

CITY OF ALBUQUERQUE

Planning Department
Alan Varela, Interim Director



Mayor Timothy M. Keller

September 3, 2021

Åsa Nilsson-Weber, P.E.
Isaacson & Arfman, P.A.
128 Monroe St. N.E.
Albuquerque, NM 87108

**RE: Aspire Subdivision Units 2
Interim Grading & Drainage Plan and Drainage Report
Engineer's Stamp Date: 08/03/21
Hydrology File: N08D006F3**

Dear Ms. Nilsson-Weber:

Based upon the information provided in your submittal received 08/03/2021, the Interim Grading & Drainage Plan and Drainage Report are approved for Grading Permit and Work Order.

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,

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

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov



City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 11/2018)

Project Title: Aspire Subdivision Unit 2 Building Permit #: _____ Hydrology File #: N08D006F3
DRB#: PR-2018-001501 (1010023) **EPC#:** _____ **Work Order#:** 757584
Legal Description: Tract FD1, Aspire Subdivision, Unit 1
City Address: _____

Applicant: Isaacson & Arfman, Inc. **Contact:** Asa Nilsson-Weber
Address: 128 Monroe Street NE - Albuquerque, NM 87108
Phone#: (505) 268-8828 **Fax#:** _____ **E-mail:** asaw@iacivil.com

Owner: DR Horton, Inc. **Contact:** Brent Lesley
Address: 4400 Alameda Blvd. NE, Ste B - Albuquerque, NM 87113
Phone#: (505) 797-4245 **Fax#:** _____ **E-mail:** PBLesley@drhorton.com

TYPE OF SUBMITTAL: ☒ PLAT (155 # OF LOTS) _____ RESIDENCE _____ DRB SITE _____ ADMIN SITE

IS THIS A RESUBMITTAL?: _____ Yes ☒ No

DEPARTMENT: _____ TRAFFIC/ TRANSPORTATION ☒ HYDROLOGY/ DRAINAGE

Check all that Apply:

TYPE OF SUBMITTAL:

☐ ENGINEER/ARCHITECT CERTIFICATION
☐ PAD CERTIFICATION
☐ CONCEPTUAL G & D PLAN
☒ GRADING PLAN INTERIM GRADING
☐ 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:

☐ 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: August 3, 2021 **By:** Asa Nilsson-Weber

COA STAFF:

ELECTRONIC SUBMITTAL RECEIVED: _____

FEE PAID: _____

AUGUST 3, 2021

DRAINAGE REPORT

FOR

ASPIRE SUBDIVISION, UNIT 2 INTERIM DRAINAGE REPORT

ALBUQUERQUE, NEW MEXICO

PREPARED BY

City of Albuquerque
Planning Department
Development Review Services
HYDROLOGY SECTION

APPROVED

DATE: 09/03/21
BY: *Renée C. Brissette*
HydroTrans # N08D0006F3

THE APPROVAL OF THESE PLANS/REPORT SHALL NOT BE
CONSTRUED TO PERMIT VIOLATIONS OF ANY CITY
ORDINANCE OR STATE LAW, AND SHALL NOT PREVENT
THE CITY OF ALBUQUERQUE FROM REQUIRING
CORRECTION, OR ERROR OR DIMENSIONS IN PLANS,
SPECIFICATIONS, OR CONSTRUCTIONS. SUCH APPROVED PLANS
SHALL NOT BE CHANGED, MODIFIED OR ALTERED WITHOUT
AUTHORIZATION.



Isaacson & Arfman, Inc.
Civil Engineering Consultants



128 Monroe Street NE
Albuquerque, NM 87108
505-268-8828 | www.iacivil.com

I&A Project No. 2423

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AHYMO 100-yr, 24-hr Summary & Output

APPENDIX B: Calculations for:
- **Pond Volume**
- **Channel Capacity**
- **Culvert Outflow**
- **Standpipe**

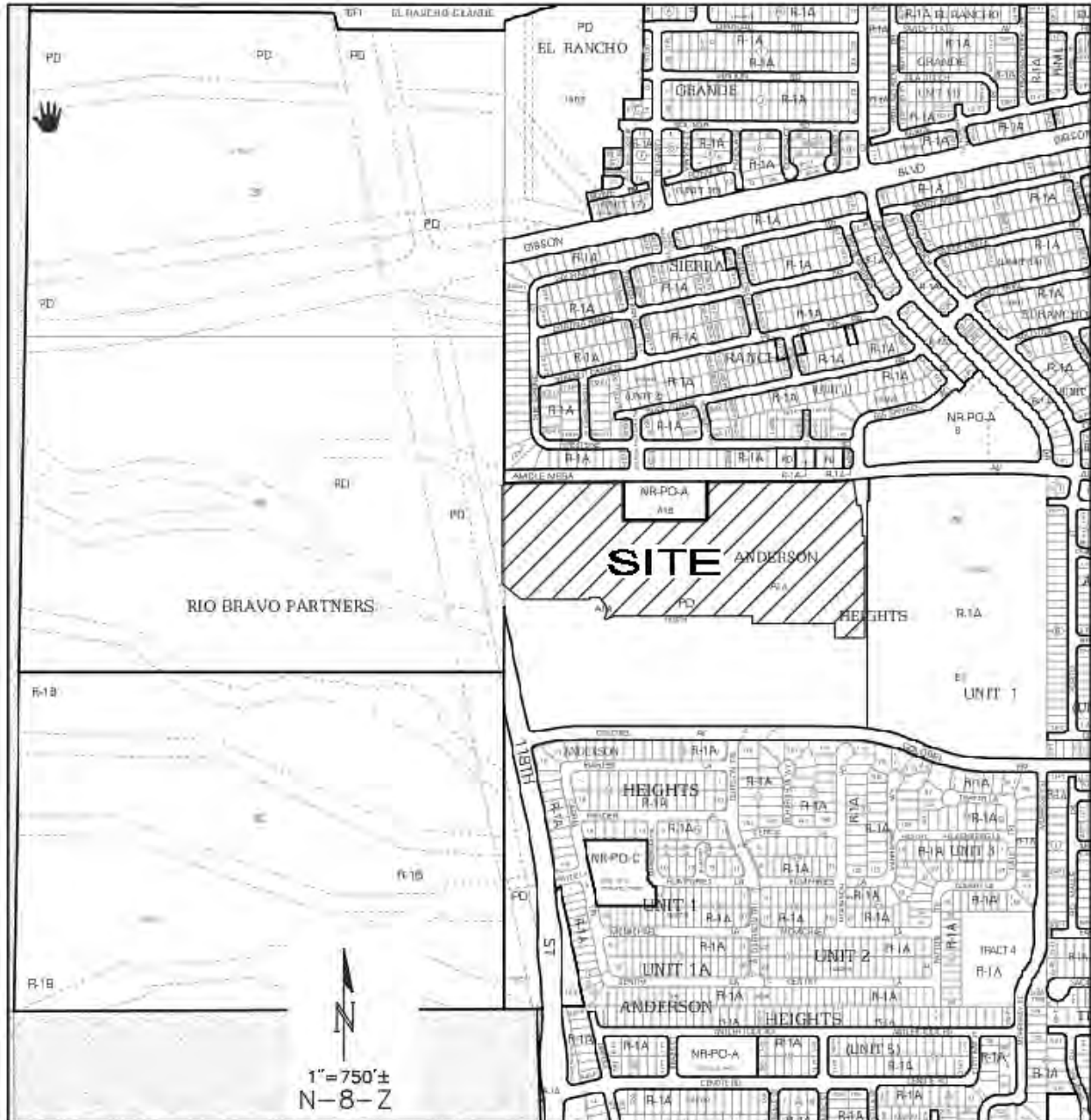
APPENDIX C: Storm Drain Calculations

POCKET

Interim Drainage Basin Exhibit

Unit 2 Interim Grading Plan

ASPIRE SUBDIVISION, UNIT 2 - INTERIM DRAINAGE REPORT



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



LOCATION MAP

PROJECT INFORMATION

PROPOSED LEGAL DESCRIPTION:

Aspire Subdivision, Unit 2

EXISTING LEGAL DESCRIPTION:

Tract FD1, Aspire Subdivision, Unit 1

ENGINEER:

Isaacson & Arfman, Inc.
128 Monroe Street NE
Albuquerque, NM 87108
(505) 268-8828
Attn: Åsa Nilsson-Weber

DEVELOPER:

DR Horton, Inc.
4400 Alameda Blvd., NE, Ste. B
Albuquerque, NM 87113
(505) 797-4245
Attn: Patrick B. Lesley

SURVEYOR:

Cartesian Land Surveys, Inc.
1005 21st St, SE
Rio Rancho, NM 87124
(505) 896-3050
Attn: Will Plotner

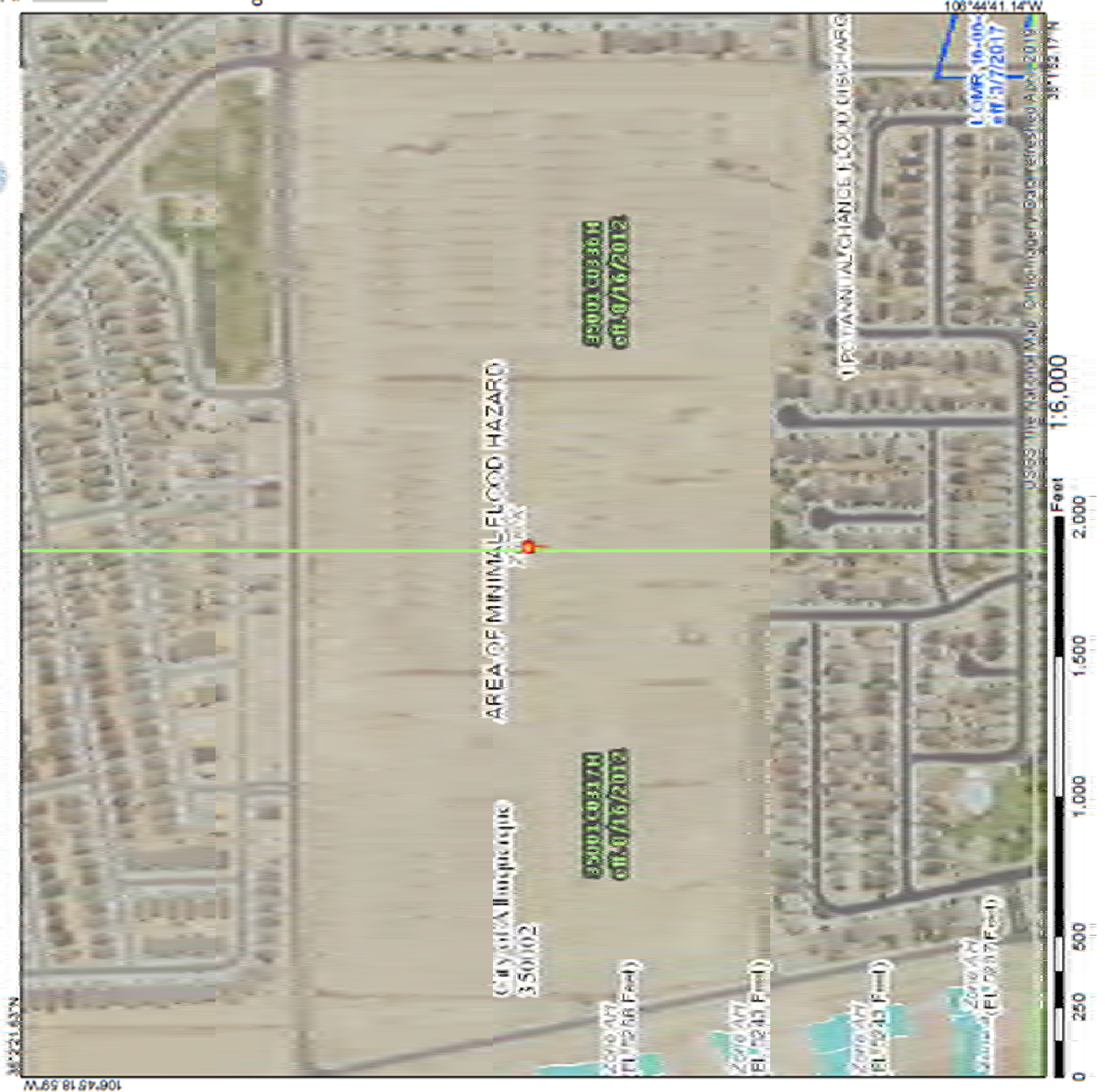
UNIT 2 AREA: 27.4817 AC.

DISTURBED AREA: 33.2 AC.±

NUMBER OF PROPOSED DWELLING UNITS: 155

FLOOD PLAIN: This property lies within Flood Zone X which is defined as an area of minimal flood hazard as determined by F.E.M.A. and shown on the Flood Insurance Rate Maps dated August 16, 2012, Map No. 35001C0336H and Map No. 35001C0317H.

National Flood Hazard Layer FIRMette



SEE FISH REPORT FROM OYSTER BEACHES AND OTHER MAPS FOR FURTHER DETAILS ABOUT

Wellpoint Water Flood Elimination (BFE)
James A. V. at 335
With BFE or Depth Limit 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100
Regulatory Floodway

0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with average areas of less than one square mile Zone X
Future Conditions 2% Annual Chance Flood Hazard Zone A
Area with Reduced Flood Risk due to Levees, Sea Walls, Zone B
Area with Flood Risk due to Levees Zone D

Area of Minimal Flood Hazard
Effective LOMRs
Area of Undetermined Flood Hazard
Channel, Culvert, or Storm Sewer
Levee, Dike or Floodwall

Cross Sections with 1% Annual Chance
 Water Surface Elevation
 Coastal Transport
 Base Elevation Line (BFL)
 Limit of Study
 Jurisdiction Boundary
 Coastal Transport Baseline
 Profile Baseline
 Hydrographic Feature

Digital Data Available
No Digital Data Available
Unmapped

Information displayed on this map is an approximate indication of location and does not represent a warranty of location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

This flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/16/2020 at 5:45:43 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is valid if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, plate panel numbers, and FEMA effective date. Map images for unwrapped and unrotated areas cannot be used for navigational purposes.

I. INTRODUCTION

Aspire Subdivision, Unit 2 is located east of 118th St. SW; south of Amole Mesa Ave. SW and north of Colobel Ave. SW. An approved drainage report for Aspire Units 1-4 dated August 25, 2020 (DMP) including an amendment to the report dated December 15, 2020 and an approved grading and drainage plan for Units 1-4 dated December 15, 2020 prepared by Isaacson & Arfman, Inc. are on file with City of Albuquerque Hydrology.

Unit 2 will be developed with 155 lots and this report identifies the required drainage improvements required to mitigate developed and undeveloped flows in the interim condition until the remaining units develop.

II. EXISTING CONDITIONS

As part of previous development efforts, the site has been graded, and a series of retention ponds and retaining walls have been installed. The property drains from west to east and the storm water is retained in a series of ponds on the property. Unit 1 (south of Unit 2) is currently under construction. A 42-inch storm drain discharging to an interim retention pond will be installed with Unit 1 to capture flows that will drain to a future storm drain system.

III. INTERIM CONDITIONS

The Aspire Subdivision will be developed as a private, gated community with 506 lots, and the first phase of the development, Unit 1, is currently under construction. Unit 2 is comprised of 155 lots. The existing ponds, interior walls and perimeter walls in Unit 2 will be demolished with the Unit 2 grading. See back pocket for the Unit 2 Interim Grading Plan, including an Existing Pond and Wall Plan, and the Unit 2 Interim Drainage Basin Exhibit.

The south and west area of Unit 1 (Basin INT-WEST) drains via 24”-30” storm drains that connect to the existing Colobel Ave. storm drain through a 20-foot storm drain easement at the southeast end of Unit 1 (Easement storm drain). The majority of Unit 2 (Basin INT-U2-A), a portion of Unit 1 (Basin INT-EAST) and Memorial Park drain to a future storm drain system in Crestone Way and Colobel Ave. that will be constructed with Unit 3. In the interim condition for Unit 1, the storm water captured in the Crestone Way storm drain system is retained in the interim pond east of the Unit 1 terminus of Caresso Loop.

ASPIRE SUBDIVISION, UNIT 2 – INTERIM DRAINAGE REPORT

The remainder of Unit 2 (Basin INT-U2-B) drains to a future storm drain in Cantara Ln. with a connection to the 78-inch storm drain in Colobel Ave.

In the interim condition for Unit 2, the existing Unit 1 retention pond shall be converted to a detention pond and a new 24-inch culvert will direct the storm water in the pond to a new interim detention pond for Unit 2 via a trapezoidal 2-foot deep lined channel.

Along the east perimeter of Unit 2, a trapezoidal 1.5-foot deep channel shall be graded to divert the flows from Basin INT-U2-B to the interim pond. Erosion protection shall be installed at the east terminus of Valedon Ln. to protect the edge of the paving. The channel capacity calculations are included in Appendix B and show non-erosive velocities of max. 4.9 fps. The building pads for Units 3 & 4 along the east perimeter of Unit 2 shall be graded with this project.

LAND TREATMENTS

Land treatments for the Unit 1 and Unit 2 basins are 57.6% D; 38.2% B; 4.2% C (as calculated in the DMP). Basin INT-U2-OFF was designated 6% D; 44% C; 50% B, and the pond areas, 50% B; 50% C. See Appendix A for a basin area and flow summary table and the back pocket for the Interim Drainage Basin Exhibit.

HYDROLOGY

The drainage calculations were performed for the 100-year, 24-hour storm using AHYMO-S4, 2009 with rainfall data from the NOAA Atlas 14. See Appendix A for AHYMO summary and output files.

