

Timothy M. Keller, Mayor

April 10, 2018

Diane Hoelzer, P.E. Mark Goodwin & Associates PO Box 90606 Albuquerque, NM, 87199

RE: Ceja Vista Unit 1A, 1B, 1C, 2A, 2B, & C

**Amended Drainage Management Plan** 

Stamp Date: 03/30/18 Hydrology File: P09D002E

Dear Ms. Hoelzer:

PO Box 1293

Based upon the information provided in your submittal received 03/30/18, the Amended Drainage Management Plan **is not** approved for Grading Permit or action by the DRB on the Preliminary Plat. The following comments need to be addressed for approval of the above referenced project:

Albuquerque

NM 87103

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- 1. Since the temporary retention pond is within Bernalillo County jurisdiction, the County will need to approve the Grading and Drainage Plans. Please contact Mr. Chen, PE at (505) 848-1500 or at <a href="mailto:tchen@bernco.gov">tchen@bernco.gov</a>. An approval must be given prior to Hydrology's approval.
- 2. Proposed drainage swale and culvert within Dennis Chavez Right-of-Way will not be maintained by the City of Albuquerque and requires an approval from New Mexico Department of Transportation prior to the City's approval. Please contact Tim Trujilo, PE at (505) 798-6690 or TimothyR.Trujilo@state.nm.us.
- 3. Since this development ultimately drains into the Borrega Dam, approval by AMAFCA will be need prior to Hydrology's approval. Please contact Nicole Friedt, PE at (505) 884-2215 or <a href="mailto:nfriedt@amafca.org">nfriedt@amafca.org</a>.
- 4. A Permanent Public Drainage Easement granted to the City of Albuquerque and an Agreement and Covenant for the public drainage channel and temporary retention pond will have to be recorded prior to Hydrology's approval for the preliminary plat at DRB.



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- 5. Please provide a Drainage Covenant per Chapter 17 of the DPM for each diversion / temporary pond on Tract RR-3-A-1, RR-3-A-2, and RR-3-B prior to Work Order. I have attached a word document of this drainage covenant for your use.
- 6. Amended Drainage Management Plan. Please label the Master Drainage Plan that was provided as "within Bernalillo County".
- 7. Amended Drainage Management Plan. Please add the attached Master Drainage Plan, update with the new drainage system, and label as "within City of Albuquerque".
- 8. Amended Drainage Management Plan. Please provide the calculations and summary table for the above Master Drainage Plan within City. See attached summary table.

PO Box 1293

9. Amended Drainage Management Plan. Please provide the calculations for each diversion / temporary ponds and the temporary retention pond within Bernalillo County.

Albuquerque

10. Amended Drainage Management Plan. Please provide the calculations for the offsite drainage channel to the south within Bernalillo County.

NM 87103

11. Grading and Drainage Plan. Please label both sheets as "Ceja Vista Unit 1, Grading and Drainage Plan".

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- 12. Grading and Drainage Plan. Please number the sheets 1 of 2 and 2 of 2.
- 13. Grading and Drainage Plan Sheet 1. Please label the Tracts per the plat (I.e. Tract RR-3-A-1) and not Tract A, B, & C.
- 14. Grading and Drainage Plan Sheet 1. Please fix the vicinity map to include Tract RR-3-B, 98<sup>th</sup> street, and the offsite drainage channel & temporary retention pond within Bernalillo County.
- 15. Grading and Drainage Plan Sheet 1. Please label the diversion / temporary ponds on each Tract and in the calculation table.
- 16. Grading and Drainage Plan Sheet 1. Please connect each proposed diversion / temporary ponds to the proposed storm sewer stub outs.



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- 17. Grading and Drainage Plan Sheet 1. Please add either a Private Cross Lot Drainage Easement at the southwest corner of Tract RR-3-A-2 for the pipe to Tract RR-3-A-1 or move the storm stub out from Tract RR-3-A-2 to Tract RR-3-A-1.
- 18. Grading and Drainage Plan Sheet 1. Please add a public turn-a-round at the end of Ceja Vista Road and provide grading for the turn-a-round.
- 19. Grading and Drainage Plan sheet 1. Please provide a section along Dennis Chavez showing the proposed ditch and show a trapezoidal section per the design calculation in the Amended Drainage Management Plan. Again maintenance must be accepted by NMDOT or change to curb and gutter.
- 20. Grading and Drainage Plan Sheet 1. Remove the arrows and label of "Valle de Atrisco Project". All work within Dennis Chavez will be done with this Grading and Drainage Plan.

