PLAN.
4	1' CURB OPENING. SEE DETAIL SHEET C-500.
5	CONCRETE SPLASH BLOCK. SEE DETAIL SHEET C-501.
6	5" CONCRETE STEP. NUMBER OF STEPS SHOWN PER PLAN.
7	7" CONCRETE STEP. NUMBER OF STEPS SHOWN PER PLAN.
8	4" CONCRETE STEP. NUMBER OF STEPS SHOWN PER PLAN.

GENERAL NOTES

1. FINAL GRADES FOR ADJACENT ROADWAYS TO BE ESTABLISHED WITH WORK ORDER PLANS.
2. GRADING SHALL NOT ENCROACH ON ADJACENT PROPERTIES.

0 20 40
SCALE: 1" = 20'

NAME: N:\Projects\04022 sonata trails unit 4 apartments\3 .dwg\onsite plan set\Sheets\04022 C-104 SITE GRADING PLAN.dwg PLOT DATE: Jun 10, 2021 9:39am

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NEW MEXICO
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6/03/2021

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PROJECT NAME: SONATA TRAILS UNIT 4 APARTMENTS

SHEET TITLE: SITE GRADING PLAN

SUBMITTED FOR: CONSTRUCTION

SHEET NUMBER: C-109

SHEET C-109

SHEET C-111

SHEET C-107

SHEET C-108

TRACT 2
1533 Ac.

TYPICAL AS SHOWN

TYPICAL AS SHOWN

TYPICAL AS SHOWN

Fd. 5/8" Rebar and cap stamped "L.S. 7719"

330.61'

BLDG 17

BLDG 16

BLDG 15

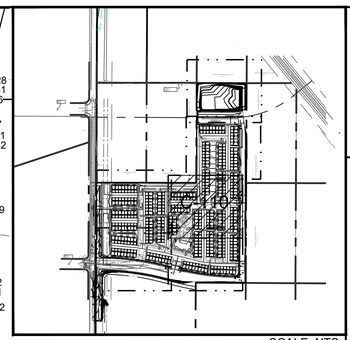
BLDG 14

BLDG 13

BLDG 5

BLDG 4

BLDG 29



KEY MAP SCALE: NTS

LEGEND

GRADING LIMITS	
MAJOR CONTOUR	4985
MINOR CONTOUR	
EXISTING MAJOR CONTOUR	4985
EXISTING MINOR CONTOUR	
MATCHLINE	
SLOPE ARROW	-1.5% -51.2%
SIDEWALK CULVERT	

SPOT ELEVATION SYMBOLS

1. ALL SPOT ELEVATIONS ARE AT FLOWLINE UNLESS OTHERWISE NOTED IN THE PLANS.
   - 20.00 FLOWLINE
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   - TW 20.00 TOP WALL
   - SW 20.00 SIDEWALK
   - FG 20.00 FINISHED GROUND
   - BS 20.00 BOTTOM STEP
   - TS 20.00 TOP STEP

KEYED NOTES

I.D.#	DESCRIPTION
1	NDS 5" PRO SERIES CHANNEL DRAIN W/ GALVANIZED METAL GRATE TYP.
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7	7" CONCRETE STEP. NUMBER OF STEPS SHOWN PER PLAN.
8	4" CONCRETE STEP. NUMBER OF STEPS SHOWN PER PLAN.

GENERAL NOTES

1. FINAL GRADES FOR ADJACENT ROADWAYS TO BE ESTABLISHED WITH WORK ORDER PLANS.
2. GRADING SHALL NOT ENCROACH ON ADJACENT PROPERTIES.

