CITY OF ALBUQUERQUE



November 26, 2012

Åsa, P.E. Isaacson & Arfman, P.A. 128 Monroe St NE Albuquerque, NM 87108

Re:

Sage and Unser Marketplace

Supplemental Calculations

Engineer's Stamp Date 11/20/2012 (M10/D019)

Dear Ms. Åsa

PO Box 1293

Based upon the information provided in your submittal received 11/21/2012, the above referenced Supplemental Calculation is approved for Grading Permit and Work Order Permit. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology.

Albuquerque

Albuquerque's MS4 Permit became effective March 1st, 2012. Grading and Drainage Plans and Drainage Reports will have to comply with the requirements of the new permit. The permit is available online at; http://www.cabq.gov/planning/landcoord/documents/EPA-NMS000101-FinalPermit.pdf

NM 87103

If you have any questions, you can contact me at 924-3695 or Rudy Rael at 924-3977.

www.cabq.gov

4

Sincerely,

Shahab Biazar, P.E.

Senior Engineer, Planning Dept.

Development and Building Services

RR/SB

 \mathbf{C}

e-mail

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (Rev. 12/05)

PROJECT TITLE: Unser and Sage Marketplace	ZONE MAP/DRG. FILE
DRB#: <u>1008203</u> EPC#:	WORK ORDER#: <u>793682</u>
LEGAL DESCRIPTION: Tracts A-1 through A-6, Sage as	nd Unser Marketplace
CITY ADDRESS:	——————————————————————————————————————
	aarm. 9 ret 1
ENGINEERING FIRM: ISAACSON & ARFMAN, PA	CONTACT: <u>Åsa Nilsson-Weber</u>
ADDRESS: 128 MONROE NE	PHONE: 268-8828
CITY, STATE: <u>ALBUQUERQUE, NM</u>	ZIP CODE: <u>87108</u>
OWNER: Unser Sage Partnership.	CONTACT: Jimmy Daskalos
ADDRESS: 6300 Jefferson St, NE, Suite 102	PHONE: 975-0617
CITY, STATE: Albuquerque, NM	
CITI, SIAIL. <u>Albuqueique, IVIII</u>	
ARCHITECT:	CONTACT:
ADDRESS:	PHONE:
CITY, STATE:	ZIP CODE:
SURVEYING FIRM: Survek, Inc LIC	ENSED SURVEYOR: Russ Hugg
ADDRESS:	PHONE:
CITY, STATE:	
CONTRACTOR:	
ADDRESS:	
CITY, STATE:	ZIP CODE:
	CK TYPE OF APPROVAL SOUGHT:
DRAINAGE REPORT (resubmittal)	SIA/FINANCIAL GUARANTEE RELEASE
DRAINAGE PLAN 1 st SUBMITTAL	PRELIMINARY PLAT APPROVAL
DRAINAGE PLAN RESUBMITTAL	S. DEV. PLAN FOR SUB'D APPROVAL
CONCEPTUAL G & D PLAN	S. DEV. FOR BLDG. PERMIT APPROVAL
GRADING PLAN	SECTOR PLAN APPROVAL
	FINAL PLAT APPROVAL
	FOUNDATION PERMIT APPROVAL
	BUILDING PERMIT APPROVAL
	CERTIFICATE OF OCCUPANCY (PERM)
	CERTIFICATE OF OCCUPANCY (TEMP)
	GRADING PERMIT APPROVAL
ENGINEER/ARCHITECT CERT (AA)	PAVING PERMIT APPROVAL
X OTHER (SPECIFY)	X WORK ORDER APPROVAL
Unser/Sage Street Capacity and storm drain calculations	OTHER (SPECIFY)
per request at DRC	
WAS A PRE-DESIGN CONFERENCE ATTENDED:	
YES	
NO	
COPY PROVIDED	UULSECTION
OTTD : (1000000 D. 17	LAND DEVELOPINITY
COPY PROVIDED SUBMITTED BY:ISAACSON & ARFMAN: Åsa Nilsson-Y	weber DATE: November 20, 2010
Requests for approvals of Site Development Plans and/or Subdivision	

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope to the proposed development define the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

- 1. Conceptual Grading and Drainage Plan: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
- 2. Drainage Plans: Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
- 3. Drainage Report: Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more.

SUPPLEMENTAL CALCULATIONS

FOR

SAGE & UNSER MARKETPLACE Albuquerque, NM

BY

, 21 2012 LAND DEVELOPMENT SECTION ! ISAACSON & ARFMAN, P.A. Consulting Engineering Associates

> Thomas O. Isaacson, PE (Ret.) & LS (Ret) Fred C. Arfman, PE Åsa Nilsson-Weber, PE

> > I&A Project No. 1948

17631

Prepared by:

LICENSED PROFESSIONS! Åsa Nilsson-Weber, PE

Date

SAGE RD & UNSER BLVD STREET FLOW STUDY

This is a submittal to quantify the street flows at Sage Rd and Unser Blvd. No drainage study was found for this intersection, so flows were estimated based on the following information. Though there are nine existing inlets at the intersection, a worst-case scenario analysis was made assuming street flows are maximized at the existing inlet locations at the west end of the site.

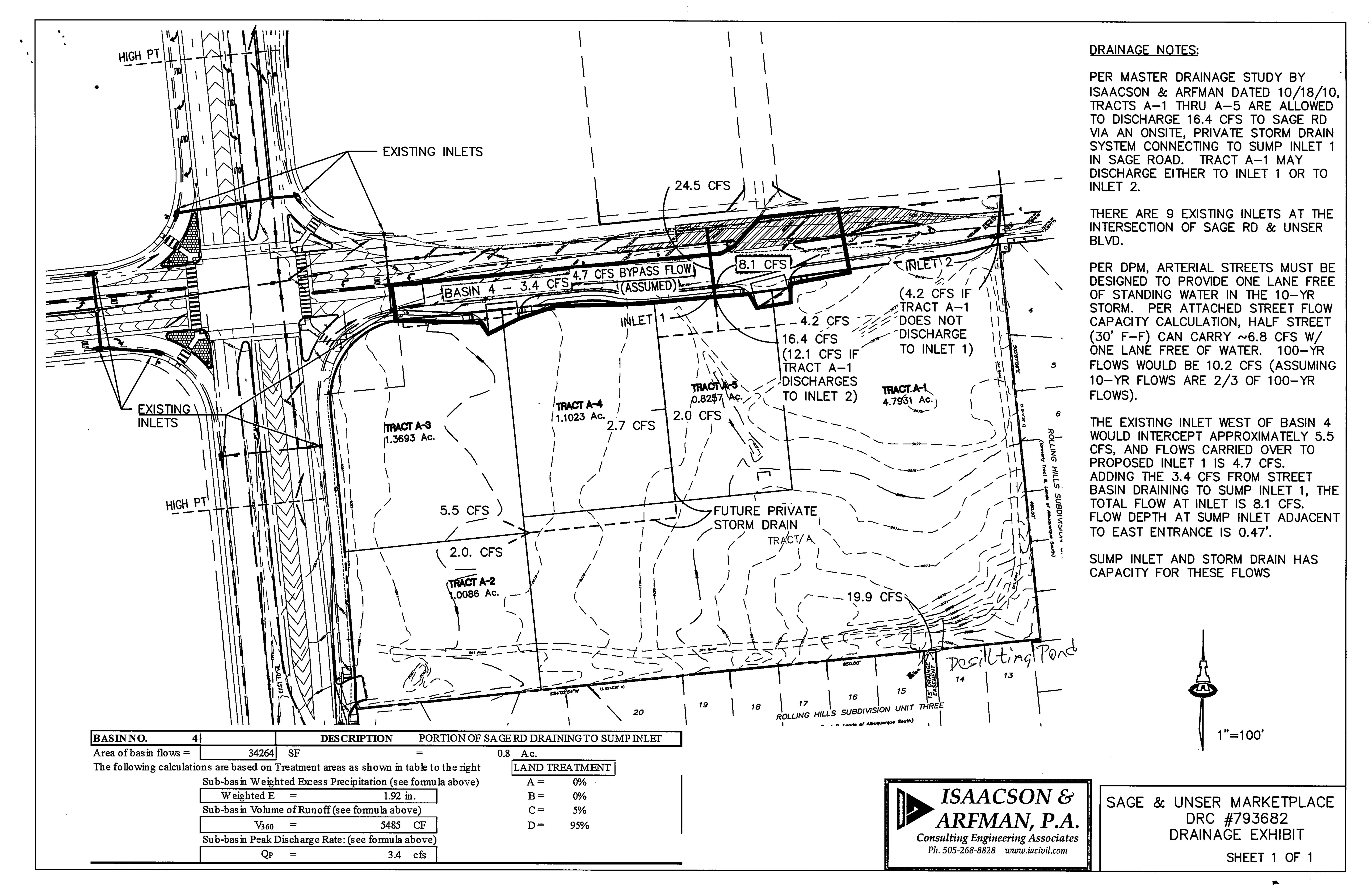
DPM criteria for arterial streets state that one lane must be dry in the 10-year storm. Per the street flow capacity calculations, the street can carry 6.8 cfs with one dry lane. The 100-year flow is estimated as 3/2 of the 10-year flows—10.2 cfs. The existing inlet at the west end of site would intercept approximately 5.5 cfs and bypass 4.7 cfs. Combined with the basin contributing 3.4 cfs to the proposed sump inlet #1, the total flow at inlet is 8.1 cfs with a flow depth of 0.47 feet.