PO Box 1293

21. Grading and Drainage Plan Sheet 1. Please show the proposed pavement returns for 98<sup>th</sup> Street at Dennis Chavez.

Albuquerque

22. Grading and Drainage Plan Sheet 1. Please provide the 30 inch culvert inverts.

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23. Grading and Drainage Plan Sheet 2. Please insure that under the Phasing Notes that each temporary pond is labeled and also which Tract they are located on.

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- 24. Grading and Drainage Plan Sheet 2. The permanent drainage easement needs to be granted to the City of Albuquerque since this is receiving City public water and the City's required first flush volume for Tract RR-3-A-2. This easement can also be granted to the Bernalillo County if they also require it.
- 25. Grading and Drainage Plan Sheet 2. Please provide a section through the retention pond and spillway.
- 26. Grading and Drainage Plan Sheet 2. Please provide a detail of the spillway.
- 27. Grading and Drainage Plan Sheet 2. Per the DPM Chapter 22 Section 5.I, temporary retention ponds need to be sized based on the 100 year 10 day storm event and not two (2) times the 100 year -6 hour storm event.
- 28. Grading and Drainage Plan Sheet 2. Offsite temporary retention pond must be sized for the Developed Conditions for all of Unit 1.



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29. Grading and Drainage Plan Sheet 2. Please correct Phasing Note #6 to reflect comment #28.