0 20 40
SCALE: 1" = 20'

REVISION	
DESIGNED	BE
DRAWN	BE
CHECKED	SG
DATE	6.03.2021

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6/03/2021

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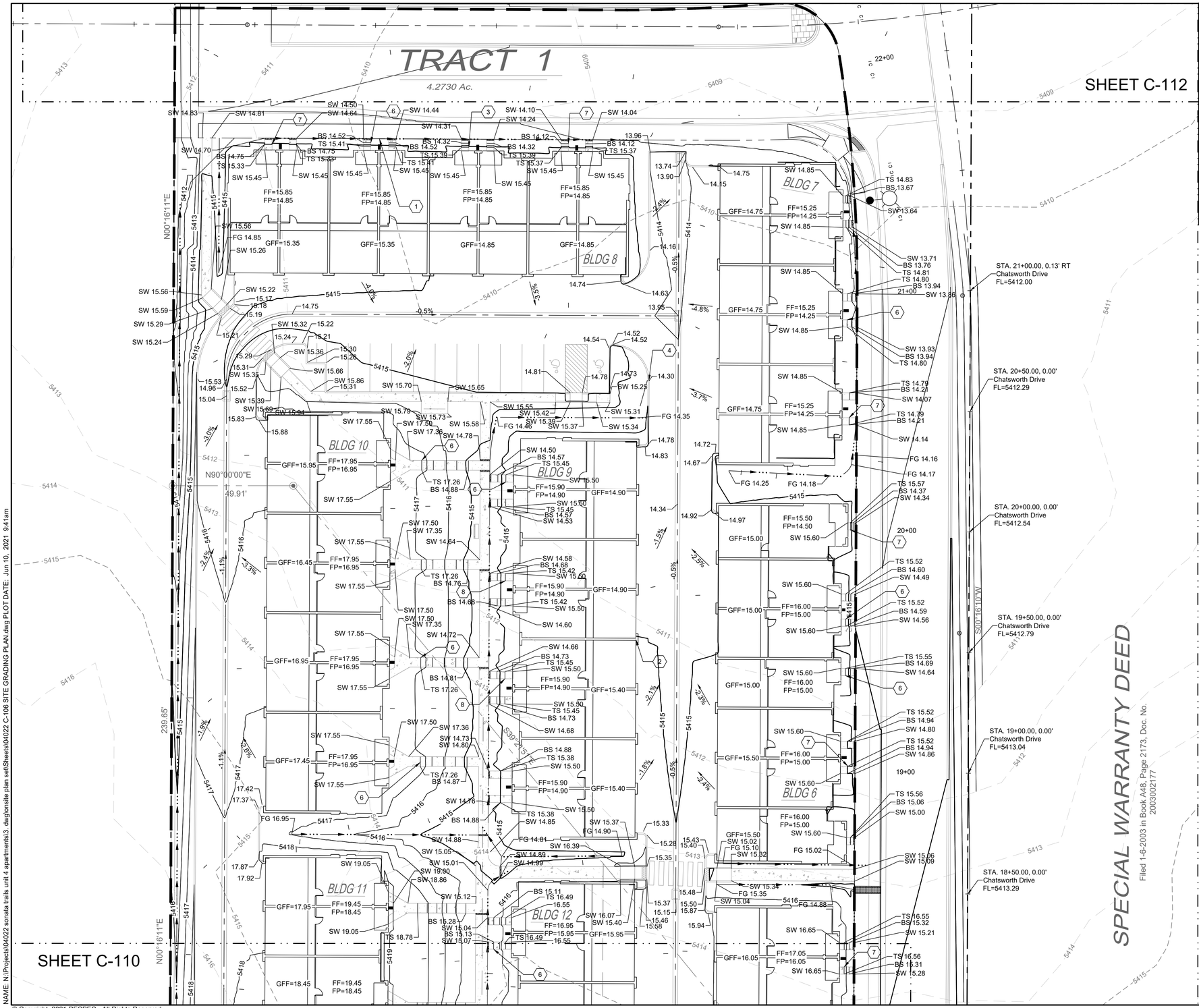
PROJECT NAME: SONATA TRAILS UNIT 4 APARTMENTS

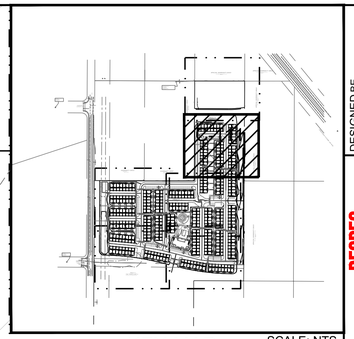
SHEET TITLE: SITE GRADING PLAN

SUBMITTED FOR: CONSTRUCTION

SHEET NUMBER: C-110

NAME: N:\Projects\04022 sonata trails unit 4 apartments\3. dwg\onsite plan set\Sheets\04022 C-105 SITE GRADING PLAN.dwg PLOT DATE: Jun 10, 2021 9:40am





