CITY OF ALBUQUERQUE

April 18, 2018

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

RE: Heritage Trails Subdivision
Drainage Report Stamp Date: 3/15/18
Drainage Report Supplement Stamp Date: 4/13/18
Grading Plan Stamp Date: 4/13/18
Hydrology File: N08D006F

Dear Ms. Hoelzer:

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Based on the information provided on 4/13/18 and previous submittals, the Drainage Report, Drainage Report Supplement, and Grading Plan are approved for Preliminary Plat and Grading Permit.

Prior to Work Order Approval:
A detailed drainage report will be required prior to submitting for Work Order. This report will need to address the following outstanding items, not addressed in this drainage report.

1. Capacity of the valley gutter on Emerald Peak Trail, south of Crest Trail Drive will need to be verified to justify the lack of a waterblock.
2. Capacity of the valley gutter on Tyler Peak Trail, south of Crest Trail Drive will need to be verified to justify the lack of a waterblock.
3. At DRC, waterblock height will be verified. If waterblocks are not designed to 0.87', the Drainage Report will need to be revised to demonstrate capacity similar to the previous two cases.
4. Please include the interim grading plan for Unit 2/3 in the work order set.
5. Provide stormdrain profiles showing finished grade, Q, V, and HGL.
6. All pipe hydraulics need to be analyzed. Either separate WSPGW models need to be created for these, or V depth calculations may be used per DPM, Chapter 22.D.2.c&d. The following pipes will need to be analyzed:
    a. Basin B Model. Between the B2 inlets and SDMH 23B.
    b. Basin B Model. Between sump inlet B12 and SDMH 10B. It may be more reasonable to connect one of these inlets directly to SDMH 24B instead.
    c. Colobel. Between Inlets 3D and SDMH 58E.
    d. Basin C Model. Between Inlet C8 and SDMH 4C.
    e. Basin C Model. Between Inlet C6 and SDMH 6C.

Orig: Drainage File

f. Basin C Model. Between Inlet C5 and SDMH 7C.
g. Basin C Model. Between Inlet C3 and SDMH 10C.

7. In order to expedite the review of this project for Preliminary Plat an in depth review of the WSPGW model was not conducted. Prior to Work Order, the model will be thoroughly reviewed and stormdrain sizes, alignments, and inlets may be subject to change.
8. Please include the first flush pond designs in the work order set; several design items will need to be addressed at such time: design of the outlet structures, retaining walls designed for saturated soils, end treatments for the inlet pipes, perimeter fencing, etc.
9. This list is not exhaustive; additional comments may reasonably be expected.

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

Sincerely,

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

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Orig: Drainage File

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Heritage Trails (AKA Anderson Heights Unit 4) Building Permit #: _____ City Drainage #: N8 / D006F

DRB#: 1002739 EPC#: _____ Work Order#: _____

Legal Description: Tract A-1-A and tract B-1, Anderson Heights Unit 4

City Address: 118th street and Amole Mesa Avenue

Engineering Firm: MARK GOODWIN AND ASSOCIATES, PA Contact: Diane Hoelzer, PE

Address: PO BOX 90606, ABQ, NM 87199

Phone#: 828-2200 Fax#: _____ E-mail: diane@goodwinengineers.com

Owner: KB Home New Mexico Inc. Contact: Morris Barbera or Bo Johnson

Address: 7807 E.Peakview Avenue, Ste. 300, Centennial, Colorado, 80111

Phone#: (303)908-0575 or (505)450-4616 Fax#: _____ E-mail: _____

Architect: N/A Contact: _____

Address: _____

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

Other Contact: N/A Contact: _____

Address: _____

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

Check all that Apply:

DEPARTMENT:

X HYDROLOGY/ DRAINAGE

_____ TRAFFIC/ TRANSPORTATION

_____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

_____ ENGINEER/ ARCHITECT CERTIFICATION

_____ CONCEPTUAL G & D PLAN

X GRADING PLAN

_____ DRAINAGE MASTER PLAN

_____ DRAINAGE REPORT

_____ CLOMR/LOMR

_____ TRAFFIC CIRCULATION LAYOUT (TCL)

_____ TRAFFIC IMPACT STUDY (TIS)

_____ EROSION & SEDIMENT CONTROL PLAN (ESC)

_____ OTHER (SPECIFY) _____

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

_____ BUILDING PERMIT APPROVAL

_____ CERTIFICATE OF OCCUPANCY

X 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

X GRADING PERMIT APPROVAL

_____ SO-19 APPROVAL

_____ PAVING PERMIT APPROVAL

_____ GRADING/ PAD CERTIFICATION

_____ WORK ORDER APPROVAL

_____ CLOMR/LOMR

_____ PRE-DESIGN MEETING

_____ OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: X Yes _____ No

DATE SUBMITTED: April 13, 2018 By: Diane Hoelzer, PE

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ___

Heritage Trails
(Residential Subdivision)

Drainage Management Plan
Supplemental Information

Prepared by
Mark Goodwin & Associates, P.A.

April 13, 2018

D. Mark Goodwin & Associates, P.A.
Consulting Engineers
P.O. BOX 90606, ALBUQUERQUE,NM 87199
(505) 828-2200 FAX 797-9539

~ 2012 ACEC/NM Award Winner for Engineering Excellence ~
~ 2008 ACEC/NM Award Winner for Engineering Excellence ~
~ 2017 ENR Landscape/Urban Development Award of Merit~

April 13, 2018

Mr. Dana Peterson
Hydrology Department
City of Albuquerque
PO Box 1293
Albuquerque, NM 87103

Re: Heritage Trails Subdivision – (DRB 1002739)
Request Approval of Drainage Report and Grading Plan
File: N08D006F

Dear Mr. Peterson:

In response to your comment letter dated April 3, 2018:

Prior to Preliminary Plat/Grading Permit Approval:

1. Per your design revision request, additional manholes and straight lateral connections have been made at B6 and B11.
2. The required drainage easement across Lot 9, Block 13, Unit 1 was calculated to be 25.28'. The easement has been revised to be 26 feet. A trench prism details has been added to the drainage report supplemental information.
3. The outfall from Unit 1 pond was design to allow discharge out of the pond with 1' of head. I understand your concern about the EGL being at 5150.0. I have redesigned the Unit 1 first flush pond to eliminate the backwater effect at the outfall. I have raised the ground elevation along the east property boundary to 5150.5 which should is now at the maximum EGL elevation. The grading plan has been revised to reflect the design change.
4. First Flush ponds have a label now "to be constructed by work order" on the grading plan.

Prior to Work order Approval:

5.-12. Understood

Additional response:

13. The 118 th swale calculation report was in the street capacity appendix but I have included it again in this "supplemental information report. After you have reviewed this submittal and after all elements are approved, if you want me to submit a complete Drainage report, I can do that. Just let me know.
14. On the preliminary plat, the language about public and private easements was removed as a condition of final plat will be to work out the exact language to be used.
15. A 29' public drainage easement has been added through Tract JJ as requested.

Sincerely,

MARK GOODWIN & ASSOCIATES, PA

Diane Hoelzer, PE
Senior Engineer
DLH/dlh

CITY OF ALBUQUERQUE

April 3, 2018

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

RE: Heritage Trails Subdivision
Drainage Report Stamp Date: 3/15/18
Grading Plan Stamp Date: 3/29/18
Hydrology File: N08D006F

Dear Ms. Hoelzer:

Based on the information provided in your submittal received on 3/30/18, the Drainage Report and Grading Plan cannot be approved for Preliminary Plat or Grading Permit until the following are corrected and a revised Drainage Report and Grading Plan are submitted.

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Prior to Preliminary Plat/Grading Permit:

1. Several of the inlets are shown crisscrossing over the trunk line with their connecter pipes. Revise to provide straight connections to the manholes:
   a. Inlets B6.
   b. Inlet B11.
2. Reconfirm the trenching prism across Unit 1, Block 13, Lot 9. Provide the new pipe size, invert, finished grade elevation, and calculations used to justify the 24' easement.
3. The estimated maximum water surface elevation of 5145.4' in the unit 1 first flush pond is significantly less than the HGL elevation of 5150.5' or the EGL of 5151.7' provided in the WSPGW model. It appears the MWSE in the pond will be governed by the EGL, leading to water ponding against the existing garden wall bordering Arrowwood subdivision. Provide a solution to prevent ponding and saturated conditions against the existing wall and update the grading plan and Section F accordingly.
4. Label the ponds as "to be constructed by Work Order." These are infrastructure list items and their designs will need to be worked out further as discussed in comment 12.

Prior to Work Order Approval:

A detailed drainage report will be required prior to submitting for Work Order. This report will need to address the following outstanding items, not addressed in this drainage report.

5. Capacity of the valley gutter on Emerald Peak Trail, south of Crest Trail Drive will need to be verified to justify the lack of a waterblock.

Orig: Drainage File

6. Capacity of the valley gutter on Tyler Peak Trail, south of Crest Trail Drive will need to be verified to justify the lack of a waterblock.
7. At DRC, waterblock height will be verified. If waterblocks are not designed to 0.87', the Drainage Report will need to be revised to demonstrate capacity similar to the previous two cases.
8. Please include the interim grading plan for Unit 2/3 in the work order set.
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10. All pipe hydraulics need to be analyzed. Either separate WSPGW models need to be created for these, or V depth calculations may be used per DPM, Chapter 22.D.2.c&d. The following pipes will need to be analyzed:
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    f. Basin C Model. Between Inlet C5 and SDMH 7C.
    g. Basin C Model. Between Inlet C3 and SDMH 10C.
11. In order to expedite the review of this project for Preliminary Plat an in depth review of the WSPGW model was not conducted. Prior to Work Order, the model will be thoroughly reviewed and stormdrain sizes, alignments, and inlets may be subject to change.
12. Please include the first flush pond designs in the work order set; several design items will need to be addressed at such time: design of the outlet structures, retaining walls designed for saturated soils, end treatments for the inlet pipes, perimeter fencing, etc.

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

Sincerely,

Dana Peterson, P.E.
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Development Review Services

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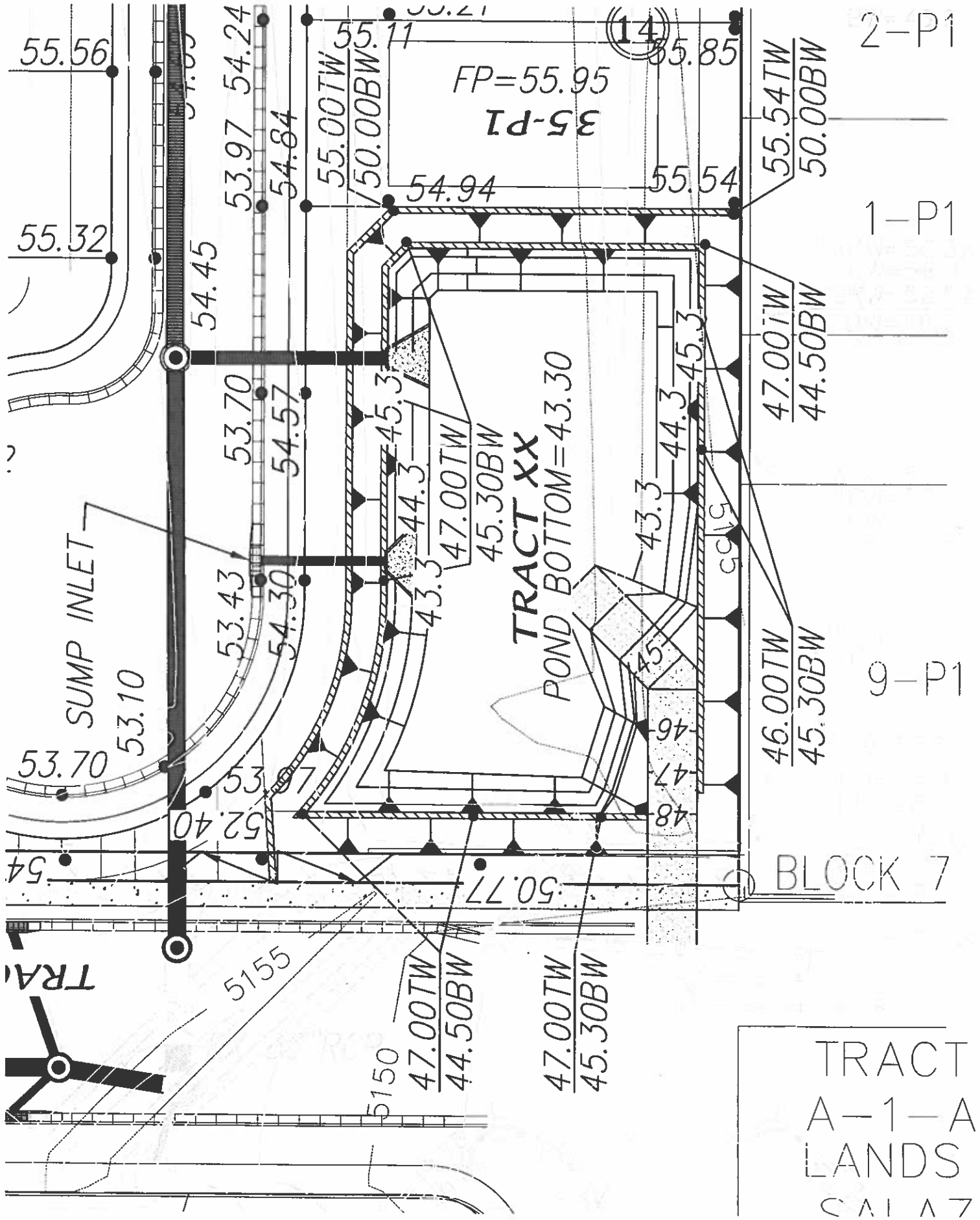
Orig: Drainage File



Unit 1 First Flush Pond Details (revised):

Req'd Volume = 20,683 Cu.Ft.

Volume Provided = 20,770 Cu.Ft.

Pond Bottom = 5143.3

Top Pond = 5150.50

Max WSEL (First Flush) = 5146.0

12' wide Maintenance Road 10:1 slope Max

Use maintenance road at emergency overflow spillway

Maximum elevation at or near right of way line =5148.00.

Use weir equation:

Q = C x L x H^(3/2)

= 3 x 12 x (2)^(1.5) = 102 cfs

Assumes maximum WSEL at spillway = 5150.00,

*** (below adjacent unit 1 pad elevations and the Arrowood retaining walls)

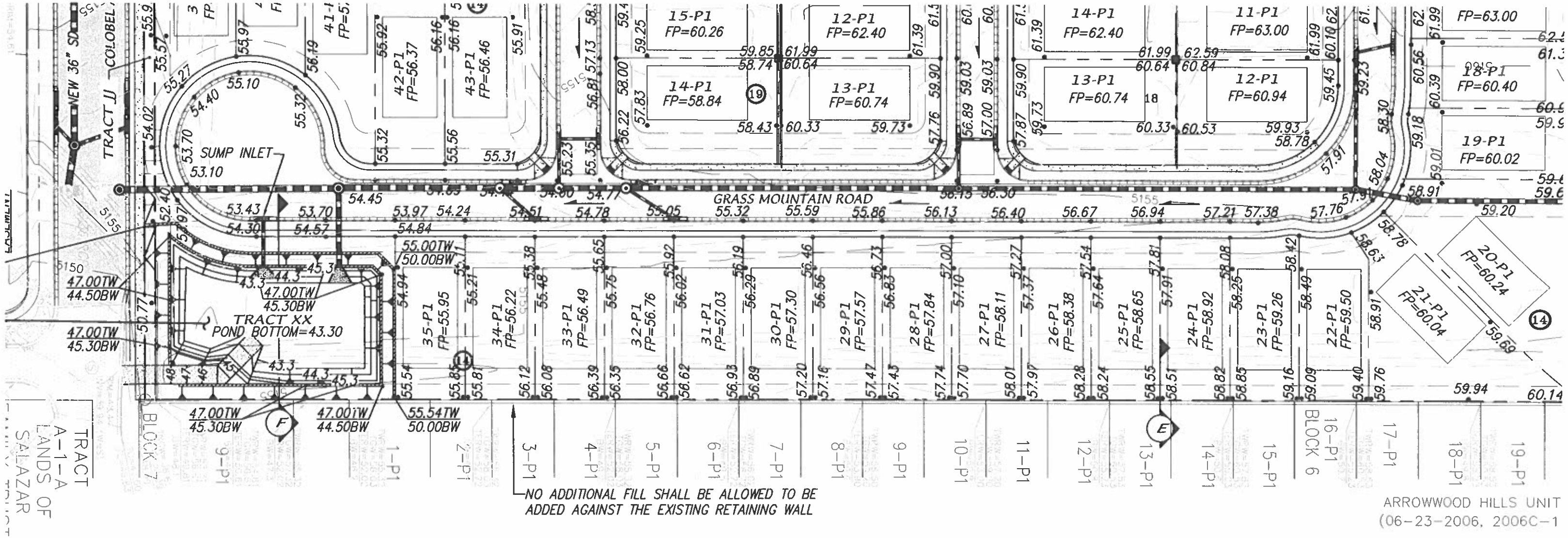
Manhole C2 details:

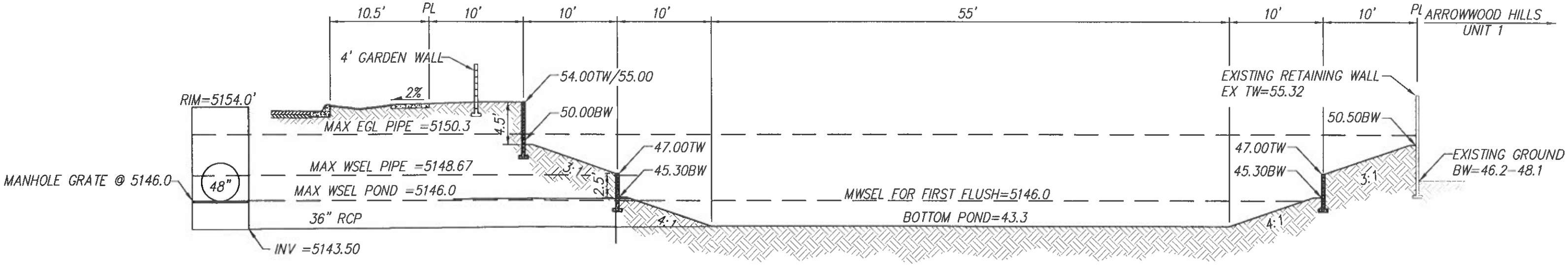
Refer to First Flush Pond Unit 1 Exhibit

=➔ Manhole C2 will have 48" RCP north and south invert at approximate elevation 5146.0. There will be a grate at this elevation that will divert first flush discharge to first flush pond until required volume is reached at elevation 5146.0, then the rest of the storm discharge will continue south to the existing 72" storm stub and ultimately into regional pond 10. The exact grate size and configuration details will be worked out at DRC.

Table 5

Heritage Trails Unit 1 First Flush Pond (REVISED 4-12-18)				
Volume Calculations-Design Provided				
ELEV ft.	AREA sq.ft.	VOLUME cu.ft.	SUM-VOL cu.ft.	SUM-VOL ac.ft.
43.3	5,662.60			
44.3	7,190.30	6,411	6,411	
44.8	8,667.00	3,959	10,370	0.238
45.3	8,667.00	4,334	14,703	0.338
46.0	8,667.00	6,067	20,770	0.477





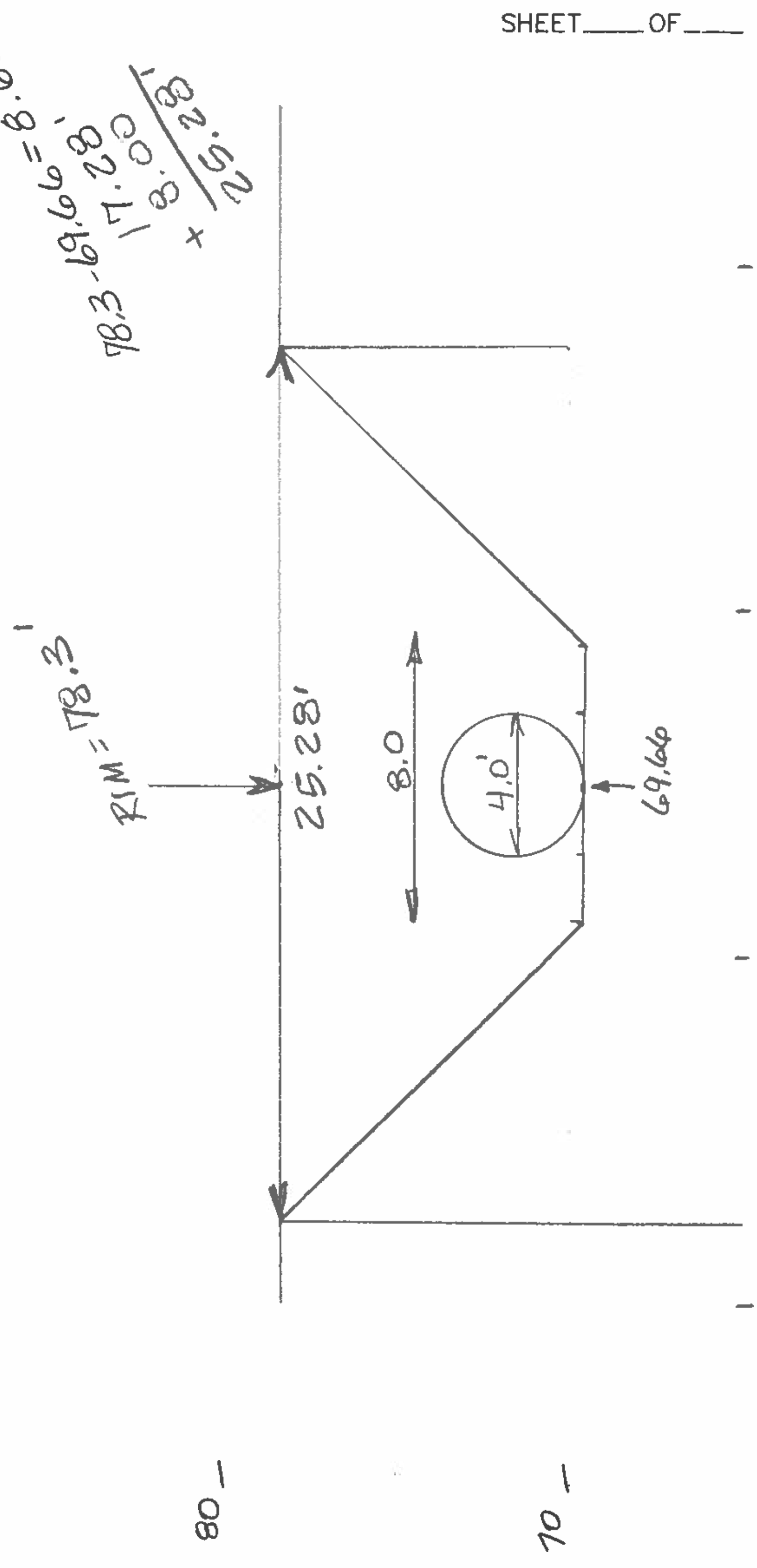
SECTION F - POND DETAIL

(TRACT XX) SCALE: 1"=10'

Heritage Trails Subdivision – Unit 1
First Flush Pond typical cross section

dmg
D. Mark Goodwin & Associates, P.A.
Consulting Engineers
P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539

PROJECT *Heritage Trails*
SUBJECT *Lot 9, Block 13, Unit 1*
BY________ DATE________
CHECKED________ DATE *4-10-18*
SHEET____ OF____



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Feb 15 2018

118th Street Road side Swale - 2.33%

Triangular

Side Slopes (z:1)	= 10.00, 10.00
Total Depth (ft)	= 2.50
Invert Elev (ft)	= 10.00
Slope (%)	= 2.33
N-Value	= 0.030

Calculations

Compute by:	Known Q
Known Q (cfs)	= 47.00

Highlighted

Depth (ft)	= 1.00
Q (cfs)	= 47.00
Area (sqft)	= 10.00
Velocity (ft/s)	= 4.70
Wetted Perim (ft)	= 20.10
Crit Depth, Yc (ft)	= 1.07
Top Width (ft)	= 20.00
EGL (ft)	= 1.34

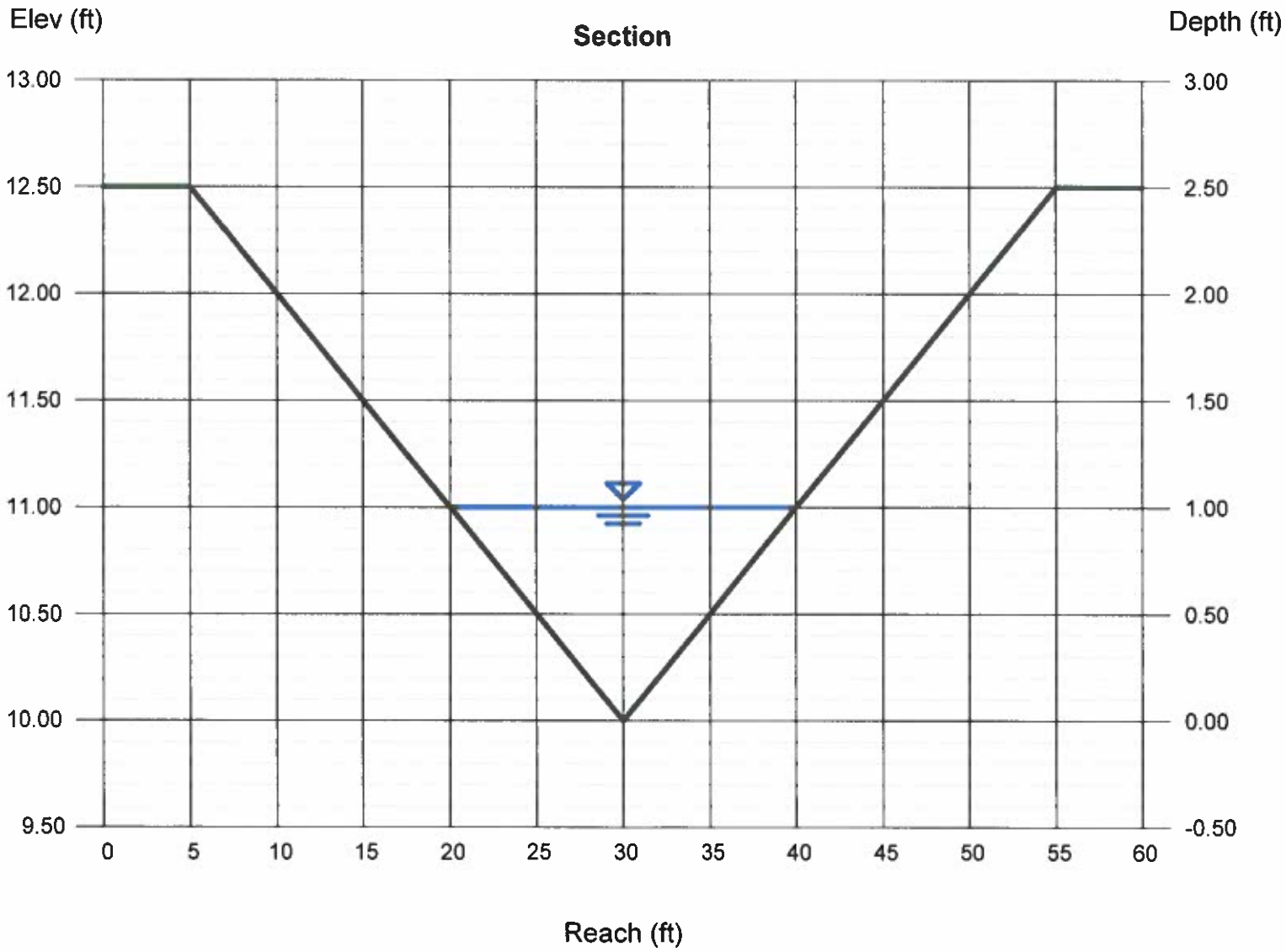


Table 3

Heritage Trails Subdivision							
WSPGW - Storm Drain Analysis							
Storm Drain "C"							
Manhole # - WSPGW Station ID							
Manhole ID	WSPGW Station	Rim Estimate	WSEL	Manhole ID	WSPGW Station	Rim Estimate	WSEL
1E	1207.1 1217.1	145.9	142.7	3C	2060.4 2066.4	54	150.8
SD Size	78"			SD Size	48"		
2E	1407.4 1417.4	147.2	146.3	4C	2098.4 2104.4	54.4	151.0
SD Size	78"			SD Size	42"		
3E	1594.4	148.7	147.1	5C	2141.9 2147.9	54.6	151.6
SD Size	78"			SD Size	42"		
57E	1778.9 1786.9	51.52	150.7	6C	2357.4 2363.4	54.8	152.5
SD Size	72"			SD Size	36"		
1C	1814.3 1820.3	152	150.8	7C	2615.2 2619.2	56.7	154.6
SD Size	72"			SD Size	36"		
2C	1904.7 1910.7	54	150.8	8C	2657.8	57.9	154.9
36" To First Flush Pond				SD Size	36"		
SD Size	60"			9C	2859.1	58.9	155.7
				SD Size	36"		
				10C	2897.4 2901.4	59.6	156.4
				SD Size	24"		
				11C	2953.4 2957.4	60.5	157.6
				SD Size	24"		
				12C	3135.4	58.5	158.3
				SD Size	24"		
				13C	3213.5	61.5	158.6

↓ Upstream Direction

↓ Upstream Direction

Between 1C - 2C = 72"

Between 2C - 3C = 60"

It brought WSEL to an acceptable level upstream.

Current DRC
Project Number:_____

FIGURE 12

INFRASTRUCTURE LIST

EXHIBIT "A"

TO SUBDIVISION IMPROVEMENTS AGREEMENT

EVELOPMENT REVIEW BOARD (D.R.B.) REQUIRED INFRASTRUCTURE LI

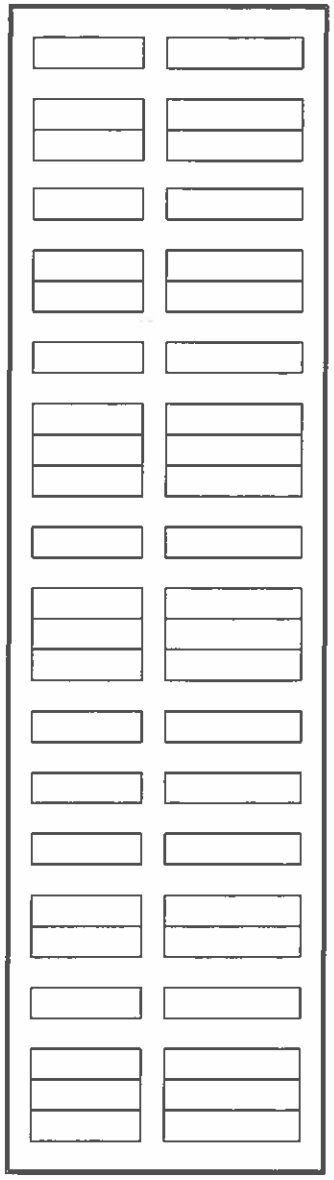
Heritage Trails Subdivision Unit 1-3
PROPOSED NAME OF PLAT

Tract A-1-A, Tract B-1, Anderson Heights Unit 4
EXISTING LEGAL DESCRIPTION PRIOR TO PLATTING ACTION

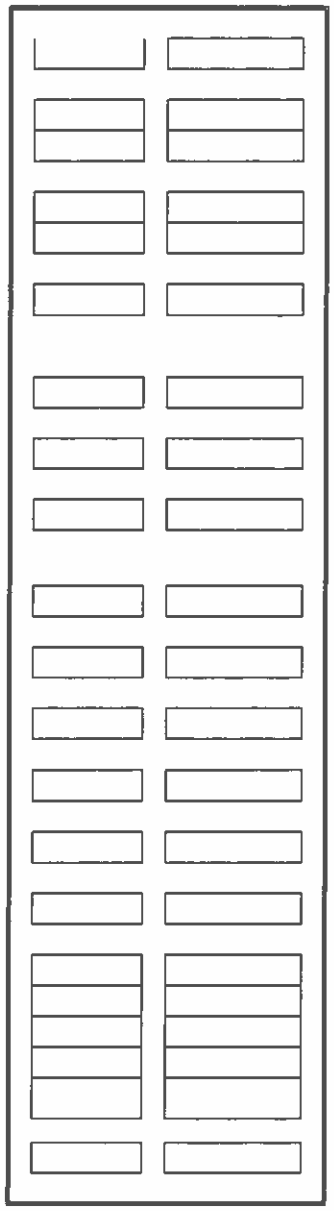
Date Submitted: 4/13/2018
Date Site Plan Approved:_____
Date Preliminary Plat Approved:_____
Date Preliminary Plat Expires:_____
DRB Project No.: 1002739
DRB Application No.: 18DRB-7003
*Extended 4-19-17 to 4-19-18

Following is a summary of PUBLIC/PRIVATE Infrastructure required to be constructed or financially guaranteed for the above development. This Listing is not necessarily a complete listing. During the SIA process and/or in the review of the construction drawings, if the DRC Chair determines that appurtenant items and/or unforeseen items have not been included in the infrastructure listing, the DRC Chair may include those items in the listing and related financial guarantee. Likewise, if the DRC Chair determines that appurtenant or non-essential items can be deleted from the listing, those items may be deleted as well as the related portions of the financial guarantees. All such revisions require approval by the DRC Chair, the User Department and agent/owner. If such approvals are obtained, these revisions to the listing will be incorporated administratively. In addition, any unforeseen items which arise during construction which are necessary to complete the project and which normally are the Subdivider's responsibility will be required as a condition of project acceptance and close out by the City.

SIA Sequence #	COA DRC Project #	Size	Type of Improvement	Location	From	To	Private Inspector	City Inspector	City Cnst Engineer
			OFF-SITE PAVING - UNIT 1						
		36' FF	Perm Pvmt (Collector)	Amole Mesa Ave.	118th Street	Lot 12 Block 12	/	/	/
		8"	C&G (south side only)						
		6'	Sidewalk (south side)	Amole Mesa Ave.	118th Street	East Property Line	/	/	/
		48' FF	Perm Pvmt (Collector)	Colobel Avenue	Duerson Trail Exist Pavement	Exist Pvmt at Morrissey	/	/	/
		8"	C&G (both sides)						
		6'	Sidewalk (north side)				/	/	/
			PAVING - UNIT 1						
		46' FF	Perm Pvmt	Crest Trail Drive	Three Rivers Road	Unit 1/2 Boundary	/	/	/
		6'	Sidewalk (both sides)						
		6'	Median				/	/	/
		8"	C&G (both sides)				/	/	/
		26' FF	Perm Pvmt	Crest Trail Drive (2)	Three Rivers Road	Grass Mountain Road	/	/	/
			C&G (both sides) (9)						
		4'	Sidewalk (both sides) (1)				/	/	/
		4'	Sidewalk	Tract DD, EE, II, HH			/	/	/



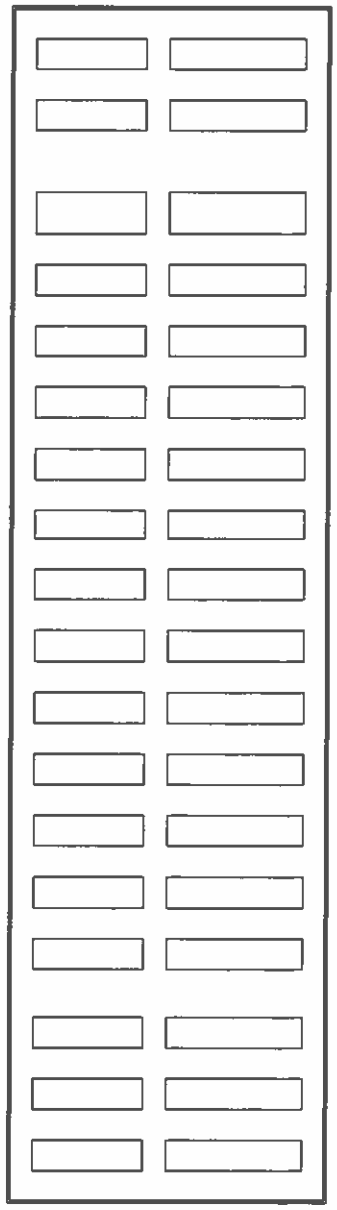
28' FF	Perm Pvmt	South Peak Road (2)	Three Rivers Road	Winsor Street	/	/	/
8"	C&B (both sides)						
4'	Sidewalk (both sides) (1)				/	/	/
4'	Sidewalk	Tract GG			/	/	/
26' FF	Perm Pvmt	Horseshoe Lake Road (2)	Three Rivers Road	Winsor Street	/	/	/
8"	C&G (both sides)						
4'	Sidewalk (both sides) (1)				/	/	/
4'	Sidewalk	Tract GG, HH, CC, DD			/	/	/
26' FF	Perm Pvmt	Gold Hill Road	Three Rivers Road	Grass Mountain Road	/	/	/
8"	C&G (both sides)						
4'	Sidewalk (both sides) (1)				/	/	/
4'	Sidewalk	Tract II, EE, FF			/	/	/
10'	Traffic calming speed hump	Gold Hill Road	Near Tract II		/	/	/
28' FF	Perm Pvmt	West Fork Culdesac (2)	Three Rivers Road	Grass Mountain Road	/	/	/
8"	C&G (both sides)						
4'	Sidewalk (north side) (1)				/	/	/
4'	Sidewalk (south side)				/	/	/
4'	Sidewalk (south side) (1)	Lot 13,14, Blk 13			/	/	/
48' R	Perm Pvmt Culdesac	West Fork Culdesac			/	/	/
8"	C&G (both sides)						
4'	Sidewalk (both sides) (1)				/	/	/
28' FF	Perm Pvmt	Three Rivers Road (2)	South Peak Road	West Fork Road	/	/	/
8"	C&G (both sides)						
4'	Sidewalk (west side) (1)				/	/	/
4'	Sidewalk (east side)	Tract CC, DD, EE, FF			/	/	/
26' FF	Perm Pvmt	Grass Mountain Road (2)	Crest Trail Drive Road	End 48' Radius Culdesac	/	/	/
8"	C&G (both sides)						
4'	Sidewalk (both sides) (1)				/	/	/
4'	Sidewalk (west side)	Lot 12,13 Block 18			/	/	/
4'	Sidewalk (west side)	Lot 13, 14, Block 19			/	/	/



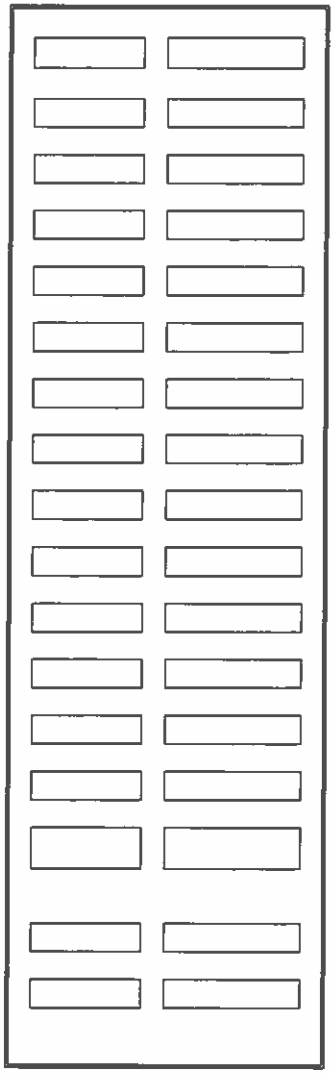
26' FF	Perm Pvmt	Winsor Street (2)	South Peak Road	Horseshoe Lake Road	/	/	/
8"	C&G (both sides)						
4'	Sidewalk (1) (north, east, south)				/	/	/
4'	Sidewalk (west side)	Lot 2, 3, Block 16			/	/	/
32' FF	Perm Pvmt	Rider Ridge Drive	Amole Mesa Ave.	Crest Trail Drive Drive	/	/	/
4'	Median				/	/	/
8"	C&G (both sides)						
6'	Sidewalk (both sides)				/	/	/
6'	Sidewalk	Tract II	Crest Trail Dr.	Gold Hill Rd.	/	/	/
32' FF	Perm Pvmt	Quail Canyon Road	West Fork Road	Colobel Ave.	/	/	/
8"	C&G (both sides)						
6"	Sidewalk (both sides)				/	/	/

WATER - UNIT 1

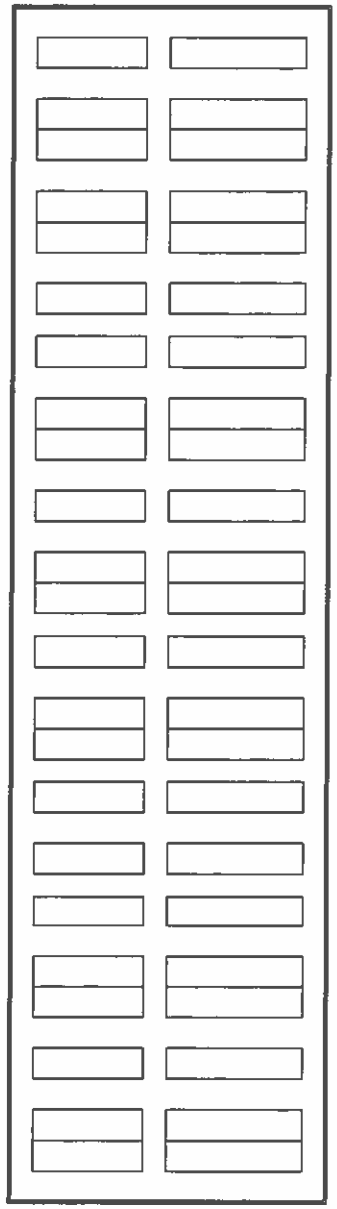
8"	Waterline	Grass Mountain Rd.	Colobel Ave. Exist 10" WL	Crest Trail Dr.	/	/	/
8"	Waterline	Rider Ridge Drive	Amole Mesa Exist 12" WL	South Peak Rd.	/	/	/
8"	Waterline	Rider Ridge Drive	Horseshoe Lake Rd.	Crest Trail Dr.	/	/	/
6"	Waterline	Three Rivers Rd.	South Peak Rd.	West Fork Rd.	/	/	/
4"	Waterline	West Fork Dr.	Culdesac (7 Lots)		/	/	/
8"	Waterline	Winsor St.	South Peak Road	Horseshoe Lake Rd.	/	/	/
6"	Waterline	South Peak Rd.	Three Rivers Rd.	Rider Ridge Drive	/	/	/
8"	Waterline	South Peak Rd.	Rider Ridge Drive	Winsor St.	/	/	/
6"	Waterline	Horseshoe Lake Rd.	Three Rivers Rd.	Rider Ridge Drive	/	/	/
8"	Waterline	Horseshoe Lake Rd.	Rider Ridge Drive	Winsor St.	/	/	/
8"	Waterline	Crest Trail Dr.	Grass Mountain Rd.	Unit 1/2 Bndry (L28 B11/L1 B12)	/	/	/
6"	Waterline	Gold Hill Rd.	Grass Mountain Rd.	Three Rivers Rd.	/	/	/



6"	Waterline	West Fork Rd.	Grass Mountain Rd.	Three Rivers Rd.	/	/	/
8"	Waterline Stub (3 Each)	Colobel Ave. (*)	Rem & Dispose Cap at Main		/	/	/
SANITARY SEWER - UNIT 1							
8"	Sanitary Sewer	Quail Canyon Rd.	West Fork Rd.	Exist 8" SAS Colobel Ave.	/	/	/
8"	Sanitary Sewer	West Fork Rd.	Lot 14, Block 19	Three Rivers Road	/	/	/
8"	Sanitary Sewer	West Fork Rd. Culdesac	7 Lots		/	/	/
8"	Sanitary Sewer	Three Rivers Rd.	West Fork Rd.	Lot 1, Block 13	/	/	/
8"	Sanitary Sewer	Grass Mountain Rd.	Existing SAS Colobel Ave.	Crest Trail Dr.	/	/	/
8"	Sanitary Sewer	Gold Hill Rd.	Grass Mountain Rd.	Lot 24 Blk 18/Lot 1 Blk 19	/	/	/
8"	Sanitary Sewer	Crest Trail Dr.	Grass Mountain Rd.	Three Rivers Rd.	/	/	/
8"	Sanitary Sewer	Three Rivers Rd.	Crest Trail Dr.	South Peak Rd.	/	/	/
8"	Sanitary Sewer	Rider Ridge Dr.	Crest Trail Dr.	Horseshoe Lake Rd.	/	/	/
8"	Sanitary Sewer	Horseshoe Lake Rd.	Winsor St.	L18 B15, L1 B17	/	/	/
8"	Sanitary Sewer	Winsor St.	Horseshoe Lake Rd.	South Peak Rd.	/	/	/
8"	Sanitary Sewer	South Peak Lake Rd.	Three Rivers Rd.	Winsor St.	/	/	/
8"	Sanitary Sewer	Colobel Ave.	Exist SAS	Row Line @ Tract AA	/	/	/
STORM DRAIN - UNIT 1							
18"	Storm Drain	West Fork Rd.	Lot 14, Blk 19		/	/	/
18"- 24"	Storm Drain	Crest Trail Dr.	Grass Mountain Rd.	Rider Ridge Dr.	/	/	/
18"-24"	Storm Drain	Winsor St.	Horseshoe Lake Rd.	South Peak Rd.	/	/	/

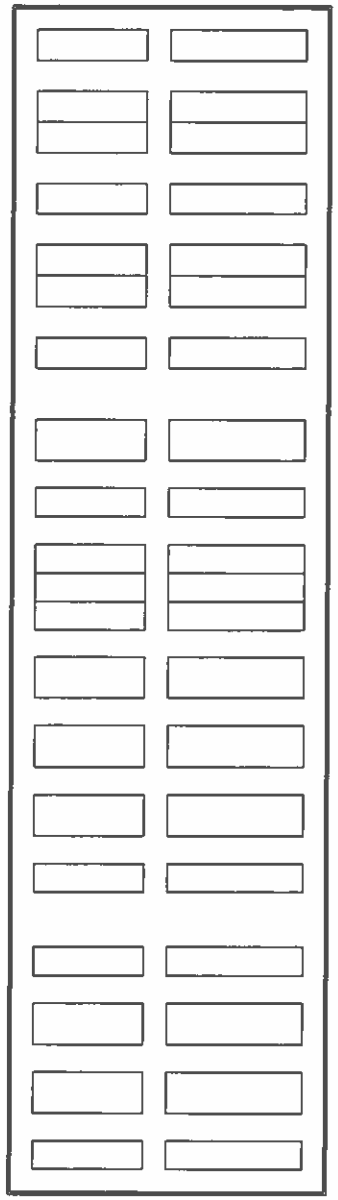


24"	Storm Drain	South Peak Rd.	Winsor St.	Rider Ridge Dr.	/	/	/
48"	Storm Drain	Tract XX	Exist MH 57 Colobel	Tract XX Pond	/	/	/
36"	Storm Drain	24' Easement	Lot 20, B14	Lot 13, B14	/	/	/
24"	Storm Drain	Tract XX	Grass Mtn Culdesac	Traxt XX Pond	/	/	/
36"-48"	Storm Drain	Grass Mountain Rd.	Tract XX	24' Esmt Lot 20, B 14	/	/	/
18"	Storm Drain	Horseshoe Lake Dr.	Winsor St.	Rider Ridge Dr.	/	/	/
18" - 24"	Storm Drain	Gold Hill Rd.	Grass Mountain Rd.	Lot 13	/	/	/
18"	Storm Drain & (2) Inlets	Colobel Ave.	Near Tract ZZ		/	/	/
18" - 24"	Storm Drain & (4) Inlets	Colobel Ave.	Near Grass Mountain Culdesac		/	/	/
48"	Storm Drain (10)	Colobel Ave.	Exist 57 MH	Quail Canyon Rd.	/	/	/
48"-54"	Storm Drain (10)	Quail Canyon Rd.	Colobel Ave.	West Fork Rd.	/	/	/
48"	Storm Drain (10)	West Fork Rd.	Quail Run	Three Rivers Rd.	/	/	/
48"	Storm Drain (10)	Three Rivers Rd.	West Fork Rd.	26' Esmt Lot 9, B 13	/	/	/
48"	Storm Drain (10)	26' Esmt Lot 9, B 13	Three Rivers Road	Tr.ZZ, 20' Stub Unit 2	/	/	/
30'	Drainage Swale (With Agreement & Covenant and Drainage Easement)(14)	West of 118th St.	Existing Pond 2	63 ft. N. of 118th St. & Amole Mesa Intersect	/	/	/
18"	Single A Inlet & SD Connection	Amole Mesa	Near East P.L. Unit 1		/	/	/
20,683 CF	First Flush Pond (11) (With Maintenance Access Road and 4' Perimeter Wall/Fence)	Tract XX			/	/	/



PAVING - UNIT 2 (INTERNAL PRIVATE ROADS)

28' FF	Perm Pvmt (Access/Normal Local)	Emerald Peak Trail	Crag Peak Way	Basin Peak Way	/ / /
	C&G (both sides) (9)				
4'	Sidewalks (both sides) (1)				/ / /
4'	Sidewalk (both sides)	Tract H-1, J, G-1, I, O-1, N, P-1, S			/ / /
42' - 54'	Perm Pvmt (Major Local)	Emerald Peak Trail	Amole Mesa Ave.	Crag Peak Way	/ / /
10'	Median & Turnaround				
8"	C&G (both sides)				
6'	Sidewalks (both sides)				/ / /
26' FF	Perm Pvmt (Access)	Pine Town Way (2)	Tyler Peak Trail	Alta Peak Trail	/ / /
	C&G (both sides) (9)				
4'	Sidewalks (north side) (1)				/ / /
4'	Sidewalk (south side)	Tract T			/ / /
26' FF	Perm Pvmt (Access)	Tyler Peak Trail	Pine Town Way	Crest Trail Drive	/ / /
	C&G (both sides) (9)				
4'	Sidewalks (both sides) (1)				/ / /
4'	Sidewalk (east side)	Tract M			/ / /
26' FF	Perm Pvmt	Tyler Peak Trail	Crest Trail Drive	Basin Peak Way	/ / /
	C&G (both sides) (9)				
4'	Sidewalk (both sides (1)				/ / /
4'	Sidewalk (both side)	Tract I, L, J, K			/ / /
28' FF	Perm Pvmt	Crest Trail Drive	Unit 2/3 Boundary	Alta Peak Trail	/ / /
8"	C&G (both sides)				
6'	Sidewalk	Tract O-1, G-1			/ / /
46' FF	Perm Pvmt	Crest Trail Drive	Alta Peak Trail	Unit 1/2 Boundary	/ / /
8"	C&G (both sides)				
6'	Median				/ / /
6'	Sidewalk (both sides)				/ / /
26' FF	Perm Pvmt (Access)	Alta Peak Trail (2)	Basin Peak Way	Pine Town Way	/ / /
	C&G (both sides) (9)				
4'	Sidewalk (both sides) (1)				/ / /
4'	Sidewalk	Tract M, L, BB, R-1			/ / /



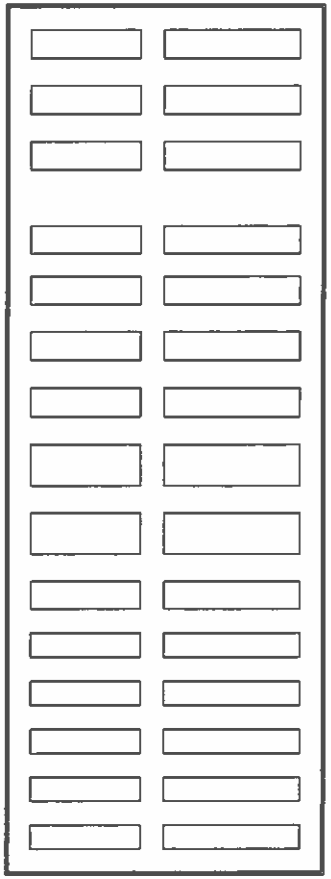
26' FF	Perm Pvmt	Crag Peak Way	Unit 2/3 Bndry	Tyler Peak Trail			
	C&G (both sides) (9)						
4'	Sidewalk (north side) (1)	Lots 45-52					
4'	Sidewalk (both sides)	Tracts Q, R, P-1, S					
26' FF	Perm Pvmt	Basin Peak Way	Unit 2/3 Bndry	Alta Peak Trail			
	C&G (both sides) (9)						
4'	Sidewalk (south side) (1)	Lots 36-50					
4'	Sidewalk (both sides)	Tracts H-1, J, K, AA, ZZ					
6'	Sidewalk (Private Access)	Tract AA	Basin Peak Way	Colobel Avenue			

WATER - UNIT 2

8"	Waterline	Emerald Peak Trail	Amole Mesa Existing 12" WL	Basin Peak Way			
8"	Waterline	Pine Town Way	Tyler Peak Trail	Alta Peak Trail			
8"	Waterline	Tyler Peak Trail	Pine Town Way	Crag Peak Way			
6"	Waterline	Tyler Peak Trail	Crag Peak Way	Basin Peak Way			
8"	Waterline	Alta Peak Trail	Basin Peak Way	Pine Town Way			
8"	Waterline	Basin Peak Way	Unit 2/3 Boundary Lot 35/36	Alta Peak Trail			
8"	Waterline	Crest Trail Drive	Alta Peak Trail	Unit 1/2 Boundary L28 B11/Lot1 B12			
8"	Waterline	Crag Peak Way	Tyler Peak Trail	Unit 2/3 Boundary Lot 49/50 B 3			
8"	Waterline	Tract AA	Colobel Ave. Ext. 10" WL	Basin Peak Way			

SANITARY SEWER - UNIT 2

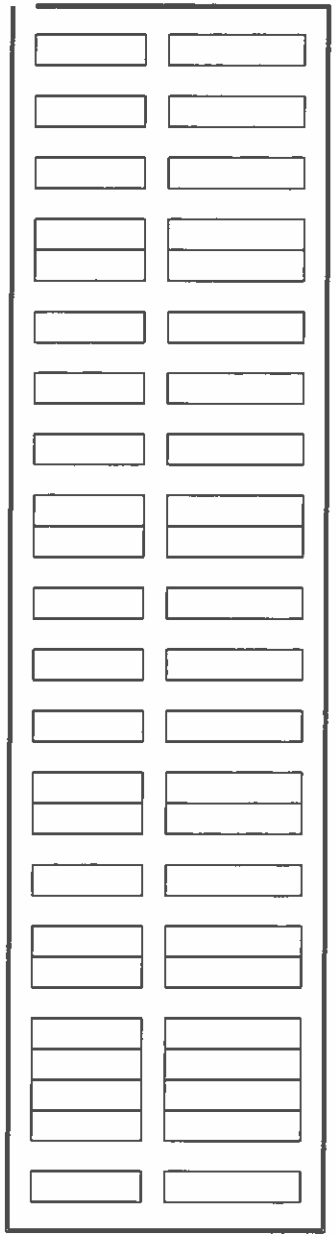
8"	Sanitary Sewer	Basin Peak Way	Unit 2/3 Bndry Lot 35/36	Alta Peak Trail			
8"	Sanitary Sewer	Tract AA	Basin Peak Way	Existing 8" SAS Colobel Ave.			
8"	Sanitary Sewer	Crag Peak Way	Unit 2/3 Boundary Lot 49/50	Tyler Peak Trail			
8"	Sanitary Sewer	Emerald Peak Trail	Crag Peak Way	Basin Peak Way			



8"	Sanitary Sewer	Tyler Peak Trail	Basin Peak Way	Pine Town Way			
8"	Sanitary Sewer	Pine Town Way	Tyler Peak Trail	Alta Peak Trail			
8"	Sanitary Sewer	Alta Peak Trail	Pine Town Way	Basin Peak Way			

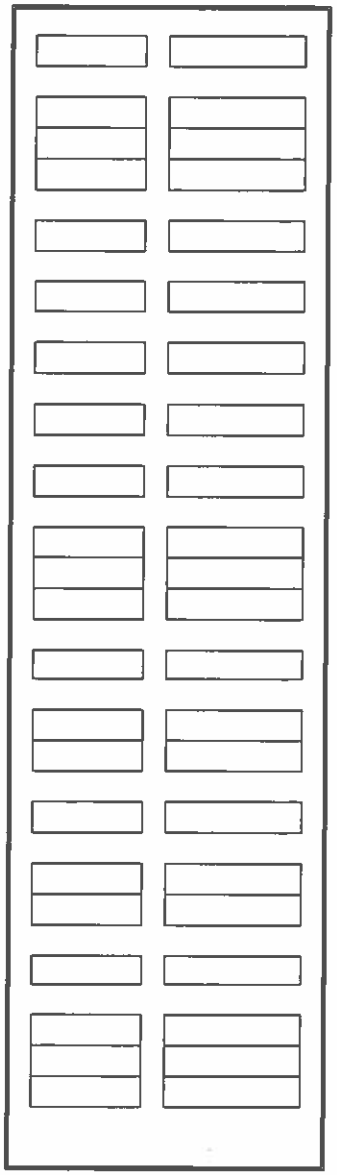
STORM DRAIN - UNIT 2 (INTERNAL STORM DRAIN PRIVATE)

36" - 54"	Storm Drain	Alta Peak Trail	Tract ZZ	Pine Town Way			
18" - 36"	Storm Drain	Basin Peak Way	Alta Peak Trail	Tyler Peak Trail			
30"-36"	Storm Drain	Pine Town Way	Alta Peak Trail	Tyler Peak Trail			
30"	Storm Drain	Tyler Peak Trail	Pine Town Way	Crag Peak St.			
24"-30"	Storm Drain	Crag Peak St.	Tyler Peak Trail	Unit 2/3 Bndry, L 49/50 B3			
48"	Storm Drain	Tract ZZ	Exist Stub	Tract ZZ First Flush Pond			
54"	Storm Drain	Tract 22	First Flush Pond	Alta Peak Drive			
10 ft.	Swale	Tract L					
10 ft.	Swale	Tract R					
28,857 CF	First Flush Pond (11)	Tract ZZ					
	Maintenance Access Road with 4' Perimeter Wall/Fence						

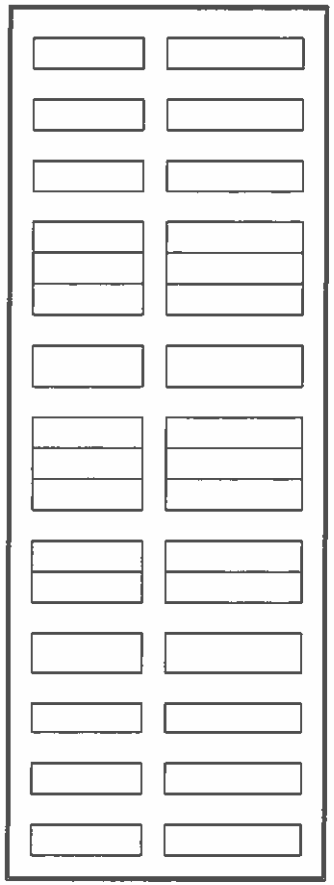


PAVING - UNIT 3 (INTERNAL PAVING PRIVATE)

26' FF	Perm Pvmt (Access)	Cirque Peak Way (2)	Eagle Peak Trail	Bord Peak Trail	/ / /
	C&G (both sides) (9)				
4'	Sidewalk (both sides) (1)				/ / /
26' FF	Perm Pvmt (Access)	Eagle Peak Trail (2)	Costilla Peak Way	Cirque Peak Way	/ / /
	C&G (both sides) (9)				
4'	Sidewalk (west side) (1)				/ / /
4'	Sidewalk (east side)	Tract OO			/ / /
26' FF	Perm Pvmt (Access)	Costilla Peak Way (2)	Eagle Peak Trail	Bord Peak Trail	/ / /
	C&G (both sides) (9)				
4'	Sidewalk (both sides) (1)				/ / /
26' FF	Perm Pvmt (Access)	Bord Peak Trail	Cirque Peak Way	Costilla Peak Way	/ / /
	C&G (both sides) (9)				
4'	Sidewalk (east side) (1)				/ / /
4'	Sidewalk (west side)	Tract NN			/ / /
28' FF	Perm Pvmt (Normal Local)	Bord Peak Trail	Costilla Peak Way	Crest Trail Drive	/ / /
8"	C&G both sides				
4'	Sidewalks (both sides)	Tract X, Tract V, Tract W, Tract C			/ / /
26' FF	Perm Pvmt (Access)	Bord Peak Trail	Crest Trail Drive	Banner Peak Way	/ / /
	C&G both sides (9)				
4'	Sidewalks (both sides) (1)				/ / /
4'	Sidewalks	Tract E, Tract F			/ / /
26' FF	Perm Pvmt (Access)	Diamond Peak Way	Bord Peak Trail	Deer Horn Peak Trail	/ / /
	C&G (both sides) (9)				
4'	Sidewalk (north side) (1)				/ / /
4'	Sidewalk (south side)	Tract W			/ / /
56' FF	Perm Pvmt (Normal Local) (9)	Barrow Way	118th Street	Bord Peak Trail	/ / /
28'	Westbound Lane				/ / /
16'	Eastbound Lane				/ / /
12'	Median (Varies) & Turnaround				/ / /
8"	C&G (both sides)				
6'	Sidewalk (both sides)				/ / /

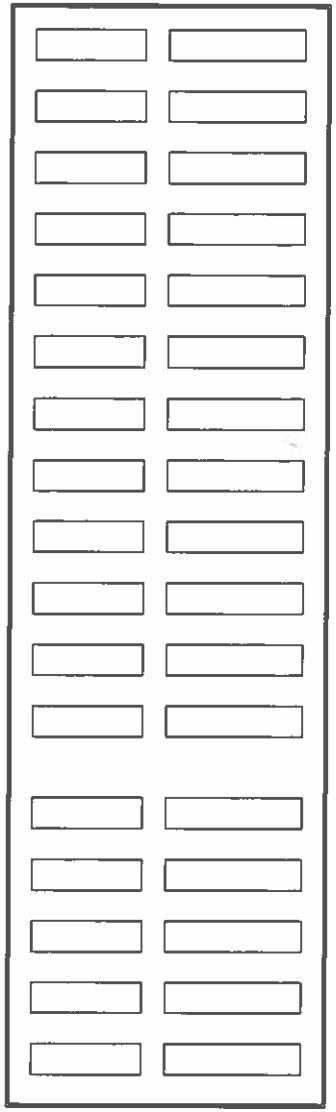


28' FF	Perm Pvmt (Access)	Crest Trail Drive	Bord Peak Trail	Unit 2/3 Boundary	/ / /
	C&G (both sides) (9)				
4'	Sidewalk (north side)	Tract W, O			/ / /
4'	Sidewalk (south side) (1)				/ / /
4'	Sidewalk (south side)	Tract G			/ / /
26' FF	Perm Pvmt (Access)	Crest Trail Drive (2)	Adams Peak Trail	Bord Peak Trail	/ / /
	C&G (both sides) (9)				
4'	Sidewalk (both sides)	Tract C, Tract E			/ / /
26' FF	Perm Pvmt (Access)	Adams Peak Trail (2)	Crest Trail Drive	Banner Peak Way	/ / /
	C&G (both sides) (9)				
4'	Sidewalks (both sides) (1)				
26' FF	Perm Pvmt (Access)	Banner Peak Way (2)	Adams Peak Trail	Bord Peak Trail	/ / /
	C&G (both sides) (9)				
4'	Sidewalk (south side) (1)				/ / /
4'	Sidewalk (north side)	Tract F			/ / /
4'	Sidewalk (south side)	Tract B			/ / /
26' FF	Perm Pvmt (Normal Local)	Crag Peak Way (2)	Deer Horn Peak Trail	Unit 2/3 Boundary	/ / /
	C&G (both sides) (9)				
4'	Sidewalk (Northside) (1)				/ / /
4'	Sidewalk (south side)	Tract P			/ / /
26' FF	Perm Pvmt (Access)	Deer Horn Peak Trail (2)	Crag Peak Way	Basin Peak Way	/ / /
	C&G (both sides) (9)				
4'	Sidewalks (west side)	Tract W, U, Lot 25, Blk 1			/ / /
4'	Sidewalks (both sides) (1)				/ / /
26' FF	Perm Pvmt (Access)	Basin Peak Way (2)	Deer Horn Peak Trail	Unit 2/3 Boundary	/ / /
	C&G (both sides) (9)				
4'	Sidewalks (south sides) (1)				/ / /
4'	Sidewalks (north side)	Tract H-2			/ / /
6'	Sidewalk	Tract B	Banner Peak Way	Colobel Avenue	/ / /
	(Private Access)				



WATER - UNIT 3

6"	Waterline	Cirque Peak Way	Eagle Peak Trail	Bord Peak Trail	/	/	/
6"	Waterline	Eagle Peak Trail	Costilla Peak Way	Cirque Peak Way	/	/	/
6"	Waterline	Costilla Peak Way	Eagle Peak Trail	Bord Peak Trail	/	/	/
6"	Waterline	Bord Peak Trail	Cirque Peak Way	Costilla Peak Way	/	/	/
8"	Waterline	Bord Peak Trail	Costilla Peak Way	Banner Peak Way	/	/	/
6"	Waterline	Diamond Peak Way	Bord Peak Trail	Deer Horn Peak Trail	/	/	/
10"	Waterline	Barrow Way	118th Street Existing 18" WL	Bord Peak Trail	/	/	/
6"	Waterline	Crest Trail Drive	Adams Peak Trail	Bord Peak Trail	/	/	/
8"	Waterline	Crest Trail Drive	Bord Peak Trail	Deer Horn Peak Trail	/	/	/
6"	Waterline	Adams Peak Trail	Crest Trail Drive	Banner Peak Way	/	/	/
6"	Waterline	Banner Peak Way	Adams Peak Trail	Tract B	/	/	/
8"	Waterline	Banner Peak Way	Tract B	Bord Peak Trail	/	/	/
8"	Waterline	Tract B	Banner Peak Way	Existing 10" WL Colobel Stub	/	/	/
8"	Waterline	Crag Peak Way	Deer Horn Peak Trail	Unit 2/3 Bndry Lot 49/50	/	/	/
8"	Waterline	Deer Horn Peak Trail	Crag Peak Way	Basin Peak Way	/	/	/
8"	Waterline	Basin Peak Way	Deer Horn Peak Trail	Unit 2/3 Bndry Lot 35/36	/	/	/

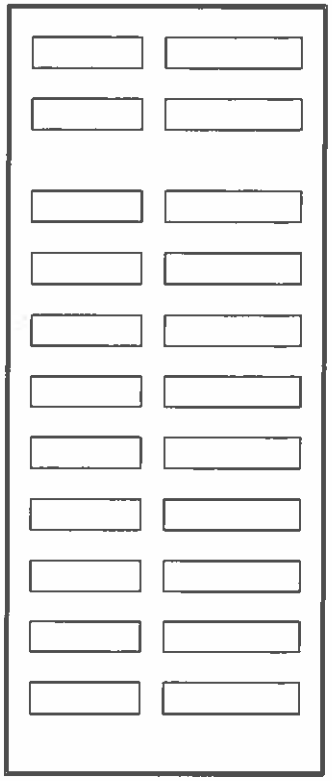


SANITARY SEWER - UNIT 3

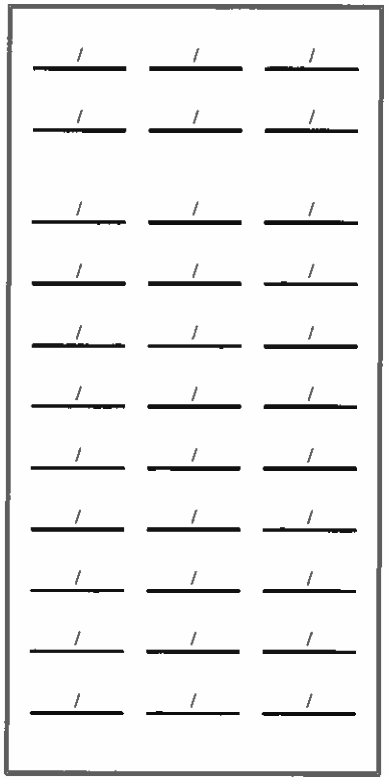
8"	Sanitary Sewer	Cirque Peak Way	Eagle Peak Trail	Bord Peak Trail	/ / /
8"	Sanitary Sewer	Eagle Peak Trail	Costilla Peak Way	Cirque Peak Way	/ / /
8"	Sanitary Sewer	Costilla Peak Way	Eagle Peak Trail	Bord Peak Trail	/ / /
8"	Sanitary Sewer	Bord Peak Trail	Cirque Peak Way	Banner Peak Way	/ / /
8"	Sanitary Sewer	Diamond Peak Way	Lot 35 B3	Deer Horn Peak Trail	/ / /
8"	Sanitary Sewer	Crest Trail Drive	Lot 21 B1	Deer Horn Peak Trail	/ / /
8"	Sanitary Sewer	Adams Peak Trail	Lot 1 Crest Trail Drive	Banner Peak Way	/ / /
8"	Sanitary Sewer	Banner Peak Way	Adams Peak Trail	Bord Peak Trail	/ / /
8"	Sanitary Sewer	Tract B	Banner Peak Way	Colobel Ave. Exst SAS	/ / /
8"	Sanitary Sewer	Crag Peak Way	Lot 49/50 B 3	Deer Horn Peak Rd.	/ / /
8"	Sanitary Sewer	Deer Horn Peak Rd.	Crag Peak Way	Basin Peak Way	/ / /
8"	Sanitary Sewer	Basin Peak Way	Deer Horn Peak Rd.	Unit 2/3 Bndry Lot 35/36	/ / /

STORM DRAIN - UNIT 3 (INTERNAL STORM DRAIN PRIVATE)

24"	Storm Drain	Crag Peak St.	Unit 2/3 Boundary	Deer Horn Peak Tr.	/ / /
24"	Storm Drain	Deer Horn Peak Tr.	Crag Peak St.	Diamond Peak Way	/ / /
18"-24"	Storm Drain	Diamond Peak Way	Deer Horn Peak Tr.	Lot 39/40 Blk 3	/ / /
24"	Storm Drain	Colobel Ave (*)	Tract B	Existing MH 1A	/ / /
24"	Storm Drain	Tract B	Existing SD Colobel Ave.	Banner Peak Way	/ / /



24"	Storm Drain	Banner Peak Way	Tract B	Tract F Pond
3,826 CF	First Flush Pond (11)	Tract F		
	Concrete Rundown, including (3) Double D Inlets and 4' Perimeter Wall/Fence			
10 ft.	Swale	Tract A-2		
10 ft.	Swale	Tract C		
0.035 AF	Retention Pond	Tract D		
0.0207 AF	Retention Pond	Tract Y		
10 ft.	Swale	Tract X		
10 ft.	Swale	Tract Z		



to DRB approval of this listing. The Items listed below are subject to the standard SIA requirements.

Financially Guaranteed DRC #	Constructed Under DRC #	Size	Type of Improvement	Location	From	To	Construction Certification: Private Inspector P.E.		City Cnst Engineer
							/	/	/
							/	/	/

Approval of Creditable Items: _____
Impact Fee Admistrator Signature **Dat**

Approval of Creditable Items: _____
City User Dept. Signature **Date**

1	Sidewalks to be Deferred per Exhibit
2	Includes Knuckles
3	Street Lights Per DPM
4	Water Infrastructure includes Valves, Fittings, Valve Boxes, Fire Hydrants, and Appurtenances.
5	Sanitary Sewer includes manholes and service connection to property line
6	Storm Drain includes manholes & inlets
7	Grading & Drainage certification per DPM for release of SIA & Financial Guaranty's. Financial Guaranty's are not required for grading.
8	Colobel (*) to include remove and replace asphalts; remove unused existing storm pipe and stubs or water or sewer stubs
9	Refer to 8" Curb and Gutter Exhibit
10	These Storm Drain items are associates with and for benefit of Unit 2
11	Agreement and Covenant for First Flush Pond Tracts Required
12	If Unit 2 & 3 are developed seperately, a revised phasing plan shall be submitted and included in the work order of the first unit developed
13	storm drain sizes may be subject to change at DRC, pending Hydrology approval of the finalized HGL calculations.
14	At Final Plat

AGENT / OWNER

Diane Hoelzer, P.E.
NAME (print)

MARK GOODWIN & ASSOCIATES
FIRM

4-12-18
SIGNATURE - date

MAXIMUM TIME ALLOWED TO CONSTRUCT THE IMPROVEMENTS WITHOUT A DRB EXTENSION: N/A

DEVELOPMENT REVIEW BOARD MEMBER APPROVALS

DRB CHAIR - date	**PARKS & GENERAL SERVICES - date**
TRANSPORTATION DEVELOPMENT - date	**AMAFCA - date**
UTILITY DEVELOPMENT - date	**CODE ENFORCEMENT - date**
CITY ENGINEER - date	_____ **- date**

DESIGN REVIEW COMMITTEE REVISIONS

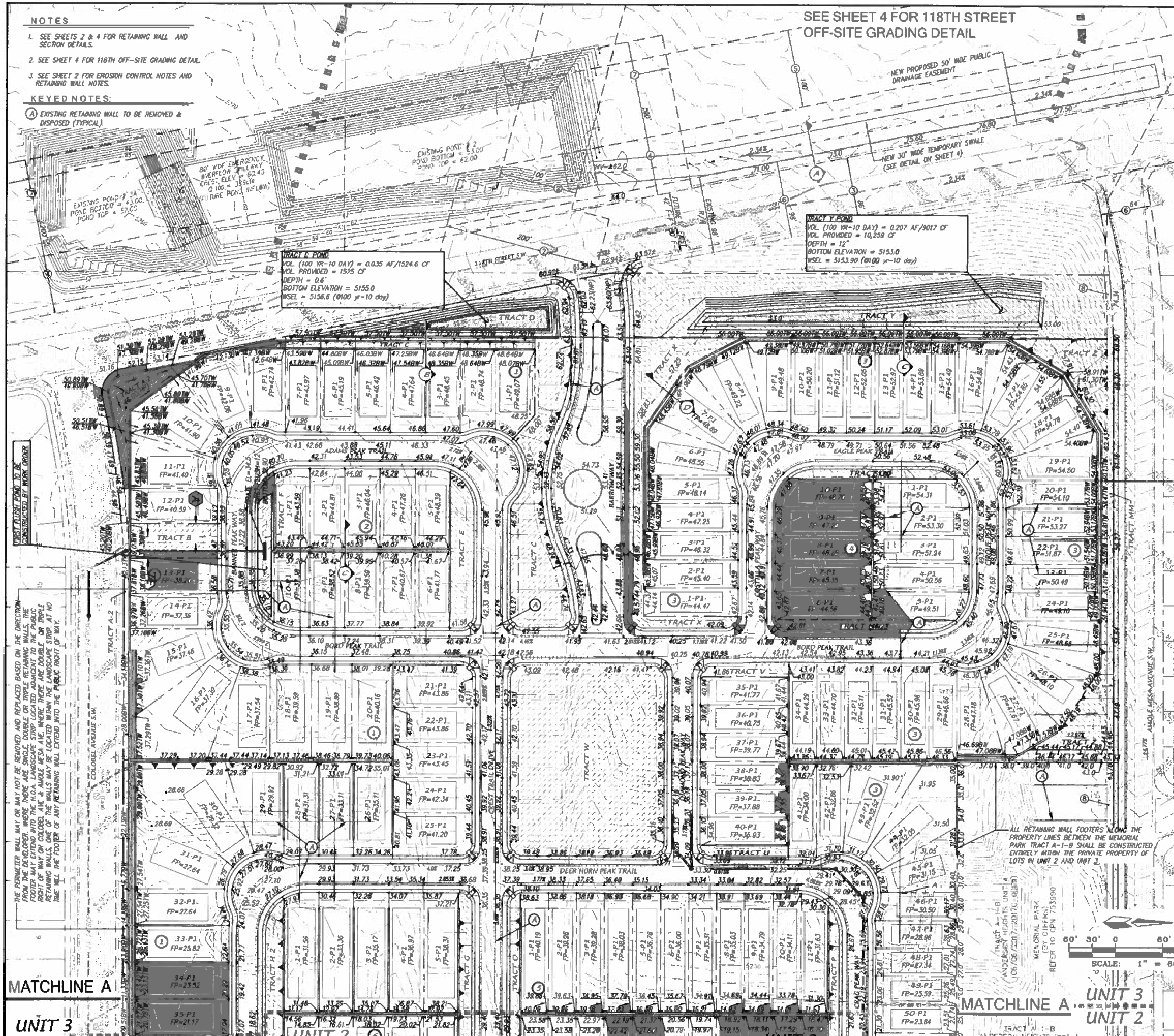
REVISION	DATE	DRC CHAIR	USER DEPARTMENT	AGENT /OWNER

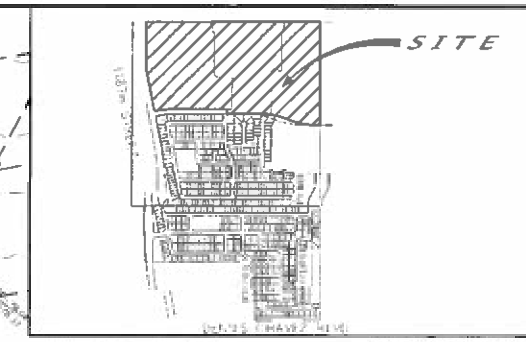
NOTES

1. SEE SHEETS 2 & 4 FOR RETAINING WALL AND SECTION DETAILS.
2. SEE SHEET 4 FOR 118TH OFF-SITE GRADING DETAIL.
3. SEE SHEET 2 FOR EROSION CONTROL NOTES AND RETAINING WALL NOTES.

KEYED NOTES:

(A) EXISTING RETAINING WALL TO BE REMOVED & DISPOSED (TYPICAL).





VICINITY MAP

LEGEND

- EXISTING CONTOUR (MAJOR)
- EXISTING CONTOUR (MINOR)
- EXISTING SPOT ELEVATION
- EXISTING TOP CURB/FLOWLINE ELEVATION
- EXISTING TOP WEST RETAINING WALL ELEV.
- EXISTING TOP WEST GROUND ELEVATION
- EXISTING TOP EAST RETAINING WALL ELEV.
- EXISTING BOTTOM WALL EAST GROUND ELEV.
- EXISTING SANITARY SEWER MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING ELECTRIC TRANSFORMER
- EXISTING FENCE
- EXISTING POWER POLE
- EXISTING GAS LINE
- EXISTING STORM DRAIN
- EXISTING SAS LINE
- EXISTING WATER LINE
- NEW MOUNTABLE CURB & GUTTER
- NEW STANDARD CURB & GUTTER
- NEW SIDEWALK (THIS PROJECT)
- NEW RIGHT-OF-WAY
- NEW CENTERLINE
- NEW LOT LINES
- NEW EASEMENTS
- .81.77 NEW SPOT ELEVATIONS
- 81.77TW / 81.77BW NEW TOP OF WALL ELEVATION / NEW BOTTOM OF WALL ELEVATION
- NEW FLOW DIRECTION
- NEW FLOW DIRECTION
- NEW SLOPE
- HIGH PT NEW HIGH POINT
- NEW STORM DRAIN INLET
- ZONE BOUNDARY LINE
- NEW SINGLE RETAINING WALL
- NEW DOUBLE RETAINING WALL
- NEW TRIPLE RETAINING WALL
- PI 94.60 NEW POINT OF VERTICAL INTERSECTION
- 24" RCP NEW STORM DRAIN
- NEW STORM DRAIN MANHOLE
- EXISTING ASPHALT PAVEMENT
- EXISTING CONCRETE
- NEW OFF-SITE PAVEMENT

APPROVED ROUGH GRADING ±18" — CITY HYDROLOGY — DATE

AS BUILT INFORMATION

CONTRACTOR — DATE
WORK STARTED BY — DATE
INSPECTOR'S ACCEPTANCE BY — DATE
FIELD VERIFICATION BY — DATE
DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION
RECORDED BY — DATE
NO.

BENCH MARKS

AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
G-G=0.999676466
δα=-00°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

SURVEY INFORMATION — FIELD NOTES — NO. — BY — DATE

ENGINEER'S SEAL
DIANE HOELZER, NEW MEXICO, 11903, LICENSED PROFESSIONAL ENGINEER
4-13-18

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	DLH	DATE	10/17
DRAWN BY	DEK	DATE	10/17
CHECKED BY	DMG	DATE	10/17

dmg MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
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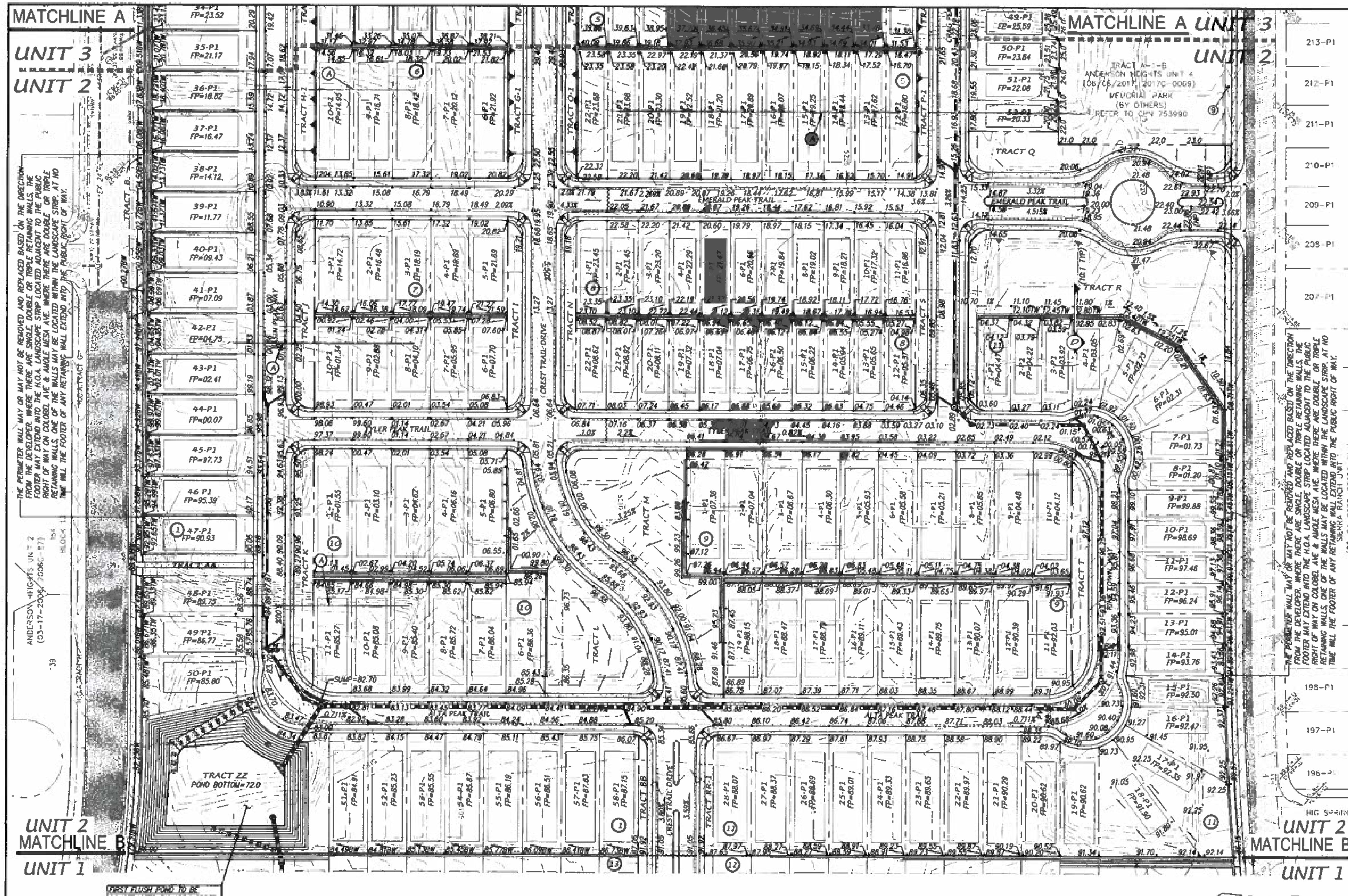
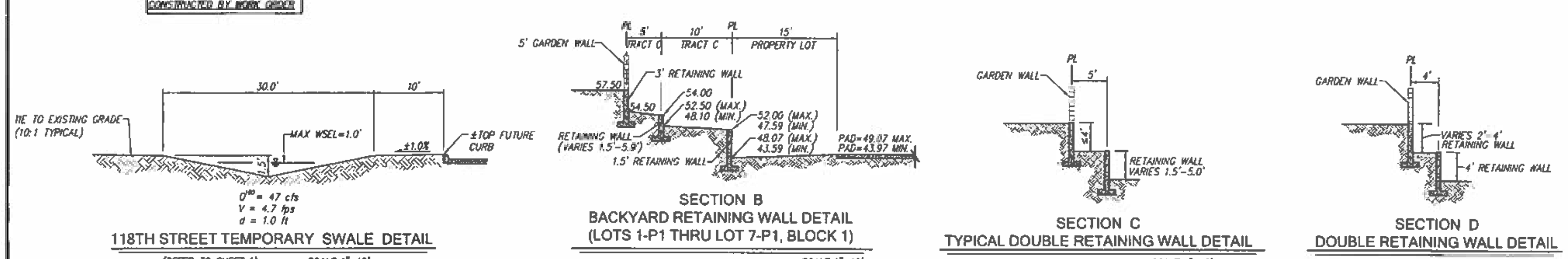
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: HERITAGE TRAILS SUBDIVISION
OVERALL GRADING & DRAINAGE PLAN

DESIGN REVIEW COMMITTEE — CITY ENGINEER APPROVAL — MO./DAY/YR. — MO./DAY/YR.
LAST DESIGN UPDATE

CITY PROJECT NO. — ZONE MAP NO. N-8-Z — SHEET 1 OF 4





NOTE:

USE RETAINING WALLS:
WHERE THE DIFFERENCE IN ELEVATION BETWEEN THE ADJACENT PADS IS 3.0' OR MORE A RETAINING WALL MUST BE CONSTRUCTED BETWEEN THE LOTS AS SHOWN ON THE PLAN AND THERE WILL BE NO PRIVATE DRAINAGE EASEMENT.

USE STEM WALLS:
WHERE THE DIFFERENCE IN ELEVATION BETWEEN THE ADJACENT PADS IS GREATER THAN 1.5' BUT LESS THAN 3.0', A STEM WALL SHALL BE CONSTRUCTED BY THE BUILDER ON THE "HIGH SIDE" OF LOT PAD.

FOR ALL SIDE YARDS:
EACH LOT OWNER MUST CONSTRUCT, OPERATE, AND MAINTAIN HIS OWN SEPARATE DRAINAGE SWALE ALL THE WAY TO THE STREET AND CROSS LOT DRAINAGE WILL BE PREVENTED BY SOME COMBINATION OF WALLS AND BERMS ON THE COMMON LOT LINE TO BE JOINTLY MAINTAINED BY BOTH LOT OWNERS.

LEGEND

- EXISTING CONTOUR (MAJOR)
- EXISTING CONTOUR (MINOR)
- EXISTING SPOT ELEVATION
- EXISTING TOP CURB/FLOWLINE ELEVATION
- EXISTING TOP WEST RETAINING WALL ELEV.
- EXISTING TOP WEST GROUND ELEVATION
- EXISTING TOP EAST RETAINING WALL ELEV.
- EXISTING BOTTOM WALL EAST GROUND ELEV.
- EXISTING SANITARY SEWER MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING ELECTRIC TRANSFORMER
- EXISTING FENCE
- EXISTING POWER POLE
- EXISTING GAS LINE
- EXISTING STORM DRAIN
- EXISTING SAS LINE
- EXISTING WATER LINE
- NEW MOUNTABLE CURB & GUTTER
- NEW STANDARD CURB & GUTTER
- NEW SIDEWALK (THIS PROJECT)
- NEW RIGHT-OF-WAY
- NEW CENTERLINE
- NEW LOT LINES
- NEW EASEMENTS
- +81.77 NEW SPOT ELEVATIONS
- 81.77TW / 81.77BW NEW TOP OF WALL ELEVATION / NEW BOTTOM OF WALL ELEVATION
- NEW FLOW DIRECTION
- NEW FLOW DIRECTION
- NEW SLOPE
- HIGH PT NEW HIGH POINT
- NEW STORM DRAIN INLET
- ZONE BOUNDARY LINE
- NEW SINGLE RETAINING WALL
- NEW DOUBLE RETAINING WALL
- NEW TRIPLE RETAINING WALL
- PI 94.60 NEW POINT OF VERTICAL INTERSECTION
- 24" RCP NEW STORM DRAIN
- NEW STORM DRAIN MANHOLE
- EXISTING ASPHALT PAVEMENT
- EXISTING CONCRETE
- NEW OFF-SITE PAVEMENT

EROSION CONTROL NOTES

1. CONTRACTOR MUST OBTAIN A TOPSOIL DISTURBANCE PERMIT FROM THE ENVIRONMENTAL HEALTH DIVISION PRIOR TO CONSTRUCTION.
2. CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST EDITION SHALL GOVERN ALL WORK.
3. THE CONTRACTOR SHALL CONFORM TO ALL CITY, COUNTY, STATE AND FEDERAL DUST CONTROL MEASURES AND REQUIREMENTS AND WILL BE RESPONSIBLE FOR PREPARING AND OBTAINING ALL NECESSARY APPLICATIONS AND APPROVALS.
4. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE LOTS INTO PUBLIC RIGHT-OF-WAY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AND WETTING THE SOIL TO KEEP IT FROM BLOWING
5. THE EARTHWORK CONTRACTOR SHALL STOCKPILE ENOUGH MATERIAL ADJACENT TO RETAINING WALL LOCATIONS TO BE UTILIZED FOR WALL BACKFILL.