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

Renée C. Brissette

PO Box 1293

Albuquerque

NM 87103

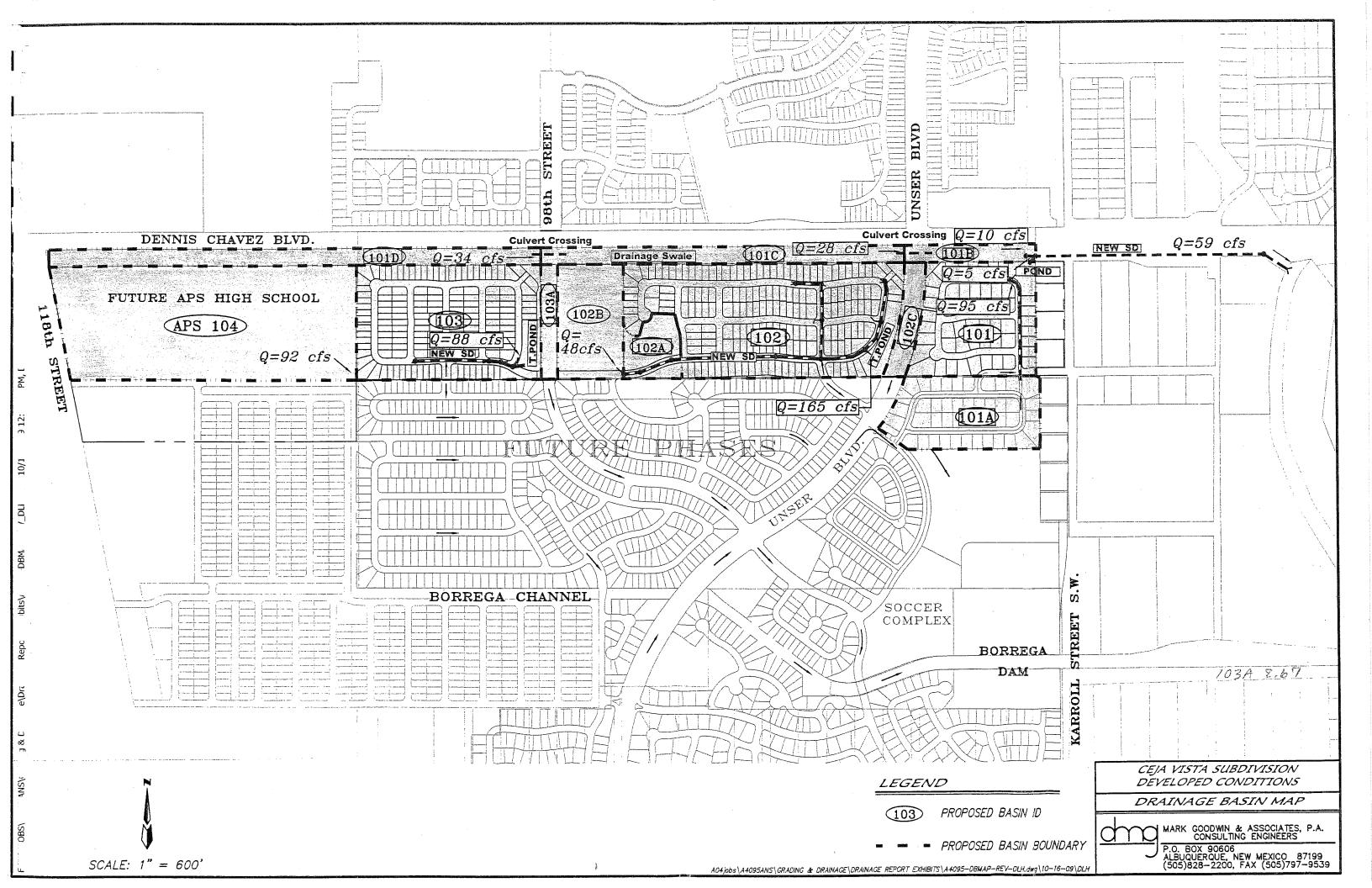
www.cabq.gov

# **CEJA VISTA SUBDIVISION**

TABLE 1: SUMMARY OF HYDROLOGIC PARAMETERS

		-		Land	Land	200	בה ה		RINOFF
SUB-BASIN ID	DESCRIPTION	AREA (sq.mi)	AREA (acres)	Treat A	Treat B	Treat	Treat	Q(100) cfs	VOL. (AF)
101	SUBDIVISION N.	0.02654	16.9851	0	33.5	33.5	33.0	52.6	1.707
101A	SUBDIVISION S.	0.02141	13.703	0	33.5	33.5	33.0	42.5	1.377
101B	DENNIS CHAVEZ E.	0.00442	2.8314	0	25	25	20	10.2	0.351
101C	DENNIS CHAVEZ N.	0.01224	7.8338	0	25	25	20	28.3	0.972
101D	DENNIS CHAVEZ W.	0.01651	10.5695	0	25	25	20	34.7	1.311
102	SUBDIVISION	0.05734	36.6998	0	25	26	49	124.7	4.263
102A	OPEN SPACE	0.00455	2.9143	0	95	0	5	6.4	0.179
102B	COMMERCIAL TRACT G	0.01499	9.5907	0	10	10	80	38.1	1.402
102C	UNSER BLVD. R/W	0.00485	3.1011	0	20	20	90	11.2	0.393
103	SUBDIVISION	0.04136	26.4687	0	21.5	21.5	57	93.7	3.277
103A	98 <sup>TH</sup> ST. R/W	0.00341	2.18054	0	10	10	08	8.7	0.319
103B	TRACT E (TEMP)	0.00197	1.26	100	0	0	0	1.7	0.047