KEY MAP

SCALE: NTS

LEGEND

GRADING LIMITS	
MAJOR CONTOUR	4985
MINOR CONTOUR	
EXISTING MAJOR CONTOUR	4985
EXISTING MINOR CONTOUR	
MATCHLINE	
SLOPE ARROW	-1.5% -51.2%
SIDEWALK CULVERT	

SPOT ELEVATION SYMBOLS

1. ALL SPOT ELEVATIONS ARE AT FLOWLINE UNLESS OTHERWISE NOTED IN THE PLANS.
   - 20.00 FLOWLINE
   - 20.00± MATCH EX. GRADE ELEV. (APPROXIMATE)
   - BW 20.00 BOTTOM WALL
   - TW 20.00 TOP WALL
   - SW 20.00 SIDEWALK
   - FG 20.00 FINISHED GROUND
   - BS 20.00 BOTTOM STEP
   - TS 20.00 TOP STEP

KEYED NOTES

I.D.#	DESCRIPTION
1	NDS 5" PRO SERIES CHANNEL DRAIN W/ GALVANIZED METAL GRATE TYP.
2	WARP ASPHALT BETWEEN GARAGES/UNITS AS NECESSARY TYP.
3	6" CONCRETE STEP TYP UNLESS SHOWN OTHERWISE. NUMBER OF STEPS SHOWN PER PLAN.
4	1' CURB OPENING. SEE DETAIL SHEET C-500.
5	CONCRETE SPLASH BLOCK. SEE DETAIL SHEET C-501.
6	5" CONCRETE STEP. NUMBER OF STEPS SHOWN PER PLAN.
7	7" CONCRETE STEP. NUMBER OF STEPS SHOWN PER PLAN.
8	4" CONCRETE STEP. NUMBER OF STEPS SHOWN PER PLAN.

GENERAL NOTES

1. FINAL GRADES FOR ADJACENT ROADWAYS TO BE ESTABLISHED WITH WORK ORDER PLANS.
2. GRADING SHALL NOT ENCROACH ON ADJACENT PROPERTIES.

0 20 40
SCALE: 1" = 20'

DESIGNED BE
DRAWN BE
CHECKED SG
DATE 6.03.2021

REVISION

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STAMP

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PROFESSIONAL ENGINEER
6/03/2021

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PROJECT NAME: SONATA TRAILS UNIT 4 APARTMENTS

SHEET TITLE: SITE GRADING PLAN

SUBMITTED FOR: CONSTRUCTION

SHEET NUMBER: C-111

NAME: N:\Projects\04022 sonata trails unit 4 apartments\3. dwg\onsite plan set\Sheets\04022 C-106 SITE GRADING PLAN.dwg PLOT DATE: Jun 10, 2021 9:41am

SPECIAL WARRANTY DEED

Filed 1-6-2003 in Book A48, Page 2173, Doc. No. 2003002177

SPECIAL WARRANTY DEED

Filed 1-6-200

WARRANTY DEED

February 26, 2007
Book A133, Pg. 563

Fd. 5/8" Rebar and cap stamped "L.S. 7719"

Fd. 5/8" Rebar and cap stamped "L.S. 11808"

S89°49'22"E

4716.38'

330.09'

420.26'

758.84'

POND TOP ELEVATION=5412.50'

POND BOTTOM ELEVATION=5403.50'

TEMPORARY PUBLIC RETENTION POND A

TRACT 1

4.2730 Ac.

SHEET C-111

18+00 19+00 20+00 21+00 22+00

BW 12.50 TW 12.50 BW 12.50 TW 12.50 BW 13.81 BW 12.50 TW 14.81 TW 15.60 BW 14.60 BW 12.50 TW 15.77 BW 14.77 BW 12.50 TW 15.77 BW 9.00 TW 13.76 BW 10.00 BW 9.00 BW 13.41 TW 13.41 BW 11.00 BW 12.00 TW 13.44