NOTES

1. SEE SHEET 4 FOR MORE RETAINING WALL & SECTION DETAILS.

KEYED NOTES:

(A) EXISTING RETAINING WALL TO BE REMOVED & DISPOSED (TYPICAL).

AS BUILT INFORMATION	
CONTRACTOR	
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE
MICRO-FILM INFORMATION	
RECORDED BY	DATE
NO.	

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CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

SURVEY INFORMATION		
FIELD NOTES		
NO.	BY	DATE

ENGINEER'S SEAL

DIANE HOELZER NEW MEXICO 11987 LICENSED PROFESSIONAL ENGINEER

4-13-18

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	DLH	DATE	10/17
DRAWN BY	DER	DATE	10/17
CHECKED BY	DMG	DATE	10/17

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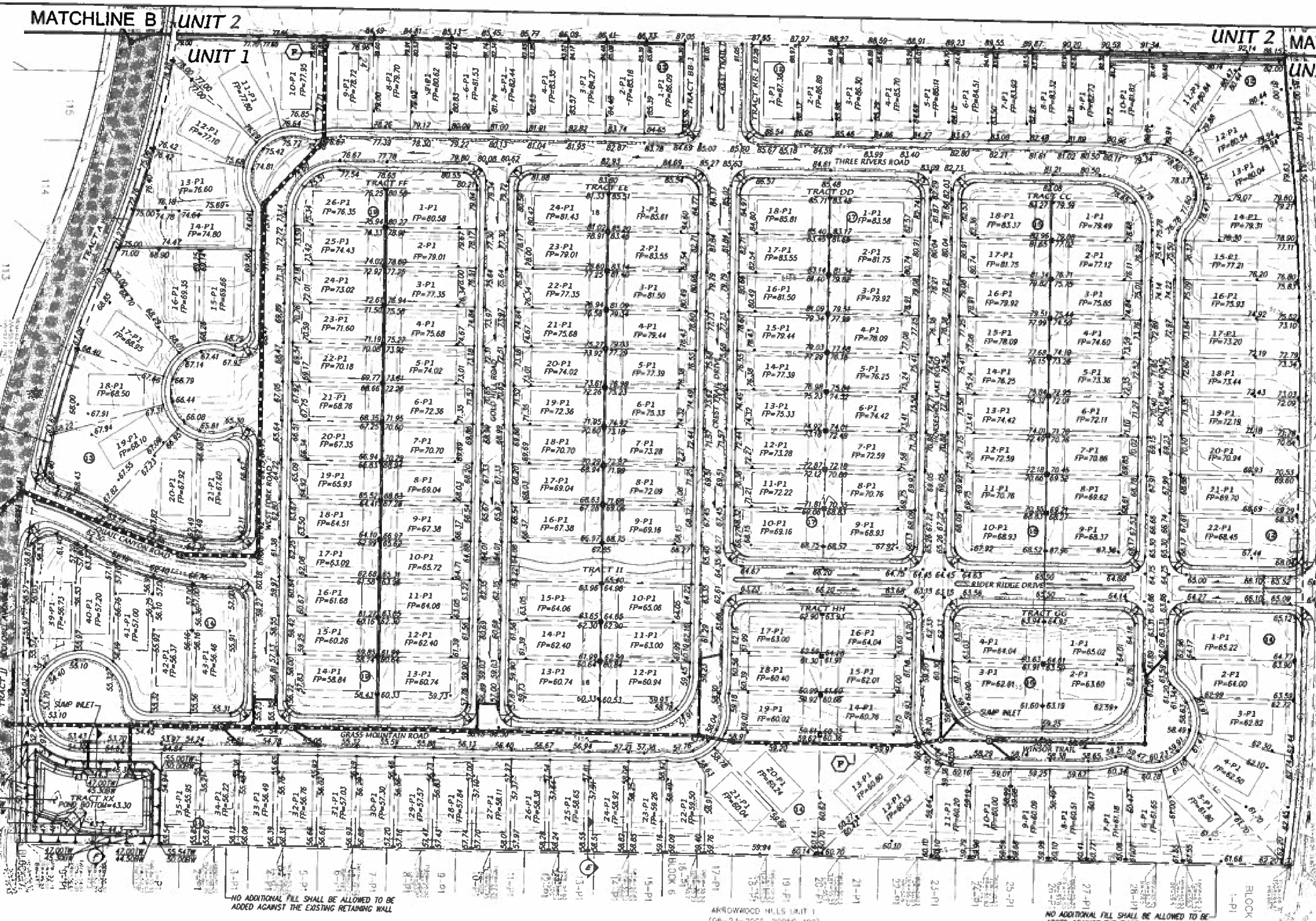
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE:
HERITAGE TRAILS SUBDIVISION
OVERALL GRADING & DRAINAGE PLAN

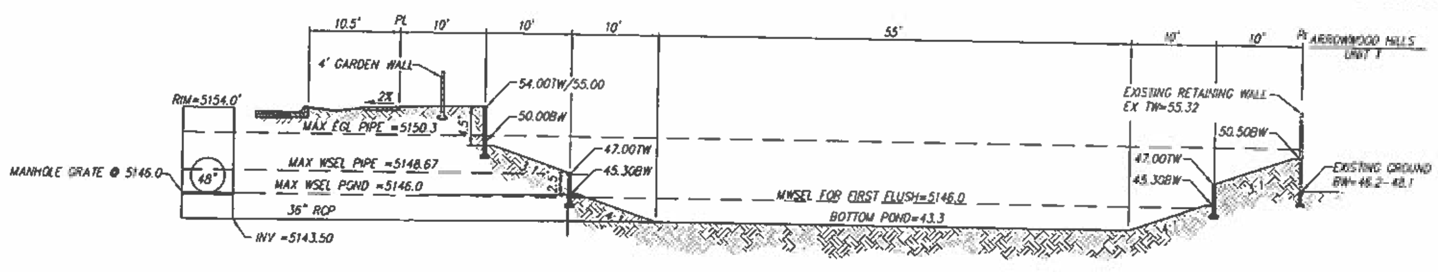
DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.
CITY PROJECT NO.		ZONE MAP NO. N-8-Z	SHEET 2	OF 4

F:\A17\A17022\A17022 - Anderson Heights 2017\GRADE & DRAIN\A17022_GD.dwg Last saved by: Dwayne 3/29/2018



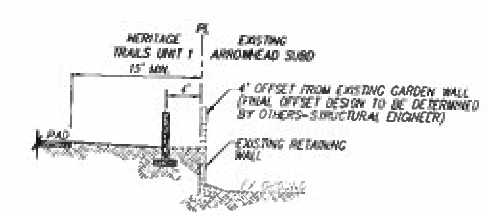
THE PERIMETER WALL MAY OR MAY NOT BE REMOVED AND REPLACED BASED ON THE DIRECTION FROM THE DEVELOPER. WHERE THERE ARE SINGLE, DOUBLE OR TRIPLE RETAINING WALLS, THE FOOTER MAY EXTEND INTO THE H.O.A. LANDSCAPE STRIP LOCATED ADJACENT TO THE PUBLIC RIGHT OF WAY ON COLOBEL AVE & AMOLE MESA AVE. WHERE THERE ARE DOUBLE OR TRIPLE RETAINING WALLS, ONE OF THE WALLS MAY BE LOCATED WITHIN THE LANDSCAPE STRIP. AT NO TIME WILL THE FOOTER OF ANY RETAINING WALL EXTEND INTO THE PUBLIC RIGHT OF WAY.

THE PERIMETER WALL MAY OR MAY NOT BE REMOVED AND REPLACED BASED ON THE DIRECTION FROM THE DEVELOPER. WHERE THERE ARE SINGLE, DOUBLE OR TRIPLE RETAINING WALLS, THE FOOTER MAY EXTEND INTO THE H.O.A. LANDSCAPE STRIP LOCATED ADJACENT TO THE PUBLIC RIGHT OF WAY ON COLOBEL AVE & AMOLE MESA AVE. WHERE THERE ARE DOUBLE OR TRIPLE RETAINING WALLS, ONE OF THE WALLS MAY BE LOCATED WITHIN THE LANDSCAPE STRIP. AT NO TIME WILL THE FOOTER OF ANY RETAINING WALL EXTEND INTO THE PUBLIC RIGHT OF WAY.



SECTION F - POND DETAIL

(TRACT XX) SCALE: 1"=10'



SECTION E
EAST BOUNDARY RETAINING WALL DETAIL

SCALE: 1"=10'

NOTES

1. SEE SHEET 2 FOR MORE RETAINING WALL & SECTION DETAILS.
2. SEE SHEET 2 FOR EROSION CONTROL NOTES AND RETAINING WALL NOTES.

KEYED NOTES:

(A) EXISTING RETAINING WALL TO BE REMOVED & DISPOSED (TYPICAL).

SCALE: 1" = 60'

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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE:
HERITAGE TRAILS SUBDIVISION
OVERALL GRADING & DRAINAGE PLAN

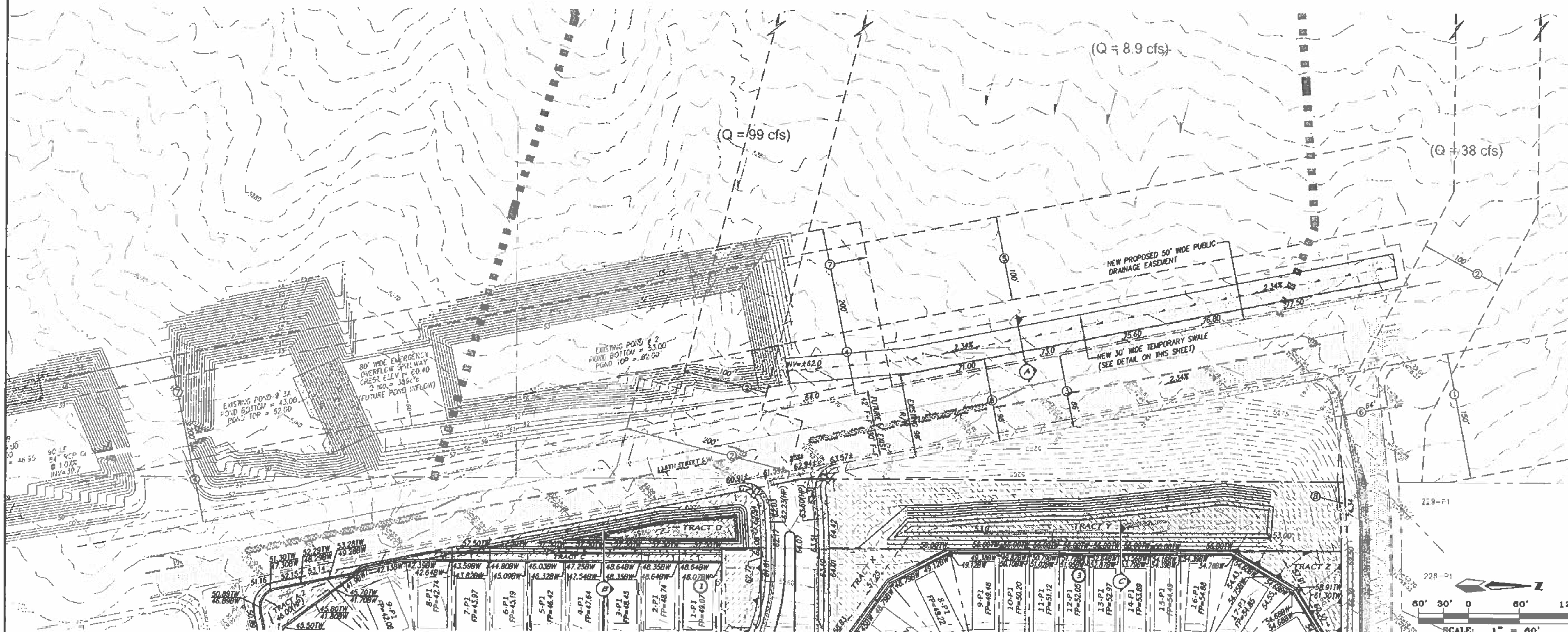
ENGINEER'S SEAL	SURVEY INFORMATION	BENCH MARKS	AS BUILT INFORMATION
4-13-18	FIELD NOTES: NO. / BY / DATE	AGRS MONUMENT & BENCHMARK "1-N8" N=1470741.879, E=1488701.820 G-G=0.999676466 Δα=-00°17'27.70" CENTRAL ZONE ELEVATION=5307.250 (NAD83/NAVD88)	CONTRACTOR / WORK STARTED BY / DATE INSPECTOR'S ACCEPTANCE BY / DATE FIELD VERIFICATION BY / DATE DRAWINGS CORRECTED BY / DATE MICRO-FILM INFORMATION RECORDED BY / DATE NO.

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	

DESIGNED BY	DLH	DATE	10/17
DRAWN BY	DER	DATE	10/17
CHECKED BY	DMG	DATE	10/17

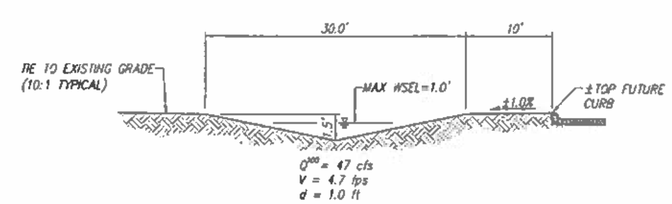
DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.

CITY PROJECT NO.	ZONE MAP NO.	SHEET	OF
	N-8-7	2	8

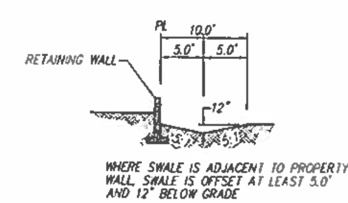


EXISTING EASEMENTS

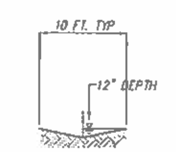
1. 150' AMAFCA DRAINAGE EASEMENT (04-17-1996, 96C-160)
2. 100' OR 200' AMAFCA DRAINAGE EASEMENT (07-19-1990, 90C-163)
3. 86' PUBLIC ROADWAY EASEMENT (04-17-1996, 96C-160)
4. 200' POWER LINE EASEMENT U.S.B.R. (02-05-1952, BK. D197, PG. 587) (06-16-2000, BK. A6, PG. 8301)
5. 100' PNM EASEMENT (04-20-1978, BK. MISC 602, PG. 558-561)
6. 64' OR 98' FUTURE R/W (05-04-2005, 2005C-138)
7. 200' C.O.A. PUBLIC DRAINAGE EASEMENT (04-20-2005, BK. A95, PG. 4276)
8. 10' PNM ELECTRIC EASEMENT (04-28-2009, DOC. 2009056097)



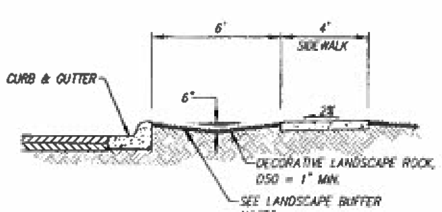
118TH STREET TEMPORARY SWALE DETAIL
(REFER TO SHEET 1) SCALE: 1"=10'



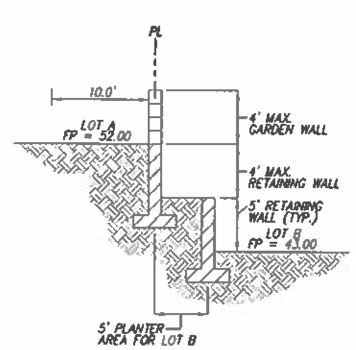
SWALE DETAIL ALONG PROPERTY WALL
SCALE: 1"=10'



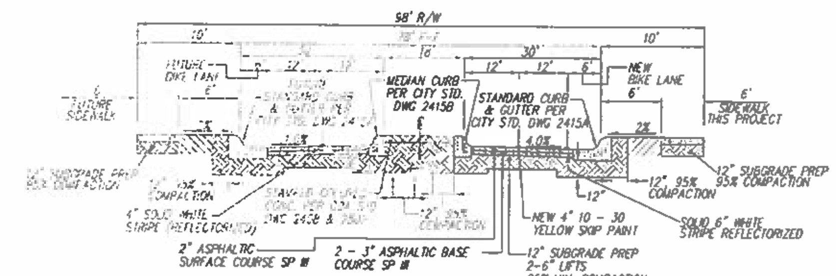
Typical Swale Detail
(adjacent to garden walls in landscape tracts)



TYPICAL DEPRESSED LANDSCAPE DETAIL
1"=20'



TYPICAL DOUBLE RETAINING WALL DETAIL
NTS



TYPICAL 78' F-F STREET SECTION
NTS
118th STREET S.W.
FROM SOUTH PROPERTY LINE TO AMOLE MESA

AS BUILT INFORMATION	
CONTRACTOR	
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE
MICRO FILM INFORMATION	
RECORDED BY	DATE
NO.	

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G-G=0.999676466
Δα=-00°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

SURVEY INFORMATION — FIELD NOTES — NO. BY DATE

ENGINEER'S SEAL — DIANE HOELZER, NEW MEXICO, 11987, LICENSED PROFESSIONAL ENGINEER — 4-13-18

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	DLH	DATE	10/17
DRAWN BY	DER	DATE	10/17
CHECKED BY	DMG	DATE	10/17

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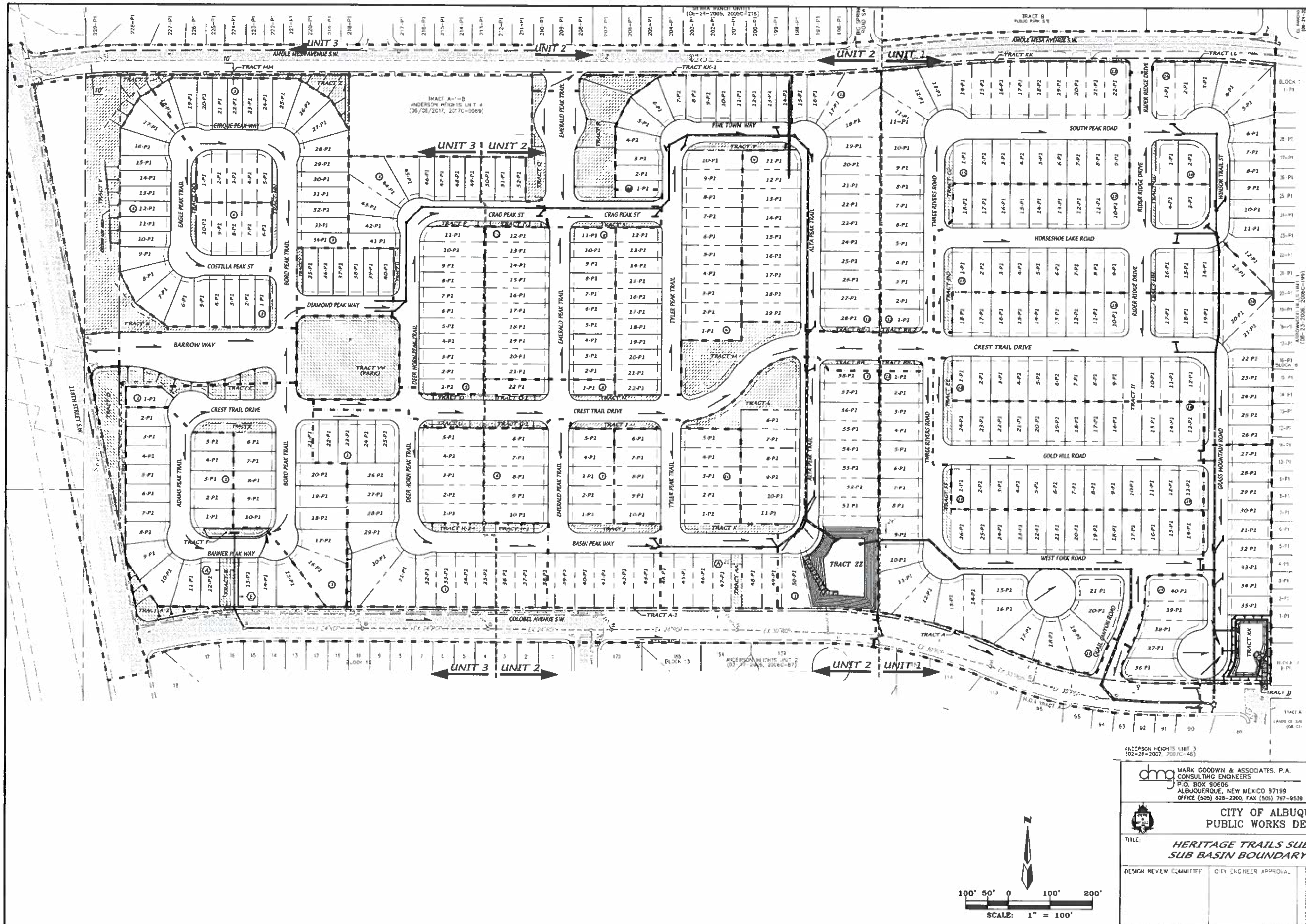
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: HERITAGE TRAILS SUBDIVISION
118TH STREET OFFSITE GRADING & DRAINAGE PLAN

DESIGN REVIEW COMMITTEE | CITY ENGINEER APPROVAL | MO./DAY/YR | MO./DAY/YR | LAST DESIGN UPDATE

CITY PROJECT NO. | ZONE MAP NO. N-8-Z | SHEET 4 OF 4



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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: *HERITAGE TRAILS SUBDIVISION*
SUB BASIN BOUNDARY EXHIBIT

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.

CITY PROJECT NO.	ZONE MAP NO.	SHEET	OF
	N-8-Z	1	3

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	DLH	DATE	12/17
DRAWN BY	DER	DATE	12/17
CHECKED BY	DMG	DATE	12/17

ENGINEER'S SEAL

4-13-18

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

BENCH MARKS

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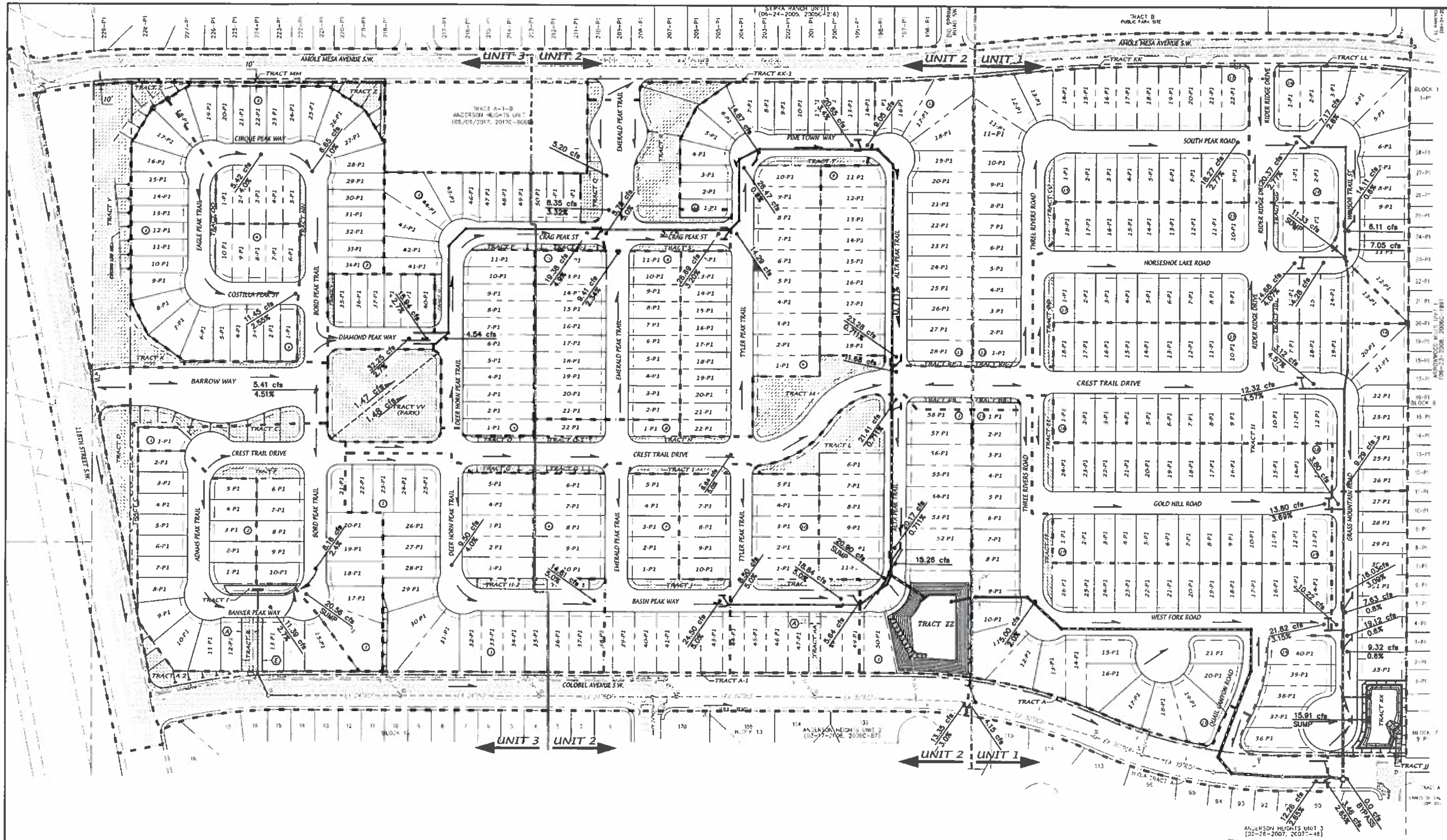
G-G=0.999676466
Δα=-0°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

AS BUILT INFORMATION

CONTRACTOR	
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICRO-FILM INFORMATION

RECORDED BY	DATE
NO.	



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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: *HERITAGE TRAILS SUBDIVISION STREET CAPACITY EXHIBIT*

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.
CITY PROJECT NO.		ZONE MAP NO. N-8-Z	SHEET 2	OF 3

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	DLH	DATE	12/17
DRAWN BY	DER	DATE	12/17
CHECKED BY	DMG	DATE	12/17

ENGINEER'S SEAL

4-13-18

SURVEY INFORMATION		
FIELD NOTES		
NO.	BY	DATE

BENCH MARKS
AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
G-G=0.999678466
Δα=-0017'27.70"
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AS BUILT INFORMATION	
CONTRACTOR	
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
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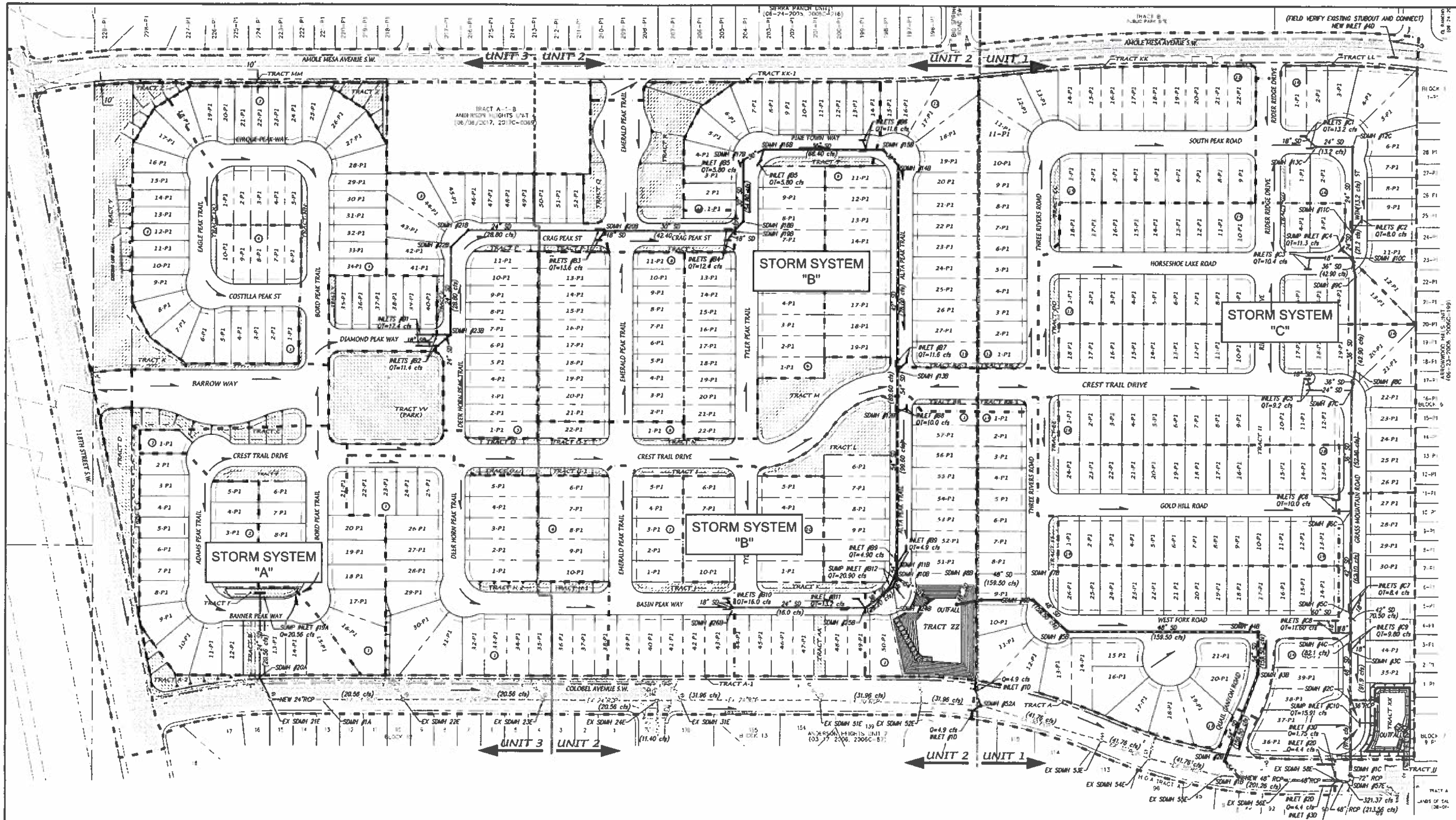

LEGEND

Symbol	Description
	EXISTING SANITARY SEWER MANHOLE
	EXISTING SAS LINE
	EXISTING FIRE HYDRANT
	EXISTING WATER LINE
	EXISTING STORM DRAIN
	EXISTING STORM DRAIN MANHOLE
	NEW RIGHT-OF-WAY
	NEW LOT LINES
	NEW EASEMENTS
	NEW STORM DRAIN INLET
	NEW STORM DRAIN
	NEW STORM DRAIN MANHOLE

SCALE: 1" = 100'

100' 50' 0 100' 200'

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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: HERITAGE TRAILS SUBDIVISION
PRELIMINARY STORM DRAIN LAYOUT

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.
CITY PROJECT NO.	ZONE MAP NO. N-8-Z	SHEET 3	OF 3

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY DLH		DATE	12/17
DRAWN BY DER		DATE	12/17
CHECKED BY DMG		DATE	12/17

ENGINEER'S SEAL: DIANE HOELZER, NEW MEXICO, 11987, LICENSED PROFESSIONAL ENGINEER — 4-13-18

SURVEY INFORMATION — FIELD NOTES

NO.	BY	DATE

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INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICRO-FILM INFORMATION

RECORDED BY	DATE
NO.	

AMENDED PRELIMINARY PLAT
HERITAGE TRAILS
WITHIN THE TOWN OF ATRISCO GRANT PROJECTED SECTIONS 5 AND 8 TOWNSHIP 9 NORTH, RANGE 2 EAST, NMPM CITY OF ALBUQUERQUE BERNALILLO COUNTY, NEW MEXICO MARCH, 2018

Line Table		
Line #	Direction	Length
L1	S78°44'25"W	40.72'

EASEMENT KEYED NOTES:

(A) NEW 25' PUBLIC SANITARY SEWER & WATERLINE EASEMENT TO A.B.C.W.U.A.
(B) NEW 20' CROSS LOT DRAINAGE EASEMENT TO BE MAINTAINED BY H.O.A.
(C) NEW 20' PUBLIC WATER LINE EASEMENT TO A.B.C.W.U.A.
(D) NEW 20' PUBLIC SAS LINE EASEMENT TO A.B.C.W.U.A.
(E) NEW 28' PRIVATE DRAINAGE EASEMENT TO H.O.A.
(F) NEW 24' PUBLIC STORM DRAIN EASEMENT TO C.O.A.

EASEMENTS

1. 150' AMAFCA DRAINAGE EASEMENT (04-17-1996, 96C-180)
2. 100' OR 200' AMAFCA DRAINAGE EASEMENT (07-19-1990, 90C-183)
3. 86' PUBLIC ROADWAY EASEMENT (04-17-1996, 96C-180)
4. 200' POWER LINE EASEMENT U.S.B.R. (02-05-1952, BK. D197, PG. 567) (06-16-2000, BK. A8, PG. 8301)
5. 100' PNM EASEMENT (04-20-1978, BK. MISC 602, PG. 558-561)
6. 64' OR 98' FUTURE R/W (05-04-2005, 2005C-138)
7. 200' C.O.A. PUBLIC DRAINAGE EASEMENT (04-20-2005, BK. A95, PG. 4276)
8. 10' PNM ELECTRIC EASEMENT (04-28-2009, DOC. 2009058097)
9. 10' PUE (GRANTED BY TRACT A-1-B (06/06/2017, 2017c-0089)

CROSS LOT DRAINAGE EASEMENTS ON LOTS 9, 10 & 11, BLOCK 1, UNIT 3 FOR BENEFIT OF TRACT A-2, TO BE MAINTAINED BY OWNERS OF LOTS 9, 10 & 11.

CROSS LOT DRAINAGE EASEMENTS ON LOTS 1-9, BLOCK 1, UNIT 3 FOR BENEFIT OF TRACT C, TO BE MAINTAINED BY OWNERS OF LOTS 1-9, BLOCK 1.

CROSS LOT DRAINAGE EASEMENT ON TRACT O FOR BENEFIT OF TRACT A-1-B TO BE MAINTAINED BY OWNER OF TRACT O.

Curve Table					
C#	Length	Radius	Delta	Chord B.	Chord L.
C1	97.16'	966.00'	5°45'45"	N86°35'19"E	97.11'
C2	327.48'	3155.42'	5°56'47"	N86°47'47"E	327.33'
C3	322.44'	3087.42'	5°59'02"	N86°48'55"E	322.29'
C4	171.92'	1281.12'	7°41'21"	S86°20'55"E	171.80'
C5	392.99'	966.00'	23°18'33"	N78°18'49"W	390.28'
C6	428.62'	1034.00'	23°45'02"	N78°05'35"W	425.56'
C7	203.77'	1034.00'	11°17'29"	S84°23'10"W	203.44'
C8	47.12'	30.00'	90°00'00"	N56°15'35"W	42.43'

LEGEND

- 1-P1 — LOT NUMBER
- (1) — BLOCK NUMBER
- ▲ — CENTER LINE MONUMENT
- ROW — RIGHT-OF-WAY
- ZONE BOUNDARY

PROPERTY CORNERS

- ● SET REBAR WITH CAP "ALS LS 7719" (TYP)
- ○ FOUND 5/8" REBAR WITH CAP "LS 7719" (TYP)

AGRS MONUMENT "TRANS"

SCALE: 1" = 100'

TRACTS JJ IS A PUBLIC DRAINAGE EASEMENT.

SUBDIVISION DATA

GROSS ACREAGE	84.9303 AC
ZONE ATLAS NO.	N-8-Z
NO. OF LOTS CREATED	425 LOTS
NO. OF TRACTS CREATED	50 TRACTS
DATE OF SURVEY	MARCH, 2015

LEGAL DESCRIPTION

A tract of land situate within the Town of Atrisco Grant, projected Sections 5 and 8, Township 9 North, Range 2 East, New Mexico Principal Meridian, City of Albuquerque, Bernalillo County, New Mexico, being all of TRACT A-1-A, ANDERSON HEIGHTS UNIT 4, as the same is shown and designated on said plat, filed for record in the office of the County Clerk of Bernalillo County, New Mexico, on June 08, 2017 in Plat Book 2017C, Page 0069, together with TRACT B-1, ANDERSON HEIGHTS UNIT 4, as the same is shown and designated on said plat, filed for record in the office of the County Clerk of Bernalillo County, New Mexico, on March 23, 2015, in Plat Book 2015C, Page 29, and containing 84.9303 acres more or less.

PURPOSE OF PLAT

1. SUBDIVIDE TRACTS A-1-A, B-1 ANDERSON HEIGHTS INTO 425 RESIDENTIAL LOTS & 50 TRACTS AS SHOWN.
2. DEDICATE NEW RIGHT-OF-WAY AS SHOWN.
3. GRANT NEW EASEMENTS AS SHOWN.

DEDICATION OF DRAINAGE EASEMENTS: CITY CONSTRUCTS AND MAINTAINS

A PERPETUAL EASEMENT ON THE AREAS DESIGNATED ON THIS PLAT AS "DRAINAGE EASEMENT" ("DETENTION AREA") IS HEREBY DEDICATED TO THE CITY OF ALBUQUERQUE FOR THE PURPOSE OF PERMITTING THE CONVEYANCE OF STORM WATER RUNOFF AND FOR THE PURPOSE OF CONSTRUCTING, MAINTAINING, OPERATING, REMOVING, AND REPLACING STORM WATER DRAINAGE FACILITIES (DETENTION FACILITIES). NO FENCE, WALL, PLANTING, BUILDING, OR OTHER OBSTRUCTION MAY BE PLACED OR MAINTAINED IN SAID EASEMENT AREA AND THERE SHALL BE NO ALTERATION OF THE GRADES OR CONTOURS IN SAID DEDICATED AREA WITHOUT THE APPROVAL OF SAID CITY ENGINEER OF THE CITY OF ALBUQUERQUE. NO OBSTRUCTIONS MAY BE PLACED IN SAID EASEMENT AREA WHICH WOULD PREVENT INGRESS AND EGRESS TO SAME BY MAINTENANCE VEHICLES OR WHICH WOULD PREVENT SAID VEHICLES TRAVELING ON SAID DRAINAGE WAY FOR MAINTENANCE PURPOSES.

NOTES

1. UNLESS OTHERWISE NOTED, ALL BOUNDARY CORNERS SHOWN THUS ○ SHALL BE A SET #4 REBAR WITH YELLOW PLASTIC CAP "N.M.P.S. 7719"
2. ALL STREET CENTERLINE MONUMENTATION SHALL BE INSTALLED AT ALL CENTERLINE PC'S, PT'S, ANGLE POINTS, AND STREET INTERSECTIONS AND SHOWN THUS ▲. WILL BE MARKED BY A FOUR INCH (4") ALUMINUM CAP STAMPED: "CITY OF ALBUQUERQUE CENTERLINE MONUMENTATION" "DO NOT DISTURB" N.M.P.S. #7719
3. BOUNDARY SHALL BE TIED TO THE NEW MEXICO STATE PLANE COORDINATE SYSTEM AS SHOWN.
4. BASIS OF BEARING SHALL BE NEW MEXICO STATE PLANE GRID BEARINGS.
5. ALL DISTANCES SHALL BE GROUND DISTANCES.
6. MANHOLES WILL BE OFFSET AT ALL POINTS OF CURVATURE, POINTS OF TANGENCY, STREET INTERSECTIONS, AND ALL OTHER ANGLE POINTS TO ALLOW USE OF CENTERLINE MONUMENTATION.
7. TRACT WW IS A PRIVATE ACCESS, PRIVATE DRAINAGE EASEMENT AND PUBLIC WATERLINE & SANITARY SEWER EASEMENT. IT IS FOR THE BENEFIT OF ALL LOTS WITHIN UNIT 2&3 AND WILL BE MAINTAINED BY THE H.O.A.
8. TRACTS "A-00" ARE PRIVATE COMMON AREAS FOR THE BENEFIT OF ALL LOTS WITHIN UNIT 2&3. TRACTS WILL BE DEEDED TO THE H.O.A. AND WILL BE MAINTAINED BY THE H.O.A.

ABBREVIATIONS

10' PUE = PUBLIC UTILITY EASEMENTS GRANTED WITH THIS PLAT
ROW = RIGHT-OF-WAY
H.O.A.= HOME OWNERS ASSOCIATION
C.O.A.= CITY OF ALBUQUERQUE
A.B.C.W.U.A.= ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY

UNIT 1
TRACTS LL, KK, CC, GG, DD, HH, EE, II, BB-1, FF, JJ, RR-2, XX, & A ARE FOR LANDSCAPING PURPOSES AND WILL BE MAINTAINED BY THE "UNIT 1" H.O.A.

UNIT 2 (GATED COMMUNITY)
TRACTS Q, R, RR-1 KK-1, S, T, M, L, BB, I, N, P-1, G-1, D-1, H-1, J, K, AA, A-1, O-1, & ZZ ARE FOR LANDSCAPING PURPOSES AND WILL BE MAINTAINED BY THE "UNIT 2 & UNIT 3" H.O.A.

UNIT 3 (GATED COMMUNITY)
TRACTS A-2, Y, W, Z, X, NN, OO, O, MM, P, W, C, G, D, E, H-2, F, B, A, U, V ARE FOR LANDSCAPING PURPOSES AND WILL BE MAINTAINED BY THE "UNIT 2 & UNIT 3" H.O.A.

APPROVED

City Surveyor, City of Albuquerque, N.M. — P.S. — Date: 2/7/18

Owner: KB HOME NEW MEXICO Inc
Randy Carpenter, President — Date: 3-5-2018

OWNERS
KB HOME NEW MEXICO Inc
7801 Pedview Ave
Suite 300
CENTENNIAL, COLORADO 80111
(303) 323-1130

ENGINEERS
D. MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200

SITE BENCHMARK
AGRS MONUMENT "1-N8"
ELEVATION=5307.250 (NAD83/NAVD88)

SURVEYOR
ALDRICH LAND SURVEY
P.O. BOX 30701
ALBUQUERQUE, NEW MEXICO 87190
(505) 884-1990

CITY PROJECT No. 1002739
SHEET 1 OF 1

VICINITY MAP — ZONE MAP: N-8-Z

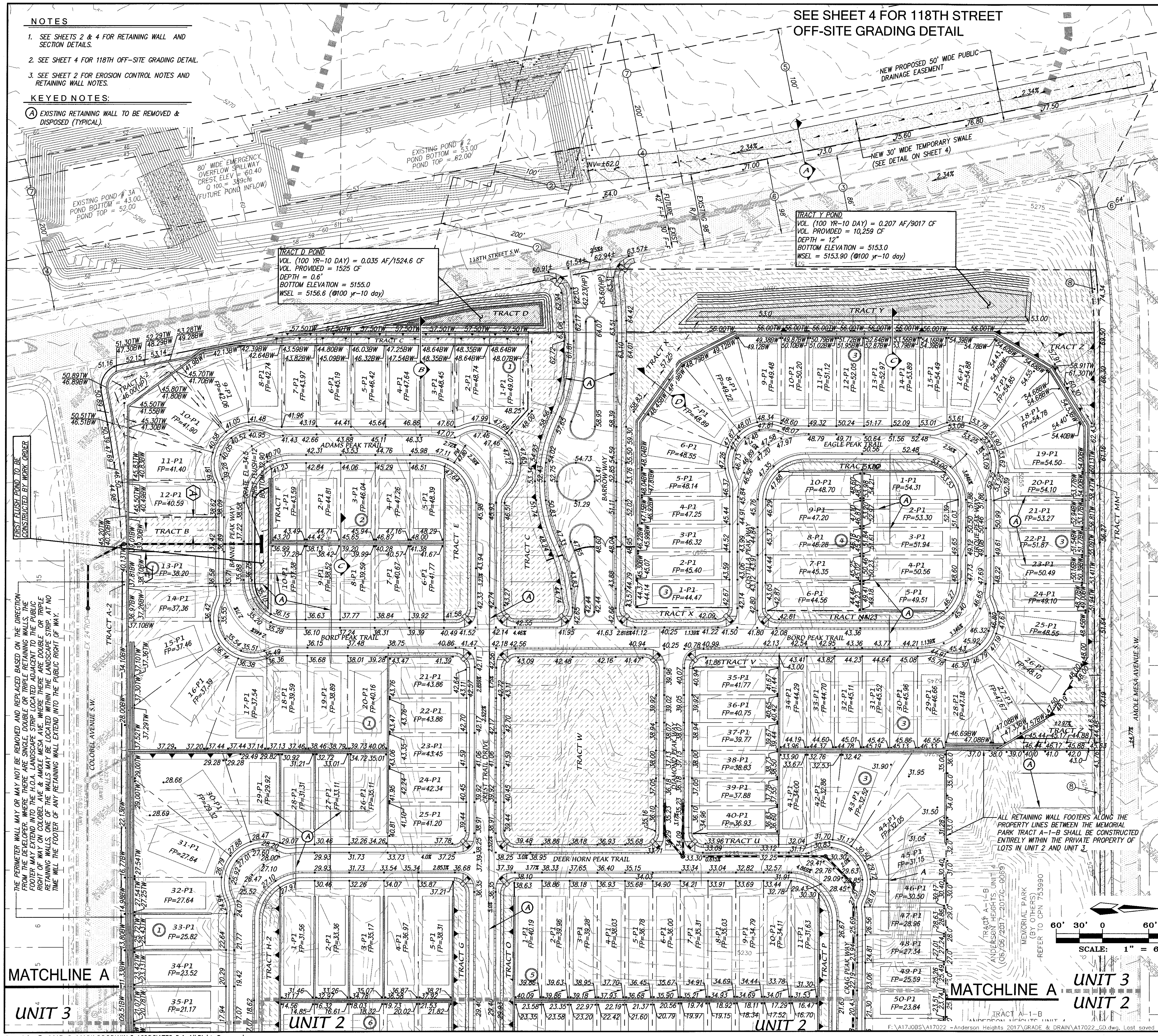
NOTES

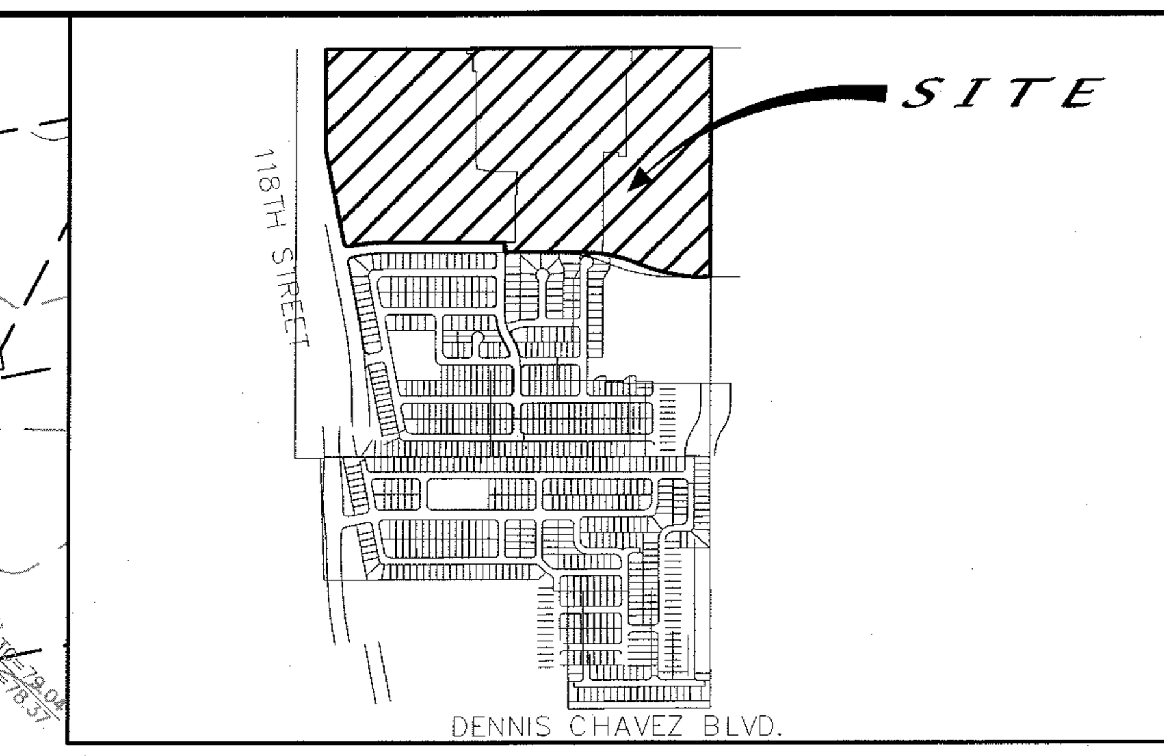
1. SEE SHEETS 2 & 4 FOR RETAINING WALL AND SECTION DETAILS.
2. SEE SHEET 4 FOR 118TH OFF-SITE GRADING DETAIL.
3. SEE SHEET 2 FOR EROSION CONTROL NOTES AND RETAINING WALL NOTES.

KEYED NOTES:

(A) EXISTING RETAINING WALL TO BE REMOVED & DISPOSED (TYPICAL).

SEE SHEET 4 FOR 118TH STREET OFF-SITE GRADING DETAIL





VICINITY MAP ZONE ATLAS #N-8/P-8
SCALE: NONE

LEGEND

— — —	EXISTING CONTOUR (MAJOR)
- - -	EXISTING CONTOUR (MINOR)
x 00.0	EXISTING SPOT ELEVATION
TC= / FL=	EXISTING TOP CURB/FLOWLINE ELEVATION
TWRW=56.50	EXISTING TOP WEST RETAINING WALL ELEV.
TGW=59.20	EXISTING TOP WEST GROUND ELEVATION
TERW=53.90	EXISTING TOP EAST RETAINING WALL ELEV.
BW=50.6	EXISTING BOTTOM WALL EAST GROUND ELEV.
(S)	EXISTING SANITARY SEWER MANHOLE
	EXISTING FIRE HYDRANT
	EXISTING ELECTRIC TRANSFORMER
	EXISTING FENCE
	EXISTING POWER POLE
6"GAS	EXISTING GAS LINE
30"SD	EXISTING STORM DRAIN
8"SAS	EXISTING SAS LINE
10"WL	EXISTING WATER LINE
	NEW MOUNTABLE CURB & GUTTER
	NEW STANDARD CURB & GUTTER
	NEW SIDEWALK (THIS PROJECT)
	NEW RIGHT-OF-WAY
	NEW CENTERLINE
	NEW LOT LINES
	NEW EASEMENTS
•81.77	NEW SPOT ELEVATIONS
81.77TW / 81.77BW	NEW TOP OF WALL ELEVATION / NEW BOTTOM OF WALL ELEVATION
	NEW FLOW DIRECTION
	NEW FLOW DIRECTION
	NEW SLOPE
HIGH PT	NEW HIGH POINT
	NEW STORM DRAIN INLET
	ZONE BOUNDARY LINE
	NEW SINGLE RETAINING WALL
	NEW DOUBLE RETAINING WALL
	NEW TRIPLE RETAINING WALL
PVI / 94.60	NEW POINT OF VERTICAL INTERSECTION
24" RCP	NEW STORM DRAIN
	NEW STORM DRAIN MANHOLE
	EXISTING ASPHALT PAVEMENT
	EXISTING CONCRETE
	NEW OFF-SITE PAVEMENT

APPROVED ROUGH GRADING ±18" ____________
CITY HYDROLOGY DATE

MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
OFFICE (505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: **HERITAGE TRAILS SUBDIVISION OVERALL GRADING & DRAINAGE PLAN**

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.

CITY PROJECT NO.	ZONE MAP NO.	SHEET	OF
.	N-8-Z	1	4

AS BUILT INFORMATION: CONTRACTOR; WORK STAKED BY — DATE; INSPECTOR'S ACCEPTANCE BY — DATE; FIELD VERIFICATION BY — DATE; DRAWINGS CORRECTED BY — DATE
MICRO-FILM INFORMATION: RECORDED BY — DATE; NO.

BENCH MARKS
AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
G-G=0.999676466
Δα=-00°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

SURVEY INFORMATION — FIELD NOTES: NO. | BY | DATE

ENGINEER'S SEAL: DIANE HOELZER, NEW MEXICO 11987, LICENSED PROFESSIONAL ENGINEER — 4-13-18

NO.	DATE	REMARKS	BY

REVISIONS
DESIGN

DESIGNED BY	DLH	DATE	10/17
DRAWN BY	DER	DATE	10/17
CHECKED BY	DMG	DATE	10/17

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MATCHLINE A

UNIT 3

UNIT 2

MATCHLINE A UNIT 3

UNIT 2

TRACT A-1-B
ANDERSON HEIGHTS UNIT 4
(06/06/2017, 2017C-0069)
MEMORIAL PARK
(BY OTHERS)
(REFER TO CON 753990

EMERALD PEAK TRAIL

TYLER PEAK TRAIL

CREST TRAIL DRIVE

ALTA PEAK TRAIL

BIG SPRINGS

UNIT 2
MATCHLINE B

UNIT 1

THE PERIMETER WALL MAY OR MAY NOT BE REMOVED AND REPLACED BASED ON THE DIRECTION FROM THE DEVELOPER. WHERE THERE ARE SINGLE, DOUBLE OR TRIPLE RETAINING WALLS, THE FOOTER MAY EXTEND INTO THE H.O.A. LANDSCAPE STRIP LOCATED ADJACENT TO THE PUBLIC RIGHT OF WAY ON COLOBEL AVE & AMOLE MESA AVE. WHERE THERE ARE DOUBLE OR TRIPLE RETAINING WALLS, ONE OF THE WALLS MAY BE LOCATED WITHIN THE LANDSCAPE STRIP. AT NO TIME WILL THE FOOTER OF ANY RETAINING WALL EXTEND INTO THE PUBLIC RIGHT OF WAY.

FIRST FLUSH POND TO BE CONSTRUCTED BY WORK ORDER

TRACT ZZ
POND BOTTOM=72.0

LEGEND

- EXISTING CONTOUR (MAJOR)
- EXISTING CONTOUR (MINOR)
- EXISTING SPOT ELEVATION
- EXISTING TOP CURB/FLOWLINE ELEVATION
- EXISTING TOP WEST RETAINING WALL ELEV.
- EXISTING TOP WEST GROUND ELEVATION
- EXISTING TOP EAST RETAINING WALL ELEV.
- EXISTING BOTTOM WALL EAST GROUND ELEV.
- EXISTING SANITARY SEWER MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING ELECTRIC TRANSFORMER
- EXISTING FENCE
- EXISTING POWER POLE
- EXISTING GAS LINE
- EXISTING STORM DRAIN
- EXISTING SAS LINE
- EXISTING WATER LINE
- NEW MOUNTABLE CURB & GUTTER
- NEW STANDARD CURB & GUTTER
- NEW SIDEWALK (THIS PROJECT)
- NEW RIGHT-OF-WAY
- NEW CENTERLINE
- NEW LOT LINES
- NEW EASEMENTS
- NEW SPOT ELEVATIONS
- NEW TOP OF WALL ELEVATION / NEW BOTTOM OF WALL ELEVATION
- NEW FLOW DIRECTION
- NEW FLOW DIRECTION
- NEW SLOPE
- NEW HIGH POINT
- NEW STORM DRAIN INLET
- ZONE BOUNDARY LINE
- NEW SINGLE RETAINING WALL
- NEW DOUBLE RETAINING WALL
- NEW TRIPLE RETAINING WALL
- NEW POINT OF VERTICAL INTERSECTION
- NEW STORM DRAIN
- NEW STORM DRAIN MANHOLE
- EXISTING ASPHALT PAVEMENT
- EXISTING CONCRETE
- NEW OFF-SITE PAVEMENT

EROSION CONTROL NOTES

1. CONTRACTOR MUST OBTAIN A TOPSOIL DISTURBANCE PERMIT FROM THE ENVIRONMENTAL HEALTH DIVISION PRIOR TO CONSTRUCTION.
2. CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST EDITION SHALL GOVERN ALL WORK.
3. THE CONTRACTOR SHALL CONFORM TO ALL CITY, COUNTY, STATE AND FEDERAL DUST CONTROL MEASURES AND REQUIREMENTS AND WILL BE RESPONSIBLE FOR PREPARING AND OBTAINING ALL NECESSARY APPLICATIONS AND APPROVALS.
4. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE LOTS INTO PUBLIC RIGHT-OF-WAY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AND WETTING THE SOIL TO KEEP IT FROM BLOWING
5. THE EARTHWORK CONTRACTOR SHALL STOCKPILE ENOUGH MATERIAL ADJACENT TO RETAINING WALL LOCATIONS TO BE UTILIZED FOR WALL BACKFILL.

NOTES

1. SEE SHEET 4 FOR MORE RETAINING WALL & SECTION DETAILS.

KEYED NOTES:

(A) EXISTING RETAINING WALL TO BE REMOVED & DISPOSED (TYPICAL).

60' 30' 0 60' 120'

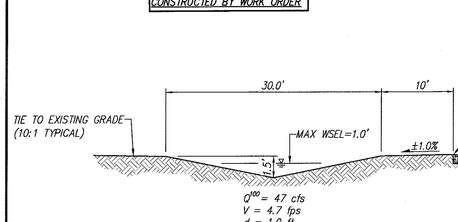
SCALE: 1" = 60'

NOTE:

USE RETAINING WALLS:
WHERE THE DIFFERENCE IN ELEVATION BETWEEN THE ADJACENT PADS IS 3.0' OR MORE A RETAINING WALL MUST BE CONSTRUCTED BETWEEN THE LOTS AS SHOWN ON THE PLAN AND THERE WILL BE NO PRIVATE DRAINAGE EASEMENT.

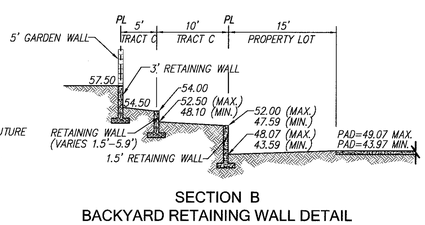
USE STEM WALLS:
WHERE THE DIFFERENCE IN ELEVATION BETWEEN THE ADJACENT PADS IS GREATER THAN 1.5' BUT LESS THAN 3.0', A STEM WALL SHALL BE CONSTRUCTED BY THE BUILDER ON THE "HIGH SIDE" OF LOT PAD.

FOR ALL SIDE YARDS:
EACH LOT OWNER MUST CONSTRUCT, OPERATE, AND MAINTAIN HIS OWN SEPARATE DRAINAGE SWALE ALL THE WAY TO THE STREET AND CROSS LOT DRAINAGE WILL BE PREVENTED BY SOME COMBINATION OF WALLS AND BERMS ON THE COMMON LOT LINE TO BE JOINTLY MAINTAINED BY BOTH LOT OWNERS.



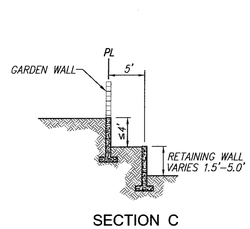
118TH STREET TEMPORARY SWALE DETAIL

(REFER TO SHEET 1) SCALE: 1"=10'



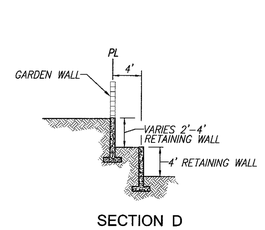
SECTION B
BACKYARD RETAINING WALL DETAIL
(LOTS 1-P1 THRU LOT 7-P1, BLOCK 1)

SCALE: 1"=10'



SECTION C
TYPICAL DOUBLE RETAINING WALL DETAIL

SCALE: 1"=10'



SECTION D
DOUBLE RETAINING WALL DETAIL

SCALE: 1"=10'

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AS BUILT INFORMATION

CONTRACTOR — DATE
STAKED BY — DATE
INSPECTOR'S — DATE
AS-BUILT MARK — DATE
FIELD VERIFICATION BY — DATE
DRAWING CORRECTED BY — DATE

MICRO-FILM INFORMATION

RECORDED BY — DATE
NO.

BENCH MARKS

ACRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
G-G=0.999676466
Δα = -00°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

(06-24-2005, 2005C-216)

ENGINEER'S SEAL

DWAYNE HOELZER
NEW MEXICO
19867
LICENSED PROFESSIONAL ENGINEER

4-13-18

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
		DESIGNED BY	DLH
		DRAWN BY	DER
		CHECKED BY	DMG

DATE 10/17
DATE 10/17
DATE 10/17

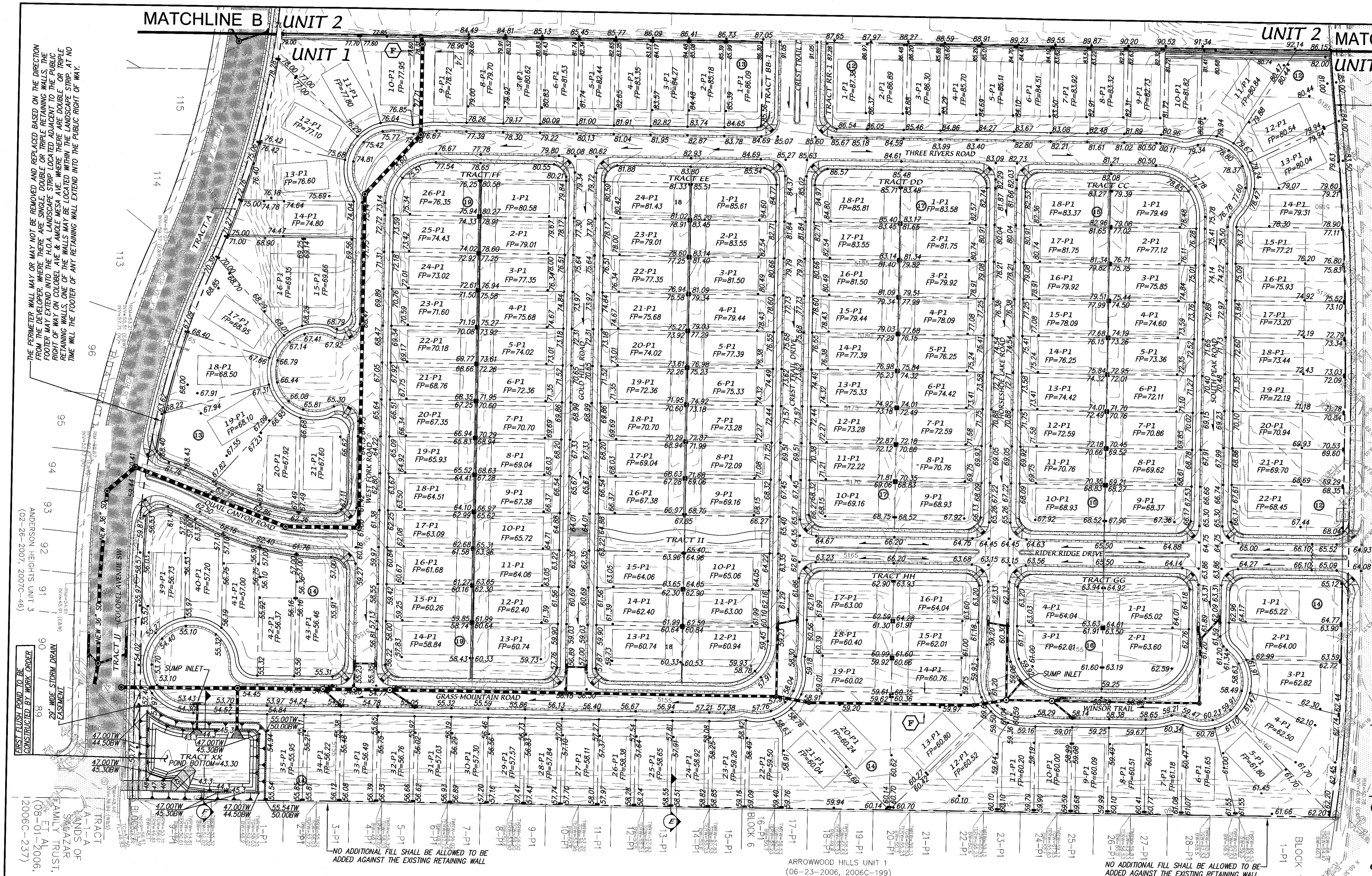
dmg
MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
OFFICE (505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE:
HERITAGE TRAILS SUBDIVISION
OVERALL GRADING & DRAINAGE PLAN

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.

CITY PROJECT NO.	ZONE MAP NO.	SHEET OF
·	N-8-Z	2 4



MATCHLINE B
UNIT 2
UNIT 1
THE PERIMETER WALL MAY OR MAY NOT BE REMOVED AND REPLACED BASED ON THE DIRECTION FROM THE DEVELOPER. WHERE THERE ARE SINGLE, DOUBLE OR TRIPLE RETAINING WALLS, THE FOOTER MAY EXTEND INTO THE H.O.A. LANDSCAPE STRIP LOCATED ADJACENT TO THE PUBLIC RIGHT OF WAY ON COLOBEL AVE & AMOLE MESA AVE. WHERE THERE ARE DOUBLE OR TRIPLE RETAINING WALLS, ONE OF THE WALLS MAY BE LOCATED WITHIN THE LANDSCAPE STRIP. AT NO TIME WILL THE FOOTER OF ANY RETAINING WALL EXTEND INTO THE PUBLIC RIGHT OF WAY.
TRACT FF
TRACT EE
TRACT DD
TRACT CC
TRACT II
TRACT HH
TRACT GG
TRACT XX
TRACT A
TRACT BB-1
TRACT RR-1
THREE RIVERS ROAD
QUAIL CANYON ROAD
WEST FORK ROAD
GOLD ROAD
CREST TRAIL DRIVE
HORSESHOE LAKE ROAD
SOUTH PEAK ROAD
RIDER RIDGE DRIVE
GRASS MOUNTAIN ROAD
WINSOR TRAIL
COLOBEL AVENUE SW
AMOLE MESA AVENUE SW
SUMP INLET
POND BOTTOM=43.30
29' WIDE STORM DRAIN EASEMENT
FIRST FLUSH POND TO BE CONSTRUCTED BY WORK ORDER
ANDERSON HEIGHTS UNIT 3 (02-26-2007, 2007C-46)
TRACT B PUBLIC PARK SITE
ARROWOOD HILLS UNIT 1 (06-23-2006, 2006C-199)
NO ADDITIONAL FILL SHALL BE ALLOWED TO BE ADDED AGAINST THE EXISTING RETAINING WALL
BLOCK 6
BLOCK 1

NOTES

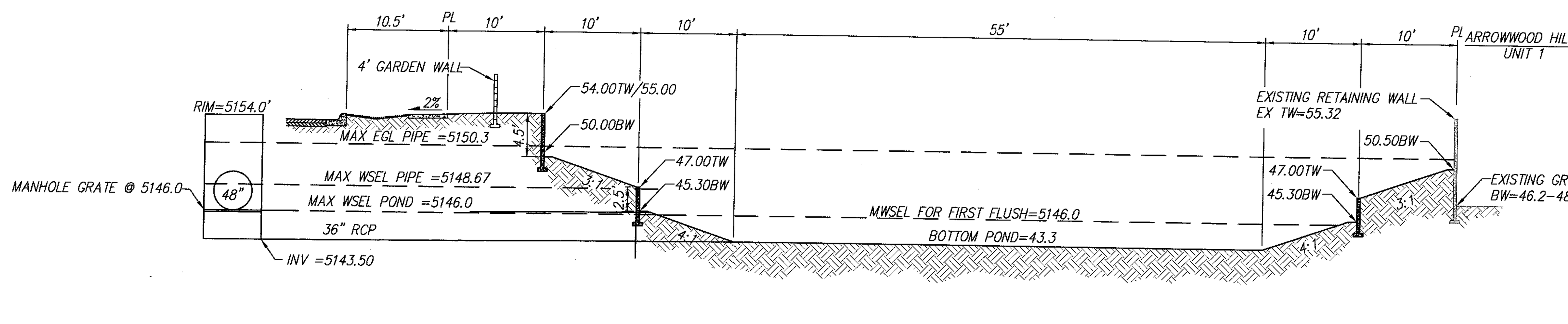
1. SEE SHEET 2 FOR MORE RETAINING WALL & SECTION DETAILS.
2. SEE SHEET 2 FOR EROSION CONTROL NOTES AND RETAINING WALL NOTES.

KEYED NOTES:

(A) EXISTING RETAINING WALL TO BE REMOVED & DISPOSED (TYPICAL).

60' 30' 0 60' 120'

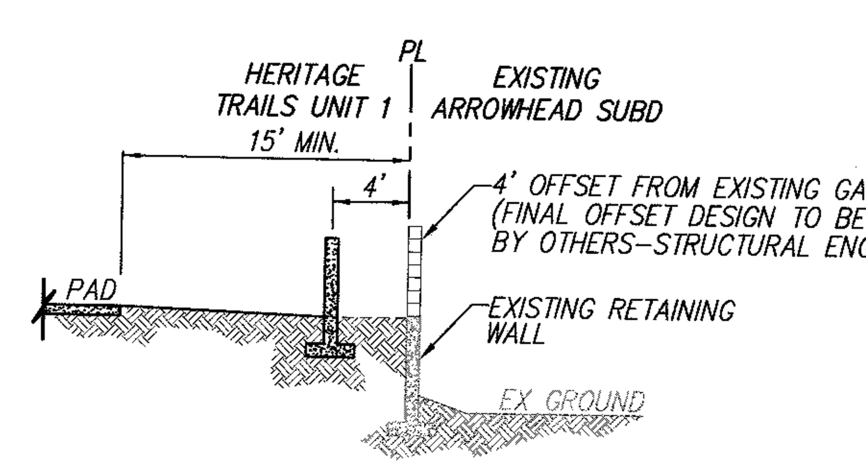
SCALE: 1" = 60'



4' GARDEN WALL
54.00TW/55.00
50.00BW
47.00TW
45.30BW
RIM=5154.0'
MAX EGL PIPE = 5150.3
MAX WSEL PIPE = 5148.67
MAX WSEL POND = 5146.0
MANHOLE GRATE @ 5146.0
48"
36" RCP
INV = 5143.50
MWSEL FOR FIRST FLUSH=5146.0
BOTTOM POND=43.3
EXISTING RETAINING WALL EX TW=55.32
50.50BW
EXISTING GROUND BW=46.2-48.1
ARROWOOD HILLS UNIT 1

SECTION F - POND DETAIL

(TRACT XX) SCALE: 1"=10'



SECTION E
EAST BOUNDARY RETAINING WALL DETAIL

SCALE: 1"=10'

AS BUILT INFORMATION	
CONTRACTOR	DATE
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE
MICRO-FILM INFORMATION	
RECORDED BY	DATE
NO.	

BENCH MARKS

AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
G-G=0.999676466
Δα=-0°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

SURVEY INFORMATION

NO.	FIELD NOTES BY	DATE

ENGINEER'S SEAL

4-13-18

NO.	DATE	BY	REVISIONS REMARKS

DESIGN		
DESIGNED BY	DLH	DATE 10/17
DRAWN BY	DER	DATE 10/17
CHECKED BY	DMG	DATE 10/17

MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
OFFICE (505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE:

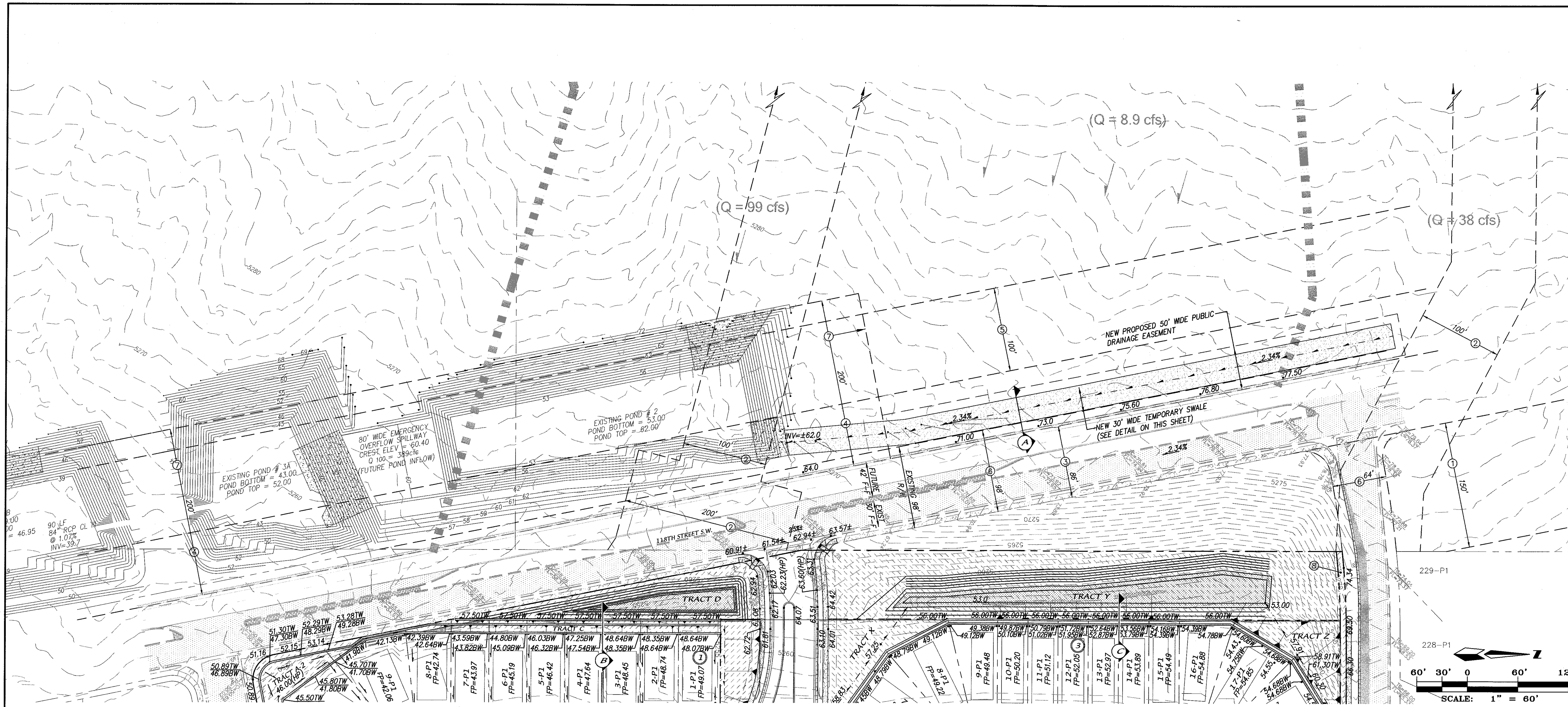
HERITAGE TRAILS SUBDIVISION
OVERALL GRADING & DRAINAGE PLAN

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.

LAST DESIGN UPDATE

CITY PROJECT NO.	ZONE MAP NO.	SHEET	OF
	N-8-Z	3	4

F:\A17JOBS\A17022 -Anderson Heights 2017\GRADE & DRAIN\EARTHWORK\A17022_EARTHWORK.dwg, Last saved by: Dwayne, 4/12/2018



EXISTING EASEMENTS

① 150' AMAFCA DRAINAGE EASEMENT (04-17-1996, 96C-160)

② 100' OR 200' AMAFCA DRAINAGE EASEMENT (07-19-1990, 90C-163)

③ 86' PUBLIC ROADWAY EASEMENT (04-17-1996, 96C-160)

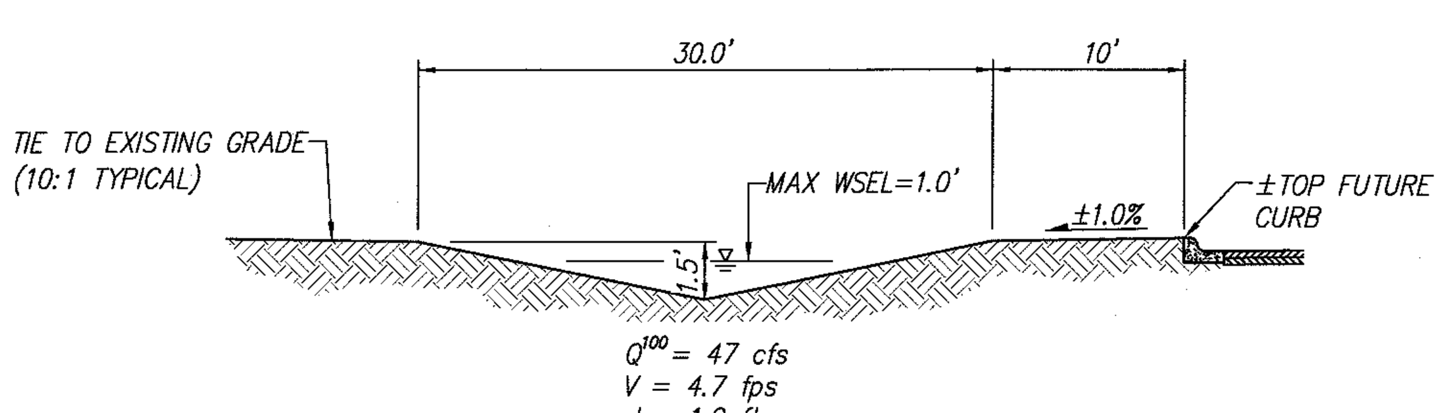
④ 200' POWER LINE EASEMENT U.S.B.R. (02-05-1952, BK. D197, PG. 567) (06-16-2000, BK. A6, PG. 8301)

⑤ 100' PNM EASEMENT (04-20-1978, BK. MISC 602, PG. 558-561)

⑥ 64' OR 98' FUTURE R/W (05-04-2005, 2005C-138)

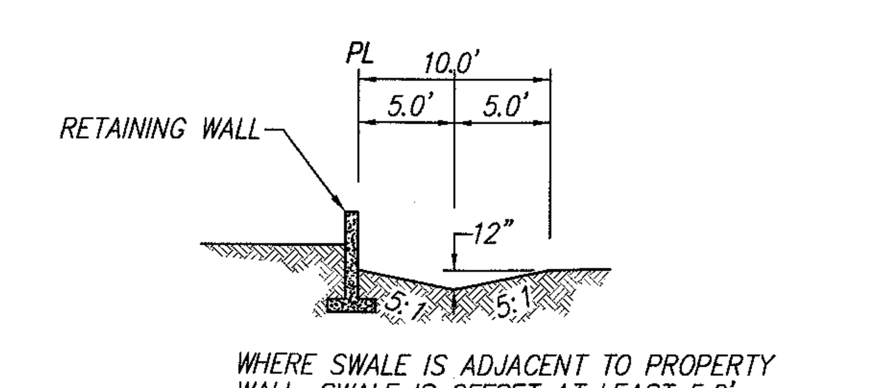
⑦ 200' C.O.A. PUBLIC DRAINAGE EASEMENT (04-20-2005, BK. A95, PG. 4276)

⑧ 10' PNM ELECTRIC EASEMENT (04-28-2009, DOC. 2009056097)



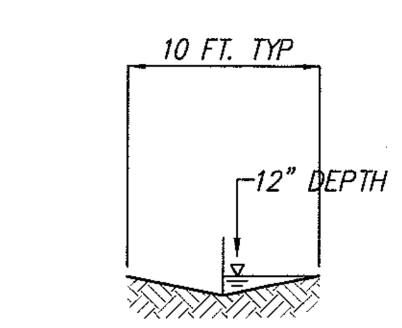
118TH STREET TEMPORARY SWALE DETAIL

(REFER TO SHEET 1) SCALE: 1"=10'



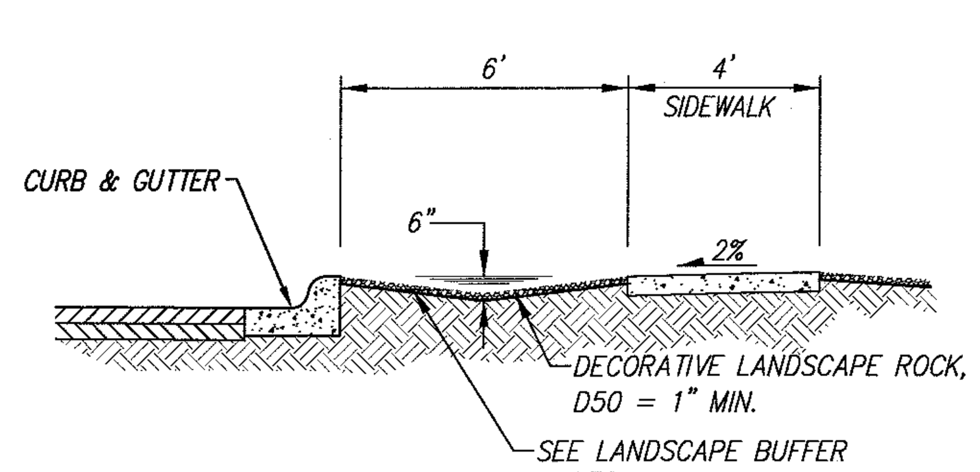
SWALE DETAIL ALONG PROPERTY WALL

SCALE: 1"=10'



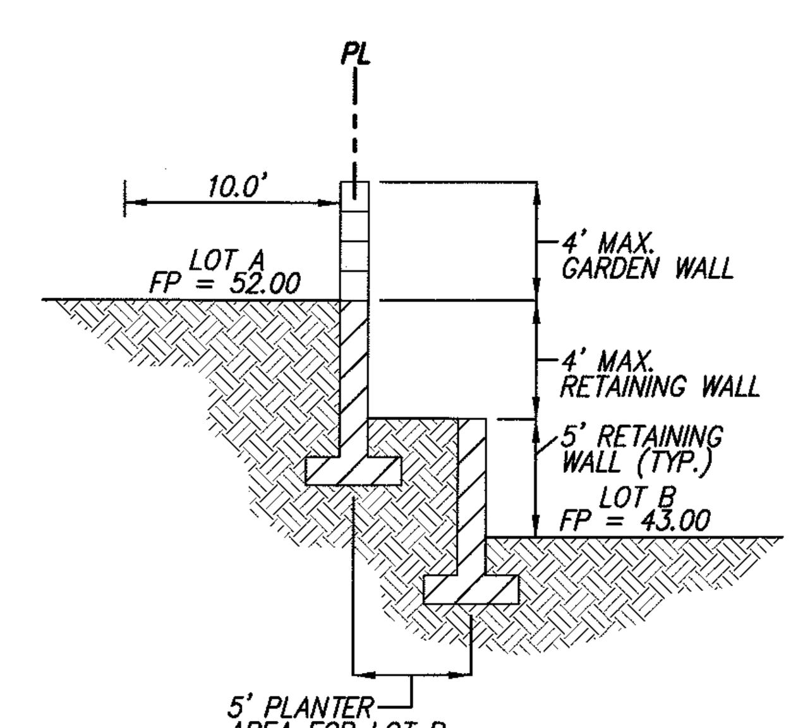
Typical Swale Detail

(adjacent to garden walls in landscape tracts)



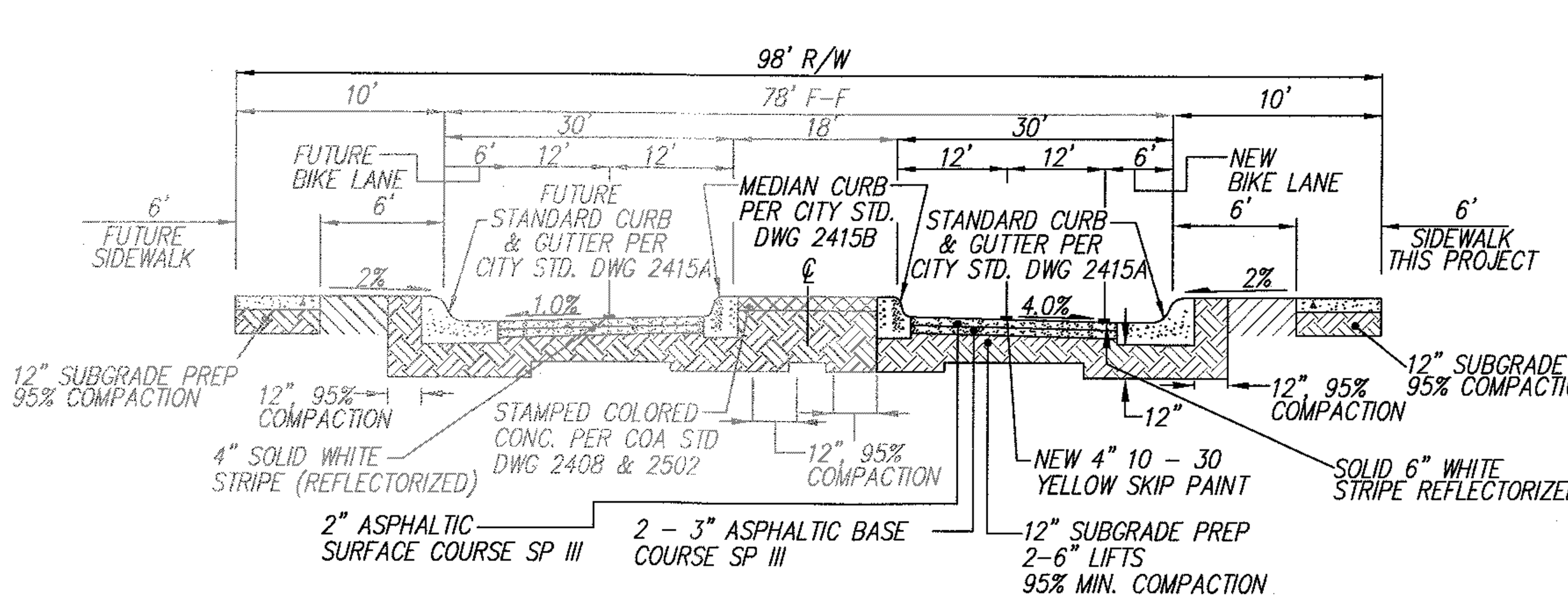
TYPICAL DEPRESSED LANDSCAPE DETAIL

1"=20'



TYPICAL DOUBLE RETAINING WALL DETAIL

NTS



TYPICAL 78' F-F STREET SECTION NTS

118th STREET S.W. FROM SOUTH PROPERTY LINE TO AMOLE MESA

F:\A17JOBS\A17022 -Anderson Heights 2017\GRADE & DRAIN\A17022_GD.dwg, Last saved by: Dwayne, 4/12/2018

AS BUILT INFORMATION

CONTRACTOR	DATE
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICRO-FILM INFORMATION

RECORDED BY	DATE
NO.	