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# City of Albuquerque

#### Planning Department

#### Development & Building Services Division

#### DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title:	Building Permit #: City Drainage #:
DRB#: EPC#:	Work Order#:
Legal Description:	
City Address:	
Engineering Firm:	Contact:
Address:	
Phone#: Fax#:	E-mail:
Owner:	Contact:
Address:	
	E-mail:
Architect:	Contact:
Address:	
	E-mail:
Other Contact:	Contact:
Address:	
Phone#: Fax#:	E-mail:
HYDROLOGY/ DRAINAGETRAFFIC/ TRANSPORTATIONMS4/ EROSION & SEDIMENT CONTROL	CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:  BUILDING PERMIT APPROVAL  CERTIFICATE OF OCCUPANCY
	CERTIFICATE OF OCCUPANCY
TYPE OF SUBMITTAL:	PRELIMINARY PLAT APPROVAL
ENGINEER/ ARCHITECT CERTIFICATION	SITE PLAN FOR SUB'D APPROVAL
	SITE PLAN FOR BLDG. PERMIT APPROVAL
CONCEPTUAL G & D PLAN	FINAL PLAT APPROVAL
GRADING PLAN	SIA/ RELEASE OF FINANCIAL GUARANTEE
DRAINAGE MASTER PLAN DRAINAGE REPORT	FOUNDATION PERMIT APPROVAL
CLOMR/LOMR	GRADING PERMIT APPROVAL
CEOWIN EOWIN	SO-19 APPROVAL
TRAFFIC CIRCULATION LAYOUT (TCL)	PAVING PERMIT APPROVAL  GRADING/ PAD CERTIFICATION
TRAFFIC IMPACT STUDY (TIS)	WORK ORDER APPROVAL
EROSION & SEDIMENT CONTROL PLAN (ESC)	CLOMR/LOMR
OTHER (SPECIFY)	PRE-DESIGN MEETING
	OTHER (SPECIFY)
IS THIS A RESUBMITTAL?: Yes No	
DATE SUBMITTED:By:	
-	

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: \_\_\_\_

Ceja Vista Unit 1A,1B,1C, 2A, 2B, C (Mixed Use)

Amended
Drainage Management Plan
For
Preliminary Plat Approval



Prepared by Mark Goodwin & Associates, P.A.

March 2018

# Amendment to Ceja Vista Drainage Management Plan PROJECT DESCRIPTION AND HISTORY

The purpose of this summary report and grading plan is to amend the previously approved plan and address some issues that hydrology had raised at the last DRB hearing.

At this time, we are seeking amended preliminary plat approval on what was previously known as Ceja Vista Units 1A-1E, 2 and 3, which were all to be developed into single family residential homes, with one small tract in Unit 2 reserved for commercial. The purpose of this amendment is two split the existing Tract RR-3A into two tracts so that one of the tracts can be financed and developed.

Unit 1A-1E, located west of 98th street, has been rezoned and apartment complex is now being proposed and is being divided into Unit 1A,1B,1C. The residential layouts in Unit 2 and 3 remains unchanged from what was previously approved. Unit 2 has been split into Unit 2A (commercial) and Unit 2B (residential).

The overall master drainage plan remains unchanged. The grading plan and drainage plans for Units 2A, 2B and 3 have not changed from what was originally designed and approved.

#### DRAINAGE PLAN FOR UNIT 1A,1B,1C

In order to split the two existing tracts (RR-3-A and RR-3-B) into 3 tracts, temporary retention ponds were designed to retain the 100 year 10 day storm so that each tract could develop while retaining and containing undeveloped flows on each site. All calculations and details are on the Temporary Retention Ponds Grading Plan and attached to this report.

#### STORM DRAIN DESIGN FOR UNIT 1A.1B.1C

The public storm drain sizes found in the infrastructure list are based on the AHYMO calculations done in association the Drainage Report for Villa De Atrisco Apartment complex. A note has been added to the infrastructure list that these "Storm Drain sizes may change in accordance with final HGL calculations, pending Hydrology approval". The land treatment values for Unit 1A and Unit 1C that are undeveloped vacant land at this time are conservatively assumed values so that the storm drain could be designed. The approved and designed maximum 100 year offsite flows from the APS site were also factored into the public storm design that runs eastward in Ceja Vista Road to 98th street and then south to a temporary offsite pond.

#### FIRST FLUSH VOLUME CALCULATIONS

Since the original approval of the overall grading plan for Unit 1,2,3, the City of Albuquerque has initiated the requirement to retain the first flush volume onsite or pay cash in lieu for the required volume. The first flush volumes have been calculated for Unit 2A, 2B and 3. This item and volumes have been added to the infrastructure list under the respective Units.

#### CEJA VISTA UNIT 2 AND 3 RESIDENTIAL AND UNIT 2 COMMERCIAL

#### **First Flush Calculations**

#### **Unit 2 Commercial**

Area = 418,900 sq.ft.