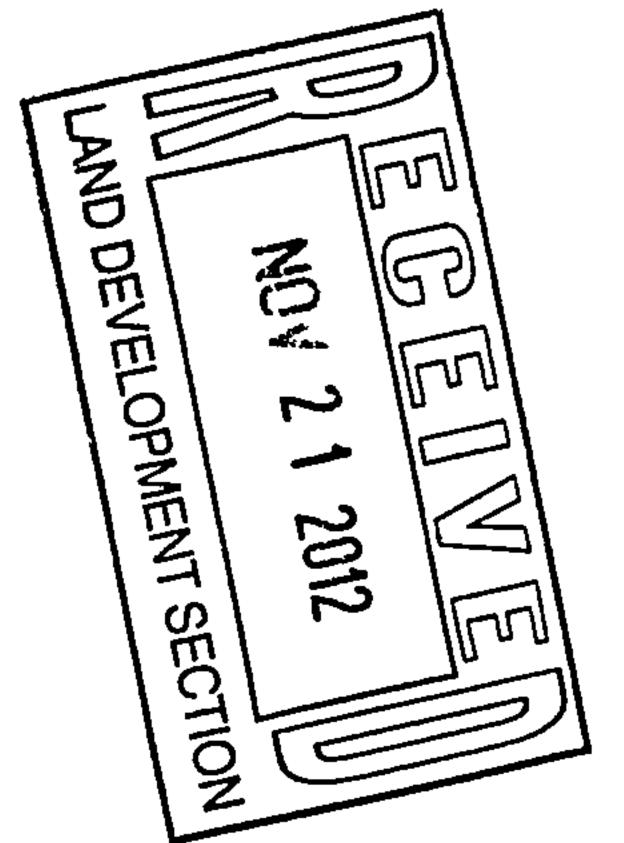
The inlet and storm drain has capacity as shown in the attached calculations.

SUPPORTING INFORMATION

- Drainage Exhibit
- Street Flow Calculations
- Sump Inlet Calculations
- Hydraflow Storm Drain Calculations







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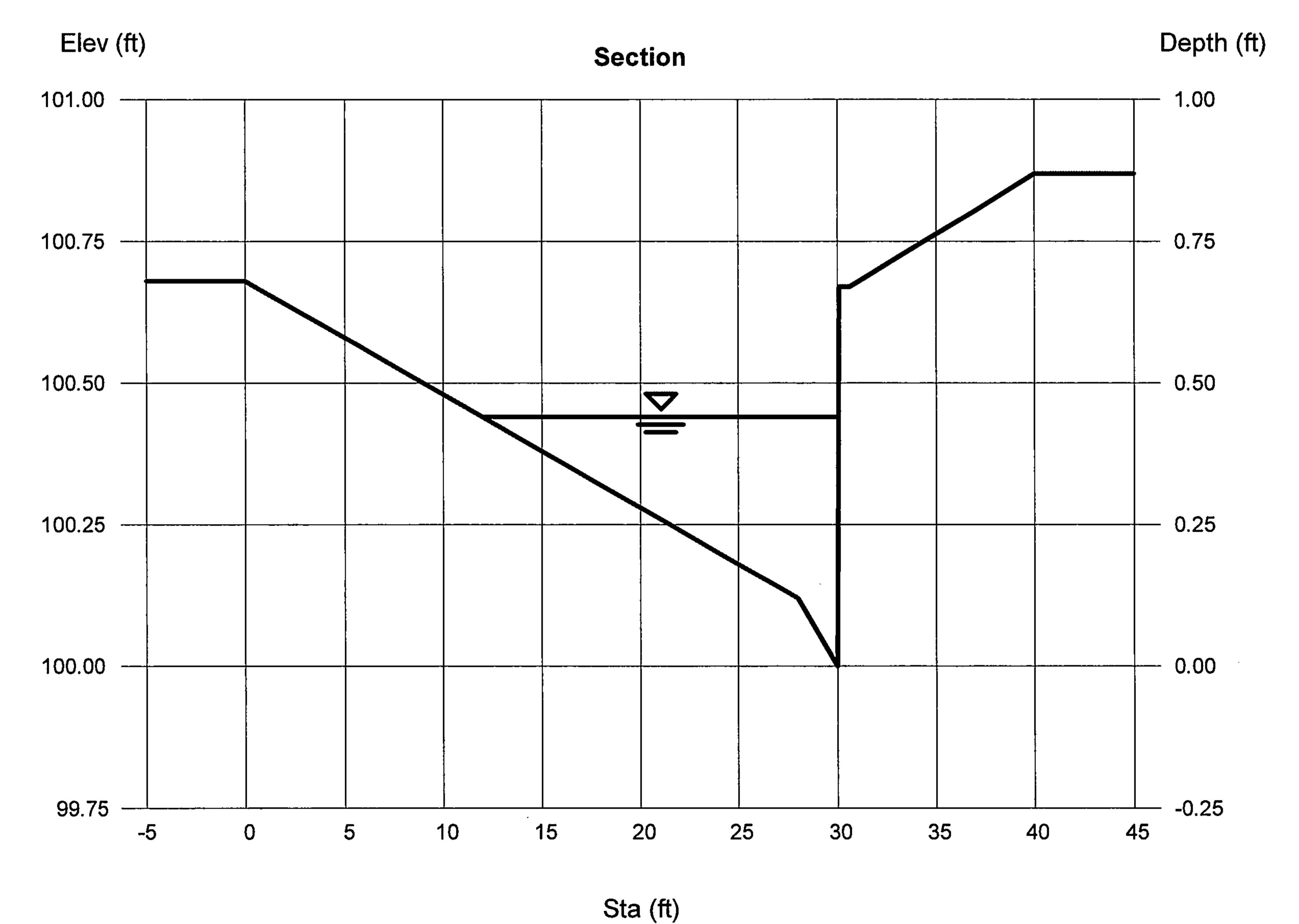
Hydraflow Express Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc.

Tuesday, Nov 20 2012

SAGE RD STREET FLOWS-ONE LANE DRY 10-YR STORM)

User-defined Highlighted = 0.44 4 = 6.798 4 Invert Elev (ft) = 100.00Depth (ft) Q (cfs) Slope (%) = 0.50N-Value = 0.016Area (sqft) = 3.33Velocity (ft/s) = 2.04Wetted Perim (ft) = 18.45Calculations Crit Depth, Yc (ft) Compute by: $= 0.42^{\circ}$ Known Depth Top Width (ft) = 18.07 ़ ← Known Depth (ft) = 0.44EGL (ft) = 0.50

(Sta, 10168) 128 (Sta, 017) -(30.00, 100.00, 0.013) -(30.10, 100.67, 0.013) -(30.63, 100.67, 0.020) -(40.00, 100.87, 0.020)