SURVEY INFORMATION

NO.	FIELD NOTES BY	DATE

BENCH MARKS

AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
G-G=0.99967646
Δα=-0°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

ENGINEER'S SEAL

NO.	DATE	REMARKS / REVISIONS	BY
DESIGNED BY	DLH	DESIGN	10/17
DRAWN BY	DER	DATE	10/17
CHECKED BY	DMG	DATE	10/17

MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
OFFICE (505) 828-2200, FAX (505) 797-9539

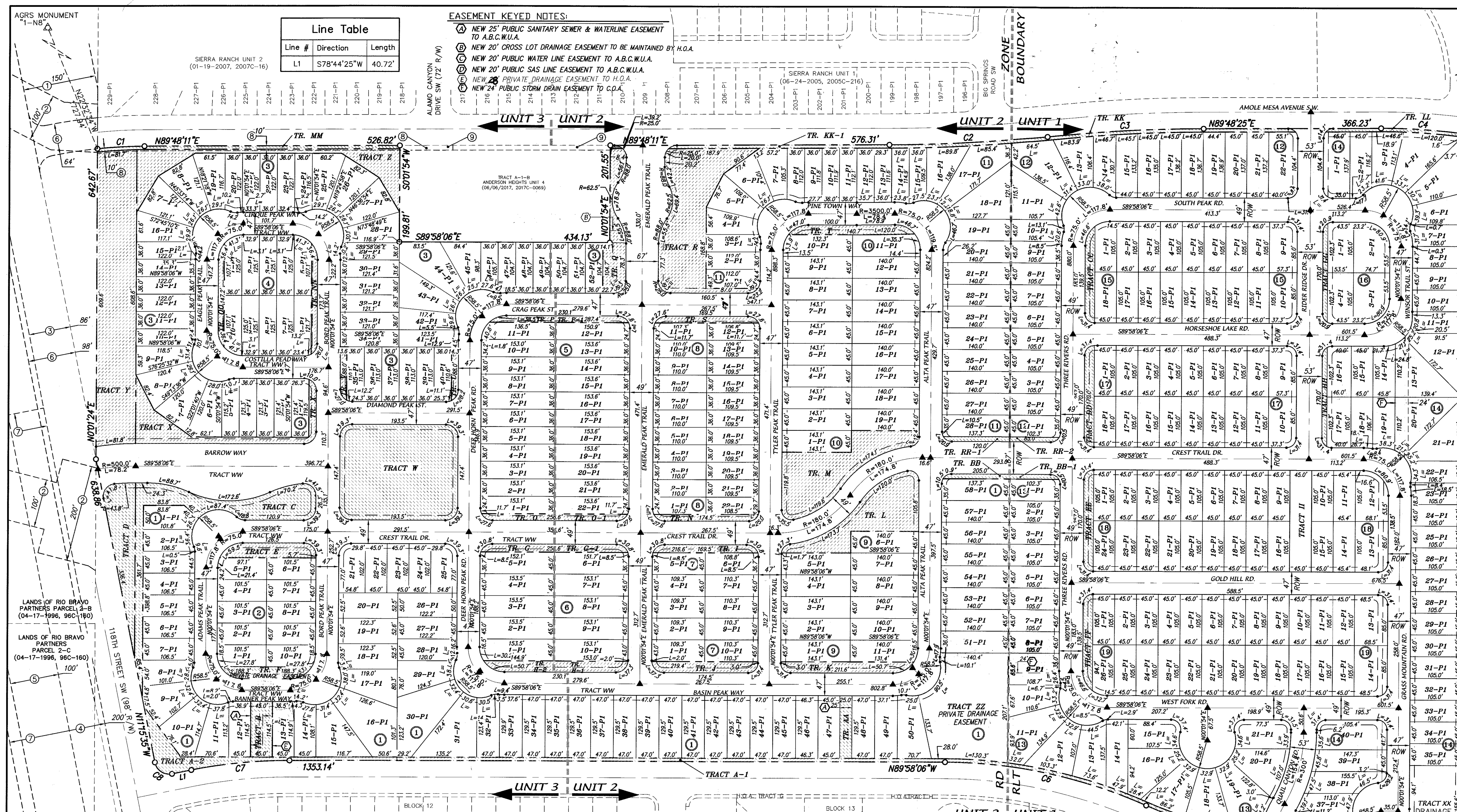
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: *HERITAGE TRAILS SUBDIVISION*
118TH STREET OFFSITE GRADING & DRAINAGE PLAN

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.

CITY PROJECT NO.	ZONE MAP NO.	SHEET	OF
.	N-8-Z	4	4

AMENDED PRELIMINARY PLAT
HERITAGE TRAILS
WITHIN THE
TOWN OF ATRISCO GRANT
PROJECTED SECTIONS 5 AND 8
TOWNSHIP 9 NORTH, RANGE 2 EAST, NMPM
CITY OF ALBUQUERQUE
BERNALILLO COUNTY, NEW MEXICO
MARCH, 2018



Line Table		
Line #	Direction	Length
L1	S78°44'25"W	40.72'

EASEMENT KEYED NOTES:

- (A) NEW 25' PUBLIC SANITARY SEWER & WATERLINE EASEMENT TO A.B.C.W.U.A.
- (B) NEW 20' CROSS LOT DRAINAGE EASEMENT TO BE MAINTAINED BY H.O.A.
- (C) NEW 20' PUBLIC WATER LINE EASEMENT TO A.B.C.W.U.A.
- (D) NEW 20' PUBLIC SAS LINE EASEMENT TO A.B.C.W.U.A.
- (E) NEW 28' PRIVATE DRAINAGE EASEMENT TO H.O.A.
- (F) NEW 24' PUBLIC STORM DRAIN EASEMENT TO C.O.A.

EASEMENTS

1. 150' AMAFCA DRAINAGE EASEMENT (04-17-1996, 96C-160)
2. 100' OR 200' AMAFCA DRAINAGE EASEMENT (07-19-1990, 90C-163)
3. 86' PUBLIC ROADWAY EASEMENT (04-17-1996, 96C-160)
4. 200' POWER LINE EASEMENT U.S.B.R. (02-05-1952, BK. D197, PG. 567) (06-16-2000, BK. A6, PG. 8301)
5. 100' PNM EASEMENT (04-20-1978, BK. MISC 602, PG. 558-561)
6. 64' OR 98' FUTURE R/W (05-04-2005, 2005C-138)
7. 200' C.O.A. PUBLIC DRAINAGE EASEMENT (04-20-2005, BK. A95, PG. 4276)
8. 10' PNM ELECTRIC EASEMENT (04-28-2009, DOC. 2009056097)
9. 10' PUE (GRANTED BY TRACT A-1-B (06/06/2017, 2017c-0069)

CROSS LOT DRAINAGE EASEMENTS ON LOTS 9, 10 & 11, BLOCK 1, UNIT 3 FOR BENEFIT OF TRACT A-2, TO BE MAINTAINED BY OWNERS OF LOTS 9, 10 & 11.

CROSS LOT DRAINAGE EASEMENTS ON LOTS 1-9, BLOCK 1, UNIT 3 FOR BENEFIT OF TRACT C, TO BE MAINTAINED BY OWNERS OF LOTS 1-9, BLOCK 1.

CROSS LOT DRAINAGE EASEMENT ON TRACT Q FOR BENEFIT OF TRACT A-1-B TO BE MAINTAINED BY OWNER OF TRACT Q.

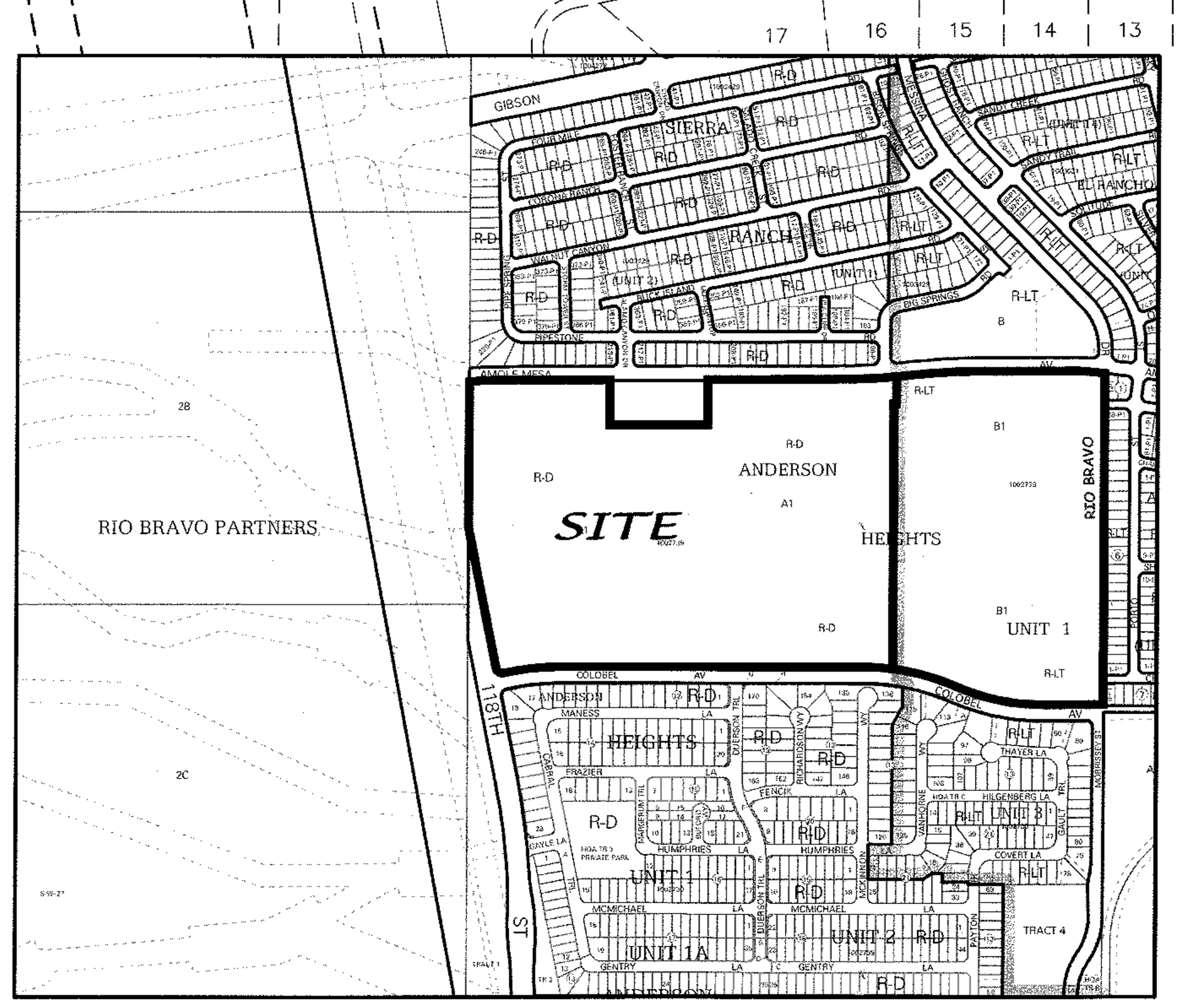
Curve Table					
C#	Length	Radius	Delta	Chord B.	Chord L.
C1	97.16'	966.00'	5°45'45"	N86°55'19"E	97.11'
C2	327.48'	3155.42'	5°56'47"	N86°47'47"E	327.33'
C3	322.44'	3087.42'	5°59'02"	N86°48'55"E	322.29'
C4	171.92'	1281.12'	7°41'21"	S86°20'55"E	171.80'
C5	392.99'	966.00'	23°18'33"	N78°18'49"W	390.28'
C6	428.62'	1034.00'	23°45'02"	N78°05'35"W	425.56'
C7	203.77'	1034.00'	11°17'29"	S84°23'10"W	203.44'
C8	47.12'	30.00'	90°00'00"	N56°15'35"W	42.43'

LEGEND

- 1-P1 — LOT NUMBER
- (1) — BLOCK NUMBER
- ▲ — CENTER LINE MONUMENT
- ROW — RIGHT-OF-WAY
- ZONE BOUNDARY

PROPERTY CORNERS

- ● SET REBAR WITH CAP "ALS LS 7719" (TYP)
- ○ FOUND 5/8" REBAR WITH CAP "LS 7719" (TYP)



VICINITY MAP

ZONE MAP: N-8-Z

SUBDIVISION DATA

GROSS ACREAGE	84.9303 AC
ZONE ATLAS NO.	N-8-Z
NO. OF LOTS CREATED	425 LOTS
NO. OF TRACTS CREATED	50 TRACTS
DATE OF SURVEY	MARCH, 2015

LEGAL DESCRIPTION

A tract of land situate within the Town of Atrisco Grant, projected Sections 5 and 8, Township 9 North, Range 2 East, New Mexico Principal Meridian, City of Albuquerque, Bernalillo County, New Mexico, being all of TRACT A-1-A, ANDERSON HEIGHTS UNIT 4, as the same is shown and designated on said plat, filed for record in the office of the County Clerk of Bernalillo County, New Mexico, on June 06, 2017 in Plat Book 2017C, Page 0069, together with TRACT B-1, ANDERSON HEIGHTS UNIT 4, as the same is shown and designated on said plat, filed for record in the office of the County Clerk of Bernalillo County, New Mexico, on March 23, 2015, in Plat Book 2015C, Page 29, and containing 84.9303 acres more or less.

PURPOSE OF PLAT

1. SUBDIVIDE TRACTS A-1-A, B-1 ANDERSON HEIGHTS INTO 425 RESIDENTIAL LOTS & 50 TRACTS AS SHOWN.
2. DEDICATE NEW RIGHT-OF-WAY AS SHOWN.
3. GRANT NEW EASEMENTS AS SHOWN.

NOTES

1. UNLESS OTHERWISE NOTED, ALL BOUNDARY CORNERS SHOWN THUS ○ SHALL BE A SET #4 REBAR WITH YELLOW PLASTIC CAP "N.M.P.S. 7719"
2. ALL STREET CENTERLINE MONUMENTATION SHALL BE INSTALLED AT ALL CENTERLINE PC'S, PT'S, ANGLE POINTS, AND STREET INTERSECTIONS AND SHOWN THUS , ▲ WILL BE MARKED BY A FOUR INCH (4") ALUMINUM CAP STAMPED: "CITY OF ALBUQUERQUE CENTERLINE MONUMENTATION" "DO NOT DISTURB" N.M.P.S.#7719
3. BOUNDARY SHALL BE TIED TO THE NEW MEXICO STATE PLANE COORDINATE SYSTEM AS SHOWN.
4. BASIS OF BEARING SHALL BE NEW MEXICO STATE PLANE GRID BEARINGS.
5. ALL DISTANCES SHALL BE GROUND DISTANCES.
6. MANHOLES WILL BE OFFSET AT ALL POINTS OF CURVATURE, POINTS OF TANGENCY, STREET INTERSECTIONS, AND ALL OTHER ANGLE POINTS TO ALLOW USE OF CENTERLINE MONUMENTATION.
7. TRACT WW IS A PRIVATE ACCESS, PRIVATE DRAINAGE EASEMENT AND PUBLIC WATERLINE & SANITARY SEWER EASEMENT. IT IS FOR THE BENEFIT OF ALL LOTS WITHIN UNIT 2&3 AND WILL BE MAINTAINED BY THE H.O.A.
8. TRACTS "A-OO" ARE PRIVATE COMMON AREAS FOR THE BENEFIT OF ALL LOTS WITHIN UNIT 2&3. TRACTS WILL BE DEEDED TO THE H.O.A. AND WILL BE MAINTAINED BY THE H.O.A.

DEDICATION OF DRAINAGE EASEMENTS: CITY CONSTRUCTS AND MAINTAINS

A PERPETUAL EASEMENT ON THE AREAS DESIGNATED ON THIS PLAT AS "DRAINAGE EASEMENT" ("DETENTION AREA") IS HEREBY DEDICATED TO THE CITY OF ALBUQUERQUE FOR THE PURPOSE OF PERMITTING THE CONVEYANCE OF STORM WATER RUNOFF AND FOR THE PURPOSE OF CONSTRUCTING, MAINTAINING, OPERATING, REMOVING, AND REPLACING STORM WATER DRAINAGE FACILITIES (DETENTION FACILITIES). NO FENCE, WALL, PLANTING, BUILDING, OR OTHER OBSTRUCTION MAY BE PLACED OR MAINTAINED IN SAID EASEMENT AREA AND THERE SHALL BE NO ALTERATION OF THE GRADES OR CONTOURS IN SAID DEDICATED AREA WITHOUT THE APPROVAL OF SAID CITY ENGINEER OF THE CITY OF ALBUQUERQUE. NO OBSTRUCTIONS MAY BE PLACED IN SAID EASEMENT AREA WHICH WOULD PREVENT INGRESS AND EGRESS TO SAME BY MAINTENANCE VEHICLES OR WHICH WOULD PREVENT SAID VEHICLES TRAVELING ON SAID DRAINAGE WAY FOR MAINTENANCE PURPOSES.

ABBREVIATIONS

- 10' PUE = PUBLIC UTILITY EASEMENTS GRANTED WITH THIS PLAT
- ROW = RIGHT-OF-WAY
- H.O.A.= HOME OWNERS ASSOCIATION
- C.O.A.= CITY OF ALBUQUERQUE
- A.B.C.W.U.A.= ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY

UNIT 1
TRACTS LL, KK, CC, GG, DD, HH, EE, II, BB-1, FF, JJ, RR-2, XX, & A ARE FOR LANDSCAPING PURPOSES AND WILL BE MAINTAINED BY THE "UNIT 1" H.O.A.

UNIT 2 (GATED COMMUNITY)
TRACTS Q, R, RR-1 KK-1, S, T, M, L, BB, I, N, P-1, G-1, O-1, H-1, J, K, AA, A-1, D-1, & ZZ ARE FOR LANDSCAPING PURPOSES AND WILL BE MAINTAINED BY THE "UNIT 2 & UNIT 3" H.O.A.

UNIT 3 (GATED COMMUNITY)
TRACTS A-2, Y, M, Z, X, NN, OO, O, MM, P, W, C, G, D, E, H-2, F, B, A, U, V ARE FOR LANDSCAPING PURPOSES AND WILL BE MAINTAINED BY THE "UNIT 2 & UNIT 3" H.O.A.

APPROVED

Loren N. Risenhoover P.S. 3/7/18
City Surveyor, City of Albuquerque, N.M. — Date

Owner: KB HOME NEW MEXICO Inc
3-5-2018
Randy Carpenter, President — Date

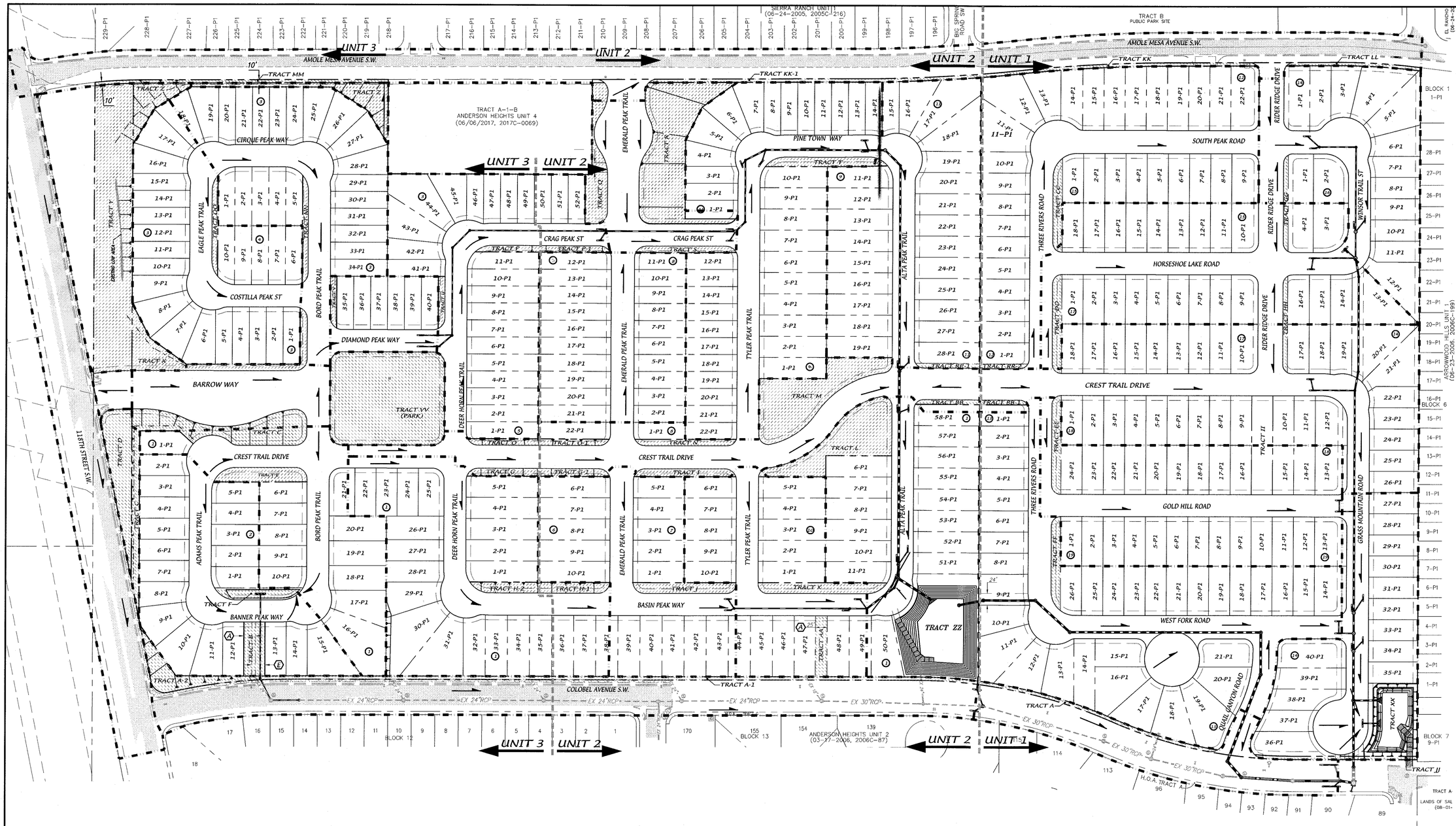
OWNERS
KB HOME NEW MEXICO Inc
7807 PeakView Ave
Suite 300
CENTENNIAL, COLORADO 80111
(303) 323-1130

ENGINEERS
D. MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200

SITE BENCHMARK
AGRS MONUMENT
"1-N8"
ELEVATION=5307.250
(NAD83/NAVD88)

SURVEYOR
ALDRICH LAND SURVEY
P.O. BOX 30701
ALBUQUERQUE, NEW MEXICO 87190
(505) 884-1990

CITY PROJECT No. 1002739
SHEET 1 OF 1



SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

AS BUILT INFORMATION

	DATE
CONTRACTOR	
STAKED BY	
INSPECTOR'S INITIALS BY	
FIELD VERIFICATION BY	
AS BUILT MADE CORRECTED BY	

MICRO-FILM INFORMATION

	DATE
RECORDED BY	
NO.	

BENCH MARKS

AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
G-G=0.99967646
Δα = -0017'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

ENGINEER'S SEAL

DANIEL MARK GOODWIN 11987 NEW MEXICO REGISTERED PROFESSIONAL ENGINEER
4-12-18

NO.	DATE	REMARKS	BY
		REVISIONS	
DESIGNED BY		DESIGN	DLH 12/17
DRAWN BY			DER 12/17
CHECKED BY			DMG 12/17

dmg MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
OFFICE (505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE:
HERITAGE TRAILS SUBDIVISION
SUB BASIN BOUNDARY EXHIBIT

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.

CITY PROJECT NO.	ZONE MAP NO.	SHEET	OF
.	N-8-Z	1	3

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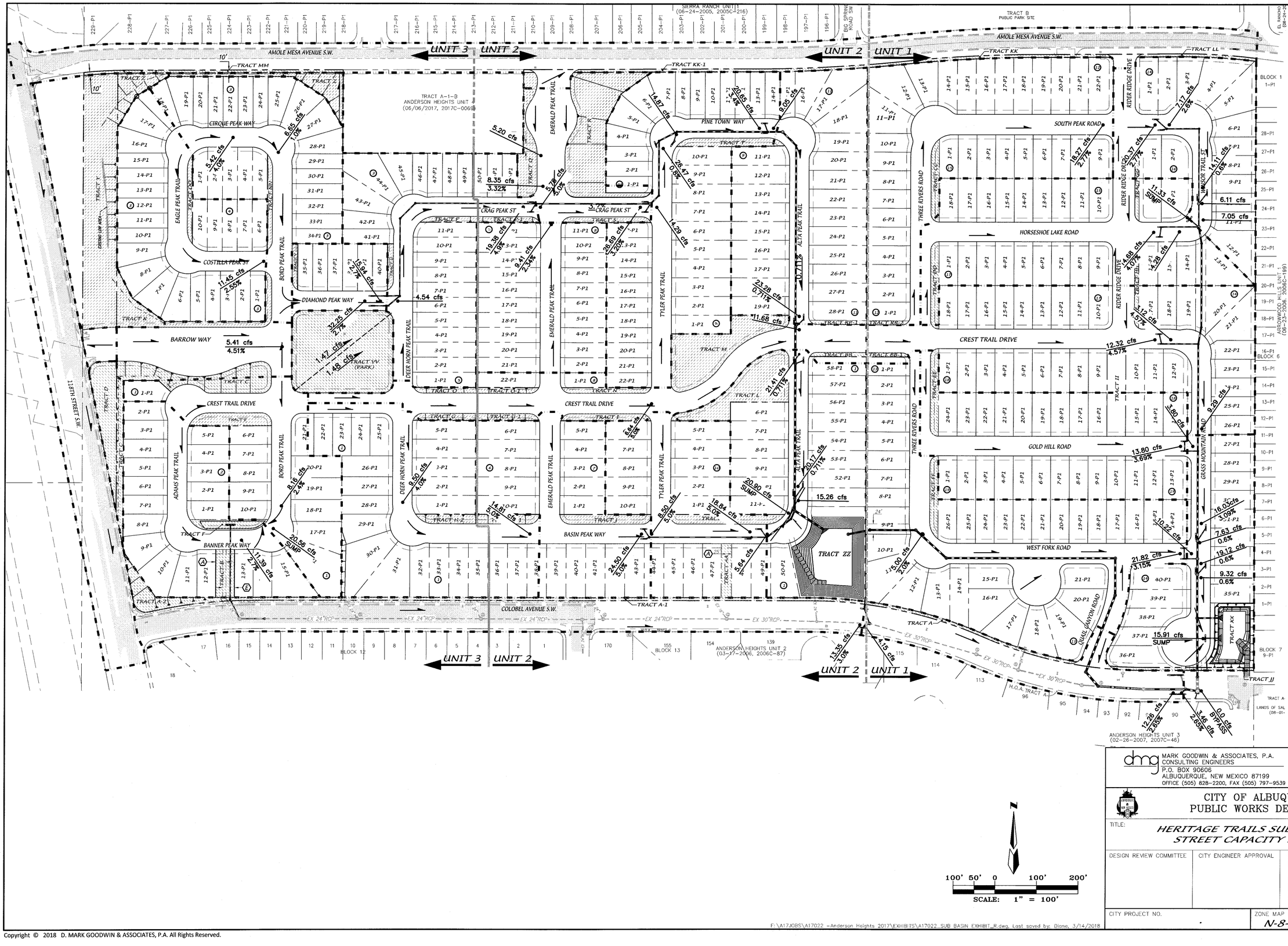

SURVEY INFORMATION
FIELD NOTES
NO. BY DATE

BENCH MARKS
AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
C-G=0.999676466
Δα = -00°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

AS BUILT INFORMATION
CONTRACTOR
WORK STARTED BY DATE
INSPECTORS ACCEPTANCE BY DATE
FIELD VERIFICATION BY DATE
DRAWINGS CORRECTED BY DATE
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

ENGINEER'S SEAL
DIANE HOELLER 11857 NEW MEXICO REGISTERED PROFESSIONAL ENGINEER
LICENSED PROFESSIONAL ENGINEER
12/17/18

NO. DATE REMARKS BY
REVISIONS
DESIGNED BY DLH DATE 12/17
DRAWN BY DER DATE 12/17
CHECKED BY DMG DATE 12/17

MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
OFFICE (505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE:
HERITAGE TRAILS SUBDIVISION
STREET CAPACITY EXHIBIT

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.

CITY PROJECT NO. .
ZONE MAP NO. N-8-Z
SHEET 2 OF 3

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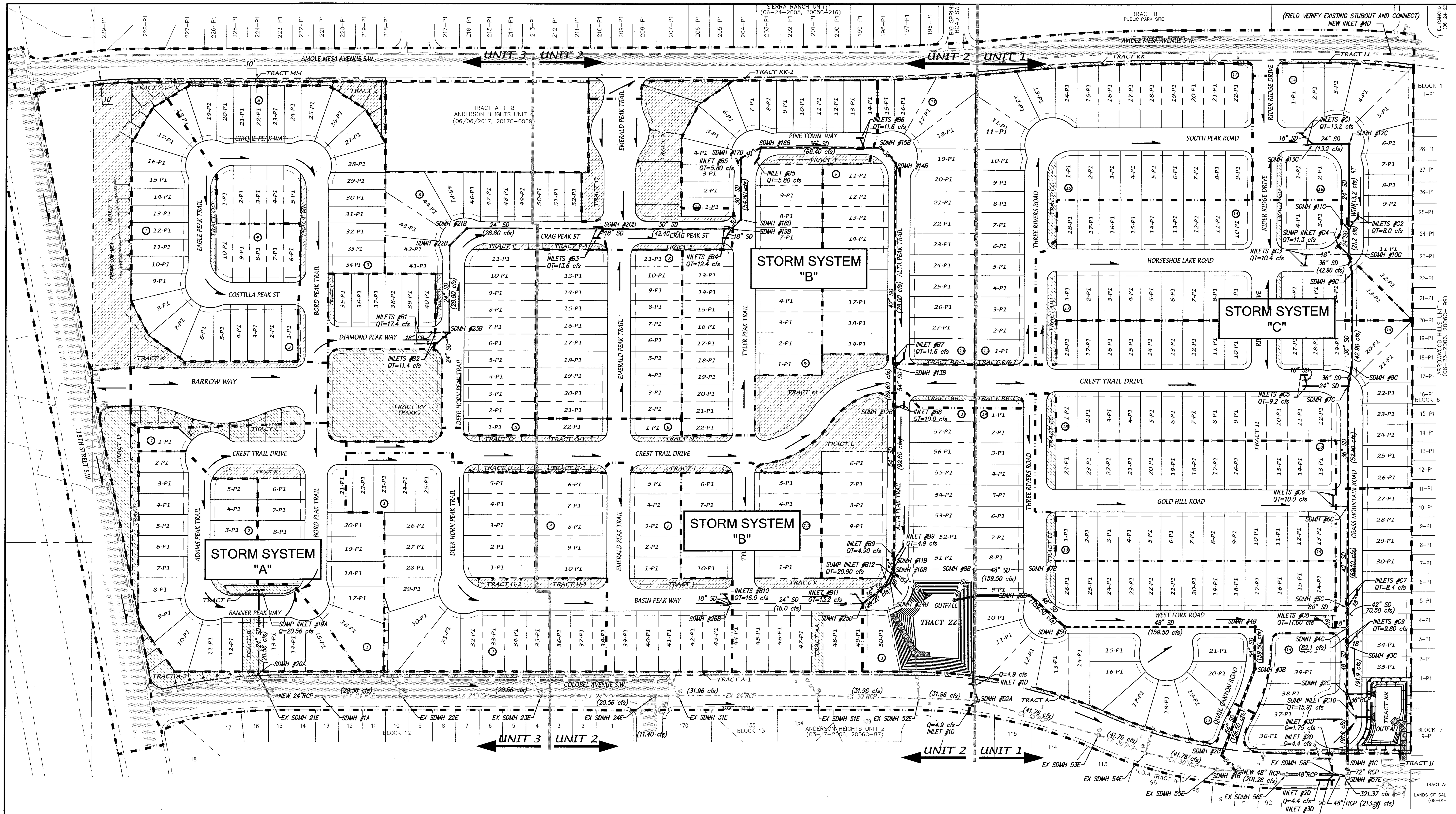

LEGEND

- EXISTING SANITARY SEWER MANHOLE
- EXISTING SAS LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING STORM DRAIN
- EXISTING STORM DRAIN MANHOLE
- NEW RIGHT-OF-WAY
- NEW LOT LINES
- NEW EASEMENTS
- NEW STORM DRAIN INLET
- NEW STORM DRAIN
- NEW STORM DRAIN MANHOLE

SCALE: 1" = 100'

AS BUILT INFORMATION

CONTRACTOR | WORK STARTED BY | DATE | INSPECTOR'S ACCEPTANCE BY | DATE | FIELD VERIFICATION BY | DATE | DRAWINGS CORRECTED BY | DATE

MICRO-FILM INFORMATION

RECORDED BY | DATE | NO.

BENCH MARKS

AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
G-G=0.9999676466
Δα=-00°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

SURVEY INFORMATION

FIELD NOTES | NO. | BY | DATE

ENGINEER'S SEAL

REVISIONS | NO. | DATE | REMARKS | BY

DESIGN	DATE
DESIGNED BY DLH	12/17
DRAWN BY DER	12/17
CHECKED BY DMG	12/17

MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
OFFICE (505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: HERITAGE TRAILS SUBDIVISION
PRELIMINARY STORM DRAIN LAYOUT

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.

LAST DESIGN UPDATE

CITY PROJECT NO.	ZONE MAP NO.	SHEET	OF
.	N-8-Z	3	3

F:\A17JOBS\A17022 -Anderson Heights 2017\EXHIBITS\A17022_SUB BASIN EXHIBIT_R.dwg, Last saved by: Diane, 3/14/2018

CITY OF ALBUQUERQUE

March 23, 2018

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

RE: Heritage Trails Subdivision
Drainage Report and Grading Plan
Engineers Stamp Date: 3/15/18
Hydrology File: N08D006F

Dear Ms. Hoelzer:

Based on the information provided in your submittal received on 3/15/18, the Drainage Report and Grading Plan cannot be approved for Preliminary Plat or Grading Permit until the following are corrected and a revised Drainage Report and Grading Plan are submitted.

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Prior to Preliminary Plat/Grading Permit:

1. The offsite swale under the powerline, west of 118th will need a new public drainage easement, granted by the owner of Parcel 2-B (Rio Bravo Partners & Peoria Car Wash).
2. The offsite swale will need an agreement and covenant to be maintained by the owner of the currently platted Tract A1 and B1 (KB Homes) and successors. This needs to be a named item under Unit 1 of the infrastructure list (offsite swale with agreement and covenant).
3. Extend the offsite swale 40 feet north to divert all the flows from the upstream basin into Pond #2, per the original Anderson Heights drainage report.
4. Include the single-A inlet and storm drain connection in Amole Mesa near the intersection of Messina on Unit 1 of the infrastructure list.
5. The following tracts in Unit 1 will need to be dedicated as public drainage easements maintained by the owners of the subdivision by using the easement language for "*Drainage Facilities and/or Detention Areas Maintained by Lot Owner*" defined in the DPM, Chapter 21, Section 4, Part A.:
    a. Tract XX (first flush pond, required volume=20,683CF)
6. The following tracts in Units 2 and 3 will need to be dedicated as private drainage easements maintained by the owners of the subdivision by using the easement language for "*Drainage Facilities and/or Detention Areas Maintained by Lot Owner*" defined in the DPM, Chapter 21, Section 4, Part A.:
    a. Tract A-2 (swale and storm drain)
    b. Tract C (swale)

Orig: Drainage File

c. Tract D (retention pond)
d. Tract F (first flush pond, volume required=3,826CF)
e. Tract L (swale)
f. Tract R (swale)
g. Tract X (swale)
h. Tract Y(retention pond)
i. Tract Z (swale)
j. Tract ZZ (first flush pond, volume required=28,857CF)

7. Cross-lot drainage easements are needed on the following lots/tracts:
   a. Unit 3, Block 1, Lots 9, 10, and 11 for the benefit of Tract A-2, to be maintained by the owners of Lots 9, 10, and 11, unless these lots are extended to include the corner of Tract A-2 at Colobel and 118th.
   b. Unit 3, Block 1, Lots 1-9 for the benefit of Tract C, to be maintained by the owners of Lots 1-9, unless these lots are extended to contain the terraced portion of Tract C.
   c. The drainage easement on Tract Q (near the memorial park) needs to a cross lot drainage easement for the benefit of Tract A1A to be maintained by the owner of Tract Q; not a stormdrain easement as currently shown.
8. Correct the pad elevation on Unit 3, Block 4, Lot 10.
9. Please add the dimensional data to the Tract Y pond, similar to the Tract D pond.
10. The waterblock on Tyler Peak Trail, north of Crest Trail Drive does not make sense with respect to the spot elevations provided, please correct.
11. Add a footnote to the infrastructure list that "If units 2 and 3 are developed separately, a revised phasing plan will need to be submitted and included the work order of the first unit to develop."
12. Between Unit 1, Block 3, Lot 28 and the memorial park. Provide a cross section here showing the retaining walls and their footers as contained on Lot 28.
13. Clarify Section E-E (the wall section along the boundary with Arrowhead Subdivision) to show that no new fill is being placed against the existing wall. Show and label the existing vs. proposed grades (typ.) and add a note that "no additional fill is to be placed against the existing wall".
14. Provide typical wall sections along Colobel and Amole Mesa showing property lines and horizontal and vertical dimensions. Show the existing perimeter wall to remain or to be removed; assuming it's just a garden wall, it may be appropriate to condition is removal on the grade change from one side to the other (<2' grade change for garden wall).
15. Add the typical swale detail as discussed (10:1.5 v-ditch, I believe) and callout where used.
16. Please provide the Curb and Gutter Exhibit (referenced on the infrastructure list footnotes).
17. Add a footnote to the infrastructure list that "storm drain sizes may be subject to change at DRC, pending Hydrology approval of the finalized HGL calculations."

PO Box 1293
Albuquerque
NM 87103
www.cabq.gov

Orig: Drainage File

18. On Unit 1, Block 13, Lot 9, please put the easement and storm drain on the south side of the lot so that a more economic and hydraulically efficient storm drain can be built straight from the pond to the road.
19. Several of the inlets are shown crisscrossing over the trunk line with their connecter pipes. Revise to provide straight connections to the manholes:
    a. Inlets B6.
    b. Inlet B11.
20. Many of the storm drain easements are too narrow for the required trenching prism, per DPM, Ch. 22.6.C.2:
    a. The private easement across Tract B should be ~28' minimum. But this is private storm drain on a private tract, it may be better just to put a private drainage easement on the whole tract, then shift the stormdrain west several feet to allow for a sufficient trenching prism.
    b. The private easement across Unit 2, Block 1, Lot 51 should be ~36' minimum. However if the storm drain alignment is straightened as recommended in comment 18, no easement would even be needed here.
    c. The public easement across Unit 1, Block 13, Lot 9 needs to be ~30' minimum. Please reconfirm this trenching prism if the easement is shifted south as recommended in comment 18.
    d. The public easement across Unit 1, Block 14, Lot 13 needs to be ~24' minimum.
    e. The public easement across Unit 1, Block 14, Lot 20 needs to be ~24' minimum.
    f. The public easement across Tract JJ (near the unit 1 pond) needs to be ~29' minimum and it needs to be realigned over the revised storm drain alignment.
21. The Public storm drain easements need to use the easement language for "*Dedication of Drainage Easements: City Constructs and Maintains*" defined in the DPM, Chapter 21, Section 4, Part B.

PO Box 1293

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Prior to Work Order Approval:

A detailed drainage report will be required prior to submitting for Work Order. This report will need to address the following outstanding items, not addressed in this drainage report.

22. Capacity of the valley gutter on Emerald Peak Trail, south of Crest Trail Drive will need to be verified to justify the lack of a waterblock.
23. Capacity of the valley gutter on Tyler Peak Trail, south of Crest Trail Drive will need to be verified to justify the lack of a waterblock.
24. At DRC, waterblock height will be verified. If waterblocks are not designed to 0.87', the Drainage Report will need to be revised to demonstrate capacity similar to the previous two cases.
25. Please include the interim grading plan for Unit 2/3 in the work order set.
26. Provide stormdrain profiles showing finished grade, Q, V, and HGL.

Orig: Drainage File

27. All pipe hydraulics need to be analyzed. Either separate WSPGW models need to be created for these, or V depth calculations may be used per DPM, Chapter 22.D.2.c&d. The following pipes will need to be analyzed:
    a. Basin B Model. Between the B2 inlets and SDMH 23B.
    b. Basin B Model. Between sump inlet B12 and SDMH 10B. It may be more reasonable to connect one of these inlets directly to SDMH 24B instead.
    c. Colobel. Between Inlets 3D and SDMH 58E.
    d. Basin C Model. Between Inlet C8 and SDMH 4C.
    e. Basin C Model. Between Inlet C6 and SDMH 6C.
    f. Basin C Model. Between Inlet C5 and SDMH 7C.
    g. Basin C Model. Between Inlet C3 and SDMH 10C.
28. In order to expedite the review of this project for Preliminary Plat an in depth review of the WSPGW model was not conducted. Prior to Work Order, the model will be thoroughly reviewed and stormdrain sizes, alignments, and inlets may be subject to change.
29. Please include the first flush pond designs in the work order set; several design items will need to be addressed at such time: design of the outlet structures, retaining walls designed for saturated soils, end treatments for the inlet pipes, perimeter fencing, etc.

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

Sincerely,

PO Box 1293

Albuquerque

NM 87103

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

Orig: Drainage File

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Heritage Trails (AKA Anderson Heights Unit 4) Building Permit #: _____ City Drainage #: N8 / D006F

DRB#: 1002739 EPC#: _____ Work Order#: _____

Legal Description: Tract A-1-A and tract B-1, Anderson Heights Unit 4

City Address: 118th street and Amole Mesa Avenue

Engineering Firm: MARK GOODWIN AND ASSOCIATES, PA Contact: Diane Hoelzer, PE

Address: PO BOX 90606, ABQ, NM 87199

Phone#: 828-2200 Fax#: _____ E-mail: diane@goodwinengineers.com

Owner: KB Home New Mexico Inc Contact: Morris Barbera or Bo Johnson

Address: 7807 E Peakview Avenue, Ste. 300, Centennial, Colorado, 80111

Phone#: (303)908-0575 or (505)450-4616 Fax#: _____ E-mail: _____

Architect: N/A Contact: _____

Address: _____

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

Other Contact: N/A Contact: _____

Address: _____

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

Check all that Apply:

DEPARTMENT:

- [x] HYDROLOGY/ DRAINAGE
- [ ] TRAFFIC/ TRANSPORTATION
- [ ] MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

- [ ] ENGINEER/ ARCHITECT CERTIFICATION
- [ ] CONCEPTUAL G & D PLAN
- [x] GRADING PLAN
- [ ] DRAINAGE MASTER PLAN
- [x] DRAINAGE REPORT
- [ ] CLOMR/LOMR
- [ ] TRAFFIC CIRCULATION LAYOUT (TCL)
- [ ] TRAFFIC IMPACT STUDY (TIS)
- [ ] EROSION & SEDIMENT CONTROL PLAN (ESC)
- [ ] OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: [x] Yes [ ] No

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

- [ ] BUILDING PERMIT APPROVAL
- [ ] CERTIFICATE OF OCCUPANCY
- [x] 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
- [x] GRADING PERMIT APPROVAL
- [ ] SO-19 APPROVAL
- [ ] PAVING PERMIT APPROVAL
- [ ] GRADING/ PAD CERTIFICATION
- [ ] WORK ORDER APPROVAL
- [ ] CLOMR/LOMR
- [ ] PRE-DESIGN MEETING
- [ ] OTHER (SPECIFY) _____

DATE SUBMITTED: March 15, 2018 By: Diane Hoelzer, PE

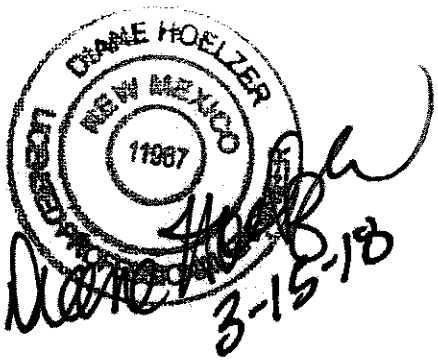
COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ___

Heritage Trails
(Residential Subdivision)

Drainage Management Plan

Prepared by
Mark Goodwin & Associates, P.A.

March 15, 2018



City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Heritage Trails (AKA Anderson Heights Unit 4) Building Permit #: _____ City Drainage #: N8 / D006F

DRB#: 1002739 EPC#: _____ Work Order#: _____

Legal Description: Tract A-1-A and tract B-1, Anderson Heights Unit 4

City Address: 118th street and Amole Mesa Avenue

Engineering Firm: MARK GOODWIN AND ASSOCIATES, PA Contact: Diane Hoelzer, PE

Address: PO BOX 90606, ABQ, NM 87199

Phone#: 828-2200 Fax#: _____ E-mail: diane@goodwinengineers.com

Owner: KB Home New Mexico Inc. Contact: Morris Barbera or Bo Johnson

Address: 7807 E.Peakview Avenue, Ste. 300, Centennial, Colorado, 80111

Phone#: (303)908-0575 or (505)450-4616 Fax#: _____ E-mail: _____

Architect: N/A Contact: _____

Address: _____

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

Other Contact: N/A Contact: _____

Address: _____

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

Check all that Apply:

DEPARTMENT:

X HYDROLOGY/ DRAINAGE
_____ TRAFFIC/ TRANSPORTATION
_____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

_____ ENGINEER/ ARCHITECT CERTIFICATION

_____ CONCEPTUAL G & D PLAN
X GRADING PLAN
_____ DRAINAGE MASTER PLAN
X DRAINAGE REPORT
_____ CLOMR/LOMR

_____ TRAFFIC CIRCULATION LAYOUT (TCL)
_____ TRAFFIC IMPACT STUDY (TIS)
_____ EROSION & SEDIMENT CONTROL PLAN (ESC)

_____ OTHER (SPECIFY) _____

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

_____ BUILDING PERMIT APPROVAL
_____ CERTIFICATE OF OCCUPANCY

X 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
X GRADING PERMIT APPROVAL
_____ SO-19 APPROVAL
_____ PAVING PERMIT APPROVAL
_____ GRADING/ PAD CERTIFICATION
_____ WORK ORDER APPROVAL
_____ CLOMR/LOMR

_____ PRE-DESIGN MEETING
_____ OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: X Yes _____ No

DATE SUBMITTED: March 15, 2018 By: Diane Hoelzer, PE

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ___

Heritage Trails
Table of Contents

APPENDIX E *Existing Drainage Covenant Temporary Onsite Ponds*

FEMA Offsite Powerline Pond Exhibit

POCKET 1 *GRADING AND DRAINAGE PLAN*
POCKET 2 *PRELIMINARY PLAT*
SUB BASIN BOUNDARY EXHIBIT
POCKET 3 *STREET CAPACITY EXHIBIT*
PRELIMINARY STORM DRAIN LAYOUT

POCKET 4 *INTERIM POND EXHIBITS*

D. Mark Goodwin & Associates, P.A.
Consulting Engineers
P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539

~ 2012 ACEC/NM Award Winner for Engineering Excellence ~
~ 2008 ACEC/NM Award Winner for Engineering Excellence ~
~ 2017 ENR Landscape/Urban Development Award of Merit~

March 15, 2018

Mr. Dana Peterson
Hydrology Department
City of Albuquerque
PO Box 1293
Albuquerque, NM 87103

Re: Heritage Trails Subdivision – (DRB 1002739)
Request Approval of Drainage Report and Grading Plan
File: N08D006F

Dear Mr. Peterson:

In response to your comment letter dated January 31, 2018:

HYDROLOGY:

1. *Runoff from Tract D will flow to a small retention pond within the tract. The maximum WSEL for the 100 year-10 day storm is 0.6 feet.*

   Runoff from Tract Y will flow to a small retention pond within the tract. The volume retained include the offsite sloped area adjacent to the east side of 118th street ROW. The maximum WSEL for the 100 year-10 day storm is 1.0 feet. The west triangular portion of Tract Z and Tract X also drains into this pond through a shallow 1' deep gravel lined swale.

   Runoff from the east triangular portion of Tract Z will flow into landscape areas and ultimately into Amole Mesa Avenue. All Landscape Tract will include a drainage covenant which will be included on the infrastructure list.

2. *Offsite drainage west of 118th street are offsite flows and do not enter our project site. The ultimate drainage plan for all flows west of 118th street was to be directed to the northern most powerline pond #2 as shown in the CLOMR/LOMR for the 118th Street Powerline Ponds. This plan was approved by the City and FEMA and the City has a copy of this report and study and as builts. These ponds were design to accept the flows from these offsite areas. A sheet has been added to this grading plan showing a well defined swale that will be graded to insure runoff west of 118th street and Amole Mesa Avenue ROW will be directed to the existing rundown apron as was previously designed.*

   A temporary berm should not be necessary. My recollection is that the City maintains these ponds, so no drainage covenant should be necessary.

3. *This report is an amendment to the previously approved drainage report. Up until now there was never a requirement for a storm drain or inlet in Amole Mesa. Another project constructed Amole Mesa Road. The ultimate section is constructed at the eastern end of our site. It has been brought to my attention that there is a storm drain at the east end of Amole Mesa, with a possible stubout for an inlet on the south side of the road. It appears that the construction of this inlet was overlooked. If there is a stubout for an inlet our project can construct the inlet. The capacity of the road was checked and found to be adequate for the entire length.*

4. *The east half of Tract Z has been regraded to runoff towards the landscape area and ultimately to Amole Mesa ROW.*

5. *There was and still is a waterblock on Emerald Peak trail north of Crest Trail Drive. There is no waterblock on the south side of Crest Trail Drive. To add a 0.87' waterblock in this area would be difficult to create and would unnecessarily increase the slope in the road south of Crest Trail. There is such a small amount of runoff that may go down this road that it would be best not to change the existing plan. The valley gutter grades around the curb return radius can be manipulated in this area so that most if not all of the small amount of runoff down Crest Trail Drive. We can work this out at DRC.*

6. *Refer to answer #5. This also applies to Tyler Peak Trail.*

7. *Crest Trail Drive is the high point at the intersection with Three Rivers Road. There is a slight high point just north of Crest Trail Drive. Ultimately Three Rivers Road flows north, north of Crest Trail Road and Three Rivers Road flows south, south of Crest Trail Road.*

   Additional flow arrows have been added to the plans for clarification.

8. *Street capacities for this project were analyzed in great detail as presented in Table 2 Street Capacity Summary. There should be no problem with waterblocks working.*

9. *Deer Horn Peak Trail was reviewed and standard C&C is now shown in the area where the knuckle begins. Street capacity should not be an issue. The valley gutter was removed at this intersection as requested. The small amount of flow in this area should decrease the concern of a split flow scenario.*

10. *Inconsistency noted and corrected.*

GRADING PLAN:

11. *The site is already protected with numerous onsite temporary retention ponds that were sized for the undeveloped drainage conditions. Unit 1 is at the downstream end of the development so the downstream infrastructure will be constructed first and will support and connected to the later Units. The existing topography showing the existing retention ponds are included in this resubmittal along with an overall plan showing how these ponds work into the Unit 1 phase of development.*

12. *All the existing information requested has been provided on the grading plan. The proposed grading plan is within 12 inches of the existing top of retaining wall grades. No additional retaining walls are proposed. A private 4.0' garden wall will need to be constructed within all the lots along the eastern boundary because the existing garden walls constructed with the adjacent subdivision do not extend high enough to provide proper safety. The proposed garden wall should probably be offset about 4 feet from the existing property line but the exact design should be determined by a licensed structural engineer.*

13. *Retaining walls are shown where required with top of wall (TW) and bottom of wall (BW) grades. More detail has been added around the perimeter boundary. At this time, it is unclear whether the client will keep or remove the perimeter wall. In some areas it may require removal and replacement in order to match this design. Regardless what the client decides, there will be a perimeter wall around the entire site.*

14. *Tract A and C have been regraded. Runoff from these areas will pass into the adjacent lots as shown on the revised grading plan. Additional grades and a typical wall section has been added to the plan.*

15. *Double retaining walls have been detailed in Block 2 of Unit 3.*

16. *Double retaining walls have been detailed in Block 3 of Unit 3.*

17. *Double retaining walls have been detailed in Block 1 of Unit 2 and Unit 3.*

18. *The double retaining wall has been revised to be contained within the boundary of Lot 28.*

19. *Proposed grades for the Memorial Park have been added to the plan. There will be a wall constructed between the City memorial park and the residential lot backyards.*

20. *Grading detail has been added to Tract R along with a 1.0' deep swale that is to convey runoff to either Amole Mesa to the north or Crag Peak to the south.*

21. *Tract M has been graded in more detail. Retaining walls have been added that have negated the use of a swale.*

22. *Tract L has been graded in more detail, Retaining walls have been added and a swale created ten feet north of Lot 6, Block 10, that directs runoff down to Alta Peak Trail.*

23. *The street name has been corrected on all sheets to be Crest Trail Drive.*

24. *Finished pad elevation has been provided for Lot 16, Block 11.*

25. *Lot 10, Block 12 has been revised. The easement in this area has been removed since the storm drain layout has changed. The plat and the grading plan lot lines match now.*

26. *Additional spot elevations and retaining walls have been added between Block 13 and 14 and Colobel Avenue.*

27. *Done..*

28. *Done.*

29. *Done.*

30. *A valley gutter was added across Three Rivers road on the north side at Crest Trail Drive but not on the south side. The runoff will turn south here so it is not necessary.*

31. *Done.*

32. *Done.*

33. *Done.*

34. *Done*

STREET FLOW CAPACITY:

35. *Footnote added about 8" curb height. Isn't this standard? I have never been required to call out curb height before, it has always been understood. Only on commercial sites is 6" curb used.*

36. *Mid points street capacities are analyzed to determine where mountable to standard curb and gutter transitions should occur. As an example, on Bord Peak, at 8.16 cfs at 2.40% slope the transition from mountable to standard G&G occurs as shown on the grading plan. This is typically done throughout the street capacity analysis table. All of the original hydrology peak flows have now changed after updating precipitation values using NM Atlas 14.*

37. *Again, this is where the transition form mountable to standard C&G begins.*

38. *Refer to explanation #36.*

39. *Refer to explanation #36.*

40. *Refer to explanation #36. There is a transition from mountable to standard curb and gutter at this location.*

41. *No one told me that the City memorial park was draining into our site. I have been given the approved plan now and have added their peak flow into our design, so it is now accounted for.*

42. *With the revised hydrology analysis, this is no longer a problem. The 0.87' is not exceeded.*

43. *The sump inlet at the intersection of Horseshoe Lake Road and Winsor has been revised. Now, only one double C inlet will be required. There is a rather large radius of curvature at this location, so they should be able to construct a double. If not, this can be worked out to (2) single C during DRC.*

44. *Colobel Avenue street capacity calculation have been added to Table 2. Yes, all of the runoff will be picked up at the last two eastern most inlets.*

WSPGW Analysis

45. *Done.*

46. *The storm drain in Colobel Avenue has been revised. The storm drain in Unit 2 has been completely redesigned to pass through internally to and through Unit 1 before connecting to Colobel storm drain from Quail Canyon Road.*

47. *Curvilinear pipe has been removed.*

48. *This is understood.*

49. *All of this information is shown in Table 2.*

50. *Done.*

51. *This level of detail is for DRC construction plans. The construction plans are not available until the Infrastructure list is approved. The storm drain is designed based on rough grading spot elevation on the grading plan. As stated previously storm drain sizes "are subject to change" during the DRC design process.*

    Table 3 is a summary of the WSPGW, that gives "estimated" rim elevations at each manhole and the WSEL for the 100 year storm. This will be reanalyzed during the DRC process.

52. *As we discussed previously, these short sections of pipe from the inlet to the manhole are analyzed using Mannings equation. This should be adequate for these short reaches of pipe*

53. *Runoff from Tract A1B has been added to this project sites drainage plan.*

54. *All storm drain manhole labels have been revised and should be consistent now between drawings and summary tables.*

55. *Existing storm manholes have an "E" after the number.*

56. *Refer to response #52.*

57. *Refer to response #52.*

58. *Refer to response #52.*

59. *Done.*

60. *The storm drain model have been updated.*

61. *Refer to response #52.*

62. *Refer to response #52.*

63. *This model has been revised and updated.*

64. *The storm drain model has been revised and updated. Results are summarized in Table 3 and on Sheet 3, Preliminary Storm Drain layout.*

65. *Refer to response #63.*

66. *The required volume for first flush pond retention have been added to each of the Units at the downstream end of the storm drain system as shown on the revised grading plan. Volume calculations are in the appendix for each of the ponds. No credit is being taken for retaining first flush volume on the individual lots.*

67. *Acknowledged.*

68. *At our meeting it was decided that offsite flows from Colobel Avenue, which would also include Amole Mesa and 118th street would not be part of our first flush volume requirement.*

69. *The storm drain in this area has been revised. There is no longer a need for an easement in this area. Refer to revised storm drain layout.*

70. *A 20 foot wide drainage easement is shown on the plat through Tracts JJ and XX.*

71. *The drainage easement is labeled and can be revised during final plat.*

72. *Okay, revised.*

73. *Okay, revised.*

74. *Refer to Note 7 on the preliminary plat. A private drainage easement is called out and to be maintained by the HOA. No designation is made between surface and subsurface, but as noted earlier, the infrastructure will reflect that all storm drain pipe is private. If there are additional adjustments in language, hopefully this can be a condition of final plat approval when the time comes.*

Sincerely,

MARK GOODWIN & ASSOCIATES, PA

Diane Hoelzer, PE
Senior Engineer

DLH/dlh

CITY OF ALBUQUERQUE

January 31, 2018

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

RE: Heritage Trails Subdivision
Drainage Report and Grading Plan
Engineers Stamp Date: 1/16/18
Hydrology File: N08D006F

Dear Ms. Hoelzer:

Based on the information provided in your submittal received on 1/16/18, the Drainage Report and Grading Plan cannot be approved for Preliminary Plat or Grading Permit until the following are corrected and a revised Drainage Report and Grading Plan are submitted.

If providing an additional Drainage Report prior to Work Order approval, only the items in bold will need to be addressed for Preliminary Plat/Grading Permit.

Hydrology:

1. **What is the drainage plan for tracts D, Y, and Z? These seem to drain to low areas, but not onto 118th. Please define low areas and size for the contributing drainage (these tracts are not part of the other defined subbasins). These should be sized for the 10-day, 100 year volume and accompanied by with a drainage covenant.**
2. **Offsite drainage is not adequately addressed with regard to flows entering 118th St north of the powerline ponds and at the intersection of 118th and Amole Mesa. Provide analysis of flows entering in these areas; a temporary berm, with covenant is likely necessary to keep flows from entering the road in these areas.**
3. **How are flows along Amole Mesa being addressed? Construction of the south half street needs to provide adequate street capacity. It seems that a storm drain plug was left at Messina and Amole Mesa for the purpose of intercepting the south half street with a new inlet once constructed.**
4. **The east half of Tract Z is graded to drain into Tract A-1-B. Please grade to drain to Amole Mesa or retain on-site. If cross-lot drainage is necessary, a new easement will need to be granted by the owner of Tract A-1-B.**
5. **Add 0.87' high waterblocks on Emerald Peak Trail, north and south of Crest Trail Drive to contain Subbasin 17 on Crest Trail Drive.**

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6. **Add 0.87' high waterblocks on Tyler Peak Trail, north and south of Crest Trail Drive to contain Subbasin 17 on Crest Trail Drive.**
7. **Add 0.87' high waterblocks on Three Rivers Road, north and south of Crest Trail Drive to contain Subbasin 21 on Crest Trail Drive.**
8. At DRC, waterblock height will be verified. If waterblocks are not designed to 0.87', the Drainage Report will need to be revised to address the new subbasins and potential split flows.
9. **It is unclear how flows in the south half street of Crest Trail Drive are turned south onto Deer Horn Peak Trail in Subbasin 3. It seems as though the valley gutter crossing Deer Horn Peak should be deleted and the grades around the SW corner of the intersection be adjusted to prevent a split flow scenario here.**
10. In the AHYMO Model, the summary table for subbasin 2 reports %impervious as 52.94% but the input file and the excel table for subbasin 2 report only 45% land treatment D. Please recheck land treatments and resolve. This issue may also be the cause of the inconsistent street capacity analysis at analysis point "Bord Peak -26-MTB-2.40%" and the sump at Bord Peak and Banner Peak described below.

Grading Plan:

11. **Provide a phasing plan for each unit demonstrating how offsite, undeveloped flows will be managed. Demonstrate that the downstream units will not be impacted by the temporary lack of upstream drainage infrastructure. Items such as ponds, berms and swales will need to be included on the infrastructure list of the downstream phase, with Drainage Covenants signed by the underlying landowner.**
12. **Provide wall sections along the boundary with Arrowhead Subdivision showing: property lines, existing grades, finished grades, existing retaining wall/garden wall, proposed retaining wall/garden wall, footers, and dimensional data. Demonstrate that the adjoining properties are not damaged or constrained in their use by the new grade at property line.**
13. **Provide typical sections around the entire perimeter of this project showing property lines and horizontal and vertical dimensions. Show the existing wall to remain or to be removed.**
14. **Please define the swales along Tracts A and C. Show cross sections, slopes, and capacity to demonstrate that these will be able to safely convey flows out to the streets and will not cause damage along the backs of the residential lots and their walls. These swales need to be included on the Infrastructure List with Drainage Covenants.**
15. Unit 3, Block 2. A double retaining wall may be more desirable between Lots 1-5 and 6-10 to support the 6-7' grade change, plus garden wall.
16. Unit 3, Block 3. A double retaining wall may be more desirable along the backs of Lots 10-12 and 17-19 to support the 6'+ grade change, plus garden wall.
17. Unit 2, Block 1. A double retaining wall may be more desirable between Lots 36-44 and Colobel to support the 5'-11' grade change, plus garden wall.

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18. **Unit 1, Block 3, Lot 28. The double retaining wall is shown crossing the property line and onto Tract A-1-B. Please revise to show as contained on Lot 28 and provide a cross section here.**
19. **In anticipation of grading for the park on Lot A-1-B, provide proposed grades on Tract A-1-B and how they will support grading along Unit 1, Block 3, Lots 44-49. Presumably the temporary pond will be filled and grades restored to where retaining walls/ cross lot drainage is not necessary here.**
20. **Tract R is graded towards the backs of Unit 2, Block 11, Lots 1-6. Please provide a swale with Drainage Covenant to divert stormwater south to Crag Peak and include on the Infrastructure List.**
21. **Tract M appears to slope towards the side-yard of Unit 2, Block 9, Lot 19. Please provide a swale with Drainage Covenant to divert stormwater east to Alta Peak Trail and include on the Infrastructure List.**
22. **Tract L appears to slope towards the side-yard of Unit 2, Block 10, Lot 6. Please provide a swale with Drainage Covenant to divert stormwater east to Alta Peak Trail and include on the Infrastructure List.**
23. On sheet 1 of the Grading Plan between Tracts C and Tract R and on sheet 2 of the Grading Plan, between Tracts N and I, the road is called "Hawkins Peak Way"; on the Plat it is "Crest Trail Drive". Please resolve.
24. **Unit 2, Block 11, Lot 16. Provide the Finished Pad elevation.**
25. **Unit 1, Block 12, Lot 10. The north lot line does not match the Plat and the pad size may be too wide for the sideyard setbacks.**
26. **On sheet 3 of the Grading Plan, please provide bottom of wall grades between Blocks 13 and 14 and the Colobel ROW, similar to sheets 1 and 2.**
27. Provide valley gutter across Tyler Peak Trail, north and south of Crest Trail Drive.
28. Provide valley gutter across Tyler Peak Trail, north of Basin Peak Way.
29. Provide valley gutter across Crest Trail Drive, east and west of Alta Peak Trail.
30. Provide valley gutter across Three Rivers Road, north and south of Crest Trail Drive.
31. Provide valley gutter across Quail Canyon Road, north of Colobel.
32. Provide valley gutter across Quail Canyon Road, south of West Fork Road.
33. Provide valley gutter across Gold Hill Road west of Grass Mountain Road.
34. Provide valley gutter across Rider Ridge Drive, south of Amole Mesa.

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Street Flow Capacity:

35. **Add a footnote to the infrastructure list that all curb and gutter shall be 8" standard, unless adequate street capacity has been demonstrated.**
36. Analysis point "Bord Peak -26-MTB-2.40%" has a known Q of 9.00 cfs but subbasin 2 reports a peak runoff of 10.12 cfs. Additionally, the sump at the junction of Banner Peak and Bord Peak Trail reports a peak flow of only 20.98cfs whereas the sum of the peak flows from the contributing subbasins 1 and 2 is 22.10 cfs. 1.12 cfs appears to be unaccounted for; if true, 1.12 cfs will also need to be added to the WSPGW model.
37. At analysis point "Banner Peak-26-MTB-2.70%", flow depth exceeds the curb height. Either add inlets on Banner Peak or use standard curb.

38. At analysis point "Bord Peak-26-MTB-1.0%", flow depth exceeds the curb height. Either add inlets on Bord Peak or use standard curb.
39. At analysis point "Costilla Peak-26-MTB-2.55%", flow depth exceeds the curb height. Either add inlets on Costilla Peak or use standard curb.
40. At analysis point "Deer Horn-26-MTB-4.0%", the EGL exceeds 0.53'. However it seems unlikely that 10 cfs is generated at this point in the subbasin when the entire subbasin runoff is only 15.59 cfs. Consider reducing the estimated flow, otherwise an inlet or standard curb will be required on this street.
41. Where does the runoff from the proposed park on Tract A-1-B go? It is not accounted for at analysis point "Crag Peak-26-Std-3.2%". Assuming these flows (4.80cfs) route here, the street capacity analysis will need to be updated at this analysis point and all the downstream analysis points until there are no bypass flows to account for (all the way to the sump at Alta Peak and Basin Peak). The WSPGW model will then need to be updated as well.
42. **The EGL in Basin Peak Way exceeds 0.87'. Extend stormdrain and add inlets along Basin Peak Way upstream of inlet B3, in the vicinity of Block 1, Lot 40, to keep the EGL from entering residential lots in this area.**
43. Please relook the street capacity analysis and grading at Windsor Trail Street and Horseshoe Lake Road. There appear to be a few unintended sump points around this corner on the grading plan and it is difficult to tell what the intended sump is. Two single-A inlets appear to be planned for this point, but only one inlet is shown. Also consider the constructability of building anything bigger than a single-C around a curve.
44. **Please include the Colobel street capacity results. Will the Colobel inlets near the Morrissey intersection be in sumps or are they adequately sized to remove all flows prior to the intersection?**

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WSPGW Analysis:

45. **Add a footnote to the Infrastructure List that stormdrain sizes are subject to change at DRC, pending Hydrology approval of the HGL calculations.**
46. **Provide a single storm drain for Colobel, sized to carry existing, System-A, and System-B flows. Parallel pipes are not desirable, if the existing pipe is now overcapacity, it should be replaced with a larger one. Alternately, provide trenching prisms showing the location of the new and old pipe, the new inlet laterals, other utilities, and ROW.**
47. **Do not show curvilinear pipe in Colobel.**
48. **The storm drain in Colobel will need to be constructed prior to paving Colobel, please update the infrastructure list to reflect.**
49. Include an inlet summary table describing inlet size, type, inlet ID, inflow, and downstream manhole/inlet.
50. In the WSPGW printouts, label the structures.
51. Provide stormdrain profiles showing finished grade, Q, V, and HGL.

Basin B Model

52. Provide hydraulic analysis for the 24" pipe connecting SDMH #2B and SDMH 8B. As discussed in above in the street flow capacity analysis, additional inlets are also needed in Basin Peak Way (EGL over 0.87'), which will likely lengthen this section of pipe and add a new manhole.
53. Bypass flows originating from Tract A1B, which were not considered in the street capacity analysis, will need to be added to the Basin B model.
54. SDMH 8B appears to be erroneously called 51E in Table 3.

Basin C Model

55. In Table 3, Add descriptors that the first several manholes are existing, part of Anderson Heights Unit 2, and not the same as the new manholes having the same IDs in Heritage Trails.
56. Please provide hydraulic analysis for the stormdrain pipe connecting SDMH #4C and south Inlet #C14 under West Fork Road.
57. Please provide hydraulic analysis for the stormdrain pipe connecting SDMH #6C and south Inlet #C12 under Gold Hill Road.
58. Please provide hydraulic analysis for the stormdrain pipe connecting SDMH #7C and south Inlet #C11 under Crest Trail Drive.
59. Add inflows from Inlets #C5 separately at SDMH 16C and SDMH 17C.
60. It appears SDMH 19C was not modeled and its inlet inflows were instead added at SDMH 18C; 19C should be at Sta. 4625.80, according to Table 3.
61. Please provide hydraulic analysis for the stormdrain pipe connecting SDMH #23C and south Inlet #C2 under Diamond Peak Way.
62. Please provide hydraulic analysis for the stormdrain pipe connecting SDMH #23C and north Inlet #C2 under Diamond Peak Way.

Basin A Model

63. This model will need to be updated to show the single stormdrain in Colobel.
64. According to the Basin C model, 110.86 cfs are added at SDMH-57; according to this model 140.04 cfs are added here. Please quantify and clarify what flows are being added at this junction and where they are coming from.
65. Please provide hydraulic analysis for the stormdrain system upstream of SDMH 21.

First Flush Ponding:

66. **The first flush ponding on individual lots cannot be used towards meeting the first flush requirement; a central pond(s) or payment of fee-in-lieu is required.**
67. **The proposal to deepen Pond 10 in order to meet first flush requirements cannot be accepted. This pond is publicly maintained; meaning the on-going maintenance of the increased size would become the city's responsibility. On-site ponding with private maintenance of the pond(s) is required.**
68. **Include subbasin 33 and the new impervious section of subbasin 32 in the first flush volume calculations.**

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CITY OF ALBUQUERQUE

Preliminary Plat:

69. **A storm drain easement is required across Block 11, Lot 18 and Block 12, Lot11 for the proposed storm drain running from Pine Town Way to South Peak Road.**
70. **A storm drain easement is required across Block 14, Lot 38 and Tract JJ for the proposed storm drain running from Grass Mountain Road to Colobel Road.**
71. **Please label the new 25' drainage easement across Tract Q and move the easement language to the easement notes to be consistent with the other easements.**
72. **All drainage easements within Units 2 and 3 need to be private drainage easements.**
73. **All drainage infrastructure within Units 2 and 3 need to private, and stated as private on the Infrastructure List**
74. **Tract WW needs to be noted as a private surface and subsurface drainage easement, to be maintained by the HOA.**

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

Sincerely,

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

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

Orig: Drainage File

I. PROJECT DESCRIPTION

The Heritage Trails project site covers an area of approximately 87 acres. It was formerly known as Anderson Heights Unit 4, 6 and 9, (drainage file: N-8/D006F) and was part of a larger development also known as Anderson Heights. The site is located at the southeast corner of the intersection of Amole Mesa and 118th street SW.

This project is an amendment to the previously approved Drainage Management Plan for Anderson Heights Unit 4 that consisted of 474 lots. This project proposes to develop 425 single family residential lots, in three phases or Units as shown on the amended preliminary plat. Unit 2 and 3 is still a private gated community with private streets that are encumbered with a private storm drain easement and public water and sanitary sewer easements (ABCWUA). There is an internal 1.0 acre private park along with substantial community open space areas. Unit 2 and 3 will be graded at the same time, so an interim temporary pond design was not required at this time.

The project will tie into existing roads and existing water, sanitary sewer and storm drain infrastructure located in Amole Mesa to the north, 118th street to the west and to Colobel Avenue to the south. There are existing subdivisions to the north, south and east of this project. On a larger scale, this project is located between Gibson Blvd. and Dennis Chavez Blvd. and west of 98th street in the southwest part of Albuquerque.

II. DESIGN CRITERIA AND PREVIOUS DEVELOPMENT

The design criteria used in this report was in accordance with Section 22.2 Hydrology of the Development Process Manual, Volume 2, Design Criteria, January 1993 edition. The 100-year 6-hour storm event was analyzed to determine street capacities and sizing of the storm drain system using P(1 hr)=1.81", P(6 hr)=2.31". The onsite Land Treatment values used were based on Table A-5, in the DPM.

A. HISTORY

This project site was formerly known as Anderson Heights Unit 4 and 6 and Unit 9. Upon initial DRB approval of the grading and drainage plan and preliminary plat for Units 4, 6 and 9, the site was mass graded. At a later date, the lot layout was changed for Unit 4 and 6 and a new grading and drainage plan and preliminary plat was submitted and approved but the site was never regraded to this new layout configuration. The client moved forward with Unit 9, completing construction plans and filing the plat but no construction was ever initiated beyond rough grading. And then development was suspended indefinitely due to the poor economy. In 2007-2008, an interim grading plan was approved with interim ponds to retain onsite runoff for the purpose of protecting downstream development. This grading plan was implemented and certified. Under current conditions, the project site reflect the original grading scheme and the interim ponds. The interim pond plan has been added to this submittal.

In March of 2015, a bulk land plan was approved and recorded that dissolved all internal lot, tract and right of way lines and created two new parcels: Tracts A-1 and B-1. In June of 2017, a 2 acre parcel was

separated from Tract A-1 for the purpose of letting the City create a Memorial Park.

A LOMR was approved by FEMA for the 118th street ponds that ultimately took this project site out of the floodplain (refer to Figure 3 – FEMA panel 35001C0317).

The original Master Drainage Plan for Anderson Heights included drainage solutions for all the Units (1 thru 9) in Anderson Heights, which included detention ponds and storm drain systems. The drainage plan for the proposed site involves collection of all the onsite runoff to the southeast corner where it is to be intercepted by an existing 72"-78" RCP storm drain and conveyed south through Gault Trail in the existing Anderson Heights Unit 3 subdivision to an existing regional detention pond (POND 10). The construction plan for this existing storm drain can be found in Appendix. There is also an existing storm drain in Colobel Avenue that was constructed to intercept flows at several locations along the southern boundary of the project site. This storm drain will require some modification to accommodate the new layout configuration. The RECORD DRAWING as builts can be found in the Appendix.

III. EXISTING DRAINAGE CONDITIONS

Under existing drainage conditions, onsite runoff is conveyed to a number of onsite temporary retention ponds. The topography in the area is generally in an eastward direction. ***There are no offsite flows that enter the site.*** *The 118th street powerline ponds along the western boundary (approved by FEMA and the City and certified) intercept offsite flows from the major arroyos to the west and convey runoff south to the existing concrete channel located along the north side of Dennis Chavez Blvd. There is an existing storm drain in Colobel Avenue and in Gault Trail that was designed to intercept all the runoff from this site and discharge into the existing Pond 10. The RECORD DRAWING as builts for these existing storm drains can be found in Appendix C.*

The offsite basins just north of Amole Mesa and west of 118th street were designed and approved by the City and FEMA to intercept flows into the northern most Powerline Pond #2. There is an existing concrete runoff to accept the flows from a swale, that presently is very ill defined and others (?) have actually created berms and obstructed runoff from reaching the pond.

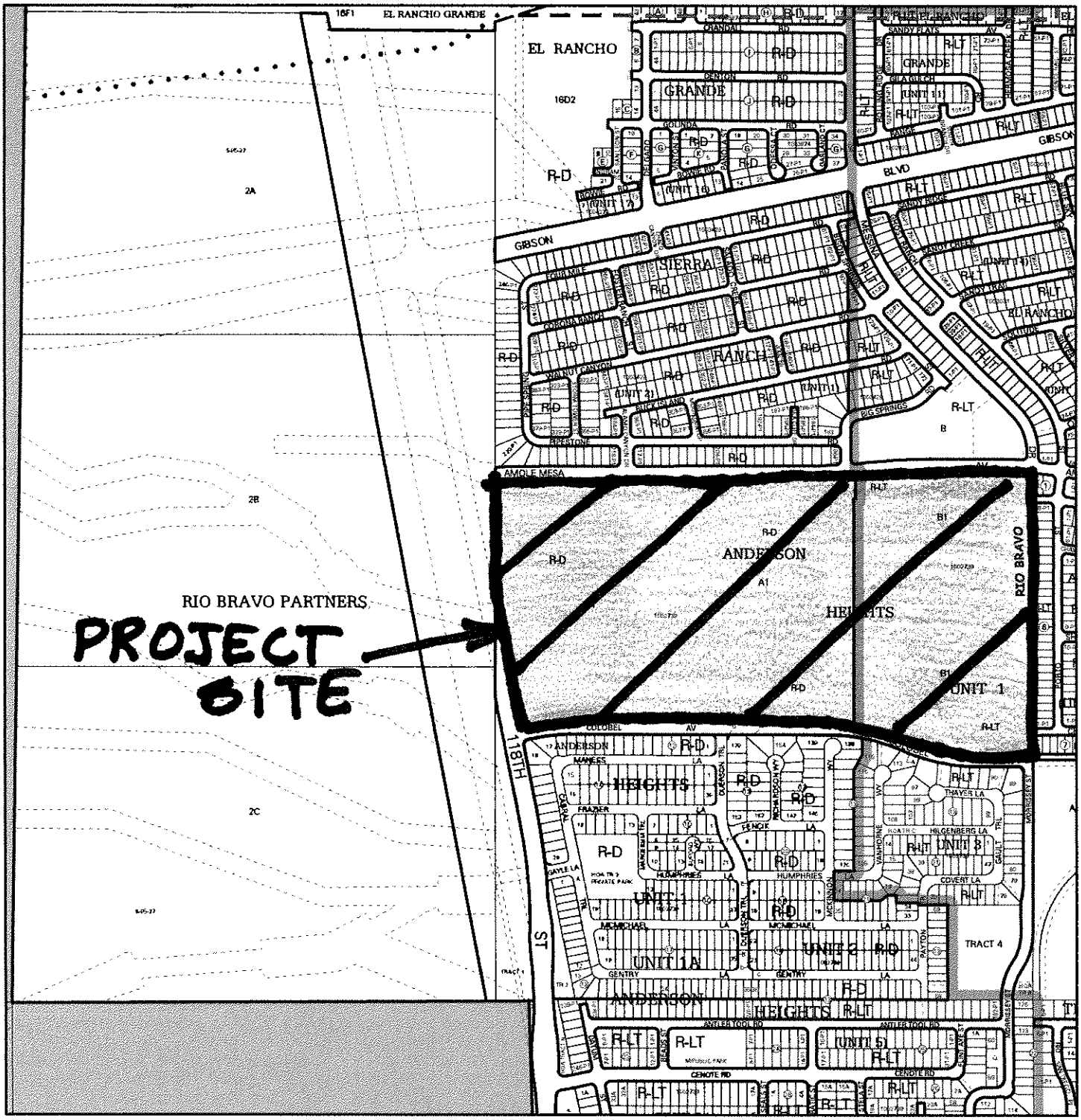
There is also an existing storm drain at the far east end (our project eastern most boundary) of Amole Mesa, where the full build out road is completed along with an inlet on the north side of the road. There is rumor that a lateral stub out existing to the south side with no inlet. If this stub out is verified to exist, then our project site will construct an inlet and connect to it.

IV. DEVELOPED DRAINAGE CONDITIONS

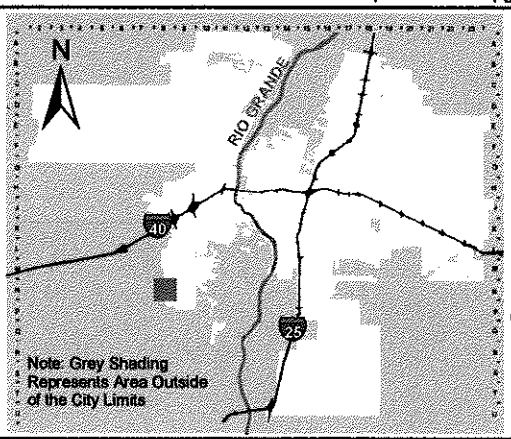
Under developed conditions, onsite runoff will be conveyed as surface street flow within the street right of way. At the point that runoff approached top of curb, inlets and an underground storm system is designed to intercept and convey the runoff to a First Flush Pond located in each of the three Unit2. Outfalls from each pond spills over and back into a storm drain system that then carries runoff to the Regional Pond 10 located in the existing Anderson Heights Unit 3 subdivision.

First Flush pond volumes, both required and provided are detailed in the Appendix.

An unimproved swale along the west side of 118 th street will be improved to carry the offsite flows from just north of Amole Mesa intersection south and into Powerline Pond #2. The details of this pond can be found on sheet 4.



For more current information and details visit: http://www.cabq.gov/gis



Albuquerque Geographic Information System

Map amended through: 1/28/2016

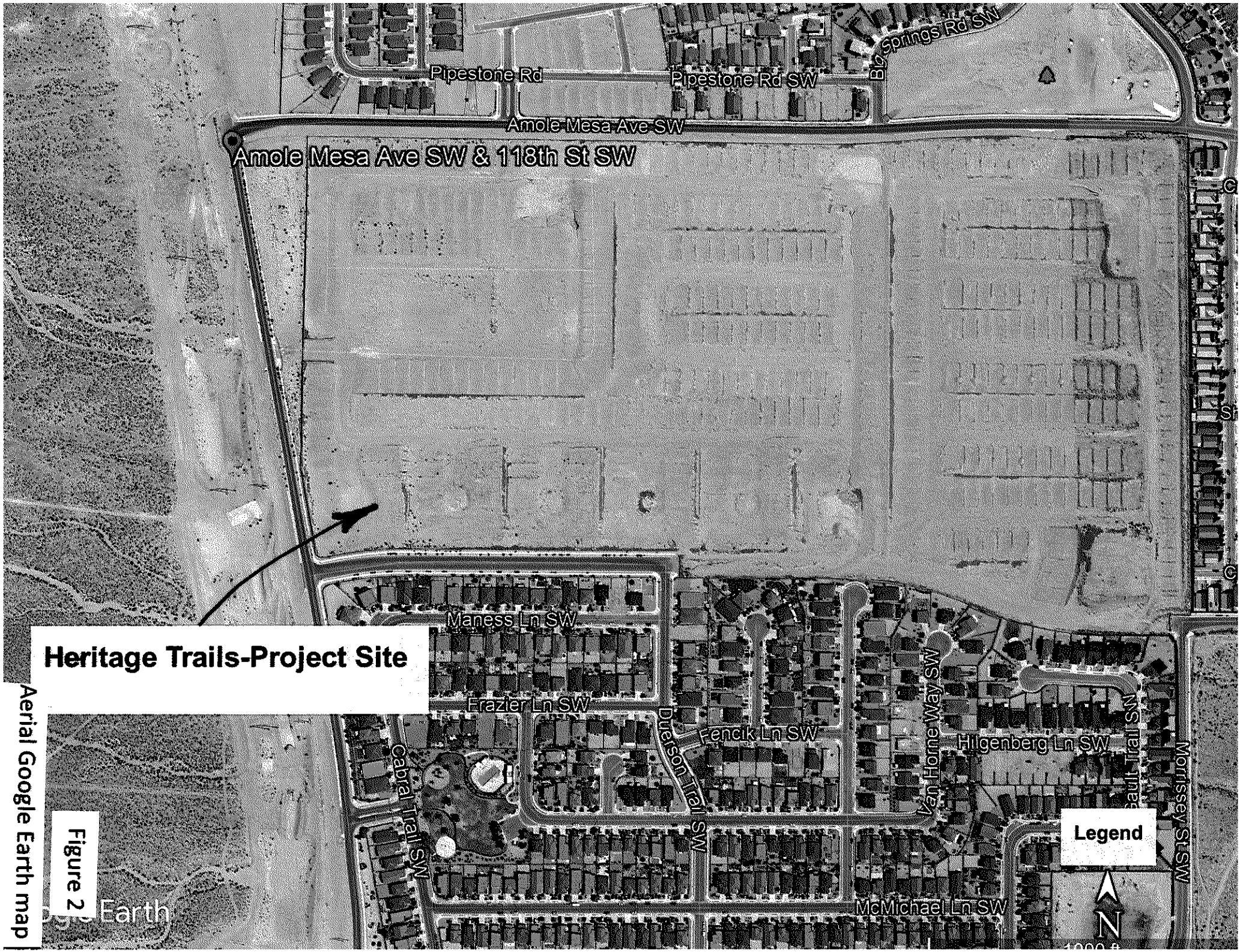
Zone Atlas Page:

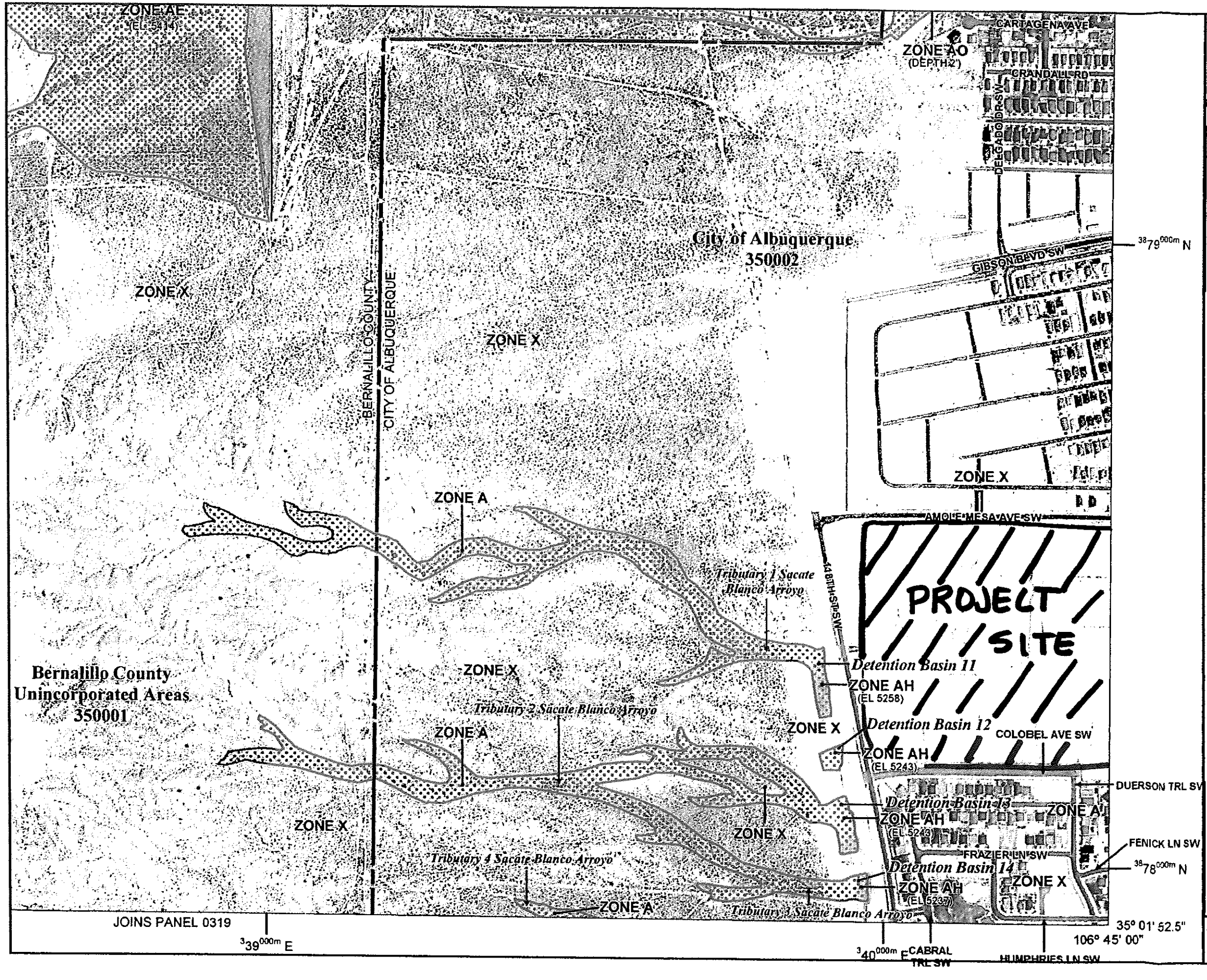
N-08-Z

Selected Symbols

- SECTOR PLANS
- Design Overlay Zones
- City Historic Zones
- H-1 Buffer Zone
- Petroglyph Mon.
- Escarpment
- 2 Mile Airport Zone
- Airport Noise Contours
- Wall Overlay Zone

Figure 1 Vicinity Map


Pipestone Rd
Pipestone Rd SW
Big Springs Rd SW
Amole Mesa Ave SW
Amole Mesa Ave SW & 118th St SW
Heritage Trails-Project Site
Maness Ln SW
Frazier Ln SW
Fencik Ln SW
Duerson Trail SW
Cabral Trail SW
Van Horne Way SW
Hilgenberg Ln SW
Morrissey St SW
McMichael Ln SW
Legend
N
Aerial Google Earth map
Figure 2



MAP SCALE 1" = 500'

0 500 1000 FEET

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0317H

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO
AND INCORPORATED AREAS

PANEL 317 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0317	H
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0317	H

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

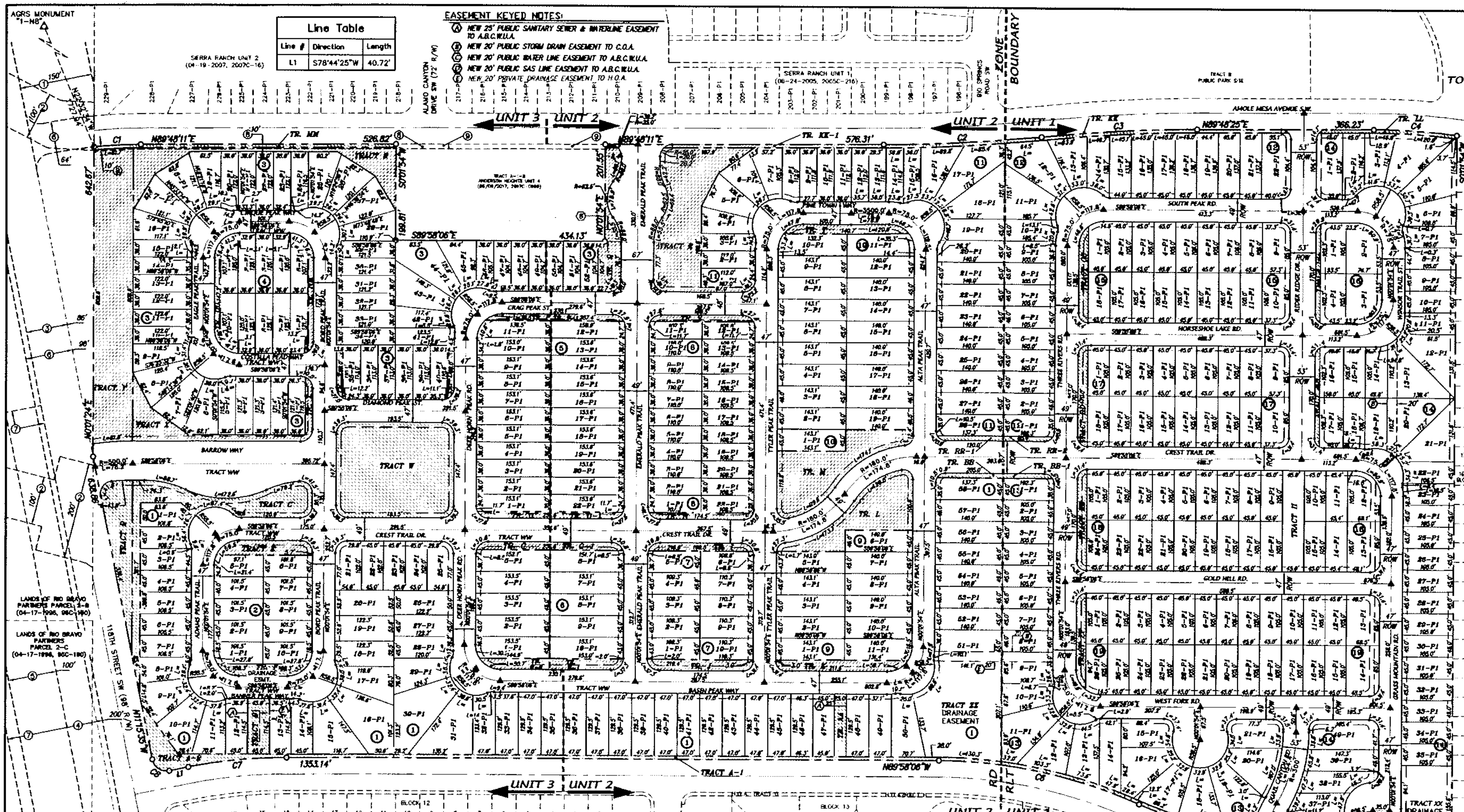
MAP NUMBER
35001C0317H

MAP REVISED
AUGUST 16, 2012

Federal Emergency Management Agency

FIGURE 3
FEMA Map

AMENDED PRELIMINARY PLAT
HERITAGE TRAILS
WITHIN THE
TOWN OF ATRISCO GRANT
PROJECTED SECTIONS 5 AND 8
TOWNSHIP 9 NORTH, RANGE 2 EAST, NMPM
CITY OF ALBUQUERQUE
BERNALILLO COUNTY, NEW MEXICO
MARCH, 2018



Line Table		
Line #	Direction	Length
L1	S78°44'25"W	40.72'

EASEMENT KEYED NOTES:

- (A) NEW 25' PUBLIC SANITARY SEWER & WATERLINE EASEMENT TO A.B.C.W.U.A.
- (B) NEW 20' PUBLIC STORM DRAIN EASEMENT TO C.O.A.
- (C) NEW 20' PUBLIC WATER LINE EASEMENT TO A.B.C.W.U.A.
- (D) NEW 20' PUBLIC SAS LINE EASEMENT TO A.B.C.W.U.A.
- (E) NEW 20' PRIVATE DRAINAGE EASEMENT TO H.O.A.