INTERIM TEMPORARY PONDS

A 42-inch pipe (part of the Crestone/Colobel system) installed with Unit 1 will discharge 119.3 cfs from basins INT-EAST, INT-U2-A and Memorial Park to the Unit 1 interim retention pond. With the Unit 2 development, this pond shall be converted to a detention pond by installing a 24-inch culvert that will have a peak discharge of 38.9 cfs to the Unit 2 interim pond via a 2-foot deep lined trapezoidal channel. See Appendix B for pond volume and culvert stage-discharge calculations and Appendix A for the AHYMO output file which indicates that the max. storage in the Unit 1 pond is 2.2338 ac-ft at a water surface elevation of 5181.2. The top of the pond is 5182.0—0 8 feet of free board is provided.

The Unit 2 interim pond will have a peak discharge of 26.3 cfs via a 24-inch standpipe to a 24-inch pipe connecting to an existing 24-inch storm drain stub connected to the Colobel Ave. storm drain system. An 18-inch orifice plate shall be installed at the upstream end of the new 24-inch pipe.

ASPIRE SUBDIVISION, UNIT 2 - INTERIM DRAINAGE REPORT

See Appendix B for pond volume and standpipe calculations. The AHYMO output file in Appendix A shows that the Unit 2 interim pond has a max. storage of 2.2131 ac-ft. at a water surface elevation of 5170.0. The top of the pond is at 5171.0—1-foot of freeboard is provided.

A six-foot chain link fence shall be installed around the perimeter of the Unit 2 interim pond as shown on the Interim Grading Plan included in the back pocket.

The two interim ponds shall remain in place until the Crestone storm drain system is installed and connected to the 78" storm drain in Colobel Ave. that drains south to a regional pond.

STORM DRAIN

Appendix C includes interim storm drain calculations for the Easement and Colobel storm drains, including the 26.3 cfs discharged from the Unit 2 interim pond.

WATER QUALITY VOLUMES

In-lieu payment will be made for the storm water quality volumes discharging from Unit 2 and also for volumes previously retained in the Unit 1 interim pond. The volumes calculated are based on the requirements in the previous Development Process Manual (DPM) of 0.34 inches of the impervious area since the preliminary plat and master grading & drainage plans were submitted in July 2020; the 2020 DPM took effect for projects submitted after August 1, 2020. The water quality volume calculations listed on the Interim Grading Plan (sheet CG-101) show that 19,537 cubic feet total is generated in Unit 2. In addition, payment is also due for 7,727 cubic feet for the water quality volumes previously retained in the interim retention pond for Unit 1. The total water quality volumes for in-lieu payment with Unit 2 is 27,263 cubic feet.

IV. SUMMARY & CONCLUSIONS

Unit 2 shall be graded per the approved grading plan included in the DMP and infrastructure as specified in the approved infrastructure list shall be installed with a public work order. The interim grading shall include the following:

- Removal of existing retaining walls and perimeter walls and filling the existing ponds located in Unit 2.
- Construction of an 18-inch culvert from the Unit 1 interim pond to the lined trapezoidal channel between the Unit 1 and Unit 2 ponds.
- Construction of an interim pond with a 24-inch standpipe and 24-inch storm drain with an 18-inch orifice plate connecting to the Colobel Ave. storm drain system and a chain link perimeter fence.
- Grading for a trapezoidal channel along the east perimeter of Unit 2 and a trapezoidal channel between the Unit 1 and Unit 2 ponds.
- Grading of the Units 3 and 4 building pads along the east perimeter of Unit 2.
- Installation of erosion protection as shown on the Interim Grading Plan—in the channel between the ponds, east of the terminus of Valedon Ln at the north end of Unit 2, and around the standpipe.
- Payment of in-lieu fees for 7,727 cubic feet of Unit 1 storm water quality volumes and 19,537 cubic feet for Unit 2 for a total of 27,263 cubic feet.

APPENDIX A

Basin Area and Flow Summary Table

NOAA Atlas 14

AHYMO 100-yr, 24-hr Summary & Output

ASPIRE SUBDIVISION, UNIT 2

INTERIM BASIN AREA AND FLOW/VOLUME SUMMARY

By: Åsa Nilsson-Weber, Isaacson & Arfman, Inc.

7/26/2021

INTERIM BASIN AREAS & 100-YR, 24-HR FLOW/VOLUME SUMMARY (from AHYMO)						
BASIN	AREA (SF)	AREA (AC.)	AREA (SQ.MI.)	Q ₁₀₀ (CFS)	IMPERV. (%)	V ₁₀₀ 24 HR (AC-FT)
TO EASEMENT STORM DRAIN						
INT-WEST	583,033	13.3846	0.02091	47.2	57.6	
TO INTERIM POND						
INT-EAST	411,360	9.4435	0.01476	33.3	57.6	1.365
INT-POND	21,989	0.5048	0.00079	1.4	0	0.039
INT-U2A	998,312	22.9181	0.03581	80.8	57.6	3.312
INT-U2 POND	81,940	1.8811	0.00294	5.1	0	0.146
INT-U2B	199,038	4.5693	0.00714	16.1	57.6	0.66
INT-U2OFF	165,349	3.7959	0.00593	10.5	6.0	0.319
MEMORIAL PARK*	87,120	2.0000	0.00313	5.2	18.0	0.176
				152.4		6.017

To Easement U1 SD

to U1 Pond
to U1 Pond
to U1 Pond
to U2 Pond
to U2 Pond via swale
to U2 Pond via swale
to U1 Pond

Unit 2 Disturbed Area: 33.16 ac.



NOAA Atlas 14, Volume 1, Version 5
Location name: Albuquerque, New Mexico, USA*
Latitude: 35.0355°, Longitude: -106.7515°
Elevation: 5229.74 ft**

* source: ESRI Maps

** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps_&_aerials](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.175 (0.150-0.203)	0.226 (0.194-0.263)	0.303 (0.259-0.352)	0.363 (0.309-0.420)	0.445 (0.377-0.514)	0.508 (0.430-0.588)	0.576 (0.483-0.665)	0.646 (0.538-0.746)	0.741 (0.612-0.858)	0.817 (0.670-0.946)
10-min	0.265 (0.228-0.309)	0.344 (0.295-0.400)	0.461 (0.395-0.537)	0.553 (0.471-0.640)	0.677 (0.575-0.783)	0.774 (0.654-0.895)	0.876 (0.735-1.01)	0.983 (0.819-1.14)	1.13 (0.931-1.31)	1.24 (1.02-1.44)
15-min	0.329 (0.283-0.383)	0.426 (0.366-0.496)	0.572 (0.489-0.665)	0.685 (0.585-0.793)	0.840 (0.713-0.971)	0.959 (0.811-1.11)	1.09 (0.912-1.25)	1.22 (1.02-1.41)	1.40 (1.16-1.62)	1.54 (1.26-1.78)
30-min	0.443 (0.381-0.516)	0.574 (0.493-0.668)	0.770 (0.659-0.896)	0.923 (0.787-1.07)	1.13 (0.960-1.31)	1.29 (1.09-1.49)	1.46 (1.23-1.69)	1.64 (1.37-1.90)	1.88 (1.56-2.18)	2.08 (1.70-2.40)
60-min	0.549 (0.471-0.638)	0.711 (0.610-0.827)	0.953 (0.815-1.11)	1.14 (0.974-1.32)	1.40 (1.19-1.62)	1.60 (1.35-1.85)	1.81 (1.52-2.09)	2.03 (1.69-2.35)	2.33 (1.92-2.70)	2.57 (2.11-2.97)
2-hr	0.637 (0.546-0.755)	0.817 (0.698-0.968)	1.08 (0.922-1.28)	1.29 (1.10-1.52)	1.59 (1.34-1.86)	1.82 (1.53-2.13)	2.07 (1.72-2.42)	2.33 (1.93-2.72)	2.70 (2.20-3.15)	3.00 (2.42-3.50)
3-hr	0.683 (0.590-0.804)	0.867 (0.748-1.02)	1.14 (0.980-1.34)	1.35 (1.16-1.58)	1.65 (1.40-1.93)	1.89 (1.60-2.20)	2.14 (1.80-2.49)	2.41 (2.01-2.81)	2.78 (2.29-3.24)	3.09 (2.52-3.60)
6-hr	0.787 (0.686-0.918)	0.992 (0.867-1.16)	1.28 (1.12-1.49)	1.50 (1.31-1.75)	1.81 (1.57-2.10)	2.05 (1.77-2.38)	2.31 (1.97-2.67)	2.57 (2.18-2.97)	2.93 (2.47-3.39)	3.23 (2.69-3.74)
12-hr	0.873 (0.767-0.998)	1.10 (0.969-1.26)	1.40 (1.22-1.59)	1.63 (1.42-1.85)	1.94 (1.69-2.20)	2.18 (1.89-2.48)	2.43 (2.10-2.76)	2.69 (2.30-3.06)	3.04 (2.58-3.46)	3.33 (2.80-3.79)
24-hr	0.980 (0.868-1.12)	1.23 (1.09-1.40)	1.54 (1.36-1.75)	1.78 (1.58-2.02)	2.12 (1.86-2.39)	2.37 (2.08-2.68)	2.64 (2.30-2.97)	2.90 (2.53-3.27)	3.26 (2.82-3.68)	3.55 (3.05-4.00)
2-day	1.03 (0.921-1.16)	1.30 (1.15-1.46)	1.62 (1.44-1.81)	1.87 (1.66-2.09)	2.21 (1.96-2.47)	2.47 (2.18-2.76)	2.74 (2.42-3.06)	3.01 (2.64-3.37)	3.38 (2.95-3.78)	3.66 (3.17-4.10)
3-day	1.14 (1.03-1.26)	1.42 (1.29-1.58)	1.76 (1.59-1.95)	2.03 (1.83-2.24)	2.38 (2.15-2.63)	2.65 (2.38-2.93)	2.93 (2.62-3.23)	3.21 (2.86-3.54)	3.58 (3.18-3.95)	3.86 (3.41-4.27)
4-day	1.25 (1.15-1.37)	1.55 (1.42-1.70)	1.91 (1.74-2.08)	2.18 (2.00-2.38)	2.56 (2.33-2.79)	2.84 (2.58-3.09)	3.12 (2.83-3.40)	3.41 (3.08-3.71)	3.78 (3.41-4.13)	4.06 (3.65-4.44)
7-day	1.44 (1.32-1.57)	1.79 (1.63-1.95)	2.17 (1.99-2.37)	2.47 (2.27-2.69)	2.87 (2.63-3.11)	3.17 (2.89-3.43)	3.46 (3.15-3.75)	3.74 (3.41-4.06)	4.11 (3.73-4.46)	4.38 (3.96-4.76)
10-day	1.59 (1.46-1.73)	1.97 (1.81-2.15)	2.42 (2.22-2.63)	2.76 (2.54-3.00)	3.22 (2.95-3.49)	3.56 (3.25-3.86)	3.91 (3.56-4.23)	4.24 (3.86-4.59)	4.68 (4.24-5.07)	5.00 (4.52-5.43)
20-day	2.00 (1.84-2.19)	2.49 (2.29-2.71)	3.02 (2.78-3.29)	3.42 (3.14-3.72)	3.93 (3.61-4.27)	4.30 (3.94-4.67)	4.66 (4.26-5.05)	5.00 (4.57-5.41)	5.42 (4.94-5.87)	5.72 (5.21-6.20)
30-day	2.40 (2.21-2.60)	2.98 (2.74-3.23)	3.59 (3.30-3.88)	4.04 (3.71-4.36)	4.60 (4.22-4.95)	5.00 (4.58-5.38)	5.37 (4.92-5.79)	5.73 (5.24-6.17)	6.15 (5.62-6.63)	6.45 (5.88-6.95)
45-day	2.92 (2.70-3.16)	3.62 (3.34-3.91)	4.31 (3.98-4.65)	4.80 (4.43-5.17)	5.40 (4.99-5.81)	5.81 (5.37-6.25)	6.18 (5.71-6.64)	6.50 (6.01-6.99)	6.87 (6.35-7.38)	7.09 (6.56-7.61)
60-day	3.38 (3.12-3.65)	4.18 (3.86-4.52)	4.98 (4.60-5.38)	5.55 (5.13-5.99)	6.25 (5.77-6.73)	6.71 (6.20-7.24)	7.14 (6.60-7.71)	7.53 (6.95-8.12)	7.96 (7.36-8.60)	8.23 (7.63-8.89)

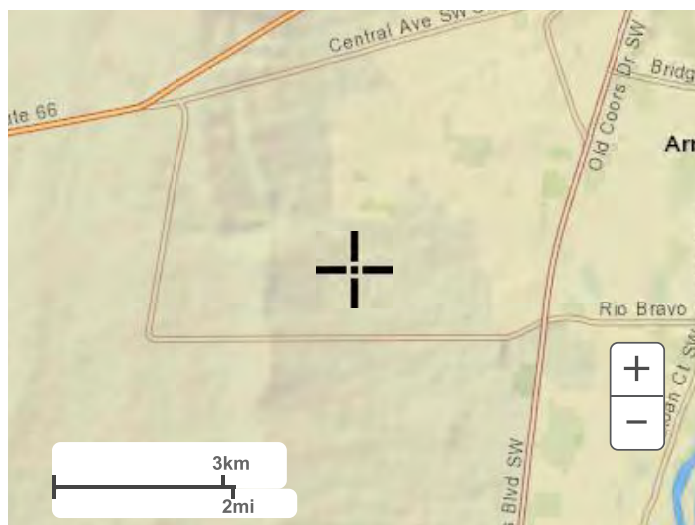
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



Large scale terrain



Large scale map



Large scale aerial

		FROM	TO			PEAK	RUNOFF	TIME TO	CFS	PAGE =	1
COMMAND	HYDROGRAPH IDENTIFICATION	ID NO.	ID NO.	AREA (SQ MI)	DISCHARGE (CFS)	VOLUME (AC-FT)	RUNOFF (INCHES)	PEAK (HOURS)	PER ACRE	NOTATION	
*S	ASPIRE SUBDIVISION, UNIT 2										
*S	INTERIM DRAINAGE CALCULATIONS										
*S	100-YR, 24-HR STORM										
*S	2423-24R.DAT										
*S	JULY 2021										
*S	ISAACSON & ARFMAN, P.A.										
*S	*****										
START									TIME=	0.00	
RAINFALL TYPE= 2 NOAA 14									RAIN24=	2.640	
*S	BASIN INT-EAST										
COMPUTE NM HYD	101.00	-	1	0.01476	33.30	1.365	1.73394	1.500	3.525	PER IMP=	57.60
*S	BASIN INT-WEST										
COMPUTE NM HYD	102.00	-	2	0.02091	47.16	1.934	1.73394	1.500	3.524	PER IMP=	57.60
*S	BASIN INT-POND										
COMPUTE NM HYD	103.00	-	3	0.00079	1.37	0.039	0.92927	1.500	2.701	PER IMP=	0.00
*S	BASIN INT-U2A										
COMPUTE NM HYD	104.00	-	4	0.03581	80.76	3.312	1.73394	1.500	3.524	PER IMP=	57.60
*S	BASIN INT-U2B										
COMPUTE NM HYD	105.00	-	5	0.00714	16.12	0.660	1.73394	1.500	3.527	PER IMP=	57.60
*S	BASIN INT-U2OFF										
COMPUTE NM HYD	106.00	-	6	0.00593	10.51	0.319	1.00995	1.500	2.768	PER IMP=	6.00
*S	BASIN INT-U2POND										
COMPUTE NM HYD	107.00	-	7	0.00294	5.06	0.146	0.92927	1.500	2.690	PER IMP=	0.00
*S	BASIN MEMORIAL PARK										
COMPUTE NM HYD	108.00	-	8	0.00288	5.25	0.176	1.14584	1.500	2.850	PER IMP=	18.00
*S	ADD BASINS INT-EAST, INT-U2A, INT-POND & MEMORIAL PARK										
ADD HYD	110.00	1& 3	10	0.01555	34.66	1.404	1.69304	1.500	3.483		
ADD HYD	111.00	4&10	11	0.05136	115.42	4.716	1.72155	1.500	3.512		
ADD HYD	112.00	8&11	12	0.05424	120.68	4.892	1.69098	1.500	3.476		
*S	~~~~~UNIT 1 INTERIM POND~~~~~										
*S	ROUTE THROUGH UNIT 1 INTERIM POND (24-IN PIPE)										
ROUTE RESERVOIR	113.00	12	13	0.05424	38.88	4.892	1.69098	1.750	1.120	AC-FT=	2.234
*S	ADD BASINS INT-U2B, INT-U2OFF & INT-U2POND										
ADD HYD	150.00	5& 6	15	0.01307	26.62	0.980	1.40542	1.500	3.182		
ADD HYD	160.00	15& 7	16	0.01601	31.68	1.125	1.31798	1.500	3.092		
ADD HYD	170.00	13&16	17	0.07025	62.74	6.017	1.60595	1.550	1.395		
*S	~~~~~UNIT 2 INTERIM POND~~~~~										
*S	ROUTE THROUGH UNIT 2 INTERIM POND										
*S	24-IN STANDPIPE W/ 18-IN ORIFICE PLATE AT 24-IN OUTFLOW PIPE										
ROUTE RESERVOIR	113.00	17	20	0.07025	26.33	6.017	1.60595	2.450	0.586	AC-FT=	2.213
FINISH											

AHYMO PROGRAM (AHYMO-S4)

- Version: S4.01a - Rel: 01a

RUN DATE (MON/DAY/YR) = 07/28/2021

START TIME (HR:MIN:SEC) = 10:54:18

USER NO.= AHYMO_Temp_User:20122010

INPUT FILE = M:\PROJECTS\2400-2499\2423\CALCS\POND CALCULATIONS\2423-24R.DAT

*S ASPIRE SUBDIVISION, UNIT 2

*S INTERIM DRAINAGE CALCULATIONS

*S 100-YR, 24-HR STORM

*S 2423-24R.DAT

*S JULY 2021

*S ISAACSON & ARFMAN, P.A.