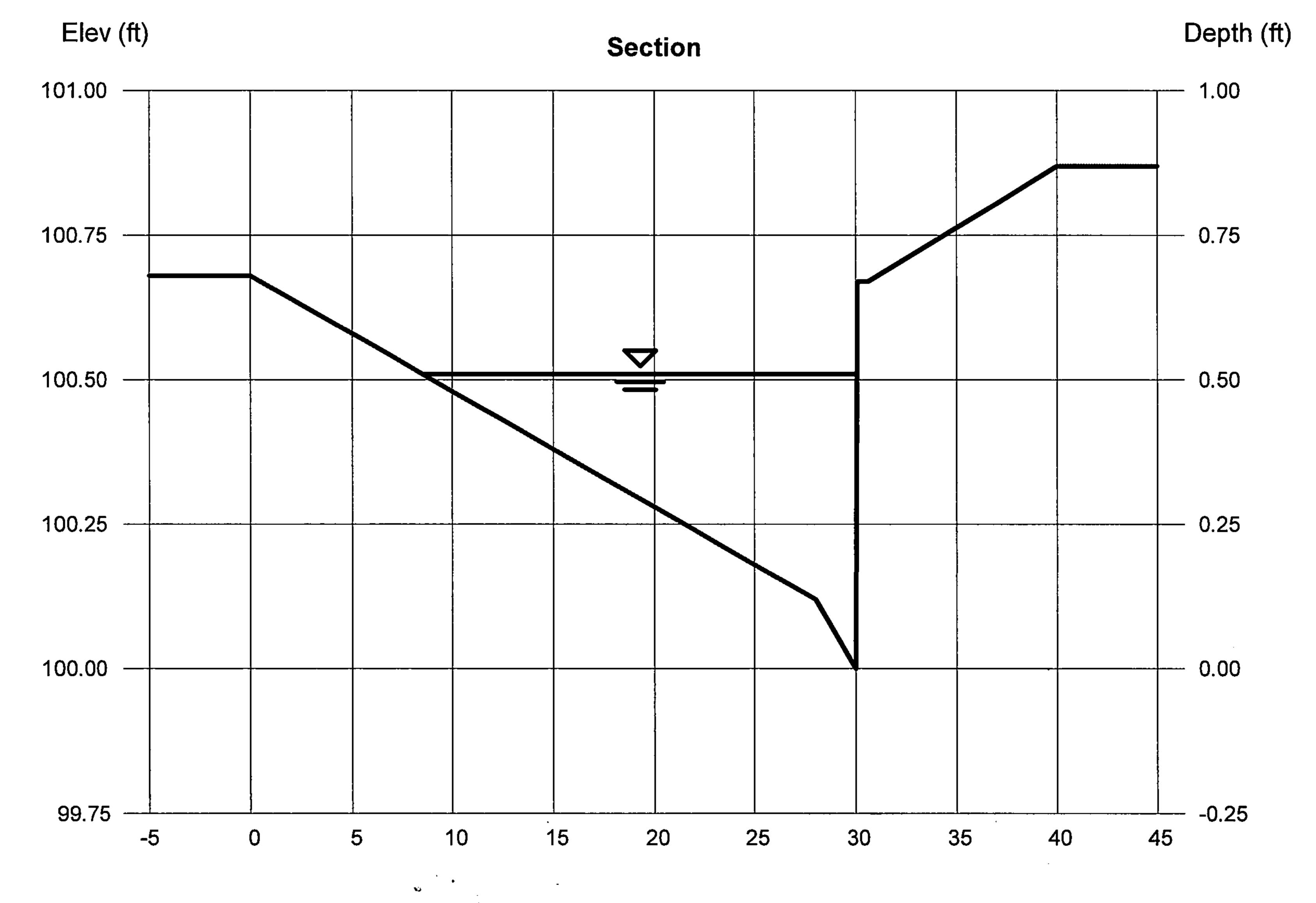


Hydraflow Express Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc.

Tuesday, Nov 20 2012

SAGE RD STREET FLOWS--100-YR FLOWS (3/2*10-YR FLOWS)

User-defined		Highlighted	
Invert Elev (ft)	= 100.00	Depth (ft)	= 0.51
Slope (%)	= 0.50	Q (cfs)	= 10.20 ←
N-Value	= 0.017	Area (sqft)	= 4.72
		Velocity (ft/s)	= 2.16
Calculations	3	Wetted Perim (ft)	= 22.02
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.48
Known Q (cfs)	= 10.20	Top Width (ft)	= 21.58
		EGL (ft)	= 0.58
(Sta,1268h)28Sta92f, 94	17) -(30.00, 100.00, 0.013) -(30.10, 100.67, 0.013) -(30.0	63, 100.67, 0.020) -(40.00, 100.87, 0.6	020)



Sta (ft)

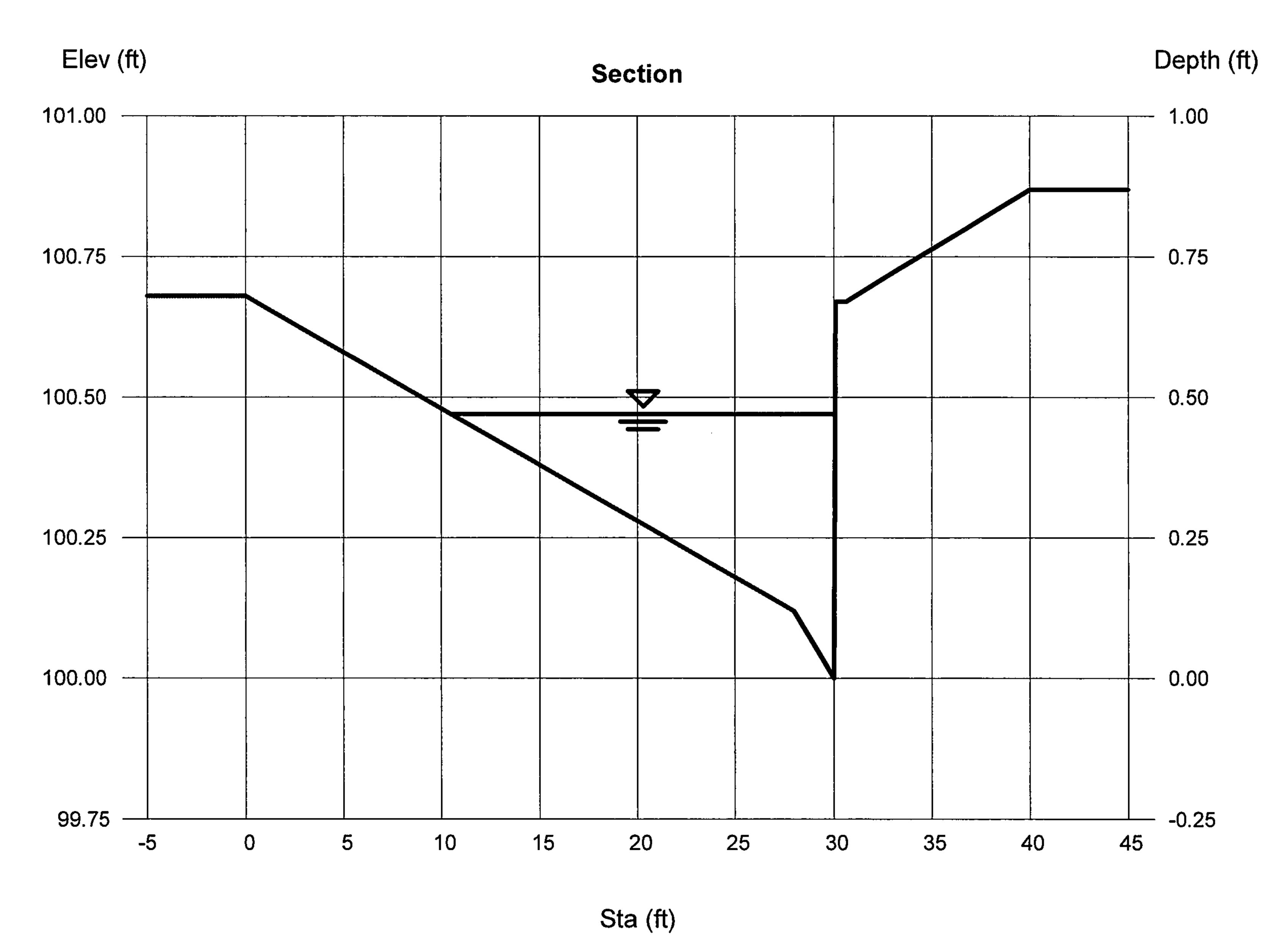
Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2012 by Autodesk, Inc.