EASEMENTS

1. 150' AMAFCA DRAINAGE EASEMENT (04-17-1996, 96C-180)
2. 100' OR 200' AMAFCA DRAINAGE EASEMENT (07-19-1990, 90C-163)
3. 86' PUBLIC ROADWAY EASEMENT (04-17-1996, 96C-180)
4. 200' POWER LINE EASEMENT U.S.B.R. (02-05-1952, BK. D197, PG. 567) (08-16-2000, BK. A8, PG. 8301)
5. 100' PNM EASEMENT (04-26-1978, BK. MISC 602, PG. 558-561)
6. 84' OR 96' FUTURE R/W (06-04-2005, 2005C-138)
7. 200' C.O.A. PUBLIC DRAINAGE EASEMENT (04-20-2005, BK. A95, PG. 4276)
8. 10' PNM ELECTRIC EASEMENT (04-28-2008, DOC. 2008056007)
9. 10' PUE (GRANTED BY TRACT A-1-B (06/06/2017, 2017C-0069)

Curve Table					
C#	Length	Radius	Delta	Chord B.	Chord L.
C1	97.16'	966.00'	5°45'45"	N86°55'19"E	97.11'
C2	327.48'	3155.42'	5°56'47"	N86°47'47"E	327.33'
C3	322.44'	3087.42'	5°59'02"	N86°48'55"E	322.29'
C4	171.92'	1281.12'	7°41'21"	S86°20'55"E	171.80'
C5	392.99'	966.00'	23°18'33"	N78°18'49"W	390.28'
C6	428.62'	1034.00'	23°45'02"	N78°05'35"W	425.56'
C7	203.77'	1034.00'	11°17'29"	S84°23'10"W	203.44'
C8	47.12'	30.00'	90°00'00"	N56°15'35"W	42.43'

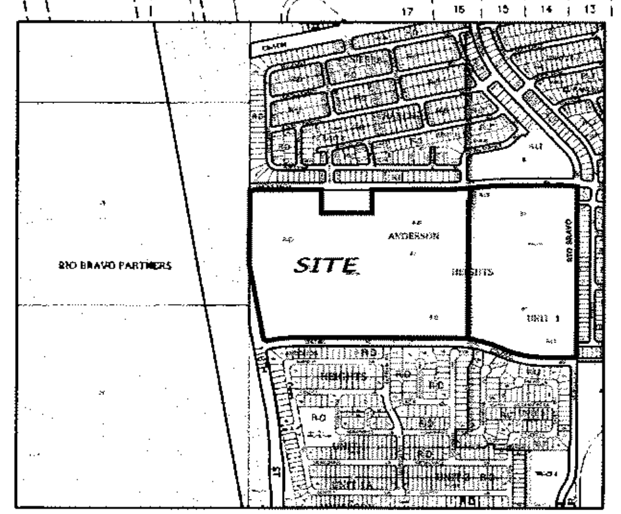
LEGEND

- 1-P1 — LOT NUMBER
- (1) — BLOCK NUMBER
- ▲ — CENTER LINE MONUMENT
- ROW — RIGHT-OF-WAY
- - - - - — ZONE BOUNDARY

PROPERTY CORNERS

- ● SET REBAR WITH CAP "ALS LS 7719" (TYP)
- ○ FOUND 5/8" REBAR WITH CAP "LS 7719" (TYP)

SCALE: 1" = 100'



VICINITY MAP

ZONE MAP: N-8-Z

SUBDIVISION DATA

GROSS ACREAGE	84.9303 AC
ZONE ATLAS NO.	N-8-Z
NO. OF LOTS CREATED	425 LOTS
NO. OF TRACTS CREATED	50 TRACTS
DATE OF SURVEY	MARCH, 2015

LEGAL DESCRIPTION

A tract of land situate within the Town of Atrisco Grant, projected Sections 5 and 8, Township 9 North, Range 2 East, New Mexico Principal Meridian, City of Albuquerque, Bernalillo County, New Mexico, being all of TRACT A-1-A, ANDERSON HEIGHTS UNIT 4, as the same is shown and designated on said plat, filed for record in the office of the County Clerk of Bernalillo County, New Mexico, on June 06, 2017 in Plat Book 2017C, Page 0069, together with TRACT B-1, ANDERSON HEIGHTS UNIT 4, as the same is shown and designated on said plat, filed for record in the office of the County Clerk of Bernalillo County, New Mexico, on March 23, 2015, in Plat Book 2015C, Page 29, and containing 84.9303 acres more or less.

PURPOSE OF PLAT

1. SUBDIVIDE TRACTS A-1-A, B-1 ANDERSON HEIGHTS INTO 425 RESIDENTIAL LOTS & 50 TRACTS AS SHOWN.
2. DEDICATE NEW RIGHT-OF-WAY AS SHOWN.
3. GRANT NEW EASEMENTS AS SHOWN.

NOTES

1. UNLESS OTHERWISE NOTED, ALL BOUNDARY CORNERS SHOWN THUS ○ SHALL BE A SET #4 REBAR WITH YELLOW PLASTIC CAP "N.M.P.S. 7719"
2. ALL STREET CENTERLINE MONUMENTATION SHALL BE INSTALLED AT ALL CENTERLINE PC'S, PT'S, ANGLE POINTS, AND STREET INTERSECTIONS AND SHOWN THUS , ▲ WILL BE MARKED BY A FOUR INCH (4") ALUMINUM CAP STAMPED: "CITY OF ALBUQUERQUE CENTERLINE MONUMENTATION" "DO NOT DISTURB" N.M.P.S.#7719
3. BOUNDARY SHALL BE TIED TO THE NEW MEXICO STATE PLANE COORDINATE SYSTEM AS SHOWN.
4. BASIS OF BEARING SHALL BE NEW MEXICO STATE PLANE GRID BEARINGS.
5. ALL DISTANCES SHALL BE GROUND DISTANCES.
6. MANHOLES WILL BE OFFSET AT ALL POINTS OF CURVATURE, POINTS OF TANGENCY, STREET INTERSECTIONS, AND ALL OTHER ANGLE POINTS TO ALLOW USE OF CENTERLINE MONUMENTATION.
7. TRACT WW IS A PRIVATE ACCESS, PRIVATE DRAINAGE EASEMENT AND PUBLIC WATERLINE & SANITARY SEWER EASEMENT. IT IS FOR THE BENEFIT OF ALL LOTS WITHIN UNIT 2&3 AND WILL BE MAINTAINED BY THE H.O.A.
8. TRACTS "A-00" ARE PRIVATE COMMON AREAS FOR THE BENEFIT OF ALL LOTS WITHIN UNIT 2&3. TRACTS WILL BE DEEDED TO THE H.O.A. AND WILL BE MAINTAINED BY THE H.O.A.

ABBREVIATIONS

- 10' PUE = PUBLIC UTILITY EASEMENTS GRANTED WITH THIS PLAT
- ROW = RIGHT-OF-WAY
- H.O.A. = HOME OWNERS ASSOCIATION
- C.O.A. = CITY OF ALBUQUERQUE
- A.B.C.W.U.A. = ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY

UNIT 1
TRACTS LL, KK, CC, GG, DD, HH, EE, II, BB-1, FF, JJ, RR-2, XX, & A ARE FOR LANDSCAPING PURPOSES AND WILL BE MAINTAINED BY THE "UNIT 1" H.O.A.

UNIT 2 (GATED COMMUNITY)
TRACTS Q, R, RR-1 KK-1, S, T, M, L, BB, I, N, P-1, G-1, O-1, H-1, J, K, AA, A-1, D-1, & ZZ ARE FOR LANDSCAPING PURPOSES AND WILL BE MAINTAINED BY THE "UNIT 2 & UNIT 3" H.O.A.

UNIT 3 (GATED COMMUNITY)
TRACTS A-2, Y, M, Z, X, NN, OO, O, MM, P, W, C, G, D, E, H-2, F, B, A, U, V ARE FOR LANDSCAPING PURPOSES AND WILL BE MAINTAINED BY THE "UNIT 2 & UNIT 3" H.O.A.

APPROVED

[signature] P.S. 2/7/18
City Surveyor, City of Albuquerque, N.M. — Date

Owner: KB HOME NEW MEXICO Inc
[signature] 3-5-2018
Randy Carpenter, President — Date

OWNERS

KB HOME NEW MEXICO Inc
7807 PeakView Ave
Suite 300
CENTENNIAL, COLORADO 80111
(303) 323-1130

SITE BENCHMARK

AGRS MONUMENT
"1-NB"
ELEVATION=5307.250
(NAD83/NAVD88)

ENGINEERS

D. MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200

SURVEYOR

ALDRICH LAND SURVEY
P.O. BOX 30701
ALBUQUERQUE, NEW MEXICO 87190
(505) 884-1990

CITY PROJECT No. 1002739
SHEET 1 OF 1

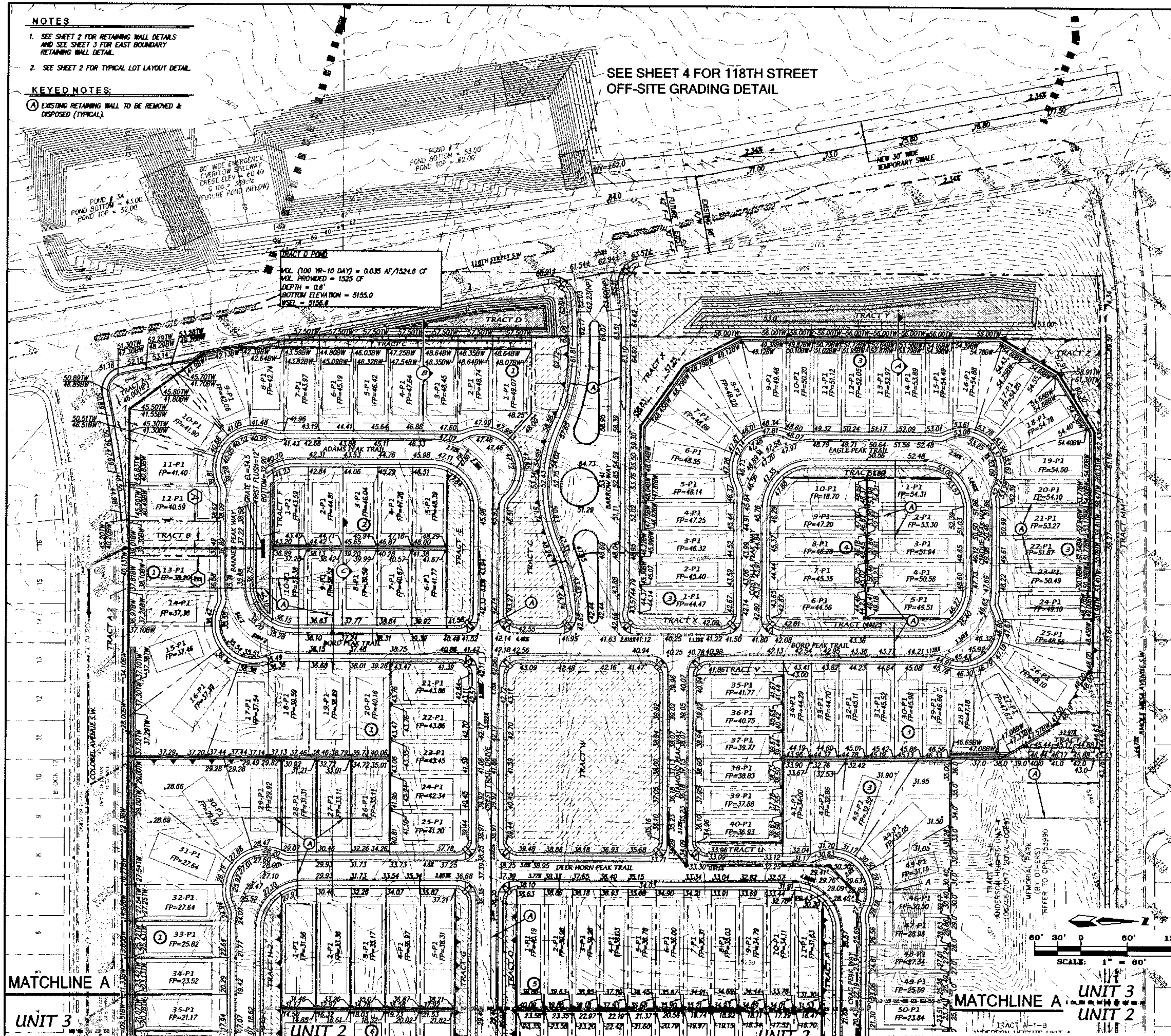
NOTES

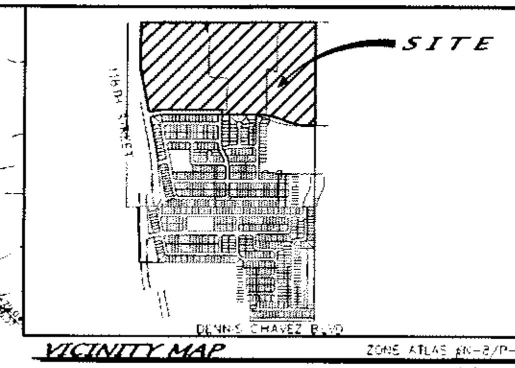
1. SEE SHEET 2 FOR RETAINING WALL DETAILS AND SEE SHEET 3 FOR EAST BOUNDARY RETAINING WALL DETAIL.
2. SEE SHEET 2 FOR TYPICAL LOT LAYOUT DETAIL.

KEYED NOTES:

(A) EXISTING RETAINING WALL TO BE REMOVED & DISPOSED (TYPICAL).

SEE SHEET 4 FOR 118TH STREET OFF-SITE GRADING DETAIL





VICINITY MAP ZONE ATLAS #N-8/P-8 SCALE: NONE

LEGEND

- EXISTING CONTOUR (MAJOR)
- EXISTING CONTOUR (MINOR)
- EXISTING SPOT ELEVATION
- EXISTING TOP CURB/FLOWLINE ELEVATION
- EXISTING TOP WEST RETAINING WALL ELEV.
- EXISTING TOP WEST GROUND ELEVATION
- EXISTING TOP EAST RETAINING WALL ELEV.
- EXISTING BOTTOM WALL EAST GROUND ELEV.
- EXISTING SANITARY SEWER MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING ELECTRIC TRANSFORMER
- EXISTING FENCE
- EXISTING POWER POLE
- EXISTING GAS LINE
- EXISTING STORM DRAIN
- EXISTING GAS LINE
- EXISTING WATER LINE
- NEW MOUNTABLE CURB & GUTTER
- NEW STANDARD CURB & GUTTER
- NEW SIDEWALK (THIS PROJECT)
- NEW RIGHT-OF-WAY
- NEW CENTERLINE
- NEW LOT LINES
- NEW EASEMENTS
- +81.77 NEW SPOT ELEVATIONS
- 81.77TW / 81.77BW NEW TOP OF WALL ELEVATION / NEW BOTTOM OF WALL ELEVATION
- NEW FLOW DIRECTION
- NEW FLOW DIRECTION
- NEW SLOPE
- NEW HIGH POINT
- NEW STORM DRAIN INLET
- ZONE BOUNDARY LINE
- NEW SINGLE RETAINING WALL
- NEW DOUBLE RETAINING WALL
- NEW TRIPLE RETAINING WALL
- PVI 94.60 NEW POINT OF VERTICAL INTERSECTION
- 24" RCP NEW STORM DRAIN
- NEW STORM DRAIN MANHOLE
- EXISTING ASPHALT PAVEMENT
- EXISTING CONCRETE
- NEW OFF-SITE PAVEMENT

APPROVED ROUGH GRADING ±18" ______ CITY HYDROLOGY ______ DATE

AS BUILT INFORMATION

CONTRACTOR

WORK STAKED BY ______ DATE

INSPECTOR'S ACCEPTANCE BY ______ DATE

FIELD VERIFICATION BY ______ DATE

DRAWINGS CORRECTED BY ______ DATE

MICRO-FILM INFORMATION

RECORDED BY ______ DATE

NO.

BENCH MARKS

AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
G-G=0.999676466
$\Delta\alpha$=-00°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

DIANE HOELZER NEW MEXICO 19087 LICENSED PROFESSIONAL ENGINEER
3-15-18

NO.	DATE	REMARKS	BY

REVISIONS

DESIGN

DESIGNED BY	DLH	DATE	10/17
DRAWN BY	DER	DATE	10/17
CHECKED BY	DMG	DATE	10/17

dmg MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
OFFICE (505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: **HERITAGE TRAILS SUBDIVISION OVERALL GRADING & DRAINAGE PLAN**

DESIGN REVIEW COMMITTEE | CITY ENGINEER APPROVAL | MO./DAY/YR. | MO./DAY/YR.

LAST DESIGN UPDATE

CITY PROJECT NO. | ZONE MAP NO. N-8-Z | SHEET 1 OF 4

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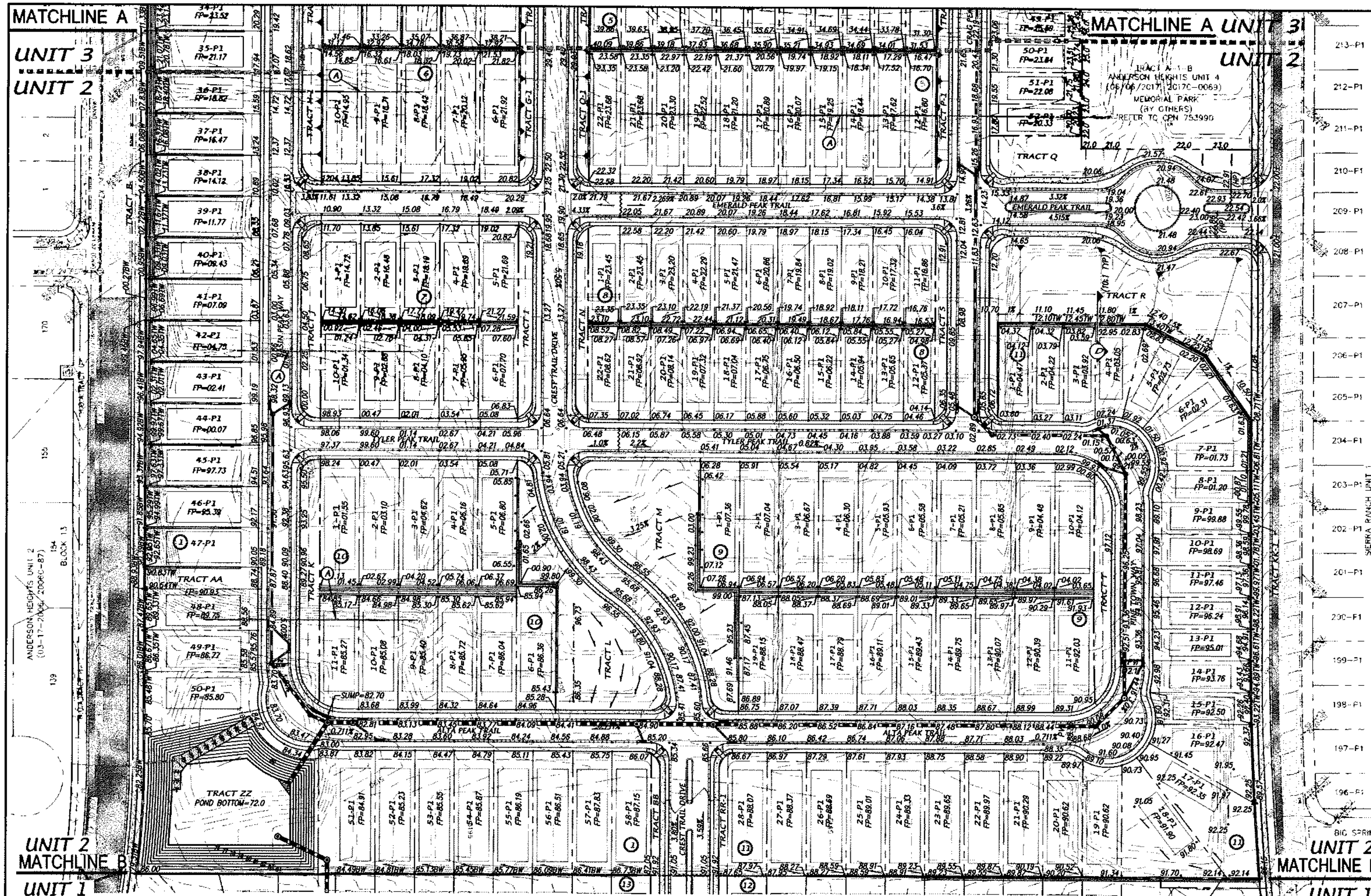
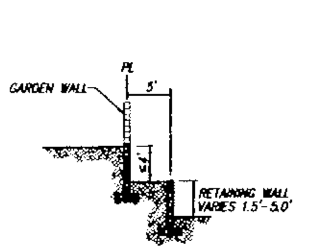
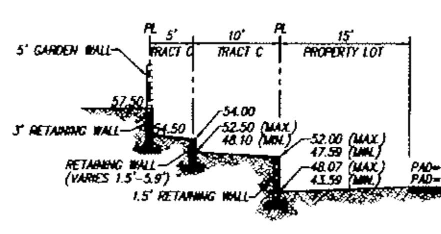
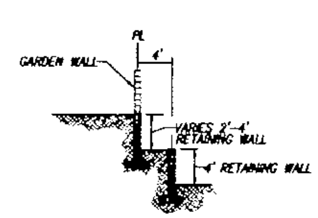




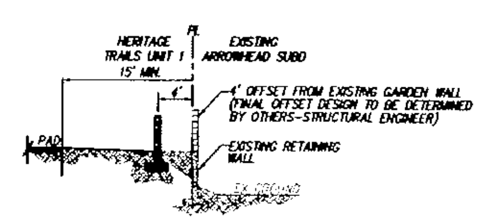
SECTION A-A
DOUBLE RETAINING WALL DETAIL
SCALE: 1"=10'



SECTION B-B
BACKYARD RETAINING WALL DETAIL
(LOTS 1-P1 THRU LOT 7-P1, BLOCK 1)
SCALE: 1"=10'



SECTION C-C
DOUBLE RETAINING WALL DETAIL
SCALE: 1"=10'



SECTION E-E
EAST BOUNDARY RETAINING WALL DETAIL
SCALE: 1"=10'

NOTE:

USE RETAINING WALLS:
WHERE THE DIFFERENCE IN ELEVATION BETWEEN THE ADJACENT PADS IS 3.0' OR MORE A RETAINING WALL MUST BE CONSTRUCTED BETWEEN THE LOTS AS SHOWN ON THE PLAN AND THERE WILL BE NO PRIVATE DRAINAGE EASEMENT.

USE STEM WALLS:
WHERE THE DIFFERENCE IN ELEVATION BETWEEN THE ADJACENT PADS IS GREATER THAN 1.5' BUT LESS THAN 3.0', A STEM WALL SHALL BE CONSTRUCTED BY THE BUILDER ON THE "HIGH SIDE" OF LOT PAD.

FOR ALL SIDE YARDS:
EACH LOT OWNER MUST CONSTRUCT, OPERATE, AND MAINTAIN HIS OWN SEPARATE DRAINAGE SWALE ALL THE WAY TO THE STREET AND CROSS LOT DRAINAGE WILL BE PREVENTED BY SOME COMBINATION OF WALLS AND BERMS ON THE COMMON LOT LINE TO BE JOINTLY MAINTAINED BY BOTH LOT OWNERS.

SCALE: 1" = 60'

LEGEND

- EXISTING CONTOUR (MAJOR)
- EXISTING CONTOUR (MINOR)
- EXISTING SPOT ELEVATION
- EXISTING TOP CURB/FLOWLINE ELEVATION
- EXISTING TOP WEST RETAINING WALL ELEV.
- EXISTING TOP WEST GROUND ELEVATION
- EXISTING TOP EAST RETAINING WALL ELEV.
- EXISTING BOTTOM WALL EAST GROUND ELEV.
- EXISTING SANITARY SEWER MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING ELECTRIC TRANSFORMER
- EXISTING FENCE
- EXISTING POWER POLE
- EXISTING GAS LINE
- EXISTING STORM DRAIN
- EXISTING SAS LINE
- EXISTING WATER LINE
- NEW MOUNTABLE CURB & GUTTER
- NEW STANDARD CURB & GUTTER
- NEW SIDEWALK (THIS PROJECT)
- NEW RIGHT-OF-WAY
- NEW CENTERLINE
- NEW LOT LINES
- NEW EASEMENTS
- 81.77 NEW SPOT ELEVATIONS
- 81.77TW / 81.77BW NEW TOP OF WALL ELEVATION / NEW BOTTOM OF WALL ELEVATION
- NEW FLOW DIRECTION
- NEW FLOW DIRECTION
- NEW SLOPE
- NEW HIGH POINT
- NEW STORM DRAIN INLET
- ZONE BOUNDARY LINE
- NEW SINGLE RETAINING WALL
- NEW DOUBLE RETAINING WALL
- NEW TRIPLE RETAINING WALL
- PVI 94.60 NEW POINT OF VERTICAL INTERSECTION
- 24" RCP NEW STORM DRAIN
- NEW STORM DRAIN MANHOLE
- EXISTING ASPHALT PAVEMENT
- EXISTING CONCRETE
- NEW OFF-SITE PAVEMENT

EROSION CONTROL NOTES

1. CONTRACTOR MUST OBTAIN A TOPSOIL DISTURBANCE PERMIT FROM THE ENVIRONMENTAL HEALTH DIVISION PRIOR TO CONSTRUCTION.
2. CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST EDITION SHALL GOVERN ALL WORK.
3. THE CONTRACTOR SHALL CONFORM TO ALL CITY, COUNTY, STATE AND FEDERAL DUST CONTROL MEASURES AND REQUIREMENTS AND WILL BE RESPONSIBLE FOR PREPARING AND OBTAINING ALL NECESSARY APPLICATIONS AND APPROVALS.
4. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE LOTS INTO PUBLIC RIGHT-OF-WAY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AND WETTING THE SOIL TO KEEP IT FROM BLOWING
5. THE EARTHWORK CONTRACTOR SHALL STOCKPILE ENOUGH MATERIAL ADJACENT TO RETAINING WALL LOCATIONS TO BE UTILIZED FOR WALL BACKFILL.

NOTES

1. SEE SHEET 3 FOR EAST BOUNDARY RETAINING WALL DETAIL.

KEYED NOTES:

(A) EXISTING RETAINING WALL TO BE REMOVED & DISPOSED (TYPICAL).

dmg MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
OFFICE (505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: HERITAGE TRAILS SUBDIVISION
OVERALL GRADING & DRAINAGE PLAN

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.
CITY PROJECT NO.		ZONE MAP NO. N-8-Z	SHEET 2	OF 4

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	DLH	DATE	10/17
DRAWN BY	DER	DATE	10/17
CHECKED BY	DMG	DATE	10/17

ENGINEER'S SEAL
DIANE HOELZER, NEW MEXICO, 11987, LICENSED PROFESSIONAL ENGINEER
3-15-18

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

BENCH MARKS
AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
G-G=0.999878466
Δα=-00°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

AS BUILT INFORMATION
CONTRACTOR
WORK STAKED BY — DATE
INSPECTOR'S ACCEPTANCE BY — DATE
FIELD VERIFICATION BY — DATE
DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION
RECORDED BY — DATE
NO.

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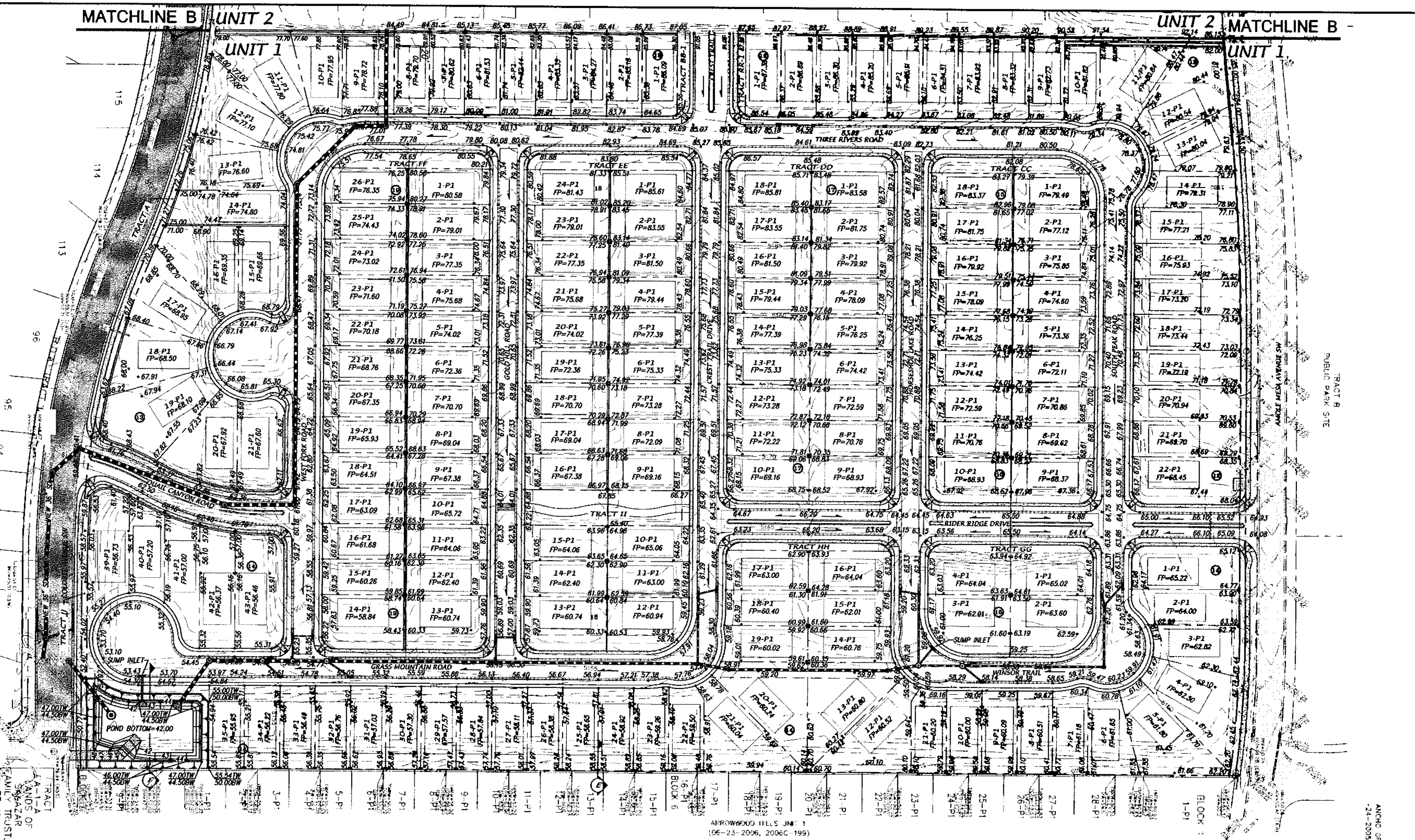

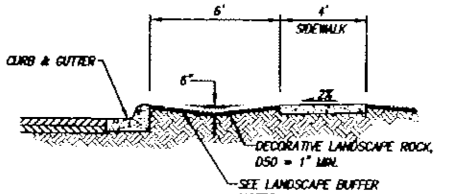

DEPRESSED LANDSCAPE DETAIL
1"=5'

NOTES

1. SEE SHEET 2 FOR RETAINING WALL DETAILS.
2. SEE SHEET 4 FOR SECTION B POND DETAIL.

KEYED NOTES:

(A) EXISTING RETAINING WALL TO BE REMOVED & DISPOSED (TYPICAL).

SCALE: 1" = 60'

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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: HERITAGE TRAILS SUBDIVISION
OVERALL GRADING & DRAINAGE PLAN

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.

LAST DESIGN UPDATE

CITY PROJECT NO.	ZONE MAP NO.	SHEET 3 OF 4
	N-8-Z	3 of 4

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	

DESIGNED BY	DLH	DATE	10/17
DRAWN BY	DER	DATE	10/17
CHECKED BY	DMG	DATE	10/17

ENGINEER'S SEAL
3-15-18

SURVEY INFORMATION		
FIELD NOTES		
NO.	BY	DATE

BENCH MARKS
AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
G-G=0.999676466
Δα =-00°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

AS BUILT INFORMATION
CONTRACTOR
WORK STAKED BY — DATE
INSPECTOR'S ACCEPTANCE BY — DATE
FIELD VERIFICATION BY — DATE
DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION
RECORDED BY — DATE
NO.

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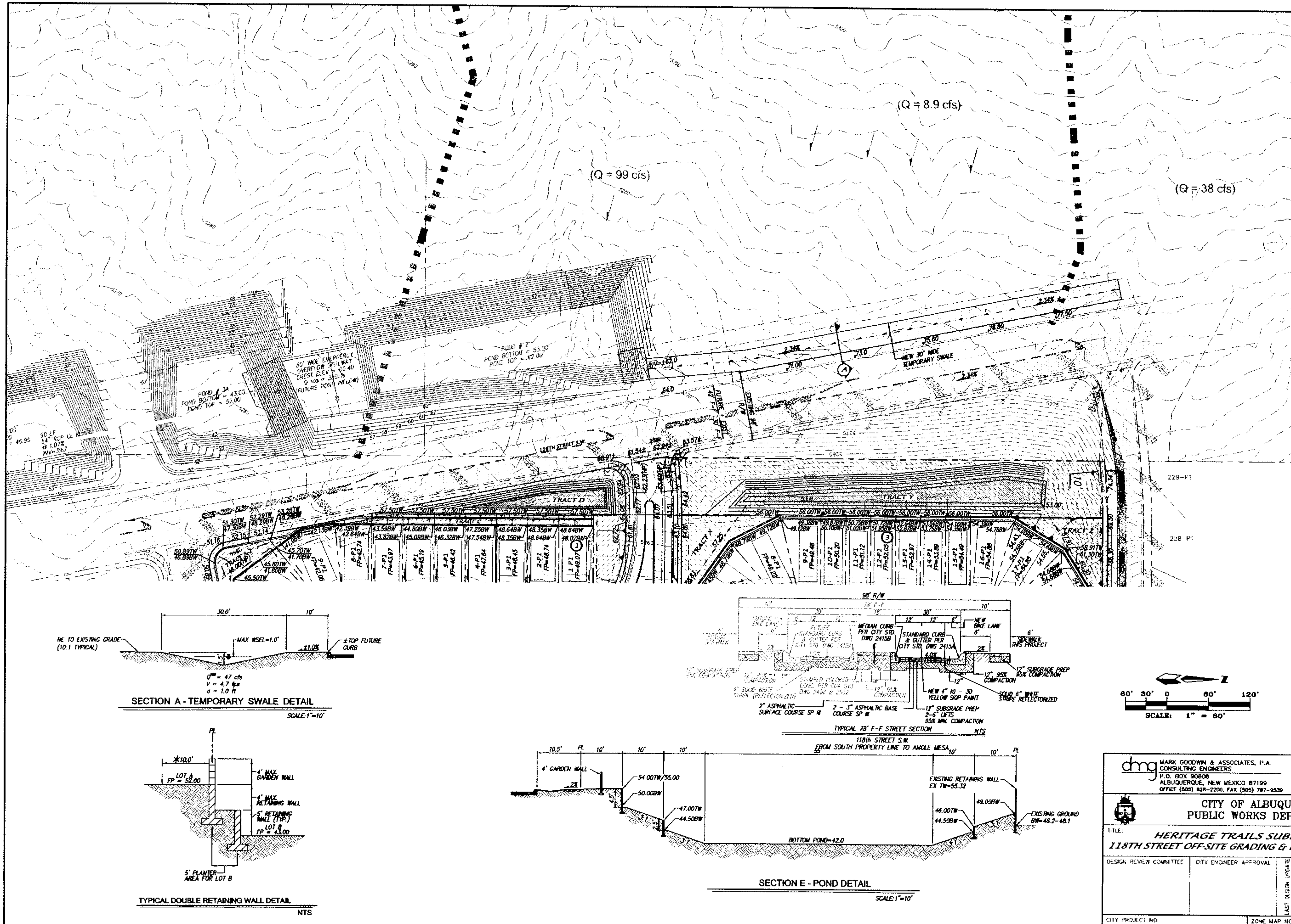

AS BUILT INFORMATION	
CONTRACTOR	DATE
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICRO-FILM INFORMATION	
RECORDED BY	DATE
NO.	

BENCH MARKS

AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
G-G=0.999676466
Δα=-00°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

SURVEY INFORMATION

FIELD NOTES		
NO.	BY	DATE

ENGINEER'S SEAL

DIANE HOELZER — NEW MEXICO — 17957 — LICENSED PROFESSIONAL ENGINEER
3-15-18

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	DLH	DATE	10/17
DRAWN BY	DER	DATE	10/17
CHECKED BY	DMG	DATE	10/17

dmg MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
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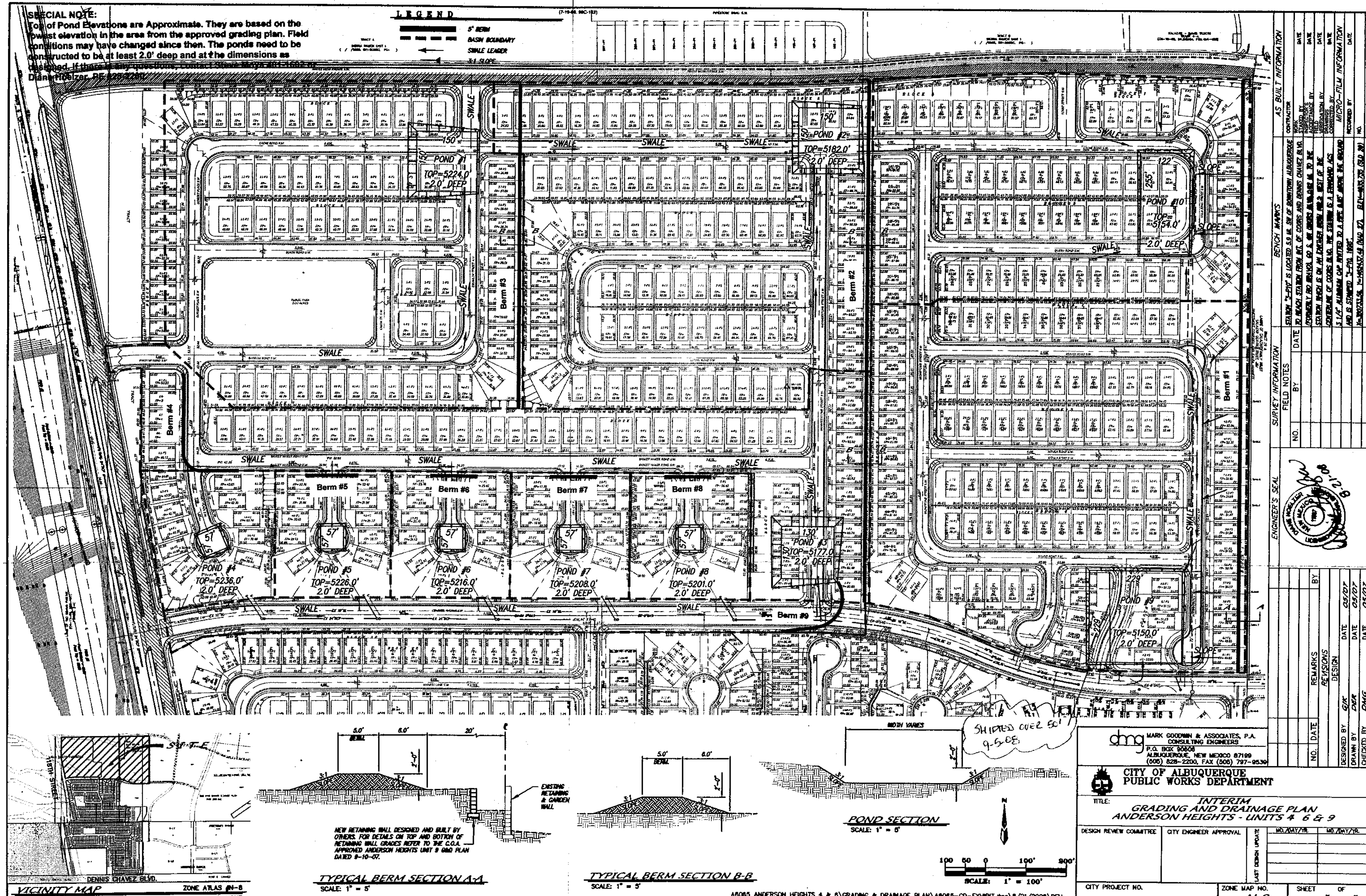
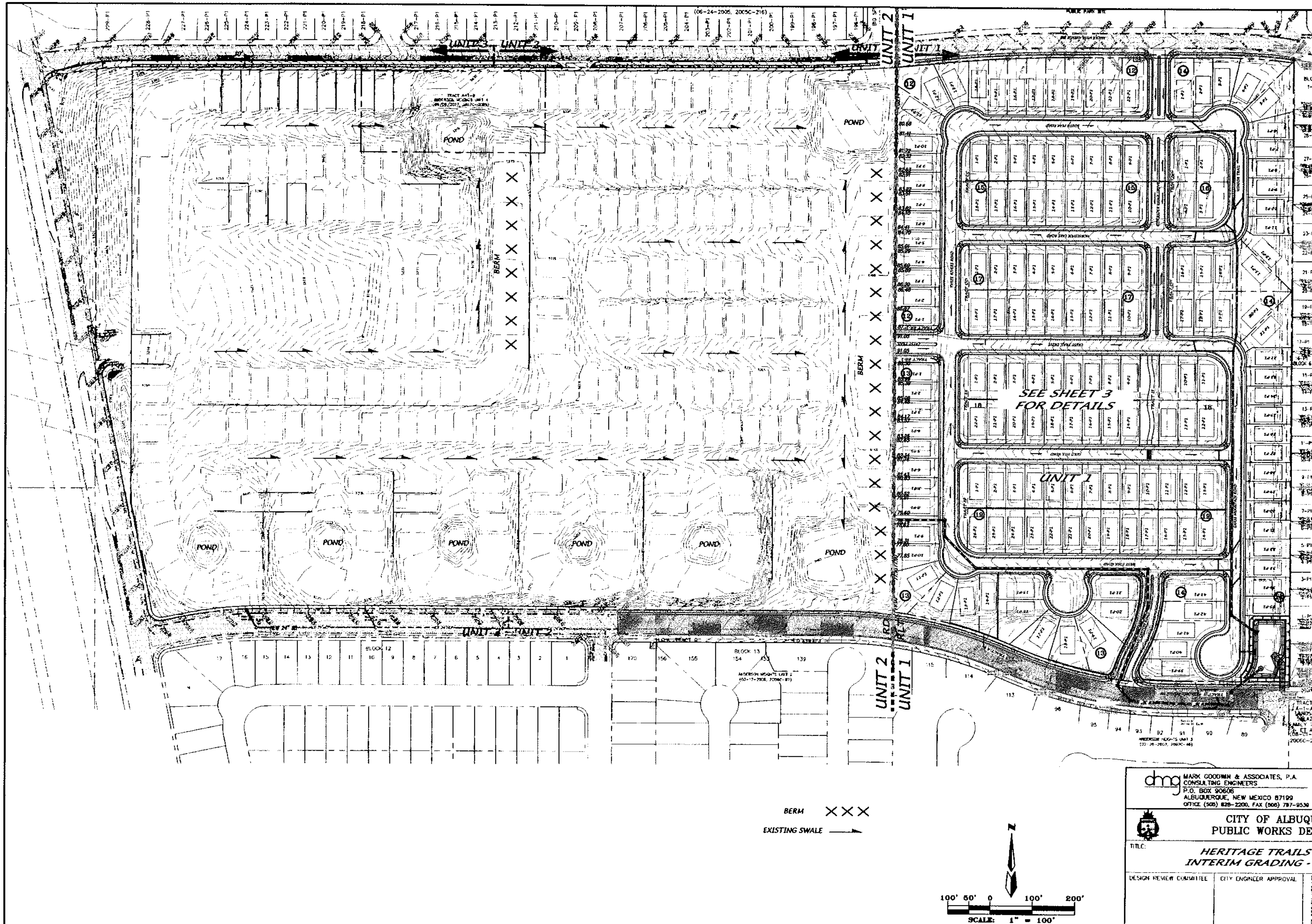
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: **HERITAGE TRAILS SUBDIVISION**
118TH STREET OFF-SITE GRADING & DRAINAGE PLAN

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.
	LAST DESIGN UPDATE		

CITY PROJECT NO.	ZONE MAP NO.	SHEET	OF
	N-8-Z	4	4


SPECIAL NOTE:
Top of Pond Elevations are Approximate. They are based on the lowest elevation in the area from the approved grading plan. Field conditions may have changed since then. The ponds need to be constructed to be at least 2.0' deep and at the dimensions as designed.
LEGEND
5' BERM
BASIN BOUNDARY
SWALE LEADER
3:1 SLOPE
POND #1 TOP=5224.0' 2.0' DEEP
POND #2 TOP=5182.0' 2.0' DEEP
POND #3 TOP=5177.0' 2.0' DEEP
POND #4 TOP=5236.0' 2.0' DEEP
POND #5 TOP=5226.0' 2.0' DEEP
POND #6 TOP=5216.0' 2.0' DEEP
POND #7 TOP=5208.0' 2.0' DEEP
POND #8 TOP=5201.0' 2.0' DEEP
POND #9 TOP=5150.0' 2.0' DEEP
POND #10 TOP=5154.0' 2.0' DEEP
Berm #1
Berm #2
Berm #3
Berm #4
Berm #5
Berm #6
Berm #7
Berm #8
Berm #9
SWALE
SLOPE
SHIFTED OVER 50' 9-5-08
VICINITY MAP
ZONE ATLAS #N-8
DENNIS CHAVEZ BLVD.
118TH STREET
SITE
TYPICAL BERM SECTION A-A
SCALE: 1" = 5'
NEW RETAINING WALL DESIGNED AND BUILT BY OTHERS. FOR DETAILS ON TOP AND BOTTOM OF RETAINING WALL GRADES REFER TO THE C.O.A. APPROVED ANDERSON HEIGHTS UNIT 8 G&D PLAN DATED 8-10-07.
EXISTING RETAINING & GARDEN WALL
TYPICAL BERM SECTION B-B
SCALE: 1" = 5'
POND SECTION
SCALE: 1" = 5'
WIDTH VARIES
SCALE: 1" = 100'
A6065 ANDERSON HEIGHTS 4 & 6\GRADING & DRAINAGE PLAN\A6065-GD-EXHIBIT.dwg\8/21/2008\RFH
dmg MARK GOODWIN & ASSOCIATES, P.A. CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200, FAX (505) 797-9539
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
TITLE: INTERIM GRADING AND DRAINAGE PLAN ANDERSON HEIGHTS - UNITS 4 6 & 9
DESIGN REVIEW COMMITTEE
CITY ENGINEER APPROVAL
LAST DESIGN UPDATE
CITY PROJECT NO.
ZONE MAP NO. N-8
SHEET 1 OF 1
AS BUILT REVISIONS.
ENGINEER'S SEAL
DIANE HOELZER
NEW MEXICO
8-21-08
SURVEY INFORMATION
FIELD NOTES
NO. BY DATE
BENCH MARKS
STATION "3-P10" IS LOCATED 5.9 MI. SW OF DOWNTOWN ALBUQUERQUE TO REACH STATION FROM INT. OF COORS AND DENNIS CHAVEZ BLVD. (FORMERLY RIO BRAVO), GO S. ON COORS BLVD. TO THE STATION WHICH IS ON AN EARTHEN BERM WEST OF THE CENTERLINE OF COORS BLVD. THE STATION IS A STANDARD ACS 3 1/4" ALUMINUM CAP RIVITED TO A PIPE ABOVE THE GROUND AND IS STAMPED "3-P10, 1996".
AS BUILT INFORMATION
CONTRACTOR
WORK STAKED BY DATE
INSPECTOR'S ACCEPTANCE BY DATE
FIELD VERIFICATION BY DATE
DRAWINGS CORRECTED BY DATE
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.
NO. DATE REMARKS BY
REVISIONS
DESIGN
DESIGNED BY GJK DATE 05/07
DRAWN BY DER DATE 05/07
CHECKED BY DMG DATE 05/07



mdg MARK GOODWIN & ASSOCIATES, P.A.
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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE:

HERITAGE TRAILS UNIT 1
INTERIM GRADING - UNIT 2/3

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.	LAST DESIGN UPDATE

CITY PROJECT NO.	ZONE MAP NO.	SHEET	OF
.	N-8-Z	1	1

NO.	DATE	REMARKS	BY

REVISIONS

DESIGN			
DESIGNED BY	DLH	DATE	10/17
DRAWN BY	DER	DATE	10/17
CHECKED BY	DMG	DATE	10/17

ENGINEER'S SEAL

DUANE HOELZER NEW MEXICO 11987 LICENSED

3-15-18

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

BENCH MARKS

AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
G-G=0.999876468
Δα=-00°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

AS BUILT INFORMATION

CONTRACTOR
WORK STAKED BY DATE
INSPECTOR'S ACCEPTANCE BY DATE
FIELD VERIFICATION BY DATE
DRAWINGS CORRECTED BY DATE

MICRO-FILM INFORMATION

RECORDED BY DATE
NO.

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APPENDIX A - HYDROLOGY

Table 1 Summary of Hydrologic Parameters
Sub Basin Boundary Exhibit

AHYMO Input file

AHYMO Summary files (100y-6h)

Precip Values NOAA Atlas 14

TABLE 1

Heritage Trails Residential

Summary of Hydrology Parameters

Sub Basin	Location Descript	Area	Area	Area	Land Treatment Values				Runoff Volume	Runoff Volume	Discharge value	Discharge value
ID	Unit ?	sq.ft	acre	sq.mi.	A	B	C	D	acre-ft	acre-fet	cfs	cfs
									100yr 6 hr	Totals	100-yr 6-hr	Totals
1	3	136,116.0	3.12	0.004882	0.0	25.0	15.0	60.0	0.415		11.39	
2	3	118,581.0	2.72	0.004254	0.0	37.0	18.0	45.0	0.321	0.736	9.17	20.56
3	2/3	184,551.0	4.24	0.006620	0.0	29.5	19.5	51.0	0.527		14.81	
4	2	124,767.0	2.86	0.004475	0.0	29.4	19.4	51.2	0.357		10.02	
5	2	124,416.0	2.86	0.004463	0.0	29.3	19.3	51.4	0.357		10.01	
6	2	174,647.0	4.01	0.006265	0.0	32.6	21.7	45.7	0.479		13.65	
7	3	142,490.0	3.27	0.005111	0.0	25.0	15.0	60.0	0.435		11.92	
8	3	136,839.0	3.14	0.004908	0.0	25.0	15.0	60.0	0.418		11.45	
9	3	63,185.0	1.45	0.002266	0.0	23.0	12.0	65.0	0.200		5.41	
10	3	36,818.0	0.85	0.001321	0.0	25.0	15.0	60.0	0.112		3.09	
11	3	47,544.0	1.09	0.001705	0.0	63.0	30.0	7.0	0.088		2.95	
12	2/3	159,689.0	3.67	0.005728	0.0	25.0	15.0	60.0	0.487		13.36	
13	2	112,524.0	2.58	0.004036	0.0	25.0	15.0	60.0	0.343		9.41	
14	2	81,491.0	1.87	0.002923	0.0	37.0	18.0	45.0	0.221		6.30	
15	2	214,811.0	4.93	0.007705	0.0	25.0	15.0	60.0	0.656		17.96	
16	2	175,842.0	4.04	0.006307	0.0	28.3	18.9	52.8	0.510		14.23	
17	2/3	121,839.0	2.80	0.004370	0.0	30.0	20.0	50.0	0.346	5.536	9.73	154.3
18	1	218,495.0	5.02	0.007837	0.0	25.0	15.0	60.0	0.667		18.27	
19	1	178,699.0	4.10	0.006410	0.0	26.5	17.7	55.8	0.530		14.68	
20	1	125,963.0	2.89	0.004518	0.0	31.0	20.7	48.3	0.535		9.98	
21	1	225,668.0	5.18	0.008095	0.0	26.8	17.9	55.3	0.667		18.49	
22	1	165,024.0	3.79	0.005919	0.0	25.0	15.0	60.0	0.504		13.80	
23	1	269,100.0	6.18	0.009653	0.0	28.1	18.7	53.2	0.782		21.82	
24	1	132,662.0	3.05	0.004759	0.0	27.7	18.5	53.8	0.387		10.80	107.8

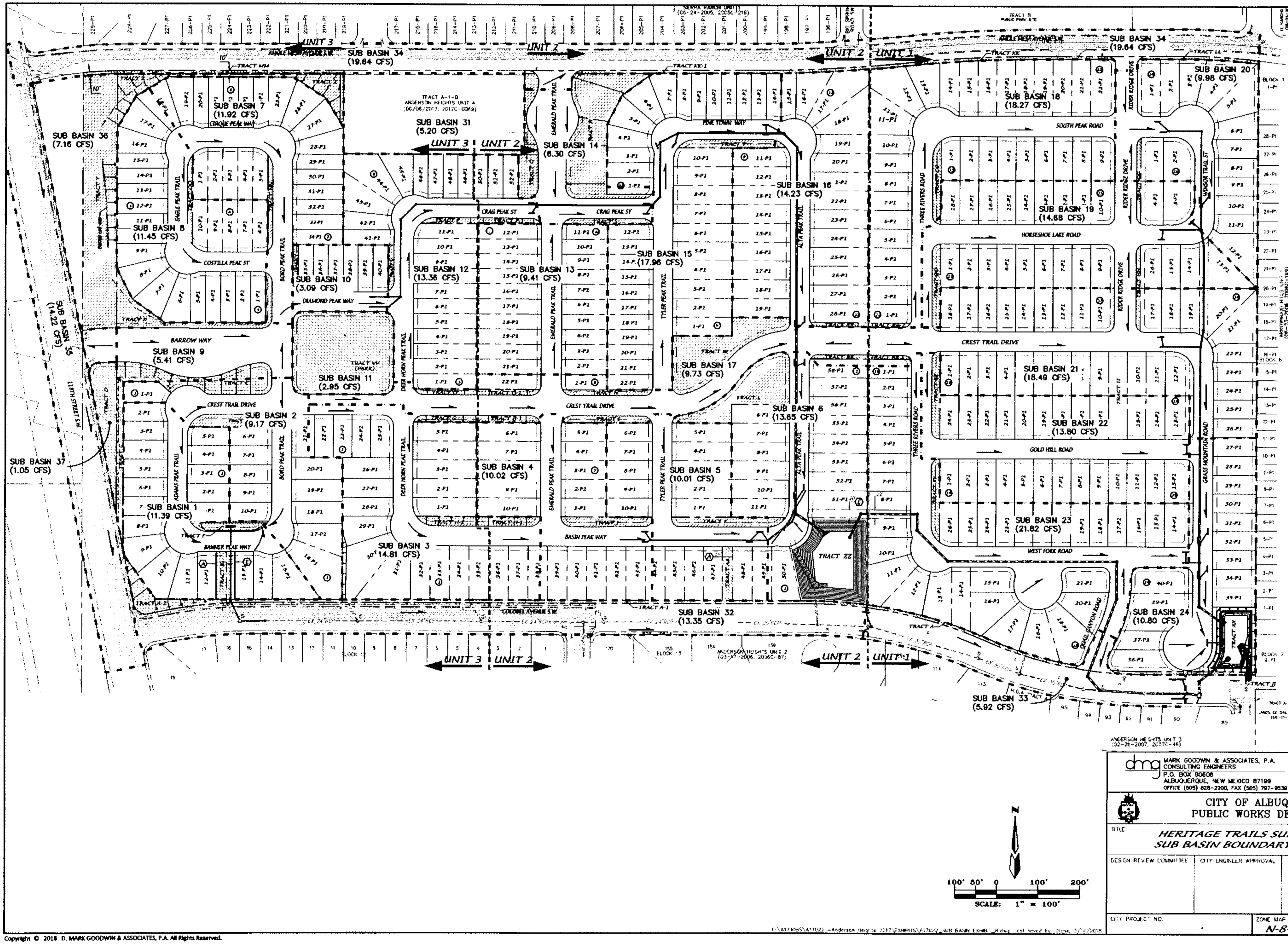
Table 1

Heritage Trails Residential
Summary of Hydrology Parameters

Sub Basin ID		Area sq.ft	Area acre	Area sq.mi.	Land Treatment Values A	B	C	D	Runoff Volume acre-ft 100yr 6 hr		Discharge value cfs 100-yr 6-hr	Discharge value cfs Totals
31	Park(*)	84,116.0	1.93	0.003017					0.161		5.20	
32	E.Colobel	150,209.0	3.45	0.005388	0	0.0	36.0	64.0	0.488		13.35	
33	W.Colobel	67,368.0	1.55	0.002416	0	0.0	40.0	60.0	0.214		5.92	
34	Amole Mesa	229,804.4	5.28	0.008243	0	31.0	0.0	69.0	0.737		19.64	
35	118th Street	151,075.0	3.47	0.005419	0	12.0	0.0	88.0	0.552		14.22	
36	118th N sump	102,386.0	2.35	0.003673	0	0.0	100.0	0.0	0.207		7.16	
37	118th S.sump	12,735.0	0.29	0.000457	0	0.0	100.0	0.0	0.035		1.05	

(*) HYDROLOGY CALCS By Isaacson & Arfman, 1-22-18

F:/PROJECTS/17046 Heritage Trails -Summary Table 1 Hydrology REVISED 3-14-18



ANDERSON HEIGHTS UNIT 3 (02-26-2007, 2007C-46)

dmg MARK GOODWIN & ASSOCIATES, P.A.
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CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: *HERITAGE TRAILS SUBDIVISION*
SUB BASIN BOUNDARY EXHIBIT

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.
LAST DESIGN UPDATE			

CITY PROJECT NO.	ZONE MAP NO.	SHEET	OF
	N-8-Z	1	3

ENGINEER'S SEAL	SURVEY INFORMATION	BENCH MARKS	AS BUILT INFORMATION
	FIELD NOTES	AGRS MONUMENT & BENCHMARK "1-N8"	CONTRACTOR / DATE
	NO. / BY / DATE	N=1470741.879, E=1488701.820	WORK STAKED BY / DATE
		G-G=0.99967846B	INSPECTOR'S ACCEPTANCE BY / DATE
		Δα=-00°17'27.70"	FIELD VERIFICATION BY / DATE
		CENTRAL ZONE	DRAWINGS CORRECTED BY / DATE
		ELEVATION=5307.250	MICRO-FILM INFORMATION
		(NAD83/NAVD88)	RECORDED BY / DATE
			NO.

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	DLH	DATE	12/17
DRAWN BY	DER	DATE	12/17
CHECKED BY	DMG	DATE	12/17

3-15-18

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AHYMO PROGRAM SUMMARY TABLE (AHYMO-S4)                    - Ver. S4.01a, Rel: 01a      RUN DATE (MON/DAY/YR) =02/08/2018
INPUT FILE = C:\Program Files (x86)\AHYMO-S4\HTRAILS_6S.DAT                           USER NO.= M-GoodwinNMSiteA90075759

                               FROM  TO                 PEAK        RUNOFF                TIME TO   CFS      PAGE =  1
                  HYDROGRAPH   ID    ID       AREA    DISCHARGE    VOLUME      RUNOFF     PEAK     PER
COMMAND         IDENTIFICATION NO.   NO.    (SQ MI)     (CFS)      (AC-FT)    (INCHES)  (HOURS)    ACRE     NOTATION

START                                                                                                    TIME=       0.00
LOCATION                       NEW MEXICO
*S*************************************************************
*S******************  FILE:HTrails_6S.DAT  REV: 2-9-18  DLH
*S*************************************************************
*S*************************************************************
*S                    100 YEAR 6 HOUR STORM EVENT
*S*************************************************************
*S*************************************************************
RAINFALL  TYPE= 1 NOAA 14                                                                                RAIN6=     2.310
*S*************************************************************
*S      SUB BASIN 1
*S      (3.12 ACRES)
*S*************************************************************
COMPUTE NM HYD        100.10   -     1      0.00488       11.39        0.415      1.59575    1.500    3.645 PER IMP=  60.00
*S*************************************************************
*S      SUB BASIN 2
*S      (2.72 ACRES)
*S*************************************************************
COMPUTE NM HYD        100.20   -     1      0.00425        9.17        0.321      1.41638    1.500    3.367 PER IMP=  45.00
*S*************************************************************
*S      SUB BASIN 3
*S      (4.24 ACRES)
*S*************************************************************
COMPUTE NM HYD        100.30   -     1      0.00662       14.81        0.527      1.49404    1.500    3.495 PER IMP=  51.00
*S*************************************************************
*S      SUB BASIN 4
*S      (2.86 ACRES)
*S*************************************************************
COMPUTE NM HYD        100.40   -     1      0.00448       10.02        0.357      1.49630    1.500    3.500 PER IMP=  51.20
*S*************************************************************
*S      SUB BASIN 5
*S      (2.86 ACRES)
*S*************************************************************
COMPUTE NM HYD        100.50   -     1      0.00446       10.01        0.357      1.49856    1.500    3.503 PER IMP=  51.40
*S*************************************************************
*S      SUB BASIN 6
*S      (4.01 ACRES)
*S*************************************************************
COMPUTE NM HYD        100.60   -     1      0.00627       13.65        0.479      1.43316    1.500    3.405 PER IMP=  45.70
*S*************************************************************
*S      SUB BASIN 7
*S      (3.27 ACRES)
*S*************************************************************
COMPUTE NM HYD        100.70   -     1      0.00511       11.92        0.435      1.59575    1.500    3.644 PER IMP=  60.00
*S*************************************************************
*S      SUB BASIN 8
*S      (3.14 ACRES)
```

```
*S**********************************************************
COMPUTE NM HYD        100.80   -     1       0.00491        11.45        0.418      1.59575    1.500    3.645 PER IMP=  60.00
*S**********************************************************
*S      SUB BASIN 9
*S      (1.45 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.90   -     1       0.00227         5.41        0.200      1.65118    1.500    3.730 PER IMP=  65.00
*S**********************************************************
*S      SUB BASIN 10
*S      (0.85 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.10   -     1       0.00132         3.09        0.112      1.59575    1.500    3.658 PER IMP=  60.00
*S**********************************************************
*S      SUB BASIN 11
*S      (1.09 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.11   -     1       0.00171         2.95        0.088      0.97157    1.500    2.704 PER IMP=   7.00
*S**********************************************************
*S      SUB BASIN 12
*S      (3.67 ACRES)
*S**********************************************************
                               FROM  TO                    PEAK        RUNOFF                TIME TO   CFS       PAGE =   2
                 HYDROGRAPH    ID    ID        AREA      DISCHARGE     VOLUME      RUNOFF     PEAK     PER
COMMAND        IDENTIFICATION  NO.   NO.      (SQ MI)      (CFS)       (AC-FT)    (INCHES)  (HOURS)    ACRE      NOTATION

COMPUTE NM HYD        100.12   -     1       0.00573        13.36        0.487      1.59575    1.500    3.644 PER IMP=  60.00
*S**********************************************************
*S      SUB BASIN 13
*S      (2.58 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.13   -     1       0.00404         9.41        0.343      1.59575    1.500    3.645 PER IMP=  60.00
*S**********************************************************
*S      SUB BASIN 14
*S      (1.87 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.14   -     1       0.00292         6.30        0.221      1.41638    1.500    3.370 PER IMP=  45.00
*S**********************************************************
*S      SUB BASIN 15
*S      (4.93 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.15   -     1       0.00771        17.96        0.656      1.59575    1.500    3.643 PER IMP=  60.00
*S**********************************************************
*S      SUB BASIN 16
*S      (4.04 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.16   -     1       0.00631        14.23        0.510      1.51505    1.500    3.527 PER IMP=  52.80
*S**********************************************************
*S      SUB BASIN 17
*S      (2.80 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.17   -     1       0.00437         9.73        0.346      1.48274    1.500    3.480 PER IMP=  50.00
*S**********************************************************
*S      SUB BASIN 18
*S      (5.02 ACRES)
*S**********************************************************
```

```
COMPUTE NM HYD        100.18   -     1       0.00784        18.27       0.667       1.59575    1.500    3.642 PER IMP=  60.00
*S**********************************************************
*S      SUB BASIN 19
*S      (4.10 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.19   -     1       0.00641        14.68       0.530       1.54961    1.500    3.578 PER IMP=  55.80
*S**********************************************************
*S      SUB BASIN 20
*S      (2.89 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.20   -     1       0.00452         9.98       0.353       1.46320    1.500    3.451 PER IMP=  48.30
*S**********************************************************
*S      SUB BASIN 21
*S      (5.18 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.21   -     1       0.00810        18.49       0.667       1.54385    1.500    3.569 PER IMP=  55.30
*S**********************************************************
*S      SUB BASIN 22
*S      (3.79 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.22   -     1       0.00592        13.80       0.504       1.59575    1.500    3.644 PER IMP=  60.00
*S**********************************************************
*S      SUB BASIN 23
*S      (6.18 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.23   -     1       0.00965        21.82       0.782       1.51957    1.500    3.532 PER IMP=  53.20
*S**********************************************************
*S      SUB BASIN 24
*S      (3.05 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.24   -     1       0.00476        10.80       0.387       1.52657    1.500    3.545 PER IMP=  53.80
*S**********************************************************
*S**********************************************************
*S      SUB BASIN 31
*S      (1.93 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.31   -     1       0.00302         4.56       0.133       0.82396    1.500    2.361 PER IMP=   0.00
*S**********************************************************
*S      SUB BASIN 32
*S      COLOBEL WEST
*S      (3.45 ACRES)
*S**********************************************************
```


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	NOTATION
COMPUTE NM HYD	100.32	-	1	0.00539	13.35	0.488	1.69794	1.500	3.872	PER IMP= 64.00

```
*S**********************************************************
*S      SUB BASIN 33
*s      COLOBEL EAST
*S      (1.55 ACRES)
*S**********************************************************
COMPUTE NM HYD        100.33   -     1       0.00242         5.92       0.214       1.65784    1.500    3.827 PER IMP=  60.00
*S**********************************************************
*S**********************************************************
```

```
*S      SUB BASIN 34
*s      AMOLE MESA FULLY DEVELOPED
*S      (5.2755 ACRES)
*S*********************************************************
COMPUTE NM HYD        100.34   -     1       0.00824        19.64       0.737      1.67602    1.500    3.723 PER IMP=  69.00
*S*********************************************************
*S      SUB BASIN 35
*s      118 TH STREET FULLY DEVELOPED
*S      (3.4682)
*S*********************************************************
COMPUTE NM HYD        100.35   -     1       0.00542        14.22       0.552      1.91064    1.500    4.099 PER IMP=  88.00
*S*********************************************************
*S      SUB BASIN 36
*s      118 TH STREET SUMP NORTH
*S      (2.3504 ACRES)
*S*********************************************************
COMPUTE NM HYD        100.36   -     1       0.00367         7.16       0.207      1.05636    1.500    3.045 PER IMP=   0.00
*S*********************************************************
*S      SUB BASIN 37
*s      118 TH STREET SUMP SOUTH
*S      (0.2923 ACRES)
*S*********************************************************
COMPUTE NM HYD        100.37   -     1       0.00046         1.05       0.035      1.43229    1.500    3.578 PER IMP=  37.50
FINISH
```

```
START                TIME=0.0 HR PUNCH CODE=0 PRINT LINES=-6
LOCATION             NEW MEXICO
*S************************************************************
*S******************  FILE:HTrails_6S.DAT  REV: 2-9-18  DLH
*S************************************************************
*S************************************************************
*S                    100 YEAR 6 HOUR STORM EVENT
*S************************************************************
*S************************************************************
RAINFALL             TYPE=1 RAIN QUARTER=0.0
                     RAIN ONE=1.81 IN RAIN SIX=2.31 IN
                     RAIN DAY=2.64 IN DT=0.05 HRS
*S************************************************************
*S       SUB BASIN 1
*S       (3.12 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.1 AREA= 0.004882 SQ MI
                     PER A=0  PER B=25  PER C=15  PER D=60
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S       SUB BASIN 2
*S       (2.72 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.2 AREA= 0.004254 SQ MI
                     PER A=0  PER B=37  PER C=18  PER D=45
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S       SUB BASIN 3
*S       (4.24 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.3 AREA= 0.006620 SQ MI
                     PER A=0  PER B=29.5  PER C=19.5  PER D=51
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S       SUB BASIN 4
*S       (2.86 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.4 AREA= 0.004475 SQ MI
                     PER A=0  PER B=29.4  PER C=19.4  PER D=51.2
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S       SUB BASIN 5
*S       (2.86 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.5 AREA= 0.004463 SQ MI
                     PER A=0  PER B=29.3  PER C=19.3  PER D=51.4
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S       SUB BASIN 6
*S       (4.01 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.6 AREA= 0.006265 SQ MI
                     PER A=0  PER B=32.6  PER C=21.7  PER D=45.7
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S       SUB BASIN 7
*S       (3.27 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.7 AREA= 0.005111 SQ MI
                     PER A=0  PER B=25  PER C=15  PER D=60
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S       SUB BASIN 8
*S       (3.14 ACRES)
```

```
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.8 AREA= 0.004908 SQ MI
                     PER A=0  PER B=25  PER C=15  PER D=60
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S      SUB BASIN 9
*S      (1.45 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.9 AREA= 0.002266 SQ MI
                     PER A=0  PER B=23  PER C=12  PER D=65
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S      SUB BASIN 10
*S      (0.85 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.10 AREA= 0.001321 SQ MI
                     PER A=0  PER B=25  PER C=15  PER D=60
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S      SUB BASIN 11
*S      (1.09 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.11 AREA= 0.001705 SQ MI
                     PER A=0  PER B=63  PER C=30  PER D=7
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S      SUB BASIN 12
*S      (3.67 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.12 AREA= 0.005728 SQ MI
                     PER A=0  PER B=25  PER C=15  PER D=60
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S      SUB BASIN 13
*S      (2.58 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.13 AREA= 0.004036 SQ MI
                     PER A=0  PER B=25  PER C=15  PER D=60
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S      SUB BASIN 14
*S      (1.87 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.14 AREA= 0.002923 SQ MI
                     PER A=0  PER B=37  PER C=18  PER D=45
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S      SUB BASIN 15
*S      (4.93 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.15 AREA= 0.007705 SQ MI
                     PER A=0  PER B=25  PER C=15  PER D=60
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S      SUB BASIN 16
*S      (4.04 ACRES)
*S************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.16 AREA= 0.006307 SQ MI
                     PER A=0  PER B=28.3  PER C=18.9  PER D=52.8
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S************************************************************
*S      SUB BASIN 17
```

```
*S      (2.80 ACRES)
*S*************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.17 AREA= 0.004370 SQ MI
                     PER A=0  PER B=30  PER C=20  PER D=50
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S*************************************************************
*S      SUB BASIN 18
*S      (5.02 ACRES)
*S*************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.18 AREA= 0.007837 SQ MI
                     PER A=0  PER B=25  PER C=15  PER D=60
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S*************************************************************
*S      SUB BASIN 19
*S      (4.10 ACRES)
*S*************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.19 AREA= 0.006410 SQ MI
                     PER A=0  PER B=26.5  PER C=17.7  PER D=55.8
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S*************************************************************
*S      SUB BASIN 20
*S      (2.89 ACRES)
*S*************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.20 AREA= 0.004518 SQ MI
                     PER A=0  PER B=31  PER C=20.7  PER D=48.3
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S*************************************************************
*S      SUB BASIN 21
*S      (5.18 ACRES)
*S*************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.21 AREA= 0.008095 SQ MI
                     PER A=0  PER B=26.8  PER C=17.9  PER D=55.3
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S*************************************************************
*S      SUB BASIN 22
*S      (3.79 ACRES)
*S*************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.22 AREA= 0.005919 SQ MI
                     PER A=0  PER B=25  PER C=15  PER D=60
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S*************************************************************
*S      SUB BASIN 23
*S      (6.18 ACRES)
*S*************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.23 AREA= 0.009653 SQ MI
                     PER A=0  PER B=28.1  PER C=18.7  PER D=53.2
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S*************************************************************
*S      SUB BASIN 24
*S      (3.05 ACRES)
*S*************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.24 AREA= 0.004759 SQ MI
                     PER A=0  PER B=27.7  PER C=18.5 PER D=53.8
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
*S*************************************************************
*S*************************************************************
*S      SUB BASIN 31
*S      (1.93 ACRES)
*S*************************************************************
COMPUTE NM HYD       ID=1  HYD NO=100.31 AREA= 0.003017 SQ MI
                     PER A=0  PER B=100  PER C=0  PER D=0
                     TP=-.1333 HR  MASS RAIN=-1
PRINT HYD            ID=1 CODE=1
```