*S*****

START RAINFALL BEGINS AT 0.0 HRS

RAINFALL TYPE=2 RAIN QUARTER=0 RAIN ONE=1.81

RAIN SIX=2.31 RAIN DAY=2.64 DT=0.05HR

24-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE AREAS (NM & AZ) - D1

DT = 0.050000 HOURS END TIME = 24.000002 HOURS

0.0000	0.0033	0.0068	0.0104	0.0144	0.0185	0.0232
0.0297	0.0401	0.0512	0.0627	0.0753	0.0880	0.1011
0.1146	0.1284	0.1436	0.1595	0.1767	0.1999	0.2260
0.2611	0.3008	0.3499	0.4154	0.4891	0.6163	0.8141
1.1529	1.3911	1.5790	1.6734	1.7561	1.8155	1.8628
1.9041	1.9342	1.9620	1.9848	2.0032	2.0193	2.0338
2.0474	2.0594	2.0708	2.0819	2.0926	2.1015	2.1065
2.1113	2.1162	2.1207	2.1251	2.1295	2.1338	2.1380
2.1420	2.1459	2.1498	2.1536	2.1574	2.1610	2.1645
2.1680	2.1715	2.1749	2.1781	2.1814	2.1845	2.1877
2.1908	2.1938	2.1968	2.1998	2.2028	2.2057	2.2086
2.2114	2.2142	2.2170	2.2197	2.2224	2.2251	2.2278
2.2304	2.2330	2.2356	2.2381	2.2406	2.2431	2.2456
2.2480	2.2504	2.2528	2.2552	2.2575	2.2599	2.2622
2.2645	2.2667	2.2690	2.2712	2.2734	2.2756	2.2777
2.2799	2.2820	2.2841	2.2862	2.2883	2.2903	2.2924
2.2944	2.2964	2.2984	2.3004	2.3023	2.3043	2.3062
2.3081	2.3100	2.3109	2.3118	2.3128	2.3137	2.3146
2.3155	2.3164	2.3173	2.3183	2.3192	2.3201	2.3210
2.3219	2.3228	2.3238	2.3247	2.3256	2.3265	2.3274
2.3283	2.3293	2.3302	2.3311	2.3320	2.3329	2.3338
2.3348	2.3357	2.3366	2.3375	2.3384	2.3393	2.3403
2.3412	2.3421	2.3430	2.3439	2.3448	2.3458	2.3467
2.3476	2.3485	2.3494	2.3503	2.3513	2.3522	2.3531
2.3540	2.3549	2.3558	2.3568	2.3577	2.3586	2.3595
2.3604	2.3613	2.3623	2.3632	2.3641	2.3650	2.3659
2.3668	2.3678	2.3687	2.3696	2.3705	2.3714	2.3723
2.3733	2.3742	2.3751	2.3760	2.3769	2.3778	2.3788
2.3797	2.3806	2.3815	2.3824	2.3833	2.3843	2.3852
2.3861	2.3870	2.3879	2.3888	2.3898	2.3907	2.3916
2.3925	2.3934	2.3943	2.3953	2.3962	2.3971	2.3980
2.3989	2.3998	2.4008	2.4017	2.4026	2.4035	2.4044
2.4053	2.4063	2.4072	2.4081	2.4090	2.4099	2.4108
2.4118	2.4127	2.4136	2.4145	2.4154	2.4163	2.4173
2.4182	2.4191	2.4200	2.4209	2.4218	2.4228	2.4237
2.4246	2.4255	2.4264	2.4273	2.4283	2.4292	2.4301
2.4310	2.4319	2.4328	2.4338	2.4347	2.4356	2.4365
2.4374	2.4383	2.4393	2.4402	2.4411	2.4420	2.4429
2.4438	2.4448	2.4457	2.4466	2.4475	2.4484	2.4493
2.4503	2.4512	2.4521	2.4530	2.4539	2.4548	2.4558
2.4567	2.4576	2.4585	2.4594	2.4603	2.4613	2.4622
2.4631	2.4640	2.4649	2.4658	2.4668	2.4677	2.4686
2.4695	2.4704	2.4713	2.4723	2.4732	2.4741	2.4750
2.4759	2.4768	2.4778	2.4787	2.4796	2.4805	2.4814
2.4823	2.4833	2.4842	2.4851	2.4860	2.4869	2.4878
2.4888	2.4897	2.4906	2.4915	2.4924	2.4933	2.4943
2.4952	2.4961	2.4970	2.4979	2.4988	2.4998	2.5007
2.5016	2.5025	2.5034	2.5043	2.5053	2.5062	2.5071
2.5080	2.5089	2.5098	2.5108	2.5117	2.5126	2.5135
2.5144	2.5153	2.5163	2.5172	2.5181	2.5190	2.5199
2.5208	2.5218	2.5227	2.5236	2.5245	2.5254	2.5263
2.5273	2.5282	2.5291	2.5300	2.5309	2.5318	2.5328
2.5337	2.5346	2.5355	2.5364	2.5373	2.5383	2.5392
2.5401	2.5410	2.5419	2.5428	2.5438	2.5447	2.5456
2.5465	2.5474	2.5483	2.5493	2.5502	2.5511	2.5520
2.5529	2.5538	2.5548	2.5557	2.5566	2.5575	2.5584
2.5593	2.5603	2.5612	2.5621	2.5630	2.5639	2.5648

2.5658	2.5667	2.5676	2.5685	2.5694	2.5703	2.5713
2.5722	2.5731	2.5740	2.5749	2.5758	2.5768	2.5777
2.5786	2.5795	2.5804	2.5813	2.5823	2.5832	2.5841
2.5850	2.5859	2.5868	2.5878	2.5887	2.5896	2.5905
2.5914	2.5923	2.5933	2.5942	2.5951	2.5960	2.5969
2.5978	2.5988	2.5997	2.6006	2.6015	2.6024	2.6033
2.6043	2.6052	2.6061	2.6070	2.6079	2.6088	2.6098
2.6107	2.6116	2.6125	2.6134	2.6143	2.6153	2.6162
2.6171	2.6180	2.6189	2.6198	2.6208	2.6217	2.6226
2.6235	2.6244	2.6253	2.6263	2.6272	2.6281	2.6290
2.6299	2.6308	2.6318	2.6327	2.6336	2.6345	2.6354
2.6363	2.6373	2.6382	2.6391	2.6400		

*S BASIN INT-EAST

COMPUTE NM HYD

ID=1 HYD NO=101 AREA= 0.01476 SQ MI
 PER A=0 PER B=38.2 PER C=4.2 PER D=57.6
 TP=-0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
 UNIT PEAK = 33.565 CFS UNIT VOLUME = 0.9988 B = 526.28 P60 = 1.8100
 AREA = 0.008502 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

K = 0.129387HR TP = 0.133300HR K/TP RATIO = 0.970647 SHAPE CONSTANT, N = 3.638876
 UNIT PEAK = 15.509 CFS UNIT VOLUME = 1.000 B = 330.33 P60 = 1.8100
 AREA = 0.006258 SQ MI IA = 0.48514 INCHES INF = 1.20840 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD

ID=1 CODE=1

PARTIAL HYDROGRAPH 101.00

RUNOFF VOLUME = 1.73394 INCHES = 1.3650 ACRE-FEET
 PEAK DISCHARGE RATE = 33.30 CFS AT 1.500 HOURS BASIN AREA = 0.0148 SQ. MI.

*S BASIN INT-WEST

COMPUTE NM HYD

ID=2 HYD NO=102 AREA= 0.02091 SQ MI
 PER A=0 PER B=38.2 PER C=4.2 PER D=57.6
 TP=-0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
 UNIT PEAK = 47.551 CFS UNIT VOLUME = 0.9989 B = 526.28 P60 = 1.8100
 AREA = 0.012044 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

K = 0.129387HR TP = 0.133300HR K/TP RATIO = 0.970647 SHAPE CONSTANT, N = 3.638876
 UNIT PEAK = 21.971 CFS UNIT VOLUME = 1.001 B = 330.33 P60 = 1.8100
 AREA = 0.008866 SQ MI IA = 0.48514 INCHES INF = 1.20840 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD

ID=2 CODE=1

PARTIAL HYDROGRAPH 102.00

RUNOFF VOLUME = 1.73394 INCHES = 1.9337 ACRE-FEET
 PEAK DISCHARGE RATE = 47.16 CFS AT 1.500 HOURS BASIN AREA = 0.0209 SQ. MI.

*S BASIN INT-POND

COMPUTE NM HYD

ID=3 HYD NO=103 AREA= 0.00079 SQ MI
 PER A=0 PER B=50 PER C=50 PER D=0
 TP=-0.1333 HR MASS RAIN=-1

K = 0.118619HR TP = 0.133300HR K/TP RATIO = 0.889864 SHAPE CONSTANT, N = 3.985528
 UNIT PEAK = 2.0992 CFS UNIT VOLUME = 0.9954 B = 354.21 P60 = 1.8100
 AREA = 0.000790 SQ MI IA = 0.42500 INCHES INF = 1.04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD

ID=3 CODE=1

PARTIAL HYDROGRAPH 103.00

RUNOFF VOLUME = 0.92927 INCHES = 0.0392 ACRE-FEET
 PEAK DISCHARGE RATE = 1.37 CFS AT 1.500 HOURS BASIN AREA = 0.0008 SQ. MI.

*S BASIN INT-U2A

COMPUTE NM HYD

ID=4 HYD NO=104 AREA= 0.03581 SQ MI
 PER A=0 PER B=38.2 PER C=4.2 PER D=57.6
 TP=-0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
 UNIT PEAK = 81.435 CFS UNIT VOLUME = 0.9990 B = 526.28 P60 = 1.8100
 AREA = 0.020627 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
 RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

K = 0.129387HR TP = 0.133300HR K/TP RATIO = 0.970647 SHAPE CONSTANT, N = 3.638876

UNIT PEAK = 37.626 CFS UNIT VOLUME = 1.001 B = 330.33 P60 = 1.8100
AREA = 0.015183 SQ MI IA = 0.48514 INCHES INF = 1.20840 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000
PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 104.00

RUNOFF VOLUME = 1.73394 INCHES = 3.3116 ACRE-FEET
PEAK DISCHARGE RATE = 80.76 CFS AT 1.500 HOURS BASIN AREA = 0.0358 SQ. MI.

*S BASIN INT-U2B

COMPUTE NM HYD ID=5 HYD NO=105 AREA= 0.00714 SQ MI
PER A=0 PER B=38.2 PER C=4.2 PER D=57.6

TP=-0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428

UNIT PEAK = 16.237 CFS UNIT VOLUME = 0.9985 B = 526.28 P60 = 1.8100

AREA = 0.004113 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

K = 0.129387HR TP = 0.133300HR K/TP RATIO = 0.970647 SHAPE CONSTANT, N = 3.638876

UNIT PEAK = 7.5022 CFS UNIT VOLUME = 0.9995 B = 330.33 P60 = 1.8100

AREA = 0.003027 SQ MI IA = 0.48514 INCHES INF = 1.20840 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD ID=5 CODE=1

PARTIAL HYDROGRAPH 105.00

RUNOFF VOLUME = 1.73394 INCHES = 0.6603 ACRE-FEET
PEAK DISCHARGE RATE = 16.12 CFS AT 1.500 HOURS BASIN AREA = 0.0071 SQ. MI.

*S BASIN INT-U2OFF

COMPUTE NM HYD ID=6 HYD NO=106 AREA= 0.00593 SQ MI
PER A=0 PER B=50 PER C=44 PER D=6

TP=-0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428

UNIT PEAK = 1.4047 CFS UNIT VOLUME = 0.9911 B = 526.28 P60 = 1.8100

AREA = 0.000356 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

K = 0.119476HR TP = 0.133300HR K/TP RATIO = 0.896294 SHAPE CONSTANT, N = 3.955033

UNIT PEAK = 14.726 CFS UNIT VOLUME = 1.000 B = 352.17 P60 = 1.8100

AREA = 0.005574 SQ MI IA = 0.42979 INCHES INF = 1.05340 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD ID=6 CODE=1

PARTIAL HYDROGRAPH 106.00

RUNOFF VOLUME = 1.00995 INCHES = 0.3194 ACRE-FEET
PEAK DISCHARGE RATE = 10.51 CFS AT 1.500 HOURS BASIN AREA = 0.0059 SQ. MI.

*S BASIN INT-U2POND

COMPUTE NM HYD ID=7 HYD NO=107 AREA= 0.00294 SQ MI
PER A=0 PER B=50 PER C=50 PER D=0

TP=-0.1333 HR MASS RAIN=-1

K = 0.118619HR TP = 0.133300HR K/TP RATIO = 0.889864 SHAPE CONSTANT, N = 3.985528

UNIT PEAK = 7.8123 CFS UNIT VOLUME = 0.9996 B = 354.21 P60 = 1.8100

AREA = 0.002940 SQ MI IA = 0.42500 INCHES INF = 1.04000 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD ID=7 CODE=1

PARTIAL HYDROGRAPH 107.00

RUNOFF VOLUME = 0.92927 INCHES = 0.1457 ACRE-FEET
PEAK DISCHARGE RATE = 5.06 CFS AT 1.500 HOURS BASIN AREA = 0.0029 SQ. MI.

*S BASIN MEMORIAL PARK

COMPUTE NM HYD ID=8 HYD NO=108 AREA= 0.00288 SQ MI
PER A=0 PER B=62 PER C=20 PER D=18

TP=-0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428

UNIT PEAK = 2.0467 CFS UNIT VOLUME = 0.9941 B = 526.28 P60 = 1.8100

AREA = 0.000518 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

K = 0.125497HR TP = 0.133300HR K/TP RATIO = 0.941463 SHAPE CONSTANT, N = 3.755488

UNIT PEAK = 5.9975 CFS UNIT VOLUME = 0.9991 B = 338.53 P60 = 1.8100

AREA = 0.002362 SQ MI IA = 0.46341 INCHES INF = 1.14756 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD ID=8 CODE=1
 PARTIAL HYDROGRAPH 108.00
 RUNOFF VOLUME = 1.14584 INCHES = 0.1760 ACRE-FEET
 PEAK DISCHARGE RATE = 5.25 CFS AT 1.500 HOURS BASIN AREA = 0.0029 SQ. MI.

*S ADD BASINS INT-EAST, INT-U2A, INT-POND & MEMORIAL PARK
 ADD HYD ID=10 HYD NO=110 ID I=1 ID II=3
 PRINT HYD ID=10 CODE=1
 PARTIAL HYDROGRAPH 110.00
 RUNOFF VOLUME = 1.69304 INCHES = 1.4041 ACRE-FEET
 PEAK DISCHARGE RATE = 34.66 CFS AT 1.500 HOURS BASIN AREA = 0.0156 SQ. MI.

ADD HYD ID=11 HYD NO=111 ID I=4 ID II=10
 PRINT HYD ID=11 CODE=1
 PARTIAL HYDROGRAPH 111.00
 RUNOFF VOLUME = 1.72155 INCHES = 4.7156 ACRE-FEET
 PEAK DISCHARGE RATE = 115.42 CFS AT 1.500 HOURS BASIN AREA = 0.0514 SQ. MI.

ADD HYD ID=12 HYD NO=112 ID I=8 ID II=11
 PRINT HYD ID=12 CODE=1
 PARTIAL HYDROGRAPH 112.00
 RUNOFF VOLUME = 1.69098 INCHES = 4.8916 ACRE-FEET
 PEAK DISCHARGE RATE = 120.68 CFS AT 1.500 HOURS BASIN AREA = 0.0542 SQ. MI.

*S -----UNIT 1 INTERIM POND-----
 *S ROUTE THROUGH UNIT 1 INTERIM POND (24-IN PIPE)
 ROUTE RESERVOIR ID=13 HYD NO=113 INFLOW ID=12 CODE=24
 OUTFLOW(CFS) STORAGE(AC-FT) ELEVATION(FT)
 0.0 0.000 5275
 4.5 0.3820 5276
 14.0 0.6631 5277
 22.7 0.9760 5278
 28.7 1.3225 5279
 36.5 1.9580 5280.6
 42.0 2.5951 5282

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	5275.00	0.000	0.00
1.20	13.25	5275.51	0.196	2.31
2.40	5.41	5278.73	1.228	27.06
3.60	0.62	5275.76	0.291	3.42
4.80	0.58	5275.32	0.124	1.46
6.00	0.71	5275.20	0.077	0.91
7.20	0.35	5275.12	0.046	0.55
8.40	0.35	5275.09	0.035	0.41
9.60	0.35	5275.08	0.031	0.37
10.80	0.35	5275.08	0.030	0.36
12.00	0.35	5275.08	0.030	0.35
13.20	0.35	5275.08	0.030	0.35
14.40	0.35	5275.08	0.030	0.35
15.60	0.35	5275.08	0.030	0.35
16.80	0.35	5275.08	0.030	0.35
18.00	0.35	5275.08	0.030	0.35
19.20	0.35	5275.08	0.030	0.35
20.40	0.35	5275.08	0.030	0.35
21.60	0.35	5275.08	0.030	0.35
22.80	0.35	5275.08	0.030	0.35
24.00	0.35	5275.08	0.030	0.35
25.20	0.00	5275.03	0.011	0.13
26.40	0.00	5275.01	0.003	0.04
27.60	0.00	5275.00	0.001	0.01
28.80	0.00	5275.00	0.000	0.00

PEAK DISCHARGE = 38.881 CFS - PEAK OCCURS AT HOUR 1.75
 MAXIMUM WATER SURFACE ELEVATION = 5281.206
 MAXIMUM STORAGE = 2.2338 AC-FT INCREMENTAL TIME= 0.050000HRS
 PRINT HYD ID=13 CODE=1
 PARTIAL HYDROGRAPH 113.00

RUNOFF VOLUME = 1.69098 INCHES = 4.8916 ACRE-FEET
 PEAK DISCHARGE RATE = 38.88 CFS AT 1.750 HOURS BASIN AREA = 0.0542 SQ. MI.