Tuesday, Nov 20 2012

SAGE RD AT SUMP INLET

User-defined		Highlighted	
Invert Elev (ft)	= 100.00	Depth (ft)	= 0.47 4 -
Slope (%)	= 0.50	Q (cfs)	= 8.100 ←
N-Value	= 0.016	Area (sqft)	= 3.90
		Velocity (ft/s)	= 2.08
Calculations		Wetted Perim (ft)	= 19.98
Compute by:	Known Q	Crit Depth, Yc (ft)	= 0.44
Known Q (cfs)	= 8.10	Top Width (ft)	= 19.57
		EGL (ft)	= 0.54
(Sta,19968) 1928 Sta,096, 9	1 717) -(30.00, 100.00, 0.013) -(30.10, 100.67	, 0.013) -(30.63, 100.67, ò.ó20) -(40.00, 100.87, 0	.020)



ANALYZE SUMP INLETS

GRATE OPEN AREA:

(per COA std dwg #2220, single grate)

GROSS AREA FOR ONE GRATE = (25 in/12)(40 in/12) = 6.94 SF LESS BEARING BARS = (0.5 in/12)(3.33 ft)(13) = 1.80 SF LESS CROSS BARS = (0.5 in/12)(7)[(25 in/12)-(13)(0.5 in/12)] = 0.45 SF

NET GRATE OPEN AREA = 4.69 SF

GRATE OPEN AREA (assuming 50% clogging factor) = 2.35 SF

ORIFICE EQUATION:

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

Where:

C = 0.67

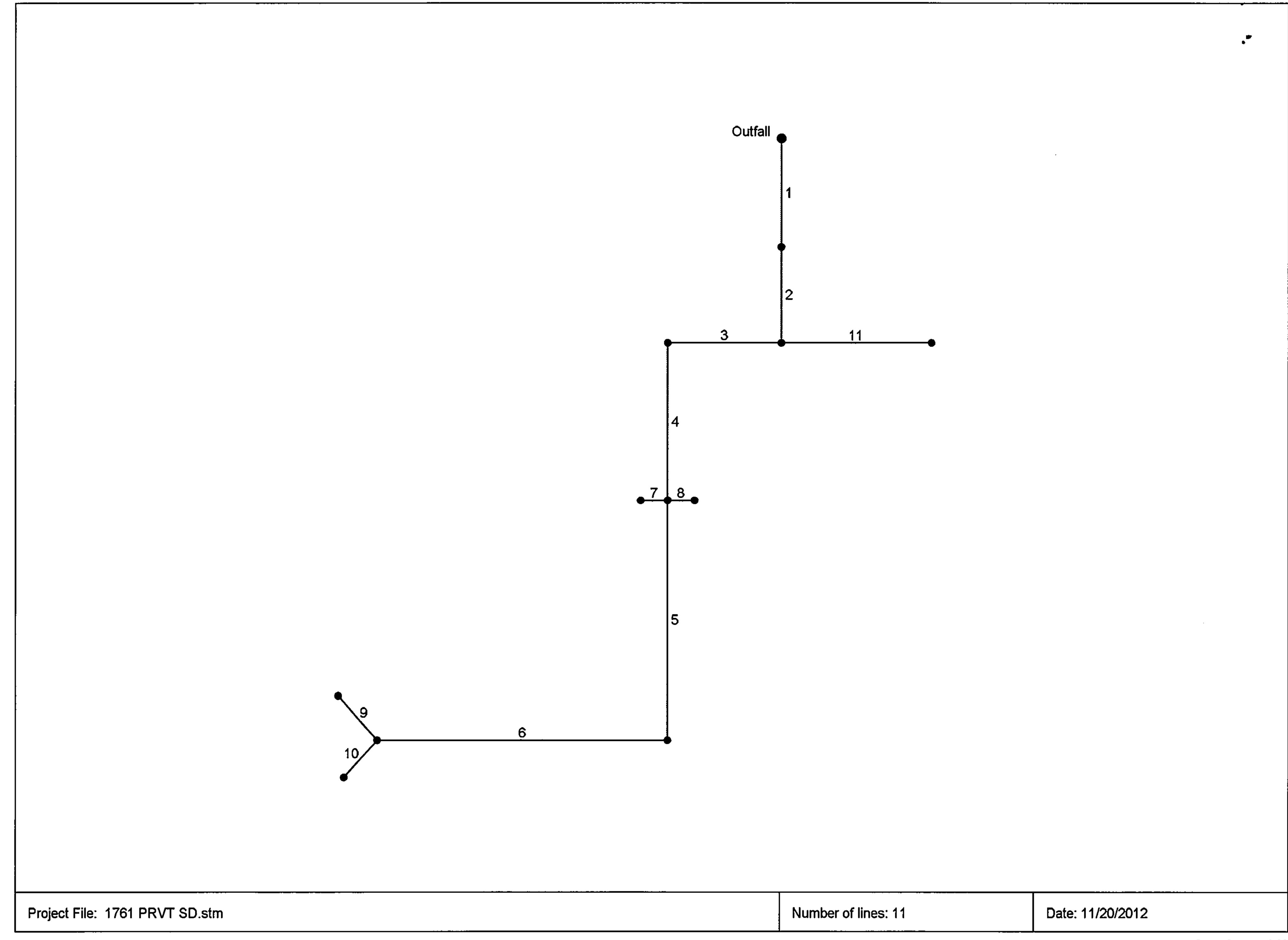
 $A = 2.35 \text{ ft}^2$

 $g = 32.2 \text{ ft/sec}^2$

h = height of the water surface above the grate

CAPACITY CALCULATIONS:

INLET # 1 LOCATION: SAGE RD WEST OF EAS	ST ENTRANCE
$h = 0.47$ ft $Q_{(capacity)} = 8.645815$ cfs	REQUIRED Q = 8.1 cfs
NUMBER OF GRATES REQUIRED =	<u> </u>



Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape		Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type "
1	EX MH	24.50	24	Cir	60.600	70.74	71.13	0.644	73.10*	73.71*	0.47	74.18	End	Generic
2	Inserted Line	16.40	24	Cir	54.000	71.33	71.60	0.500	74.18*	74.42*	0.42	74.84	1	Manhole
3	Inserted Line	12.20	24	Cir	71.900	71.60	71.96	0.501	74.84*	75.02*	0.23	75.26	2	Manhole
4	Inserted Line	12.20	24	Cir	88.900	71.96	72.38	0.472	75.26*	75.48*	0.23	75.71	3	Manhole
5	Inserted Line	7.50	24	Cir	134.500	72.38	73.00	0.461	75.71*	75.84*	0.09	75.93	4	Manhole
6	Inserted Line	7.50	24	Cir	183.500	73.00	74.01	0.550	75.93*	76.10*	0.07	76.17	5	Manhole
7	INLET A4	2.70	12	Cir	17.000	72.38	72.47	0.529	75.71*	75.80*	0.18	75.98	4	Generic
8	INLET A5	2.00	12	Cir	17.000	72.38	72.47	0.529	75.71*	75.76*	0.10	75.86	4	Generic
9	INLET A3	5.50	18	Cir	35.000	73.00	74.30	3.714	76.17*	76.25*	0.15	76.40	6	Generic
10	INLET A2	2.00	12	Cir	30.000	74.01	74.90	2.967	76.17*	76.25*	0.10	76.35	6	Generic
11	INLET A1	4.20	12	Cir	95.000	71.60	72.08	0.505	74.84*	75.97*	0.44	76.42	2	Generic
1761	<u> </u>	<u> </u>	<u>[</u>	<u> </u>	_i				Number o	of lines: 11		Rur	Date: 11/20)/2012

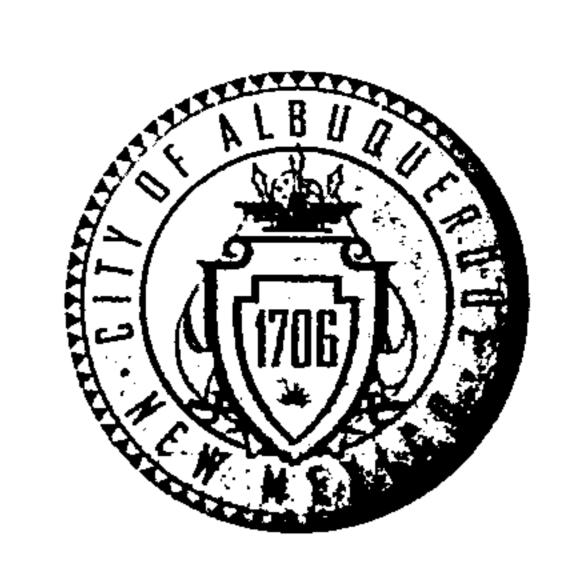
NOTES: Return period = 2 Yrs.; *Surcharged (HGL above crown).