```
*S************************************************************
*S       SUB BASIN 32
*S       COLOBEL WEST
*S       (3.45 ACRES)
*S************************************************************
COMPUTE NM HYD        ID=1  HYD NO=100.32 AREA= 0.005388 SQ MI
                      PER A=0  PER B=0  PER C=36  PER D=64
                      TP=-.1333 HR  MASS RAIN=-1
PRINT HYD             ID=1 CODE=1
*S************************************************************
*S       SUB BASIN 33
*s       COLOBEL EAST
*S       (1.55 ACRES)
*S************************************************************
COMPUTE NM HYD        ID=1  HYD NO=100.33 AREA= 0.002416 SQ MI
                      PER A=0  PER B=0  PER C=40  PER D=60
                      TP=-.1333 HR  MASS RAIN=-1
PRINT HYD             ID=1 CODE=1
*S************************************************************
*S************************************************************
*S       SUB BASIN 34
*s       AMOLE MESA FULLY DEVELOPED
*S       (5.2755 ACRES)
*S************************************************************
COMPUTE NM HYD        ID=1  HYD NO=100.34 AREA= 0.008243 SQ MI
                      PER A=0  PER B=31  PER C=0  PER D=69
                      TP=-.1333 HR  MASS RAIN=-1
PRINT HYD             ID=1 CODE=1
*S************************************************************
*S       SUB BASIN 35
*s       118 TH STREET FULLY DEVELOPED
*S       (3.4682)
*S************************************************************
COMPUTE NM HYD        ID=1  HYD NO=100.35 AREA= 0.005419 SQ MI
                      PER A=0  PER B=12  PER C=0  PER D=88
                      TP=-.1333 HR  MASS RAIN=-1
PRINT HYD             ID=1 CODE=1
*S************************************************************
*S       SUB BASIN 36
*s       118 TH STREET SUMP NORTH
*S       (2.3504 ACRES)
*S************************************************************
COMPUTE NM HYD        ID=1  HYD NO=100.36 AREA= 0.003673 SQ MI
                      PER A=0  PER B=0  PER C=100  PER D=0
                      TP=-.1333 HR  MASS RAIN=-1
PRINT HYD             ID=1 CODE=1
*S************************************************************
*S       SUB BASIN 37
*s       118 TH STREET SUMP SOUTH
*S       (0.2923 ACRES)
*S************************************************************
COMPUTE NM HYD        ID=1  HYD NO=100.37 AREA= 0.000457 SQ MI
                      PER A=0  PER B=0  PER C=100  PER D60
                      TP=-.1333 HR  MASS RAIN=-1
PRINT HYD             ID=1 CODE=1
FINISH
```

NOAA Atlas 14, Volume 1, Version 5
Location name: Albuquerque, New Mexico, USA*
Latitude: 35.0353°, Longitude: -106.751°
Elevation: 5225.6 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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APPENDIX B - HYDRAULICS

Table 2 Summary of Street Capacity Calculations
Sump Calculations
Street Capacity Exhibit
Hydraflow Street Capacity Reports

TABLE 2

Heritage Trails Subdivision

Summary of Street Capacity Calculations												
LOCATION	**WIDTH**	**CROWN**	**Std or Mtb**	**SLOPE %**	**Q cfs**	**DEPTH ft.**	**EG (ft)**	**INLET Q cfs**	**TYPE INLET**	**INLET ID**	**INLET BYPASS**	**ADD Q cfs**
Bord Peak	26	Y	Mtb	2.40	8.16	0.32	0.45					
Banner Peak	26	Y	Mtb	2.70	11.39	0.34	0.52					9.17
Banner/Bord		Y	Std	**SUMP**	**20.56**			**20.56**	**(2)DBL A**	A1	0	
Cirque Park	26	Y	Mtb	4.00	5.42	0.26	0.44					
Bord Peak	26	Y	Mtb	1.00	6.65	0.34	0.40					
Costilla Peak	26	Y	Mtb	2.55	11.45	0.34	0.52					
Barrow Rd	42	Y	Mtb	4.51	5.41	0.26	0.44					
Diamond Peak	26	Y	Std	2.70	32.25	0.45	0.87	8.7(2)	DBL A	B1	14.85	+1.09
Diamond Peak	26	Y	Std	2.70	15.94	0.37	0.60	5.7(2)	SGL C	B2	4.54	+13.36+1.48
Crag Peak	26	Y	Std	4.90	19.38	0.36	0.75	6.8(2)	SGL A	B3	5.78	
Emerald Peak	26	Y	Std	2.34	9.41	0.33	0.48					
Crag Peak	26	Y	Std	3.20	26.69	0.41	0.83	6.2(2)	SGL A	B4	14.29	
Emerald P Entrance	15	H	Std	3.32	8.35	0.37	0.63					
Tyler Peak	26	Y	Std	0.80	26.47	0.51	0.69	5.8(2)	SGL C	B5	14.87	
Pine Town Way	26	Y	Std	3.40	20.65	0.38	0.73	5.8(2)	SGL C	B6	9.05	+14.23
Alta Peak Trail(1)	26	Y	Std	0.71	23.28	0.50	0.65	5.8(2)	SGL C	B7	11.68	+9.73
Alta Peak Trail(2)	26	Y	Std	0.71	21.41	0.49	0.63	5.0(2)	SGL C	B8	11.41	+8.76
Alta Peak Trail(3)	26	Y	Std	0.71	20.17	0.48	0.61	4.9(2)	SGL C	B9	10.37	+4.89
Alta Peak Trail	26	Y	Std	SUMP	15.26							
Crest Trail	28	Y	Std	5.00	6.64	0.27	0.48					
Basin Peak	26	Y	Std	5.00	14.81	0.33	0.69					
Basin Peak(2)	26	Y	Std	5.00	24.50	0.38	0.87	8.0(2)	DBL A	B26	8.5	+10.01+0.33
Basin Peak	26	Y	Std	5.00	18.84	0.36	0.73	6.6(2)	SGL C	B25	5.64	SUMP
Alta Pk/Basin Pk	**26**	**Y**	**Std**	**SUMP**	**20.90**			**20.90**	**(2)DBL C**	**B12**		

TABLE 2

Heritage Trails Subdivision

Summary of Street Capacity Calculations												
LOCATION	**WIDTH**	**CROWN**	**Std or Mtb**	**SLOPE %**	**Q cfs**	**DEPTH ft.**	**EG (ft)**	**INLET Q cfs**	**TYPE INLET**	**INLET ID**	**INLET BYPASS**	**ADD Q cfs**
Deer Horn	26	Y	Mtb	4.00	9.50	0.31	0.52	Transition to Std C&G				
Deer Horn	26	Y	Std	4.00	9.50	0.30	0.54					
Three Rivers Rd	26	Y	Std	2.00	5.00	0.28	0.38					
South Peak Rd	26	Y	Std	2.77	18.27	0.38	0.65					
South Peak Rd	26	Y	Std	2.77	20.37	0.39	0.69	6.6(2)	DBL A	C1	7.17	+6.94
Winsor Street	26	Y	Std	0.6	14.11	0.44	0.53	4.0(2)	SGL C	C2	6.11	+0.94
Winsor Street				SUMP	7.05							
Horseshoe lake	26	Y	Std	4.07	14.68	0.34	0.64	5.2(2)	SGL A	C3	4.28	SUMP
Horseshoe/Winsor	26	No	Std	**SUMP**	**11.33**			**11.33**	**(1)DBL C**	**C4**		
Crest Trail	26	Y	Std	4.57	12.32	0.32	0.61	4.6(2)	SGL A	C5	3.12	
Gold Hill Rd	26	Y	Std	3.69	13.8	0.34	0.61	5.0(2)	SGL A	C6	3.8	
Grass Mtn Rd	26	Y	Std	0.6	16.03	0.46	0.56	4.2(2)	SGL A	C7	7.63	
West Fork Rd	26	Y	Std	3.15	21.82	0.39	0.73	5.8(2)	SGL A	C8	10.22	
Grass Mtn Rd	26	Y	Std	0.6	19.12	0.48	0.60	4.9(2)	SGL C	C9	9.32	+6.59
Grass Mtn Culdesac				**SUMP**	**15.91**			**15.91**	**(2)SGL C**	**C10**		
Colobel Avenue	48	Y	Std	3.00	13.35	0.34	0.59	4.9(2)	SGL A	D1	3.55	
Colobel Avenue	48	Y	Std	2.65	12.26	0.34	0.55	4.4(2)	SGL C	D2	3.46	
Colobel Avenue	48	Y	Std	2.65	3.46	0.24	0.35	1.73(2)	SGL C	D3	0	
Note: Sump inlets are designed for 2 times the 100 year discharge value.												

CALCULATIONS FOR SUMP INLETS
for
Heritage Trails Subdivision

Capacity is measured by the weir equation at the lip of the gutter assuming an allowable ponding elevation equal to the lowest adjacent right of way elevation. The length of the double grate facing the street is 6.5' and the maximum depth is 0.725' at the lip of the gutter. The sides are each 2' long and the average depth is 0.892'. These depths assume an 8" curb with right of way 9' behind the curb for an additional depth of 0.18' above the top of curb. From the weir equation:

FOR SINGLE 'C' INLET

*Front Q cap = (3.0) x (3.0') x (0.725) **1.5 = 5.56 cfs*

*Sides Q cap = (3.0) x (4.0') x (0.892) **1.5 = 10.11 cfs*

Total Q cap = 5.56 cfs + 10.11 cfs = 15.67 cfs

FOR DOUBLE 'C' INLET

*Front Q cap = (3.0) x (6.5') x (0.725) **1.5 = 12.04 cfs*

*Sides Q cap = (3.0) x (4.0') x (0.892) **1.5 = 10.11 cfs*

Total Q cap = 12.04 cfs + 10.11 cfs = 22.15 cfs

FOR TRIPLE 'C' INLET

*Front Q cap = (3.0) x (9.75') x (0.725) **1.5 = 18.06 cfs*

*Sides Q cap = (3.0) x (4.0') x (0.892) **1.5 = 10.11 cfs*

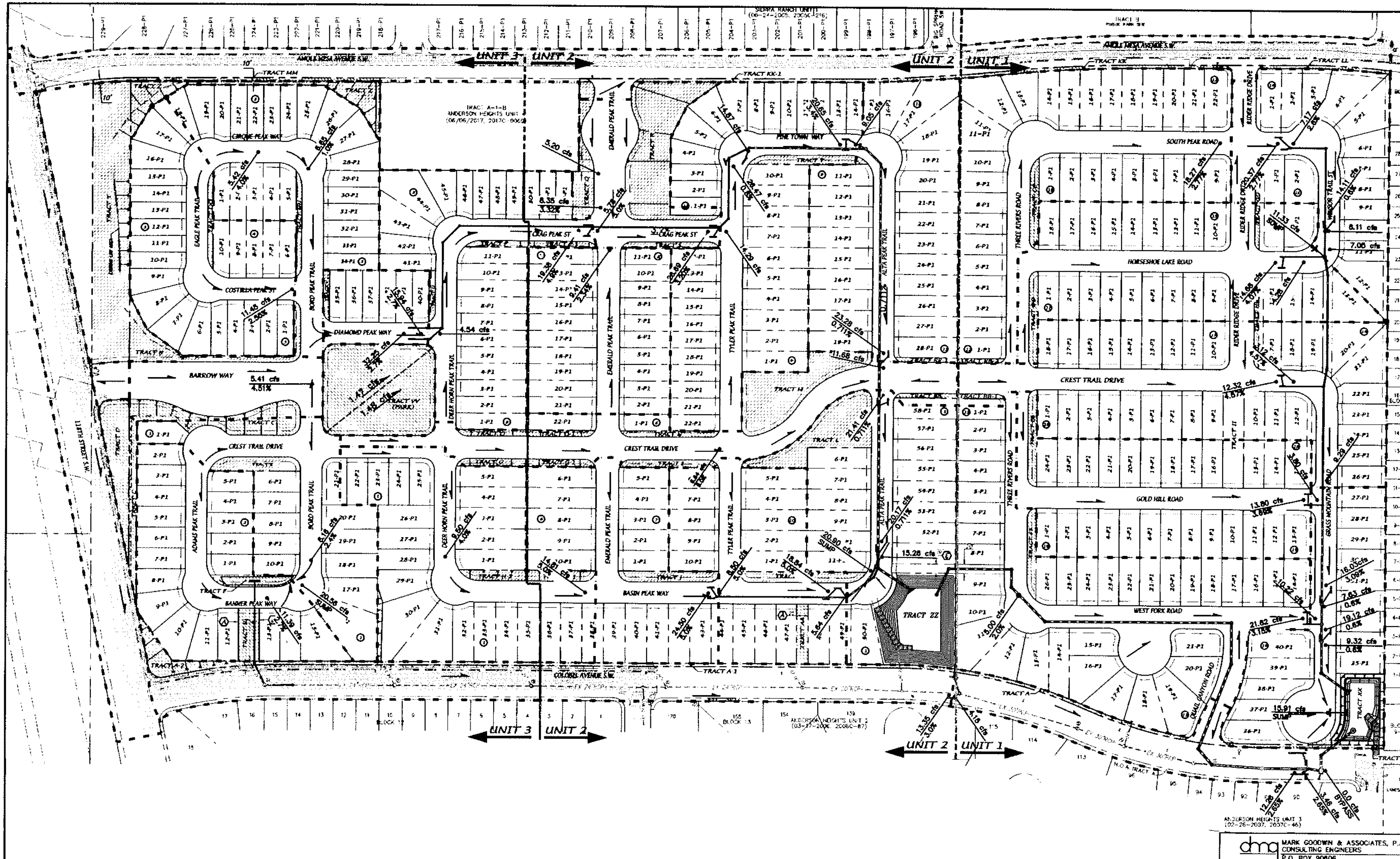
Total Q cap = 12.04 cfs + 10.11 cfs = 28.17 cfs

The 100 year flow to the sump inlet at Banner-Bord Peak (Unit 3) is 20.56 cfs. Design for 41.12 cfs ---- Use (2) Double "C" inlets (minimum)

The 100 year flow to the sump inlet at Basin Peak-Alta Peak (Unit 2) is 20.90 cfs. Design for 41.80 cfs ---- Use (2) Double "C" inlets (minimum)

The 100 year flow to the sump inlet at Horseshoe-Winsor (Unit 1) is 11.3 cfs. Design for 22.60 cfs ---- Use (1) Double "C" inlet (minimum)

The 100 year flow to the sump inlet at Grass Mountain (Unit 1) is 15.91 cfs. Design for 31.82 cfs ---- Use (2) Single "C" inlets (minimum)



ENGINEER'S SEAL	SURVEY INFORMATION	BENCH MARKS	AS BUILT INFORMATION
DIANE HOELZER, NEW MEXICO, 7160, LICENSED PROFESSIONAL ENGINEER; 3-15-18	FIELD NOTES: NO. / BY / DATE	AGRS MONUMENT & BENCHMARK "1-N8" N=1470741.879, E=1488701.820 G-G=0.999678466 Δα=-00°17'27.70" CENTRAL ZONE ELEVATION=5307.250 (NAD83/NAVD88)	CONTRACTOR WORK STAKED BY — DATE INSPECTOR'S ACCEPTANCE BY — DATE FIELD VERIFICATION BY — DATE DRAWINGS CORRECTED BY — DATE MICRO-FILM INFORMATION RECORDED BY — DATE NO.

NO.	DATE	REMARKS	BY
		REVISIONS	

DESIGN			
DESIGNED BY	DLH	DATE	12/17
DRAWN BY	DER	DATE	12/17
CHECKED BY	DMG	DATE	12/17

dmg MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
OFFICE (505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

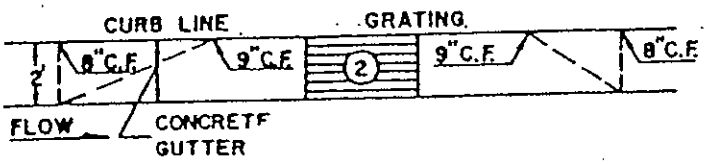
TITLE: **HERITAGE TRAILS SUBDIVISION STREET CAPACITY EXHIBIT**

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.

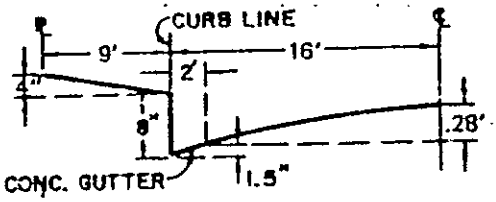
CITY PROJECT NO.	ZONE MAP NO.	SHEET
	N-8-Z	2 of 3

F:\A17\0065\A17022 - Anderson Heights 2017\EXHIBITS\A17022_SUB BASIN EXHIBIT_3.dwg, Last saved by: Dgee, 3/14/2018

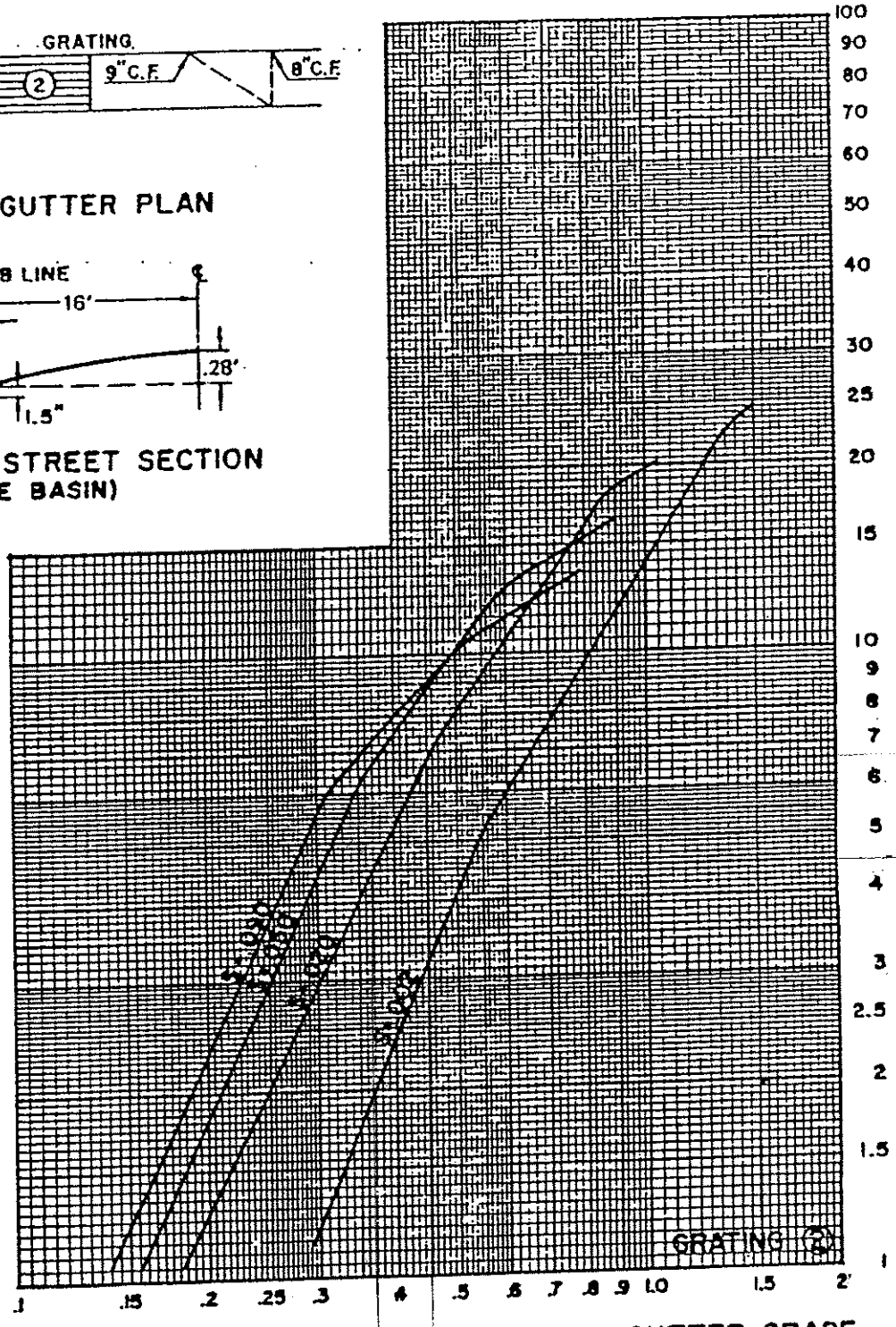
GRATING CAPACITIES FOR TYPE "A" , "C" and "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



7.42

6.6 cfs

4.5 cfs

11.1 cfs

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Mar 15 2018

Amole Mesa-36-Std-0.5%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 1.00
N-Value	= 0.017

Calculations

Compute by:	Known Q
Known Q (cfs)	= 19.64

Highlighted

Depth (ft)	= 0.46
Q (cfs)	= 19.64
Area (sqft)	= 7.05
Velocity (ft/s)	= 2.79
Wetted Perim (ft)	= 36.94
Crit Depth, Yc (ft)	= 0.48
Top Width (ft)	= 36.11
EGL (ft)	= 0.58

(Sta, El, n)-(Sta, El, n)...

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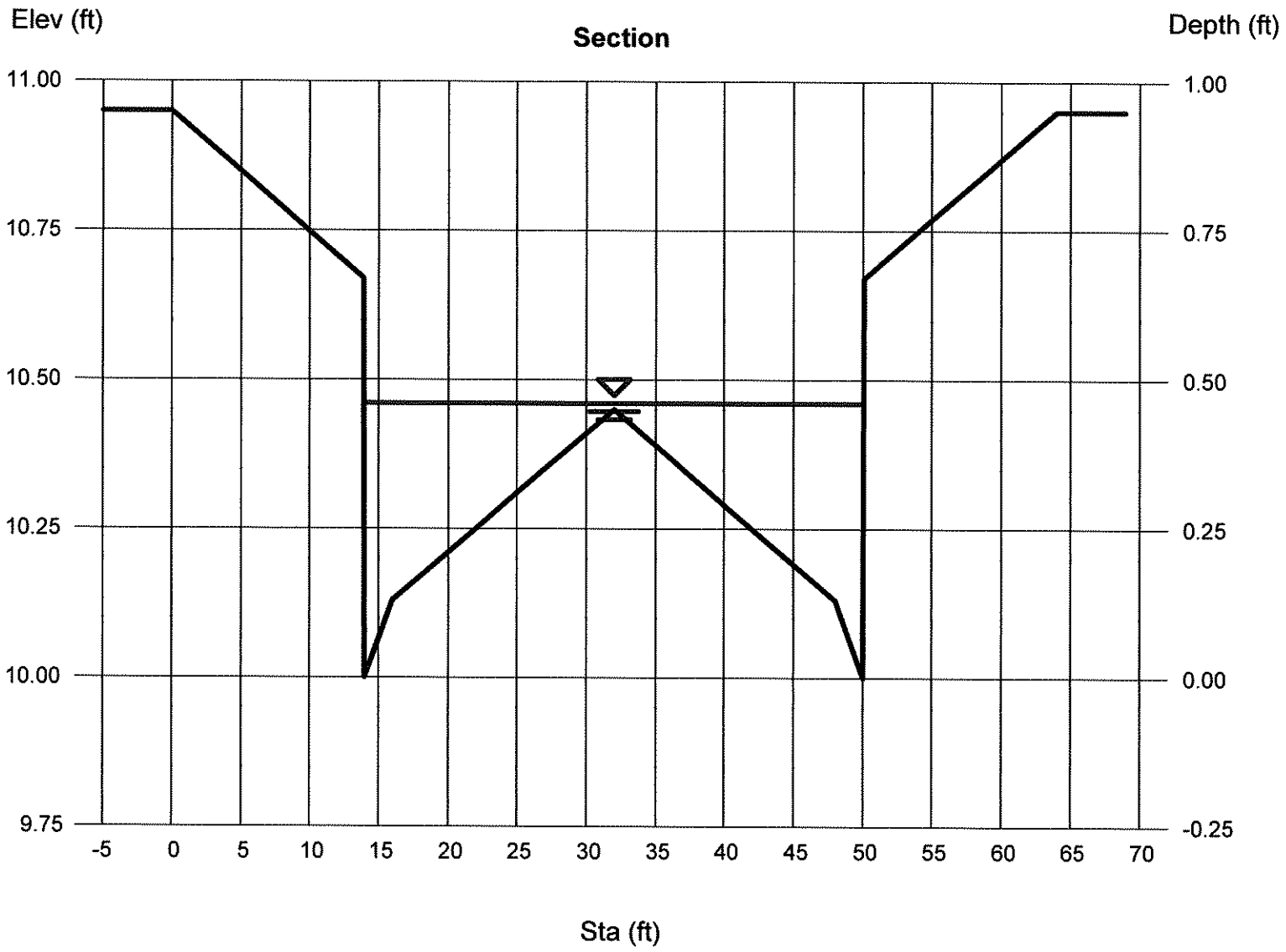

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Feb 15 2018

Amole Mesa-36-Std-1.0%

User-defined		Highlighted	
Invert Elev (ft)	= 10.00	Depth (ft)	= 0.46
Slope (%)	= 1.00	Q (cfs)	= 19.64
N-Value	= 0.017	Area (sqft)	= 7.05
		Velocity (ft/s)	= 2.79
Calculations		Wetted Perim (ft)	= 36.94
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.48
Known Q (cfs)	= 19.64	Top Width (ft)	= 36.11
		EGL (ft)	= 0.58

(Sta, El, n)-(Sta, El, n)...

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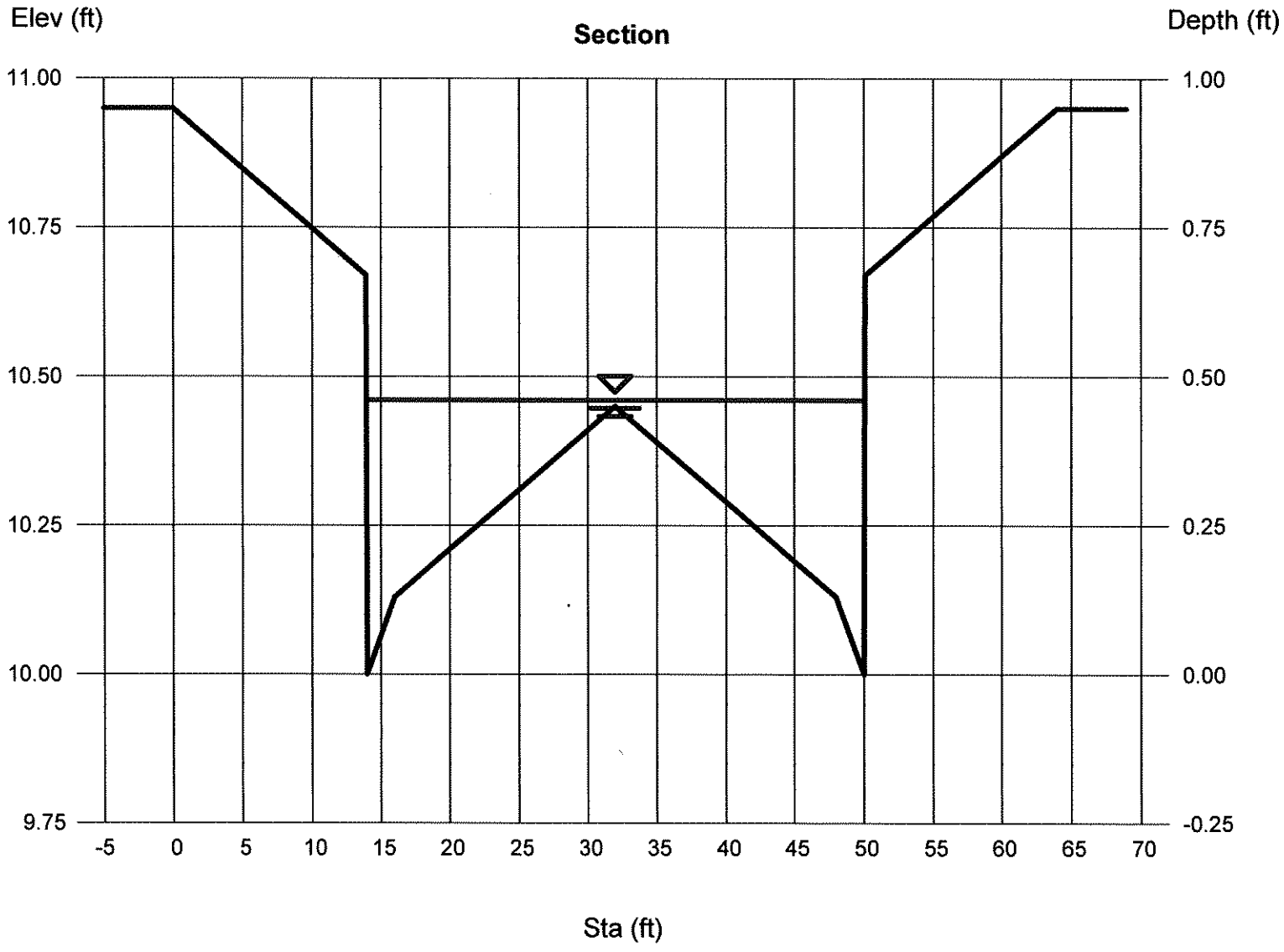


Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Grass Mountain Road-26-Std-0.6%(2)

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 0.60
N-Value	= 0.017

Calculations

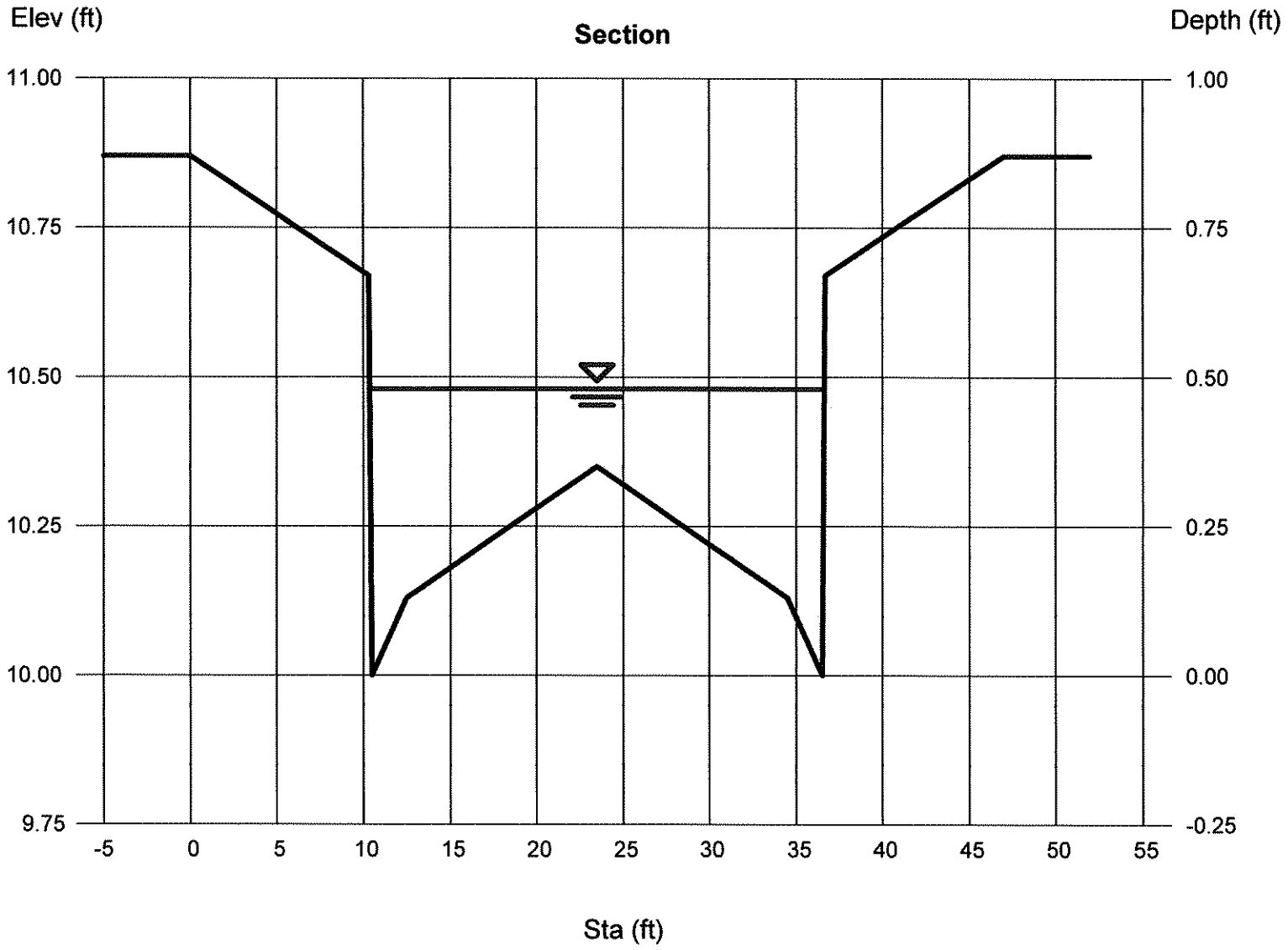
Compute by:	Known Q
Known Q (cfs)	= 19.12

Highlighted

Depth (ft)	= 0.48
Q (cfs)	= 19.12
Area (sqft)	= 7.00
Velocity (ft/s)	= 2.73
Wetted Perim (ft)	= 27.00
Crit Depth, Yc (ft)	= 0.47
Top Width (ft)	= 26.24
EGL (ft)	= 0.60

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017)
-(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

West Fork-26-Std-3.15%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 3.15
N-Value	= 0.017

Calculations

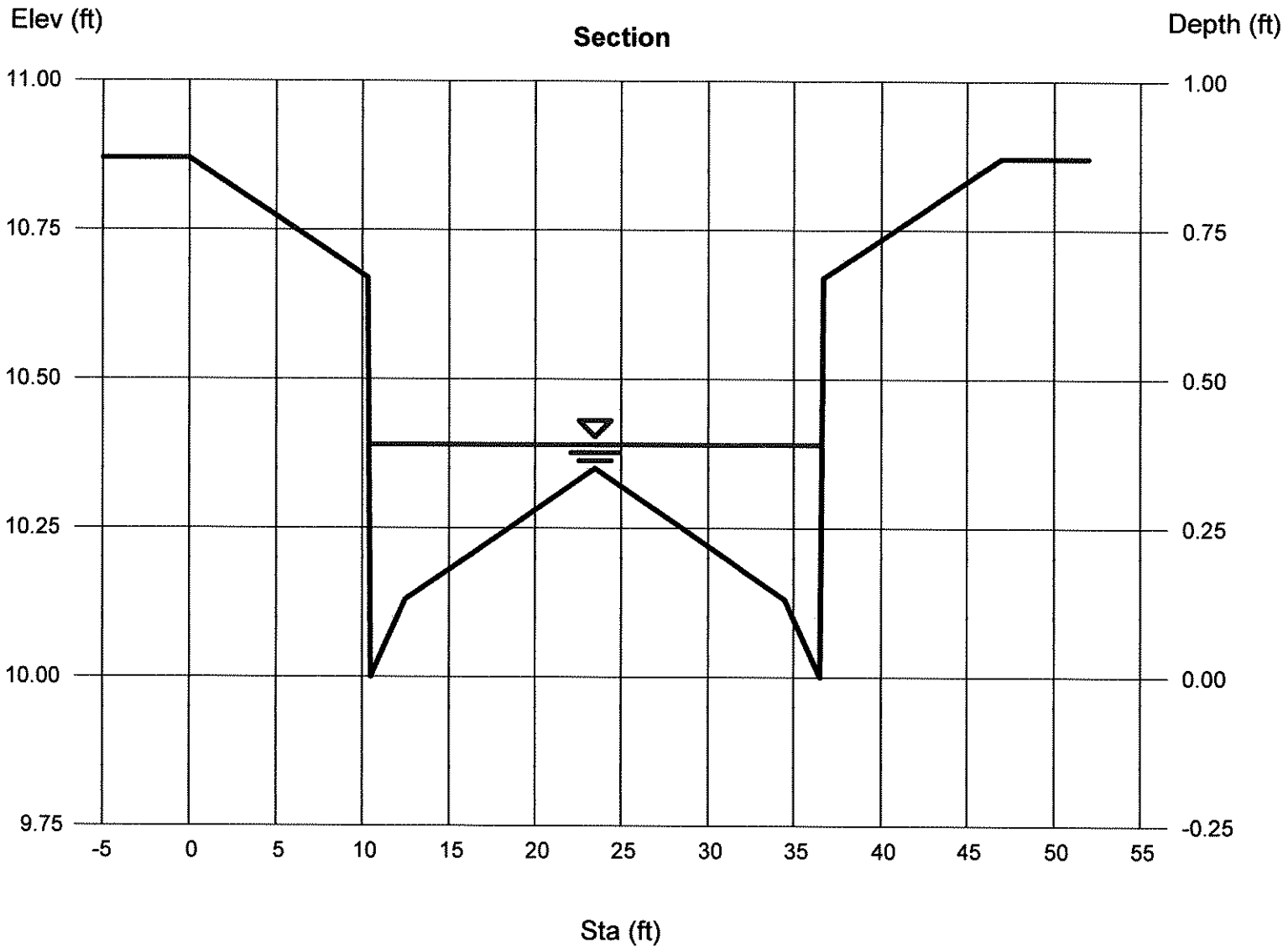
Compute by:	Known Q
Known Q (cfs)	= 21.82

Highlighted

Depth (ft)	= 0.39
Q (cfs)	= 21.82
Area (sqft)	= 4.64
Velocity (ft/s)	= 4.70
Wetted Perim (ft)	= 26.82
Crit Depth, Yc (ft)	= 0.50
Top Width (ft)	= 26.20
EGL (ft)	= 0.73

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017)
-(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Grass Mountain Road-26-Std-0.6%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 0.60
N-Value	= 0.017

Calculations

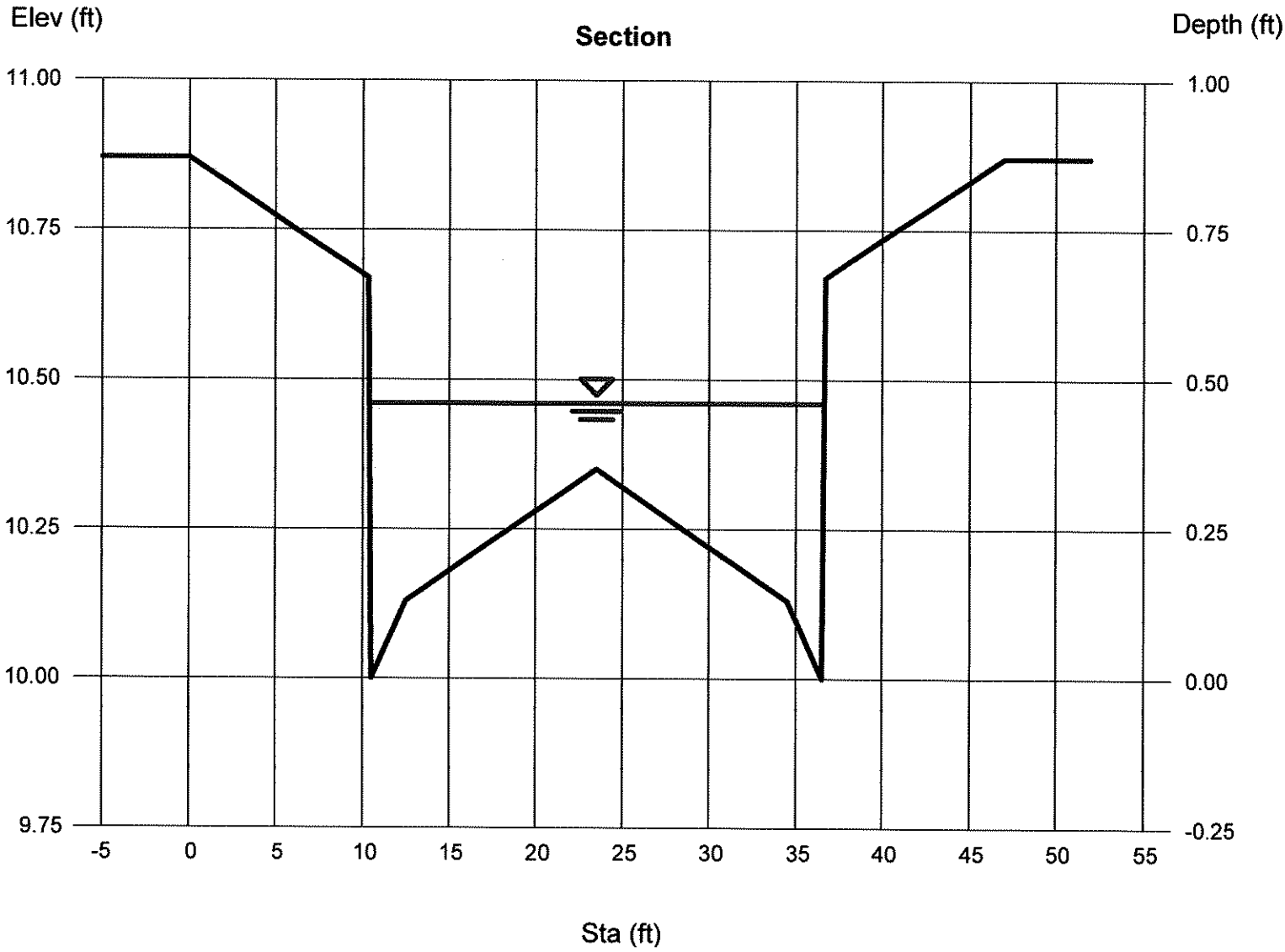
Compute by:	Known Q
Known Q (cfs)	= 16.03

Highlighted

Depth (ft)	= 0.46
Q (cfs)	= 16.03
Area (sqft)	= 6.47
Velocity (ft/s)	= 2.48
Wetted Perim (ft)	= 26.96
Crit Depth, Yc (ft)	= 0.44
Top Width (ft)	= 26.23
EGL (ft)	= 0.56

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Gold Hill-26-Std-3.69%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 3.69
N-Value	= 0.017

Calculations

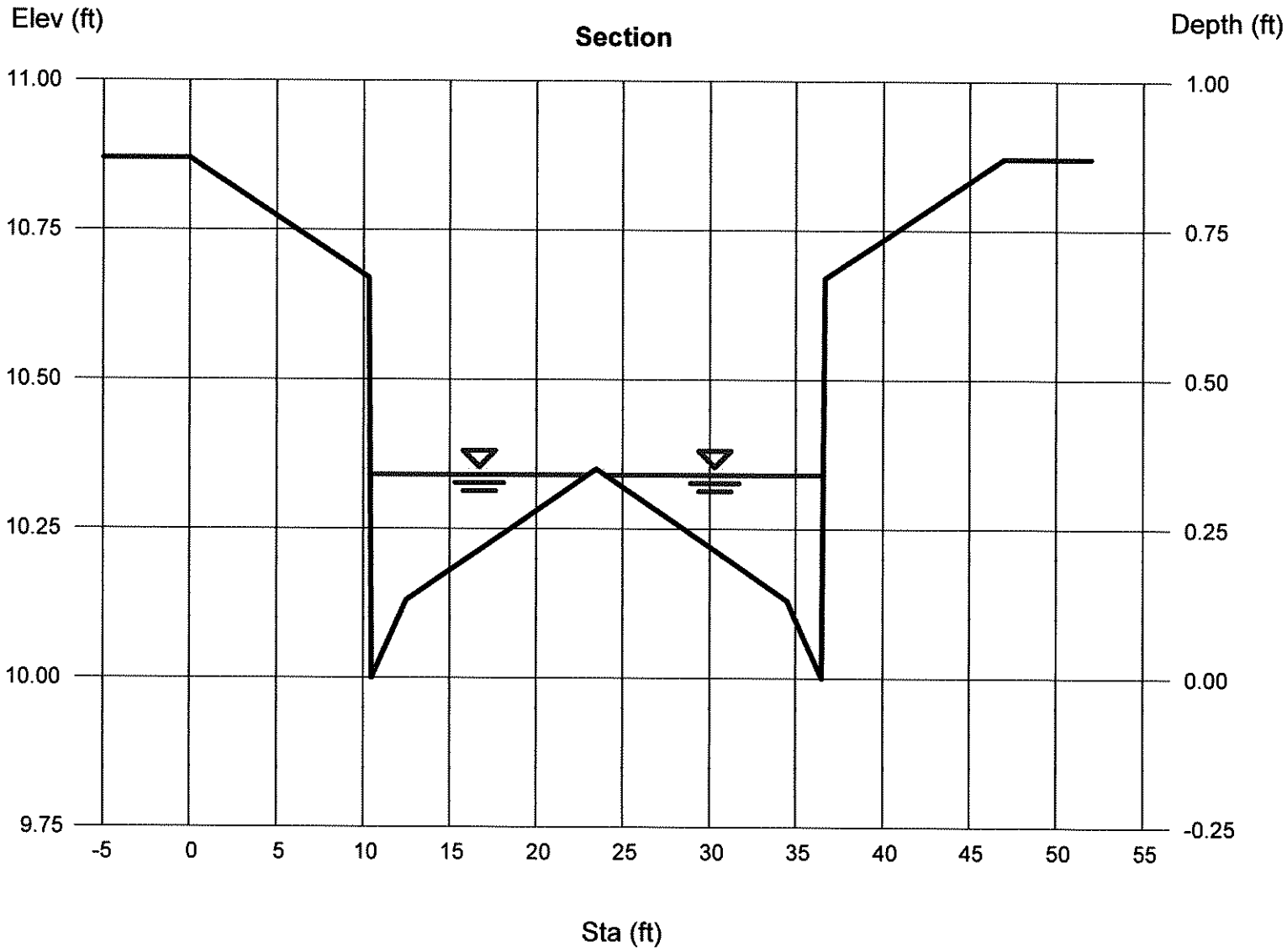
Compute by:	Known Q
Known Q (cfs)	= 13.80

Highlighted

Depth (ft)	= 0.34
Q (cfs)	= 13.80
Area (sqft)	= 3.33
Velocity (ft/s)	= 4.14
Wetted Perim (ft)	= 25.71
Crit Depth, Yc (ft)	= 0.42
Top Width (ft)	= 25.17
EGL (ft)	= 0.61

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Crest Trail-26-Std-4.57%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 4.57
N-Value	= 0.017

Calculations

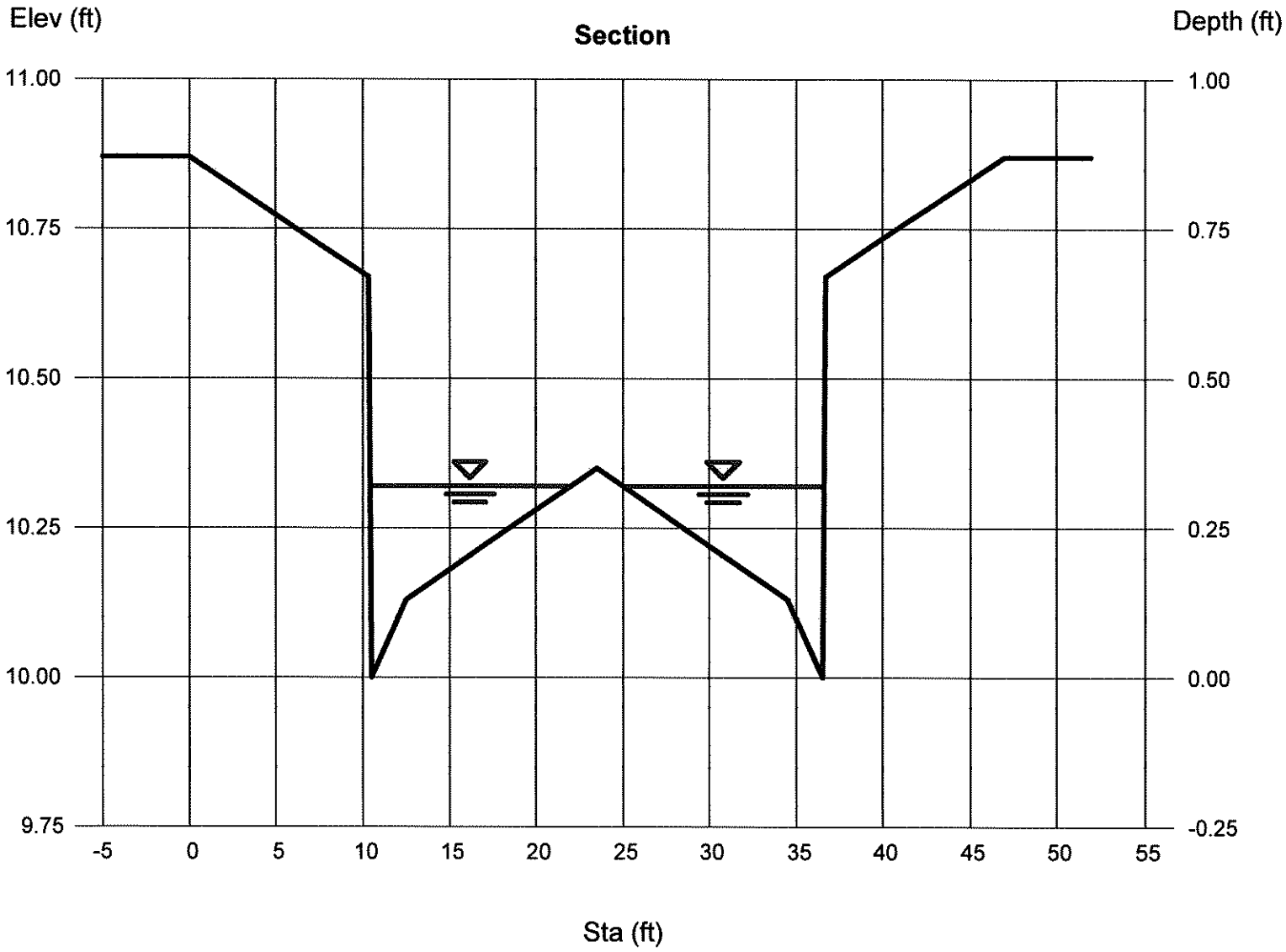
Compute by:	Known Q
Known Q (cfs)	= 12.32

Highlighted

Depth (ft)	= 0.32
Q (cfs)	= 12.32
Area (sqft)	= 2.85
Velocity (ft/s)	= 4.32
Wetted Perim (ft)	= 23.67
Crit Depth, Yc (ft)	= 0.41
Top Width (ft)	= 23.16
EGL (ft)	= 0.61

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Winsor Street-26-Std-0.6%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 0.60
N-Value	= 0.017

Calculations

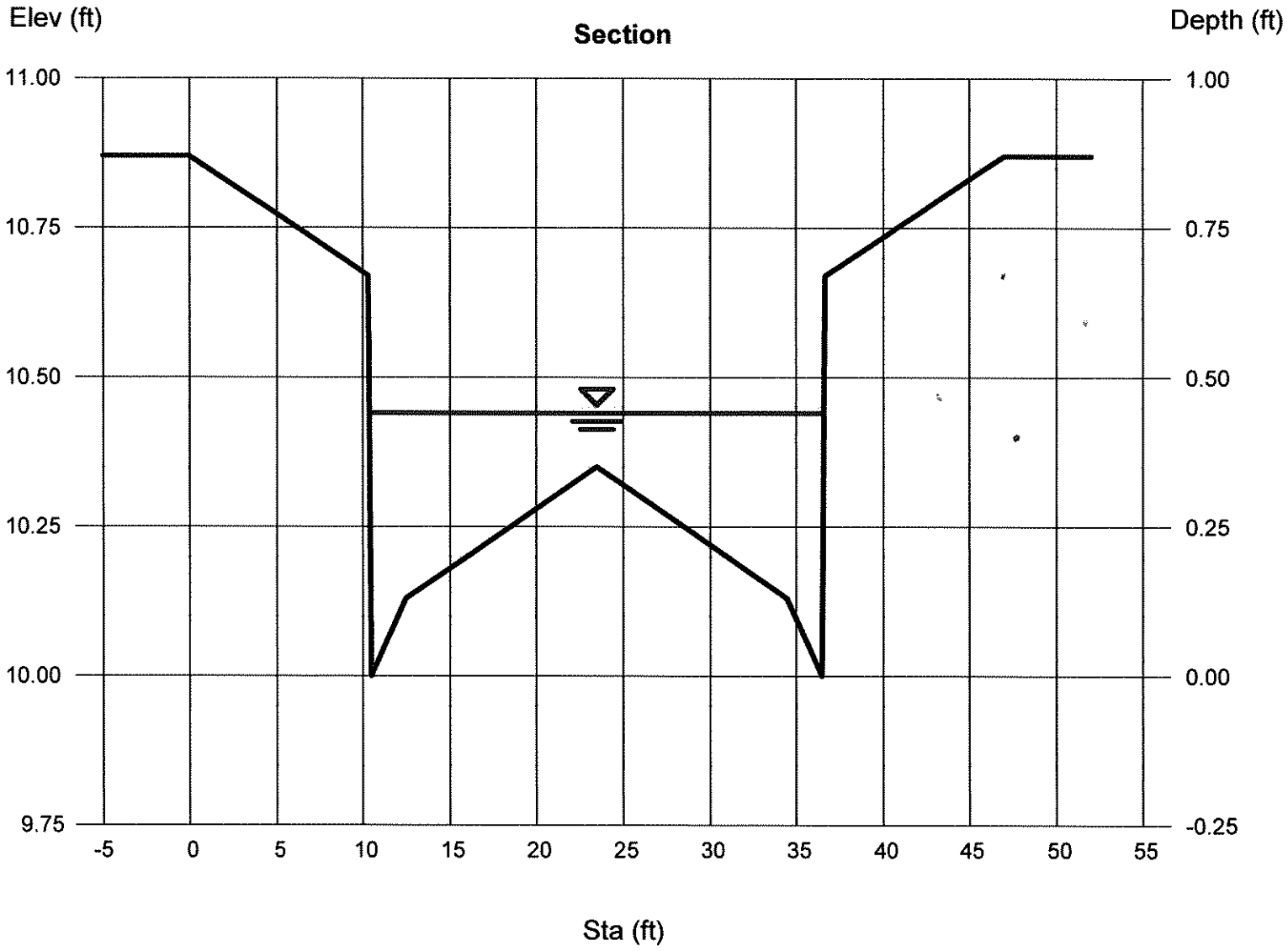
Compute by:	Known Q
Known Q (cfs)	= 14.11

Highlighted

Depth (ft)	= 0.44
Q (cfs)	= 14.11
Area (sqft)	= 5.95
Velocity (ft/s)	= 2.37
Wetted Perim (ft)	= 26.92
Crit Depth, Yc (ft)	= 0.43
Top Width (ft)	= 26.22
EGL (ft)	= 0.53

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Three Rivers-26-Std-2.0%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 2.00
N-Value	= 0.017

Calculations

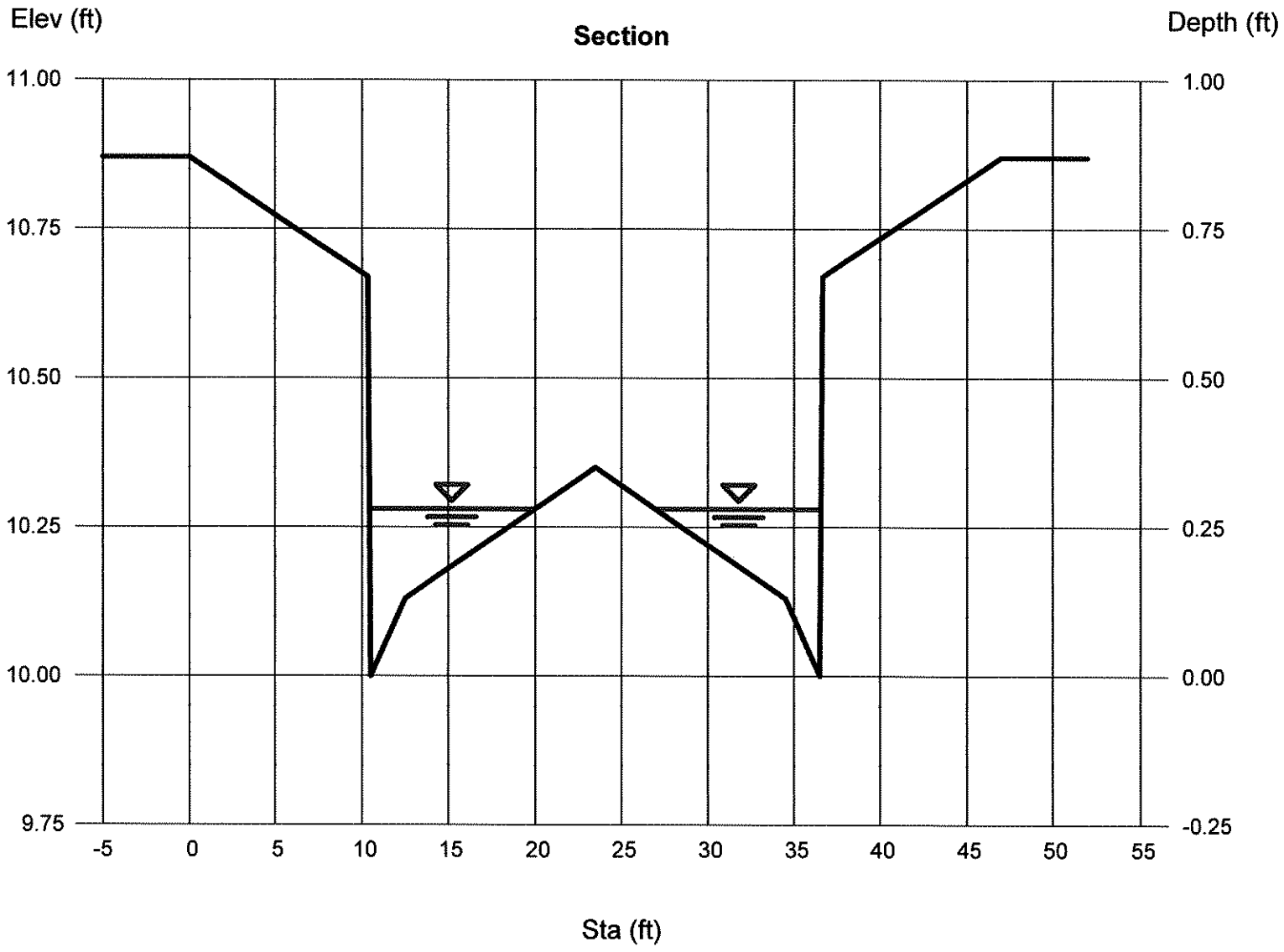
Compute by:	Known Q
Known Q (cfs)	= 5.00

Highlighted

Depth (ft)	= 0.28
Q (cfs)	= 5.000
Area (sqft)	= 2.00
Velocity (ft/s)	= 2.49
Wetted Perim (ft)	= 19.59
Crit Depth, Yc (ft)	= 0.31
Top Width (ft)	= 19.14
EGL (ft)	= 0.38

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

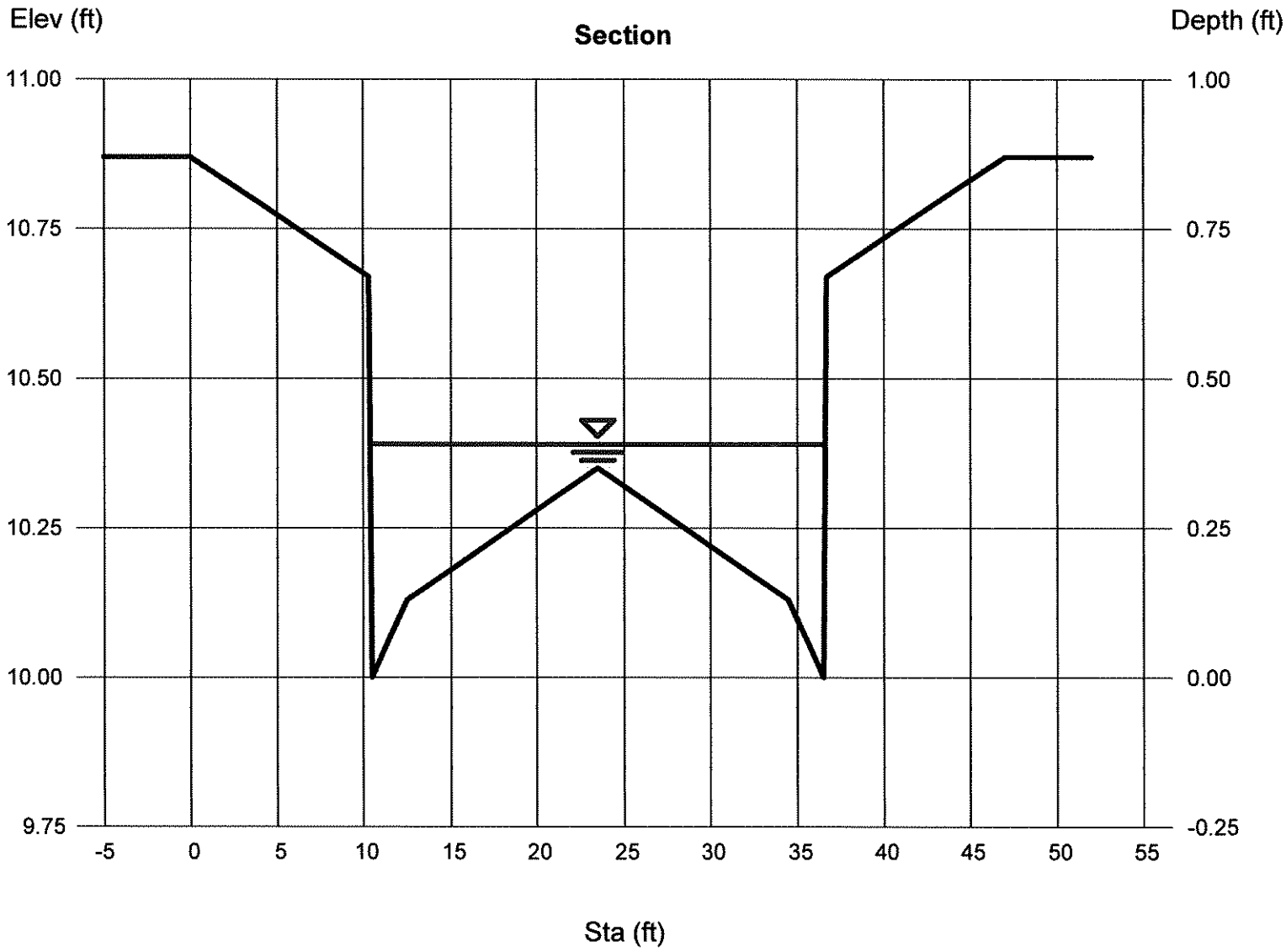
Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

South Peak-26-Std-2.77%(2)

User-defined		Highlighted	
Invert Elev (ft)	= 10.00	Depth (ft)	= 0.39
Slope (%)	= 2.77	Q (cfs)	= 20.37
N-Value	= 0.017	Area (sqft)	= 4.64
		Velocity (ft/s)	= 4.39
Calculations		Wetted Perim (ft)	= 26.82
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.48
Known Q (cfs)	= 20.37	Top Width (ft)	= 26.20
		EGL (ft)	= 0.69

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

South Peak-26-Std-2.77%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 2.77
N-Value	= 0.017

Calculations

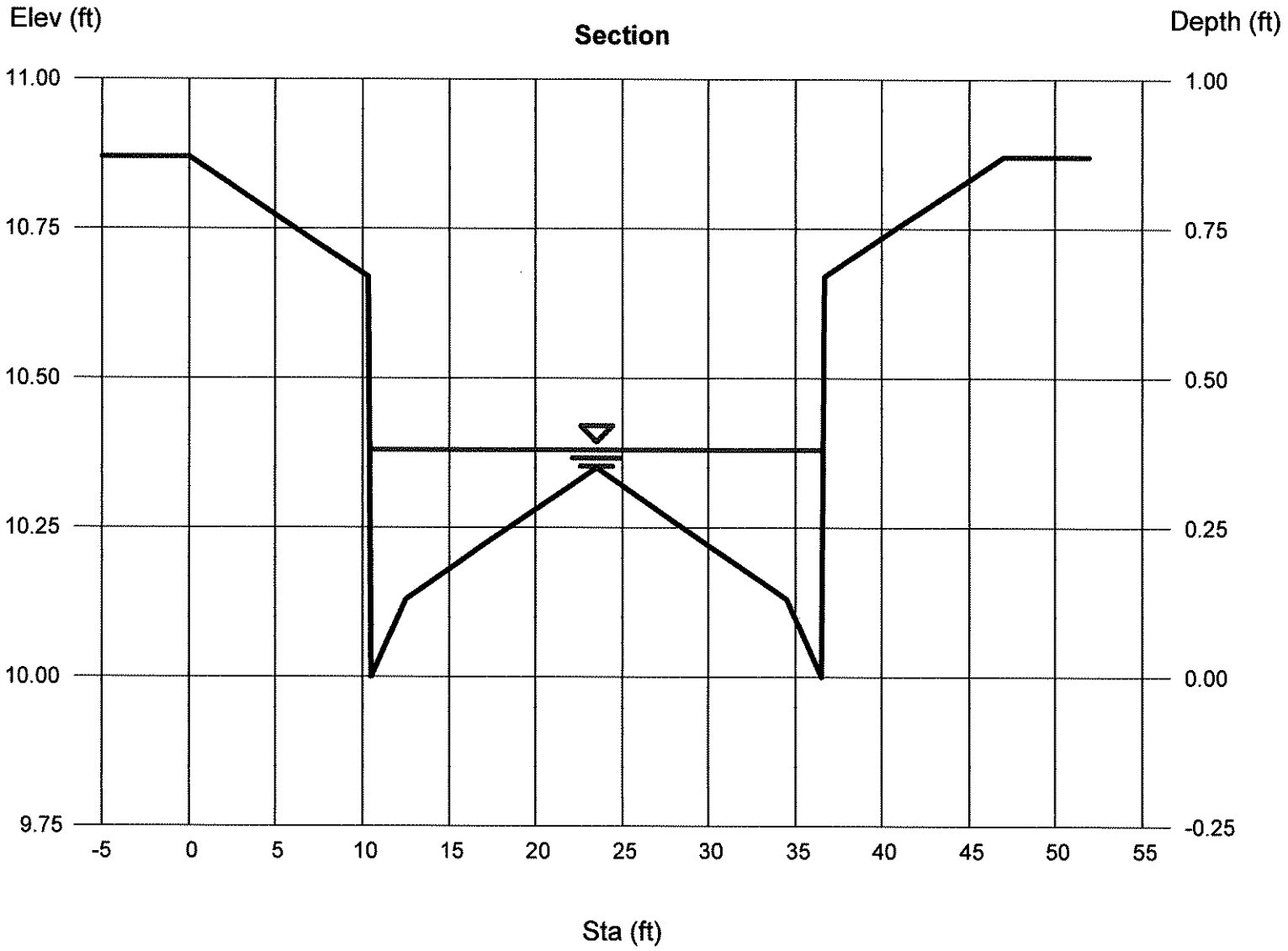
Compute by:	Known Q
Known Q (cfs)	= 18.27

Highlighted

Depth (ft)	= 0.38
Q (cfs)	= 18.27
Area (sqft)	= 4.38
Velocity (ft/s)	= 4.17
Wetted Perim (ft)	= 26.80
Crit Depth, Yc (ft)	= 0.47
Top Width (ft)	= 26.19
EGL (ft)	= 0.65

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Basin Peak-26-Std-5.0%(3)

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 5.00
N-Value	= 0.017

Calculations

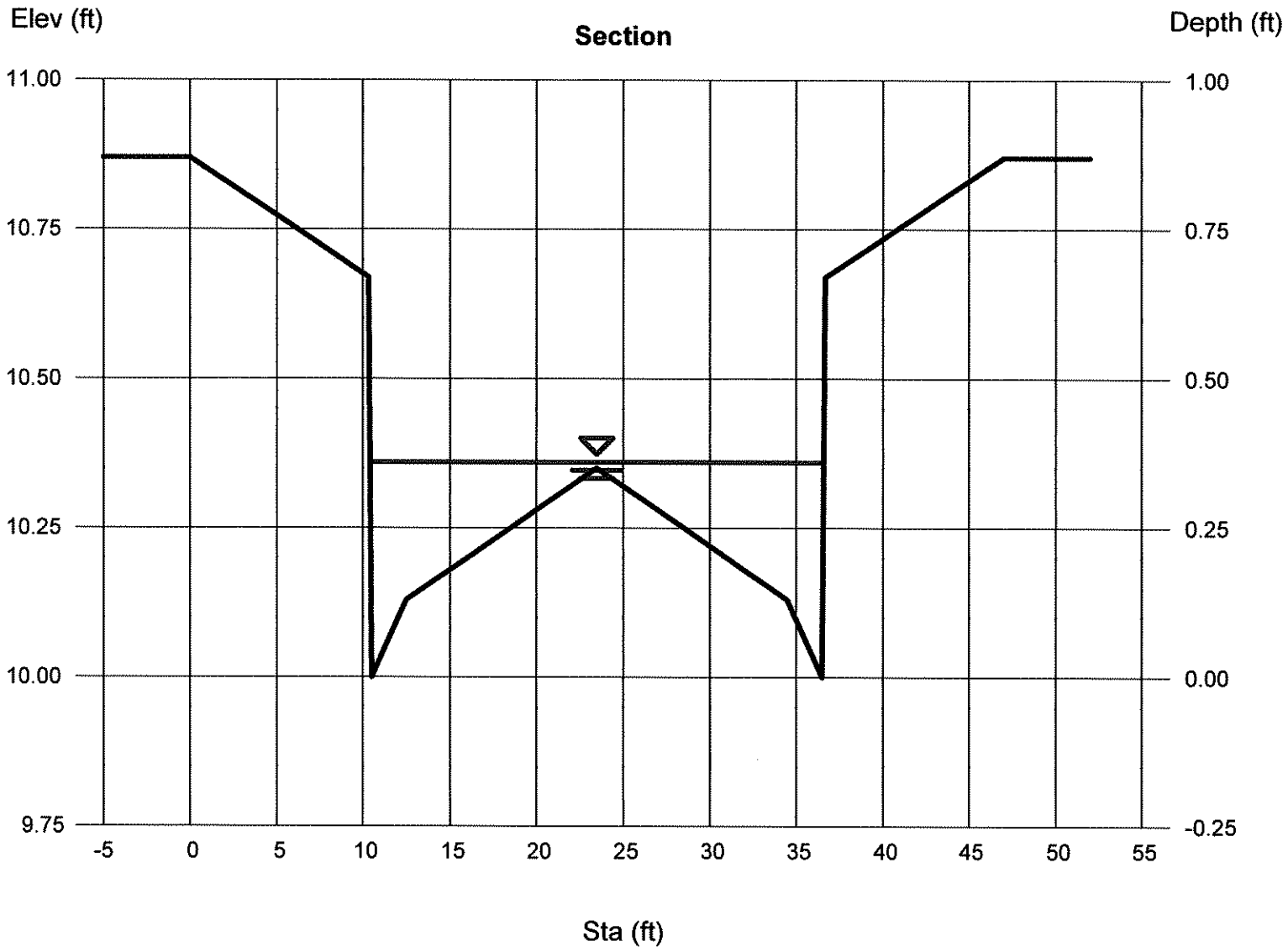
Compute by:	Known Q
Known Q (cfs)	= 18.84

Highlighted

Depth (ft)	= 0.36
Q (cfs)	= 18.84
Area (sqft)	= 3.85
Velocity (ft/s)	= 4.89
Wetted Perim (ft)	= 26.76
Crit Depth, Yc (ft)	= 0.47
Top Width (ft)	= 26.18
EGL (ft)	= 0.73

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Deer Horn-26-MTB-4.0%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 4.00
N-Value	= 0.017

Calculations

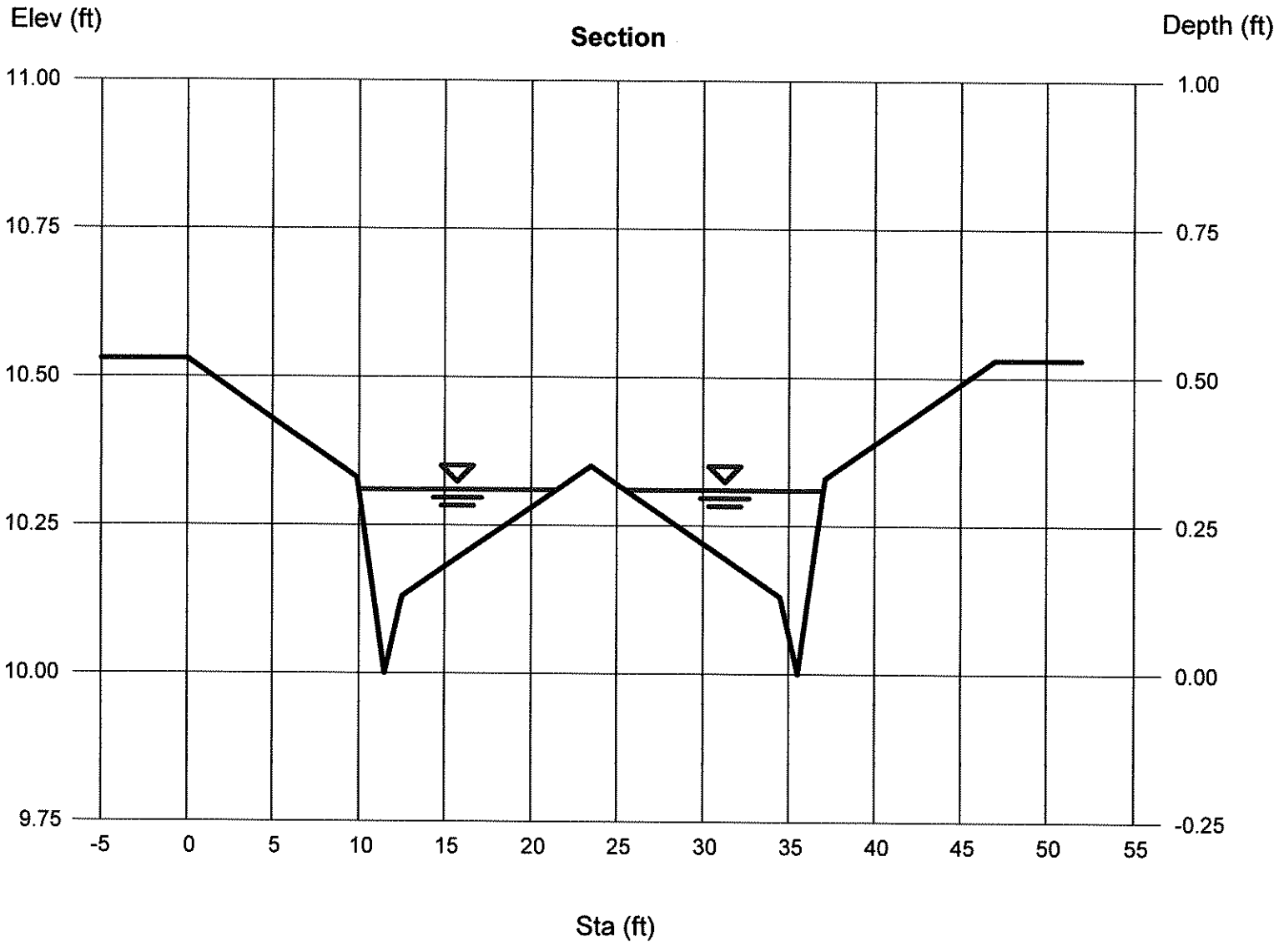
Compute by:	Known Q
Known Q (cfs)	= 9.50

Highlighted

Depth (ft)	= 0.31
Q (cfs)	= 9.500
Area (sqft)	= 2.59
Velocity (ft/s)	= 3.67
Wetted Perim (ft)	= 23.15
Crit Depth, Yc (ft)	= 0.38
Top Width (ft)	= 23.07
EGL (ft)	= 0.52

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.53)-(9.87, 10.33, 0.017)-(11.47, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(35.53, 10.00, 0.017) -(37.13, 10.33, 0.017)-(47.00, 10.53, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Deer Horn-26-Std-4.0%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 4.00
N-Value	= 0.017

Calculations

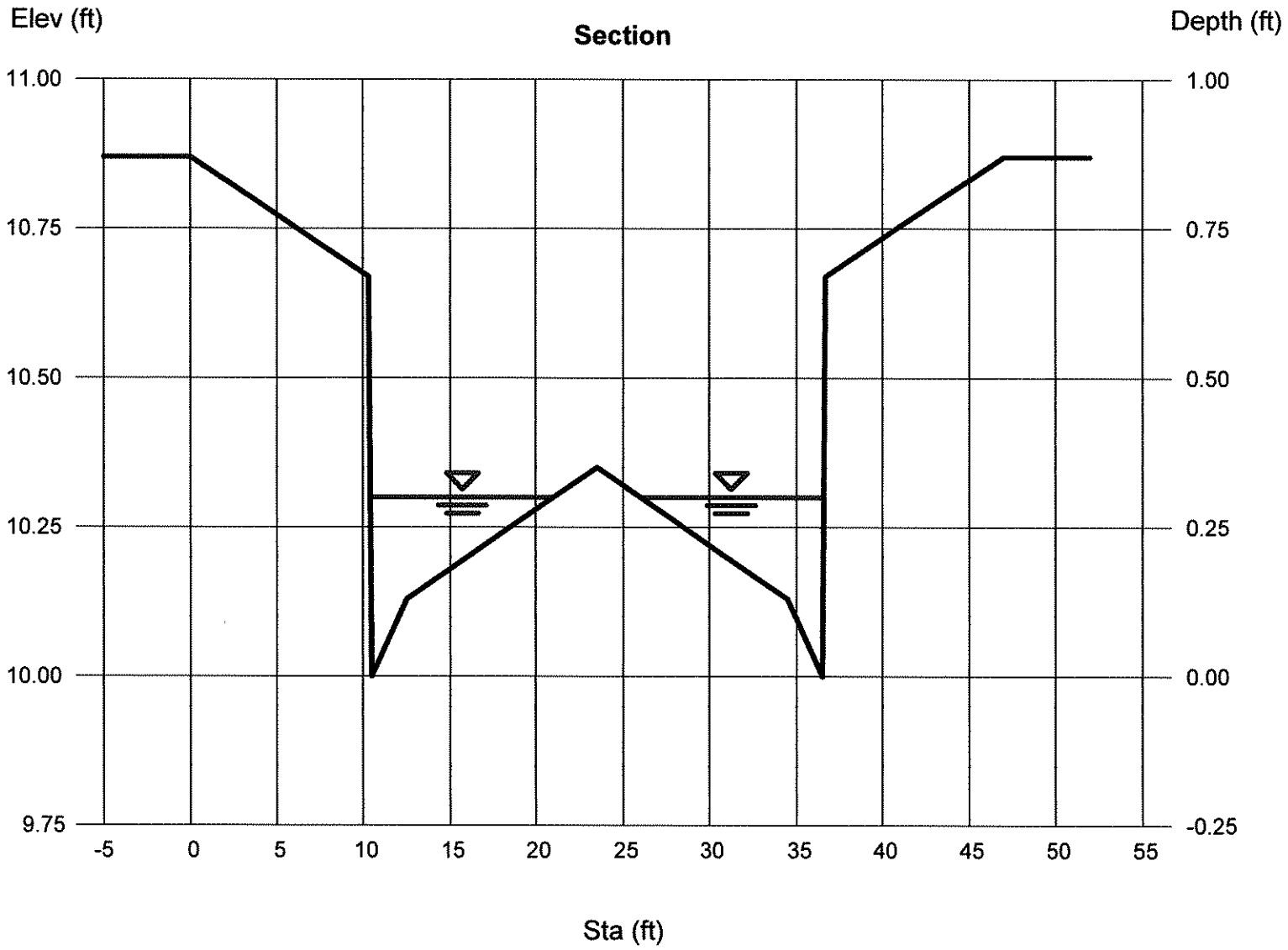
Compute by:	Known Q
Known Q (cfs)	= 9.50

Highlighted

Depth (ft)	= 0.30
Q (cfs)	= 9.500
Area (sqft)	= 2.41
Velocity (ft/s)	= 3.95
Wetted Perim (ft)	= 21.63
Crit Depth, Yc (ft)	= 0.38
Top Width (ft)	= 21.15
EGL (ft)	= 0.54

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Basin Peak-26-Std-5.0%(2)

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 5.00
N-Value	= 0.017

Calculations

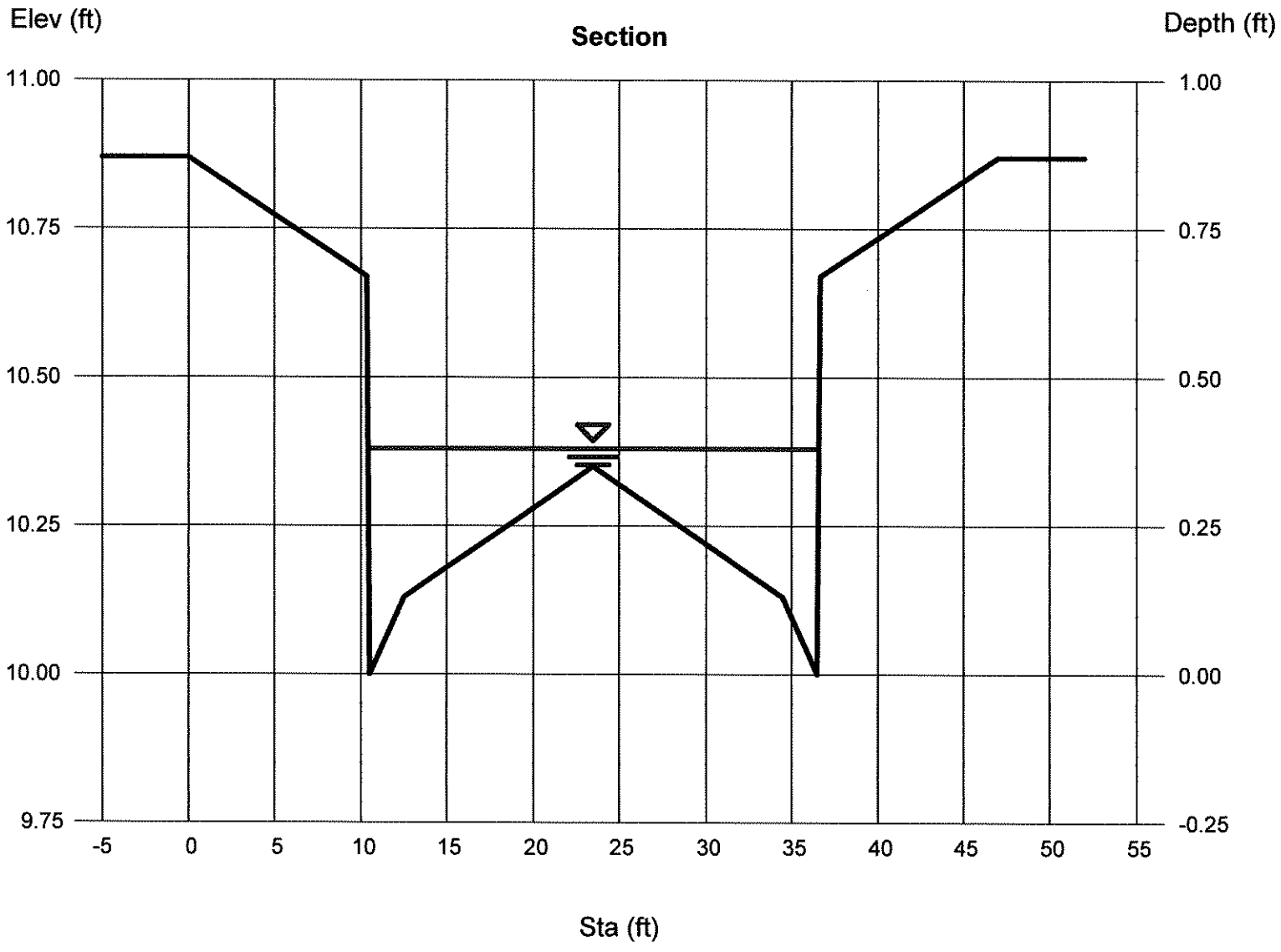
Compute by:	Known Q
Known Q (cfs)	= 24.50

Highlighted

Depth (ft)	= 0.38
Q (cfs)	= 24.50
Area (sqft)	= 4.38
Velocity (ft/s)	= 5.60
Wetted Perim (ft)	= 26.80
Crit Depth, Yc (ft)	= 0.52
Top Width (ft)	= 26.19
EGL (ft)	= 0.87

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Alta Peak Trail-26-Std-0.711%(3)

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 0.71
N-Value	= 0.017

Calculations

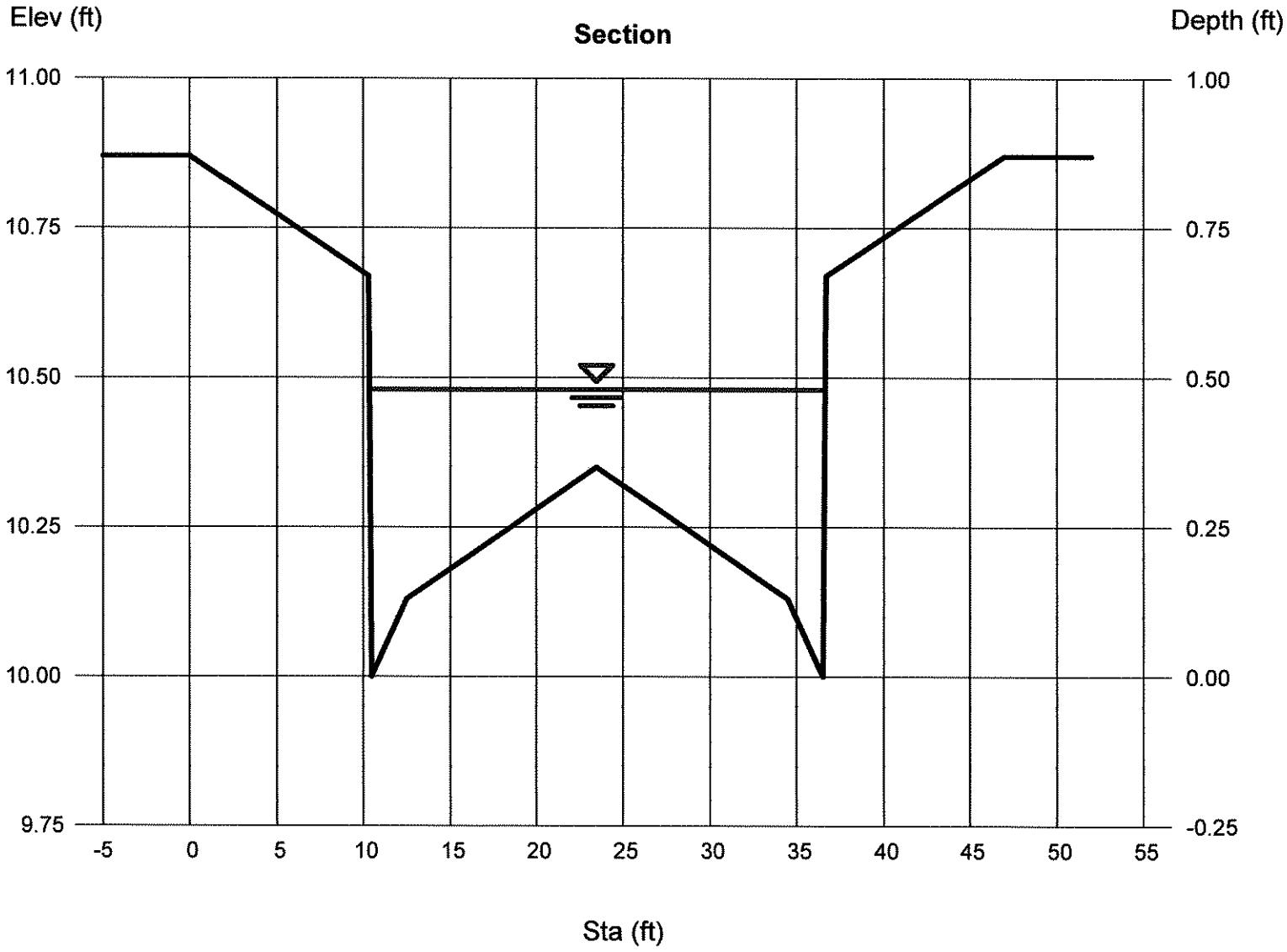
Compute by:	Known Q
Known Q (cfs)	= 20.17

Highlighted

Depth (ft)	= 0.48
Q (cfs)	= 20.17
Area (sqft)	= 7.00
Velocity (ft/s)	= 2.88
Wetted Perim (ft)	= 27.00
Crit Depth, Yc (ft)	= 0.48
Top Width (ft)	= 26.24
EGL (ft)	= 0.61

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017)
-(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Crest Trail-28-Std-5.00%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 5.00
N-Value	= 0.017

Calculations

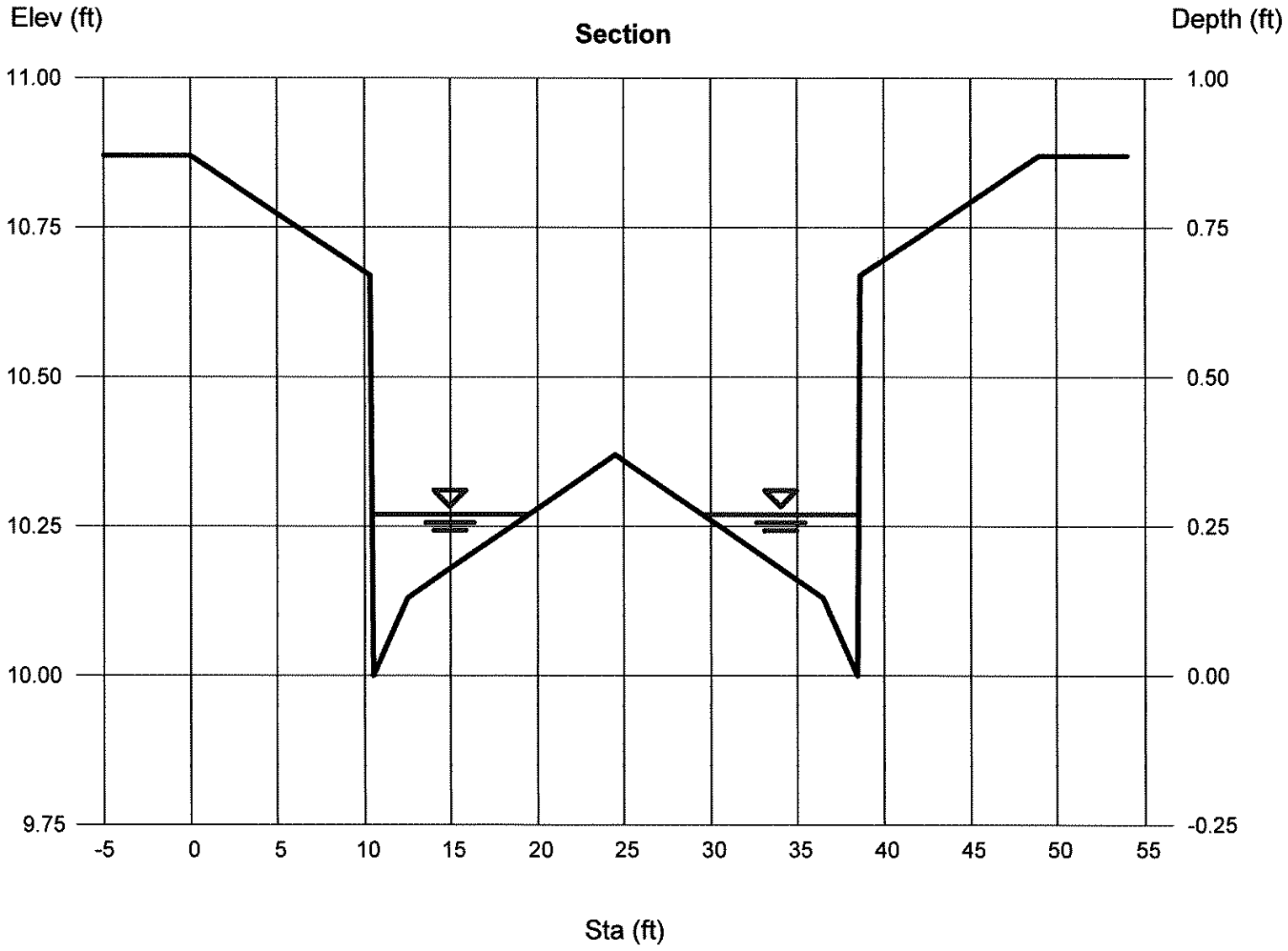
Compute by:	Known Q
Known Q (cfs)	= 6.64

Highlighted

Depth (ft)	= 0.27
Q (cfs)	= 6.640
Area (sqft)	= 1.82
Velocity (ft/s)	= 3.65
Wetted Perim (ft)	= 18.57
Crit Depth, Yc (ft)	= 0.34
Top Width (ft)	= 18.14
EGL (ft)	= 0.48

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(24.50, 10.37, 0.017)-(36.50, 10.13, 0.017)-(38.50, 10.00, 0.017) -(38.67, 10.67, 0.017)-(49.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Emerald Peak-15-STD-3.32%-Entrance

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 3.32
N-Value	= 0.017

Calculations

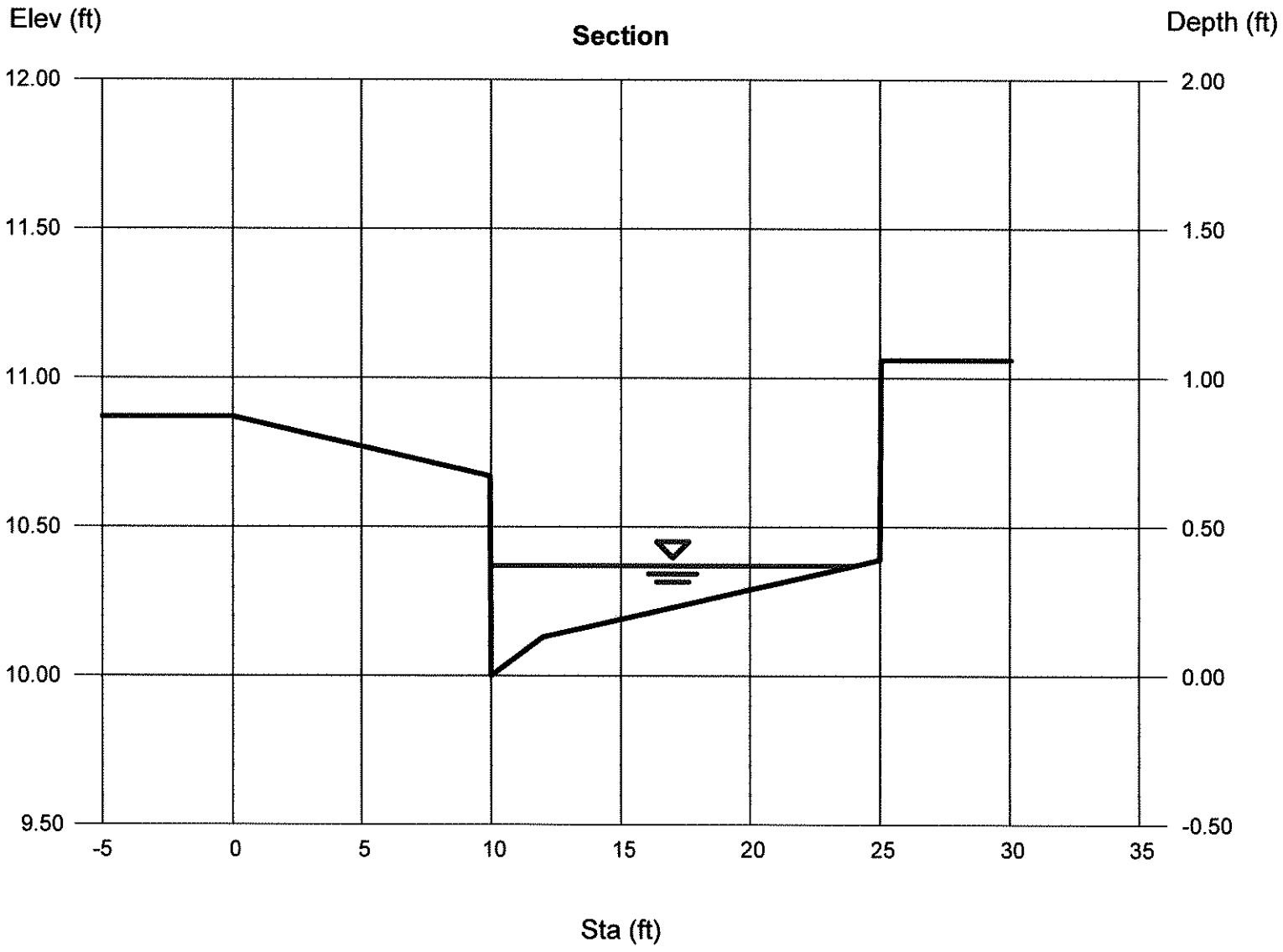
Compute by:	Known Q
Known Q (cfs)	= 8.35

Highlighted

Depth (ft)	= 0.37
Q (cfs)	= 8.350
Area (sqft)	= 2.06
Velocity (ft/s)	= 4.06
Wetted Perim (ft)	= 14.38
Crit Depth, Yc (ft)	= 0.45
Top Width (ft)	= 14.03
EGL (ft)	= 0.63

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(9.95, 10.67, 0.017)-(10.00, 10.00, 0.017)-(12.00, 10.13, 0.017)-(25.00, 10.39, 0.017)-(25.05, 11.06, 0.017)



Channel Report

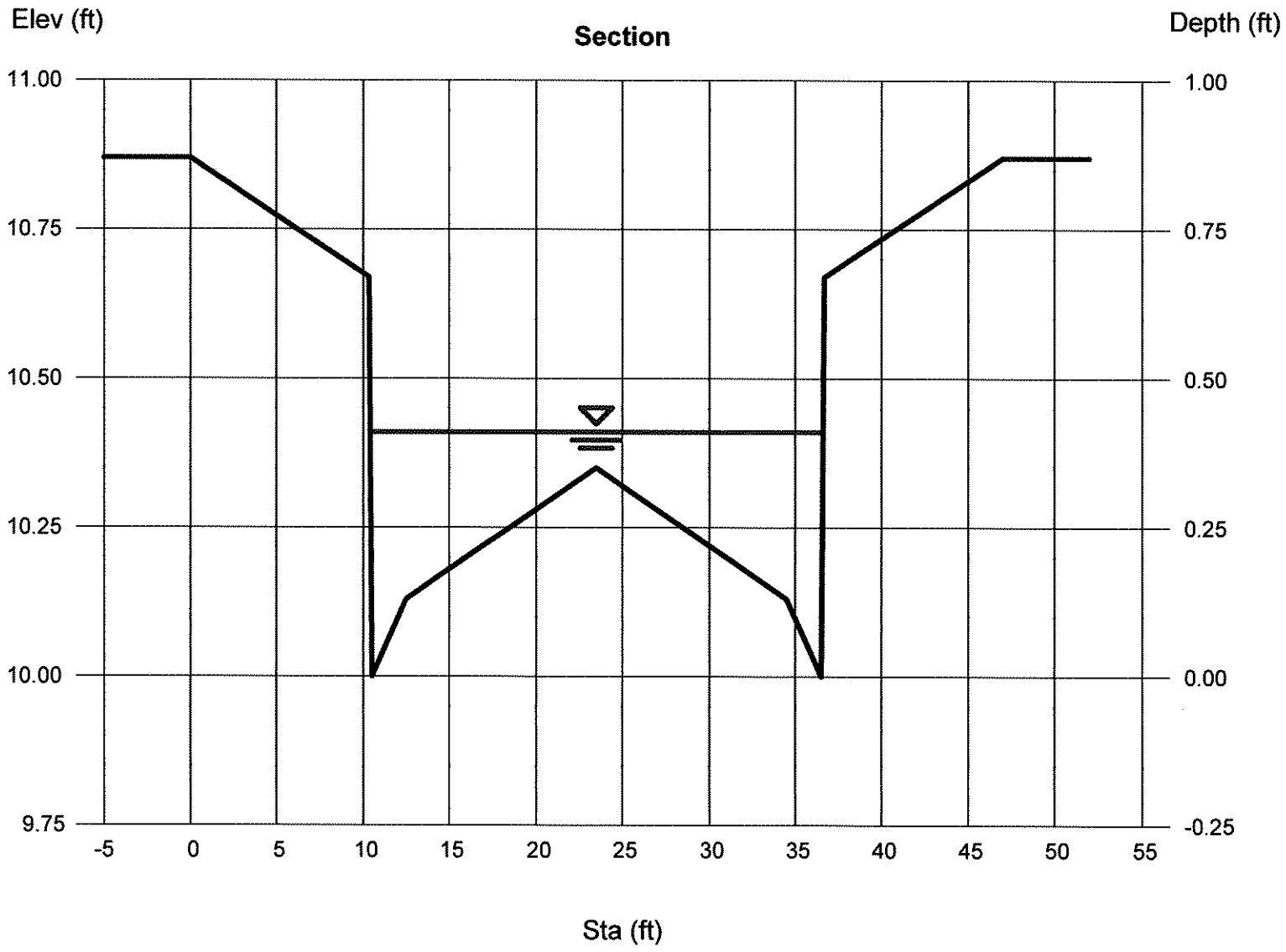
Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Crag Peak-26-Std-3.2%

User-defined		Highlighted	
Invert Elev (ft)	= 10.00	Depth (ft)	= 0.41
Slope (%)	= 3.20	Q (cfs)	= 26.69
N-Value	= 0.017	Area (sqft)	= 5.16
		Velocity (ft/s)	= 5.17
Calculations		Wetted Perim (ft)	= 26.86
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.54
Known Q (cfs)	= 26.69	Top Width (ft)	= 26.21
		EGL (ft)	= 0.83

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017)
-(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Pine Town Way-26-Std-3.4%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 3.40
N-Value	= 0.017

Calculations

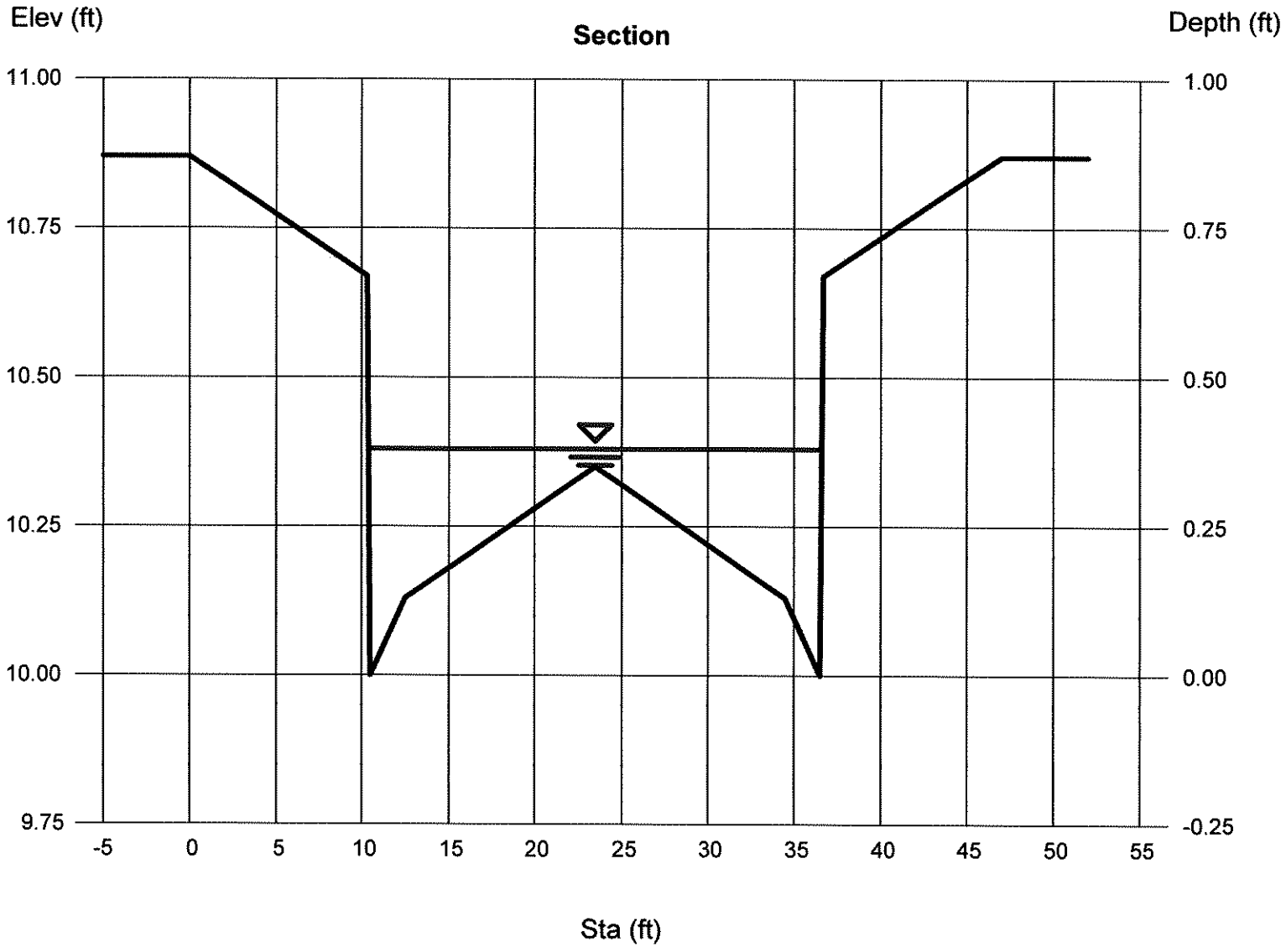
Compute by:	Known Q
Known Q (cfs)	= 20.65

Highlighted

Depth (ft)	= 0.38
Q (cfs)	= 20.65
Area (sqft)	= 4.38
Velocity (ft/s)	= 4.72
Wetted Perim (ft)	= 26.80
Crit Depth, Yc (ft)	= 0.49
Top Width (ft)	= 26.19
EGL (ft)	= 0.73

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Alta Peak Trail-26-Std-0.711%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 0.71
N-Value	= 0.017

Calculations

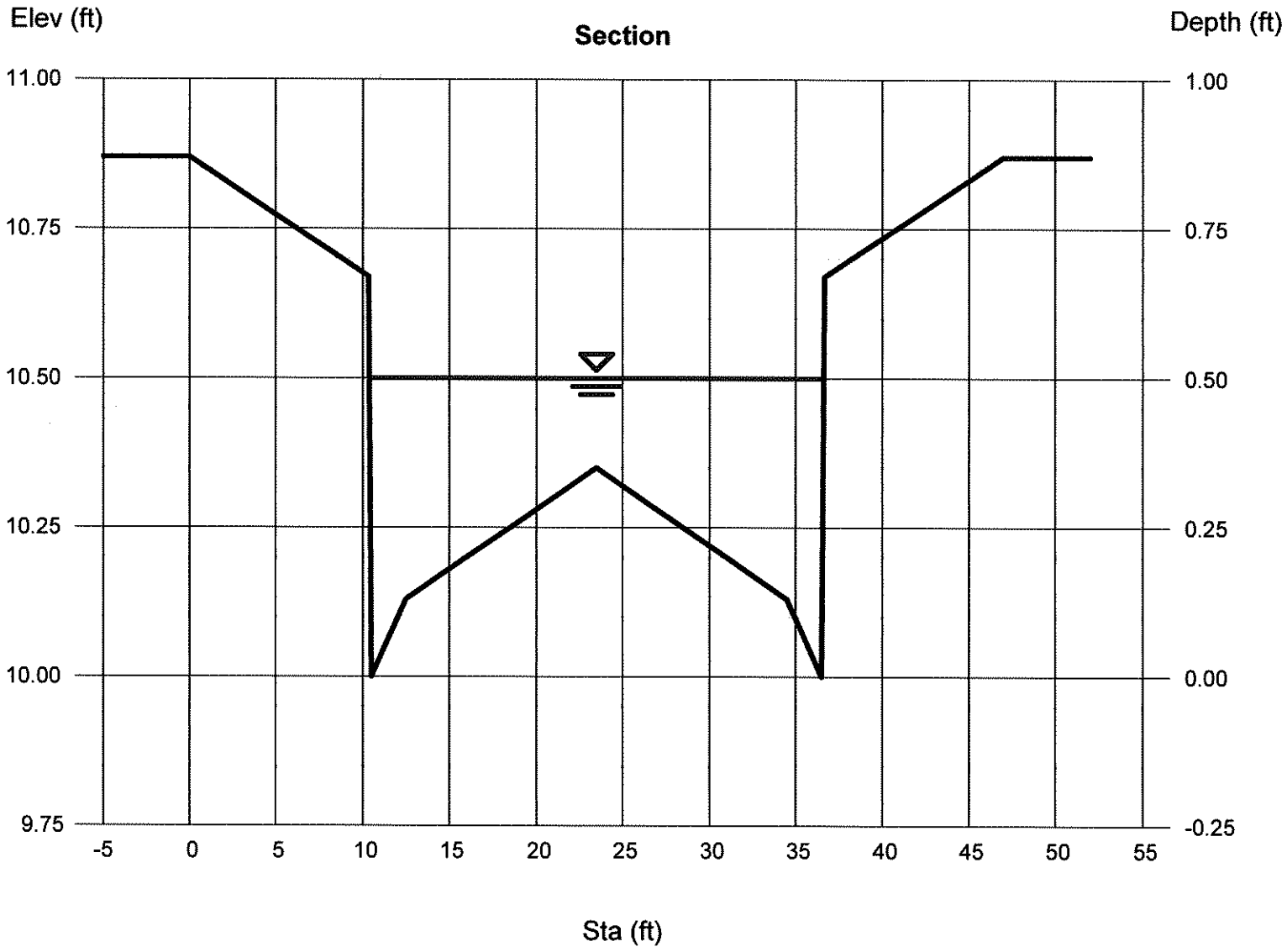
Compute by:	Known Q
Known Q (cfs)	= 23.28

Highlighted

Depth (ft)	= 0.50
Q (cfs)	= 23.28
Area (sqft)	= 7.52
Velocity (ft/s)	= 3.09
Wetted Perim (ft)	= 27.04
Crit Depth, Yc (ft)	= 0.51
Top Width (ft)	= 26.25
EGL (ft)	= 0.65

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017)
-(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

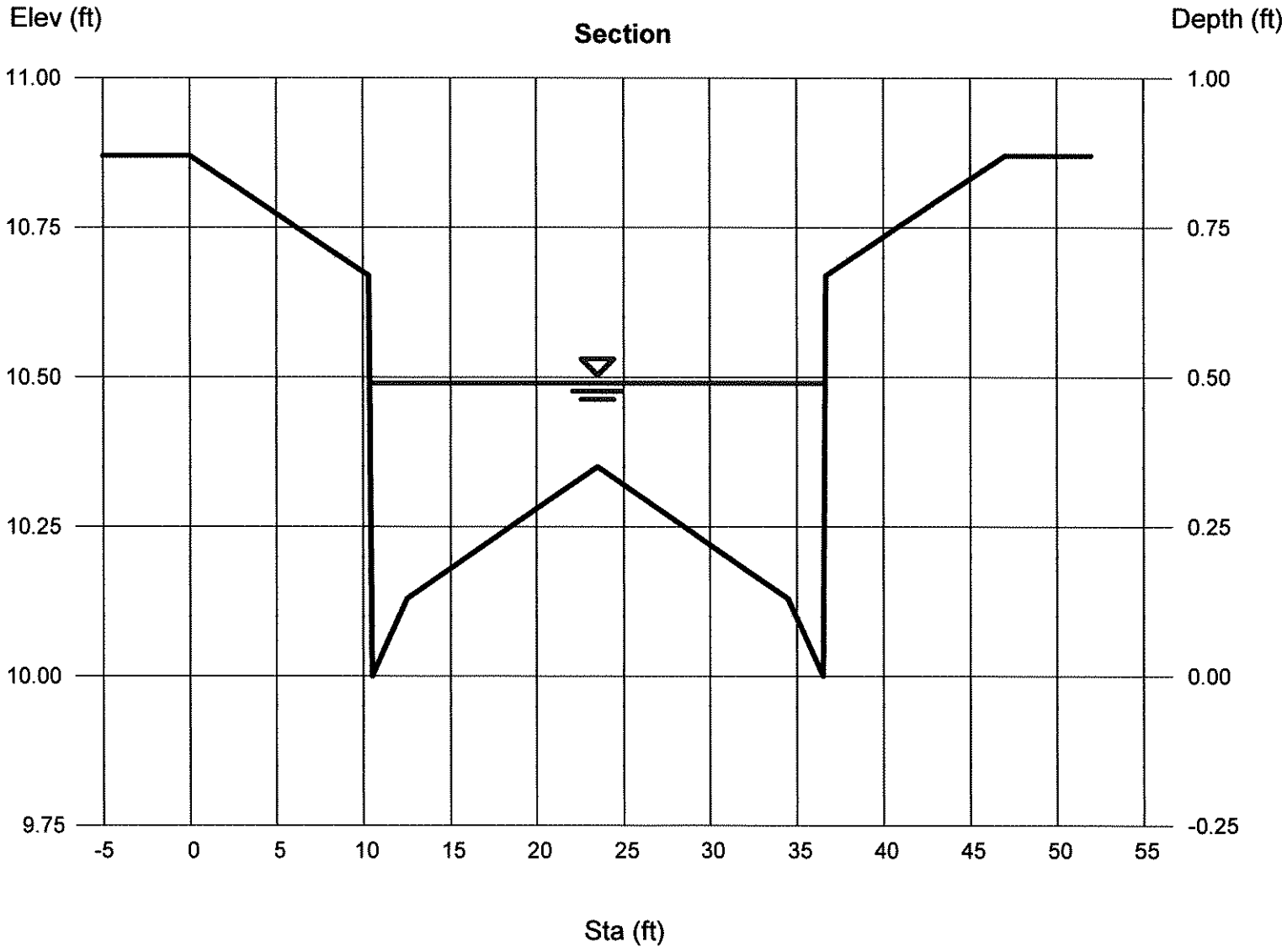
Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Alta Peak Trail-26-Std-0.711%(2)

User-defined		Highlighted	
Invert Elev (ft)	= 10.00	Depth (ft)	= 0.49
Slope (%)	= 0.71	Q (cfs)	= 21.41
N-Value	= 0.017	Area (sqft)	= 7.26
		Velocity (ft/s)	= 2.95
Calculations		Wetted Perim (ft)	= 27.02
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.49
Known Q (cfs)	= 21.41	Top Width (ft)	= 26.25
		EGL (ft)	= 0.63

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Crag Peak-26-Std-4.9% (2)

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 4.90
N-Value	= 0.017

Calculations

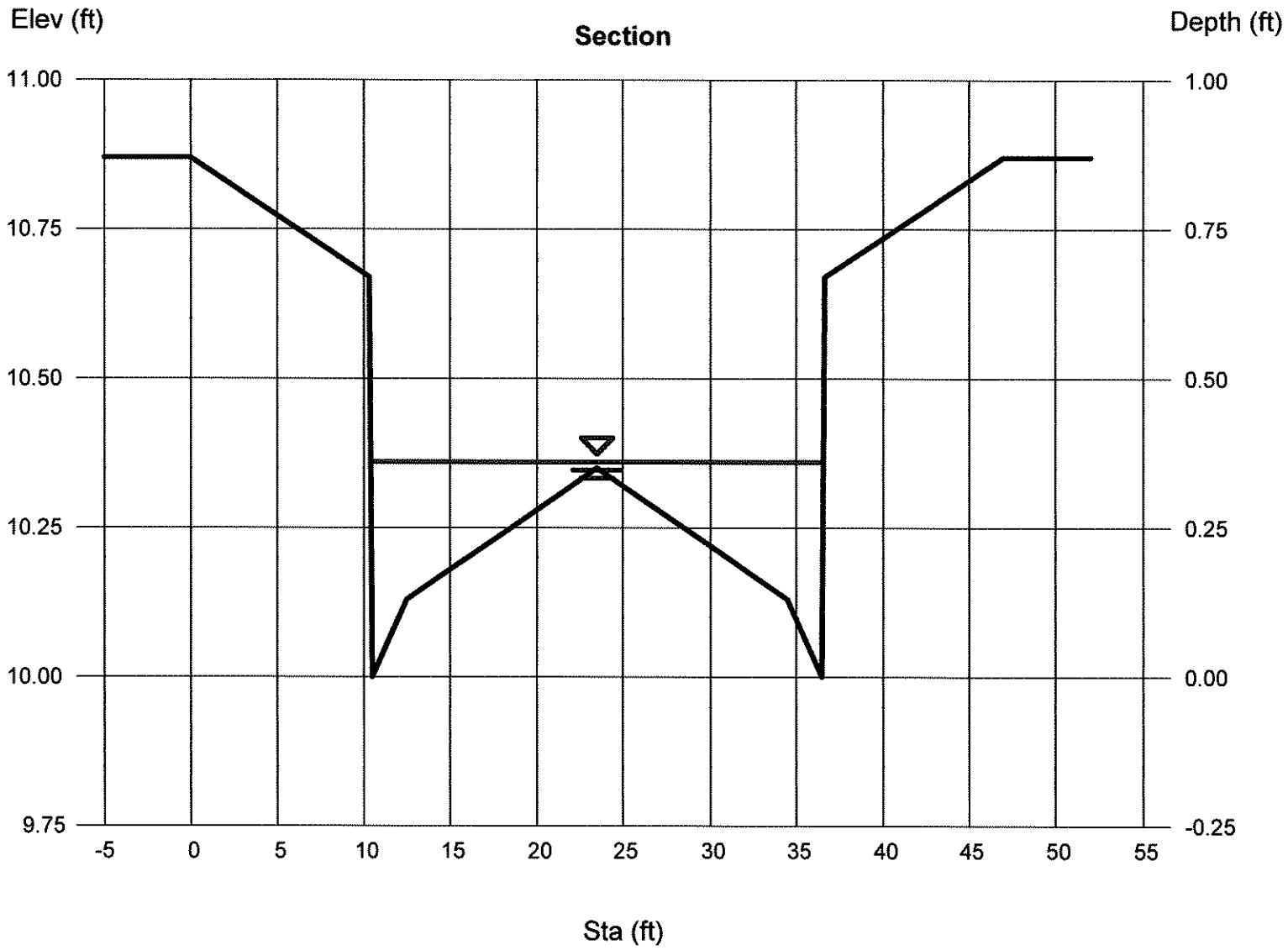
Compute by:	Known Q
Known Q (cfs)	= 19.38

Highlighted

Depth (ft)	= 0.36
Q (cfs)	= 19.38
Area (sqft)	= 3.85
Velocity (ft/s)	= 5.03
Wetted Perim (ft)	= 26.76
Crit Depth, Yc (ft)	= 0.48
Top Width (ft)	= 26.18
EGL (ft)	= 0.75

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

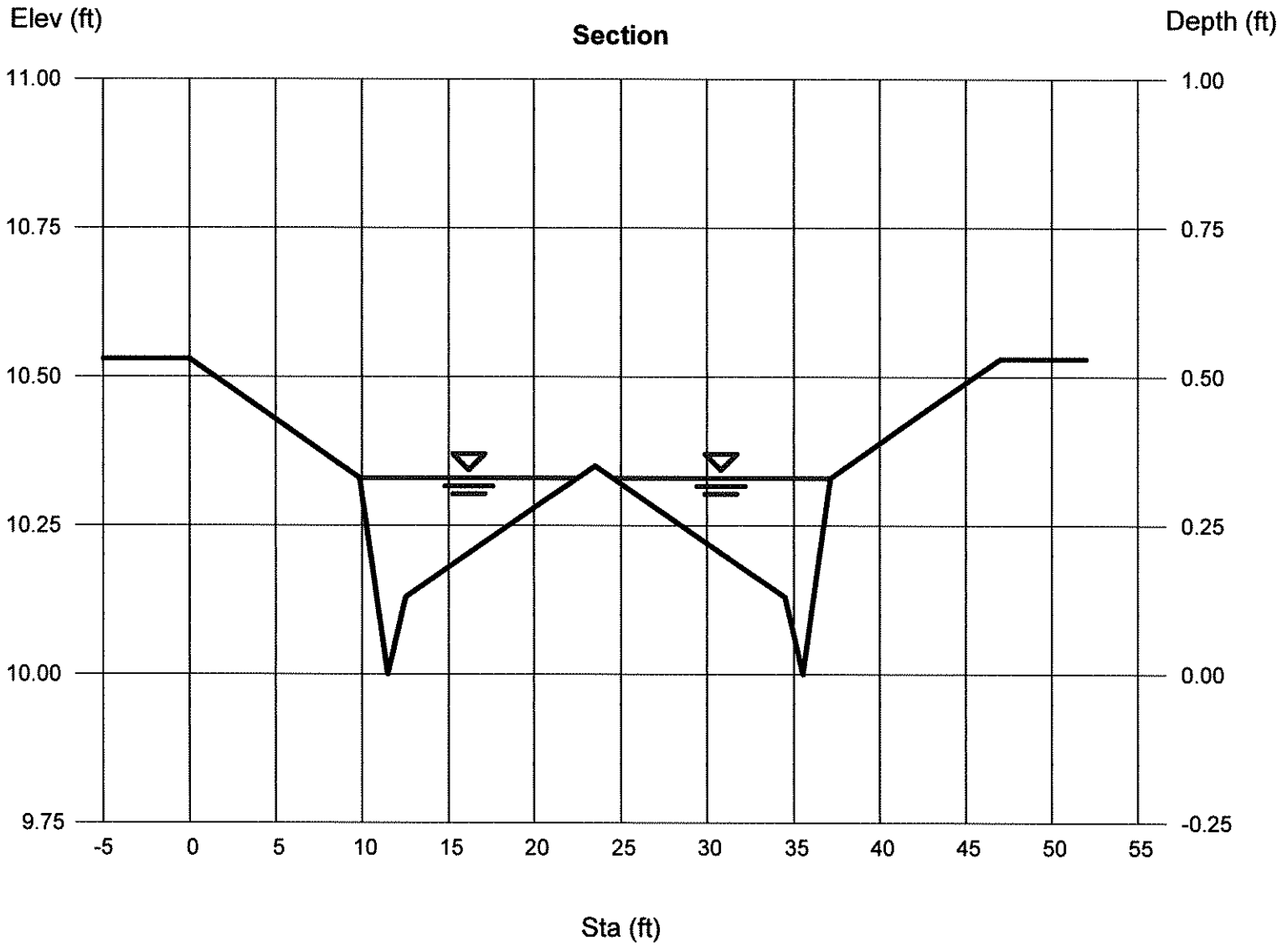
Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Monday, Feb 12 2018

Emerald Peak-26-MTB-2.34%

User-defined		Highlighted	
Invert Elev (ft)	= 10.00	Depth (ft)	= 0.33
Slope (%)	= 2.34	Q (cfs)	= 9.410
N-Value	= 0.017	Area (sqft)	= 3.07
		Velocity (ft/s)	= 3.06
Calculations		Wetted Perim (ft)	= 25.35
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.38
Known Q (cfs)	= 9.41	Top Width (ft)	= 25.26
		EGL (ft)	= 0.48

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.53)-(9.87, 10.33, 0.017)-(11.47, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(35.53, 10.00, 0.017) -(37.13, 10.33, 0.017)-(47.00, 10.53, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Sunday, Feb 11 2018

Diamond Peak-26-Std-2.7% (2)

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 2.70
N-Value	= 0.017

Calculations

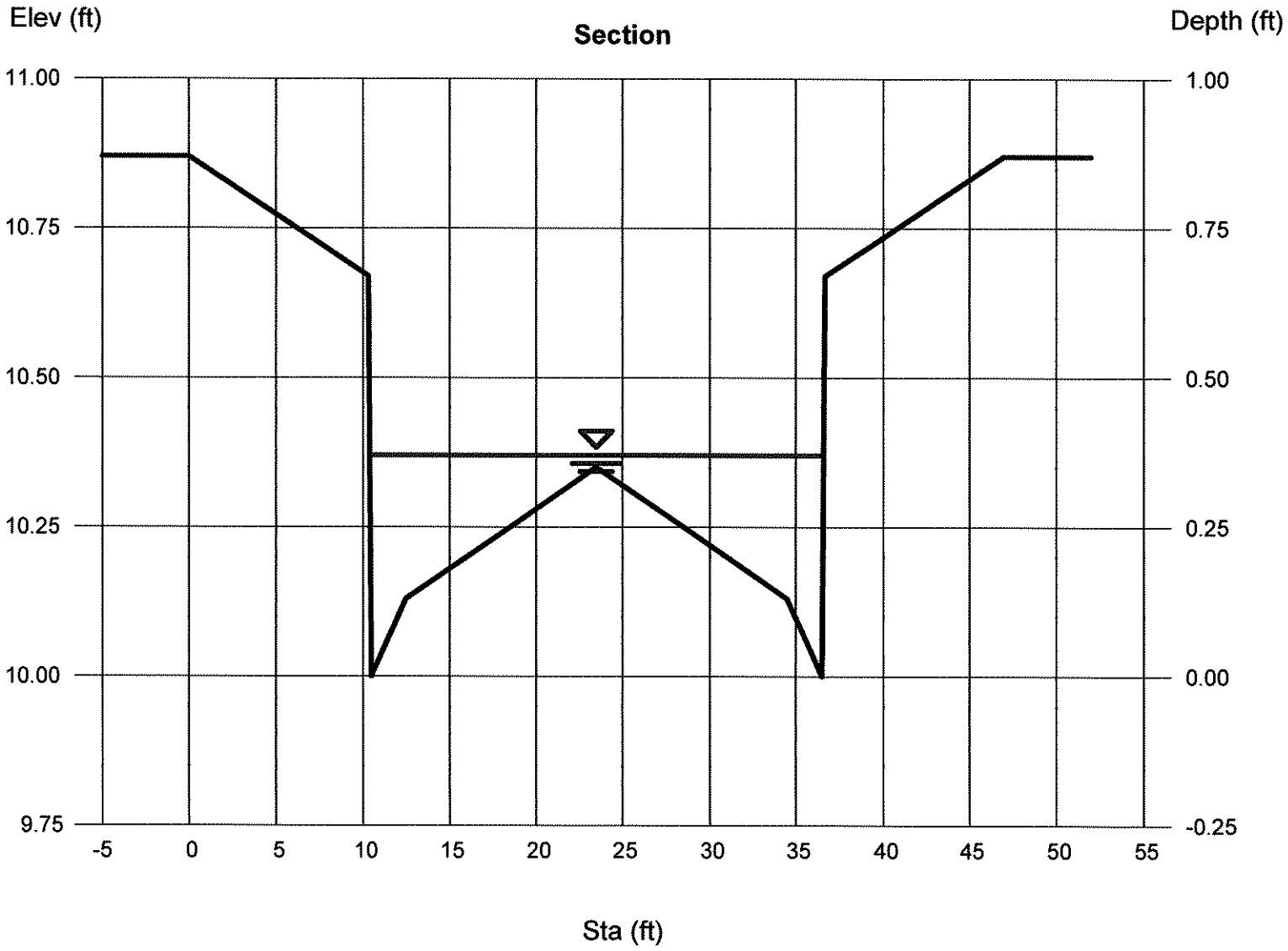
Compute by:	Known Q
Known Q (cfs)	= 15.94

Highlighted

Depth (ft)	= 0.37
Q (cfs)	= 15.94
Area (sqft)	= 4.11
Velocity (ft/s)	= 3.87
Wetted Perim (ft)	= 26.78
Crit Depth, Yc (ft)	= 0.44
Top Width (ft)	= 26.19
EGL (ft)	= 0.60

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Sunday, Feb 11 2018

Diamond Peak-26-Std-2.7%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 2.70
N-Value	= 0.017

Calculations

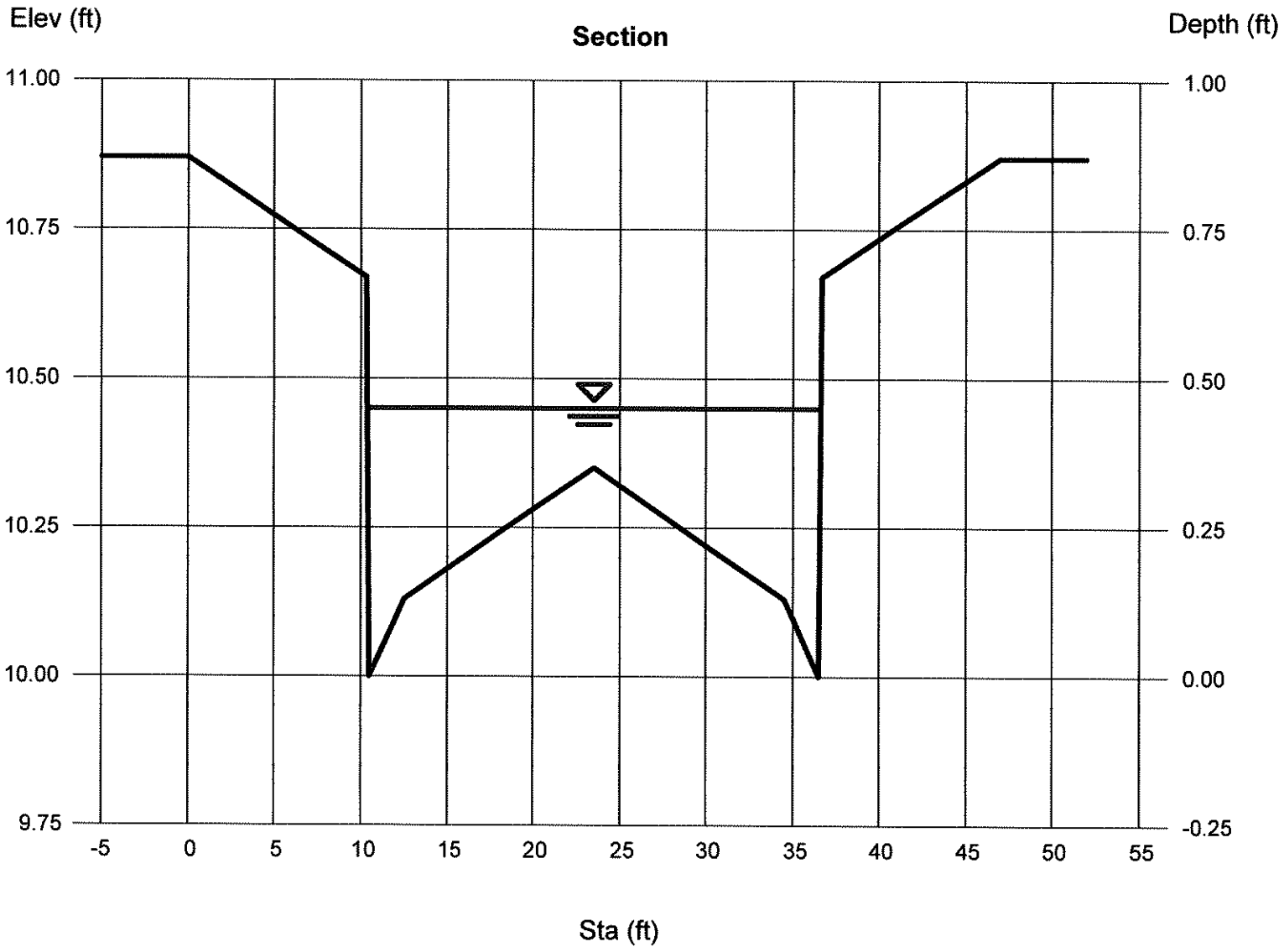
Compute by:	Known Q
Known Q (cfs)	= 32.25

Highlighted

Depth (ft)	= 0.45
Q (cfs)	= 32.25
Area (sqft)	= 6.21
Velocity (ft/s)	= 5.19
Wetted Perim (ft)	= 26.94
Crit Depth, Yc (ft)	= 0.58
Top Width (ft)	= 26.23
EGL (ft)	= 0.87

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.87)-(10.33, 10.67, 0.017)-(10.50, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(36.50, 10.00, 0.017) -(36.67, 10.67, 0.017)-(47.00, 10.87, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Sunday, Feb 11 2018

Barrow Road-42-MTB-4.51%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 4.51
N-Value	= 0.017

Calculations

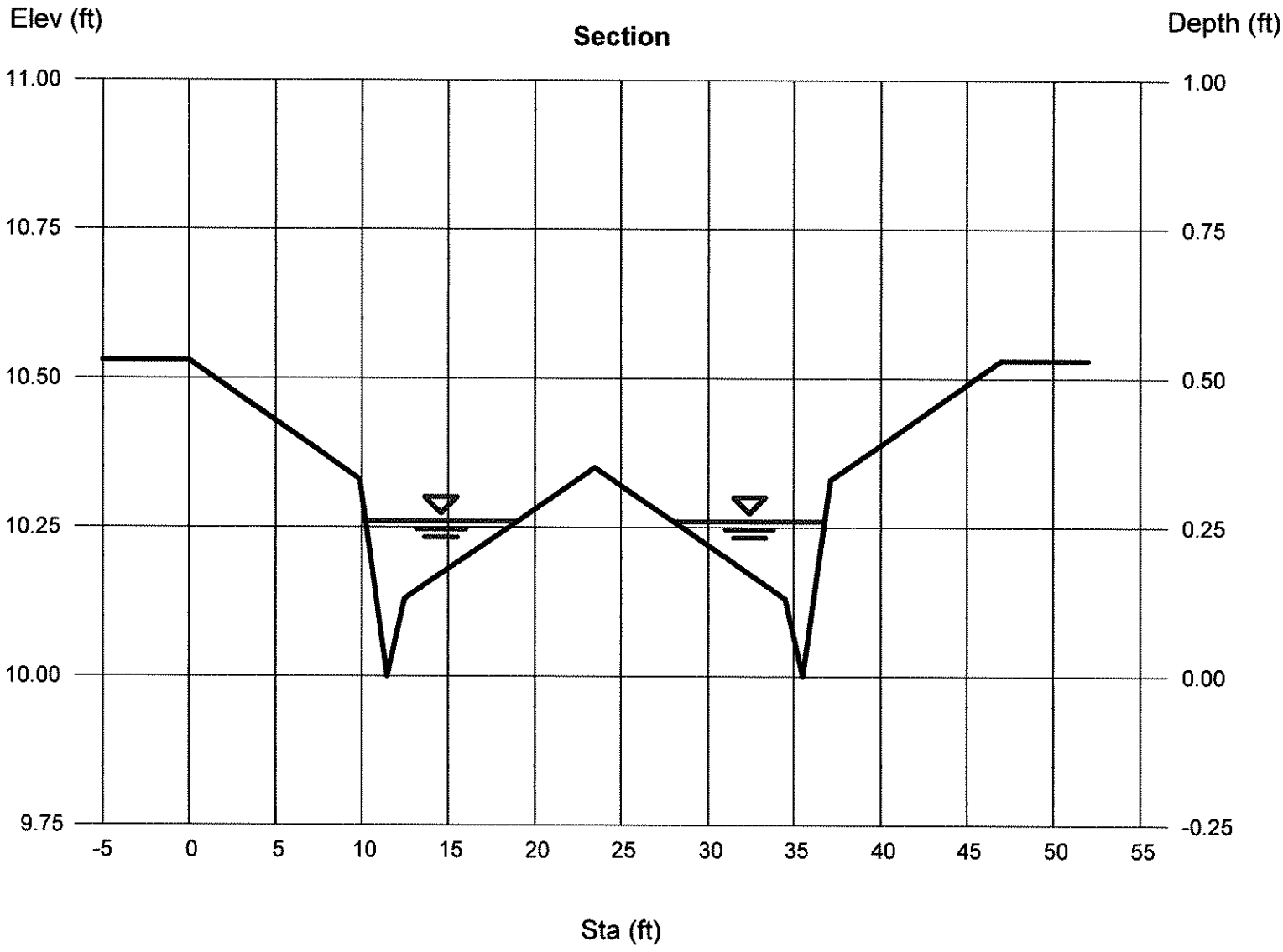
Compute by:	Known Q
Known Q (cfs)	= 5.41

Highlighted

Depth (ft)	= 0.26
Q (cfs)	= 5.410
Area (sqft)	= 1.57
Velocity (ft/s)	= 3.44
Wetted Perim (ft)	= 17.65
Crit Depth, Yc (ft)	= 0.32
Top Width (ft)	= 17.58
EGL (ft)	= 0.44

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.53)-(9.87, 10.33, 0.017)-(11.47, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(35.53, 10.00, 0.017) -(37.13, 10.33, 0.017)-(47.00, 10.53, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Sunday, Feb 11 2018

Costilla Peak-26-MTB-2.55%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 2.55
N-Value	= 0.017

Calculations

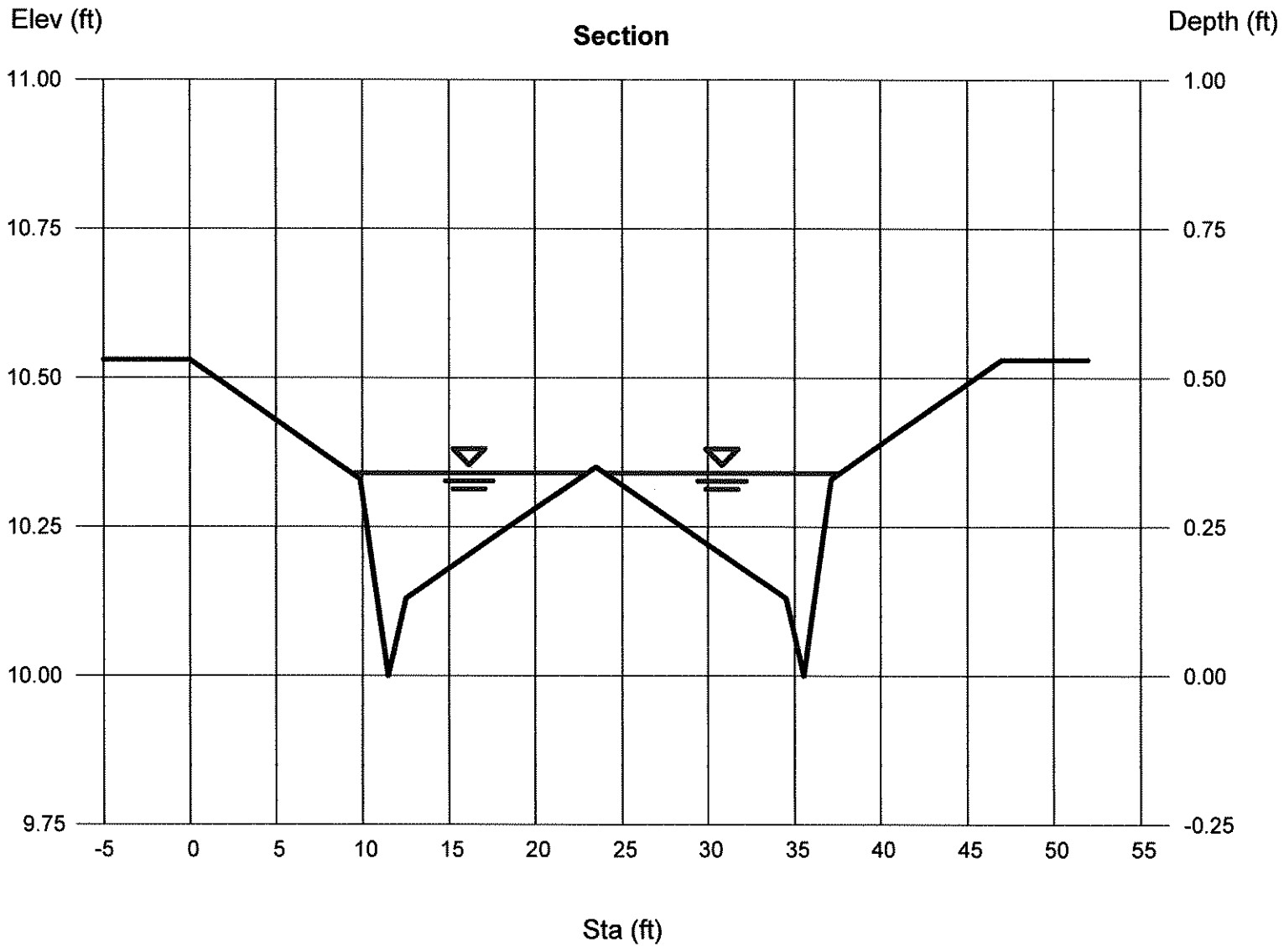
Compute by:	Known Q
Known Q (cfs)	= 11.45

Highlighted

Depth (ft)	= 0.34
Q (cfs)	= 11.45
Area (sqft)	= 3.34
Velocity (ft/s)	= 3.43
Wetted Perim (ft)	= 27.34
Crit Depth, Yc (ft)	= 0.40
Top Width (ft)	= 27.25
EGL (ft)	= 0.52

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.53)-(9.87, 10.33, 0.017)-(11.47, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(35.53, 10.00, 0.017) -(37.13, 10.33, 0.017)-(47.00, 10.53, 0.017)



Channel Report

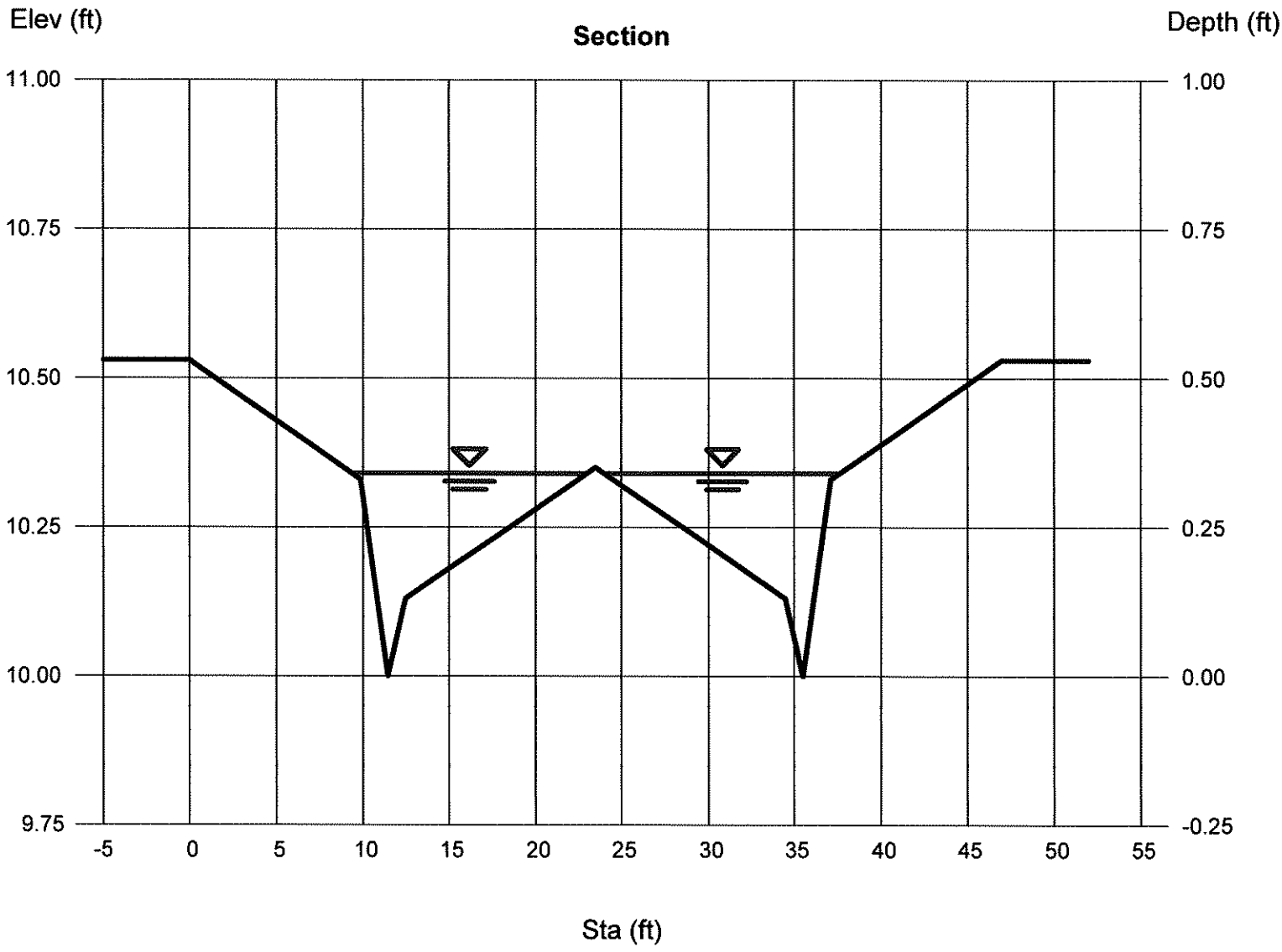
Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Sunday, Feb 11 2018

Bord Peak-26-MTB-1.0%

User-defined		Highlighted	
Invert Elev (ft)	= 10.00	Depth (ft)	= 0.34
Slope (%)	= 1.00	Q (cfs)	= 6.650
N-Value	= 0.017	Area (sqft)	= 3.34
		Velocity (ft/s)	= 1.99
Calculations		Wetted Perim (ft)	= 27.34
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.35
Known Q (cfs)	= 6.65	Top Width (ft)	= 27.25
		EGL (ft)	= 0.40

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.53)-(9.87, 10.33, 0.017)-(11.47, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(35.53, 10.00, 0.017) -(37.13, 10.33, 0.017)-(47.00, 10.53, 0.017)



Channel Report

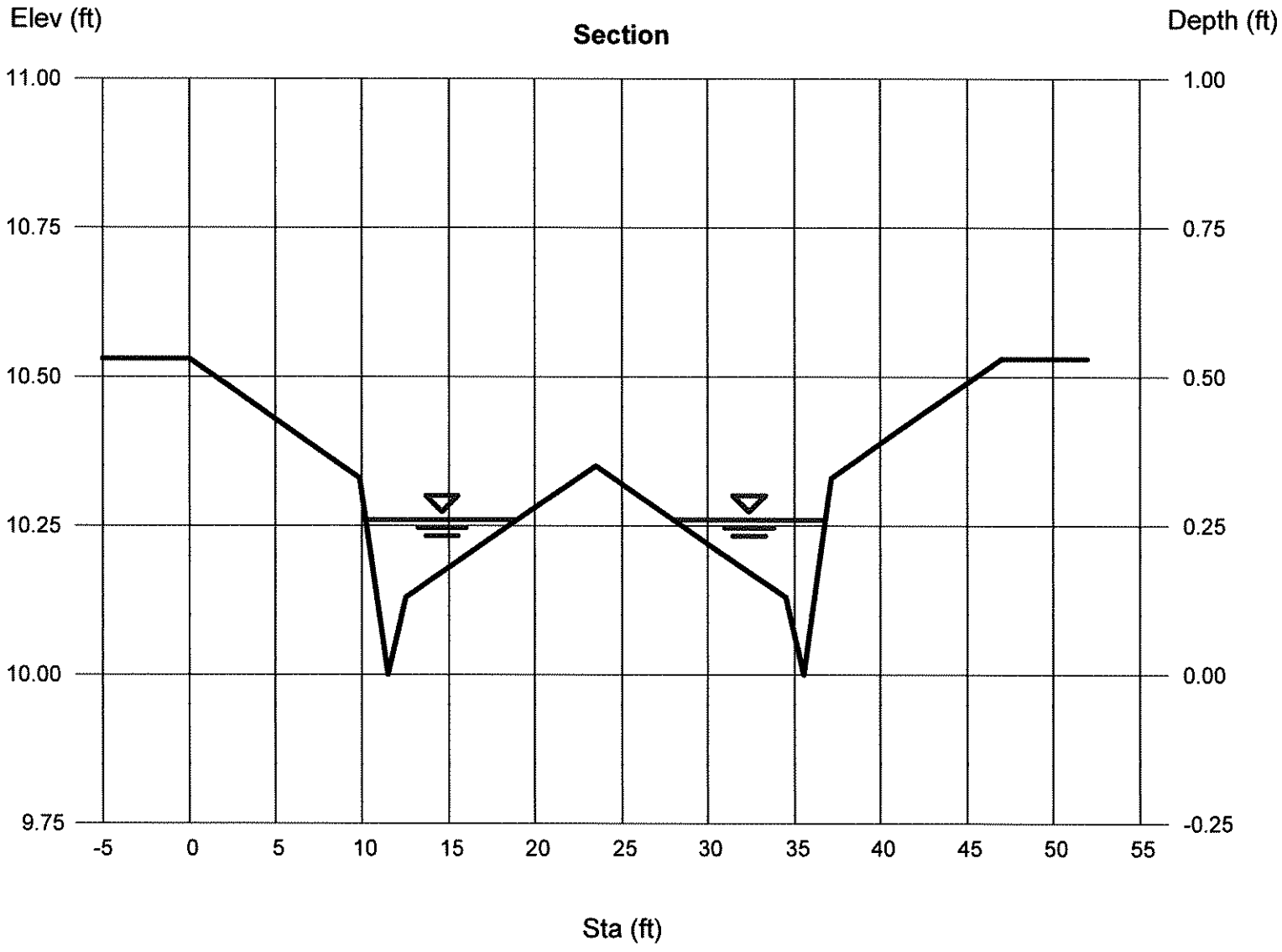
Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Sunday, Feb 11 2018

Cirque Park-26-MTB-4.0%

User-defined		Highlighted	
Invert Elev (ft)	= 10.00	Depth (ft)	= 0.26
Slope (%)	= 4.00	Q (cfs)	= 5.420
N-Value	= 0.017	Area (sqft)	= 1.57
		Velocity (ft/s)	= 3.44
Calculations		Wetted Perim (ft)	= 17.65
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.32
Known Q (cfs)	= 5.42	Top Width (ft)	= 17.58
		EGL (ft)	= 0.44

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.53)-(9.87, 10.33, 0.017)-(11.47, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(35.53, 10.00, 0.017) -(37.13, 10.33, 0.017)-(47.00, 10.53, 0.017)



Channel Report

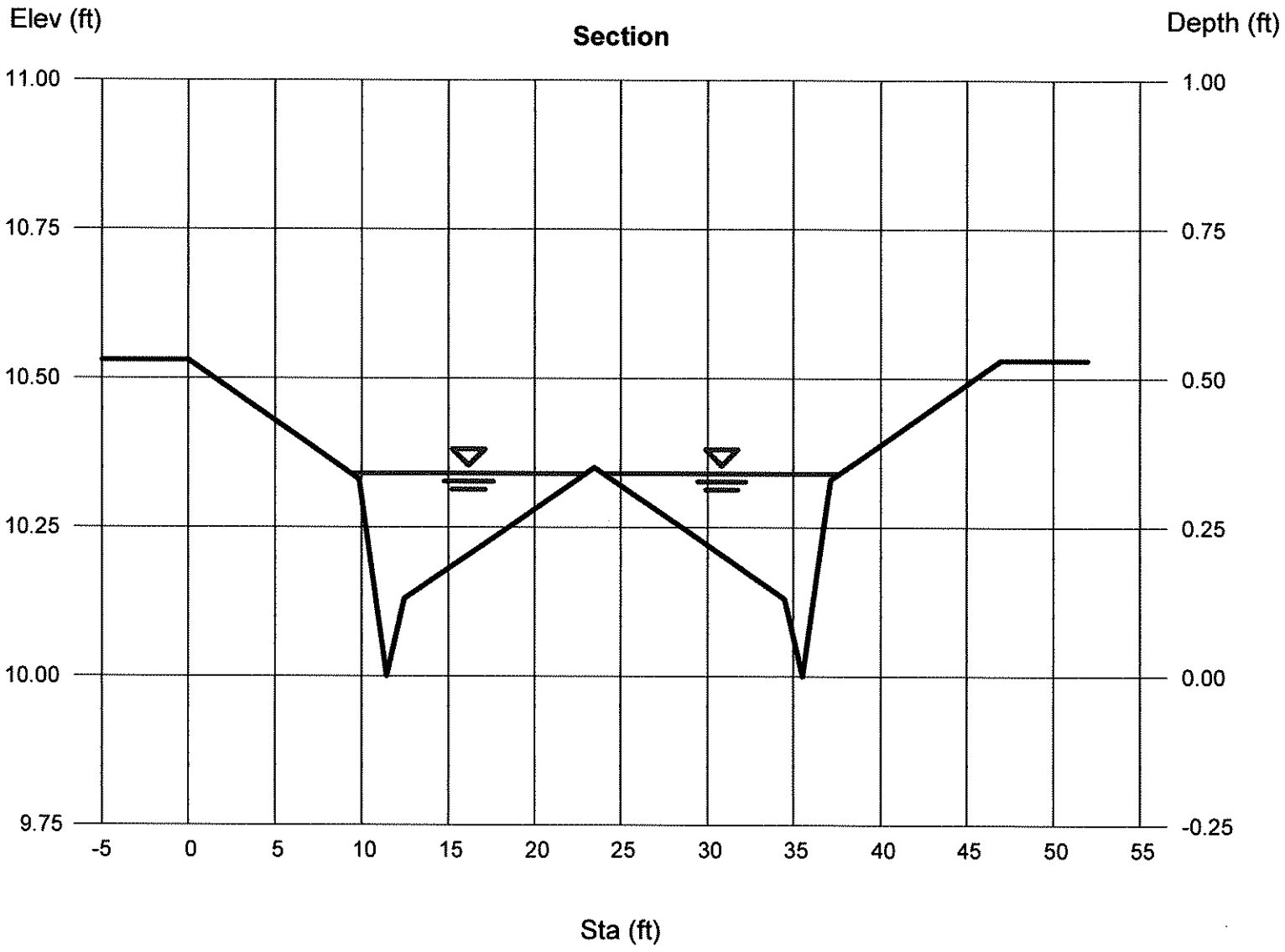
Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Sunday, Feb 11 2018

Banner Peak-26-MTB-2.70%

User-defined		Highlighted	
Invert Elev (ft)	= 10.00	Depth (ft)	= 0.34
Slope (%)	= 2.70	Q (cfs)	= 11.39
N-Value	= 0.017	Area (sqft)	= 3.34
		Velocity (ft/s)	= 3.41
Calculations		Wetted Perim (ft)	= 27.34
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.40
Known Q (cfs)	= 11.39	Top Width (ft)	= 27.25
		EGL (ft)	= 0.52

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.53)-(9.87, 10.33, 0.017)-(11.47, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(35.53, 10.00, 0.017) -(37.13, 10.33, 0.017)-(47.00, 10.53, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Sunday, Feb 11 2018

Bord Peak-26-MTB-2.40%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 2.40
N-Value	= 0.017

Calculations

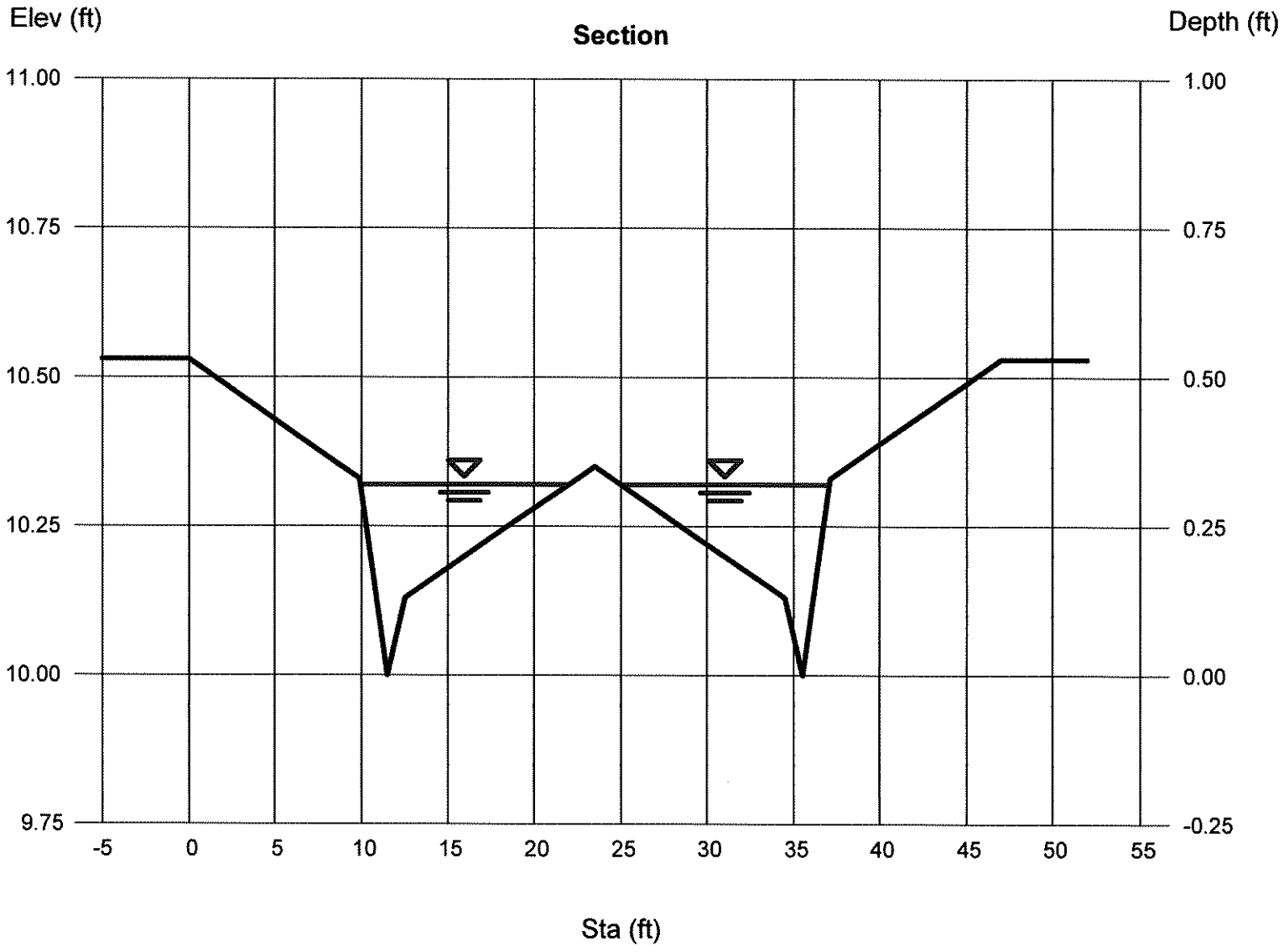
Compute by:	Known Q
Known Q (cfs)	= 8.16

Highlighted

Depth (ft)	= 0.32
Q (cfs)	= 8.160
Area (sqft)	= 2.83
Velocity (ft/s)	= 2.89
Wetted Perim (ft)	= 24.25
Crit Depth, Yc (ft)	= 0.37
Top Width (ft)	= 24.16
EGL (ft)	= 0.45

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.53)-(9.87, 10.33, 0.017)-(11.47, 10.00, 0.017)-(12.50, 10.13, 0.017)-(23.50, 10.35, 0.017)-(34.50, 10.13, 0.017)-(35.53, 10.00, 0.017) -(37.13, 10.33, 0.017)-(47.00, 10.53, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Thursday, Feb 15 2018

118th Street Road side Swale - 2.33%

Triangular

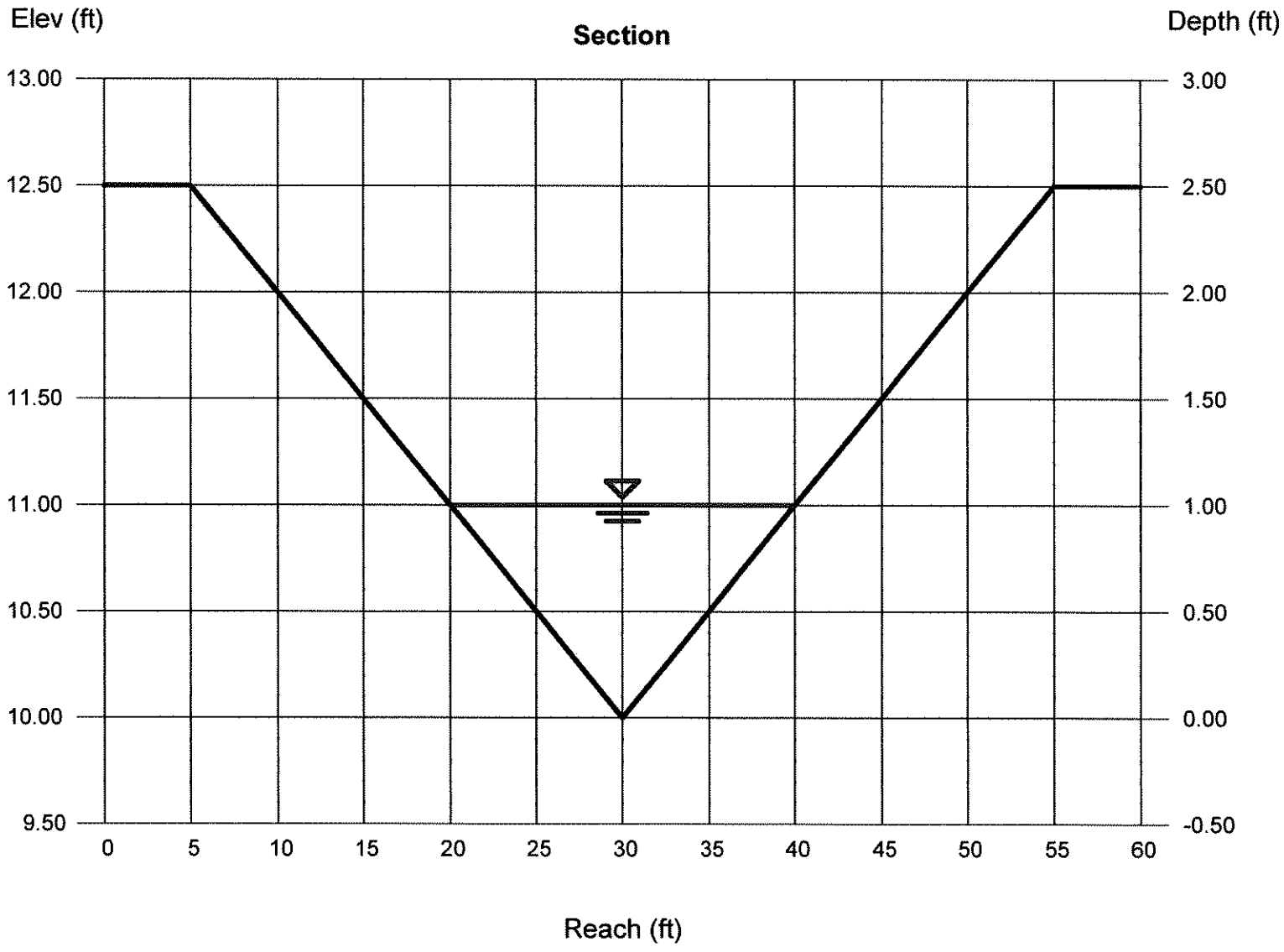
Side Slopes (z:1)	= 10.00, 10.00
Total Depth (ft)	= 2.50
Invert Elev (ft)	= 10.00
Slope (%)	= 2.33
N-Value	= 0.030

Calculations

Compute by:	Known Q
Known Q (cfs)	= 47.00

Highlighted

Depth (ft)	= 1.00
Q (cfs)	= 47.00
Area (sqft)	= 10.00
Velocity (ft/s)	= 4.70
Wetted Perim (ft)	= 20.10
Crit Depth, Yc (ft)	= 1.07
Top Width (ft)	= 20.00
EGL (ft)	= 1.34



Channel Report

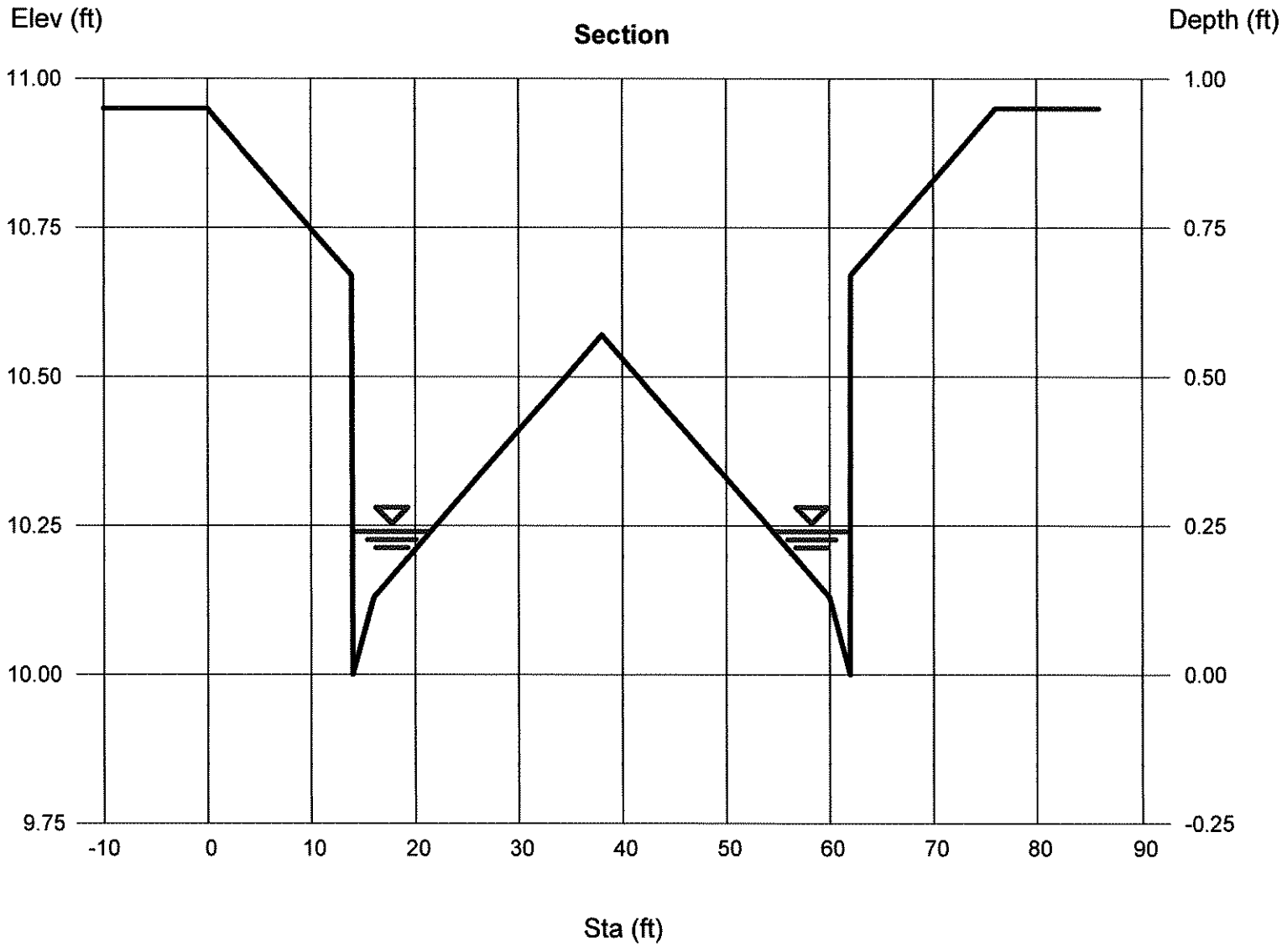
Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Tuesday, Mar 13 2018

Colobel Avenue Upstream-48-Std-2.65% (2)

User-defined		Highlighted	
Invert Elev (ft)	= 10.00	Depth (ft)	= 0.24
Slope (%)	= 2.65	Q (cfs)	= 3.460
N-Value	= 0.017	Area (sqft)	= 1.31
		Velocity (ft/s)	= 2.64
Calculations		Wetted Perim (ft)	= 15.49
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.28
Known Q (cfs)	= 3.46	Top Width (ft)	= 15.06
		EGL (ft)	= 0.35

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.95)-(13.92, 10.67, 0.017)-(14.00, 10.00, 0.017)-(16.00, 10.13, 0.017)-(38.00, 10.57, 0.017)-(60.00, 10.13, 0.017)-(62.00, 10.00, 0.017) -(62.08, 10.67, 0.017)-(76.00, 10.95, 0.017)



Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Tuesday, Mar 13 2018

Colobel Avenue Upstream-48-Std-3.0%

User-defined

Invert Elev (ft)	= 10.00
Slope (%)	= 3.00
N-Value	= 0.017

Calculations

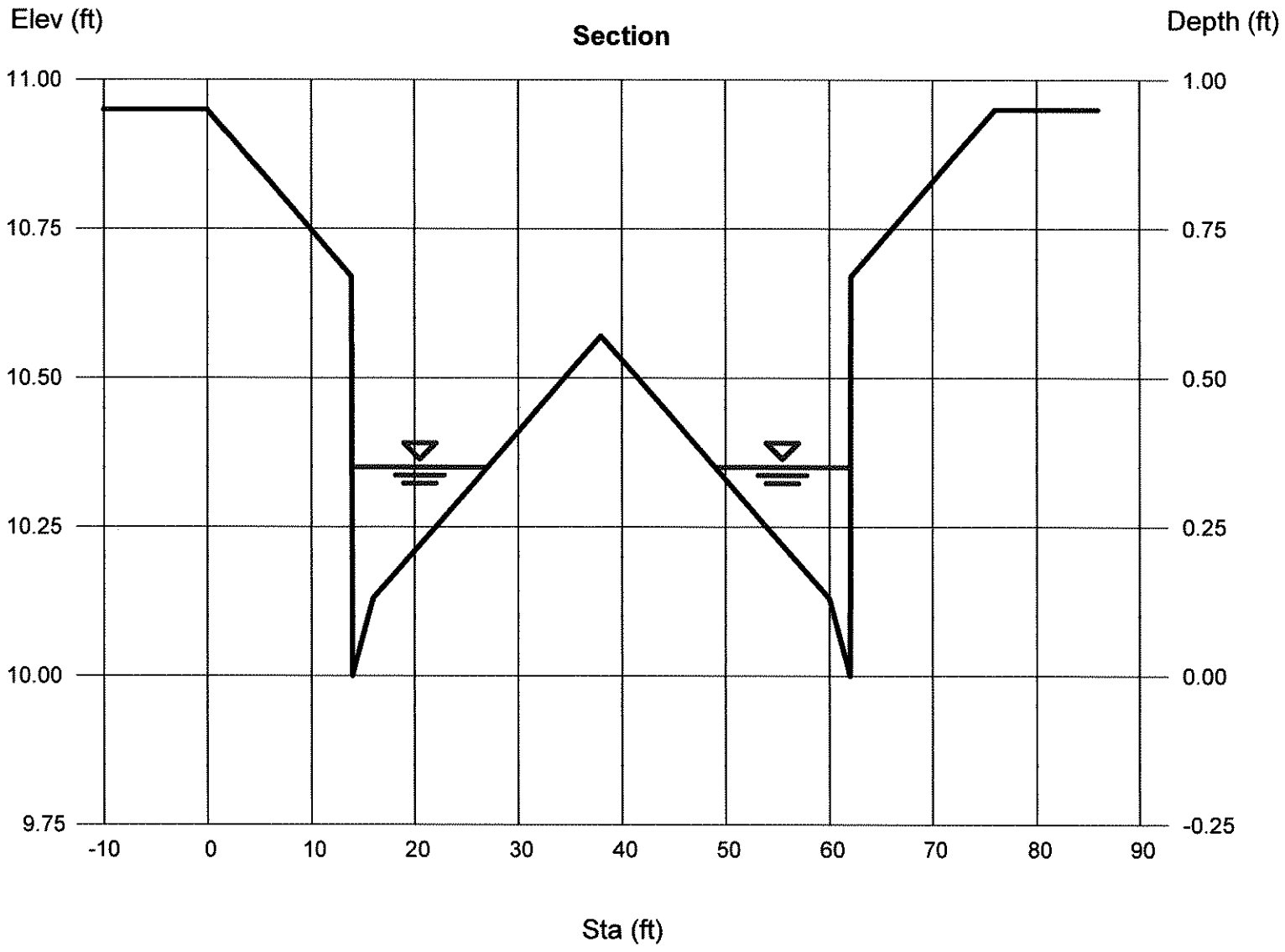
Compute by:	Known Q
Known Q (cfs)	= 13.35

Highlighted

Depth (ft)	= 0.35
Q (cfs)	= 13.35
Area (sqft)	= 3.57
Velocity (ft/s)	= 3.73
Wetted Perim (ft)	= 26.72
Crit Depth, Yc (ft)	= 0.43
Top Width (ft)	= 26.08
EGL (ft)	= 0.57

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.95)-(13.92, 10.67, 0.017)-(14.00, 10.00, 0.017)-(16.00, 10.13, 0.017)-(38.00, 10.57, 0.017)-(60.00, 10.13, 0.017)-(62.00, 10.00, 0.017) -(62.08, 10.67, 0.017)-(76.00, 10.95, 0.017)



Channel Report

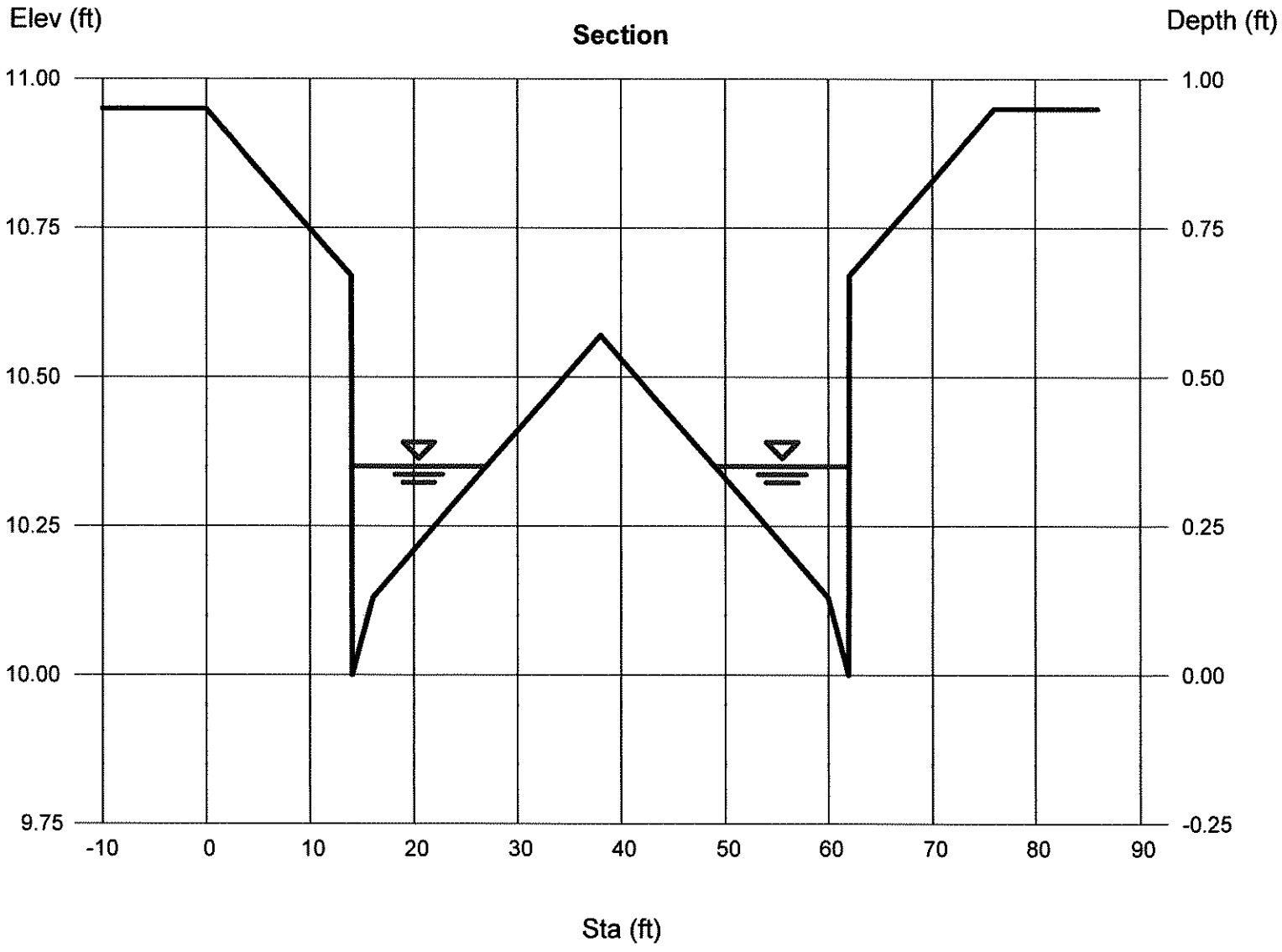
Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc. Tuesday, Mar 13 2018

Colobel Avenue Upstream-48-Std-2.65%

User-defined		Highlighted	
Invert Elev (ft)	= 10.00	Depth (ft)	= 0.35
Slope (%)	= 2.65	Q (cfs)	= 12.26
N-Value	= 0.017	Area (sqft)	= 3.57
		Velocity (ft/s)	= 3.43
Calculations		Wetted Perim (ft)	= 26.72
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.41
Known Q (cfs)	= 12.26	Top Width (ft)	= 26.08
		EGL (ft)	= 0.53

(Sta, El, n)-(Sta, El, n)...

(0.00, 10.95)-(13.92, 10.67, 0.017)-(14.00, 10.00, 0.017)-(16.00, 10.13, 0.017)-(38.00, 10.57, 0.017)-(60.00, 10.13, 0.017)-(62.00, 10.00, 0.017) -(62.08, 10.67, 0.017)-(76.00, 10.95, 0.017)



APPENDIX C – FIRST FLUSH PONDS

Table 4 First Flush Volume Calculations - Required
Table 5 First Flush Volume Calculations- Provided
First Flush Pond Unit 1 Details
First Flush Pond Unit 2 Details
First Flush Unit 3 Details

Table 4

Heritage Trails Residential First Flush Volume Calculations-Required					
Sub Basin ID	Location Descrip	Area sq.ft	Land Treatm D	First Flush Volume acre-ft	Required Volume Totals
1	Unit 3	136,116.0	60.0	2,313.97	
2	Unit 3	118,581.0	45.0	1,511.91	3,825.88
3	Unit 2/3	184,551.0	51.0	2,666.76	
4	Unit 2	124,767.0	51.2	1,809.95	
5	Unit 2	124,416.0	51.4	1,811.91	
6	Unit 2	174,647.0	45.7	2,261.39	
7	Unit 3	142,490.0	60.0	2,422.33	
8	Uint 3	136,839.0	60.0	2,326.26	
9	Unit 3	63,185.0	65.0	1,163.66	
10	Unit 3	36,818.0	60.0	625.91	
11	Unit 3	47,544.0	7.0	94.30	
12	Unit 2/3	159,689.0	60.0	2,714.71	
13	Unit 2	112,524.0	60.0	1,912.91	
14	Unit 2	81,491.0	45.0	1,039.01	
15	Unit 2	214,811.0	60.0	3,651.79	
16	Unit 2	175,842.0	52.8	2,630.60	
17	Unit 2/3	121,839.0	50.0	1,726.05	28,857.53
18	Unit 1	218,495.0	60.0	3,714.42	
19	Unit 1	178,699.0	55.8	2,825.23	
20	Unit 1	125,963.0	48.3	1,723.80	
21	Unit 1	225,668.0	55.3	3,535.84	
22	Unit 1	165,024.0	60.0	2,805.41	
23	Unit 1	269,100.0	53.2	4,056.23	
24	Unit 1	132,662.0	53.8	2,022.21	20,683.14

Revised 3-15-18

Table 5

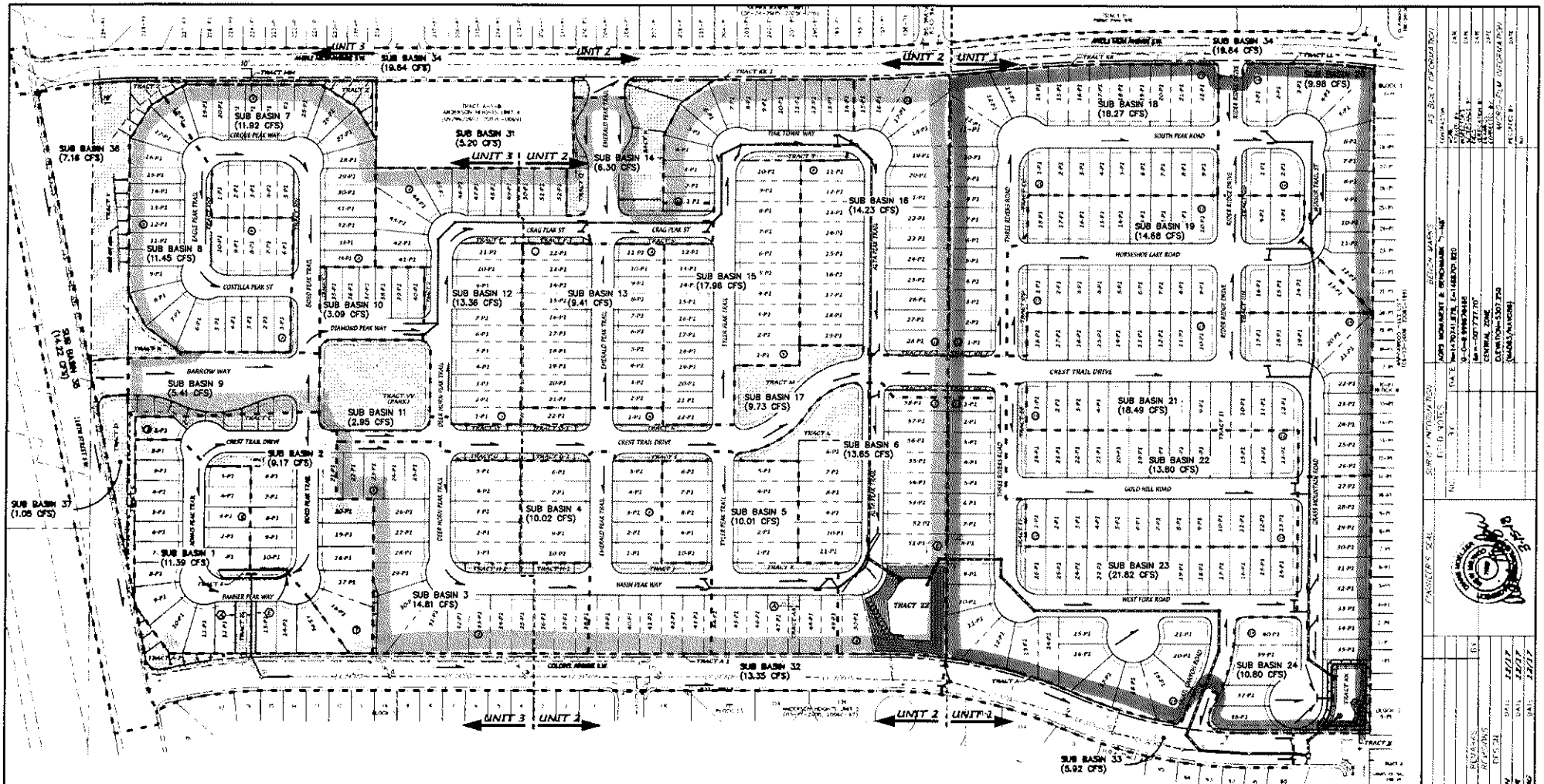
Heritage Trails Unit 1 First Flush Pond				
Volume Calculations-Design Provided				
ELEV ft.	AREA sq.ft.	VOLUME cu.ft.	SUM-VOL cu.ft.	SUM-VOL ac.ft.
41.5	5,086.00			
42.0	5,664.60	2,686	2,686	
43.0	7,202.20	6,418	9,104	0.209
44.0	8,818.70	7,997	17,101	0.393
44.5	9,787.90	4,650	21,751	0.499

Table 5

Heritage Trails Unit 2 First Flush Pond				
Volume Calculations-Design Provided				
ELEV ft.	AREA sq.ft.	VOLUME cu.ft.	SUM-VOL cu.ft.	SUM-VOL ac.ft.
72.6	12,021.40	-	0	
73.0	12,121.40	4,587	4,587	0.105
74.0	12,221.40	12,171	16,758	0.385
75.0	12,356.50	12,289	29,047	0.667

Table 5

Heritage Trails Unit 3 First Flush Pond				
Volume Calculations-Design Provided				
ELEV ft.	AREA sq.ft.	VOLUME cu.ft.	SUM-VOL cu.ft.	SUM-VOL ac.ft.
32.88	2,372.50	-	0	
34.5	2,372.50	3,843	3,843	0.088
35.0	2,372.50	1,186	5,030	0.115



dmg
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ALBUQUERQUE, NEW MEXICO 87199
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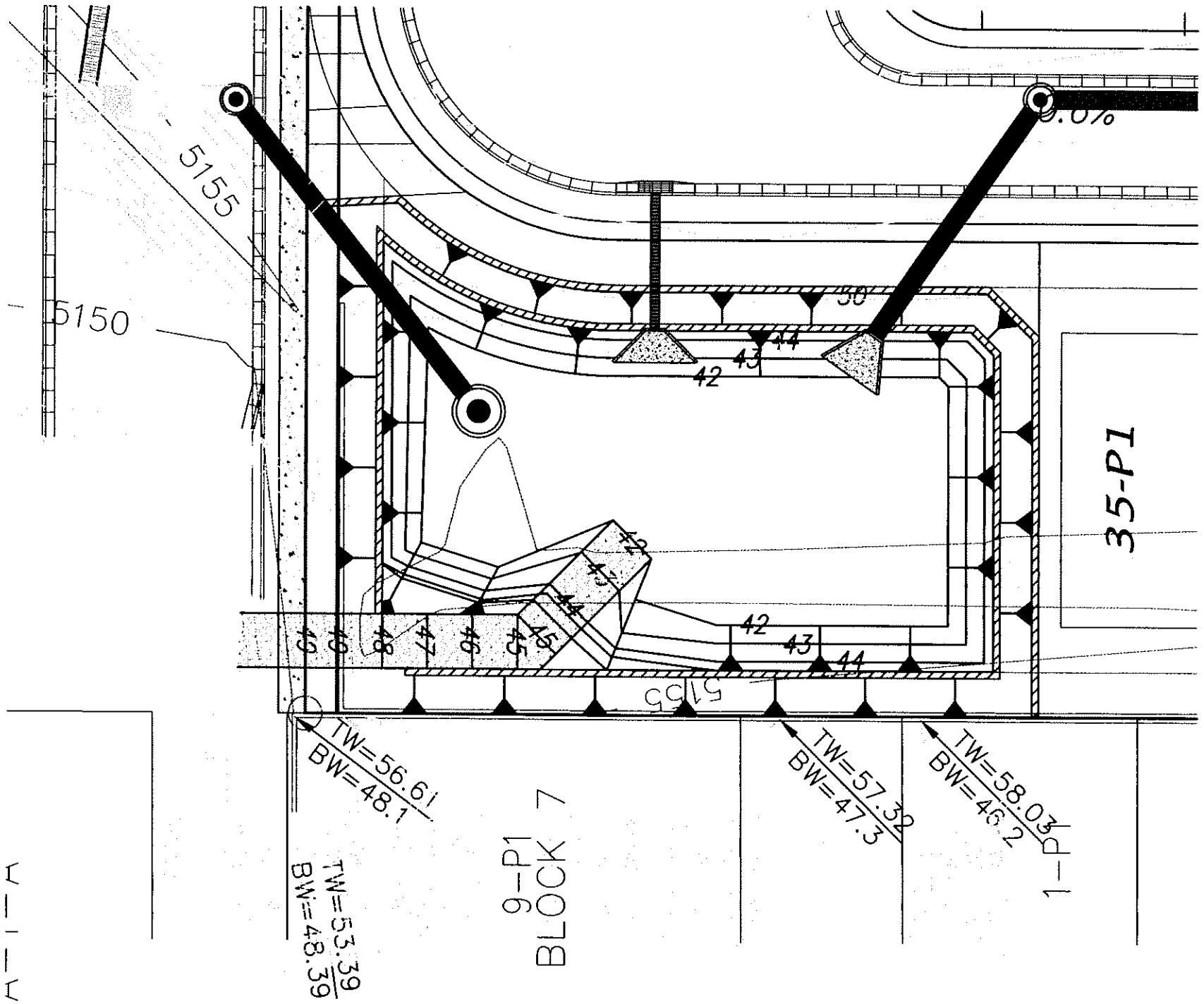
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

HERITAGE TRAILS SUBDIVISION
SUB BASIN BOUNDARY EXHIBIT

DESIGN REVIEW COMMITTEE | CITY ENGINEER APPROVAL

CITY PROJECT NO. -
ZONE MAP NO. N-8-Z
SHEET 1 3



Unit 1 First Flush Pond Details:

Req'd Volume = 20,683 Cu.Ft.

Volume Provided = 21,751 Cu.Ft.

Pond Bottom = 5141.5

Top Pond = 5144.5

Spillway Elev. = 5144.39

Max WSEL = 5145.4

12' wide Maintenance Road 10:1 slope Max

Maximum Q at Outfall = 107.81 cfs

Q=CxLx(H^3/2)

107.81 = 3 x L x (1)

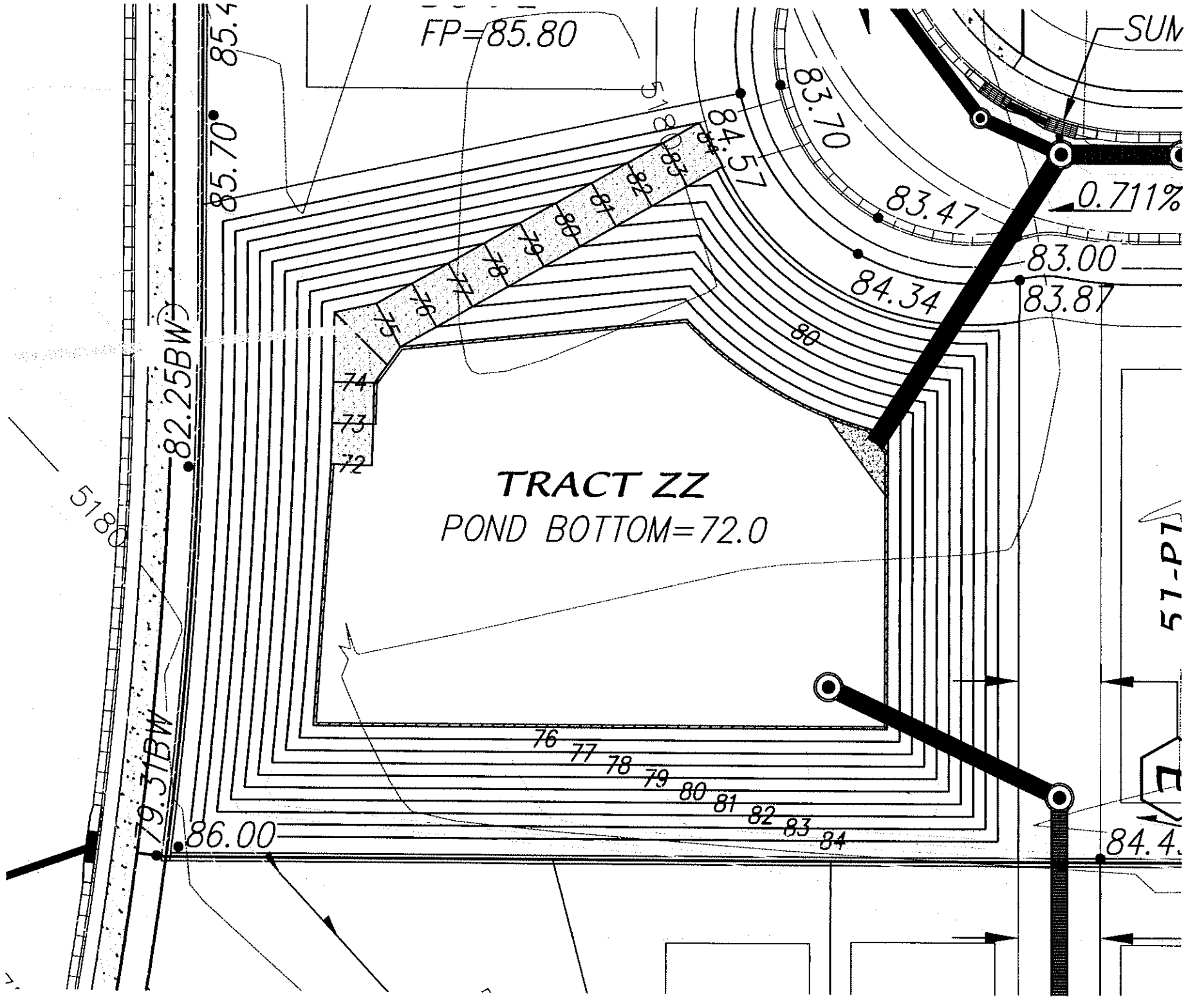
L=35 ft.

Possible Radius = 5.6 ft

Diameter Outfall = 12 feet

Exact Outfall configuration to be design at DRC

Inside Retaining Wall 3.5 Feet (44.0 to 47.5)



Unit 2 First Flush Pond Details:

Req'd Volume = 28,857 Cu.Ft.

Volume Provided = 29,047 Cu.Ft.

Pond Bottom = 5172.0

Top Pond = 5184.0

Spillway Elev. = 5175.0

Max WSEL = 5176.0

12' wide Maintenance Road 10:1 slope Max

Maximum Q at Outfall = 159.5 cfs

Q=CxLx(H^3/2)

159.5 = 3 x L x (1)

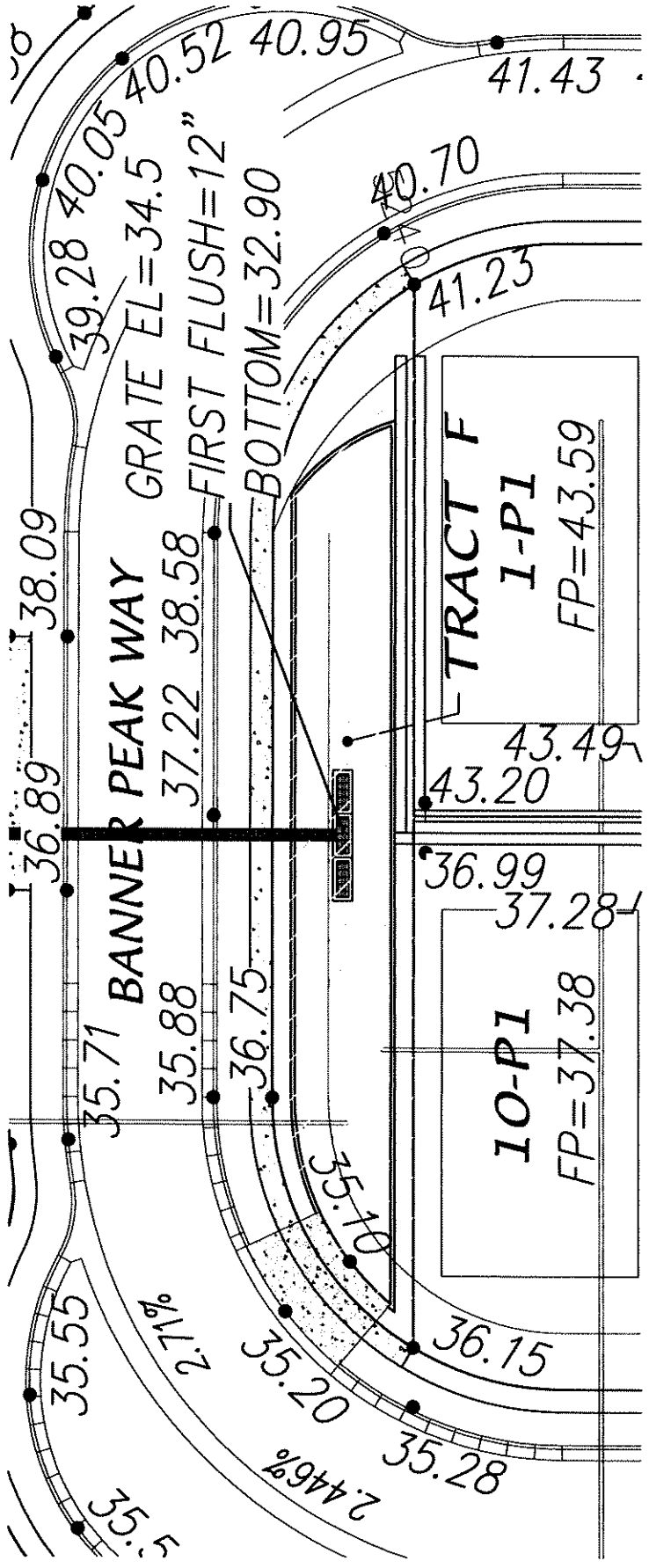
L=53.2 ft.

Possible Radius = 8.5 ft

Diameter Outfall = 17 feet

Exact Outfall configuration to be design at DRC

Inside Retaining Wall 3. Feet (72.0 to 75.0)



Unit 3 First Flush Pond Details:

Req'd Volume = 3,826 Cu.Ft.

Volume Provided = 5,030 Cu.Ft.

Pond Bottom = 5132.88

Top Pond = 5135.0

Spillway Elev. = 5134.5

Max WSEL = 5135.5

Maximum Q at Outfall = 20.56 cfs

Q=CxLx(H^3/2)

20.56 cfs = 3 x L x ((0.5)^3/2)

L=19.4 ft.

Use (3) Double D Inlets

L = 40.0 feet

Q = 3 x (40) x (0.5)^3/2 = 42.4 cfs

(twice the required capacity,

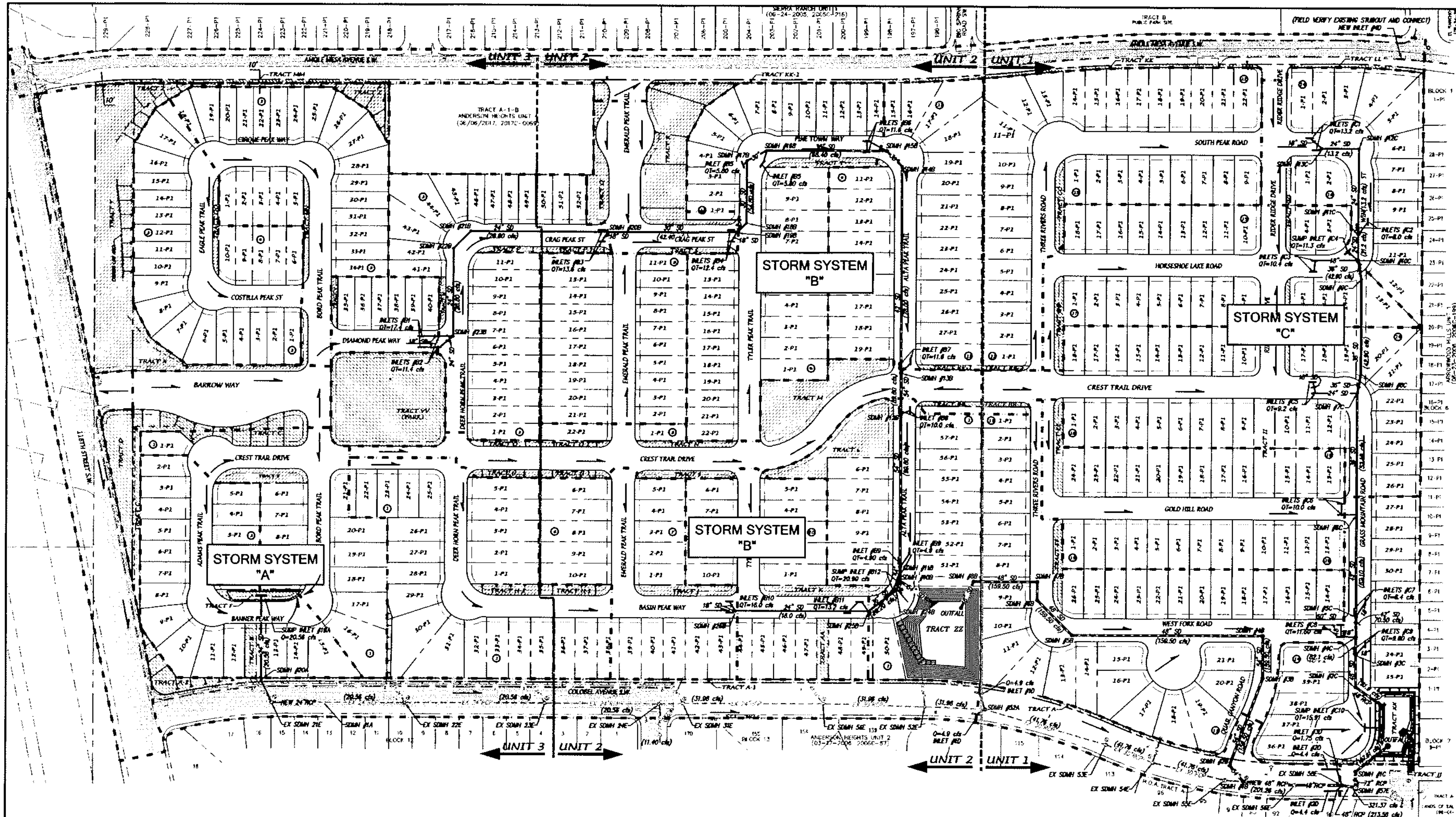
for 50% assumed clogging factor)

Note: Because this pond is so shallow, a rundown must be used.

No maintenance road provided because it is shallow.

APPENDIX D – STORM DRAIN DESIGN

Preliminary Storm Drain Layout Exhibit
Table 3 Storm Drain Analysis Summary
WSPGW Civil design storm analysis printouts
Existing Downstream Storm Drain P&P



LEGEND

- EXISTING SANITARY SEWER MANHOLE
- EXISTING GAS LINE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING STORM DRAIN
- EXISTING STORM DRAIN MANHOLE
- NEW RIGHT-OF-WAY
- NEW LOT LINES
- NEW EASEMENTS
- NEW STORM DRAIN INLET
- NEW STORM DRAIN
- NEW STORM DRAIN MANHOLE

N

100' 60' 0 100' 200'

SCALE: 1" = 100'

dmg MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
OFFICE (505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE:

HERITAGE TRAILS SUBDIVISION
PRELIMINARY STORM DRAIN LAYOUT

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	MO./DAY/YR.
		LAST DESIGN UPDATE	

CITY PROJECT NO.	ZONE MAP NO.	SHEET OF
.	N-8-Z	3 3

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	DLH	DATE	12/17
DRAWN BY	DER	DATE	12/17
CHECKED BY	DMG	DATE	12/17

ENGINEER'S SEAL: DIANE HOELZER, NEW MEXICO, 11967, LICENSED PROFESSIONAL ENGINEER — 3-15-18

SURVEY INFORMATION — FIELD NOTES

NO.	BY	DATE

BENCH MARKS

AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
G-G=0.999678486
Δα=-0°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

AS BUILT INFORMATION

CONTRACTOR	
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICRO-FILM INFORMATION

RECORDED BY	DATE
NO.	

F:\A17\JOBS\A17022 -Anderson Heights 2017\Exhibits\A17022_SUB BASIN EXHIBIT_R.dwg Last saved by: Diane 3/14/2018

Table 3

Heritage Trails Subdivision							
WSPGW - Storm Drain Analysis							
Outfall Pond 10 to Colobel Storm Drain to Storm Drain "A"							
Manhole # - WSPGW Station ID							
Manhole ID	WSPGW Station	Rim Estimate	WSEL	Manhole ID	WSPGW Station	Rim Estimate	WSEL
OUTFALL	1008.1	137.31	139.81	52A	2592.5 2596.5	172.5	170.91
SD Size	78"			SD Size	30"		
1E	1207.1 1217.1	145.9	142.71	52E	2721.67	176.6	169.5
SD Size	78"			SD Size	30"		
2E	1407.4 1417.4	147.2	146.28	51E	2936.7 2940.7	187.22	181.18
SD Size	78"			SD Size	24"		
3E	1594.4	148.7	147.1	31E	3236.4	198.77	193.24
SD Size	78"			SD Size	24"		
57E	1778.9 1786.9	151.52	146.5	24E	3284.6 3288.6	200.72	197.24
SD Size	48"			SD Size	24"		
58E	1809 1815	152.22	148.44	23E	3530.1	209.63	203.76
SD Size	48"			SD Size	24"		
56E	1913	154.61	148.89	22E	3828.4	223.1	216.53
SD Size	48"			SD Size	24"		
55E	2059.3 2065.3	158.67	157.56	21E	4110.6	240.13	229.19
SD Size	36"			SD Size	24"		
54E	2216.4 2222.4	163.21	157.01	20A	4162.3	242.6	229.72
SD Size	30"			SD Size	24"		
53E	2327	167.07	160.74	19A	4340.3	236	231.63
SD Size	30"						

↓ Upstream Direction

↓ Upstream Direction

3/14/2018

f:/projects/17046/Manhole ID Table-Outfall Pond 10- Colobel -SD A