*S ADD BASINS INT-U2B, INT-U2OFF & INT-U2POND

ADD HYD ID=15 HYD NO=150 ID I=5 ID II=6

PRINT HYD ID=15 CODE=1

PARTIAL HYDROGRAPH 150.00

RUNOFF VOLUME = 1.40542 INCHES = 0.9797 ACRE-FEET
 PEAK DISCHARGE RATE = 26.62 CFS AT 1.500 HOURS BASIN AREA = 0.0131 SQ. MI.

ADD HYD ID=16 HYD NO=160 ID I=15 ID II=7

PRINT HYD ID=16 CODE=1

PARTIAL HYDROGRAPH 160.00

RUNOFF VOLUME = 1.31798 INCHES = 1.1254 ACRE-FEET
 PEAK DISCHARGE RATE = 31.68 CFS AT 1.500 HOURS BASIN AREA = 0.0160 SQ. MI.

ADD HYD ID=17 HYD NO=170 ID I=13 ID II=16

PRINT HYD ID=17 CODE=1

PARTIAL HYDROGRAPH 170.00

RUNOFF VOLUME = 1.60595 INCHES = 6.0169 ACRE-FEET
 PEAK DISCHARGE RATE = 62.74 CFS AT 1.550 HOURS BASIN AREA = 0.0703 SQ. MI.

*S -----UNIT 2 INTERIM POND-----

*S ROUTE THROUGH UNIT 2 INTERIM POND

*S 24-IN STANDPIPE W/ 18-IN ORIFICE PLATE AT 24-IN OUTFLOW PIPE

ROUTE RESERVOIR ID=20 HYD NO=113 INFLOW ID=17 CODE=24

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEVATION(FT)
0.0	0.000	5266
0.8	0.4964	5267
8.5	1.0342	5268
24.6	1.6144	5269
26.4	2.2386	5270

* * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	5266.00	0.000	0.00
1.20	4.31	5266.13	0.066	0.11
2.40	28.23	5269.95	2.209	26.31
3.60	3.52	5268.16	1.129	11.13
4.80	1.55	5267.41	0.717	3.96
6.00	1.01	5267.13	0.569	1.83
7.20	0.60	5267.03	0.510	1.00
8.40	0.46	5266.97	0.479	0.77
9.60	0.42	5266.90	0.449	0.72
10.80	0.41	5266.85	0.420	0.68
12.00	0.41	5266.80	0.396	0.64
13.20	0.40	5266.75	0.374	0.60
14.40	0.40	5266.72	0.356	0.57
15.60	0.40	5266.69	0.340	0.55
16.80	0.40	5266.66	0.327	0.53
18.00	0.40	5266.64	0.316	0.51
19.20	0.40	5266.62	0.306	0.49
20.40	0.40	5266.60	0.298	0.48
21.60	0.40	5266.59	0.291	0.47
22.80	0.40	5266.57	0.285	0.46
24.00	0.40	5266.56	0.280	0.45
25.20	0.13	5266.52	0.261	0.42
26.40	0.04	5266.46	0.229	0.37
27.60	0.01	5266.40	0.197	0.32
28.80	0.00	5266.34	0.169	0.27
30.00	0.00	5266.29	0.144	0.23
31.20	0.00	5266.25	0.123	0.20
32.40	0.00	5266.21	0.105	0.17
33.60	0.00	5266.18	0.089	0.14
34.80	0.00	5266.15	0.076	0.12
36.00	0.00	5266.13	0.065	0.10
37.20	0.00	5266.11	0.055	0.09
38.40	0.00	5266.09	0.047	0.08
39.60	0.00	5266.08	0.040	0.06
40.80	0.00	5266.07	0.034	0.06
42.00	0.00	5266.06	0.029	0.05

43.20	0.00	5266.05	0.025	0.04
44.40	0.00	5266.04	0.021	0.03
45.60	0.00	5266.04	0.018	0.03
46.80	0.00	5266.03	0.015	0.02
48.00	0.00	5266.03	0.013	0.02
49.20	0.00	5266.02	0.011	0.02
50.40	0.00	5266.02	0.010	0.02
51.60	0.00	5266.02	0.008	0.01
52.80	0.00	5266.01	0.007	0.01
54.00	0.00	5266.01	0.006	0.01
55.20	0.00	5266.01	0.005	0.01
56.40	0.00	5266.01	0.004	0.01
57.60	0.00	5266.01	0.004	0.01
58.80	0.00	5266.01	0.003	0.01
60.00	0.00	5266.01	0.003	0.00

PEAK DISCHARGE = 26.326 CFS - PEAK OCCURS AT HOUR 2.45

MAXIMUM WATER SURFACE ELEVATION = 5269.959

MAXIMUM STORAGE = 2.2131 AC-FT INCREMENTAL TIME= 0.050000HRS

PRINT HYD ID=20 CODE=1

PARTIAL HYDROGRAPH 113.00

RUNOFF VOLUME = 1.60595 INCHES = 6.0169 ACRE-FEET

PEAK DISCHARGE RATE = 26.33 CFS AT 2.450 HOURS BASIN AREA = 0.0703 SQ. MI.

FINISH

NORMAL PROGRAM FINISH

END TIME (HR:MIN:SEC) = 10:54:18

APPENDIX B

Calculations for:

- Pond Volume**
- Channel Capacity**
- Culvert Outflow**
- Standpipe**

ASPIRE UNIT 2 INTERIM POND VOLUME CALCS

7/26/21

By: Åsa Nilsson-Weber, Isaacson & Arfman, Inc.

INTERIM POND VOLUME - UNIT 1					
ELEVATION OF CONTOUR	CONTOUR AREA (SF)	PARTIAL VOLUME (CF)	PARTIAL VOLUME (Ac-ft)	VOLUME SUMMARY AT ELEVATION (Ac-ft)	VOLUME SUMMARY AT ELEVATION (CF)
5274.4	8,874				
5275	10,240	5734	0.1316	0.1316	5,734
5276	11,569	10904	0.2503	0.3820	16,638
5277	12,923	12246	0.2811	0.6631	28,884
5278	14,337	13630	0.3129	0.9760	42,514
5279	15,850	15094	0.3465	1.3225	57,608
5280	17,502	16676	0.3828	1.7053	74,284
5281	19,192	18347	0.4212	2.1265	92,631
5282	21,634	20413	0.4686	2.5951	113,044
TOTAL INTERIM POND VOLUME - UNIT 1 VOLUME =				2.5951	113,044

INTERIM POND VOLUME - UNIT 2					
ELEVATION OF CONTOUR	CONTOUR AREA (SF)	PARTIAL VOLUME (CF)	PARTIAL VOLUME (Ac-ft)	VOLUME SUMMARY AT ELEVATION (Ac-ft)	VOLUME SUMMARY AT ELEVATION (CF)
5266	20,740				
5267	22,510	21625	0.4964	0.4964	21,625
5268	24,336	23423	0.5377	1.0342	45,048
5269	26,218	25277	0.5803	1.6144	70,325
5270	28,157	27188	0.6241	2.2386	97,513
TOTAL INTERIM POND VOLUME - UNIT 2 VOLUME =				2.2386	97,513

Channel Report

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

Wednesday, Jul 28 2021

Channel Between U1 and U2 Interim Ponds

Trapezoidal

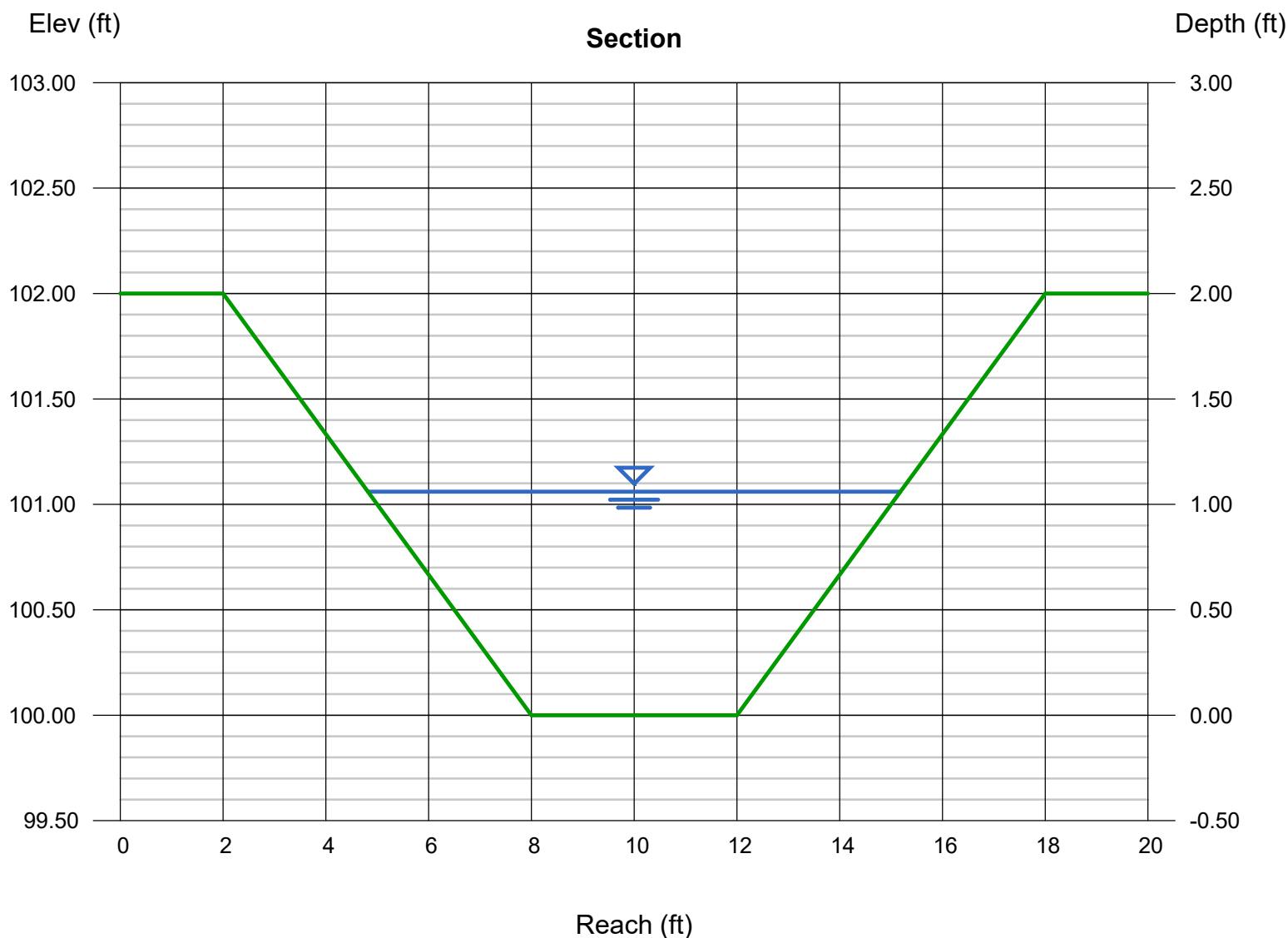
Bottom Width (ft) = 4.00
Side Slopes (z:1) = 3.00, 3.00
Total Depth (ft) = 2.00
Invert Elev (ft) = 100.00
Slope (%) = 6.50
N-Value = 0.035

Calculations

Compute by: Known Q
Known Q (cfs) = 65.50

Highlighted

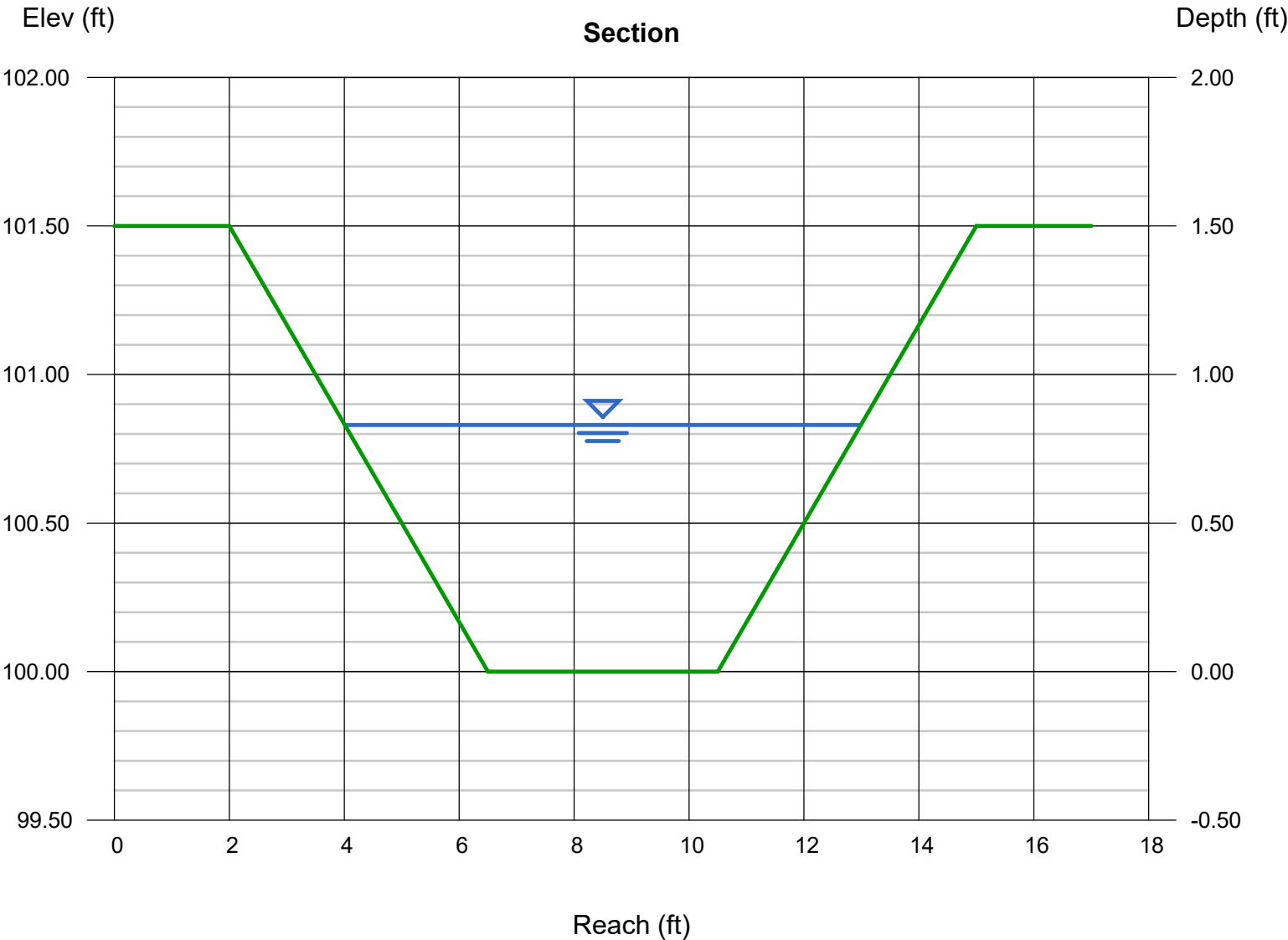
Depth (ft) = 1.06
Q (cfs) = 65.50
Area (sqft) = 7.61
Velocity (ft/s) = 8.61
Wetted Perim (ft) = 10.70
Crit Depth, Yc (ft) = 1.44
Top Width (ft) = 10.36
EGL (ft) = 2.21



Channel Report

Channel along East Perimeter to Unit 2 Interim Pond-2.1 PERCENT SLOPE

Trapezoidal		Highlighted	
Bottom Width (ft)	= 4.00	Depth (ft)	= 0.83
Side Slopes (z:1)	= 3.00, 3.00	Q (cfs)	= 26.60
Total Depth (ft)	= 1.50	Area (sqft)	= 5.39
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 4.94
Slope (%)	= 2.10	Wetted Perim (ft)	= 9.25
N-Value	= 0.030	Crit Depth, Yc (ft)	= 0.89
Calculations		Top Width (ft)	= 8.98
Compute by:		EGL (ft)	= 1.21
Known Q (cfs)	= 26.60		