Assumed Land Treatment D = 85%

First Flush required Volume =  $(418,900 \text{ sq.ft.}) \times (.85) \times (0.34^{\circ}/12) = 10,088 \text{ cu.ft.}$ 

#### **Unit 2 Residential**

Area = 1,735,088 sq.ft.

Land Treatment D = 47.4%

First Flush required Volume =  $(1,735,088 \text{ sq.ft.}) \times (.474) \times (0.34^{\circ}/12) = 23,302 \text{ cu.ft.}$ 

#### **Unit 3 Residential**

Area = 739,940 sq.ft.

Land Treatment D = 35.2%

First Flush required Volume =  $(739,940 \text{ sq.ft.}) \times (.352) \times (0.34^{\circ}/12) = 7,380 \text{ cu.ft.}$ 



NOAA Atlas 14, Volume 1, Version 5 Location name: Albuquerque, New Mexico, USA\*



#### **POINT PRECIPITATION FREQUENCY ESTIMATES**

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hirner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekla, 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

PI	PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) <sup>1</sup>									
Duration				Avera	ge recurren	ce interval (	/ears)			
Duration	1	2	5	10	25	50	100	200	500	1000
5-min	<b>0.174</b> (0.150-0.202)	<b>0.225</b> (0.194-0.262)	0.302 (0.259-0.352)	<b>0.362</b> (0.309-0.419)	<b>0.444</b> (0.377-0.513)	<b>0.508</b> (0.429-0.587)	0.575 (0.482-0.664)	0.645 (0.538-0.744)	<b>0.740</b> (0.611-0.856)	0.816 (0.669 0 944)
10-min	0.265 (0.228-0.308)	<b>0.343</b> (0.295-0.399)	<b>0.460</b> (0.394-0.535)	<b>0.552</b> (0.470-0.638)	0.676 (0.574-0.781)	<b>0.772</b> (0.653-0.893)	0.874 (0.734-1.01)	0.982 (0.818-1.13)	1.13 (0.930-1.30)	1.24 (1 02-1.44)
15-min	<b>0.329</b> (0.283-0.382)	<b>0.425</b> (0.365-0.495)	0.571 (0.488-0.663)	<b>0.684</b> (0.583-0.791)	0.838 (0.712-0.969)	0.957 (0.810-1.11)	1.08 (0.910-1.25)	1.22 (1.01-1.41)	1.40 (1.15-1.62)	1.54 (1.26-1.78)
30-min	<b>0.443</b> (0.381-0.514)	<b>0.573</b> (0.492-0.667)	0.768 (0.658-0.893)	0.921 (0.785-1.07)	<b>1.13</b> (0.958–1.31)	1.29 (1.09-1.49)	1.46 (1.23-1.69)	1.64 (1.37-1.89)	1.88 (1.55-2.18)	2.07 (1.70-2.40)
60-min	<b>0.548</b> (0.471-0.637)	<b>0.709</b> (0.609-0.825)	0.951 (0.814-1.11)	1.14 (0.972-1.32)	1.40 (1.19-1.62)	1.60 (1.35-1.85)	1.81 (1.52-2.09)	2.03 (1 69-2.34)	2.33 (1.92-2.69)	2.57 (2.11-2.97)
2-hr	0.637 (0.546-0.755)	0.816 (0.698-0.968)	1.08 (0.921-1.28)	1.29 (1.10-1.52)	1.58 (1.34-1.86)	1.82 (1.53-2.13)	2.07 (1.72-2.42)	2.33 (1 92-2 72)	2.70 (2.20-3.14)	2.99 (2.42-3.50)
3-hr		0.866 (0.747-1.02)	1.13 (0.978-1.33)	1.35 (1.16-1.58)	1.64 (1.40-1.92)	1.88 (1.60-2.20)	2.13 (1.80-2.49)	2.40 (2.00-2.80)	2.78 (2 29-3.23)	3.08 (2 52-3.60)