```
T1 Heritage Trails Storm Drain                                                  0
T2 Outfall Pond 10 to Colobel Ave
T3 File: HT-COLOBEL-R2.WSW
SO   1000.0005134.000  1                          5137.310
TS   1008.0005134.100  2      .014                                .000
JX   1008.1005134.150  3      .013
R    1207.1005135.100  3      .013                                .000    .000 1
JX   1217.1005135.200  6  4  5.013   18.380   18.3805141.1005141.100-45.0 90.0    .000
R    1407.4005136.500  6      .013                                .000    .000 1
JX   1417.4005136.600  8  7   .013  102.400         5140.370        90.0         .000
R    1594.4005137.000  8      .013                                .000  17.000 1
R    1778.9005138.080  8      .013                                .000 -90.000 1
JX   1786.9005140.600 10  9   .013  107.810         5140.600       -17.0         .000
R    1809.0005141.800 10      .013                                .000 -10.000 1
JX   1815.0005142.000 13 11 12.013    6.150    6.1505146.0005146.000-55.0 60.0    .000
R    1913.0005145.910 13      .013                                .000   5.000 1
R    2019.8005149.400 13      .013                                .000    .000 1
JX   2025.8005149.580 13 14   .013  159.500         5149.500        45.0         .000
R    2059.3005150.670 13      .013                                .000  10.000 1
JX   2065.3005150.850 13      .013
R    2216.4005155.510 15      .013                                .000  -7.000 1
JX   2222.4005155.690 16      .013
R    2327.0005159.370 16      .013                                .000  -4.000 1
R    2592.5005167.660 16      .013                                .000 -12.000 1
JX   2596.5005167.780 19 17 18.013    4.900    4.9005168.7605168.760-50.0 50.0    .000
R    2721.6705168.500 19      .013                                .000   5.000 1
R    2936.7005179.820 19      .013                                .000    .000 1
JX   2940.7005179.940 20      .013
R    3236.4005191.770 20      .013                                .000    .000 1
R    3284.6005193.320 20      .013                                .000    .000 1
JX   3288.6005193.440 22 21   .013   11.400         5193.420       -90.0         .000
R    3530.1005202.830 22      .013                                .000    .000 1
R    3828.4005215.600 22      .013                                .000    .000 1
R    4110.6005227.700 22      .013                                .000  60.000 1
R    4162.3005228.220 22      .013                                .000  28.000 1
R    4340.3005230.000 22      .013                                .000    .000 1
SH   4340.3005230.000 22                          5234.430
CD   1  2   0    .000   7.500   13.000  .000  .000  -.01
CD   2  2   0    .000   7.500    7.500  .000  .000   .00
CD   3  4   1    .000   6.500     .000  .000  .000   .00
CD   4  4   1    .000   2.000     .000  .000  .000   .00
CD   5  4   1    .000   2.000     .000  .000  .000   .00
CD   6  4   1    .000   6.500     .000  .000  .000   .00
CD   7  4   1    .000   3.000     .000  .000  .000   .00
CD   8  4   1    .000   6.500     .000  .000  .000   .00
CD   9  4   1    .000   4.000     .000  .000  .000   .00
CD  10  4   1    .000   4.000     .000  .000  .000   .00
CD  11  4   1    .000   1.500     .000  .000  .000   .00
CD  12  4   1    .000   1.500     .000  .000  .000   .00
CD  13  4   1    .000   4.000     .000  .000  .000   .00
CD  14  4   1    .000   4.000     .000  .000  .000   .00
CD  15  4   1    .000   3.000     .000  .000  .000   .00
CD  16  4   1    .000   2.500     .000  .000  .000   .00
CD  17  4   1    .000   1.500     .000  .000  .000   .00
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  19  4   1    .000   2.500     .000  .000  .000   .00
CD  20  4   1    .000   2.000     .000  .000  .000   .00
CD  21  4   1    .000   2.000     .000  .000  .000   .00
CD  22  4   1    .000   2.000     .000  .000  .000   .00
Q            20.560   .0
```

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 6-2018 Time: 3:57:48

Heritage Trails Storm Drain
Outfall Pond 10 to Colobel Ave
File: HT-COLOBEL-R2.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1000.000	5134.000	1.646	5135.646	460.53	21.53	7.20	5142.85	.00	3.39	13.00	7.500	13.000	.00	0 .0
TRANS STR	.0125					.0230	.18	1.65	2.96		.014	.00	.00	RECTANG
1008.000	5134.100	3.095	5137.195	460.53	19.84	6.11	5143.31	.00	4.89	7.50	7.500	7.500	.00	0 .0
JUNCT STR	.4982					.0110	.00	3.10	1.99		.013	.00	.00	RECTANG
		---------- WARNING - Junction Analysis - Change in Channel Type ----------												
1008.100	5134.150	5.656	5139.806	460.53	15.02	3.51	5143.31	.00	5.66	4.37	6.500	.000	.00	1 .0
31.521	.0048					.0069	.22	5.66	1.00	6.50	.013	.00	.00	PIPE
1039.621	5134.300	6.040	5140.340	460.53	14.33	3.19	5143.53	.00	5.66	3.33	6.500	.000	.00	1 .0
115.253	.0048					.0071	.81	6.04	.81	6.50	.013	.00	.00	PIPE
1154.874	5134.851	6.500	5141.351	460.53	13.88	2.99	5144.34	.00	5.66	.00	6.500	.000	.00	1 .0
52.226	.0048					.0076	.40	6.50	.00	6.50	.013	.00	.00	PIPE
1207.100	5135.100	6.693	5141.793	460.53	13.88	2.99	5144.78	.00	5.66	.00	6.500	.000	.00	1 .0
JUNCT STR	.0100					.0071	.07	6.69	.00		.013	.00	.00	PIPE
1217.100	5135.200	7.510	5142.709	423.77	12.77	2.53	5145.24	.00	5.47	.00	6.500	.000	.00	1 .0
190.300	.0068					.0065	1.24	7.51	.00	5.20	.013	.00	.00	PIPE
1407.400	5136.500	7.579	5144.080	423.77	12.77	2.53	5146.61	.00	5.47	.00	6.500	.000	.00	1 .0
JUNCT STR	.0100					.0051	.05	7.58	.00		.013	.00	.00	PIPE

OUTFALL

1E

2E

Heritage Trails Storm Drain
Outfall Pond 10 to Colobel Ave
File: HT-COLOBEL-R2.WSW

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1417.400	5136.600	9.683	5146.283	321.37	9.68	1.46	5147.74	.00	4.81	.00	6.500	.000	.00	1 .0
177.000	.0023					.0038	.67	9.68	.00	6.50	.013	.00	.00	PIPE
1594.400	5137.000	10.102	5147.103	321.37	9.68	1.46	5148.56	.00	4.81	.00	6.500	.000	.00	1 .0
184.500	.0059					.0038	.69	10.10	.00	4.40	.013	.00	.00	PIPE
1778.900	5138.080	10.221	5148.301	321.37	9.68	1.46	5149.76	.00	4.81	.00	6.500	.000	.00	1 .0
JUNCT STR	.3150					.0129	.10	10.22	.00		.013	.00	.00	PIPE
1786.900	5140.600	5.902	5146.502	213.56	16.99	4.48	5150.99	.00	3.88	.00	4.000	.000	.00	1 .0
22.100	.0543					.0221	.49	5.90	.00	2.32	.013	.00	.00	PIPE
1809.000	5141.800	5.563	5147.363	213.56	16.99	4.48	5151.85	.00	3.88	.00	4.000	.000	.00	1 .0
JUNCT STR	.0334					.0209	.13	5.56	.00		.013	.00	.00	PIPE
1815.000	5142.000	6.435	5148.435	201.26	16.02	3.98	5152.42	.00	3.85	.00	4.000	.000	.00	1 .0
48.350	.0399					.0196	.95	6.43	.00	2.47	.013	.00	.00	PIPE
1863.350	5143.929	5.584	5149.514	201.26	16.02	3.98	5153.50	.00	3.85	.00	4.000	.000	.00	1 .0
HYDRAULIC JUMP														
1863.350	5143.929	2.808	5146.737	201.26	21.36	7.08	5153.82	.00	3.85	3.66	4.000	.000	.00	1 .0
15.883	.0399					.0273	.43	2.81	2.35	2.47	.013	.00	.00	PIPE
1879.232	5144.563	2.850	5147.413	201.26	21.01	6.85	5154.27	.00	3.85	3.62	4.000	.000	.00	1 .0
33.768	.0399					.0253	.86	2.85	2.28	2.47	.013	.00	.00	PIPE

3E

5TE

5BE

Heritage Trails Storm Drain
Outfall Pond 10 to Colobel Ave
File: HT-COLOBEL-R2.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1913.000	5145.911	2.982	5148.893	201.26	20.03	6.23	5155.12	.00	3.85	3.48	4.000	.000	.00	1 .0
20.865	.0327					.0234	.49	2.98	2.08	2.65	.013	.00	.00	PIPE
1933.865	5146.592	3.043	5149.635	201.26	19.62	5.98	5155.61	.00	3.85	3.41	4.000	.000	.00	1 .0
35.875	.0327					.0217	.78	3.04	1.99	2.65	.013	.00	.00	PIPE
1969.740	5147.765	3.194	5150.959	201.26	18.71	5.43	5156.39	.00	3.85	3.21	4.000	.000	.00	1 .0
24.901	.0327					.0197	.49	3.19	1.80	2.65	.013	.00	.00	PIPE
1994.642	5148.578	3.365	5151.943	201.26	17.84	4.94	5156.88	.00	3.85	2.92	4.000	.000	.00	1 .0
16.953	.0327					.0181	.31	3.37	1.60	2.65	.013	.00	.00	PIPE
2011.594	5149.132	3.567	5152.699	201.26	17.01	4.49	5157.19	.00	3.85	2.49	4.000	.000	.00	1 .0
8.206	.0327					.0173	.14	3.57	1.37	2.65	.013	.00	.00	PIPE
2019.800	5149.400	3.850	5153.250	201.26	16.21	4.08	5157.33	.00	3.85	1.52	4.000	.000	.00	1 .0
JUNCT STR	.0300					.0090	.05	3.85	1.00		.013	.00	.00	PIPE
2025.800	5149.580	7.933	5157.513	41.76	3.32	.17	5157.68	.00	1.93	.00	4.000	.000	.00	1 .0
33.500	.0325					.0008	.03	7.93	.00	1.09	.013	.00	.00	PIPE
2059.300	5150.670	6.886	5157.556	41.76	3.32	.17	5157.73	.00	1.93	.00	4.000	.000	.00	1 .0
JUNCT STR	.0300					.0008	.01	6.89	.00		.013	.00	.00	PIPE
2065.300	5150.850	6.711	5157.561	41.76	5.91	.54	5158.10	.00	2.10	.00	3.000	.000	.00	1 .0
120.066	.0308					.0039	.47	6.71	.00	1.24	.013	.00	.00	PIPE

S6E

S5E

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 6-2018 Time: 3:57:48

Heritage Trails Storm Drain
Outfall Pond 10 to Colobel Ave
File: HT-COLOBEL-R2.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
2185.366	5154.553	3.509	5158.062	41.76	5.91	.54	5158.60	.00	2.10	.00	3.000	.000	.00	1 .0
HYDRAULIC JUMP														
2185.366	5154.553	1.195	5155.748	41.76	15.90	3.93	5159.68	.00	2.10	2.94	3.000	.000	.00	1 .0
31.034	.0308					.0355	1.10	1.19	2.96	1.24	.013	.00	.00	PIPE
2216.400	5155.510	1.186	5156.696	41.76	16.07	4.01	5160.70	.00	2.10	2.93	3.000	.000	.00	1 .0
JUNCT STR	.0300					.0352	.21	1.19	3.01		.013	.00	.00	PIPE
2222.400	5155.690	1.322	5157.012	41.76	15.85	3.90	5160.92	.00	2.17	2.50	2.500	.000	.00	1 .0
104.600	.0352					.0326	3.41	1.32	2.72	1.31	.013	.00	.00	PIPE
2327.000	5159.371	1.367	5160.738	41.76	15.21	3.59	5164.33	.00	2.17	2.49	2.500	.000	.00	1 .0
100.477	.0312					.0300	3.01	1.37	2.55	1.36	.013	.00	.00	PIPE
2427.477	5162.508	1.390	5163.898	41.76	14.89	3.44	5167.34	.00	2.17	2.48	2.500	.000	.00	1 .0
68.749	.0312					.0275	1.89	1.39	2.47	1.36	.013	.00	.00	PIPE
2496.225	5164.655	1.445	5166.100	41.76	14.20	3.13	5169.23	.00	2.17	2.47	2.500	.000	.00	1 .0
32.626	.0312					.0243	.79	1.45	2.29	1.36	.013	.00	.00	PIPE
2528.851	5165.673	1.503	5167.176	41.76	13.54	2.85	5170.02	.00	2.17	2.45	2.500	.000	.00	1 .0
20.210	.0312					.0215	.43	1.50	2.13	1.36	.013	.00	.00	PIPE
2549.062	5166.304	1.565	5167.869	41.76	12.91	2.59	5170.46	.00	2.17	2.42	2.500	.000	.00	1 .0
13.906	.0312					.0191	.26	1.57	1.97	1.36	.013	.00	.00	PIPE

54E

53E

Heritage Trails Storm Drain
Outfall Pond 10 to Colobel Ave
File: HT-COLOBEL-R2.WSW

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2562.968	5166.738	1.631	5168.369	41.76	12.31	2.35	5170.72	.00	2.17	2.38	2.500	.000	.00	1 .0
10.062	.0312					.0169	.17	1.63	1.82	1.36	.013	.00	.00	PIPE
2573.030	5167.052	1.701	5168.753	41.76	11.74	2.14	5170.89	.00	2.17	2.33	2.500	.000	.00	1 .0
7.333	.0312					.0151	.11	1.70	1.67	1.36	.013	.00	.00	PIPE
2580.364	5167.281	1.777	5169.059	41.76	11.19	1.94	5171.00	.00	2.17	2.27	2.500	.000	.00	1 .0
5.392	.0312					.0135	.07	1.78	1.54	1.36	.013	.00	.00	PIPE
2585.756	5167.450	1.858	5169.308	41.76	10.67	1.77	5171.08	.00	2.17	2.18	2.500	.000	.00	1 .0
3.692	.0312					.0121	.04	1.86	1.40	1.36	.013	.00	.00	PIPE
2589.448	5167.565	1.948	5169.513	41.76	10.17	1.61	5171.12	.00	2.17	2.07	2.500	.000	.00	1 .0
2.268	.0312					.0109	.02	1.95	1.27	1.36	.013	.00	.00	PIPE
2591.716	5167.636	2.048	5169.684	41.76	9.70	1.46	5171.14	.00	2.17	1.92	2.500	.000	.00	1 .0
.784	.0312					.0099	.01	2.05	1.14	1.36	.013	.00	.00	PIPE
2592.500	5167.660	2.165	5169.825	41.76	9.24	1.33	5171.15	.00	2.17	1.70	2.500	.000	.00	1 .0
JUNCT STR	.0299					.0078	.03	2.17	1.00		.013	.00	.00	PIPE
2596.500	5167.780	3.134	5170.914	31.96	6.51	.66	5171.57	.00	1.93	.00	2.500	.000	.00	1 .0
99.127	.0058					.0061	.60	3.13	.00	2.12	.013	.00	.00	PIPE
2695.627	5168.350	3.194	5171.543	31.96	6.51	.66	5172.20	.00	1.93	.00	2.500	.000	.00	1 .0

HYDRAULIC JUMP

52A

Heritage Trails Storm Drain
Outfall Pond 10 to Colobel Ave
File: HT-COLOBEL-R2.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
2695.627	5168.350	1.111	5169.461	31.96	15.17	3.57	5173.03	.00	1.93	2.48	2.500	.000	.00	1 .0
7.944	.0058					.0386	.31	1.11	2.90	2.12	.013	.00	.00	PIPE
2703.572	5168.396	1.079	5169.475	31.96	15.76	3.86	5173.33	.00	1.93	2.48	2.500	.000	.00	1 .0
9.207	.0058					.0434	.40	1.08	3.07	2.12	.013	.00	.00	PIPE
2712.779	5168.449	1.040	5169.489	31.96	16.53	4.24	5173.73	.00	1.93	2.46	2.500	.000	.00	1 .0
8.891	.0058					.0494	.44	1.04	3.29	2.12	.013	.00	.00	PIPE
2721.670	5168.500	1.004	5169.504	31.96	17.33	4.66	5174.17	.00	1.93	2.45	2.500	.000	.00	1 .0
52.496	.0526					.0526	2.76	1.00	3.52	1.00	.013	.00	.00	PIPE
2774.166	5171.263	1.004	5172.268	31.96	17.33	4.66	5176.93	.00	1.93	2.45	2.500	.000	.00	1 .0
120.362	.0526					.0499	6.01	1.00	3.52	1.00	.013	.00	.00	PIPE
2894.528	5177.600	1.035	5178.635	31.96	16.65	4.30	5182.94	.00	1.93	2.46	2.500	.000	.00	1 .0
42.172	.0526					.0443	1.87	1.04	3.32	1.00	.013	.00	.00	PIPE
2936.700	5179.820	1.073	5180.893	31.96	15.87	3.91	5184.80	.00	1.93	2.47	2.500	.000	.00	1 .0
JUNCT STR	.0300					.0407	.16	1.07	3.10		.013	.00	.00	PIPE
2940.700	5179.940	1.240	5181.180	31.96	15.61	3.79	5184.97	.00	1.89	1.94	2.000	.000	.00	1 .0
87.157	.0400					.0400	3.49	1.24	2.68	1.24	.013	.00	.00	PIPE
3027.857	5183.427	1.240	5184.667	31.96	15.61	3.79	5188.45	.00	1.89	1.94	2.000	.000	.00	1 .0
129.487	.0400					.0379	4.90	1.24	2.68	1.24	.013	.00	.00	PIPE

SIE

Heritage Trails Storm Drain
Outfall Pond 10 to Colobel Ave
File: HT-COLOBEL-R2.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
3157.343	5188.607	1.288	5189.895	31.96	14.93	3.46	5193.36	.00	1.89	1.92	2.000	.000	.00	1 .0
41.495	.0400					.0337	1.40	1.29	2.49	1.24	.013	.00	.00	PIPE
3198.839	5190.267	1.343	5191.610	31.96	14.24	3.15	5194.76	.00	1.89	1.88	2.000	.000	.00	1 .0
22.760	.0400					.0300	.68	1.34	2.30	1.24	.013	.00	.00	PIPE
3221.599	5191.178	1.402	5192.580	31.96	13.57	2.86	5195.44	.00	1.89	1.83	2.000	.000	.00	1 .0
14.801	.0400					.0268	.40	1.40	2.11	1.24	.013	.00	.00	PIPE
3236.400	5191.770	1.467	5193.236	31.96	12.94	2.60	5195.84	.00	1.89	1.77	2.000	.000	.00	1 .0
13.084	.0322					.0245	.32	1.47	1.93	1.34	.013	.00	.00	PIPE
3249.484	5192.190	1.506	5193.696	31.96	12.59	2.46	5196.16	.00	1.89	1.72	2.000	.000	.00	1 .0
15.610	.0322					.0226	.35	1.51	1.83	1.34	.013	.00	.00	PIPE
3265.094	5192.692	1.580	5194.272	31.96	12.00	2.24	5196.51	.00	1.89	1.63	2.000	.000	.00	1 .0
10.251	.0322					.0204	.21	1.58	1.65	1.34	.013	.00	.00	PIPE
3275.345	5193.022	1.663	5194.685	31.96	11.44	2.03	5196.72	.00	1.89	1.50	2.000	.000	.00	1 .0
6.451	.0322					.0187	.12	1.66	1.48	1.34	.013	.00	.00	PIPE
3281.796	5193.229	1.761	5194.991	31.96	10.91	1.85	5196.84	.00	1.89	1.30	2.000	.000	.00	1 .0
2.804	.0322					.0176	.05	1.76	1.28	1.34	.013	.00	.00	PIPE
3284.600	5193.320	1.889	5195.209	31.96	10.40	1.68	5196.89	.00	1.89	.91	2.000	.000	.00	1 .0
JUNCT STR	.0300					.0128	.05	1.89	1.00		.013	.00	.00	PIPE

31E

24E

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 6-2018 Time: 3:57:48

Heritage Trails Storm Drain
Outfall Pond 10 to Colobel Ave
File: HT-COLOBEL-R2.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
3288.600	5193.440	3.797	5197.237	20.56	6.54	.67	5197.90	.00	1.63	.00	2.000	.000	.00	1 .0
36.424	.0389					.0083	.30	3.80	.00	.95	.013	.00	.00	PIPE
3325.024	5194.856	2.687	5197.542	20.56	6.54	.67	5198.21	.00	1.63	.00	2.000	.000	.00	1 .0
HYDRAULIC JUMP														
3325.024	5194.856	.954	5195.810	20.56	13.91	3.00	5198.81	.00	1.63	2.00	2.000	.000	.00	1 .0
104.854	.0389					.0389	4.08	.95	2.85	.95	.013	.00	.00	PIPE
3429.877	5198.933	.954	5199.887	20.56	13.91	3.00	5202.89	.00	1.63	2.00	2.000	.000	.00	1 .0
100.223	.0389					.0408	4.09	.95	2.85	.95	.013	.00	.00	PIPE
3530.100	5202.830	.928	5203.758	20.56	14.42	3.23	5206.98	.00	1.63	1.99	2.000	.000	.00	1 .0
194.982	.0428					.0428	8.35	.93	3.00	.93	.013	.00	.00	PIPE
3725.082	5211.177	.928	5212.105	20.56	14.42	3.23	5215.33	.00	1.63	1.99	2.000	.000	.00	1 .0
103.318	.0428					.0428	4.43	.93	3.00	.93	.013	.00	.00	PIPE
3828.400	5215.600	.927	5216.527	20.56	14.43	3.23	5219.76	.00	1.63	1.99	2.000	.000	.00	1 .0
85.388	.0429					.0429	3.66	.93	3.01	.93	.013	.00	.00	PIPE
3913.789	5219.261	.927	5220.188	20.56	14.43	3.23	5223.42	.00	1.63	1.99	2.000	.000	.00	1 .0
100.524	.0429					.0405	4.07	.93	3.01	.93	.013	.00	.00	PIPE
4014.313	5223.571	.958	5224.529	20.56	13.81	2.96	5227.49	.00	1.63	2.00	2.000	.000	.00	1 .0
33.142	.0429					.0359	1.19	.96	2.82	.93	.013	.00	.00	PIPE

23E

22E

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 6-2018 Time: 3:57:48

Heritage Trails Storm Drain
Outfall Pond 10 to Colobel Ave
File: HT-COLOBEL-R2.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
4047.455	5224.992	.995	5225.987	20.56	13.17	2.69	5228.68	.00	1.63	2.00	2.000	.000	.00	1 .0
18.330	.0429					.0316	.58	1.00	2.63	.93	.013	.00	.00	PIPE
4065.785	5225.778	1.033	5226.812	20.56	12.56	2.45	5229.26	.00	1.63	2.00	2.000	.000	.00	1 .0
12.143	.0429					.0278	.34	1.03	2.45	.93	.013	.00	.00	PIPE
4077.928	5226.299	1.073	5227.372	20.56	11.97	2.23	5229.60	.00	1.63	1.99	2.000	.000	.00	1 .0
8.753	.0429					.0246	.21	1.07	2.27	.93	.013	.00	.00	PIPE
4086.681	5226.674	1.115	5227.790	20.56	11.42	2.02	5229.81	.00	1.63	1.99	2.000	.000	.00	1 .0
6.603	.0429					.0217	.14	1.12	2.11	.93	.013	.00	.00	PIPE
4093.283	5226.958	1.159	5228.117	20.56	10.88	1.84	5229.96	.00	1.63	1.97	2.000	.000	.00	1 .0
5.070	.0429					.0192	.10	1.16	1.96	.93	.013	.00	.00	PIPE
4098.354	5227.175	1.206	5228.381	20.56	10.38	1.67	5230.05	.00	1.63	1.96	2.000	.000	.00	1 .0
3.938	.0429					.0170	.07	1.21	1.82	.93	.013	.00	.00	PIPE
4102.292	5227.344	1.256	5228.600	20.56	9.90	1.52	5230.12	.00	1.63	1.93	2.000	.000	.00	1 .0
3.062	.0429					.0150	.05	1.26	1.68	.93	.013	.00	.00	PIPE
4105.354	5227.475	1.309	5228.784	20.56	9.43	1.38	5230.17	.00	1.63	1.90	2.000	.000	.00	1 .0
2.360	.0429					.0134	.03	1.31	1.55	.93	.013	.00	.00	PIPE
4107.714	5227.576	1.365	5228.941	20.56	9.00	1.26	5230.20	.00	1.63	1.86	2.000	.000	.00	1 .0
1.719	.0429					.0119	.02	1.37	1.43	.93	.013	.00	.00	PIPE

Heritage Trails Storm Drain
Outfall Pond 10 to Colobel Ave
File: HT-COLOBEL-R2.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
4109.433	5227.650	1.426	5229.076	20.56	8.58	1.14	5230.22	.00	1.63	1.81	2.000	.000	.00	1 .0
1.167	.0429					.0106	.01	1.43	1.31	.93	.013	.00	.00	PIPE
4110.600	5227.700	1.492	5229.192	20.56	8.18	1.04	5230.23	.00	1.63	1.74	2.000	.000	.00	1 .0
51.700	.0101					.0100	.52	1.49	1.20	1.49	.013	.00	.00	PIPE
4162.299	5228.220	1.496	5229.716	20.56	8.16	1.03	5230.75	.00	1.63	1.74	2.000	.000	.00	1 .0
123.015	.0100					.0100	1.23	1.50	1.19	1.50	.013	.00	.00	PIPE
4285.314	5229.450	1.496	5230.946	20.56	8.16	1.03	5231.98	.00	1.63	1.74	2.000	.000	.00	1 .0
47.342	.0100					.0096	.46	1.50	1.19	1.50	.013	.00	.00	PIPE
4332.656	5229.923	1.546	5231.469	20.56	7.89	.97	5232.44	.00	1.63	1.68	2.000	.000	.00	1 .0
7.644	.0100					.0088	.07	1.55	1.11	1.50	.013	.00	.00	PIPE
4340.300	5230.000	1.626	5231.626	20.56	7.52	.88	5232.50	.00	1.63	1.56	2.000	.000	.00	1 .0

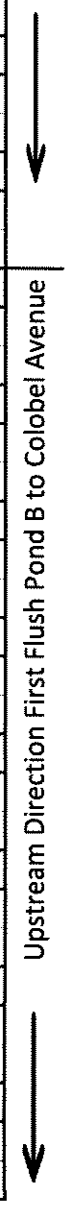
21E

20A

19A

Table 3

Heritage Trails Subdivision							
WSPGW - Storm Drain Analysis							
Storm Drain "B"							
Manhole ID	WSPGW Station	Rim Estimate	WSEL	Manhole ID	WSPGW Station	Rim Estimate	WSEL
Storm Drain B - North of Pond				Storm Drain B - West of Pond			
OUTFALL	1000	0	0	24B	1102.6	182.5	181.6
					1106.6		
SD Size	54"			SD Size	36"		
10B	1080	182.5	179.99	25B	1175.8	183	182
	1086				1179.8		
SD Size	54"			SD Size	24"		
11B	1109.4	182.8	180.33	26B	1458.5	199.1	194.5
	1115.4				0		
SD Size	54"			Storm Drain B - East of Pond			
12B	1432.8	185	181.38	1B	2019.8	158.67	156.07
	1438.8				2025.8		
SD Size	54"			SD Size	54"		
13B	1519.9	185.6	180.43	2B	2070.7	160.5	156.7
	1525.9						
SD Size	42"			SD Size	54"		
14B	1959.4	190	184.99	3B	2268.2	162	158.26
	1963.4						
SD Size	36"			SD Size	48"		
15B	2002.8	191	185.66	4B	2357.4	161	159.39
	2008.8						
SD Size	36"			SD Size	48"		
16B	2258.2	199.21	193.96	5B	2763.7	173.3	166.09
	2262.2						
SD Size	30"			SD Size	48"		
17B	2306.4	201.15	196.25	6B	2868.1	176	168.92
	2310.4						
SD Size	30"			SD Size	48"		
18B	2439.5	202.7	197.66	7B	2906.8	177	169.98
SD Size	30"			SD Size	48"		
19B	2465.8	205.8	203.24	8B	3043	185	174.18
	2469.8						
SD Size	30"						
20B	2741.3	214.9	210.09				
	2745.3						
SD Size	24"						
21B	3033.3	228.85	224.3				
SD Size	24"						
22B	3085	230.3	225.99				
SD Size	24"						
23B	3268.7	233.33	227.44				
	3272.7						



F:/projects/17046/
Manhole ID Table 17046-STORMDRAIN B