Storm Sewer Tabulation

Statio	n	Len	Drng A	rea	Rnoff	Area x	C	Тс		Ŀ	L		Vel	Pipe		Invert Ele	ev	HGL Ele	V	Grnd / R	im Elev	Line ID
Line	То		Incr	Total	coeff	Incr	Total	Inlet	Syst	(")	flow	full		Size	Slope	Dn	Up	Dn	Up	Dn	Up	_
	Line	(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	60.600	0.00	0.00	0.00	0.00	0.00	0.0	3.3	0.0	24.50	19.66	7.80	24	0.64	70.74	71.13	73.10	73.71	79.22	77.80	EX MH
2	1	54.000	0.00	0.00	0.00	0.00	0.00	0.0	3.1	0.0	16.40	17.33	5.22	24	0.50	71.33	71.60	74.18	74.42	77.80	78.80	Inserted Line
3	2	71.900	0.00	0.00	0.00	0.00	0.00	0.0	2.8	0.0	12.20	17.34	3.88	24	0.50	71.60	71.96	74.84	75.02	78.80	78.70	Inserted Line
4	3	88.900	0.00	0.00	0.00	0.00	0.00	0.0	2.4	0.0	12.20	16.84	3.88	24	0.47	71.96	72.38	75.26	75.48	78.70	77.50	Inserted Line
5	4	134.500	0.00	0.00	0.00	0.00	0.00	0.0	1.5	0.0	7.50	16.64	2.39	24	0.46	72.38	73.00	75.71	75.84	77.50	77.50	Inserted Line
6	5	183.500	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	7.50	18.18	2.39	24	0.55	73.00	74.01	75.93	76.10	77.50	77.00	Inserted Line
7	4	17.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.70	2.81	3.44	12	0.53	72.38	72.47	75.71	75.80	77.50	77.30	INLET A4
8	4	17.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.00	2.81	2.55	12	0.53	72.38	72.47	75.71	75.76	77.50	77.30	INLET A5
9	6	35.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	5.50	21.92	3.11	18	3.71	73.00	74.30	76.17	76.25	77.00	77.00	INLET A3
10	6	30.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.00	6.65	2.55	12	2.97	74.01	74.90	76.17	76.25	77.00	78.00	INLET A2
11	2	95.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	4.20	2.74	5.35	12	0.51	71.60	72.08	74.84	75.97	78.80	79.00	INLET A1
																			;			
	-																					
																						•
				·																		
1761																Number	of lines: 1	1		Run Da	te: 11/20/2	2012

NOTES:Intensity = 69.87 / (Inlet time + 13.10) ^ 0.87 ; Return period =Yrs. 2 ; c = cir e = ellip b = box

CITY OF ALBUQUERQUE



October 29, 2010

Fred C. Arfman, PE Isaacson & Arfman, PA 128 Monroe St. NE. Albuquerque, NM 87108

Re: Sage & Unser Marketplace Master Drainage Plan Engineer's Stamp dated 10/18/10 (M10/D019)

Dear Mr. Arfman,

Based upon the information provided in your submittal received 10-19-10, the above referenced plan is approved for Preliminary Plat Action by DRB.

If you have any questions, you can contact me at 924-3695.

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Sincerely, Cutu a Chem

Curtis Cherne, P.E.

Senior Engineer, Planning Department.

Development and Building Services

File
Brad Bingham

1802

DRAIN. & AND TRANSPORTATION INFORMAT N SHEET (Rev. 12/05)

PROJECT TITLE: <u>Unser and Sage Marketplace</u>	ZONE MAP/DRG. FI	FE N/10/FN010
DRB#: 1008203 EPC#:		
LEGAL DESCRIPTION: Tract A, Unit 1-B, Lands of Albuq	uerque South	· · · · · · · · · · · · · · · · · · ·
CITY ADDRESS:		• <u> </u>
ENGINEERING FIRM: ISSACSON & ARFMAN, PA	CONTACT:	Fred Arfman
ADDRESS: 128 MONROE NE	PHONE:	268-8828
CITY, STATE: ALBUQUERQUE, NM	ZIP CODE:	<u>87108</u>
OWNER: Unser Sage Parnership.	CONTACT:_	George Reinhart
ADDRESS: CO 2325 San Pedro Dr. NE, Suite 2B	PHONE:	884-9110
CITY, STATE: Albuquerque, NM	ZIP CODE: _	87110
A DCINTECT.		
ARCHITECT:	CONTACT:_	
ADDRESS:CITY, STATE:	PHONE:	
CIII, BIAID.	ZIP CODE: _	
SURVEYING FIRM: Aldrich Surveying	_ LICENSED SURVEY	OR:Tim Aldrich
ADDRESS:	PHONE:	
CITY, STATE:	· · · · · · · · · · · · · · · · · · ·	
CONTRACTOR:	_ CONTACT: _	
ADDRESS:	_ PHONE:	
CITY, STATE:	_ ZIP CODE:	
TYDE OF CIDATTTAL.		~ ^ T T C T T C
TYPE OF SUBMITTAL: CHECK X DRAINAGE REPORT (resubmittal)	TYPE OF APPROVAL	
	SIA/FINANCIAL GUA	
DRAINAGE PLAN RESUBMITTAL	PRELIMINARY PLAT	
CONCEPTUAL G & D PLAN	_ S. DEV. PLAN FOR SI _ S. DEV. FOR BLDG. P	· – · · · · · · · · · · · · · · · · · ·
GRADING PLAN	SECTOR PLAN APPR	
EROSION CONTROL PLAN	FINAL PLAT APPROV	
ENGINEER'S CERT (HYDROLOGY)	FOUNDATION PERM	
CLOMR/LOMR	BUILDING PERMIT A	· · · · · · · · · · · · · · · · · · ·
TRAFFIC CIRCULATION LAYOUT	CERTIFICATE OF OC	
ENGINEER/ARCHITECT CERT (TCL)	CERTIFICATE OF OG	CHPANCY CTEMPY
ENGINEER/ARCHITECT CERT (DRB S.P.)	GRADING PERMIT A	PPROVAL
ENGINEER/ARCHITECT CERT (AA)	PAVING PERMIT API	ROVAL
OTHER (SPECIFY)	WORK ORDER APPR	
	OTHER (SPECIFY)	OCT 19 2010
BLACIA DDE DECLOSI CONTENDATOR ACCURATOR	_	
WAS A PRE-DESIGN CONFERENCE ATTENDED:		HYDROLOGY
YES		SECTION
NO COPY PROVIDED		
COPI PROVIDED	D=	· · · · · · · · · · · · · · · · · · ·
SUBMITTED BY: ISAACSON & ARFMAN: Fred Arfman		BM 17750 10.15.10 October 12 2010
SONTHING TO TO TOUTOOUT OF WINTIATURE LIEU WITHING	DATE:	October 12, 2010
Requests for approvals of Site Development Plans and/or Subdivision P	lats shall be accompanied	by a drainage submittal. The
particular nature, location and scope to the proposed development defin	e the degree of drainage of	letail. One or more of the following
evels of submittal may be required based on the following:	. —	

1. Conceptual Grading and Drainage Plan: Required for approval of Site Development Plans greater than five (5) agres and Sector Plans.

- 2. Drainage Plans: Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
- 3. Drainage Report: Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more.

OCTOBER 18, 2010

SUPPLEMENTAL INFORMATION

FOR

SAGE & UNSER MARKETPLACE

7322 BOTTONAL ENGINE

BY

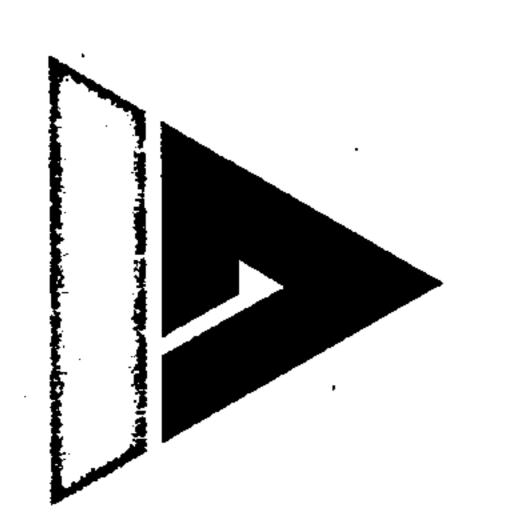
I&A PROJECT NO. 1802/1761

ISAACSON & ARFMAN, P.A. Consulting Engineering Associates 128 Monroe Street N.E.