Channel Report

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

Wednesday, Jul 28 2021

Channel along East Perimeter to Unit 2 Interim Pond-0.5 PERCENT SLOPE

Trapezoidal

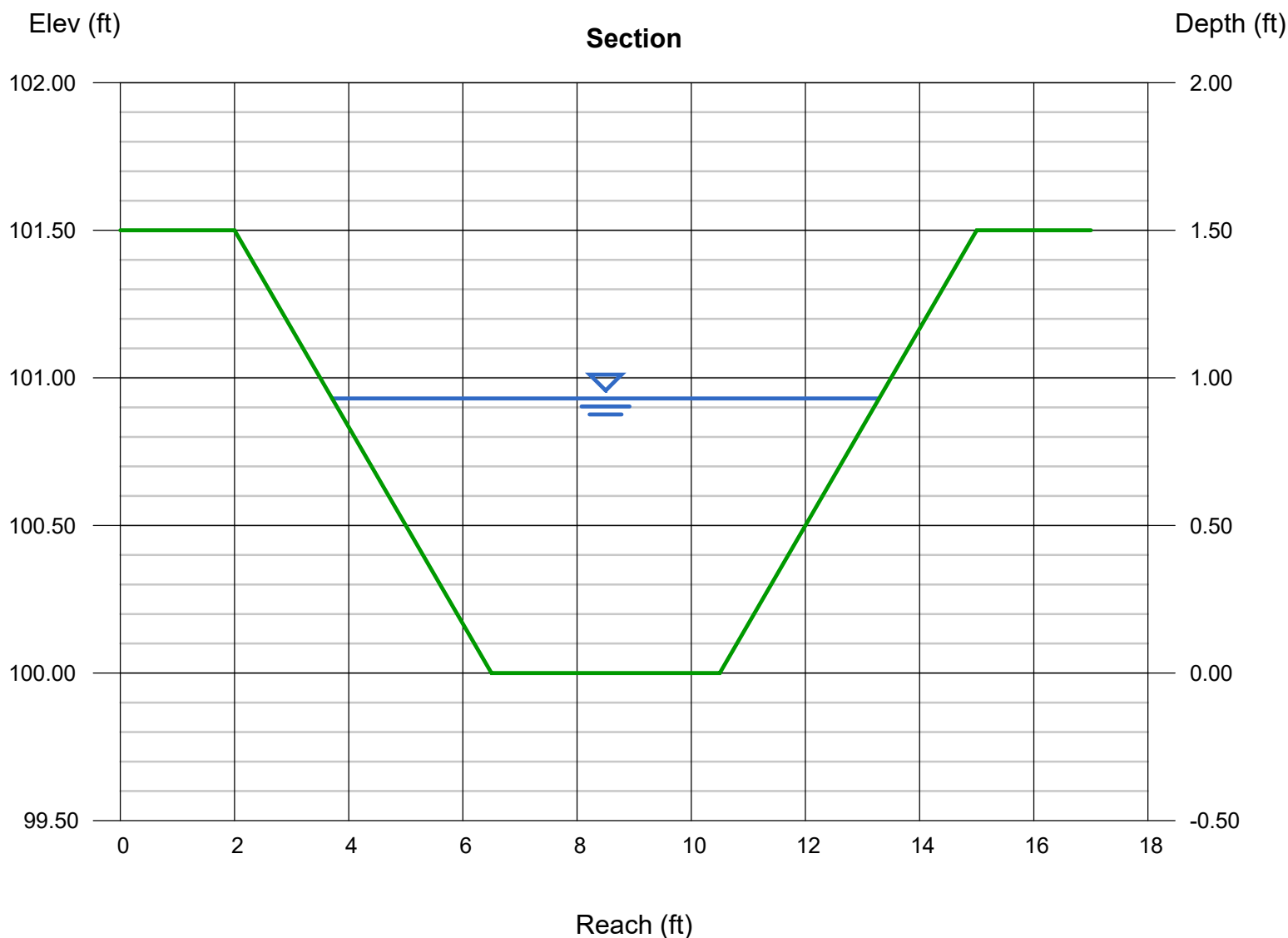
Bottom Width (ft) = 4.00
Side Slopes (z:1) = 3.00, 3.00
Total Depth (ft) = 1.50
Invert Elev (ft) = 100.00
Slope (%) = 0.50
N-Value = 0.030

Highlighted

Depth (ft) = 0.93
Q (cfs) = 16.10
Area (sqft) = 6.31
Velocity (ft/s) = 2.55
Wetted Perim (ft) = 9.88
Crit Depth, Yc (ft) = 0.67
Top Width (ft) = 9.58
EGL (ft) = 1.03

Calculations

Compute by: Known Q
Known Q (cfs) = 16.10



Culvert Report

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

Wednesday, Jul 28 2021

UNIT 1 POND 24-IN CULVERT

Invert Elev Dn (ft) = 74.00
Pipe Length (ft) = 43.00
Slope (%) = 2.33
Invert Elev Up (ft) = 75.00
Rise (in) = 24.0
Shape = Circular
Span (in) = 24.0
No. Barrels = 1
n-Value = 0.013
Culvert Type = Circular Concrete
Culvert Entrance = Groove end projecting (C)
Coeff. K,M,c,Y,k = 0.0045, 2, 0.0317, 0.69, 0.2

Embankment

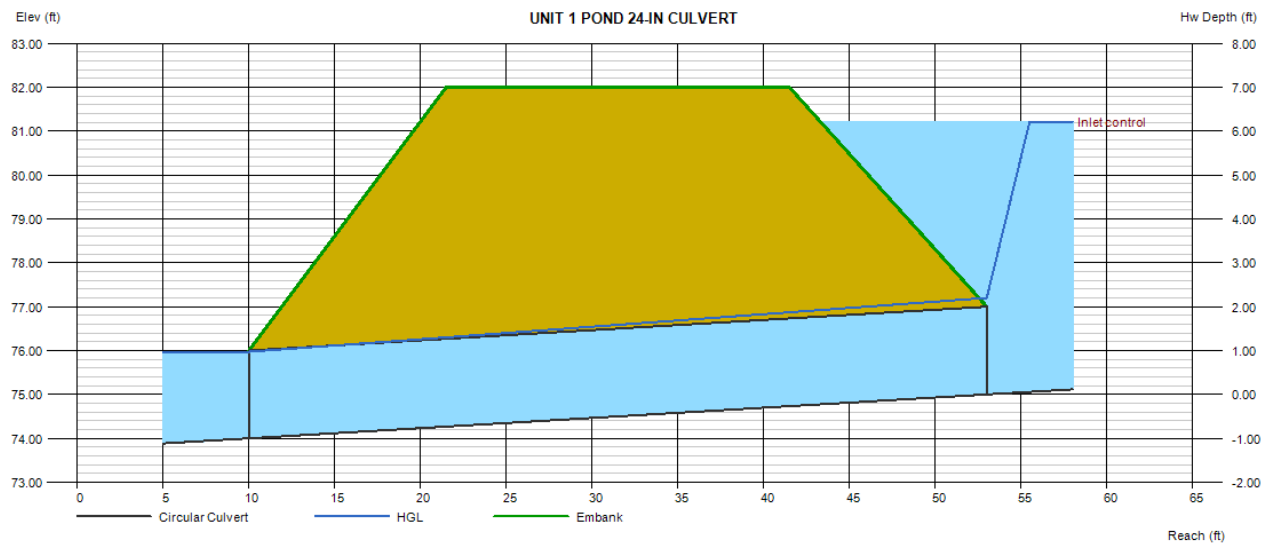
Top Elevation (ft) = 82.00
Top Width (ft) = 20.00
Crest Width (ft) = 25.00

Calculations

Qmin (cfs) = 38.90
Qmax (cfs) = 38.90
Tailwater Elev (ft) = (dc+D)/2

Highlighted

Qtotal (cfs) = 38.90
Qpipe (cfs) = 38.90
Qovertop (cfs) = 0.00
Veloc Dn (ft/s) = 12.42
Veloc Up (ft/s) = 12.38
HGL Dn (ft) = 75.97
HGL Up (ft) = 77.20
Hw Elev (ft) = 81.22
Hw/D (ft) = 3.11
Flow Regime = Inlet Control



ASPIRE SUBDIVISION, UNIT 2
CULVERT OUTFLOW TABLE

By: Åsa Nilsson-Weber, Isaacson & Arfman, Inc.
7/27/2021

Q Total (cfs)	Q Pipe (cfs)	Q Over (cfs)	Veloc Dn (ft/s)	Veloc Up (ft/s)	Depth Dn (in)	Depth Up (in)	HGL Dn (ft)	HGL Up (ft)	HGL Hw (ft)	HGL Hw/D
0.5	0.5	0	0.28	2.31	13.45	2.9	75.12	75.24	75.3	0.15
1	1	0	0.52	2.77	14.06	4.13	75.17	75.34	75.44	0.22
1.5	1.5	0	0.75	3.09	14.54	5.08	75.21	75.42	75.55	0.27
2	2	0	0.97	3.35	14.94	5.88	75.25	75.49	75.64	0.32
2.5	2.5	0	1.18	3.56	15.3	6.6	75.27	75.55	75.73	0.36
3	3	0	1.39	3.75	15.62	7.25	75.3	75.6	75.8	0.4
3.5	3.5	0	1.58	3.92	15.92	7.85	75.33	75.65	75.88	0.44
4	4	0	1.77	4.08	16.21	8.41	75.35	75.7	75.94	0.47
4.5	4.5	0	1.96	4.22	16.47	8.94	75.37	75.75	76.01	0.5
5	5	0	2.14	4.36	16.72	9.44	75.39	75.79	76.07	0.54
5.5	5.5	0	2.32	4.48	16.96	9.92	75.41	75.83	76.13	0.57
6	6	0	2.49	4.61	17.19	10.39	75.43	75.87	76.19	0.59
6.5	6.5	0	2.66	4.72	17.41	10.83	75.45	75.9	76.25	0.62
7	7	0	2.83	4.84	17.63	11.26	75.47	75.94	76.3	0.65
7.5	7.5	0	3	4.95	17.84	11.67	75.49	75.97	76.36	0.68
8	8	0	3.16	5.06	18.03	12.07	75.5	76.01	76.41	0.7
8.5	8.5	0	3.32	5.16	18.23	12.46	75.52	76.04	76.46	0.73
9	9	0	3.48	5.26	18.42	12.84	75.54	76.07	76.51	0.76
9.5	9.5	0	3.64	5.36	18.6	13.21	75.55	76.1	76.57	0.78
10	10	0	3.79	5.46	18.78	13.57	75.57	76.13	76.62	0.81
10.5	10.5	0	3.94	5.56	18.96	13.92	75.58	76.16	76.67	0.83
11	11	0	4.1	5.66	19.13	14.26	75.59	76.19	76.72	0.86
11.5	11.5	0	4.25	5.75	19.3	14.59	75.61	76.22	76.77	0.88
12	12	0	4.4	5.85	19.46	14.92	75.62	76.24	76.82	0.91
12.5	12.5	0	4.55	5.94	19.62	15.24	75.63	76.27	76.87	0.93
13	13	0	4.69	6.03	19.78	15.55	75.65	76.3	76.92	0.96
13.5	13.5	0	4.84	6.13	19.93	15.86	75.66	76.32	76.97	0.98
14	14	0	4.99	6.22	20.08	16.16	75.67	76.35	77.01	1.01
14.5	14.5	0	5.13	6.32	20.23	16.45	75.69	76.37	77.06	1.03
15	15	0	5.28	6.41	20.37	16.74	75.7	76.39	77.11	1.06
15.5	15.5	0	5.42	6.51	20.51	17.01	75.71	76.42	77.16	1.08
16	16	0	5.57	6.6	20.65	17.29	75.72	76.44	77.21	1.11
16.5	16.5	0	5.71	6.7	20.78	17.56	75.73	76.46	77.26	1.13
17	17	0	5.85	6.8	20.91	17.82	75.74	76.48	77.31	1.16
17.5	17.5	0	6	6.9	21.04	18.07	75.75	76.51	77.36	1.18
18	18	0	6.14	6.99	21.16	18.32	75.76	76.53	77.41	1.21
18.5	18.5	0	6.28	7.09	21.28	18.57	75.77	76.55	77.46	1.23

19	19	0	6.42	7.2	21.4	18.8	75.78	76.57	77.52	1.26
19.5	19.5	0	6.57	7.3	21.52	19.03	75.79	76.59	77.58	1.29
20	20	0	6.71	7.4	21.63	19.26	75.8	76.6	77.64	1.32
20.5	20.5	0	6.85	7.51	21.74	19.47	75.81	76.62	77.71	1.35
21	21	0	7	7.61	21.84	19.69	75.82	76.64	77.77	1.39
21.5	21.5	0	7.14	7.72	21.94	19.89	75.83	76.66	77.84	1.42
22	22	0	7.28	7.84	22.04	20.08	75.84	76.67	77.91	1.46
22.5	22.5	0	7.43	7.95	22.14	20.28	75.84	76.69	77.98	1.49
23	23	0	7.57	8.06	22.23	20.46	75.85	76.71	78.06	1.53
23.5	23.5	0	7.72	8.18	22.32	20.64	75.86	76.72	78.13	1.57
24	24	0	7.86	8.29	22.4	20.81	75.87	76.73	78.21	1.6
24.5	24.5	0	8.01	8.41	22.48	20.97	75.87	76.75	78.28	1.64
25	25	0	8.16	8.54	22.56	21.13	75.88	76.76	78.36	1.68
25.5	25.5	0	8.3	8.66	22.64	21.28	75.89	76.77	78.45	1.72
26	26	0	8.45	8.78	22.71	21.42	75.89	76.78	78.53	1.76
26.5	26.5	0	8.6	8.91	22.78	21.56	75.9	76.8	78.61	1.81
27	27	0	8.75	9.04	22.84	21.69	75.9	76.81	78.7	1.85
27.5	27.5	0	8.9	9.17	22.91	21.81	75.91	76.82	78.79	1.89
28	28	0	9.05	9.3	22.96	21.93	75.91	76.83	78.87	1.94
28.5	28.5	0	9.2	9.44	23.02	22.04	75.92	76.84	78.97	1.98
29	29	0	9.35	9.57	23.07	22.14	75.92	76.85	79.06	2.03
29.5	29.5	0	9.5	9.71	23.12	22.24	75.93	76.85	79.15	2.08
30	30	0	9.65	9.85	23.17	22.34	75.93	76.86	79.25	2.12
30.5	30.5	0	9.81	9.99	23.22	22.43	75.93	76.87	79.34	2.17
31	31	0	9.96	10.13	23.26	22.51	75.94	76.88	79.44	2.22
31.5	31.5	0	10.11	10.27	23.3	22.59	75.94	76.88	79.54	2.27
32	32	0	10.27	10.41	23.33	22.67	75.94	76.89	79.65	2.32
32.5	32.5	0	10.42	10.56	23.37	22.74	75.95	76.9	79.75	2.37
33	33	0	10.57	10.7	23.4	22.81	75.95	76.9	79.85	2.43
33.5	33.5	0	10.73	10.85	23.43	22.87	75.95	76.91	79.96	2.48
34	34	0	10.88	11	23.46	22.93	75.96	76.91	80.07	2.53
34.5	34.5	0	11.04	11.14	23.49	22.99	75.96	76.92	80.18	2.59
35	35	0	11.19	11.29	23.52	23.04	75.96	76.92	80.29	2.65
35.5	35.5	0	11.35	11.44	23.54	23.09	75.96	76.92	80.4	2.7
36	36	0	11.51	11.59	23.57	23.13	75.96	76.93	80.52	2.76
36.5	36.5	0	11.66	11.74	23.59	23.18	75.97	76.93	80.64	2.82
37	37	0	11.82	11.89	23.61	23.22	75.97	76.93	80.75	2.88
37.5	37.5	0	11.98	12.05	23.63	23.26	75.97	76.94	80.87	2.94
38	38	0	12.13	12.2	23.65	23.29	75.97	76.94	80.99	3
38.5	38.5	0	12.29	12.35	23.66	23.35	75.97	76.95	81.12	3.06
39	39	0	12.45	12.5	23.68	23.38	75.97	76.95	81.24	3.12
39.5	39.5	0	12.6	12.66	23.7	23.41	75.97	76.95	81.37	3.18
40	40	0	12.76	12.81	23.71	23.44	75.98	76.95	81.5	3.25
40.5	40.5	0	12.92	12.89	23.72	24	75.98	77.11	81.63	3.31
41	41	0	13.08	13.05	23.74	24	75.98	77.14	81.76	3.38
41.5	41.5	0	13.23	13.21	23.75	24	75.98	77.17	81.89	3.44
42	41.97	0.03	13.38	13.36	23.76	24	75.98	77.2	82.01	3.51

ASPIRE UNIT 2

INTERIM STANDPIPE CALCULATIONS

By: Åsa Nilsson-Weber, Isaacson & Arfman, Inc.

7/27/2021

I&A Project #: 2423

100-year WSEL = 70 ft
 Bottom of Pond ELEV = 65 ft
 Maximum discharge (Q_{max}) = 25 cfs
 Diameter of Standpipe = 24 in

Top of Standpipe = 67.5 ft

Overflow Weir Capacity at WSEL=68:

$$Q = C * L * H^{1.5}$$

C = 3.33

Q_{max} = 7.40 cfs

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

C = 0.60 (sharp edged hole)

g = 32.2 ft/s²

INV of Standpipe = 60.8 ft

Diameter of Discharge Pipe = 18 in

HOLE CALCULATIONS								
ELEVATION AT CENTER OF HOLE	HOLE DIAMETER (in.)	HOLE AREA (sq. ft.)	# OF HOLES AT THIS LEVEL	H (ft)	Q PER HOLE (cfs)	TOTAL Q AT THIS LEVEL w/ 50% CLOGGING (cfs)	WSEL	SPACE BETWEEN HOLES AT THIS LEVEL (in)
66.00	4	0.087	4	1.00	0.42	0.84	67	14.85
66.00	4	0.087	4	2.00	0.59	1.19	68	14.85
66.00	4	0.087	4	3.00	0.73	1.43	69	14.85
66.00	4	0.087	4	4.00	0.84	1.68	70	14.85

Q AT VARIED WSEL FOR AHYMO				
WSEL	CAPACITY OF HOLES BY ORIFICE (CFS)	CAPACITY OF DISCHARGE PIPE BY ORIFICE (CFS)	CAPACITY OF STAND PIPE BY WEIR* (CFS)	TOTAL DISCHARGE (CFS)
66	0.00			0.00
67	0.84			0.84
68	1.19		7.40	8.59
69	1.43	23.22		24.65
70	1.68	24.73		26.41