```
T1 Heritage Trails Storm Drain                                                0
T2 North Portion to First Flush Pond
T3 File: HT-SD-B-N.WSW
SO   1000.000 172.000  1                          176.000
R    1080.000 174.300  1      .013                                .000  58.000 1
JX   1086.000 174.400  4  2  3.013   20.900   29.200 176.500 176.000-30.0-90.0    .000
R    1109.400 174.540  4      .013                                .000    .000 1
JX   1115.400 174.640  7  5  6.013    4.900    4.900 177.380 177.380-25.0 35.0    .000
R    1432.800 176.540  7      .013                                .000    .000 1
JX   1438.800 176.640 10  8  9.013    5.000    5.000 179.420 179.420-30.0 70.0    .000
R    1519.900 177.130 10      .013                                .000    .000 1
JX   1525.900 178.130 13 11 12.013    5.800    5.800 180.500 180.500-25.0 45.0    .000
R    1959.400 182.500 13      .013                                .000 -47.000 1
JX   1963.400 183.000 14      .013
R    2002.800 184.000 14      .013                                .000 -45.000 1
JX   2008.800 184.100 16 15    .013   11.600          184.900         17.0          .000
R    2258.200 192.200 16      .013                                .000 -27.000 1
JX   2262.200 192.700 18 17    .013    5.800          193.000        -74.0          .000
R    2306.400 194.650 18      .013                                .000 -65.000 1
JX   2310.400 194.750 19      .013    5.800          195.750        -20.0          .000
R    2439.500 196.200 20      .013                                .000  40.000 1
R    2465.800 199.300 20      .013                                .000  45.000 1
JX   2469.800 199.400 25 22 23.013    6.200    6.200 199.900 199.900-10.0 90.0    .000
R    2741.300 208.400 25      .013                                .000    .000 1
JX   2745.300 209.000 28 26 27.013    6.800    6.800 209.900 209.900-50.0 10.0    .000
R    3033.300 222.900 28      .013                                .000 -45.000 1
R    3085.000 224.350 28      .013                                .000 -45.000 1
R    3268.700 227.330 28      .013                                .000  45.000 1
JX   3272.700 227.430 31 29 30.013   14.400   14.400 227.900 227.900 45.0 90.0    .000
SH   3272.700 227.430 31                          227.430
CD   1  4   1    .000   4.500     .000  .000  .000   .00
CD   2  4   1    .000   2.000     .000  .000  .000   .00
CD   3  4   1    .000   2.500     .000  .000  .000   .00
CD   4  4   1    .000   4.500     .000  .000  .000   .00
CD   5  4   1    .000   1.500     .000  .000  .000   .00
CD   6  4   1    .000   1.500     .000  .000  .000   .00
CD   7  4   1    .000   4.500     .000  .000  .000   .00
CD   8  4   1    .000   1.500     .000  .000  .000   .00
CD   9  4   1    .000   1.500     .000  .000  .000   .00
CD  10  4   1    .000   4.500     .000  .000  .000   .00
CD  11  4   1    .000   1.500     .000  .000  .000   .00
CD  12  4   1    .000   1.500     .000  .000  .000   .00
CD  13  4   1    .000   3.500     .000  .000  .000   .00
CD  14  4   1    .000   3.000     .000  .000  .000   .00
CD  15  4   1    .000   2.000     .000  .000  .000   .00
CD  16  4   1    .000   3.000     .000  .000  .000   .00
CD  17  4   1    .000   1.500     .000  .000  .000   .00
CD  18  4   1    .000   2.500     .000  .000  .000   .00
CD  19  4   1    .000   1.500     .000  .000  .000   .00
CD  20  4   1    .000   2.500     .000  .000  .000   .00
CD  22  4   1    .000   1.500     .000  .000  .000   .00
CD  23  4   1    .000   1.500     .000  .000  .000   .00
CD  25  4   1    .000   2.500     .000  .000  .000   .00
CD  26  4   1    .000   1.500     .000  .000  .000   .00
CD  27  4   1    .000   1.500     .000  .000  .000   .00
CD  28  4   1    .000   2.000     .000  .000  .000   .00
CD  29  4   1    .000   1.500     .000  .000  .000   .00
CD  30  4   1    .000   1.500     .000  .000  .000   .00
CD  31  4   1    .000   2.000     .000  .000  .000   .00
Q              .001   .0
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Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 8-2018 Time: 1:33:46

Heritage Trails Storm Drain
North Portion to First Flush Pond
File: HT-SD-B-N.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1000.000	172.000	2.585	174.585	159.50	16.87	4.42	179.00	.00	3.69	4.45	4.500	.000	.00	1 .0
4.552	.0288					.0165	.08	2.59	2.04	2.19	.013	.00	.00	PIPE
1004.552	172.131	2.603	174.734	159.50	16.72	4.34	179.08	.00	3.69	4.44	4.500	.000	.00	1 .0
21.575	.0288					.0154	.33	2.60	2.01	2.19	.013	.00	.00	PIPE
1026.127	172.751	2.709	175.460	159.50	15.94	3.95	179.41	.00	3.69	4.41	4.500	.000	.00	1 .0
16.364	.0288					.0136	.22	2.71	1.86	2.19	.013	.00	.00	PIPE
1042.491	173.222	2.820	176.042	159.50	15.20	3.59	179.63	.00	3.69	4.35	4.500	.000	.00	1 .0
12.418	.0288					.0121	.15	2.82	1.73	2.19	.013	.00	.00	PIPE
1054.909	173.579	2.939	176.518	159.50	14.50	3.26	179.78	.00	3.69	4.28	4.500	.000	.00	1 .0
9.458	.0288					.0107	.10	2.94	1.59	2.19	.013	.00	.00	PIPE
1064.367	173.851	3.065	176.916	159.50	13.82	2.97	179.88	.00	3.69	4.19	4.500	.000	.00	1 .0
6.956	.0288					.0095	.07	3.07	1.47	2.19	.013	.00	.00	PIPE
1071.324	174.051	3.201	177.252	159.50	13.18	2.70	179.95	.00	3.69	4.08	4.500	.000	.00	1 .0
4.802	.0288					.0085	.04	3.20	1.35	2.19	.013	.00	.00	PIPE
1076.125	174.189	3.349	177.538	159.50	12.56	2.45	179.99	.00	3.69	3.93	4.500	.000	.00	1 .0
2.883	.0288					.0076	.02	3.35	1.23	2.19	.013	.00	.00	PIPE
1079.008	174.271	3.511	177.783	159.50	11.98	2.23	180.01	.00	3.69	3.73	4.500	.000	.00	1 .0
.992	.0288					.0069	.01	3.51	1.12	2.19	.013	.00	.00	PIPE

OUTFALL

Heritage Trails Storm Drain
North Portion to First Flush Pond
File: HT-SD-B-N.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1080.000	174.300	3.693	177.993	159.50	11.42	2.02	180.02	.00	3.69	3.45	4.500	.000	.00	1 .0
JUNCT STR	.0167					.0048	.03	3.69	1.00		.013	.00	.00	PIPE
1086.000	174.400	5.594	179.994	109.40	6.88	.73	180.73	.00	3.08	.00	4.500	.000	.00	1 .0
23.400	.0060					.0031	.07	5.59	.00	2.83	.013	.00	.00	PIPE
1109.400	174.540	5.563	180.103	109.40	6.88	.73	180.84	.00	3.08	.00	4.500	.000	.00	1 .0
JUNCT STR	.0167					.0028	.02	5.56	.00		.013	.00	.00	PIPE
1115.400	174.640	5.686	180.326	99.60	6.26	.61	180.93	.00	2.93	.00	4.500	.000	.00	1 .0
317.400	.0060					.0026	.81	5.69	.00	2.65	.013	.00	.00	PIPE
1432.800	176.540	4.630	181.170	99.60	6.26	.61	181.78	.00	2.93	.00	4.500	.000	.00	1 .0
JUNCT STR	.0167					.0023	.01	4.63	.00		.013	.00	.00	PIPE
1438.800	176.640	4.743	181.383	89.60	5.63	.49	181.88	.00	2.78	.00	4.500	.000	.00	1 .0
66.440	.0060					.0021	.14	4.74	.00	2.48	.013	.00	.00	PIPE
1505.240	177.041	4.500	181.541	89.60	5.63	.49	182.03	.00	2.78	.00	4.500	.000	.00	1 .0
14.660	.0060					.0020	.03	4.50	.00	2.48	.013	.00	.00	PIPE
1519.900	177.130	4.437	181.567	89.60	5.65	.50	182.06	.00	2.78	1.06	4.500	.000	.00	1 .0
JUNCT STR	.1667							4.44	.26		.013	.00	.00	PIPE
1525.900	178.130	2.299	180.429	78.00	11.64	2.10	182.53	.00	2.76	3.32	3.500	.000	.00	1 .0
37.755	.0101					.0102	.39	2.30	1.44	2.31	.013	.00	.00	PIPE

10B

11B

12B

13B

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 8-2018 Time: 1:33:46

Heritage Trails Storm Drain
North Portion to First Flush Pond
File: HT-SD-B-N.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1563.655	178.511	2.294	180.805	78.00	11.67	2.11	182.92	.00	2.76	3.33	3.500	.000	.00	1 .0
144.676	.0101					.0109	1.58	2.29	1.45	2.31	.013	.00	.00	PIPE
1708.331	179.969	2.201	182.170	78.00	12.24	2.33	184.50	.00	2.76	3.38	3.500	.000	.00	1 .0
65.855	.0101					.0123	.81	2.20	1.57	2.31	.013	.00	.00	PIPE
1774.186	180.633	2.114	182.747	78.00	12.83	2.56	185.30	.00	2.76	3.42	3.500	.000	.00	1 .0
45.689	.0101					.0139	.63	2.11	1.70	2.31	.013	.00	.00	PIPE
1819.875	181.093	2.032	183.126	78.00	13.46	2.81	185.94	.00	2.76	3.45	3.500	.000	.00	1 .0
36.156	.0101					.0157	.57	2.03	1.83	2.31	.013	.00	.00	PIPE
1856.031	181.458	1.954	183.412	78.00	14.12	3.09	186.51	.00	2.76	3.48	3.500	.000	.00	1 .0
30.568	.0101					.0178	.54	1.95	1.97	2.31	.013	.00	.00	PIPE
1886.599	181.766	1.880	183.646	78.00	14.81	3.40	187.05	.00	2.76	3.49	3.500	.000	.00	1 .0
26.827	.0101					.0202	.54	1.88	2.12	2.31	.013	.00	.00	PIPE
1913.425	182.037	1.810	183.847	78.00	15.53	3.74	187.59	.00	2.76	3.50	3.500	.000	.00	1 .0
24.029	.0101					.0229	.55	1.81	2.28	2.31	.013	.00	.00	PIPE
1937.455	182.279	1.743	184.022	78.00	16.29	4.12	188.14	.00	2.76	3.50	3.500	.000	.00	1 .0
21.945	.0101					.0260	.57	1.74	2.45	2.31	.013	.00	.00	PIPE
1959.400	182.500	1.680	184.180	78.00	17.08	4.53	188.71	.00	2.76	3.50	3.500	.000	.00	1 .0
JUNCT STR	.1250					.0251	.10	1.68	2.63		.013	.00	.00	PIPE

14B

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 8-2018 Time: 1:33:46

Heritage Trails Storm Drain
North Portion to First Flush Pond
File: HT-SD-B-N.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1963.400	183.000	1.988	184.988	78.00	15.69	3.82	188.81	.00	2.75	2.84	3.000	.000	.00	1 .0
39.400	.0254					.0220	.87	1.99	2.09	1.91	.013	.00	.00	PIPE
2002.800	184.000	2.029	186.029	78.00	15.33	3.65	189.68	.00	2.75	2.81	3.000	.000	.00	1 .0
JUNCT STR	.0167					.0279	.17	2.03	2.01		.013	.00	.00	PIPE
2008.800	184.100	1.564	185.664	66.40	17.82	4.93	190.59	.00	2.61	3.00	3.000	.000	.00	1 .0
21.051	.0325					.0347	.73	1.56	2.82	1.59	.013	.00	.00	PIPE
2029.851	184.784	1.557	186.341	66.40	17.91	4.98	191.32	.00	2.61	3.00	3.000	.000	.00	1 .0
92.362	.0325					.0373	3.44	1.56	2.84	1.59	.013	.00	.00	PIPE
2122.213	187.783	1.500	189.284	66.40	18.78	5.48	194.76	.00	2.61	3.00	3.000	.000	.00	1 .0
50.151	.0325					.0423	2.12	1.50	3.05	1.59	.013	.00	.00	PIPE
2172.364	189.412	1.445	190.857	66.40	19.70	6.03	196.88	.00	2.61	3.00	3.000	.000	.00	1 .0
35.301	.0325					.0481	1.70	1.45	3.27	1.59	.013	.00	.00	PIPE
2207.665	190.559	1.393	191.952	66.40	20.66	6.63	198.58	.00	2.61	2.99	3.000	.000	.00	1 .0
27.616	.0325					.0547	1.51	1.39	3.51	1.59	.013	.00	.00	PIPE
2235.280	191.456	1.343	192.799	66.40	21.67	7.29	200.09	.00	2.61	2.98	3.000	.000	.00	1 .0
22.920	.0325					.0622	1.43	1.34	3.77	1.59	.013	.00	.00	PIPE
2258.200	192.200	1.295	193.495	66.40	22.73	8.02	201.52	.00	2.61	2.97	3.000	.000	.00	1 .0
JUNCT STR	.1250					.0758	.30	1.30	4.04		.013	.00	.00	PIPE

15B

16B

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 8-2018 Time: 1:33:46

Heritage Trails Storm Drain
North Portion to First Flush Pond
File: HT-SD-B-N.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
2262.200	192.700	1.258	193.958	60.60	24.49	9.32	203.27	.00	2.40	2.50	2.500	.000	.00	1 .0
11.525	.0441					.0888	1.02	1.26	4.34	1.55	.013	.00	.00	PIPE
2273.725	193.208	1.230	194.439	60.60	25.20	9.86	204.30	.00	2.40	2.50	2.500	.000	.00	1 .0
17.310	.0441					.0985	1.70	1.23	4.53	1.55	.013	.00	.00	PIPE
2291.035	193.972	1.185	195.157	60.60	26.43	10.85	206.01	.00	2.40	2.50	2.500	.000	.00	1 .0
15.365	.0441					.1120	1.72	1.19	4.86	1.55	.013	.00	.00	PIPE
2306.400	194.650	1.143	195.793	60.60	27.72	11.93	207.73	.00	2.40	2.49	2.500	.000	.00	1 .0
JUNCT STR	.0250					.1919	.77	1.14	5.21		.013	.00	.00	PIPE
2310.400	194.750	1.499	196.249	54.80	31.01	14.93	211.18	.00	1.50	.10	1.500	.000	.00	1 .0
2310.400	194.750	2.028	196.778	54.80	12.85	2.56	199.34	.00	2.35	1.96	2.500	.000	.00	1 .0
9.970	.0112					.0186	.19	2.03	1.53	2.50	.013	.00	.00	PIPE
2320.370	194.862	1.978	196.840	54.80	13.15	2.69	199.53	.00	2.35	2.03	2.500	.000	.00	1 .0
19.844	.0112					.0201	.40	1.98	1.62	2.50	.013	.00	.00	PIPE
2340.214	195.085	1.886	196.971	54.80	13.79	2.95	199.93	.00	2.35	2.15	2.500	.000	.00	1 .0
18.846	.0112					.0224	.42	1.89	1.79	2.50	.013	.00	.00	PIPE
2359.060	195.297	1.801	197.098	54.80	14.47	3.25	200.35	.00	2.35	2.24	2.500	.000	.00	1 .0
17.961	.0112					.0250	.45	1.80	1.96	2.50	.013	.00	.00	PIPE
2377.022	195.498	1.724	197.222	54.80	15.17	3.57	200.80	.00	2.35	2.31	2.500	.000	.00	1 .0
16.932	.0112					.0281	.48	1.72	2.14	2.50	.013	.00	.00	PIPE

17B

Heritage Trails Storm Drain
North Portion to First Flush Pond
File: HT-SD-B-N.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
2393.954	195.688	1.652	197.341	54.80	15.91	3.93	201.27	.00	2.35	2.37	2.500	.000	.00	1 .0
16.017	.0112					.0316	.51	1.65	2.33	2.50	.013	.00	.00	PIPE
2409.971	195.868	1.585	197.453	54.80	16.69	4.33	201.78	.00	2.35	2.41	2.500	.000	.00	1 .0
15.152	.0112					.0356	.54	1.59	2.52	2.50	.013	.00	.00	PIPE
2425.123	196.039	1.522	197.561	54.80	17.51	4.76	202.32	.00	2.35	2.44	2.500	.000	.00	1 .0
14.377	.0112					.0402	.58	1.52	2.72	2.50	.013	.00	.00	PIPE
2439.500	196.200	1.463	197.663	54.80	18.36	5.23	202.90	.00	2.35	2.46	2.500	.000	.00	1 .0
4.996	.1179					.0404	.20	1.46	2.94	1.08	.013	.00	.00	PIPE
2444.496	196.789	1.518	198.307	54.80	17.57	4.79	203.10	.00	2.35	2.44	2.500	.000	.00	1 .0
4.562	.1179					.0360	.16	1.52	2.74	1.08	.013	.00	.00	PIPE
2449.058	197.327	1.580	198.907	54.80	16.75	4.36	203.26	.00	2.35	2.41	2.500	.000	.00	1 .0
3.827	.1179					.0319	.12	1.58	2.53	1.08	.013	.00	.00	PIPE
2452.885	197.778	1.647	199.425	54.80	15.97	3.96	203.39	.00	2.35	2.37	2.500	.000	.00	1 .0
3.229	.1179					.0283	.09	1.65	2.34	1.08	.013	.00	.00	PIPE
2456.114	198.158	1.718	199.876	54.80	15.23	3.60	203.48	.00	2.35	2.32	2.500	.000	.00	1 .0
2.703	.1179					.0253	.07	1.72	2.15	1.08	.013	.00	.00	PIPE
2458.816	198.477	1.795	200.272	54.80	14.52	3.27	203.55	.00	2.35	2.25	2.500	.000	.00	1 .0
2.241	.1179					.0226	.05	1.80	1.98	1.08	.013	.00	.00	PIPE

18B

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 8-2018 Time: 1:33:46

Heritage Trails Storm Drain
North Portion to First Flush Pond
File: HT-SD-B-N.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
2461.058	198.741	1.879	200.620	54.80	13.84	2.98	203.60	.00	2.35	2.16	2.500	.000	.00	1 .0
1.830	.1179					.0203	.04	1.88	1.80	1.08	.013	.00	.00	PIPE
2462.887	198.957	1.971	200.928	54.80	13.20	2.71	203.63	.00	2.35	2.04	2.500	.000	.00	1 .0
1.436	.1179					.0183	.03	1.97	1.63	1.08	.013	.00	.00	PIPE
2464.324	199.126	2.074	201.200	54.80	12.58	2.46	203.66	.00	2.35	1.88	2.500	.000	.00	1 .0
1.015	.1179					.0168	.02	2.07	1.46	1.08	.013	.00	.00	PIPE
2465.338	199.246	2.195	201.441	54.80	12.00	2.24	203.68	.00	2.35	1.64	2.500	.000	.00	1 .0
.462	.1179					.0158	.01	2.20	1.27	1.08	.013	.00	.00	PIPE
2465.800	199.300	2.352	201.652	54.80	11.44	2.03	203.68	.00	2.35	1.18	2.500	.000	.00	1 .0
JUNCT STR	.0250					.0131	.05	2.35	1.00		.013	.00	.00	PIPE
2469.800	199.400	3.836	203.236	42.40	8.64	1.16	204.39	.00	2.18	.00	2.500	.000	.00	1 .0
16.865	.0331					.0107	.18	3.84	.00	1.35	.013	.00	.00	PIPE
2486.665	199.959	3.461	203.420	42.40	8.64	1.16	204.58	.00	2.18	.00	2.500	.000	.00	1 .0
HYDRAULIC JUMP														
2486.665	199.959	1.349	201.308	42.40	15.70	3.83	205.13	.00	2.18	2.49	2.500	.000	.00	1 .0
105.306	.0331					.0332	3.49	1.35	2.66	1.35	.013	.00	.00	PIPE
2591.970	203.450	1.349	204.799	42.40	15.70	3.83	208.62	.00	2.18	2.49	2.500	.000	.00	1 .0
149.330	.0331					.0350	5.23	1.35	2.66	1.35	.013	.00	.00	PIPE

198

Heritage Trails Storm Drain
North Portion to First Flush Pond
File: HT-SD-B-N.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
2741.300	208.400	1.307	209.707	42.40	16.34	4.14	213.85	.00	2.18	2.50	2.500	.000	.00	1 .0
JUNCT STR	.1500					.0425	.17	1.31	2.82		.013	.00	.00	PIPE
2745.300	209.000	1.093	210.093	28.80	16.39	4.17	214.26	.00	1.84	1.99	2.000	.000	.00	1 .0
99.629	.0483					.0480	4.78	1.09	3.07	1.09	.013	.00	.00	PIPE
2844.929	213.808	1.096	214.905	28.80	16.34	4.15	219.05	.00	1.84	1.99	2.000	.000	.00	1 .0
102.549	.0483					.0450	4.62	1.10	3.06	1.09	.013	.00	.00	PIPE
2947.478	218.758	1.139	219.897	28.80	15.58	3.77	223.67	.00	1.84	1.98	2.000	.000	.00	1 .0
34.901	.0483					.0398	1.39	1.14	2.84	1.09	.013	.00	.00	PIPE
2982.379	220.442	1.185	221.627	28.80	14.86	3.43	225.05	.00	1.84	1.97	2.000	.000	.00	1 .0
20.135	.0483					.0352	.71	1.19	2.64	1.09	.013	.00	.00	PIPE
3002.514	221.414	1.233	222.647	28.80	14.16	3.12	225.76	.00	1.84	1.94	2.000	.000	.00	1 .0
13.574	.0483					.0312	.42	1.23	2.44	1.09	.013	.00	.00	PIPE
3016.088	222.069	1.284	223.353	28.80	13.50	2.83	226.19	.00	1.84	1.92	2.000	.000	.00	1 .0
9.823	.0483					.0277	.27	1.28	2.26	1.09	.013	.00	.00	PIPE
3025.911	222.543	1.339	223.882	28.80	12.88	2.57	226.46	.00	1.84	1.88	2.000	.000	.00	1 .0
7.389	.0483					.0246	.18	1.34	2.08	1.09	.013	.00	.00	PIPE
3033.300	222.900	1.398	224.298	28.80	12.28	2.34	226.64	.00	1.84	1.83	2.000	.000	.00	1 .0
10.907	.0280					.0227	.25	1.40	1.91	1.30	.013	.00	.00	PIPE

20B

21B

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 8-2018 Time: 1:33:46

Heritage Trails Storm Drain
North Portion to First Flush Pond
File: HT-SD-B-N.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
3044.208	223.206	1.421	224.627	28.80	12.06	2.26	226.89	.00	1.84	1.81	2.000	.000	.00	1 .0
20.113	.0280					.0211	.42	1.42	1.85	1.30	.013	.00	.00	PIPE
3064.321	223.770	1.486	225.256	28.80	11.50	2.05	227.31	.00	1.84	1.75	2.000	.000	.00	1 .0
12.540	.0280					.0189	.24	1.49	1.69	1.30	.013	.00	.00	PIPE
3076.860	224.122	1.558	225.680	28.80	10.97	1.87	227.55	.00	1.84	1.66	2.000	.000	.00	1 .0
8.140	.0280					.0171	.14	1.56	1.54	1.30	.013	.00	.00	PIPE
3085.000	224.350	1.638	225.988	28.80	10.46	1.70	227.69	.00	1.84	1.54	2.000	.000	.00	1 .0
75.168	.0162					.0162	1.22	1.64	1.38	1.64	.013	.00	.00	PIPE
3160.168	225.569	1.638	227.208	28.80	10.46	1.70	228.91	.00	1.84	1.54	2.000	.000	.00	1 .0
93.489	.0162					.0156	1.46	1.64	1.38	1.64	.013	.00	.00	PIPE
3253.657	227.086	1.727	228.813	28.80	9.98	1.55	230.36	.00	1.84	1.37	2.000	.000	.00	1 .0
15.043	.0162					.0145	.22	1.73	1.21	1.64	.013	.00	.00	PIPE
3268.700	227.330	1.843	229.173	28.80	9.52	1.41	230.58	.00	1.84	1.08	2.000	.000	.00	1 .0
JUNCT STR	.0250							1.84	1.00		.013	.00	.00	PIPE
---------- WARNING - Junction Analysis - Large Lateral Flow(s)----------														
3272.700	227.430	.011	227.441	.00	.48	.00	227.44	.00	.01	.29	2.000	.000	.00	1 .0

22B

23B

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T1 Heritage Trails Storm Drain                                                0
T2 West Portion to First Flush Pond
T3 File: HT-SD-B-W.wsw
SO   1000.000 172.000  2                          176.000
R    1080.000 174.300  2      .013                                .000 -90.000 1
JX   1086.000 174.400  5  3  4.013  109.400   20.900 174.400 174.500 58.0-30.0    .000
R    1102.600 175.000  5      .013                                .000  30.000 1
JX   1106.600 175.100  6      .013
R    1175.800 176.500  6      .013                                .000  38.000 1
JX   1179.800 177.100  8  7   .013   13.200          177.100        -90.0          .000
R    1458.500 193.100  8      .013                                .000    .000 1
SH   1458.500 193.100  8                          195.100
CD   2  4   1    .000   4.500     .000  .000  .000   .00
CD   3  4   1    .000   4.500     .000  .000  .000   .00
CD   4  4   1    .000   2.000     .000  .000  .000   .00
CD   5  4   1    .000   3.000     .000  .000  .000   .00
CD   6  4   1    .000   3.000     .000  .000  .000   .00
CD   7  4   1    .000   2.000     .000  .000  .000   .00
CD   8  4   1    .000   2.000     .000  .000  .000   .00
Q            16.000   .0
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Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 8-2018 Time: 1:59: 8

Heritage Trails Storm Drain
West Portion to First Flush Pond
File: HT-SD-B-W.wsw

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	172.000	2.586	174.586	159.50	16.86	4.42	179.00	.00	3.69	4.45	4.500	.000	.00	1 .0
4.646	.0288					.0165	.08	2.59	2.04	2.19	.013	.00	.00	PIPE
1004.647	172.134	2.604	174.738	159.50	16.72	4.34	179.08	.00	3.69	4.44	4.500	.000	.00	1 .0
21.619	.0288					.0154	.33	2.60	2.01	2.19	.013	.00	.00	PIPE
1026.266	172.755	2.709	175.464	159.50	15.94	3.95	179.41	.00	3.69	4.41	4.500	.000	.00	1 .0
16.276	.0288					.0136	.22	2.71	1.86	2.19	.013	.00	.00	PIPE
1042.542	173.223	2.821	176.044	159.50	15.20	3.59	179.63	.00	3.69	4.35	4.500	.000	.00	1 .0
12.462	.0288					.0121	.15	2.82	1.72	2.19	.013	.00	.00	PIPE
1055.003	173.581	2.939	176.520	159.50	14.49	3.26	179.78	.00	3.69	4.28	4.500	.000	.00	1 .0
9.391	.0288					.0107	.10	2.94	1.59	2.19	.013	.00	.00	PIPE
1064.394	173.851	3.066	176.917	159.50	13.82	2.96	179.88	.00	3.69	4.19	4.500	.000	.00	1 .0
6.947	.0288					.0095	.07	3.07	1.47	2.19	.013	.00	.00	PIPE
1071.342	174.051	3.202	177.253	159.50	13.17	2.69	179.95	.00	3.69	4.08	4.500	.000	.00	1 .0
4.794	.0288					.0085	.04	3.20	1.35	2.19	.013	.00	.00	PIPE
1076.136	174.189	3.350	177.539	159.50	12.56	2.45	179.99	.00	3.69	3.93	4.500	.000	.00	1 .0
2.877	.0288					.0076	.02	3.35	1.23	2.19	.013	.00	.00	PIPE
1079.013	174.272	3.512	177.784	159.50	11.98	2.23	180.01	.00	3.69	3.73	4.500	.000	.00	1 .0
.987	.0288					.0069	.01	3.51	1.12	2.19	.013	.00	.00	PIPE

Heritage Trails Storm Drain
West Portion to First Flush Pond
File: HT-SD-B-W.wsw

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1080.000	174.300	3.694	177.994	159.50	11.42	2.02	180.02	.00	3.69	3.45	4.500	.000	.00	1 .0
JUNCT STR	.0167					.0042	.03	3.69	1.00		.013	.00	.00	PIPE
1086.000	174.400	7.106	181.506	29.20	4.13	.26	181.77	.00	1.75	.00	3.000	.000	.00	1 .0
16.600	.0361					.0019	.03	7.11	.00	.98	.013	.00	.00	PIPE
1102.600	175.000	6.577	181.577	29.20	4.13	.26	181.84	.00	1.75	.00	3.000	.000	.00	1 .0
JUNCT STR	.0250					.0019	.01	6.58	.00		.013	.00	.00	PIPE
1106.600	175.100	6.485	181.585	29.20	4.13	.26	181.85	.00	1.75	.00	3.000	.000	.00	1 .0
69.200	.0202					.0019	.13	6.48	.00	1.14	.013	.00	.00	PIPE
1175.800	176.500	5.264	181.764	29.20	4.13	.26	182.03	.00	1.75	.00	3.000	.000	.00	1 .0
JUNCT STR	.1500					.0035	.01	5.26	.00		.013	.00	.00	PIPE
1179.800	177.100	4.916	182.016	16.00	5.09	.40	182.42	.00	1.44	.00	2.000	.000	.00	1 .0
42.825	.0574					.0050	.21	4.92	.00	.74	.013	.00	.00	PIPE
1222.625	179.559	2.674	182.232	16.00	5.09	.40	182.64	.00	1.44	.00	2.000	.000	.00	1 .0
HYDRAULIC JUMP														
1222.625	179.559	.745	180.303	16.00	15.02	3.50	183.80	.00	1.44	1.93	2.000	.000	.00	1 .0
24.037	.0574					.0574	1.38	.74	3.57	.74	.013	.00	.00	PIPE
1246.662	180.939	.745	181.683	16.00	15.02	3.50	185.18	.00	1.44	1.93	2.000	.000	.00	1 .0
82.179	.0574					.0565	4.64	.74	3.57	.74	.013	.00	.00	PIPE

24B

25B

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 8-2018 Time: 1:59: 8

Heritage Trails Storm Drain
West Portion to First Flush Pond
File: HT-SD-B-W.wsw

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip Type Ch
1328.841	185.656	.750	186.406	16.00	14.85	3.42	189.83	.00	1.44	1.94	2.000	.000	.00	1 .0
54.399	.0574					.0522	2.84	.75	3.51	.74	.013	.00	.00	PIPE
1383.240	188.779	.777	189.557	16.00	14.16	3.11	192.67	.00	1.44	1.95	2.000	.000	.00	1 .0
21.872	.0574					.0458	1.00	.78	3.28	.74	.013	.00	.00	PIPE
1405.112	190.035	.806	190.841	16.00	13.50	2.83	193.67	.00	1.44	1.96	2.000	.000	.00	1 .0
13.267	.0574					.0402	.53	.81	3.06	.74	.013	.00	.00	PIPE
1418.379	190.797	.835	191.632	16.00	12.87	2.57	194.20	.00	1.44	1.97	2.000	.000	.00	1 .0
9.175	.0574					.0353	.32	.84	2.86	.74	.013	.00	.00	PIPE
1427.554	191.323	.866	192.190	16.00	12.27	2.34	194.53	.00	1.44	1.98	2.000	.000	.00	1 .0
6.842	.0574					.0310	.21	.87	2.67	.74	.013	.00	.00	PIPE
1434.395	191.716	.898	192.614	16.00	11.70	2.13	194.74	.00	1.44	1.99	2.000	.000	.00	1 .0
5.314	.0574					.0273	.14	.90	2.49	.74	.013	.00	.00	PIPE
1439.709	192.021	.931	192.952	16.00	11.15	1.93	194.88	.00	1.44	2.00	2.000	.000	.00	1 .0
4.206	.0574					.0240	.10	.93	2.32	.74	.013	.00	.00	PIPE
1443.915	192.263	.966	193.229	16.00	10.63	1.76	194.99	.00	1.44	2.00	2.000	.000	.00	1 .0
3.378	.0574					.0211	.07	.97	2.16	.74	.013	.00	.00	PIPE
1447.293	192.457	1.003	193.460	16.00	10.14	1.60	195.06	.00	1.44	2.00	2.000	.000	.00	1 .0
2.734	.0574					.0186	.05	1.00	2.01	.74	.013	.00	.00	PIPE

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 8-2018 Time: 1:59: 8

Heritage Trails Storm Drain
West Portion to First Flush Pond
File: HT-SD-B-W.wsw

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1450.028	192.614	1.042	193.656	16.00	9.67	1.45	195.11	.00	1.44	2.00	2.000	.000	.00	1 .0
2.241	.0574					.0164	.04	1.04	1.87	.74	.013	.00	.00	PIPE
1452.269	192.742	1.082	193.824	16.00	9.22	1.32	195.14	.00	1.44	1.99	2.000	.000	.00	1 .0
1.792	.0574					.0145	.03	1.08	1.74	.74	.013	.00	.00	PIPE
1454.061	192.845	1.125	193.970	16.00	8.79	1.20	195.17	.00	1.44	1.98	2.000	.000	.00	1 .0
1.435	.0574					.0128	.02	1.13	1.62	.74	.013	.00	.00	PIPE
1455.496	192.928	1.170	194.098	16.00	8.38	1.09	195.19	.00	1.44	1.97	2.000	.000	.00	1 .0
1.130	.0574					.0113	.01	1.17	1.50	.74	.013	.00	.00	PIPE
1456.626	192.992	1.217	194.210	16.00	7.99	.99	195.20	.00	1.44	1.95	2.000	.000	.00	1 .0
.846	.0574					.0100	.01	1.22	1.39	.74	.013	.00	.00	PIPE
1457.472	193.041	1.267	194.308	16.00	7.62	.90	195.21	.00	1.44	1.93	2.000	.000	.00	1 .0
.575	.0574					.0089	.01	1.27	1.29	.74	.013	.00	.00	PIPE
1458.048	193.074	1.321	194.395	16.00	7.26	.82	195.21	.00	1.44	1.89	2.000	.000	.00	1 .0
.353	.0574					.0079	.00	1.32	1.19	.74	.013	.00	.00	PIPE
1458.401	193.094	1.378	194.472	16.00	6.93	.74	195.22	.00	1.44	1.85	2.000	.000	.00	1 .0
.099	.0574					.0070	.00	1.38	1.09	.74	.013	.00	.00	PIPE
1458.500	193.100	1.442	194.542	16.00	6.60	.68	195.22	.00	1.44	1.79	2.000	.000	.00	1 .0

26B

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T1 Heritage Trails Storm Drain                                                  0
T2 Storm Drain B Pond to Pond 10
T3 File: HT-SD-B-E.WSW.WSW
SO   1000.0005134.000  1                          5137.310
TS   1008.0005134.100  2       .014                                .000
JX   1008.1005134.150  3       .013
R    1207.1005135.100  3       .013                                .000    .000 1
JX   1217.1005135.200  6  4  5.013   18.380   18.3805141.1005141.100-45.0 90.0    .000
R    1407.4005136.500  6       .013                                .000    .000 1
JX   1417.4005136.600  8  7    .013  102.400         5140.370        90.0          .000
R    1594.4005137.000  8       .013                                .000  17.000 1
R    1778.9005138.080  8       .013                                .000 -90.000 1
JX   1786.9005140.600 10  9    .013  107.810         5140.600       -17.0          .000
R    1809.0005141.800 10       .013                                .000 -10.000 1
JX   1815.0005142.000 13 11 12.013    6.150    6.1505146.0005146.000-55.0 60.0    .000
R    1913.0005145.910 13       .013                                .000   5.000 1
R    2019.8005149.400 13       .013                                .000    .000 1
JX   2025.8005149.580 13 14    .013   41.760         5149.500        00.0          .000
R    2070.7005150.000 15       .013                                .000  65.000 1
R    2268.2005152.000 15       .013                                .000 -20.000 1
R    2357.4005152.900 15       .013                                .000 -90.000 1
R    2763.7005163.600 16       .013                                .000  45.000 1
R    2868.1005166.350 16       .013                                .000  50.000 1
R    2906.8005167.370 16       .013                                .000 -90.000 1
R    3043.0005171.000 16       .013                                .000 -65.000 1
R    3105.1005172.000 16       .013                                .000  00.000 1
SH   3105.1005172.000 16                          5276.000
CD   1  2   0    .000   7.500   13.000  .000  .000  -.01
CD   2  2   0    .000   7.500    7.500  .000  .000   .00
CD   3  4   1    .000   6.500     .000  .000  .000   .00
CD   4  4   1    .000   2.000     .000  .000  .000   .00
CD   5  4   1    .000   2.000     .000  .000  .000   .00
CD   6  4   1    .000   6.500     .000  .000  .000   .00
CD   7  4   1    .000   3.000     .000  .000  .000   .00
CD   8  4   1    .000   6.500     .000  .000  .000   .00
CD   9  4   1    .000   4.000     .000  .000  .000   .00
CD  10  4   1    .000   4.000     .000  .000  .000   .00
CD  11  4   1    .000   1.500     .000  .000  .000   .00
CD  12  4   1    .000   1.500     .000  .000  .000   .00
CD  13  4   1    .000   4.000     .000  .000  .000   .00
CD  14  4   1    .000   4.000     .000  .000  .000   .00
CD  15  4   1    .000   4.500     .000  .000  .000   .00
CD  16  4   1    .000   4.000     .000  .000  .000   .00
Q           159.500   .0
```

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 9-2018 Time: 9:58: 4

Heritage Trails Storm Drain
Storm Drain B Pond to Pond 10
File: HT-SD-B-E.WSW.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1000.000	5134.000	1.646	5135.646	460.53	21.53	7.20	5142.85	.00	3.39	13.00	7.500	13.000	.00	0 .0
TRANS STR	.0125					.0230	.18	1.65	2.96		.014	.00	.00	RECTANG
1008.000	5134.100	3.095	5137.195	460.53	19.84	6.11	5143.31	.00	4.89	7.50	7.500	7.500	.00	0 .0
JUNCT STR	.4982					.0110	.00	3.10	1.99		.013	.00	.00	RECTANG
		---------- WARNING - Junction Analysis - Change in Channel Type ----------												
1008.100	5134.150	5.656	5139.806	460.53	15.02	3.51	5143.31	.00	5.66	4.37	6.500	.000	.00	1 .0
31.521	.0048					.0069	.22	5.66	1.00	6.50	.013	.00	.00	PIPE
1039.621	5134.300	6.040	5140.340	460.53	14.33	3.19	5143.53	.00	5.66	3.33	6.500	.000	.00	1 .0
115.253	.0048					.0071	.81	6.04	.81	6.50	.013	.00	.00	PIPE
1154.874	5134.851	6.500	5141.351	460.53	13.88	2.99	5144.34	.00	5.66	.00	6.500	.000	.00	1 .0
52.226	.0048					.0076	.40	6.50	.00	6.50	.013	.00	.00	PIPE
1207.100	5135.100	6.693	5141.793	460.53	13.88	2.99	5144.78	.00	5.66	.00	6.500	.000	.00	1 .0
JUNCT STR	.0100					.0071	.07	6.69	.00		.013	.00	.00	PIPE
1217.100	5135.200	7.510	5142.709	423.77	12.77	2.53	5145.24	.00	5.47	.00	6.500	.000	.00	1 .0
190.300	.0068					.0065	1.24	7.51	.00	5.20	.013	.00	.00	PIPE
1407.400	5136.500	7.579	5144.080	423.77	12.77	2.53	5146.61	.00	5.47	.00	6.500	.000	.00	1 .0
JUNCT STR	.0100					.0051	.05	7.58	.00		.013	.00	.00	PIPE

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 9-2018 Time: 9:58: 4

Heritage Trails Storm Drain
Storm Drain B Pond to Pond 10
File: HT-SD-B-E.WSW.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1417.400	5136.600	9.683	5146.283	321.37	9.68	1.46	5147.74	.00	4.81	.00	6.500	.000	.00	1 .0
177.000	.0023					.0038	.67	9.68	.00	6.50	.013	.00	.00	PIPE
1594.400	5137.000	10.102	5147.103	321.37	9.68	1.46	5148.56	.00	4.81	.00	6.500	.000	.00	1 .0
184.500	.0059					.0038	.69	10.10	.00	4.40	.013	.00	.00	PIPE
1778.900	5138.080	10.221	5148.301	321.37	9.68	1.46	5149.76	.00	4.81	.00	6.500	.000	.00	1 .0
JUNCT STR	.3150					.0129	.10	10.22	.00		.013	.00	.00	PIPE
1786.900	5140.600	5.902	5146.502	213.56	16.99	4.48	5150.99	.00	3.88	.00	4.000	.000	.00	1 .0
22.100	.0543					.0221	.49	5.90	.00	2.32	.013	.00	.00	PIPE
1809.000	5141.800	5.563	5147.363	213.56	16.99	4.48	5151.85	.00	3.88	.00	4.000	.000	.00	1 .0
JUNCT STR	.0334					.0209	.13	5.56	.00		.013	.00	.00	PIPE
1815.000	5142.000	6.435	5148.435	201.26	16.02	3.98	5152.42	.00	3.85	.00	4.000	.000	.00	1 .0
48.350	.0399					.0196	.95	6.43	.00	2.47	.013	.00	.00	PIPE
1863.350	5143.929	5.584	5149.514	201.26	16.02	3.98	5153.50	.00	3.85	.00	4.000	.000	.00	1 .0
HYDRAULIC JUMP														
1863.350	5143.929	2.808	5146.737	201.26	21.36	7.08	5153.82	.00	3.85	3.66	4.000	.000	.00	1 .0
15.883	.0399					.0273	.43	2.81	2.35	2.47	.013	.00	.00	PIPE
1879.232	5144.563	2.850	5147.413	201.26	21.01	6.85	5154.27	.00	3.85	3.62	4.000	.000	.00	1 .0
33.768	.0399					.0253	.86	2.85	2.28	2.47	.013	.00	.00	PIPE

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 9-2018 Time: 9:58: 4

Heritage Trails Storm Drain
Storm Drain B Pond to Pond 10
File: HT-SD-B-E.WSW.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1913.000	5145.911	2.982	5148.893	201.26	20.03	6.23	5155.12	.00	3.85	3.48	4.000	.000	.00	1 .0
20.865	.0327					.0234	.49	2.98	2.08	2.65	.013	.00	.00	PIPE
1933.865	5146.592	3.043	5149.635	201.26	19.62	5.98	5155.61	.00	3.85	3.41	4.000	.000	.00	1 .0
35.875	.0327					.0217	.78	3.04	1.99	2.65	.013	.00	.00	PIPE
1969.740	5147.765	3.194	5150.959	201.26	18.71	5.43	5156.39	.00	3.85	3.21	4.000	.000	.00	1 .0
24.901	.0327					.0197	.49	3.19	1.80	2.65	.013	.00	.00	PIPE
1994.642	5148.578	3.365	5151.943	201.26	17.84	4.94	5156.88	.00	3.85	2.92	4.000	.000	.00	1 .0
16.953	.0327					.0181	.31	3.37	1.60	2.65	.013	.00	.00	PIPE
2011.594	5149.132	3.567	5152.699	201.26	17.01	4.49	5157.19	.00	3.85	2.49	4.000	.000	.00	1 .0
8.206	.0327					.0173	.14	3.57	1.37	2.65	.013	.00	.00	PIPE
2019.800	5149.400	3.850	5153.250	201.26	16.21	4.08	5157.33	.00	3.85	1.52	4.000	.000	.00	1 .0
JUNCT STR	.0300					.0147	.09	3.85	1.00		.013	.00	.00	PIPE
2025.800	5149.580	6.493	5156.073	159.50	10.03	1.56	5157.63	.00	3.69	.00	4.500	.000	.00	1 .0
44.900	.0094					.0066	.30	6.49	.00	3.15	.013	.00	.00	PIPE
2070.700	5150.000	6.782	5156.782	159.50	10.03	1.56	5158.34	.00	3.69	.00	4.500	.000	.00	1 .0
197.500	.0101					.0066	1.30	6.78	.00	3.06	.013	.00	.00	PIPE
2268.200	5152.000	6.262	5158.262	159.50	10.03	1.56	5159.82	.00	3.69	.00	4.500	.000	.00	1 .0
89.200	.0101					.0066	.59	6.26	.00	3.07	.013	.00	.00	PIPE

1B

2B

3B

Heritage Trails Storm Drain
Storm Drain B Pond to Pond 10
File: HT-SD-B-E.WSW.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
2357.400	5152.900	6.491	5159.391	159.50	12.69	2.50	5161.89	.00	3.66	.00	4.000	.000	.00	1 .0
79.953	.0263					.0123	.99	6.49	.00	2.43	.013	.00	.00	PIPE
2437.353	5155.005	5.537	5160.542	159.50	12.69	2.50	5163.04	.00	3.66	.00	4.000	.000	.00	1 .0
HYDRAULIC JUMP														
2437.353	5155.005	2.429	5157.434	159.50	19.97	6.19	5163.63	.00	3.66	3.91	4.000	.000	.00	1 .0
17.520	.0263					.0263	.46	2.43	2.46	2.43	.013	.00	.00	PIPE
2454.873	5155.467	2.429	5157.896	159.50	19.97	6.19	5164.09	.00	3.66	3.91	4.000	.000	.00	1 .0
308.827	.0263					.0254	7.83	2.43	2.46	2.43	.013	.00	.00	PIPE
2763.700	5163.600	2.493	5166.093	159.50	19.37	5.83	5171.92	.00	3.66	3.88	4.000	.000	.00	1 .0
104.400	.0263					.0234	2.44	2.49	2.34	2.43	.013	.00	.00	PIPE
2868.100	5166.350	2.567	5168.917	159.50	18.72	5.44	5174.36	.00	3.66	3.84	4.000	.000	.00	1 .0
38.700	.0264					.0218	.84	2.57	2.21	2.43	.013	.00	.00	PIPE
2906.800	5167.370	2.614	5169.984	159.50	18.33	5.22	5175.20	.00	3.66	3.81	4.000	.000	.00	1 .0
21.976	.0267					.0208	.46	2.61	2.14	2.42	.013	.00	.00	PIPE
2928.776	5167.956	2.651	5170.606	159.50	18.04	5.05	5175.66	.00	3.66	3.78	4.000	.000	.00	1 .0
46.433	.0267					.0193	.89	2.65	2.08	2.42	.013	.00	.00	PIPE
2975.209	5169.193	2.767	5171.960	159.50	17.20	4.59	5176.55	.00	3.66	3.69	4.000	.000	.00	1 .0
30.955	.0267					.0172	.53	2.77	1.91	2.42	.013	.00	.00	PIPE

4B

5B

6B

7B

Heritage Trails Storm Drain
Storm Drain B Pond to Pond 10
File: HT-SD-B-E.WSW.WSW

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3006.164	5170.018	2.891	5172.909	159.50	16.40	4.17	5177.08	.00	3.66	3.58	4.000	.000	.00	1 .0
21.655	.0267					.0154	.33	2.89	1.75	2.42	.013	.00	.00	PIPE
3027.819	5170.595	3.026	5173.621	159.50	15.63	3.80	5177.42	.00	3.66	3.43	4.000	.000	.00	1 .0
15.181	.0267					.0138	.21	3.03	1.60	2.42	.013	.00	.00	PIPE
3043.000	5171.000	3.176	5174.176	159.50	14.91	3.45	5177.63	.00	3.66	3.24	4.000	.000	.00	1 .0
24.110	.0161					.0128	.31	3.18	1.44	2.90	.013	.00	.00	PIPE
3067.110	5171.388	3.258	5174.646	159.50	14.55	3.29	5177.93	.00	3.66	3.11	4.000	.000	.00	1 .0
28.358	.0161					.0119	.34	3.26	1.37	2.90	.013	.00	.00	PIPE
3095.468	5171.845	3.439	5175.284	159.50	13.87	2.99	5178.27	.00	3.66	2.78	4.000	.000	.00	1 .0
9.632	.0161					.0111	.11	3.44	1.20	2.90	.013	.00	.00	PIPE
3105.100	5172.000	3.663	5175.664	159.50	13.23	2.72	5178.38	.00	3.66	2.22	4.000	.000	.00	1 .0

8B

Table 3

Heritage Trails Subdivision							
WSPGW - Storm Drain Analysis							
Storm Drain "C"							
Manhole # - WSPGW Station ID							
Manhole ID	WSPGW Station	Rim Estimate	WSEL	Manhole ID	WSPGW Station	Rim Estimate	WSEL
1E	1207.1	145.9	142.7	2C	1063.8	54	48.67
	1217.1						
SD Size	78"			SD Size	48"		
2E	1407.4	147.2	146.2	3C	1128.2	54.4	49.35
	1417.4				1134.2		
SD Size	78"			SD Size	48"		
3E	1594.4	148.7	147.1	4C	1166.2	54.6	49.41
					1172.2		
SD Size	78"			SD Size	42"		
57E	1778.9	51.52	150.7	5C	1209.7	54.8	50.82
	1786.9				1215.7		
SD Size	72"			SD Size	42"		
1C	1814.3	152	150	6C	1425.2	56.7	51.49
	1820.3				1431.2		
SD Size	48"			SD Size	36"		
OUTFALL	1904.7	155	150.54	7C	1683	57.9	53.8
					1687		
To First Flush Pond				SD Size	36"		
				8C	1725.6	58.9	54.01
				SD Size	36"		
				9C	1926.9	59.6	54.91
				SD Size	36"		
				10C	1965.2	60.5	55.86
					1969.2		
				SD Size	24"		
				11C	2021.2	58.5	57.1
					2025.2		
				SD Size	24"		
				12C	2203.2	59	57.8
				SD Size	24"		
				13C	2281.3	61.5	58.11

Upstream Direction

Upstream Direction

F:/projects/17046/Manhole ID Table 17046-STORMDRAIN C