Albuquerque, New Mexico 87108 Ph. 505-268-8828 Fax. 505-268-2632

OCT 19 2010

HYDROLOGY SECTION



Isaacson & Arfman, P.A.

Consulting Engineering Associates

Thomas O. Isaacson, PE & LS * Fred C. Arfman, PE * Åsa Nilsson-Weber, PE

October 18, 2010

UNSER AND SAGE MARKETPLACE MASTER DRAINAGE STUDY

The referenced PROPERTY is an undeveloped commercial property located within City of Albuquerque (C.O.A.) Vicinity Map M-10-Z. The 9.1590 acre site is bound to the east and south by developed residential property, to the west by Unser Blvd. SW, and to the north by Sage Road SW. The PROPERTY, as shown on this preliminary plat submittal, will be subdivided into five tracts as follows:

Lands of Albuquerque South Unit 1-B, City Of Albuquerque, Bernalillo County, New Mexico.

Tract A-1: 4.79 Acres (to be subdivided into four tracts by future plating actions)

Tract A-2: 1.01 Acres

Tract A-3: 1.37 Acres

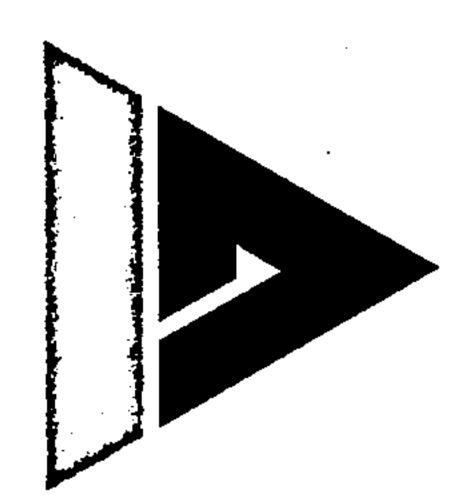
Tract A-4: 1.10 Acres

Tract A-5: 0.83 Acres

Proposed improvements: the proposed improvements include new commercial buildings, site walks, access and parking pavement and associated landscaping.

The purpose of this master plan is to identify overall basins, drainage patterns and allowable discharge rates. The individual tracts will be developed separately and will be required to adhere to the master drainage and grading plan as follows:

• The development of each tract must include the preparation of a drainage and grading plan for C.O.A. Hydrology review and approval for building permit.



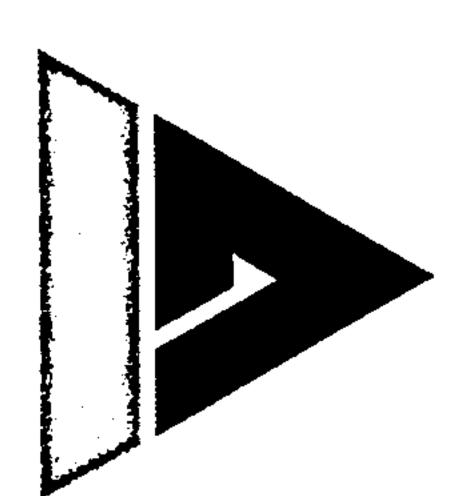
Thomas O. Isaacson, PE & LS * Fred C. Arfman, PE * Åsa Nilsson-Weber, PE

• The maximum allowable discharge from each tract is based on the 100-year, 6-hour storm event based on land treatment of 10% B, 10% C and 80% D. as follows:

TRACT Q100 SUMMARY								
Tract No:	Tract Area (ac)	*Discharge (Q)						
A-1	4.7931	19.1						
A-2	1.0086	4.0						
A-3	1.3693	5.5						
A-4	1.1023	4.4						
A-5	0.8257	3.3						
TOTAL	9.0990	36.29						

*Each Tract discharge (Q) based on 10% B, 10% C, 80% D. Discharge genereated in excess of this must be detained on individual tract.

- Each tract exceeding the above discharge rate must provide on-site detention pond(s) or underground storage as required to reduce the tract discharge to the allowable rate.
- Each tract drainage and grading plan must include temporary off-tract erosion control features such as desiltation ponds, temporary swales, etc. as required to protect undeveloped portion of PROPERTY.



Isaacson & Arfman, P.A.

Consulting Engineering Associates

Thomas O. Isaacson, PE & LS * Fred C. Arfman, PE * Åsa Nilsson-Weber, PE

BENCHMARK: vertical datum is based on AGRS monument "1-M10", a brass disc set in concrete located in the southeast quadrant of the intersection of Unser Blvd. And Sage Rd. SW. Elevation=5082.757 (navd88)

SURVEYOR: Aldrich Land Surveying, contact – Tim Aldrich, Phone: 505-884-1990

FLOOD ZONE: As shown on Flood Insurace Rate Map No: 35001C0336G, revised September 26, 2009 (see attached exhibit), The PROPERTY appears to lie mostly within ZONE X (areas determined to be outside the 0.2% annual chance flood plain.) The northerly boundary appears to be in close proximity to ZONE AO: Depth 1' (special flood hazard area – subject to inundation by the 1% annual flood chance – usually sheet flow on sloping terrain – average depths determined). The northwesterly corner appears to be in close proximity to ZONE X SHADED (areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1% annual chance flood).

OFF-SITE DRAINAGE: No off-site drainage will pass through the overall property. All proposed tracts will be covered by a blanket drainage easement.

Isaacson & Arfman, P.A.

Consulting Engineering Associates

Thomas O. Isaacson, PE & LS * Fred C. Arfman, PE * Åsa Nilsson-Weber, PE

DRAINAGE PLAN CONCEPT:

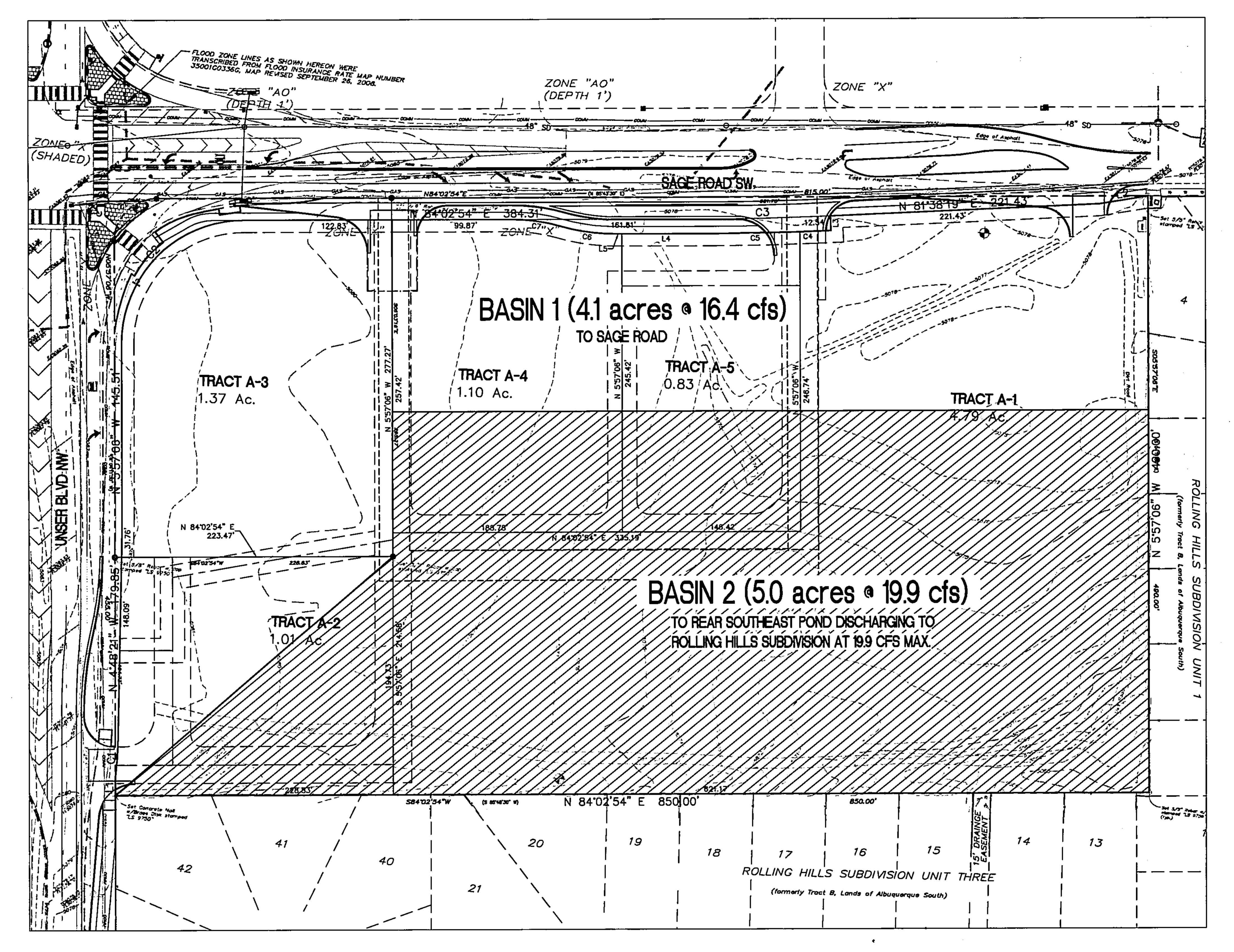
The undeveloped property currently generates approximately 16.5 cfs during the 100-year 6-hour storm. The fully developed condition will generate approximately 36.3 cfs.