*Weir overflow into standpipe at wsel=68.0

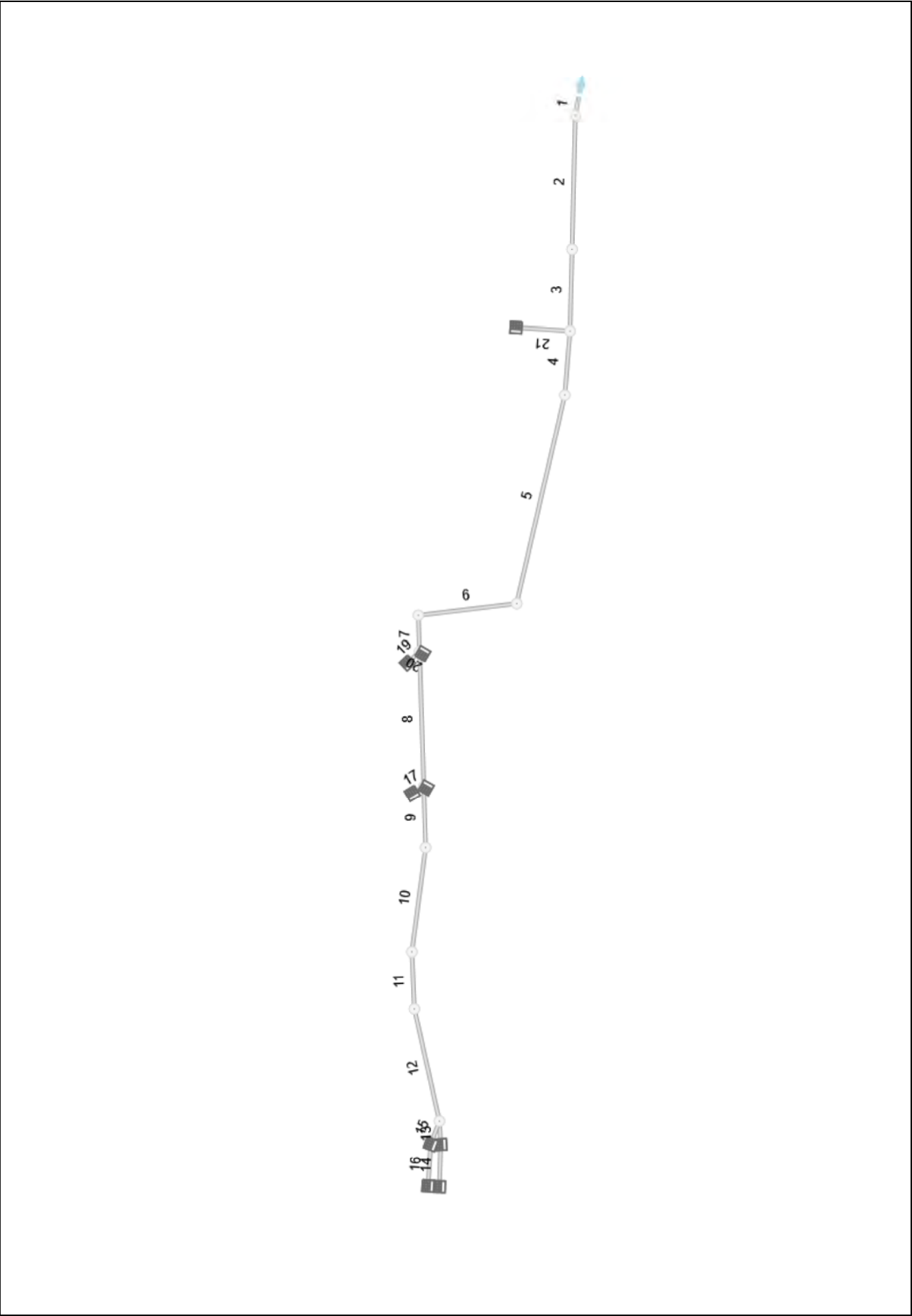
APPENDIX C

Storm Drain Calculations

Plan View

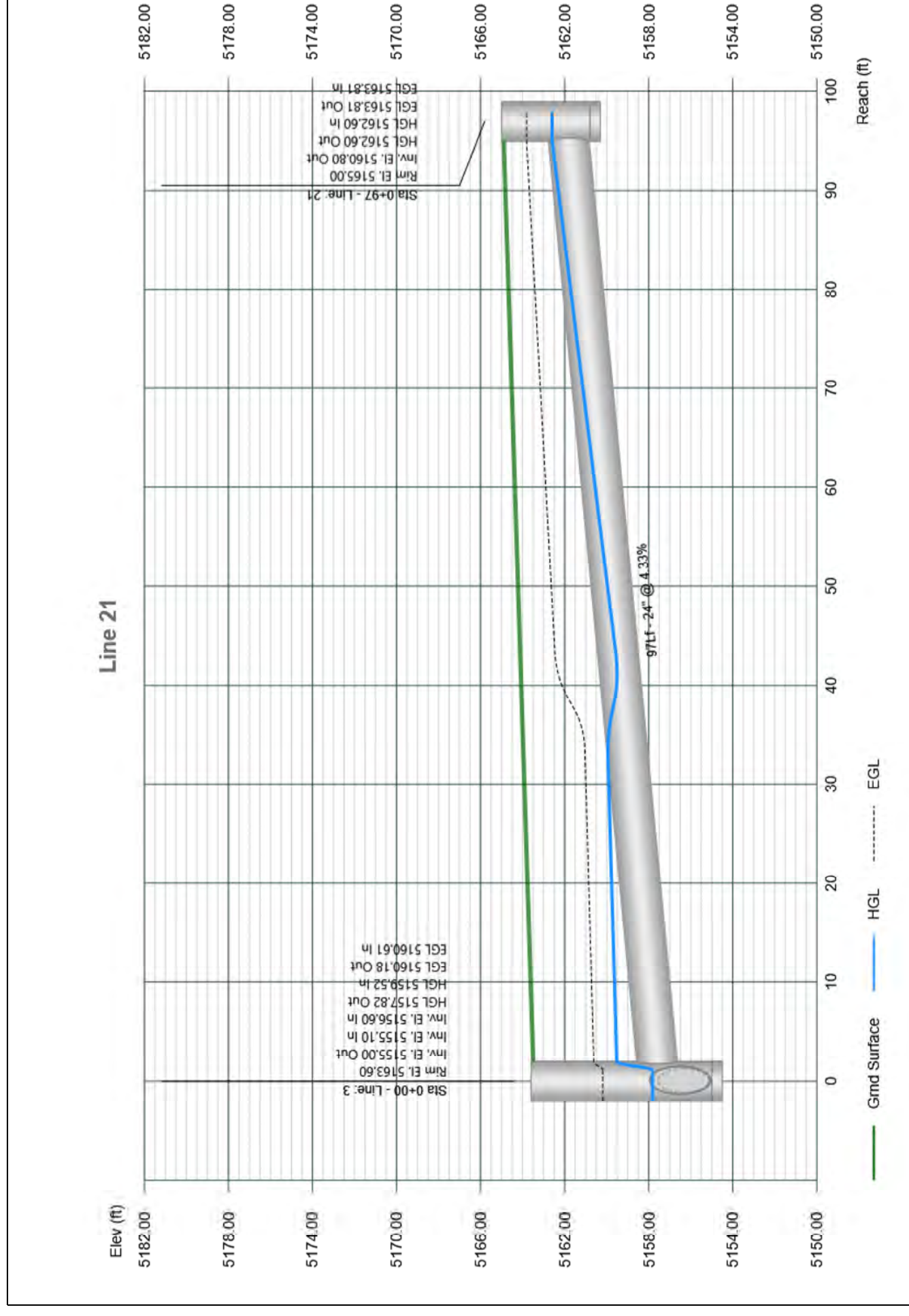
Stormwater Studio 2018 v 1.0.0.0

Project Name: UNIT 1 EASEMENT SD
07-27-2021



Project Name: UNIT 1 EASEMENT SD
07-27-2021

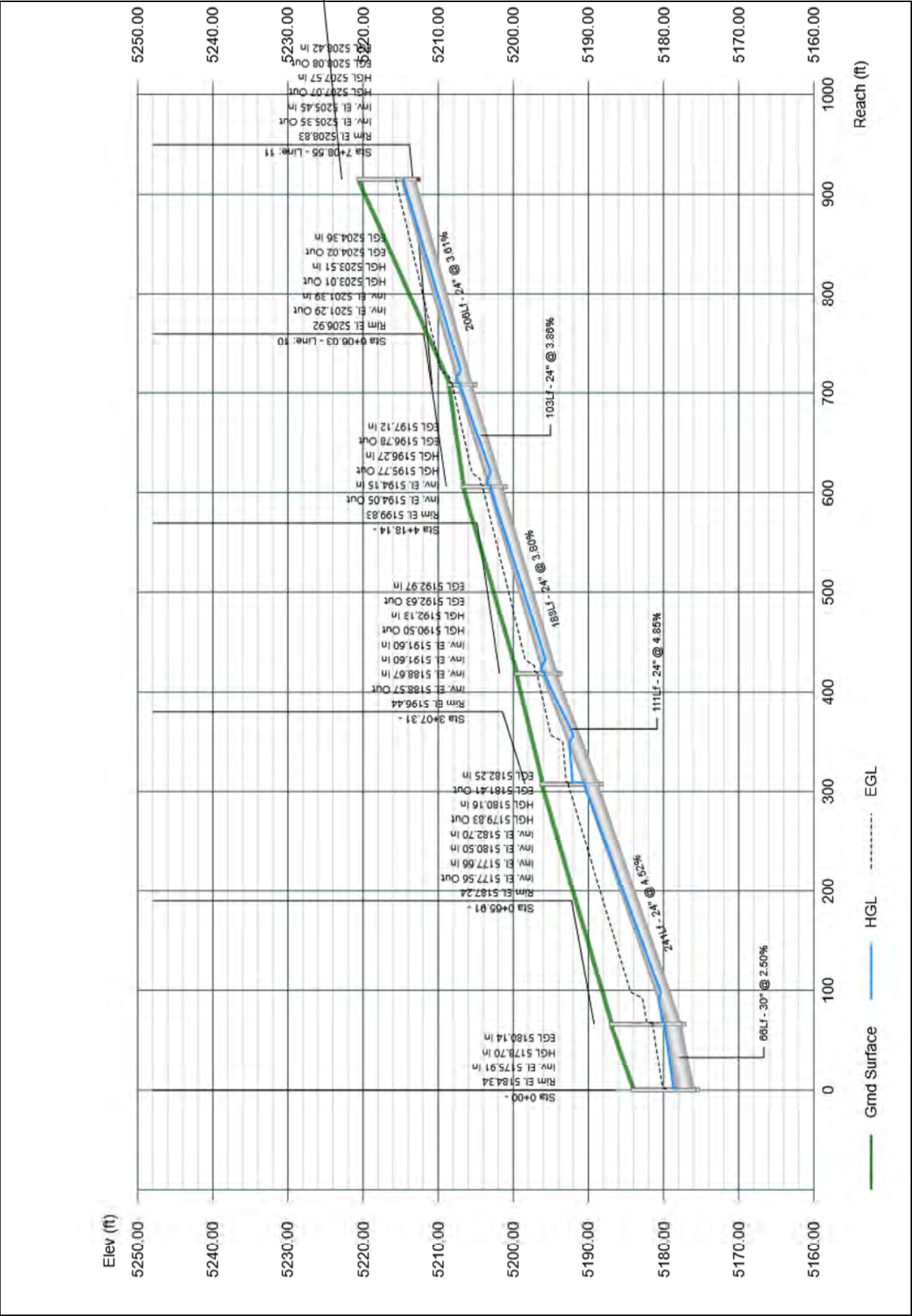
07-27-2021



Profile View

Stormwater Studio 2018 v 1.0.0.0

Project Name: UNIT 1 EASEMENT SD
07-27-2021

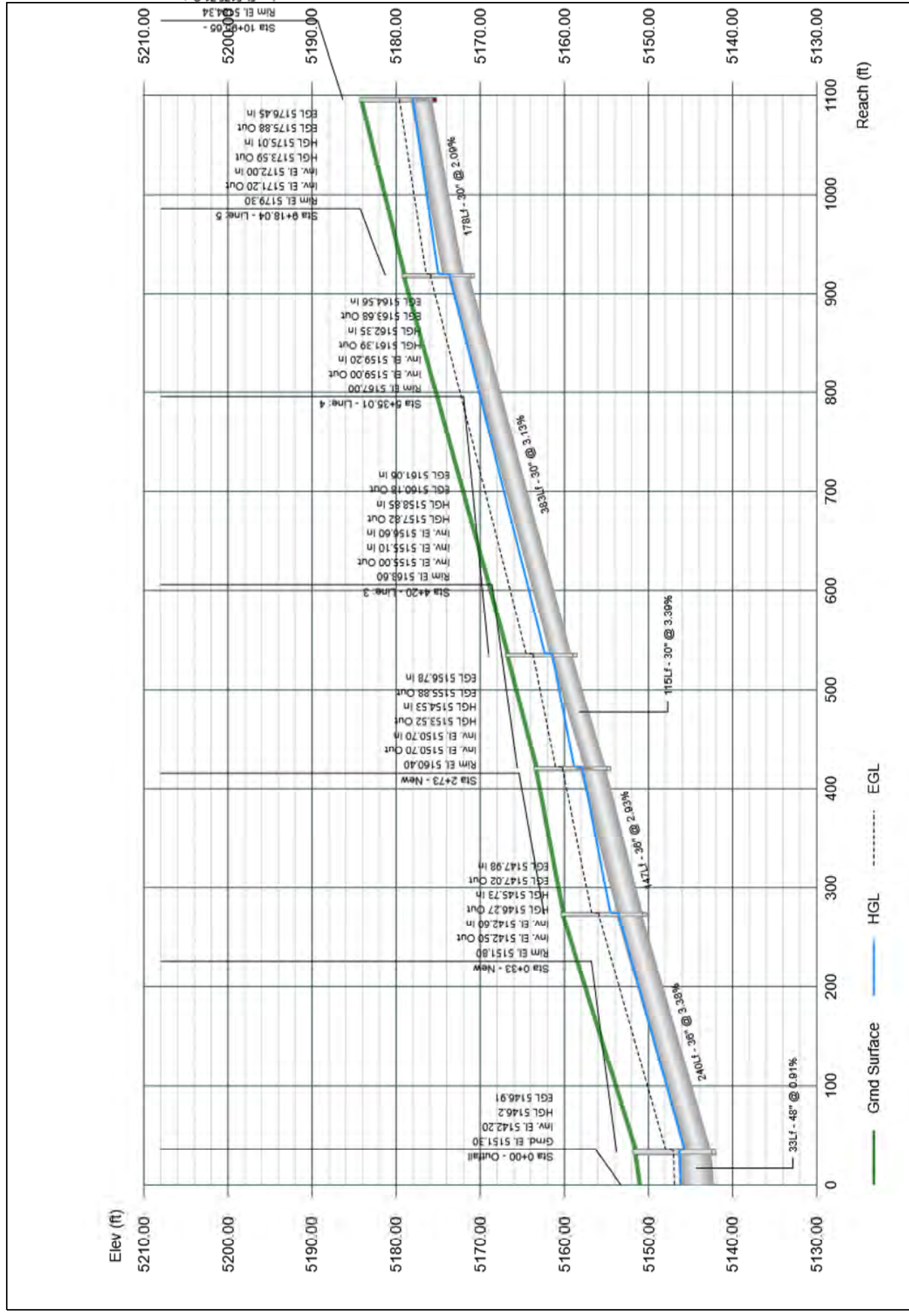


Profile View

Stormwater Studio 2018 v 1.0.0.0

Project Name: UNIT 1 EASEMENT SD

07-27-2021



Energy Grade Line Calculations

Stormwater Studio 2018 v 1.0.0.0

Project Name: UNIT 1 EASEMENT SD
07-27-2021

Line No	Line Size (in)	Q (cfs)	Downstream							Length (ft)	Upstream							Pipe		Junction		
			Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)		Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)	n Value	Energy Loss (ft)	HGLa Elev (ft)	EGLa Elev (ft)	Energy Loss (ft)
1	48	84.90	5142.20	4.00	12.56	5146.20	6.76	0.71	5146.91	33.00	5142.50	3.77	12.29	5146.27	6.91	0.74	5147.02	0.013	0.107	5146.34	5147.08	0.06
2	36	84.90	5142.60	3.00	6.89	5145.73	12.01	2.24	5147.98	240.00	5150.70	2.82²	6.89	5153.52	12.32	2.36	5155.88	0.013	3.626	5153.52	5155.88	0.00
3	36	84.90	5150.70	3.00	6.89	5154.53	12.01	2.24	5156.78	147.00	5155.00	2.82²	6.89	5157.82	12.32	2.36	5160.18	0.013	2.221	5157.82	5160.18	0.00
4	30	58.60	5155.10	2.50	4.83	5158.85	11.94	2.22	5161.06	115.01	5159.00	2.39²	4.83	5161.39	12.14	2.29	5163.68	0.013	2.193	5161.39	5163.68	0.00
5	30	58.60	5159.20	2.50	4.83	5162.35	11.94	2.22	5164.56	383.02	5171.20	2.39²	4.83	5173.59	12.14	2.29	5175.88	0.013	7.305	5173.59	5175.88	0.00
6	30	47.20	5172.00	2.50	4.68	5175.01	9.62	1.44	5176.45	177.62	5175.71	2.27²	4.68	5177.98	10.09	1.58	5179.56	0.013	2.207	5177.98	5179.56	0.00
7	30	47.20	5175.91	2.50	4.68	5178.70	9.62	1.44	5180.14	65.91	5177.56	2.27²	4.68	5179.83	10.09	1.58	5181.41	0.013	0.819	5179.83	5181.41	0.00
8	24	36.40	5177.66	2.00	3.11	5180.16	11.59	2.09	5182.25	241.40	5188.57	1.93²	3.11	5190.50	11.71	2.13	5192.63	0.013	5.869	5190.50	5192.63	0.00
9	24	23.20	5188.67	2.00	2.87	5192.13	7.39	0.85	5192.97	110.83	5194.05	1.72²	2.87	5195.77	8.08	1.02	5196.78	0.013	1.125	5195.77	5196.78	0.00
10	24	23.20	5194.15	2.00	2.87	5196.27	7.39	0.85	5197.12	187.89	5201.29	1.72²	2.87	5203.01	8.08	1.02	5204.02	0.013	1.907	5203.01	5204.02	0.00
11	24	23.20	5201.39	2.00	2.87	5203.51	7.39	0.85	5204.36	102.52	5205.35	1.72²	2.87	5207.07	8.08	1.02	5208.08	0.013	1.040	5207.07	5208.08	0.00
12	24	23.20	5205.45	2.00	2.87	5207.57	7.39	0.85	5208.42	206.05	5212.88	1.72²	2.87	5214.60	8.08	1.02	5215.61	0.013	2.091	5214.60	5215.61	0.00
13	18	11.60	5216.30	0.95†	1.18	5217.25	9.79	1.49	5218.39	41.57	5217.70	1.30²	1.63	5219.00	7.13	0.79	5219.79	0.013	0.465	5219.00	5219.79	0.00
14	18	6.60	5218.00	1.50	1.77	5219.66	3.74	0.22	5219.88	76.02	5221.60	0.98²	1.22	5222.58	5.39	0.45	5223.03	0.013	0.408	5222.58	5223.03	0.00
15	18	11.60	5213.00	1.50	1.63	5215.21	6.57	0.67	5215.88	43.65	5217.50	1.30²	1.63	5218.80	7.13	0.79	5219.59	0.013	0.510	5218.80	5219.59	0.00
16	18	6.60	5218.10	0.62†	0.68	5218.72	9.67	1.45	5219.70	75.50	5221.50	0.98²	1.22	5222.48	5.39	0.45	5222.93	0.013	0.387	5222.48	5222.93	0.00
17	18	6.60	5191.60	0.79†	0.94	5192.39	7.03	0.77	5193.03	24.21	5192.20	0.98²	1.22	5193.18	5.39	0.45	5193.63	0.013	0.164	5193.18	5193.63	0.00
18	18	6.60	5191.60	0.79†	0.94	5192.39	7.03	0.77	5193.03	4.80	5191.90	0.98²	1.22	5192.88	5.39	0.45	5193.33	0.013	0.033	5192.88	5193.33	0.00
19	18	5.40	5180.50	0.86†	1.04	5181.36	5.17	0.42	5181.77	30.19	5180.70	0.89	1.09	5181.59	4.94	0.38	5181.97	0.013	0.184	5182.08	5182.46	0.49
20	18	5.40	5182.70	0.75†	0.88	5183.45	6.12	0.58	5183.97	6.71	5182.90	0.89	1.09	5183.79	4.96	0.38	5184.17	0.013	0.041	5184.06	5184.44	0.27
21	24	26.30	5156.60	2.00	2.97	5159.52	8.37	1.09	5160.61	97.00	5160.80	1.79	2.97	5162.60	8.85	1.22	5163.81	0.013	1.235	5162.60	5163.81	0.00