6-hr	0.786 (0.685-0.917)	0.992 (0.865-1.16)	1.28 (1.11-1.49)	1.50 (1.31-1.74)	1.81 (1.56-2.10)	2.05 (1.76-2.37)	2.31 (1.97-2.67)	2.57 (2.18-2.97)	2.93 (2.46-3.39)	3.23 (2 69-3.74)
12-hr	<b>0.872</b> (0.766 -0.996)	1.10 (0.967-1.26)	1.39 (1.22-1.59)	1.62 (1.42-1.85)	1.94 (1.69-2.20)	2.17 (1.89-2.47)	2.43 (2.09-2.76)	2.68 (2.30-3.05)	3.03 (2.57-3.45)	3.32 (2 79-3.78)
24-hr	0.975 (0.864-1.11)	1,22 (1.08-1.39)	1.53 (1.35-1.74)	<b>1.77</b> (1.57-2.01)	2.10 (1.85-2.38)	2.35 (2.07-2.66)	2.62 (2.29-2.95)	2.88 (2.51-3.25)	3.24 (2.80-3.65)	3.52 (3.03-3.97)
2-day	1.03 (0.916-1.15)	1.29 (1.15-1.44)	1.60 (1.43-1.80)	<b>1.85</b> (1.65-2.07)	2.19 (1.95-2.45)	2.44 (2.17-2.73)	2.71 (2.40-3.03)	2.98 (2.62-3.33)	3.34 (2.92-3.73)	3.61 (3.14-4.05)
3-day	1.13 (1.02-1.25)	1.41 (1.28-1.56)	1.74 (1.58-1.92)	2.00 (1.81-2.21)	<b>2.35</b> (2.12-2.59)	2.62 (2.36-2.89)	2.89 (2.59-3.19)	3.16 (2.83-3.49)	3.53 (3.13-3.89)	3.80 (3.36-4.20)
4-day	1.24 (1.13-1.35)	1.54 (1.41-1.68)	1.88 (1.72-2.05)	2.15 (1.97-2.35)	2.52 (2.30~2.74)	2.80 (2.55-3.04)	3.07 (2.79-3.34)	3.35 (3.04-3.64)	3.71 (3.35-4.04)	3.99 (3.59-4.35)
7-day	1.42 (1.31–1.55)	1.76 (1.62-1.92)	2.14 (1.97-2.33)	2.44 (2.24-2.65)	<b>2.83</b> (2.59-3.06)	3.11 (2.85-3.37)	3.40 (3.11-3.68)	<b>3.67</b> (3.35-3.97)	4.03 (3.67-4.36)	<b>4.28</b> (3 89-4.64)
10-day	1.57 (1.44-1.71)	1.95 (1.79-2.12)	2.38 (2.19-2.58)	2.72 (2.50-2.95)	3.17 (2.91-3.42)	3.50 (3.21-3.78)	3.84 (3.51-4.14)	<b>4.16</b> (3.80-4.50)	4.59 (4.17–4.96)	4.90 (4.43-5.30)
20-day	1.98 (1.81-2.15)	<b>2.45</b> (2.25–2.67)	2.98 (2.74-3.23)	<b>3.37</b> (3.10-3.65)	3.87 (3.55-4.19)	4.23 (3.88-4.58)	<b>4.58</b> (4.19-4.95)	<b>4.91</b> (4.49-5.30)	<b>5.31</b> (4.85-5.75)	5.60 (5.11-6.06)
30-day	2.37 (2 18 2 56)	<b>2.93</b> (2.70-3.17)	3.53 (3.25-3.81)	3.97 (3.65-4.27)	<b>4.51</b> (4.15-4.85)	4.90 (4.50-5.27)	<b>5.26</b> (4.83-5.66)	<b>5.61</b> (5.14-6.02)	6.01 (5.51–6.47)	<b>6.29</b> (5.76-6.77)
45-day	2.88 (2.66-3.10)	3.56 (3.29-3.84)	<b>4.23</b> (3.91-4.56)	<b>4.71</b> (4.36-5.07)	<b>5.29</b> (4.90-5.69)	5.69 (5.26-6.11)	6.04 (5.60-6.48)	<b>6.35</b> (5.88-6.81)	6.69 (6.21-7.17)	6.89 (6.41-7.38)
60-day	3.32 (3.07-3.59)	<b>4.11</b> (3.80-4.44)	4.89 (4.53-5.27)	5.45 (5.05-5.87)	<b>6.12</b> (5.67-6.59)	6.58 (6.09-7.08)	7.00 (6,48-7.53)	<b>7.36</b> (6.82-7.93)	<b>7.77</b> (7 21 -8.37)	8.03 (7.46-8.64)

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.