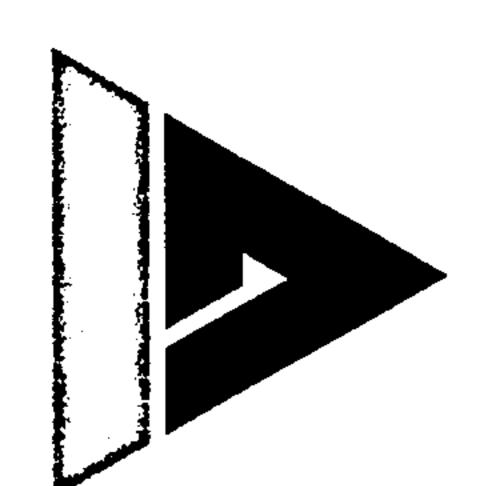
		CALCU	JLATIO	NS: Unser and Sage M	larketp	lace: August 11,	2010		
Based on Drainage D	esign C	Criteria for City of Alb	ouquerqu	e Section 22.2, DPM, Vol	2, dated	Jan., 1993			
				ON-SITE	,		_		
AREA OF SITE:		-		396356	SF	=	9.1		
				100-year, 6-hour					
HISTORIC FLOW	S:			DEVELOPED FLOWS	:			EXCESS PRECIP:	
		Treatment SF	<u> %</u>	-		Treatment SF	<u> %</u>	Precip. Zone	1
Area A	=	158542.2707	40%	Area A	=	0	0%	$E_A = 0.44$	
Area B	=	198177.8384	50%	Area B	==	39636	10%	$E_{\rm B} = 0.67$	
Area C	==	39635.56767	10%	Area C	=	39636	10%	$E_{C} = 0.99$	
Area D	=	0	0%	Area D	=	317085	80%	$E_D = 1.97$	
Total Area	=	396355.6767	100%	Total Area	=	396355.6767	100%		
		Weighted E =		$E_AA_A + E_BA_B + E_CA_C +$	E_DA_D				
				$A_A + A_B + A_C + A_C$				7	
Historic E	=	0.61	in.	A _A + A _B + A _C + A Developed E	D =	1.7	4 in.]	
Historic E On-Site Volume of R			in.	1		1.7	4 in.		
				Developed E		5753			
On-Site Volume of R	unoff:	V360 =		Developed E E*A / 12	=				
On-Site Volume of R Historic V ₃₆₀	unoff: =	V360 =	CF	Developed E E*A / 12 Developed V ₃₆₀	=				
On-Site Volume of R Historic V ₃₆₀	unoff: = rge Rat	V360 = 20148	CF	Developed E E*A / 12 Developed V ₃₆₀	=				
On-Site Volume of R Historic V ₃₆₀ On-Site Peak Discha	unoff: = rge Rat	V360 = 20148	CF	Developed E E*A / 12 Developed V ₃₆₀	=				
On-Site Volume of R Historic V ₃₆₀ On-Site Peak Discha For Precipitation Zon	unoff: = rge Rat	V360 = 20148 e: $Qp = Q_{pA}A_{A} + Q_{pB}$	CF	Developed E E*A / 12 Developed V ₃₆₀ Ac+Q _{pD} A _D / 43,560	=	5753			

Per the approved Drainage Master Plan for The Rolling Hills Subdivision prepared by Isaacson & Arfman, P.A. and dated January, 1996, PROPERTY will be divided into two drainage basins.

INDIVIDUAL TRACT CALCULATIONS

TD A CT NO.	A 1) DESCRIPTION		TOTAL TRACT DISCHARGE
TRACT NO:	A-1	200700	DESCRIPTION	=	
Area of basin flows		208789		_	4.7931 Ac. LAND TREATMENT
ine following calci	ulations al		areas as shown in table to the right		
		······································	Excess Precipitation (see formula abo	• •	$A = \frac{1}{100}$
		Weighted E	 	n.	$\mathbf{B} = \begin{cases} 10\% \\ 10\% \end{cases}$
		· · · · · · · · · · · · · · · · · · ·	Runoff (see formula above)	OF	C = \ 10% \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
		V ₃₆₀		CF	D = 80%
			harge Rate: (see formula above)	С .	
		Q _P		cfs	
TRACT NO:	A-2		DESCRIPTION		TOTAL TRACT DISCHARGE
Area of basin flows		43935		=	1.0086 Ac.
The following calcu	ulations a		areas as shown in table to the right		LAND TREATMENT
			Excess Precipitation (see formula about	•	$A = \frac{1}{5} \qquad 0\%$
		Weighted E		n.	$\mathbf{B} = \frac{10\%}{1000}$
		Sub-basin Volume of	Runoff (see formula above)	<u>.</u>	$C = \begin{cases} 10\% \end{cases}$
		V ₃₆₀	· · · · · · · · · · · · · · · · · · ·	CF	$D = \frac{1}{2} 80\%$
		Sub-basin Peak Disc	harge Rate: (see formula above)		
		Q_P	= 4.0	cfs	
TRACT NO:	A-3		DESCRIPTION		TOTAL TRACT DISCHARGE
Area of basin flows	s =	59648	SF	=	1.3693 Ac.
The following calcu	ulations a	re based on Treatment a	areas as shown in table to the right		LAND TREATMENT
		Sub-basin Weighted	Excess Precipitation (see formula ab-	ove)	A = ; 0%
		Weighted E	= 1.74	in.	B=, 10%
		Sub-basin Volume of	f Runoff (see formula above)	· · · · ·	C = 10%
		V ₃₆₀	= 8659	CF	D = 80%
		Sub-basin Peak Disc	harge Rate: (see formula above)		
		Q _P	= 5.5	cfs	
TRACT NO:	A-4		DESCRIPTION		TOTAL TRACT DISCHARGE
Area of basin flow	s =	48018	SF	=	1.1023 Ac.
The following calc	ulations a	re based on Treatment	areas as shown in table to the right		LAND TREATMENT
		Sub-basin Weighted	Excess Precipitation (see formula ab	ove)	$A = \frac{1}{1}$ 0%
		Weighted E	= 1.74	in.	$\mathbf{B} = \frac{9}{2} \qquad 10\%$
		Sub-basin Volume of	f Runoff (see formula above)	····· =	$C = \frac{1}{2}$
		V ₃₆₀	= 6971	CF	D = 80%
		Sub-basin Peak Disc	harge Rate: (see formula above)		
		Q_P	= 4.4	cfs	
TRACT NO:	A-5	Production of the Assets	DESCRIPTION		TOTAL TRACT DISCHARGE
Area of basin flow	s =	35966	SF	==	0.8257 Ac.
The following calc	ulations a	re based on Treatment	areas as shown in table to the right		LAND TREATMENT
		Sub-basin Weighted	Excess Precipitation (see formula ab	ove)	A =) 0%
		Weighted E			$\mathbf{B} = 10\%$
		Sub-basin Volume of	f Runoff (see formula above)		C = 10%
		V ₃₆₀		CF	D = \\ 80\%
			harge Rate: (see formula above)		
		Q _P	2 2	cfs	
		I "'			I,





Isaacson & Arfman, P.A.