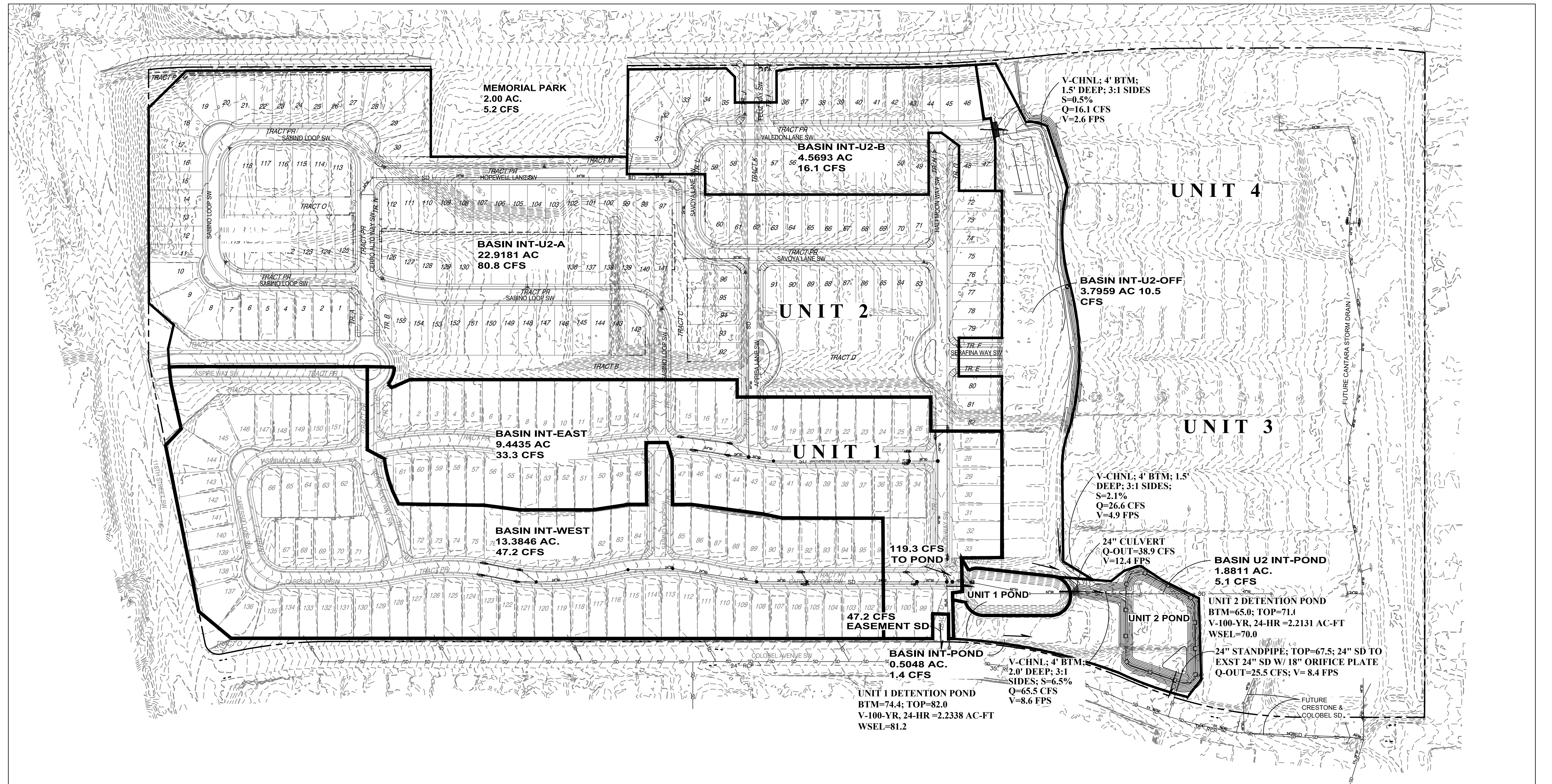
Notes: ² Critical depth. [‡] Supercritical.

Project File: INTERIM ESMT-COLOBEL SD.sws

BACK POCKET

**Interim Drainage Basin Exhibit
Unit 2 Interim Grading Plan**

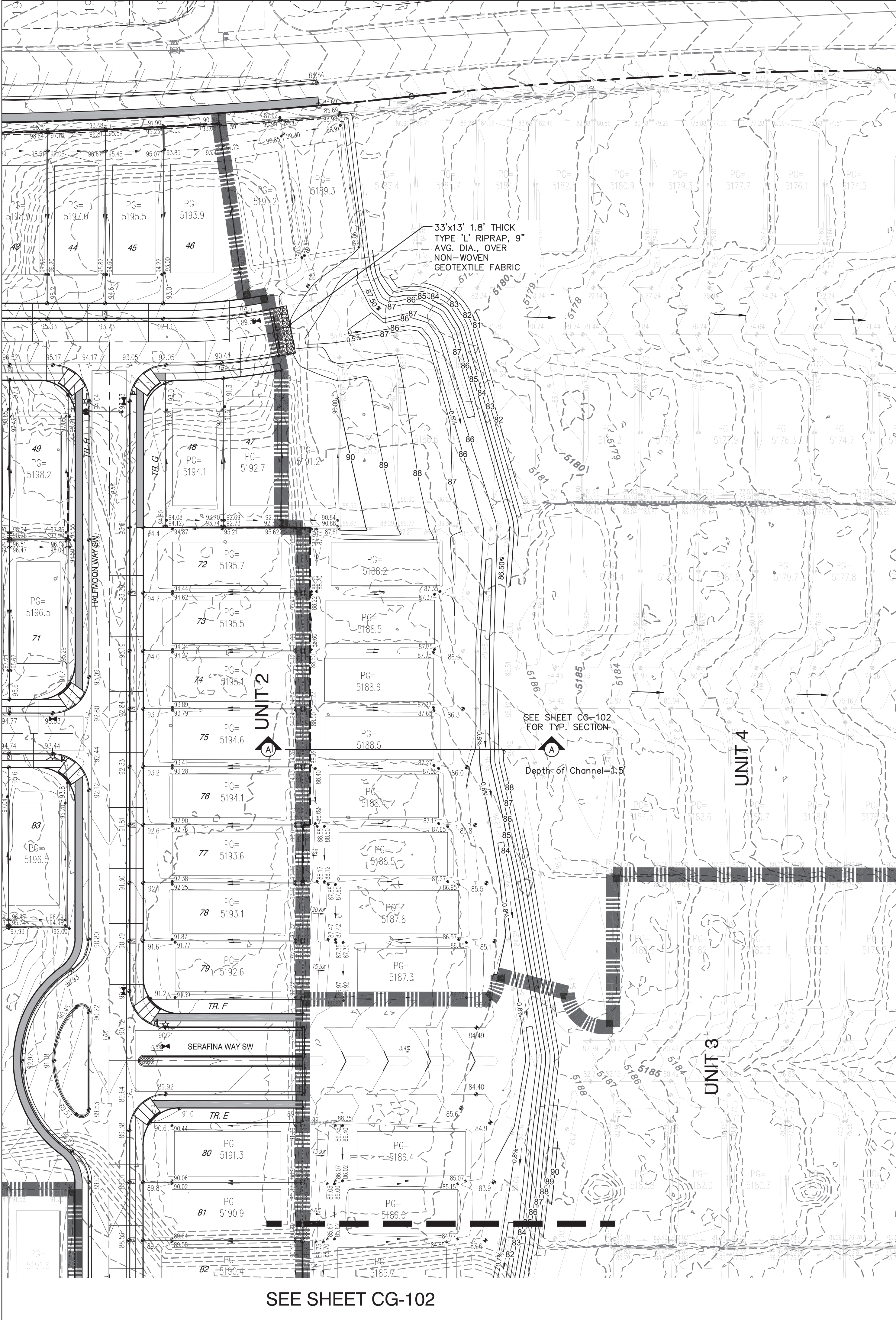
\\projects\12500-2298\2298\DWG\2421 C-701 UNIT 2 INTERIM BASIN.dwg 8/7/2021 3:27 PM



City of Albuquerque
Planning Department
Development Review Services
HYDROLOGY SECTION
APPROVED
DATE: 09/03/21
BY: *Rebecca C. Brantley*
HydroTeam # N08D006F3
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ASPIRE SUBDIVISION UNIT 2 INTERIM GRADING PLAN DR HORTON, INC.			
INTERIM BASIN EXHIBIT			
Date: 07/2021	No. Revision:	Date:	Job No. 2423
Drawn By: thor			CG-103
Ckd By: ANW			SH. OF



SEE SHEET CG-102

GENERAL NOTES

- A. UNDISTURBED AREAS:** PRIOR TO GRADING, BRUSH REMOVAL, OR SITE CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE DEVELOPER AT THE SITE TO ASCERTAIN THE AREAS OF THE PROJECT SITE THAT ARE TO BE PROTECTED AND PRESERVED.
- B. TESTING:** ALL EARTHWORK OPERATIONS SHALL BE OBSERVED AND TESTED BY THE GEOTECHNICAL ENGINEER FOR CONFORMANCE WITH THE REQUIREMENTS SET FORTH IN THE GEOTECHNICAL STUDY.
- C. STRIPPING AND DEBRIS REMOVAL:** THE BUILDING PAD SITES, AREAS TO BE PAVED, AND ALL AREAS THAT ARE TO RECEIVE FILL MATERIAL SHALL BE STRIPPED OF VEGETATION, TREES, ROOTS, STUMPS, DEBRIS, AND OTHER ORGANIC MATERIAL. THE DEPTH OF STRIPPING IS ESTIMATED TO BE ON THE ORDER OF SIX (6) INCHES IN ORDER TO REMOVE THE SURFACE SOIL CONTAINING ORGANIC MATERIAL. THE ACTUAL STRIPPING DEPTH SHALL BE BASED ON FIELD OBSERVATIONS. STRIPPED TOPSOIL SHALL BE STOCKPILED IN A LOCATION ON-SITE APPROVED BY THE DEVELOPER. ALL WASTE PRODUCTS FROM THE CONSTRUCTION SITE SHALL BE APPROPRIATELY DISPOSED OF OFF-SITE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN PERMITS REQUIRED TO HAUL OR DISPOSE OF WASTE PRODUCTS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE WASTE DISPOSAL SITE COMPLIES WITH GOVERNMENT REGULATIONS. ALL COSTS ASSOCIATED WITH DISPOSAL OF MATERIAL SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
- D. PROOF ROLLING:** UPON COMPLETION OF STRIPPING OPERATIONS, AND PRIOR TO PLACEMENT OF ANY FILL MATERIALS, THE STRIPPED AREAS SHOULD BE OBSERVED TO DETERMINE IF ADDITIONAL EXCAVATION IS REQUIRED TO REMOVE WEAK OR OTHERWISE OBJECTIONABLE MATERIALS THAT WOULD ADVERSELY AFFECT THE FILL PLACEMENT. THE SUBGRADE SHOULD BE FIRM AND ABLE TO SUPPORT CONSTRUCTION EQUIPMENT WITHOUT DISPLACEMENT. SOFT OR YIELDING SUBGRADE SHOULD BE CORRECTED AND MADE STABLE BEFORE CONSTRUCTION PROCEEDS. PROOF ROLLING SHOULD BE PERFORMED USING A HEAVY PNEUMATIC TIRE ROLLER, LOADED DUMP TRUCK, OR SIMILAR PIECE OF EQUIPMENT WEIGHING AT LEAST 25 TONS. THE PROOF ROLLING OPERATIONS SHOULD BE OBSERVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE.
- E. UNSTABLE MATERIAL:** WHEN CLAY OR OTHER UNSTABLE MATERIAL IS PRESENT IN AREAS OF PROPOSED BUILDING PADS OR PAVED AREAS, THE GEOTECHNICAL ENGINEER SHALL OBSERVE THE STABILITY OF ANY EXISTING CLAY OR WEATHERED MATERIAL THAT IS PRESENT IN THE SUBBASE, AND SHALL DETERMINE WHETHER ADDITIONAL EXCAVATION OF THESE MATERIALS WILL BE REQUIRED. IF THIS MATERIAL IS DEEMED SUITABLE FOR SUBBASE MATERIAL, THE SUBGRADE SHALL BE SCARIFIED TO A DEPTH OF EIGHT (8) INCHES, ITS MOISTURE CONTENT ADJUSTED AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER, AND THEN RE-COMPACTED TO ONE HUNDRED (100) PERCENT OF THE OPTIMUM DENSITY DETERMINED BY THE STANDARD PROCTOR TEST, ASTM D - 698 PRIOR TO PLACEMENT OF FILL MATERIALS.
- F. CONTROLLED FILL:** ALL SOILS USED FOR CONTROLLED FILL SHOULD BE FREE OF ROOTS, VEGETATION, AND OTHER DELETERIOUS OR UNDESIRABLE MATTER. ROCKS LESS THAN 4 INCHES IN LARGEST DIMENSION WITHIN 15' OF PROPOSED SUBGRADE ELEVATION, LESS THAN 6 INCHES IN SIZE FROM 15' TO 36" OF PROPOSED SUBGRADE ELEVATION, LESS THAN 12 INCHES IN SIZE FROM 36" TO 72" OF PROPOSED SUBGRADE ELEVATION, AND LESS THAN 18 INCHES IN LARGEST DIMENSION FOR FILLS IN EXCESS OF 72" FROM SUBGRADE ELEVATION, WILL BE ALLOWED AS ACCEPTABLE FILL MATERIAL. ROCK FILLS SHOULD BE SUPPLEMENTED WITH A SUFFICIENT AMOUNT OF FINE MATERIAL TO PREVENT VOIDS. SOILS IMPORTED FROM OFF-SITE FOR USE AS FILL SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER. THE FILL MATERIAL SHOULD BE PLACED IN LEVEL, UNIFORM LIFTS, WITH EACH LIFT COMPACTED TO THE MINIMUM DRY DENSITY WITHIN THE COMPACTION SOIL MOISTURE RANGES RECOMMENDED. THE LOOSE LIFT THICKNESS SHOULD NOT EXCEED 10 INCHES. EACH LAYER SHOULD BE PROPERLY PLACED, MIXED, SPREAD, AND COMPACTED TO BETWEEN 95 AND 100 PERCENT OF STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D 698.
- G. PROPOSED GRADES:** THE PROPOSED CONTOURS AND SPOT ELEVATIONS INDICATED ON THE GRADING PLAN ARE FINISHED GRADES AND CONTOURS ARE SHOWN AT ONE-FOOT INTERVALS UNLESS NOTED. SPOT ELEVATIONS SHOWN IN PAVED AREAS ARE FLOWLINE, UNLESS NOTED OTHERWISE.
- H. MASS GRADE ELEVATIONS:** THE CONTRACTOR SHALL BE RESPONSIBLE FOR MASS GRADING OF THE SITE BASED ON THE THICKNESSES PROVIDED FOR HEAVY PAVEMENT, STANDARD PAVEMENT, SIDEWALK, LANDSCAPING, ETC.
- I. EARTHWORK QUANTITIES:** THE CONTRACTOR SHALL BE RESPONSIBLE FOR CALCULATING THE EARTHWORK QUANTITIES BASED ON THE EXISTING CONTOURS SHOWN ON THESE PLANS. PROPOSED SPOT AND CONTOUR ELEVATIONS SHOWN REPRESENT TOP OF FINISH MATERIAL (I.E. TOP OF CONCRETE, TOP OF BUILDING PAD, TOP OF PAVEMENT MATERIAL, TOP OF LANDSCAPING MATERIAL, ETC.). CONTRACTOR SHALL GRADE, COMPACT SUBGRADE AND DETERMINE EARTHWORK ESTIMATES BASED ON PROPOSED ELEVATIONS SHOWN MINUS FINISH MATERIAL THICKNESSES.
- J. TRANSITION TO EXISTING:** WHERE GRADES BETWEEN NEW AND EXISTING ARE SHOWN AS 'MATCH' OR 'x', TRANSITIONS SHALL BE SMOOTH.
- K. STORMWATER FACILITIES:** POND DESIGN PARAMETERS AND STORMWATER CONTROL MEASURES SHOWN ON THIS PLAN (TOP OF POND, BOTTOM OF POND, AREA OF POND, ETC.) TO BE STRICTLY ADHERED TO FOR CERTIFICATION PURPOSES. POST-CONSTRUCTION MAINTENANCE FOR PRIVATE STORMWATER FACILITIES WILL BE THE RESPONSIBILITY OF THE FACILITIES OWNER. PERIODIC INSPECTION AND CERTIFICATIONS OF THE FACILITIES MAY BE REQUIRED. ENGINEER RECOMMENDS THAT OWNER INSPECT SITE YEARLY AND AFTER EACH RAINFALL TO IDENTIFY NEW AREAS OF EROSION AND INSTALL ADDITIONAL EROSION PROTECTION AS NEEDED.
- L. AS-BUILT SURVEY:** FOR ENGINEER'S CERTIFICATION OF SUBSTANTIAL COMPLIANCE, CONTRACTOR SHALL PROVIDE AN AUTOCAD FORMAT AS-BUILT SURVEY PREPARED BY A LICENSED SURVEYOR WHICH INCLUDES:
- AS-BUILT SPOT ELEVATIONS AT DESIGN SPOT ELEVATION SHOWN ON THE APPROVED GRADING & DRAINAGE PLAN;
 - TOP AND BOTTOM AREAS AND ELEVATIONS AS REQUIRED TO CONFIRM THE VOLUMES OF PONDS;
 - ALL CONSTRUCTION, INCLUDING PONDS SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THE APPROVED PLAN IN ORDER TO RECEIVE ENGINEER'S CERTIFICATION.
- N. ELECTRONIC FILES:** UPON WRITTEN REQUEST COORDINATED THROUGH THE PROJECT ENGINEER, THE ELECTRONIC FILE OF THE GRADING AND DRAINAGE MAY BE PROVIDED TO THE CONTRACTOR FOR VERTICAL CONTROL.