KEY MAP

SCALE: NTS

LEGEND

GRADING LIMITS	
MAJOR CONTOUR	4985
MINOR CONTOUR	
EXISTING MAJOR CONTOUR	4985
EXISTING MINOR CONTOUR	
MATCHLINE	
SLOPE ARROW	-1.5% -51.2%
SIDEWALK CULVERT	

SPOT ELEVATION SYMBOLS

1. ALL SPOT ELEVATIONS ARE AT FLOWLINE UNLESS OTHERWISE NOTED IN THE PLANS.
   - 20.00 FLOWLINE
   - 20.00± MATCH EX. GRADE ELEV. (APPROXIMATE)
   - BW 20.00 BOTTOM WALL
   - TW 20.00 TOP WALL
   - SW 20.00 SIDEWALK
   - FG 20.00 FINISHED GROUND
   - BS 20.00 BOTTOM STEP
   - TS 20.00 TOP STEP

KEYED NOTES

I.D.#	DESCRIPTION
1	1' OVERFLOW WEIR. TOP OF POND ELEVATION = 5412.50'. TOP OF WEIR ELEVATION = 5411.50'.
2	RIP RAP D50=8" DOWNSTREAM OF OVERFLOW WEIR.
3	RIP RAP D50=8" POND RUNDOWN.
4	CMU RETAINING WALL. RETAINING WALL HEIGHT VARIES FROM 0'-6'. SEE SHEET C-501 FOR DETAIL .

RIPRAP NOTES:

ALL RIP-RAP SHALL CONSIST OF 9" OF RIP-RAP OVER 8" OF FILTER MATERIAL.

RIP-RAP SHALL CONSIST OF CRUSHED ROCK MEETING THE FOLLOWING GRADATION. OR ENGINEER APPROVED EQUIVALENT.

MAX. DIMENSION	% SMALLER
12"	100
9"	50-60
6"	35-45
3"	10

GRANULAR BASE FILTER MATERIAL

FILTER MATERIAL SHALL CONSIST OF CRUSHED BASALT ROCK MEETING THE FOLLOWING GRADATION, OR ENGINEER APPROVED EQUIVALENT.

U.S. STANDARD SIEVE SIZE	PASSING BY WEIGHT
1"	100
¾"	45-65
#4	25-45
#40	0-20
#200	0-5

FILTER MATERIAL SHALL BE PLACED UNDER THE RIP-RAP CHANNEL PAVEMENT AS SHOWN HEREON. THE SUBGRADES SHALL BE PROCESSED TO A 12" MIN. DEPTH AND COMPACTED TO 95% MIN. RELATIVE DENSITY PER ASTM D 1557. THE FILTER MATERIAL SHALL BE TAMPED AND SHAPED TO FORM A SMOOTH, EVEN, AND FIRM FOUNDATION FOR THE OVERLYING RIP-RAP. THE CONTRACTOR'S OPERATIONS AND METHODS OF PLACING SHALL PREVENT SEGREGATION OF THE MATERIALS. THE FILTER MATERIAL SHALL BE PLACED AND TAMPED IN THE VOIDS OF THE RIP-RAP.

GENERAL NOTES

1. FINAL GRADES FOR ADJACENT ROADWAYS TO BE ESTABLISHED WITH WORK ORDER PLANS.
2. GRADING SHALL NOT ENCROACH ON ADJACENT PROPERTIES.

0 20
SCALE: 1" = 20'

DESIGNED BE
DRAWN BE
CHECKED SG
DATE 6.03.2021

REVISION

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STAMP

JEREMY W SHELL
NEW MEXICO
26341
PROFESSIONAL ENGINEER
6/03/2021

THIS DRAWING IS INCOMPLETE AND NOT TO BE USED FOR CONSTRUCTION UNLESS IT IS STAMPED, SIGNED AND DATED

nm811 Know what's below. Call before you dig.

PROJECT NAME: SONATA TRAILS UNIT 4 APARTMENTS

SHEET TITLE: SITE GRADING PLAN

SUBMITTED FOR: CONSTRUCTION

SHEET NUMBER: C-112

NAME: N:\Projects\04022 sonata trails unit 4 apartments\3. dwg\onsite plan set\Sheets\04022 C-107 SITE GRADING PLAN.dwg PLOT DATE: Jun 10, 2021 9:42am