AHYMO PROGRAM SUMMARY TABLE (AHYMO-S4)  INPUT FILE = C:\Program Files (x86)\AHYMO-S4\CEJA_PP.DAT FROM TO FROM TO PEAK HYDROGRAPH ID ID AREA DISCHARGE COMMAND IDENTIFICATION NO. NO. (SQ MI) (CFS) CTABL	r. S4.01a, Rel RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	RUN DATE (USER NO.= M TIME TO PEAK (HOURS)	(MON/DAY/YR) =03/11/2018 M-GoodwinNMSiteA90075759 CFS PAGE 1 PER NOTATION ACRE NOTATION TIME: 0.00	11/2018 0075759 = 1 ION
ION ************************************					
#G************************************					
K 44 K 44 K 44 K 44 K 44 K 44 K 44 K 44				RAINS=	2.310
*\$ DENNIS CHAVEZ ROAD SWALE  *\$ NEXT TO TRACT A, B, C AND UNIT 2 AND UNIT 3  ***********************************					
- E -					
1	1.192	1.19561	1.500	2.746 PER IMP=	40.00
**************************************					
COMPUTE NM HYD 100.DCM - 1 0.01382 24.29	0.881	1.19561	1.500	2.746 PER IMP=	40.00
BLVD TO EAST PROP LIN					
1 *******	0.314	1.19561	1,500	2.749 PER IMP=	40.00
*S TRACTS A, B, C *S WEST OF 98TH STREET					
***************************************					
CUMPUTE NM HYD 200.TRA - 1 0.00847 9.16 *g***********************************	0.280	0,62013	1,550	1.689 PER IMP=	00.00
《					
1 0.01475	0.488	0,62013	1.550	1.688 PER IMP-	00.0
*D************************************					
COMPUTE NM HYD 200.TRC - 1 0.01748 18.88 *S*********************************	B . 5 7 B	0,62013	1.550	1.688 PER IMP=	00 0

START	TIME=0.0 HR PUNCH CODE=0 PRINT LINES=-6
LOCATION	NEW MEXICO
_	*******
*S*********************	1100, 2011,111,111, 111, 20 10 2011
_	* ZONE ATLAS
_	**********
*S	100 YEAR 6 HOUR STORM EVENT
-	***********
*S*******	*********
RAINFALL	TYPE=1 RAIN QUARTER=0.0
	RAIN ONE=1.81 IN RAIN SIX=2.31 IN
	RAIN DAY=2.62 IN DT=0.05 HRS
	**********
	CHAVEZ ROAD SWALE
	O TRACT A,B,C AND UNIT 2 AND UNIT 3
	SIN 100.DCW
	CHAVEZ 118TH ST TO 98TH ST
	11.96 ACRES
	**********
COMPUTE NM HYD	ID=1 HYD NO=100.DCW AREA= 0.01869 SQ MI
	PER A=60 PER B=0 PER C=0 PER D=40
	TP=1333 HR MASS RAIN=-1
PRINT HYD	ID=1 CODE=1
_	********
	***************
4 000 01	SIN 100.DCM CHAVEZ 98TH STR TO UNSER BLVD.
	8.844 ACRES
_	***********
COMPUTE NM HYD	ID=1 HYD NO=100.DCM AREA= 0.01382 SQ MI
	PER A=60 PER B=0 PER C=0 PER D=40
	TP=1333 HR MASS RAIN=-1
PRINT HYD	ID=1 CODE=1
=	***********
_	************
	SIN 100.DCE
	CHAVEZ UNSER BLVD TO EAST PROP LINE 3.1503 ACRES
	3.1303 ACRES
COMPUTE NM HYD	ID=1 HYD NO=100.DCE AREA= 0.004922 SO MI
	PER A=60 PER B=0 PER C=0 PER D=40
	TP=1333 HR MASS RAIN=-1
PRINT HYD	ID=1 CODE=1
=	************
*S TRACTS	
*S WEST OF	98TH STREET
_	SIN 200.TRA
	5.4236 ACRES
	***********
COMPUTE NM HYD	ID=1 HYD NO=200.TRA AREA= 0.008474 SQ MI
	PER A=100 PER B=0 PER C=0 PER D=0
	TP=1333 HR MASS RAIN=-1
PRINT HYD	ID=1 CODE=1
<del></del>	********
<del>-</del>	**************************************
	9.4401 ACRES
	7.3301 NCNDQ
COMPUTE NM HYD	ID=1 HYD NO=200.TRB AREA= 0.01475 SO MI
	PER A=100 PER B=0 PER C=0 PER D=0
	TP=1333 HR MASS RAIN=-1
PRINT HYD	ID=1 CODE=1
*S*********	ID=1 CODE=1 *************
*S************	ID=1 CODE=1 ************************************
*s************************************	ID=1 CODE=1 ************************************
*S************************************	ID=1 CODE=1  ***********************************
*S************************************	ID=1 CODE=1  ***********************************
*S************************************	ID=1 CODE=1  ***********************************