```
T1 Heritage Trails Storm Drain                                                  0
T2 Outfall Pond 10 to SD C POND
T3 File: HT-GRASS POND.WSW
SO   1000.0005134.000  1                          5137.310
TS   1008.0005134.100  2       .014                                .000
JX   1008.1005134.150  3       .013
R    1207.1005135.100  3       .013                                .000     .000 1
JX   1217.1005135.200  6  4  5.013   18.380   18.3805141.1005141.100-45.0 90.0     .000
R    1407.4005136.500  6       .013                                .000     .000 1
JX   1417.4005136.600  8  7    .013  102.400          5140.370          90.0          .000
R    1594.4005137.000  8       .013                                .000  17.000 1
R    1778.9005138.080  8       .013                                .000 -17.000 1
JX   1786.9005138.180 10  9    .013  213.560          5140.600         -90.0          .000
R    1814.3005138.530 10       .013                                .000  50.000 1
JX   1820.3005140.530 11       .013
R    1904.7005142.000 11       .013                                .000     .000 1
SH   1904.7005142.000 11                          5144.750
CD   1  2   0     .000   7.500   13.000  .000  .000  -.01
CD   2  2   0     .000   7.500    7.500  .000  .000   .00
CD   3  4   1     .000   6.500     .000  .000  .000   .00
CD   4  4   1     .000   2.000     .000  .000  .000   .00
CD   5  4   1     .000   2.000     .000  .000  .000   .00
CD   6  4   1     .000   6.500     .000  .000  .000   .00
CD   7  4   1     .000   3.000     .000  .000  .000   .00
CD   8  4   1     .000   6.500     .000  .000  .000   .00
CD   9  4   1     .000   4.000     .000  .000  .000   .00
CD  10  4   1     .000   6.000     .000  .000  .000   .00
CD  11  4   1     .000   4.000     .000  .000  .000   .00
Q           107.810   .0
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Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 7-2018 Time: 9:26:12

Heritage Trails Storm Drain
Outfall Pond 10 to SD C POND
File: HT-GRASS POND.WSW

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT) / SF Ave	Water Elev / HF	Q (CFS) / SE Dpth	Vel (FPS) / Froude N	Vel Head / Norm Dp	Energy Grd.El. / "N"	Super Elev / X-Fall	Critical Depth / ZR	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip / Type Ch
1000.000	5134.000	1.646	5135.646	460.53	21.53	7.20	5142.85	.00	3.39	13.00	7.500	13.000	.00	0 .0
TRANS STR	.0125					.0230	.18	1.65	2.96		.014	.00	.00	RECTANG
1008.000	5134.100	3.095	5137.195	460.53	19.84	6.11	5143.31	.00	4.89	7.50	7.500	7.500	.00	0 .0
JUNCT STR	.4982					.0110	.00	3.10	1.99		.013	.00	.00	RECTANG
---------- WARNING - Junction Analysis - Change in Channel Type ----------														
1008.100	5134.150	5.656	5139.806	460.53	15.02	3.51	5143.31	.00	5.66	4.37	6.500	.000	.00	1 .0
31.521	.0048					.0069	.22	5.66	1.00	6.50	.013	.00	.00	PIPE
1039.621	5134.300	6.040	5140.340	460.53	14.33	3.19	5143.53	.00	5.66	3.33	6.500	.000	.00	1 .0
115.253	.0048					.0071	.81	6.04	.81	6.50	.013	.00	.00	PIPE
1154.874	5134.851	6.500	5141.351	460.53	13.88	2.99	5144.34	.00	5.66	.00	6.500	.000	.00	1 .0
52.226	.0048					.0076	.40	6.50	.00	6.50	.013	.00	.00	PIPE
1207.100	5135.100	6.693	5141.793	460.53	13.88	2.99	5144.78	.00	5.66	.00	6.500	.000	.00	1 .0
JUNCT STR	.0100					.0071	.07	6.69	.00		.013	.00	.00	PIPE
1217.100	5135.200	7.510	5142.709	423.77	12.77	2.53	5145.24	.00	5.47	.00	6.500	.000	.00	1 .0
190.300	.0068					.0065	1.24	7.51	.00	5.20	.013	.00	.00	PIPE
1407.400	5136.500	7.579	5144.080	423.77	12.77	2.53	5146.61	.00	5.47	.00	6.500	.000	.00	1 .0
JUNCT STR	.0100					.0051	.05	7.58	.00		.013	.00	.00	PIPE

1E

2E

Heritage Trails Storm Drain
Outfall Pond 10 to SD C POND
File: HT-GRASS POND.WSW

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1417.400	5136.600	9.683	5146.283	321.37	9.68	1.46	5147.74	.00	4.81	.00	6.500	.000	.00	1 .0
177.000	.0023					.0038	.67	9.68	.00	6.50	.013	.00	.00	PIPE
1594.400	5137.000	10.102	5147.103	321.37	9.68	1.46	5148.56	.00	4.81	.00	6.500	.000	.00	1 .0
184.500	.0059					.0038	.69	10.10	.00	4.40	.013	.00	.00	PIPE
1778.900	5138.080	9.870	5147.950	321.37	9.68	1.46	5149.41	.00	4.81	.00	6.500	.000	.00	1 .0
JUNCT STR	.0125					.0022	.02	9.87	.00		.013	.00	.00	PIPE
1786.900	5138.180	12.518	5150.698	107.81	3.81	.23	5150.92	.00	2.80	.00	6.000	.000	.00	1 .0
27.400	.0128					.0006	.02	12.52	.00	1.94	.013	.00	.00	PIPE
1814.300	5138.530	12.235	5150.765	107.81	3.81	.23	5150.99	.00	2.80	.00	6.000	.000	.00	1 .0
JUNCT STR	.3333					.0031	.02	12.23	.00		.013	.00	.00	PIPE
1820.300	5140.530	9.472	5150.002	107.81	8.58	1.14	5151.15	.00	3.14	.00	4.000	.000	.00	1 .0
84.400	.0174					.0056	.48	9.47	.00	2.16	.013	.00	.00	PIPE
1904.700	5142.000	8.535	5150.535	107.81	8.58	1.14	5151.68	.00	3.14	.00	4.000	.000	.00	1 .0

3E

57E

1C

OUTFALL

```
T1 Heritage Trails Unit 1 Storm Drain                                                0
T2 Grass Mountain- Winsor
T3 Outfall to First Flush Pond
SO   1000.0005142.000  1                          5145.000
R    1063.8005146.000  1       .013                                  .000  55.000 1
R    1128.2005146.440  1       .013                                  .000    .000 1
JX   1134.2005146.540  4  2  3.013    4.900    4.9005149.1005149.100-10.0 45.0    .000
R    1166.2005146.730  4       .013                                  .000    .000 1
JX   1172.2005147.230  6  5    .013   11.600         5149.330        -90.0          .000
R    1209.7005147.450  6       .013                                  .000    .000 1
JX   1215.7005147.550  9  7  8.013    4.200    4.2005149.6905149.690-10.0 45.0    .000
R    1425.2005148.630  9       .013                                  .000    .000 1
JX   1431.2005149.130 11 10    .013   10.000         5151.000        -90.0          .000
R    1683.0005150.400 11       .013                                  .000    .000 1
JX   1687.0005150.500 13 12    .013    9.200         5152.640        -90.0          .000
R    1725.6005150.700 13       .013                                  .000  16.000 1
R    1926.9005151.800 13       .013                                  .000 -16.000 1
R    1965.2005152.100 13       .013                                  .000  16.000 1
JX   1969.2005153.100 16 14 15.013   10.400   11.3005154.5305154.530-90.0-45.0    .000
R    2021.2005153.380 16       .013                                  .000    .000 1
JX   2025.2005153.480 19 17 18.013    4.000    4.0005154.8705154.870-10.0 45.0    .000
R    2203.2005154.400 19       .013                                  .000 -90.000 1
R    2281.3005154.790 19       .013                                  .000  45.000 1
SH   2281.3005154.790 19                          5156.290
CD   1  4   1    .000   4.000     .000  .000  .000   .00
CD   2  4   1    .000   1.500     .000  .000  .000   .00
CD   3  4   1    .000   1.500     .000  .000  .000   .00
CD   4  4   1    .000   4.000     .000  .000  .000   .00
CD   5  4   1    .000   1.500     .000  .000  .000   .00
CD   6  4   1    .000   3.500     .000  .000  .000   .00
CD   7  4   1    .000   1.500     .000  .000  .000   .00
CD   8  4   1    .000   1.500     .000  .000  .000   .00
CD   9  4   1    .000   3.500     .000  .000  .000   .00
CD  10  4   1    .000   1.500     .000  .000  .000   .00
CD  11  4   1    .000   3.000     .000  .000  .000   .00
CD  12  4   1    .000   1.500     .000  .000  .000   .00
CD  13  4   1    .000   3.000     .000  .000  .000   .00
CD  14  4   1    .000   1.500     .000  .000  .000   .00
CD  15  4   1    .000   1.500     .000  .000  .000   .00
CD  16  4   1    .000   2.000     .000  .000  .000   .00
CD  17  4   1    .000   1.500     .000  .000  .000   .00
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  19  4   1    .000   2.000     .000  .000  .000   .00
Q            13.200   .0
```

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 2-2018 Time:10:50:27

Heritage Trails Unit 1 Storm Drain
Grass Mountain- Winsor
Outfall to First Flush Pond

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT) / SF Ave	Water Elev / HF	Q (CFS) / SE Dpth	Vel (FPS) / Froude N	Vel Head / Norm Dp	Energy Grd.El. / "N"	Super Elev / X-Fall	Critical Depth / ZR	Flow Top Width / Type Ch	Height/ Dia.-FT / No Wth Prs/Pip	Base Wt or I.D. /	ZL /
1000.000	5142.000	1.664	5143.664	91.90	18.58	5.36	5149.02	.00	2.91	3.94	4.000	.000	.00
5.209	.0627					.0304	.16	1.66	2.92	1.38	.013	.00	.00
1005.209	5142.327	1.687	5144.014	91.90	18.23	5.16	5149.18	.00	2.91	3.95	4.000	.000	.00
11.668	.0627					.0279	.33	1.69	2.85	1.38	.013	.00	.00
1016.877	5143.058	1.750	5144.808	91.90	17.39	4.69	5149.50	.00	2.91	3.97	4.000	.000	.00
9.493	.0627					.0245	.23	1.75	2.65	1.38	.013	.00	.00
1026.370	5143.653	1.814	5145.467	91.90	16.58	4.27	5149.73	.00	2.91	3.98	4.000	.000	.00
7.770	.0627					.0215	.17	1.81	2.48	1.38	.013	.00	.00
1034.140	5144.141	1.882	5146.023	91.90	15.81	3.88	5149.90	.00	2.91	3.99	4.000	.000	.00
6.436	.0627					.0189	.12	1.88	2.31	1.38	.013	.00	.00
1040.576	5144.544	1.953	5146.497	91.90	15.07	3.53	5150.02	.00	2.91	4.00	4.000	.000	.00
5.336	.0627					.0167	.09	1.95	2.15	1.38	.013	.00	.00
1045.911	5144.878	2.028	5146.907	91.90	14.37	3.21	5150.11	.00	2.91	4.00	4.000	.000	.00
4.446	.0627					.0147	.07	2.03	2.00	1.38	.013	.00	.00
1050.357	5145.157	2.106	5147.263	91.90	13.70	2.91	5150.18	.00	2.91	3.99	4.000	.000	.00
3.677	.0627					.0129	.05	2.11	1.86	1.38	.013	.00	.00
1054.034	5145.388	2.188	5147.576	91.90	13.06	2.65	5150.23	.00	2.91	3.98	4.000	.000	.00
3.020	.0627					.0114	.03	2.19	1.73	1.38	.013	.00	.00

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 2-2018 Time:10:50:27

Heritage Trails Unit 1 Storm Drain
Grass Mountain- Winsor
Outfall to First Flush Pond

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1057.055	5145.577	2.274	5147.851	91.90	12.45	2.41	5150.26	.00	2.91	3.96	4.000	.000	.00	1 .0
2.414	.0627					.0101	.02	2.27	1.61	1.38	.013	.00	.00	PIPE
1059.468	5145.729	2.366	5148.095	91.90	11.87	2.19	5150.28	.00	2.91	3.93	4.000	.000	.00	1 .0
1.917	.0627					.0089	.02	2.37	1.49	1.38	.013	.00	.00	PIPE
1061.385	5145.849	2.462	5148.311	91.90	11.32	1.99	5150.30	.00	2.91	3.89	4.000	.000	.00	1 .0
1.423	.0627					.0079	.01	2.46	1.38	1.38	.013	.00	.00	PIPE
1062.808	5145.938	2.565	5148.503	91.90	10.80	1.81	5150.31	.00	2.91	3.84	4.000	.000	.00	1 .0
.992	.0627					.0070	.01	2.57	1.28	1.38	.013	.00	.00	PIPE
1063.800	5146.000	2.674	5148.674	91.90	10.29	1.65	5150.32	.00	2.91	3.77	4.000	.000	.00	1 .0
54.939	.0068					.0063	.35	2.67	1.18	2.64	.013	.00	.00	PIPE
1118.739	5146.375	2.779	5149.155	91.90	9.86	1.51	5150.66	.00	2.91	3.68	4.000	.000	.00	1 .0
9.461	.0068					.0056	.05	2.78	1.09	2.64	.013	.00	.00	PIPE
1128.200	5146.440	2.906	5149.346	91.90	9.40	1.37	5150.72	.00	2.91	3.57	4.000	.000	.00	1 .0
JUNCT STR	.0167							2.91	1.00		.013	.00	.00	PIPE
1134.200	5146.540	2.596	5149.136	82.10	9.51	1.41	5150.54	.00	2.75	3.82	4.000	.000	.00	1 .0
32.000	.0059					.0055	.18	2.60	1.11	2.57	.013	.00	.00	PIPE
1166.200	5146.730	2.682	5149.413	82.10	9.16	1.30	5150.72	.00	2.75	3.76	4.000	.000	.00	1 .0
JUNCT STR	.0833					.0056	.03	2.68	1.05		.013	.00	.00	PIPE

2C

3C

4C

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 2-2018 Time:10:50:27

Heritage Trails Unit 1 Storm Drain
Grass Mountain- Winsor
Outfall to First Flush Pond

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1172.200	5147.230	2.631	5149.861	70.50	9.09	1.28	5151.14	.00	2.63	3.02	3.500	.000	.00	1 .0
.000	.0059					.0059	.00	2.63	1.00	2.63	.013	.00	.00	PIPE
1172.200	5147.230	2.631	5149.861	70.50	9.09	1.28	5151.14	.00	2.63	3.02	3.500	.000	.00	1 .0
37.500	.0059					.0058	.22	2.63	1.00	2.63	.013	.00	.00	PIPE
1209.700	5147.450	2.631	5150.082	70.50	9.09	1.28	5151.36	.00	2.63	3.02	3.500	.000	.00	1 .0
JUNCT STR	.0166					.0046	.03	2.63	1.00		.013	.00	.00	PIPE
1215.700	5147.550	3.266	5150.815	62.10	6.65	.69	5151.50	.00	2.47	1.75	3.500	.000	.00	1 .0
80.360	.0052					.0034	.27	3.27	.51	2.50	.013	.00	.00	PIPE
1296.060	5147.964	3.054	5151.018	62.10	6.97	.75	5151.77	.00	2.47	2.33	3.500	.000	.00	1 .0
57.999	.0052					.0036	.21	3.05	.63	2.50	.013	.00	.00	PIPE
1354.059	5148.263	2.889	5151.152	62.10	7.31	.83	5151.98	.00	2.47	2.66	3.500	.000	.00	1 .0
49.959	.0052					.0040	.20	2.89	.72	2.50	.013	.00	.00	PIPE
1404.018	5148.520	2.746	5151.266	62.10	7.67	.91	5152.18	.00	2.47	2.88	3.500	.000	.00	1 .0
21.182	.0052					.0042	.09	2.75	.81	2.50	.013	.00	.00	PIPE
1425.200	5148.630	2.686	5151.316	62.10	7.84	.95	5152.27	.00	2.47	2.96	3.500	.000	.00	1 .0
JUNCT STR	.0833					.0055	.03	2.69	.84		.013	.00	.00	PIPE
1431.200	5149.130	2.363	5151.493	52.10	8.72	1.18	5152.67	.00	2.35	2.45	3.000	.000	.00	1 .0
12.647	.0050					.0063	.08	2.36	.99	3.00	.013	.00	.00	PIPE

5C

6C

Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 2-2018 Time:10:50:27

Heritage Trails Unit 1 Storm Drain
Grass Mountain- Winsor
Outfall to First Flush Pond

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1443.847	5149.194	2.486	5151.680	52.10	8.32	1.07	5152.75	.00	2.35	2.26	3.000	.000	.00	1 .0
65.881	.0050					.0057	.38	2.49	.88	3.00	.013	.00	.00	PIPE
1509.728	5149.526	2.630	5152.156	52.10	7.93	.98	5153.13	.00	2.35	1.97	3.000	.000	.00	1 .0
173.272	.0050					.0054	.94	2.63	.77	3.00	.013	.00	.00	PIPE
1683.000	5150.400	2.759	5153.159	52.10	7.66	.91	5154.07	.00	2.35	1.63	3.000	.000	.00	1 .0
JUNCT STR	.0250					.0047	.02	2.76	.66		.013	.00	.00	PIPE
1687.000	5150.500	3.299	5153.799	42.90	6.07	.57	5154.37	.00	2.13	.00	3.000	.000	.00	1 .0
38.600	.0052					.0041	.16	3.30	.00	2.21	.013	.00	.00	PIPE
1725.600	5150.700	3.317	5154.017	42.90	6.07	.57	5154.59	.00	2.13	.00	3.000	.000	.00	1 .0
201.300	.0055					.0041	.83	3.32	.00	2.16	.013	.00	.00	PIPE
1926.900	5151.800	3.109	5154.909	42.90	6.07	.57	5155.48	.00	2.13	.00	3.000	.000	.00	1 .0
38.300	.0078					.0041	.16	3.11	.00	1.90	.013	.00	.00	PIPE
1965.200	5152.100	3.026	5155.126	42.90	6.07	.57	5155.70	.00	2.13	.00	3.000	.000	.00	1 .0
JUNCT STR	.2500					.0065	.03	3.03	.00		.013	.00	.00	PIPE
1969.200	5153.100	2.765	5155.865	21.20	6.75	.71	5156.57	.00	1.65	.00	2.000	.000	.00	1 .0
52.000	.0054					.0088	.46	2.77	.00	2.00	.013	.00	.00	PIPE
2021.200	5153.380	2.977	5156.357	21.20	6.75	.71	5157.06	.00	1.65	.00	2.000	.000	.00	1 .0
JUNCT STR	.0250					.0061	.02	2.98	.00		.013	.00	.00	PIPE

7C

8C

9C

10C

11C

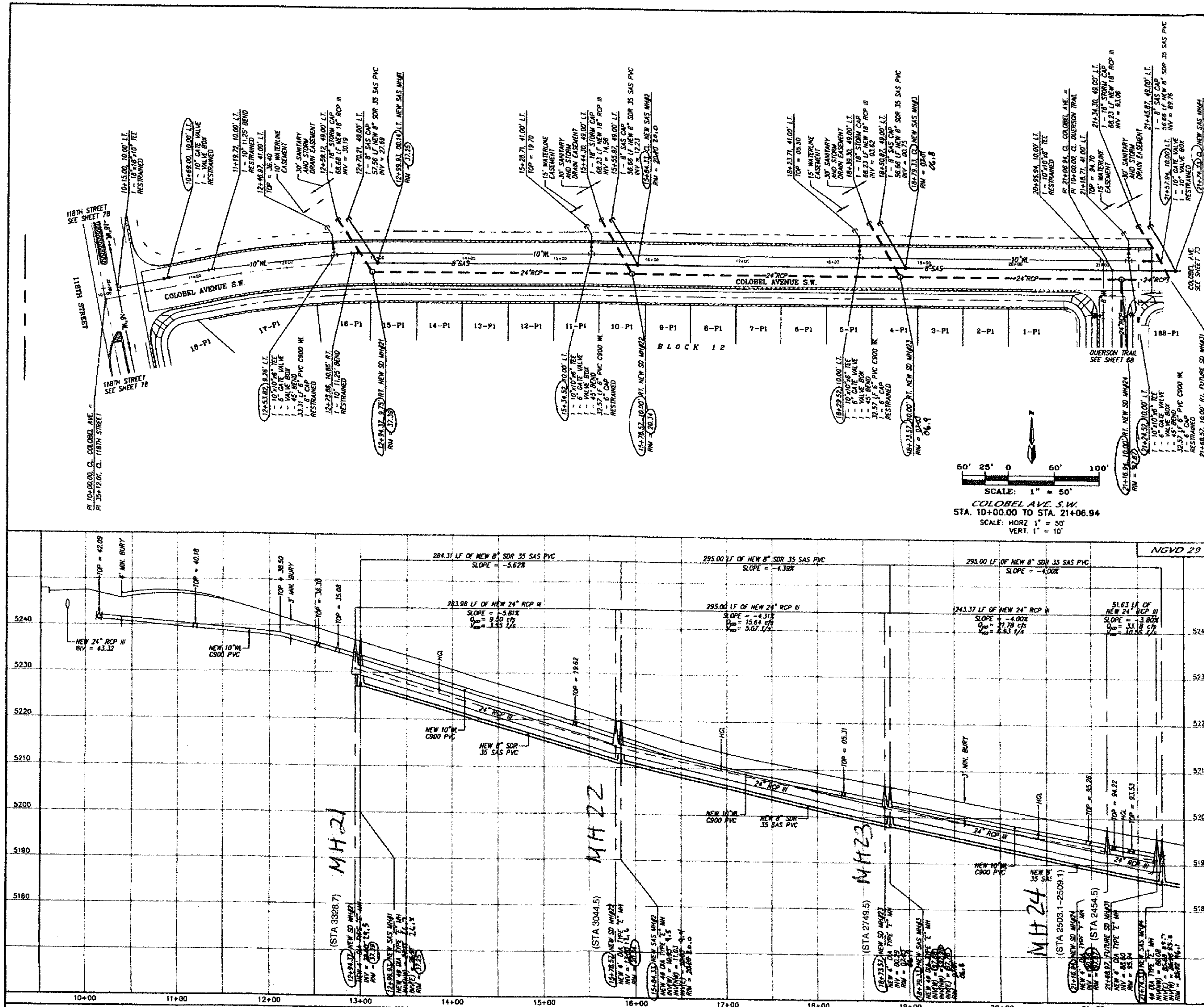
Program Package Serial Number: 1454

WATER SURFACE PROFILE LISTING Date: 3- 2-2018 Time:10:50:27

Heritage Trails Unit 1 Storm Drain
Grass Mountain- Winsor
Outfall to First Flush Pond

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT) / SF Ave	Water Elev / HF	Q (CFS) / SE Dpth	Vel (FPS) / Froude N	Vel Head / Norm Dp	Energy Grd.El. / "N"	Super Elev / X-Fall	Critical Depth / ZR	Flow Top Width / Type Ch	Height/ Dia.-FT /	Base Wt or I.D. /	ZL /	No Wth Prs/Pip /
2025.200	5153.480	3.616	5157.096	13.20	4.20	.27	5157.37	.00	1.31	.00	2.000	.000	.00	1 .0
178.000	.0052					.0034	.61	3.62	.00	1.37	.013	.00	.00	PIPE
12C 2203.200	5154.400	3.397	5157.797	13.20	4.20	.27	5158.07	.00	1.31	.00	2.000	.000	.00	1 .0
78.100	.0050					.0034	.27	3.40	.00	1.39	.013	.00	.00	PIPE
13C 2281.300	5154.790	3.328	5158.118	13.20	4.20	.27	5158.39	.00	1.31	.00	2.000	.000	.00	1 .0

RECORD DRAWINGS



NOTES

1. ALL STATIONING IS CENTERLINE STATIONING.

RESTRAINED JOINT LENGTH FOR BENDS, VALVES, DEAD ENDS (FT.)					
PIPE SIZE	90°	45°	22.5°	11.25°	VALVE
6"	17'	7'	-	-	46'
10"	-	11'	5'	3'	72'

LENGTH OF RESTRAINED PIPE ON EACH SIDE OF THE BEND. RESTRAIN BRANCH AT FITTING ONLY MINIMUM ATTACHED PIPE LENGTH, RUN SIDE OF TEE: 10.00 FEET.

RESTRAINED JOINT LENGTHS FOR REDUCERS (FT.)		
PIPE SIZE	LARGE SIDE	SMALL SIDE
10" X 6"	44'	-

RESTRAINED JOINT LENGTH FOR TEES (FT.)		
PIPE SIZE	RUN	BRANCH
10"x10"x10"	15'	5'
10"x10"x6"	6'	1'
6"x6"x6"	10'	2'

AS BUILT INFORMATION

CONTRACTOR Franchini
WORK STAKED BY Cartesian Surveys Inc DATE
INSPECTOR'S ACCEPTANCE BY MGA DATE
FIELD VERIFICATION BY Cartesian Surveys Inc DATE
DRAWINGS CORRECTED BY CARTESIAN DATE

MICRO-FILM INFORMATION

RECORDED BY DATE

NO.

BENCH MARKS

STATION "3-P10" IS LOCATED 5.9 MI. SW OF DOWNTOWN ALBUQUERQUE TO REACH STATION FROM INT. OF COORS AND DENNIS CHAVEZ BLVD. (FORMERLY RIO BRAVO), GO S. ON COORS BLVD. 0.82 MI. TO THE STATION WHICH IS ON AN EARTHEN BERM 162.2' WEST OF THE CENTERLINE OF COORS BLVD. THE STATION IS A STANDARD ACS 3 1/4" ALUMINUM CAP RIVITTED TO A PIPE 0.25' ABOVE THE GROUND AND IS STAMPED "3-P10, 1998".
X=360733.56, Y=1462437.48 (NAD 27), ELEV=4935.735 (SLD 29)

SURVEY INFORMATION

FIELD NOTES		
NO.	BY	DATE

ENGINEER'S SEAL

CERTIFICATE OF SUBSTANTIAL COMPLIANCE ON PLANS

I, Gregory J. Krenk, NMPE 11929, of the firm Mark Goodwin & Associates, P.A., a Registered Professional Engineer in the State of New Mexico, do hereby certify, to the best of my knowledge and belief that the infrastructure installed as part of this project has been inspected by me or by a qualified person under my direct supervision, and has been constructed in accordance with the plans and specifications approved by the City Engineer and that the original design intent of the approved plans has been met, except as noted by me on the as-built construction drawings. This Certification is based on site inspections by me or personnel under my direction and survey information provided by Wm. Plotner, Jr. NMPS number 14271.

Gregory J. Krenk, NMPE 11929 12-27-06

I, Gregory J. Krenk, certify that the [illegible] identical to the original reproducible APPROVED FOR CONSTRUCTION [illegible] signed by me on 5-18 2005

Certification

THE CHANGES SHOWN HEREON ARE BASED UPON A FIELD SURVEY CONDUCTED BY ME OR UNDER MY SUPERVISION AND REFLECT THE LOCATIONS (VERTICALLY AND HORIZONTALLY) TO THE BEST OF MY KNOWLEDGE AND BELIEF.

dmg MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200, FAX (505) 797-9539

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY	GJK	DATE	06/04
DRAWN BY	ACH	DATE	06/04
CHECKED BY	DMG	DATE	06/04

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: ANDERSON HEIGHTS - UNIT 1
COLOBEL AVE. S.W.
UTILITY IMPROVEMENTS

DESIGN REVIEW COMMITTEE | CITY ENGINEER APPROVAL | MO./DAY/YR | MO./DAY/YR

MAY 26 2005
CITY ENGINEER

LAST DESIGN UPDATE

CITY PROJECT NO. 753981 | ZONE MAP NO. N-8/P-8 | SHEET 56 OF 83

A3080AH/PLANS/UNIT-1/UTILITIES/UP-1/04-13-05/ACH MJR

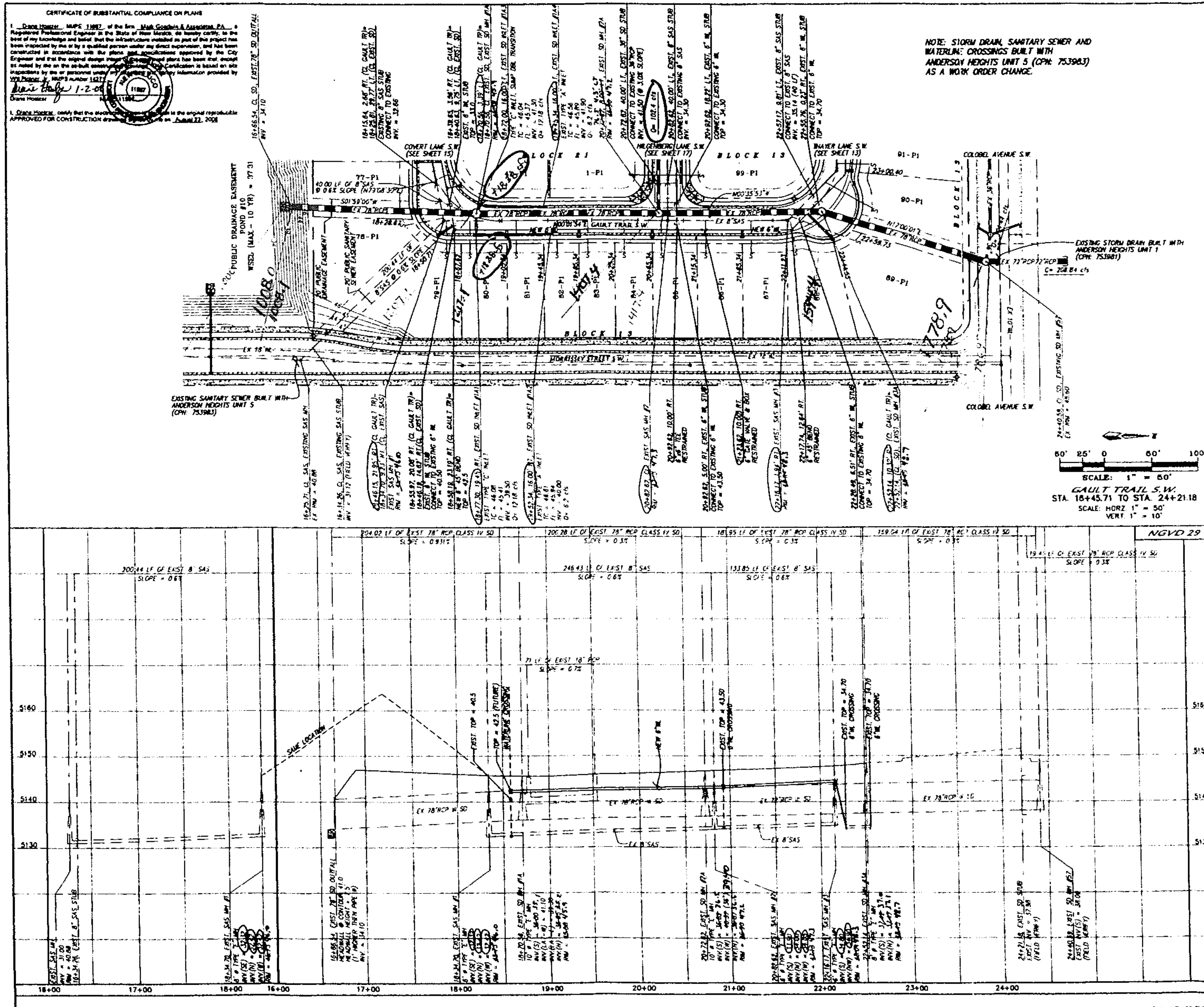
RECORD DRAWINGS

CERTIFICATE OF SUBSTANTIAL COMPLIANCE ON PLANS

I, Diane Hoelzer, NMPE 11997, of the firm Mark Goodwin & Associates, P.A., a Registered Professional Engineer in the State of New Mexico, do hereby certify, to the best of my knowledge and belief, that the infrastructure installed as part of this project has been inspected by me or by a qualified person under my direct supervision, and has been constructed in accordance with the plans and specifications approved by the City Engineer and that the original design intent of the approved plans has been met ... as noted by me on the as-built ... Certification is based on site inspections by me or personnel under my ... information provided by ... NMPS number ...

Diane Hoelzer 1-2-07

I, Diane Hoelzer, certify that the electronic ... is the original reproducible APPROVED FOR CONSTRUCTION drawings ... on August 22, 2006



NOTES

1. ALL STATIONING IS BASED ON GAULT TRAIL CENTERLINE.
2. ALL STORM DRAIN PIPE LENGTHS ARE BASED ON CENTERLINE OF MANHOLES.

Certification
THE CHANGES SHOWN HEREON ARE BASED UPON A FIELD SURVEY CONDUCTED BY ME OR UNDER MY SUPERVISION AND REFLECT THE LOCATIONS (VERTICALLY AND HORIZONTALLY) TO THE BEST OF MY KNOWLEDGE AND BELIEF.

GAULT TRAIL S.W. - ANDERSON HEIGHTS UNIT 3

STORM DRAIN SUMMARY TABLE

LOCATION		Q100	VELOCITY	UPSTREAM		DOWNSTREAM	
UPSTRM	DNSTRM	(cfs)	(fps)	GRD	HGL	GRD	HGL
MH#1A	OUTFALL	452	15.21	45.58	41.62	47.0	37.31
MH#2A	MH#1A	415	12.3	46.90	44.40	45.58	43.08
MH#3A	MH#2A	311	9.4	48.45	47.33	46.80	46.35
MH#57	MH#3A	311	9.4	48.60	48.14	48.45	47.33

EXISTING SANITARY SEWER SERVICES

BLOCK	LOT	STATION AT PUE	INV. ELEV. AT PUE	LENGTH AT PUE
13	78-P1	18+29.25	40.77	42.02
13	79-P1	18+60.97	40.66	35.03
13	85-P1	18+76.21	38.62	35.00
13	81-P1	19+15.34	38.67	35.00
13	82-P1	19+60.34	40.98	35.00
13	83-P1	19+95.34	41.23	35.00
13	84-P1	20+35.34	41.51	35.00
13	85-P1	20+75.34	41.79	35.00
13	86-P1	21+25.34	42.14	35.00
13	87-P1	21+75.34	42.49	35.00
13	88-P1	22+17.22	42.80	34.69
13	89-P1	22+56.22	43.44	75.46

RESTRAINED JOINT LENGTH FOR BENDS, VALVES, DEAD ENDS (FT.)

PIPE SIZE	90°	45°	22.5°	11.25°	VALVE
8"	17'	7'	3'	2'	46'

LENGTH OF RESTRAINED PIPE ON EACH SIDE OF THE BEND. RESTRAIN BRANCH AT FITTING ONLY MINIMUM ATTACHED PIPE LENGTH, RUN SIDE OF TEE: 10.00 FEET.

RESTRAINED JOINT LENGTH FOR TEES (FT.)

PIPE SIZE	RUN	BRANCH
6"x6"x6"	10'	2'

dmg MARK GOODWIN & ASSOCIATES, P.A. CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: ANDERSON HEIGHTS UNIT 3
GAULT TRAIL S.W.
UTILITY IMPROVEMENTS

SURVEY INFORMATION			BENCH MARKS	AS BUILT INFORMATION
FIELD NOTES			STATION "3-P10" IS LOCATED 5.9 MI. SW OF DOWNTOWN ALBUQUERQUE. TO REACH STATION FROM INT. OF COORS AND DENNIS CHAVEZ BLVD. (FORMERLY RIO BRAVO), GO S. ON COORS BLVD. 0.62 MI. TO THE STATION WHICH IS ON AN EARTHEN BERM 162.2' WEST OF THE CENTERLINE OF COORS BLVD. THE STATION IS A STANDARD ACS 3 1/4" ALUMINUM CAP RIVITTED TO A PIPE 0.25' ABOVE THE GROUND AND IS STAMPED "3-P10 1998". X=360733.56, Y=1482437.48 (NAD 27), ELEV=4935.735 (SLD 29)	CONTRACTOR; WORK STAKED BY Carlsmith Surveys Inc DATE; INSPECTOR'S ACCEPTANCE BY DATE; FIELD VERIFICATION BY Carlsmith Surveys Inc DATE; DRAWINGS CORRECTED BY DATE
NO.	BY	DATE		MICRO-FILM INFORMATION: RECORDED BY DATE; NO

ENGINEER'S SEAL: DIANE HOELZER, NEW MEXICO, 11997, LICENSED PROFESSIONAL ENGINEER, 8-23-06

NO.	DATE	REMARKS	BY
		REVISIONS	

DESIGN			
DESIGNED BY	DLH	DATE	05/06
DRAWN BY	DER	DATE	05/06
CHECKED BY	DMG	DATE	05/06

DESIGN REVIEW COMMITTEE | CITY ENGINEER APPROVAL | MO/DAY/YR | MO/DAY/YR
NOV 21 2006
CITY ENGINEER
LAST DESIGN UPDATE

CITY PROJECT NO. 753983 | ZONE MAP NO. N-8/P-8 | SHEET 16 OF 18

A3060AH/PLANS/UNIT-3/UTILITIES/UP-SD1.dwg/07-07-06/DER

RECORD DRAWINGS

CERTIFICATE OF SUBSTANTIAL COMPLIANCE ON PLANS

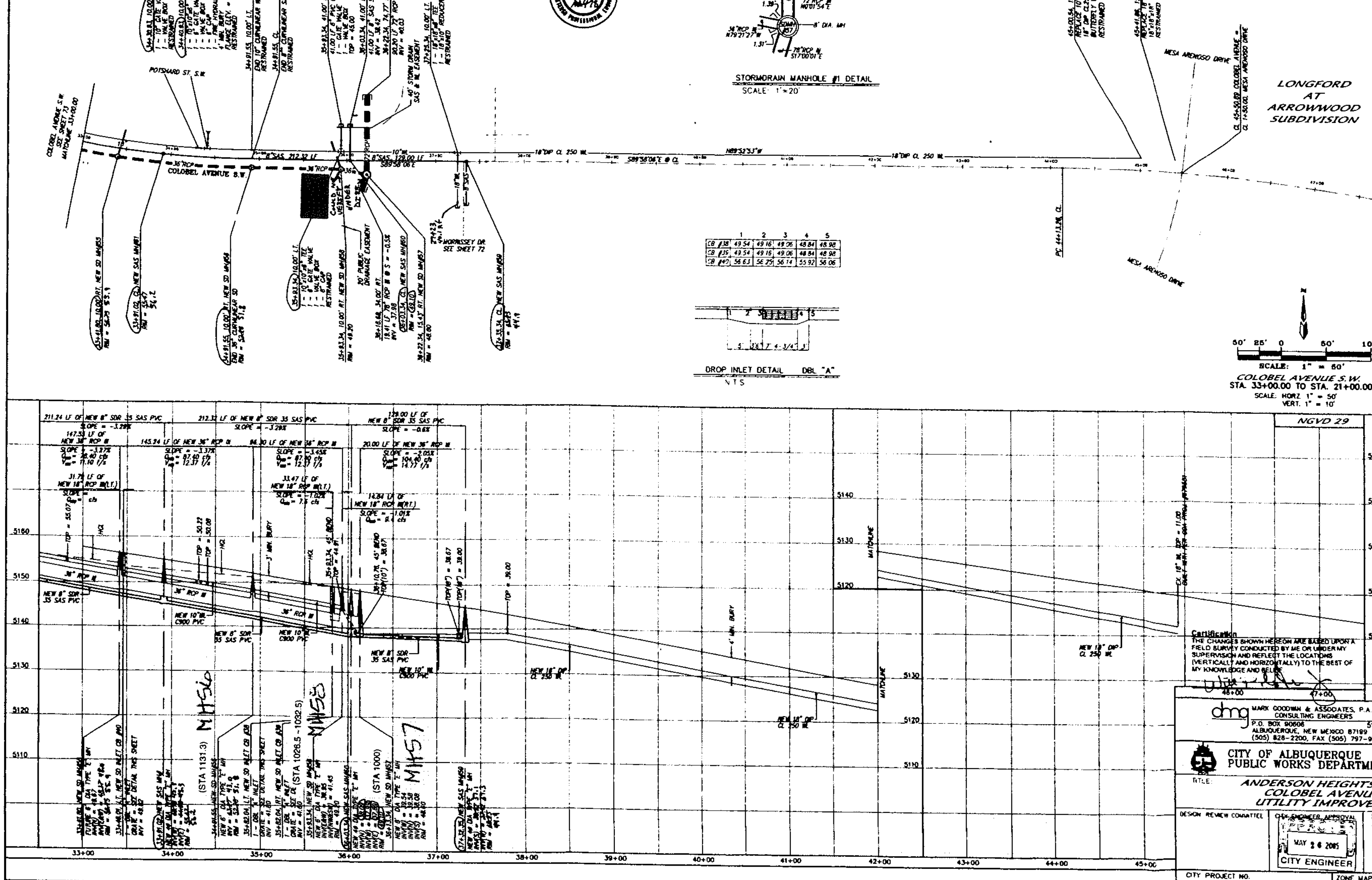
I, Gregory J. Krenik, NMPE 11929, of the firm Mark Goodwin & Associates, P.A., a Registered Professional Engineer in the State of New Mexico, do hereby certify, to the best of my knowledge and belief, that the infrastructure installed as part of this project has been inspected by me or by a qualified person under my direct supervision, and has been constructed in accordance with the plans and specifications approved by the City Engineer and that the original design intent of the approved plans has been met except as noted by me on the as-built construction drawings. This Certification is based on site inspections by me or personnel under my direction and survey information provided by Will Plotner Jr., NMPS number 14271.

12-27-06
Gregory J. Krenik NMPE 11929

I, Gregory J. Krenik, certify that this electronic version is identical to the original reproducible APPROVED FOR CONSTRUCTION drawings signed by me on 20 05

NOTES

1. ALL STATIONING IS CENTERLINE STATIONING.
2. EXISTING 10" WATERLINE STUB BUILT WITH PROJECT #479581.



	1	2	3	4	5
CB #38	49.54	49.16	49.06	48.84	48.98
CB #39	49.54	49.16	49.06	48.84	48.98
CB #40	56.63	56.25	56.14	55.92	56.06

Certification
THE CHANGES SHOWN HEREON ARE BASED UPON A FIELD SURVEY CONDUCTED BY ME OR UNDER MY SUPERVISION AND REFLECT THE LOCATIONS (VERTICALLY AND HORIZONTALLY) TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BENCH MARKS
STATION "3-P10" IS LOCATED 5.9 MI. SW OF DOWNTOWN ALBUQUERQUE. TO REACH STATION FROM INT. OF COORS AND DENNIS CHAVEZ BLVD. (FORMERLY RIO BRAVO), GO S. ON COORS BLVD. 0.62 MI. TO THE STATION WHICH IS ON AN EARTHEN BERM 162 FT. WEST OF THE CENTERLINE OF COORS BLVD. THE STATION IS A STANDARD ACS 3 1/4" ALUMINUM CAP RIVITED TO A PIPE 0.25' ABOVE THE GROUND AND IS STAMPED "3-P10, 1998".
X=380733.56, Y=1462437.48 (NAD 27), ELEV=4975.735 (SLD 29)

AS BUILT INFORMATION
CONTRACTOR: FRANKLIN'S
WORK STAKED BY: Cartesian Surveys Inc. DATE
INSPECTOR'S ACCEPTANCE BY: MGA DATE
FIELD VERIFICATION BY: Cartesian Surveys Inc. DATE 06
DRAWINGS CORRECTED BY: DATE

MICRO-FILM INFORMATION
RECORDED BY / DATE / NO.

SURVEY INFORMATION — FIELD NOTES: NO. / BY / DATE

ENGINEER'S SEAL

dmg — MARK GOODWIN & ASSOCIATES, P.A. CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: ANDERSON HEIGHTS - UNIT 1
COLOBEL AVENUE S.W.
UTILITY IMPROVEMENTS

NO	DATE	REMARKS	BY
		REVISIONS	

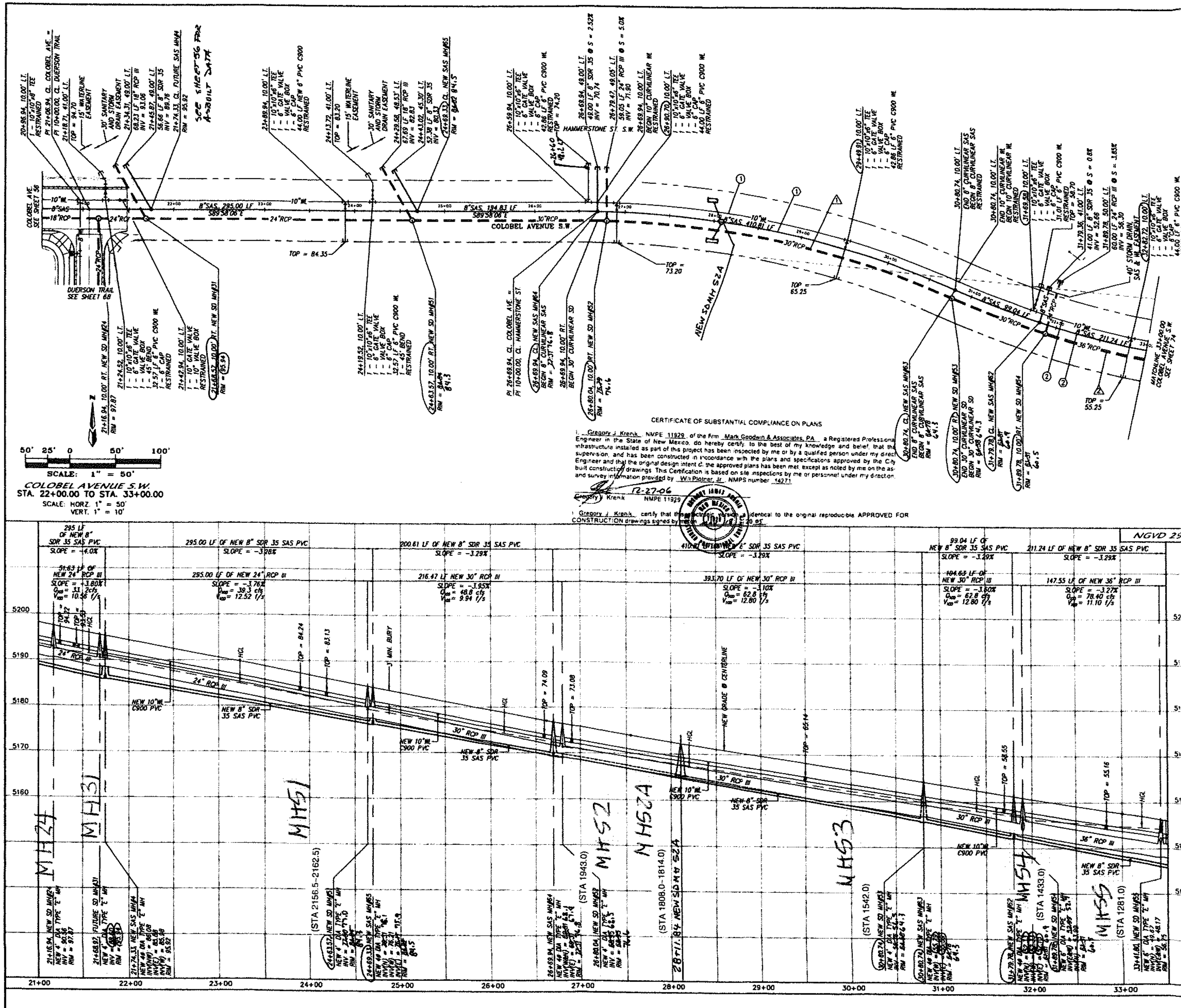
DESIGN			
DESIGNED BY	GJK	DATE	03/05
DRAWN BY	ACH	DATE	03/05
CHECKED BY	DMG	DATE	03/05

DESIGN REVIEW COMMITTEE — CITY ENGINEER APPROVAL — MO./DAY/YR. — MAY 26 2005 — CITY ENGINEER — LAST DESIGN UPDATE

CITY PROJECT NO. 753981 | ZONE MAP NO. N-8/P-8 | SHEET 74 OF 83

A03080AH\PLANS\UNIT-1\UTILITIES\UP-2A\05-18-05\ MJR ACH GJK

RECORD DRAWINGS



CERTIFICATE OF SUBSTANTIAL COMPLIANCE ON PLANS

I, Gregory J. Krenik, NMPE 11929, of the firm Mark Goodwin & Associates, PA, a Registered Professional Engineer in the State of New Mexico, do hereby certify, to the best of my knowledge and belief, that the infrastructure installed as part of this project has been inspected by me or by a qualified person under my direction and has been constructed in accordance with the plans and specifications approved by the City Engineer and that the original design intent of the approved plans has been met except as noted by me on the as-built construction drawings. This Certification is based on site inspections by me or personnel under my direction and survey information provided by Wm Plotner, Jr. NMPS number 14271.

12-27-06

Gregory Krenik NMPE 11929

I, Gregory J. Krenik, certify that these [illegible] identical to the original reproducible APPROVED FOR CONSTRUCTION drawings signed by [illegible] 20 05.

NOTES

1. ALL STATIONING IS CENTERLINE STATIONING.

CURVE DATA - DESCRIBES SANITARY SEWER

① Δ = 23°32'15", R = 1000.00', L = 410.81', T = 208.34'
② Δ = 17°46'40", R = 1000.00', L = 310.28', T = 156.40'

CURVE DATA - DESCRIBES WATERLINE

① Δ = 23°32'15", R = 1010.00', L = 414.91', T = 210.42'
② Δ = 23°32'15", R = 990.00', L = 406.70', T = 206.26'

CURVE DATA - DESCRIBES STORM DRAIN

△1 Δ = 22°36'41", R = 990.00', L = 390.70', T = 197.92'
△2 Δ = 23°32'15", R = 1010.00', L = 414.91', T = 210.42'

RESTRAINED JOINT LENGTH FOR BENDS, VALVES, DEAD ENDS (FT.)

PIPE SIZE	90°	45°	22.5°	11.25°	VALVE
6"	17'	7'	-	-	46'
10"	-	11'	5'	3'	72'

LENGTH OF RESTRAINED PIPE ON EACH SIDE OF THE BEND. RESTRAIN BRANCH AT FITTING ONLY MINIMUM ATTACHED PIPE LENGTH, RUN SIDE OF TEE: 10.00 FEET

RESTRAINED JOINT LENGTHS FOR REDUCERS (FT.)

PIPE SIZE	LARGE SIDE	SMALL SIDE
10" X 6"	44'	-

RESTRAINED JOINT LENGTH FOR TEES (FT.)

PIPE SIZE	RUN	BRANCH
10"x10"x10"	15'	5'
10"x10"x6"	6'	1'
6"x6"x6"	10'	2'

Certification
THE CHANGES SHOWN HEREON ARE BASED UPON A FIELD SURVEY CONDUCTED BY ME OR UNDER MY SUPERVISION AND REFLECT THE LOCATIONS (VERTICALLY AND HORIZONTALLY) TO THE BEST OF MY KNOWLEDGE AND BELIEF.

dmg MARK GOODWIN & ASSOCIATES, P.A. CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE: ANDERSON HEIGHTS - UNIT 1
COLOBEL AVENUE S.W.
UTILITY IMPROVEMENTS

DESIGN REVIEW COMMITTEE | CITY ENGINEER APPROVAL: MAY 26 2005, CITY ENGINEER | MO./DAY/YR. | MO./DAY/YR. | LAST DESIGN UPDATE

CITY PROJECT NO. 753981 | ZONE MAP NO. N-8/P-8 | SHEET 73 OF 83

AS BUILT INFORMATION
CONTRACTOR: Franklin's
WORK STAKED BY: Cartesian Surveys Inc.
INSPECTOR'S ACCEPTANCE BY: MGA
FIELD VERIFICATION BY: Cartesian Surveys Inc.
DRAWINGS CORRECTED BY: Cartesian
MICRO-FILM INFORMATION
RECORDED BY | DATE
NO.

BENCH MARKS
STATION "3-P10" IS LOCATED 5.9 MI. SW OF DOWNTOWN ALBUQUERQUE. TO REACH STATION FROM INT. OF COORS AND DENNIS CHAVEZ BLVD. (FORMERLY RIO BRAVO), GO S. ON COORS BLVD. 0.62 MI. TO THE STATION WHICH IS ON AN EARTHEN BERM 162.2', WEST OF THE CENTERLINE OF COORS BLVD. THE STATION IS A STANDARD ACS 3 1/4" ALUMINUM CAP RIVITTED TO A PIPE 0.25' ABOVE THE GROUND AND IS STAMPED "3-P10 1998".
X=360733.56, Y=1462437.48 (NAD 27), ELEV=4935.735 (SLD 29)

SURVEY INFORMATION: FIELD NOTES | NO. | BY | DATE

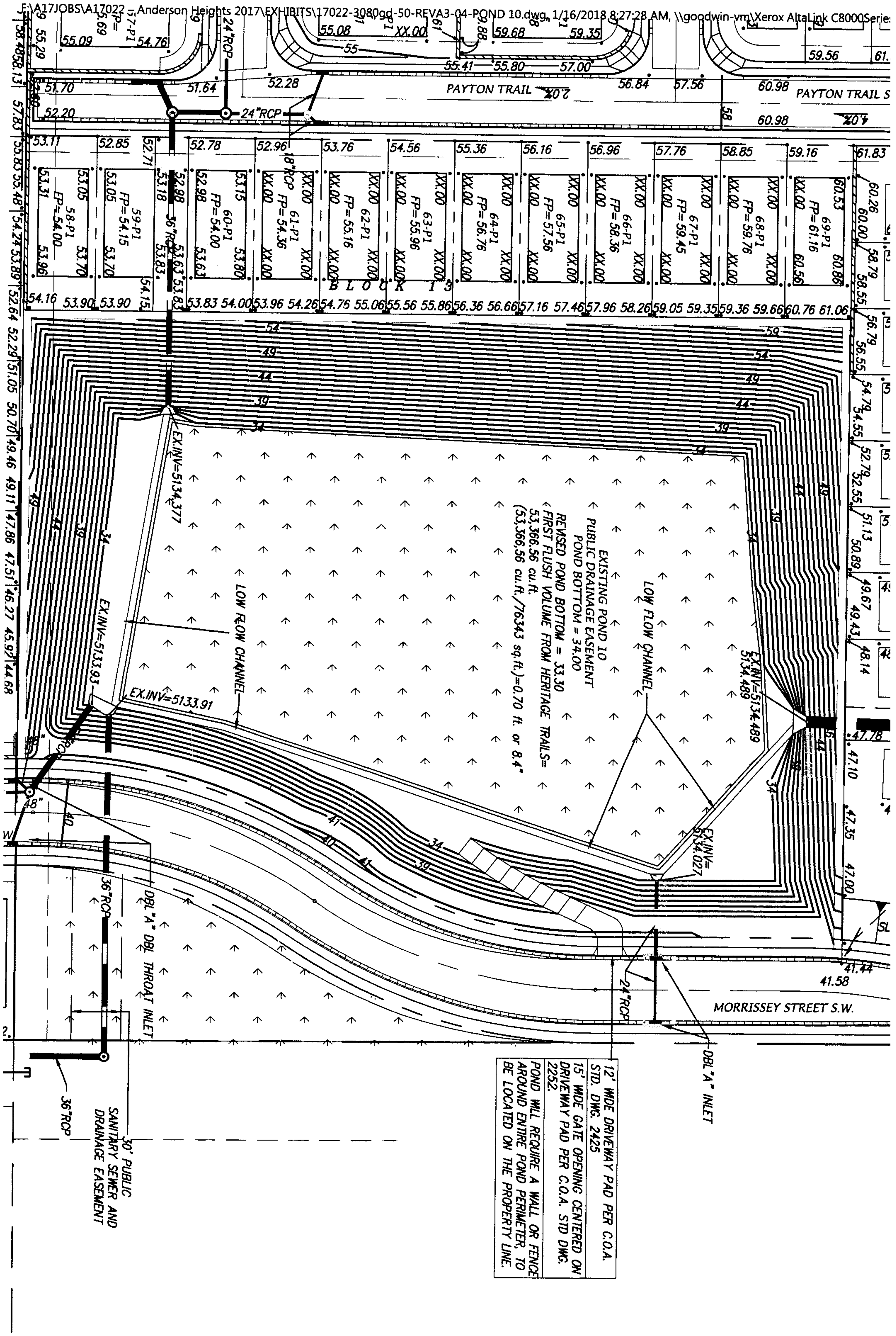
ENGINEER'S SEAL

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	

DESIGNED BY G/K DATE 03/05
DRAWN BY ACH DATE 03/05
CHECKED BY DMG DATE 03/05

A03080AH\PLANS\UNIT-1\UTILITIES\UP-2\03-29-05\ MJR ACH

F:\A17JOBS\A17022 - Anderson Heights 2017\EXHIBITS\17022-3080gd-50-REVA3-04-POND 10.dwg, 1/16/2018 8:27:28 AM, \\goodwin-vm\Xerox AltaLink C8000Series



PAYTON TRAIL
MORRISSEY STREET S.W.
BLOCK 13
EXISTING POND 10
PUBLIC DRAINAGE EASEMENT
POND BOTTOM = 34.00
REVISED POND BOTTOM = 33.30
FIRST FLUSH VOLUME FROM HERITAGE TRAILS=
53,366.56 cu.ft.
(53,366.56 cu.ft./76343 sq.ft.)=0.70 ft. or 8.4"
LOW FLOW CHANNEL
LOW FLOW CHANNEL
EX.INV=5134.377
EX.INV=5133.93
EX.INV=5133.91
EX.INV=5134.489
EX.INV=5134.027
24"RCP
18"RCP
36"RCP
DBL "A" DBL THROAT INLET
DBL"A" INLET
30' PUBLIC SANITARY SEWER AND DRAINAGE EASEMENT
12' WIDE DRIVEWAY PAD PER C.O.A. STD. DWG. 2425
15' WIDE GATE OPENING CENTERED ON DRIVEWAY PAD PER C.O.A. STD DWG. 2252.
POND WILL REQUIRE A WALL OR FENCE AROUND ENTIRE POND PERIMETER, TO BE LOCATED ON THE PROPERTY LINE.

APPENDIX E –

EXISTING DRAINAGE COVENANT *(recorded 9-18-08)*

For Onsite Temporary Interim Ponds

FEMA Offsite Powerline Ponds Exhibit

753985

#2

(NO PUBLIC EASEMENT)

DRAINAGE COVENANT

9/17/08

This Drainage Covenant ("Covenant"), between KB HOME New Mexico, Inc. ("Owner"), whose address is 6330 Riverside Plaza Lane, NW, Suite 200, Albuquerque, NM 87120 and the City of Albuquerque, New Mexico, a municipal corporation ("City"), whose address is P.O. Box 1293, Albuquerque, New Mexico 87103, is made in Albuquerque, Bernalillo County, New Mexico and is entered into as of the date Owner signs this Covenant.

1. Recital. Owner is the owner of certain real property described as:

Ponds #1, #4, #5, #6 and #7
A portion of Parcel 4, Anderson Heights, Unit 1,
recorded in the Bernalillo County Clerk's office 5/4/2006, Book 2005C, Page 138;
Ponds #2, #3 and #8
A portion of Parcel 6A, Anderson Heights, Unit 9,
recorded in the Bernalillo County Clerk's office 10/9/2007, Book 2007C, Page O291;
Pond #9
Lots 62-66, Block 1 and portions of Lots 59-63, Block 5, Anderson Heights, Unit 9,
recorded in the Bernalillo County Clerk's office 10/9/2007, Book 2007C, Page O291;
Pond #10
Lots 11-16, Block 2, Anderson Heights, Unit 9,
recorded in the Bernalillo County Clerk's office 10/9/2007, Book 2007C, Page O291

in Bernalillo County, New Mexico (the "Property"). (Give legal description and filing information).

Pursuant to City ordinances, regulations and other applicable laws, the Owner is required to construct and maintain certain drainage facilities ("Drainage Facility") on the Property, and the parties wish to enter into this Covenant to establish the obligations and responsibilities of the parties.

2. Description and Construction of Drainage Facilities. Owner shall construct the following Drainage Facility within the Property at Owner's sole expense in accordance with the standard plans and specifications approved by the City pursuant to Drainage File No. N8 / D3B
Ten (10) retention ponds and nine (9) berms

The Drainage Facility is more particularly described in the attached Exhibit A. The Owner will not permit the Drainage Facility to constitute a hazard to the health or safety of the general public.

3. Maintenance of Drainage Facility. The Owner will maintain the Drainage Facility at the Owner's cost in accordance with the approved Drainage Report and plans.

4. City's Right of Entry. The City has the right to enter upon the Property at any time

Doc# 2008103543
09/18/2008 03:40 PM Page: 1 of 6
COV R:$19.00 M. Toulouse Oliver, Bernalillo County

and perform whatever inspection, maintenance or repair of the Drainage Facility it deems appropriate, without liability to the Owner.

5. Demand for Construction or Repair. The City may send written notice ("Notice") to the Owner requiring the Owner to construct or repair the Drainage Facility within thirty (30) days ("Deadline") of receipt of the Notice, as provided in Section 11, and the Owner will comply promptly with the requirements of the Notice. The Owner will perform all required work by the Deadline, at Owner's sole expense.

6. Failure to Perform by Owner and Emergency Work by City. If the Owner fails to comply with the terms of the Notice by the Deadline, or if the City determines that an emergency condition exists, the City may perform the work itself. The City may assess the Owner for the cost of the work and for any other expenses or damages, which result from Owner's failure to perform. The Owner agrees promptly to pay the City the amount assessed. If the Owner fails to pay the City within thirty (30) days after the City gives the Owner written notice of the amount due, the City may impose a lien against Owner's Property for the total resulting amount.

7. Liability of City for Repair after Notice or as a Result of Emergency. The City shall not be liable to the Owner for any damages resulting from the City's maintenance or repair following Notice to the Owner as required in this Covenant or in an emergency unless the damages are the result of the reckless conduct or gross negligence of the City

8. Indemnification. The Owner agrees to indemnify and save the City, its officials, agents and employees harmless from all claims, actions, suits and proceedings arising out of, or resulting from the Owner's negligent maintenance, construction, repair or use of the Drainage Facility. To the extent, if at all, Section 56-7-1 NMSA 1978 is applicable to this Covenant, this Covenant to indemnify will not extend to liability, claims, damages, losses or expenses, including attorneys' fees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications by the Owner or its agents or employees; or (2) the giving of or the failure to give directions or instructions by the Owner, where such giving or failure to give directions or instructions is the primary cause of bodily injury to persons or damage to property.

9. Cancellation of Agreement and Release of Covenant. This Covenant may be released if the Drainage Facility is no longer required for the protection of the public health, safety and welfare by the City filing a "Notice of Release" with the Bernalillo County Clerk. The Notice of Release must be signed by the City's Chief Administrative Officer or his designee, and the approval of the City Hydrologist must be endorsed thereon.

10. Assessment. Nothing in this Covenant shall be construed to relieve the Owner, its heirs, assigns and successors from an assessment against the Owner's Property for improvements to the Property under a duly authorized and approved Special Assessment District. The parties specifically agree that the value of the Drainage Facility will not reduce the amount assessed by the City.

11. Notice. For purposes of giving formal written notice to the Owner, Owner's address is:

KB HOME New Mexico, Inc.
6330 Riverside Plaza Lane NW, Suite 200
Albuquerque, NM 87120

Notice may be given to the Owner either in person or by mailing the Notice by regular U.S. mail, postage paid. Notice will be considered to have been received by the Owner within three (3) days after the Notice is mailed if there is no actual evidence of receipt. The Owner may change Owner's address by giving written notice of the change by Certified Mail-Return Receipt Requested, to City Hydrologist, P.O. Box 1293, Albuquerque, New Mexico 87103.

12. Term. This Covenant shall continue until terminated by the City pursuant to Section 9 above.

13. Binding on Owner's Property. The covenants and obligations of the Owner set forth herein shall be binding on Owner, its heirs, personal representatives, assigns and successors and on Owner's Property and shall constitute covenants running with the Owner's Property until released by the City.

14. Entire Agreement. This Covenant contains the entire agreement of the parties and supersedes any and all other agreements or understandings, oral or written, whether previous to the execution hereof or contemporaneous herewith regarding this subject matter.

15. Changes to Agreement. Changes to this Covenant are not binding unless made in writing, signed by both parties.

16. Construction and Severability. If any part of this Covenant is held to be invalid or unenforceable, the remainder of the Covenant will remain valid and enforceable if the remainder is reasonably capable of completion.

17. Captions. The captions to the sections or paragraphs of this Covenant are not part of this Covenant and will not affect the meaning of construction of any of its provisions.

CITY OF ALBUQUERQUE:
ACCEPTED:

By: _____
Ed Adams
Chief Administrative Officer
Dated: 9-17-08

OWNER: **KB HOME New Mexico, Inc.**

By: _____
Its: Vice President - Land

Dated: 9.8.08

APPROVED:

City Engineer

9/12/08

9-10-08

CITY'S ACKNOWLEDGMENT

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

Richard Dourte for Ed Adams This instrument was acknowledged before me this 17th day of September, 2008, by Ed Adams, Chief Administrative Officer for the City of Albuquerque, a New Mexico municipal corporation, on behalf of the corporation.

My Commission Expires:
10-07-12

Notary Public

OWNER'S ACKNOWLEDGMENT

STATE OF New Mexico)
) ss
COUNTY OF Bernalillo)

This instrument was acknowledged before me this 8th day of September, 2008, by A. Anthony Sciarrillo, Vice President of Land, on behalf of KB HOME New Mexico, Inc..

My Commission Expires:
9.10.12

Notary Public

OFFICIAL SEAL
SUSAN IVACHNIKI
NOTARY PUBLIC-STATE OF NEW MEXICO
My commission expires: 9.10.12

(EXHIBIT A ATTACHED)

Drainage File: N8/D3B Exhibit "A"

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

INTERIM
GRADING AND DRAINAGE PLAN
ANDERSON HEIGHTS - UNITS 4 & 5

DRAWN BY: JWM
DESIGNED BY: JWM
CHECKED BY: JWM
DATE: 2/2/07

NO. | DATE | REMARKS | BY

DESIGN ACCEPTED
DATE: 2/2/07

CONSTRUCTION ACCEPTED
DATE: 2/2/07

ENGINEER'S SEAL

SURVEY INFORMATION

NO.	FIELD NOTES BY	DATE

BENCH MARKS

NO.	DESCRIPTION	ELEVATION

AS BUILT INFORMATION

NO.	DESCRIPTION	DATE

SPECIAL NOTE:
Top of Pond Elevations are Approximate. They are based on the lowest elevation in the area from the approved grading plan. Field conditions may have changed since then. The ponds need to be constructed to be at least 2.0' deep and at the dimensions as depicted. Please see Drainage Report for Pond Volumes.

SCALE 1" = 100'

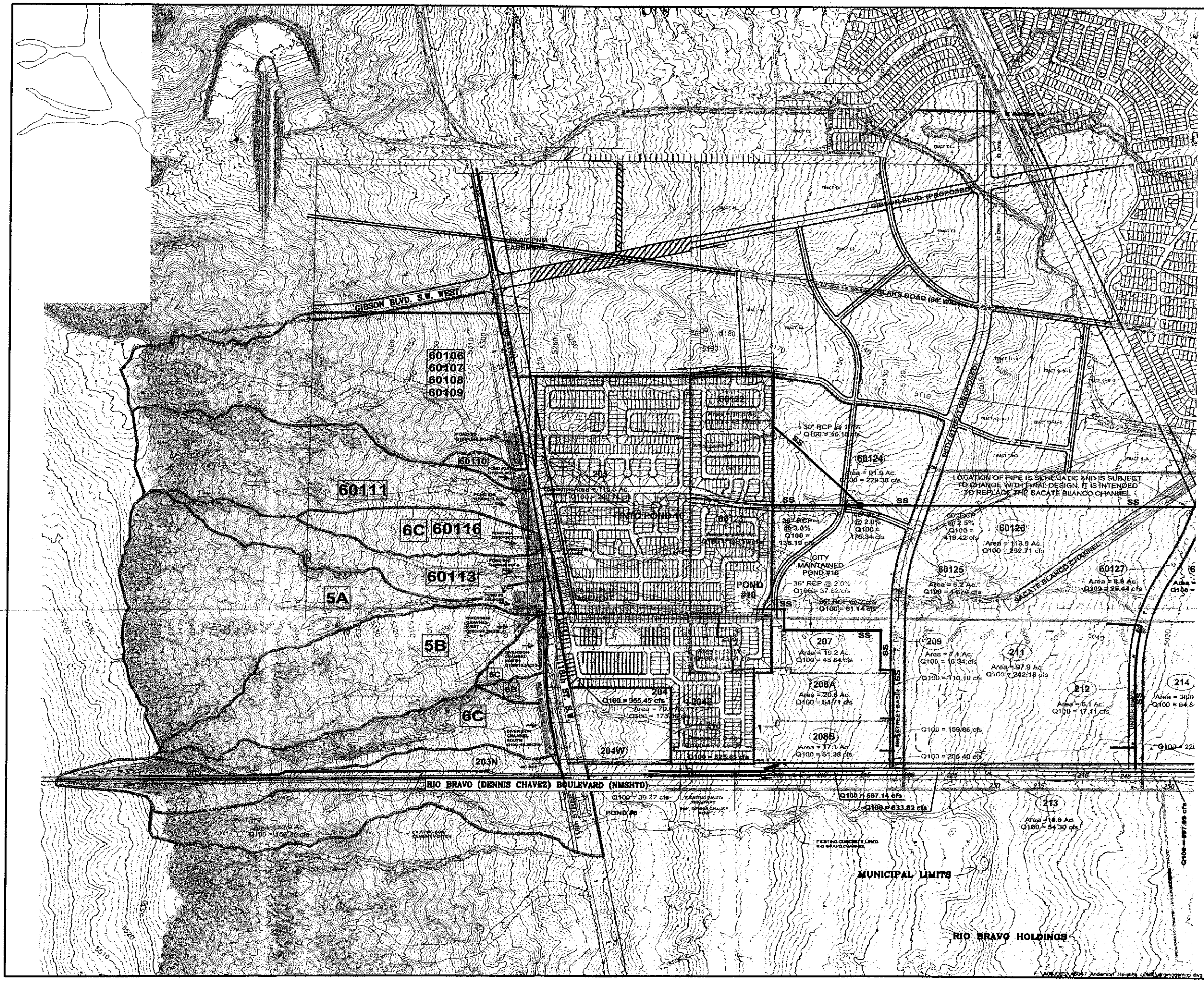
POND SECTION
SCALE 1" = 5'

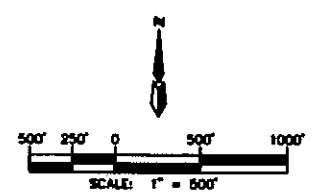
TYPICAL BERM SECTION A-A
SCALE 1" = 5'

TYPICAL BERM SECTION B-B
SCALE 1" = 5'

VICINITY MAP
ZONE ATLAS B-10
DENNIS CHAVEZ BLVD
SCALE: NONE

Berm #1 · Berm #2 · Berm #3 · Berm #4 · Berm #5 · Berm #6 · Berm #7 · Berm #8 · Berm #9
SWALE
POND A · POND B · POND C · POND D · POND E · POND F · POND G · POND H · POND I · POND J



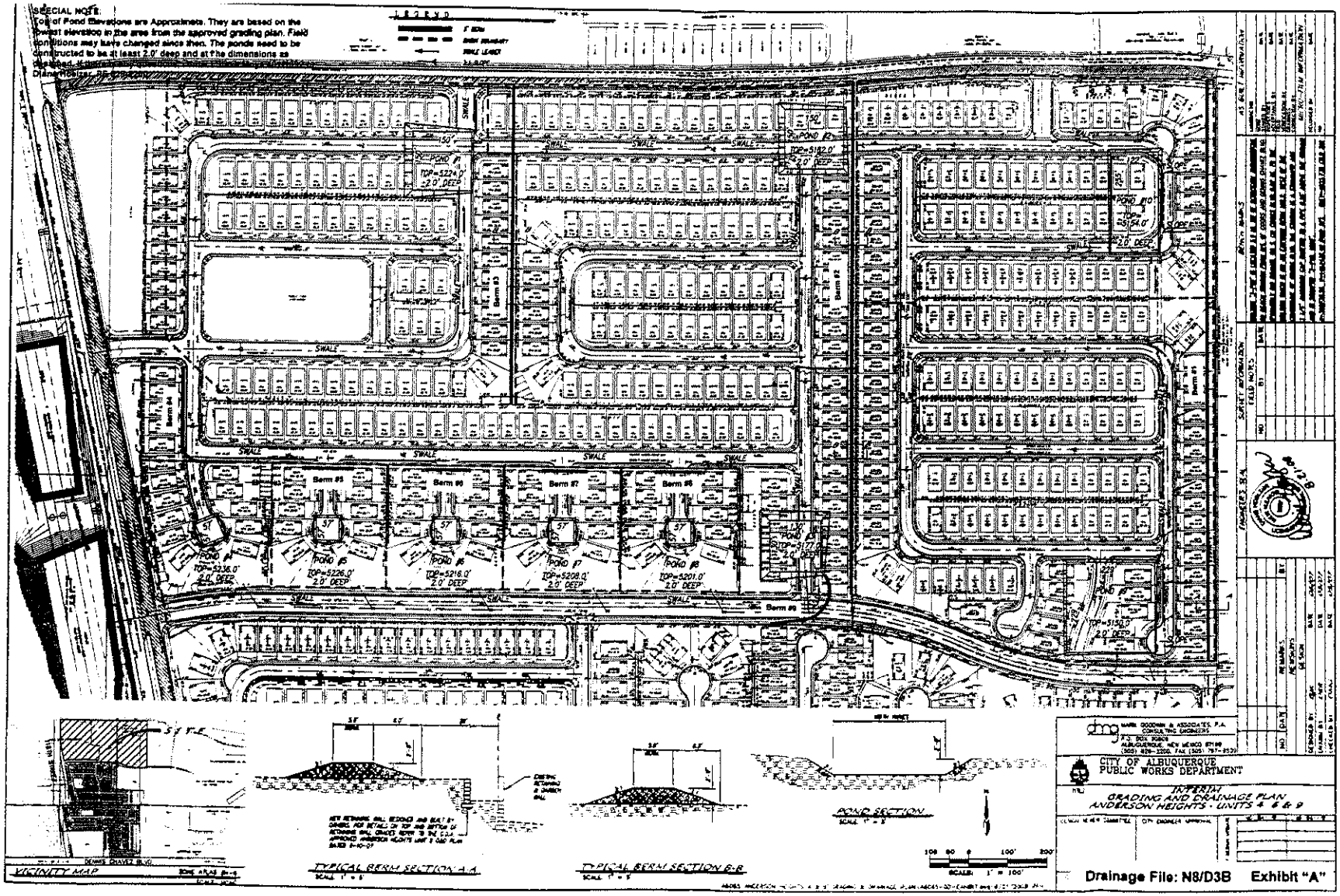


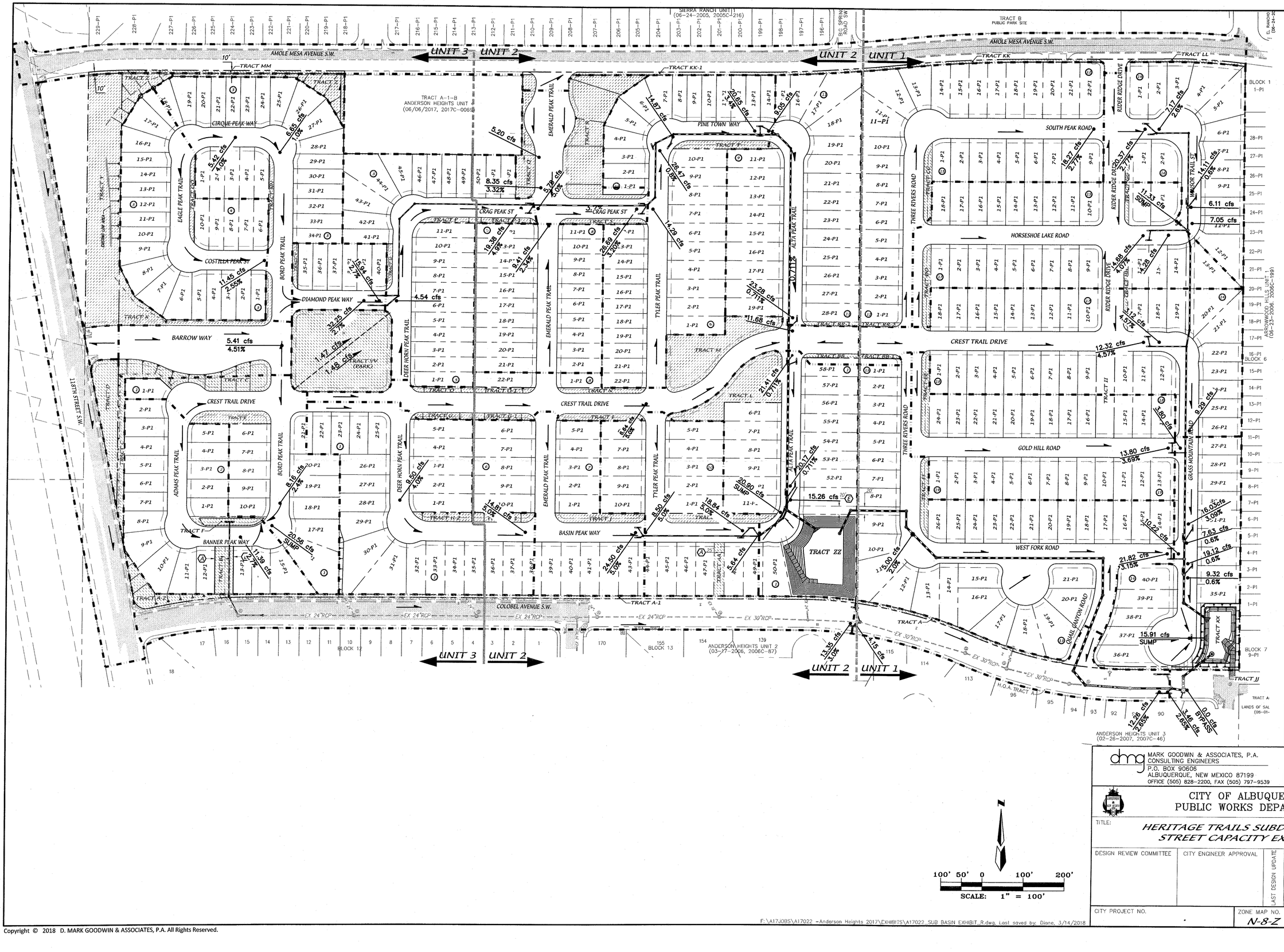
ANDERSON HEIGHTS

DRAINAGE MAP

dmg
MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505)828-2200, FAX (505)797-9539

Designed:	Drawn: SPS	Checked: DMG	Sheet 1 of 1
Scale: 1" = 500'	Date: 7/23/2008	Job: A05047	


SPECIAL NOTE:
Top of Pond Elevations are Approximate. They are based on the lowest elevation in the area from the approved grading plan. Field conditions may have changed since then. The ponds need to be constructed to be at least 2.0' deep and at the dimensions as depicted in the approved Drainage Plan.
LEGEND
SWALE
Berm #5
Berm #6
Berm #7
Berm #8
Berm #9
POND #5
TOP=5226.0'
2.0' DEEP
POND #6
TOP=5216.0'
2.0' DEEP
POND #7
TOP=5208.0'
2.0' DEEP
POND #8
TOP=5201.0'
2.0' DEEP
POND #9
TOP=5182.0'
2.0' DEEP
POND #10
TOP=5154.0'
2.0' DEEP
POND #11
TOP=5150.0'
2.0' DEEP
POND #4
TOP=5236.0'
2.0' DEEP
POND #12
TOP=5177.0'
2.0' DEEP
VICINITY MAP
TYPICAL BERM SECTION A-A
TYPICAL BERM SECTION B-B
POND SECTION
SCALE: 1" = 100'
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
IMPERIAL
GRADING AND DRAINAGE PLAN
ANDERSON HEIGHTS - UNITS 4, 6 & 9
Drainage File: N8/D3B
Exhibit "A"



SURVEY INFORMATION

FIELD NOTES

NO.	DATE	BY

BENCH MARKS

AS BUILT INFORMATION

CONTRACTOR

	BY	DATE
WORK		
INSPECTED BY		
ACCEPTANCE		
CERTIFICATION		
DRAWINGS CORRECTED BY		

MICRO-FILM INFORMATION

RECORDED BY

NO.

AGRS MONUMENT & BENCHMARK "1-N8"
N=1470741.879, E=1488701.820
C-C=0.999676466
$\Delta\alpha$ = -00°17'27.70"
CENTRAL ZONE
ELEVATION=5307.250
(NAD83/NAVD88)

ENGINEER'S SEAL

DIANE HOELZER
NEW MEXICO
11967
REGISTERED PROFESSIONAL ENGINEER

3/15/18

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
		DESIGNED BY	DLH
		DRAWN BY	DER
		CHECKED BY	DMG

DATE 12/17
DATE 12/17
DATE 12/17

dmg
MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
OFFICE (505) 828-2200, FAX (505) 797-9539

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

TITLE:

HERITAGE TRAILS SUBDIVISION
STREET CAPACITY EXHIBIT

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.

CITY PROJECT NO.	ZONE MAP NO.	SHEET	OF
.	N-8-Z	2	3

100' 50' 0 100' 200'

SCALE: 1" = 100'

F:\A17JOBS\A17022 -Anderson Heights 2017\EXHIBITS\A17022_SUB BASIN EXHIBIT_R.dwg, Last saved by: Diane, 3/14/2018