STORM WATER QUALITY VOLUMES

OUTSTANDING UNIT 1 SQOV TO BE PAID WITH UNIT 2: 7,727 CF
UNIT 2 SQOV: 19,537 CF
TOTAL: 27,263 CF

STORM WATER QUALITY VOLUME AND IN-LIEU PAYMENT					
BASINS	AREA (SF)	AREA (AC)	%D	WATERQUAL DEPTH (IN.)	WATERQUAL VOLUME (CF)
DEFERRED UNIT 1	473,463	10.8692	57.6	0.34	7,727
UNIT 2	1,197,092	27.4815	57.6	0.34	19,537
TOTAL UNIT 2	1,670,555	38.3507	57.6	0.34	27,263

LEGEND

- EXISTING CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED CONTOUR
- PROPOSED SPOT ELEVATION
- PAD GRADE ELEVATION
- FLOW ARROW
- STORM DRAIN
- STORM INLET
- RETAINING WALL

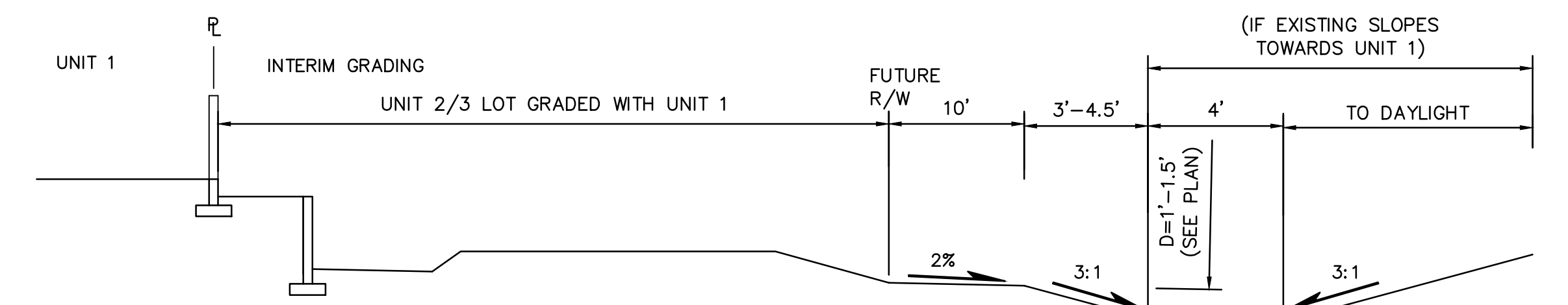


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ASPIRE SUBDIVISION
UNIT 2 INTERIM GRADING PLAN
DR HORTON, INC.

NORTHEAST EDGE

Date:	No.	Revision:	Date:	Job No.
07/2021				2423
Drawn By:				CG-101
Ckd By:				SH. OF
ANW				



6' CHAINLINK FENCE

TOP OF POND=70.5

3:1 MAX.

BOTTOM OF POND=66.0

6' CHAINLINK FENCE

4'

3:1 MAX.

3:1

6'

4'

6'

2'

1.8' THICK TYPE 'L' RIPRAP, 9" AVG. DIA., OVER NON-WOVEN GEOTEXTILE FABRIC

6' CHAINLINK FENCE

4'

WSEL=81.2

TOP OF POND=82.0

3:1 MAX.

2:1 MAX.

24" SD

INV=75.0

BTM POND=74.4

INV=74.0

CHANNEL AND EROSION PROTECTION PER SECTION D-D

TOP MAT:
3-#5 REBAR
BEND REBAR & EXTEND 2" BELOW CMP. WELD TO 18" CMP AT ENDS, TYP.

BOTTOM MAT:
#5 REBAR @ 5" O.C.

CUT NOTCH IN CMP FOR BOTTOM MAT #5 REBAR, TYP. BEND REBAR AND EXTEND 2" BELOW TOP OF CMP.

6" 6"

TOP VIEW CMP INLET

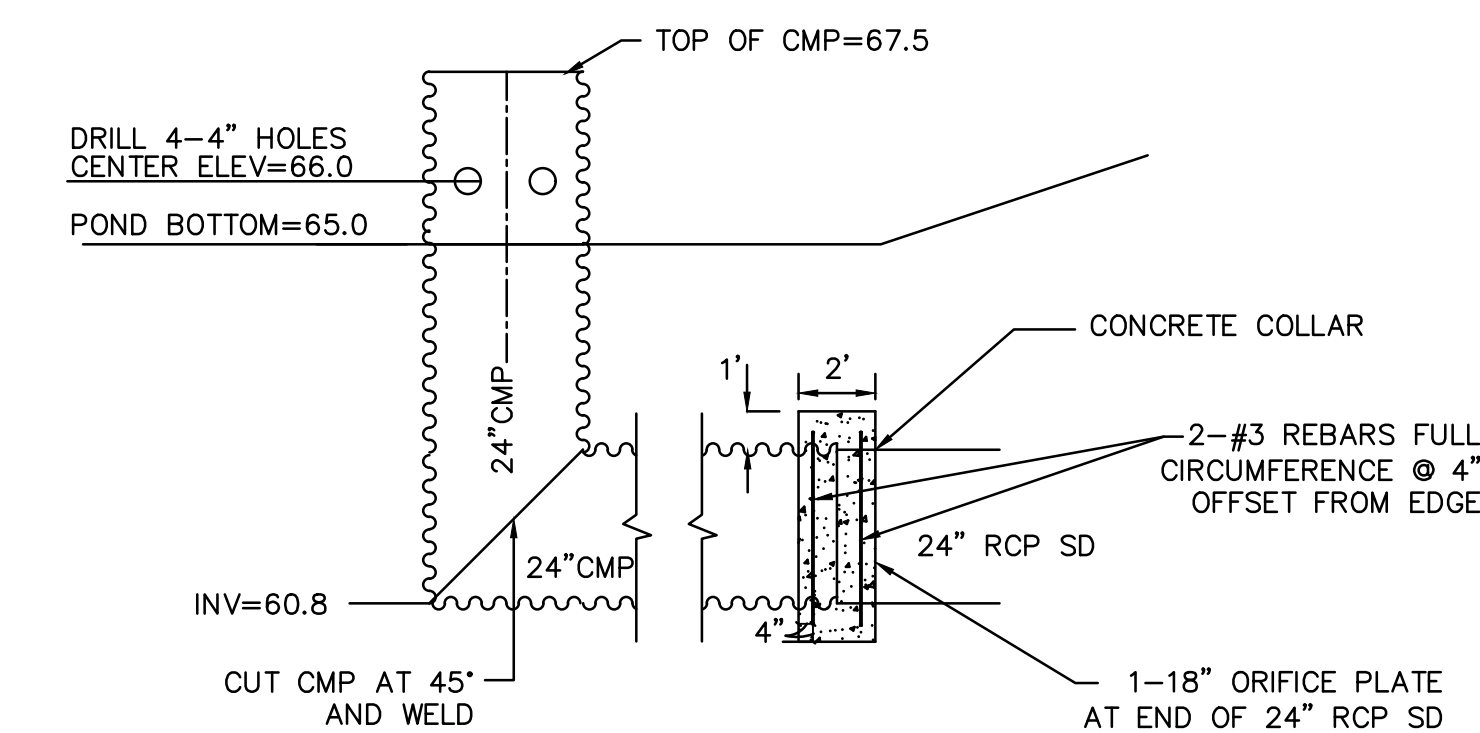
BOTTOM MAT:
CUT NOTCH IN CMP FOR #5 REBAR
BEND REBAR AND EXTEND 2" BELOW TOP OF CMP

2"

TOP MAT:
BEND REBAR & EXTEND 2" BELOW CMP. WELD TO 18" CMP AT ENDS, TYP.

SECTION D-D

- A. GRADE POND AND CHANNEL SIDE SLOPES AT 3:1 MAX AND COMPACT TO 90%.
- B. DO NOT COMPACT POND BOTTOM.
- C. STABILIZE POND SIDES WITH NATIVE GRASS SEED WITH AGGREGATE MULCH OR EQUAL. (MUST SATISFY THE "FINAL STABILIZATION CRITERIA" CGP 2.2.14.b.)



City of Albuquerque
Planning Department
Development Review Services
HYDROLOGY SECTION

APPROVED

DATE: 09/03/21

BY: *Renee A. Brissett*

HydroTrans # N08D00006F3

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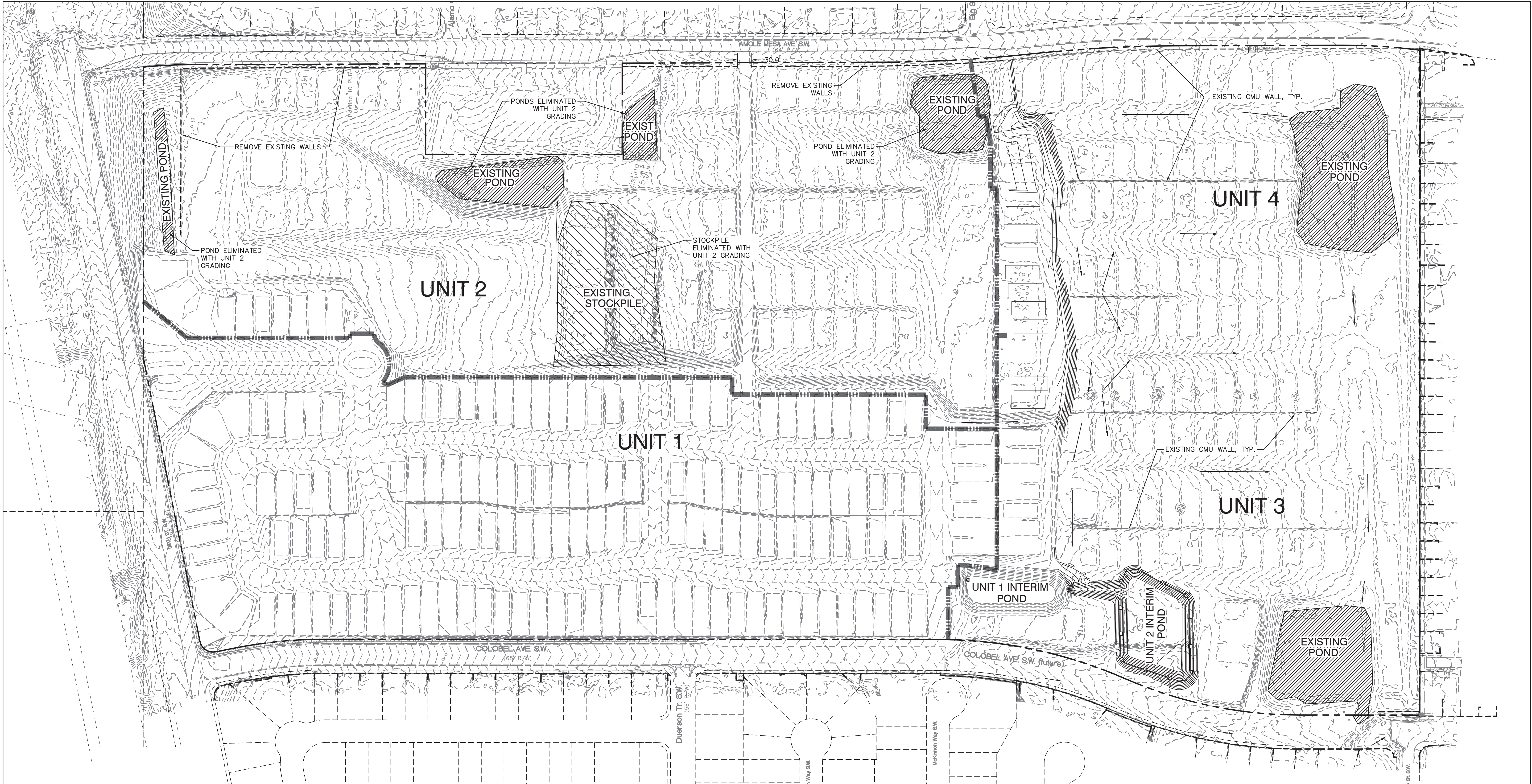
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ASPIRE SUBDIVISION
UNIT 2 INTERIM GRADING PLAN
DR HORTON, INC.

SOUTHEAST EDGE & DETAILS

Date:		No.	Revision:	Date:	Job No.
07/2021					2423
Drawn By:					CG-102
thor					
Ckd By:					SH. OF
ANW					

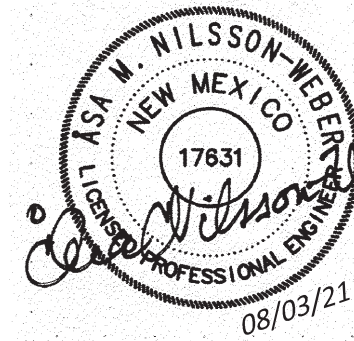
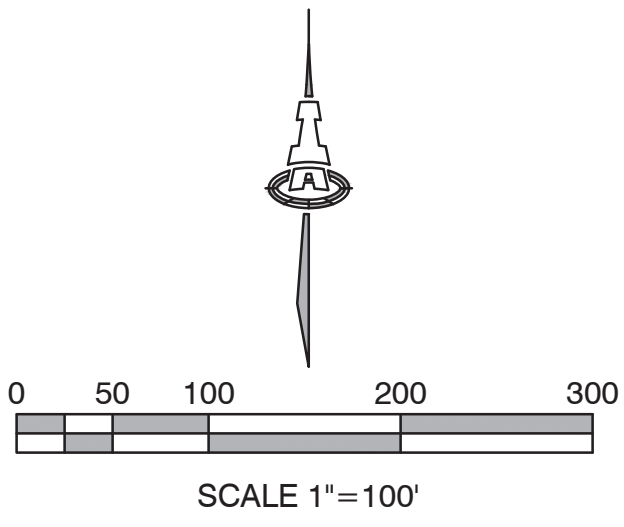


WALL DEMOLITION NOTES

1. ALL WALLS SHALL TO BE DEMOLISHED WITH UNIT 2 ARE NOTED ON PLAN. REMAINING WALLS SHALL REMAIN IN PLACE.
2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS WITHIN THE CONTRACT LIMITS AND NOTIFY THE ENGINEER IN WRITING OF ANY DEVIATION FROM CONTRACT DOCUMENTS NECESSITATED BY FIELD CONDITIONS OR ITEMS NOT COVERED.
3. ALL DEMOLITION SHALL BE PERFORMED IN A SAFE AND ACCEPTABLE MANNER TO ALL AUTHORITIES HAVING JURISDICTION AND THE OWNER.
4. THOROUGHLY CLEAN ADJACENT AREAS OF DEBRIS CAUSED BY DEMOLITION WORK.
5. PRIOR TO ANY DEMOLITION, THE CONTRACTOR SHALL COORDINATE BRACING AND MAINTAIN THE STRUCTURAL INTEGRITY OF THE WALLS TO REMAIN.
6. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY BRACING, SHORING, SCAFFOLDING, ETC., WHICH ARE NECESSARY TO PREVENT COLLAPSE, SUBSIDENCE, DEFLECTION OR ANY OTHER TYPE OF DAMAGE.
7. CONTRACTOR SHALL REVIEW ALL WALLS TO BE DEMOLISHED WITH OWNER TO IDENTIFY ANY ITEMS TO BE SALVAGED AND DETERMINE SALVAGE LOCATION. UNSALVAGEABLE WALL BLOCKS AND FOOTINGS SHALL BE REMOVED FROM SITE AND LEGALLY DISPOSED.

POND NOTES

1. ALL PONDS TO BE ELIMINATED IN WITH UNIT 2 ARE NOTED ON PLAN. REMAINING PONDS WITHIN FUTURE UNITS 3 & 4 SHALL REMAIN IN PLACE AND NOT BE DISTURBED.



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ASPIRE SUBDIVISION
UNIT 2 INTERIM GRADING PLAN
DR HORTON, INC.

EXISTING POND EXHIBIT

Date:	No.:	Revision:	Date:	Job No.
07/2021				2423
Drawn By:				CG-103
thor				
Ckd By:				SH. OF
ANW				