Compute by:

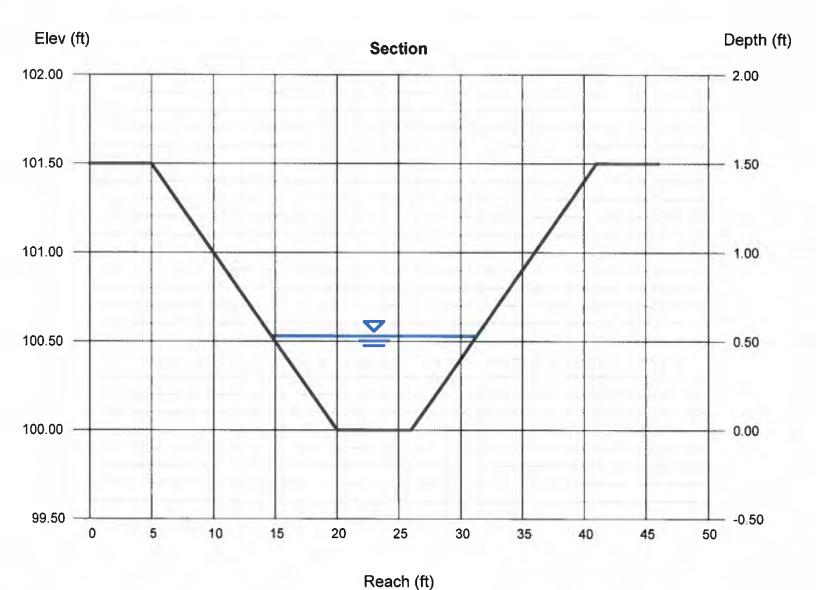
Known Q (cfs)

Known Q

= 32.85

#### Dennis Chavez Roadside Swale- West of 98th Street-Preliminary Design

Trapezoidal		Highlighted	
Bottom Width (ft)	= 6.00	Depth (ft)	= 0.53
Side Slopes (z:1)	= 10.00, 10.00	Q (cfs)	= 32.85
Total Depth (ft)	= 1.50	Area (sqft)	= 5.99
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 5.49
Slope (%)	= 3.40	Wetted Perim (ft)	= 16.65
N-Value	= 0.025	Crit Depth, Yc (ft)	= 0.68
		Top Width (ft)	= 16.60
Calculations		EGL (ft)	= 1.00



Compute by:

Known Q (cfs)

Known Q

= 32.85

### Dennis Chavez Roadside Swale- West of 98th Street-Preliminary Design II

Trapezoidal		Highlighted	
Bottom Width (ft)	= 6.00	Depth (ft)	= 0.59
Side Slopes (z:1)	= 5.00, 5.00	Q (cfs)	= 32.85
Total Depth (ft)	= 1.50	Area (sqft)	= 5.28
Invert Elev (ft)	= 100.00	Velocity (ft/s)	= 6.22
Slope (%)	= 3.40	Wetted Perim (ft)	= 12.02
N-Value	= 0.025	Crit Depth, Yc (ft)	= 0.79
		Top Width (ft)	= 11.90
Calculations		EGL (ft)	= 1.19