Consulting Engineering Associates

Thomas O. Isaacson, PE & LS * Fred C. Arfman, PE * Asa Nilsson-Weber, PE

BASIN 1 will free discharge to Sage Road to enter the existing public storm drain via existing and / or new inlets. The overall basin will consist of the following Tract portions:

Portion of Tract A-1:	1.08 Acres	4.3 CFS
Portion of Tract A-2:	0.50 Acres	2.0 CFS
Portion of Tract A-3:	1.37 Acres	5.5 CFS
Portion of Tract A-4:	0.67 Acres	2.7 CFS
Portion of Tract A-5:	0.49 Acres	2.0 CFS

Total Discharge to Sage Road = 16.4 CFS (4.1 acres).

BASIN 2 consisting of the remaining portions of the site tracts is permitted a to free discharge 19.9 cfs to the existing public 15' wide Drainage R.O.W. dedicated to the City of Albuquerque by the Plat for Rolling Hills Subdivision, Unit Three, dated March 1997 (see attached copy of plat) located near the southeast portion of PROPERTY. The overall basin will consist of the following Tract portions:

Portion of Tract A-1:	3.71 Acres	14.8 CFS
Portion of Tract A-2:	0.51 Acres	2.0 CFS
Portion of Tract A-4:	0.43 Acres	1.7 CFS
Portion of Tract A-5:	0.34 Acres	1.3 CFS

Total Discharge to Rear Detention Pond = 19.9 CFS (5.0 acres).

Flow in excess of the allowable tract discharge rate will be detained within detention ponds on each tract. See basin calculations and supplemental information for a more detailed analysis of site discharge.

1761 DPM Calculations - 100 yr 6 hr1.xlsx

DESCRIPTION

SF

BASIN NO.

Area of basin flows =

A-1

Portion To Sage Road

1.08 Ac.

LAND TREATMENT

A = 1 0%

B = 10%

C = 10%

The fellowing coloul	otions or	based on Treatment area	as as shown in table to the right		LAND TREATMENT
The following calcul	anons ar)	
			cess Precipitation (see formula abo	•	3
		Weighted E	$= \frac{1.74 \text{ is}}{2.76 \text{ (see ferminal above)}}$	II.	J j
			unoff (see formula above)	OF:	7 ·
		V ₃₆₀	= 6820	CF	$D = \frac{80\%}{1}$
		Sub-basin Peak Dischar	ge Rate: (see formula above)]
		Q_{P}	= 4.3	cfs	
BASIN NO.	A-2		DESCRIPTION		Portion To Sage Road
Area of basin flows	=	21640	SF	=	0.50 Ac.
The following calcul	lations are	e based on Treatment are	as as shown in table to the right		LAND TREATMENT
		Sub-basin Weighted Ex	cess Precipitation (see formula abo	ove)	$A = \frac{7}{8} \qquad 0\%$
		Weighted E	= 1.74 i	n.	$\mathbf{B} = \begin{cases} 10\% \end{cases}$
		Sub-basin Volume of R	unoff (see formula above)		$C = \frac{10\%}{10\%}$
		V ₃₆₀	= 3141	CF	$D = \frac{5}{4} \qquad 80\%$
		<u> </u>	ge Rate: (see formula above)		Aprille data majo e dada provincio de la provincio de la provincio della provincia della provi
		Q _P	= 2.0	cfs	
BASIN NO.	A-3		DESCRIPTION		Portion To Sage Road
Area of basin flows		59573	SF	=	1.37 Ac.
			as as shown in table to the right		LAND TREATMENT
ino iono wing carea.	idilolib di		cess Precipitation (see formula abo	ove)	A = \ 0%
		Weighted E	= 1.74 i		$B = \begin{cases} 10\% \end{cases}$
			unoff (see formula above)	11.	$C = \begin{cases} 10\% \\ 10\% \end{cases}$
				CF	D = 80%
		V ₃₆₀	= 8648	Cr	Elementario de la compansión de la compa
		Sub-basin Peak Dischar	rge Rate: (see formula above)	С.	
	<u> </u>	<u>Q</u> _P		cfs	
BASIN NO.	A-4		DESCRIPTION		Portion To Sage Road
Area of basin flows		29253	SF	=	0.67 Ac.
The following calcul	lations ar	re based on Treatment areas as shown in table to the right			LAND TREATMENT
		Sub-basin Weighted Ex	cess Precipitation (see formula abo	ove)	$\mathbf{A} = \begin{array}{ccc} & & & & & & \\ & & & & \\ & & & \end{array}$
		Weighted E	= 1.74 i	n.	$\mathbf{B} = \frac{10\%}{5}$
		Sub-basin Volume of R	unoff (see formula above)		$\mathbf{C} = \{10\%$
		V_{360}	= 4247	CF	$D = \frac{1}{2} 80\%$
		Sub-basin Peak Dischar	rge Rate: (see formula above)		
		Q _P	= 2.7	cfs	
BASIN NO.	A-5		DESCRIPTION		Portion To Sage Road
Area of basin flows	=	21384	SF	=	0.49 Ac.
The following calcul	lations ar	e based on Treatment are	as as shown in table to the right		LAND TREATMENT
		Sub-basin Weighted Ex	cess Precipitation (see formula abo	ove)	$A = \frac{1}{2} \qquad 0\%$
		Weighted E	= 1.74 i		$\mathbf{B} = \frac{6}{3}$ 10%
			unoff (see formula above)		$C = \frac{1}{5}$ 10%
		V ₃₆₀	= 3104	CF	$D = \frac{1}{2}$ 80%
			rge Rate: (see formula above)		
		Sub Subili I Suk Dibelia	- 8 - · · · · · · · · · · · · · · · · ·		

TOTAL AREA = A.I Acres

Q100 = 16.4 cfs

2.0

Tract Portions

Draining to SE ROW.

1761 DPM Calculations - 100 yr 6 hr1.xlsx

Portion To SE Drainage R.O.W. BASIN NO. DESCRIPTION A-1 Area of basin flows = SF 161807 3.71 Ac. The following calculations are based on Treatment areas as shown in table to the right LAND TREATMENT Sub-basin Weighted Excess Precipitation (see formula above) 0% $A = \frac{\pi}{4}$ Weighted E B = 11.74 in. 10% Sub-basin Volume of Runoff (see formula above) 10% CF 23489 D = 380% V_{360} Sub-basin Peak Discharge Rate: (see formula above) Q_{P} 14.8 cfs BASIN NO. Portion To SE Drainage R.O.W. **DESCRIPTION** A-2 Area of basin flows = SF 22280 0.51 Ac. The following calculations are based on Treatment areas as shown in table to the right LAND TREATMENT Sub-basin Weighted Excess Precipitation (see formula above) A = i0% Weighted E 1.74 in. B =10% Sub-basin Volume of Runoff (see formula above) $C = \frac{1}{2}$ 10% 3234 CF D =80% V_{360} Sub-basin Peak Discharge Rate: (see formula above) 2.0 cfs BASIN NO. DESCRIPTION A-4 Portion To SE Drainage R.O.W. Area of basin flows = SF 18833 0.43 Ac. The following calculations are based on Treatment areas as shown in table to the right LAND TREATMENT Sub-basin Weighted Excess Precipitation (see formula above) 0% $A = \frac{1}{2}$ Weighted E 1.74 in. $\mathbf{B} = 3$ 10% Sub-basin Volume of Runoff (see formula above) C =10% CF V_{360} 2734 $\mathbf{D} = \mathbf{i}$ 80% Sub-basin Peak Discharge Rate: (see formula above) Q_{P} cfs BASIN NO. Portion To SE Drainage R.O.W. DESCRIPTION A-5 Area of basin flows = SF 14598 0.34 Ac. The following calculations are based on Treatment areas as shown in table to the right LAND TREATMENT Sub-basin Weighted Excess Precipitation (see formula above) 0% A = Weighted E 1.74 in. 10% Sub-basin Volume of Runoff (see formula above) 10%

CF

cfs

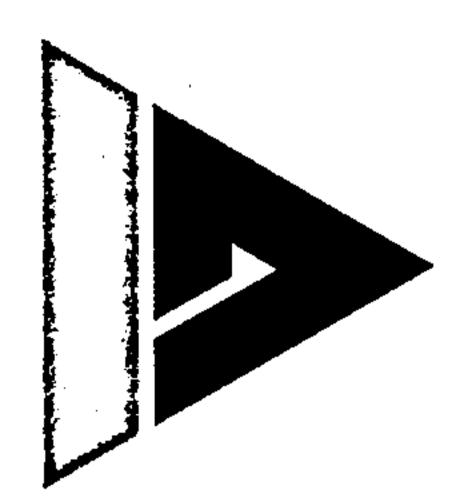
2119

1.3

 V_{360}

 Q_{P}

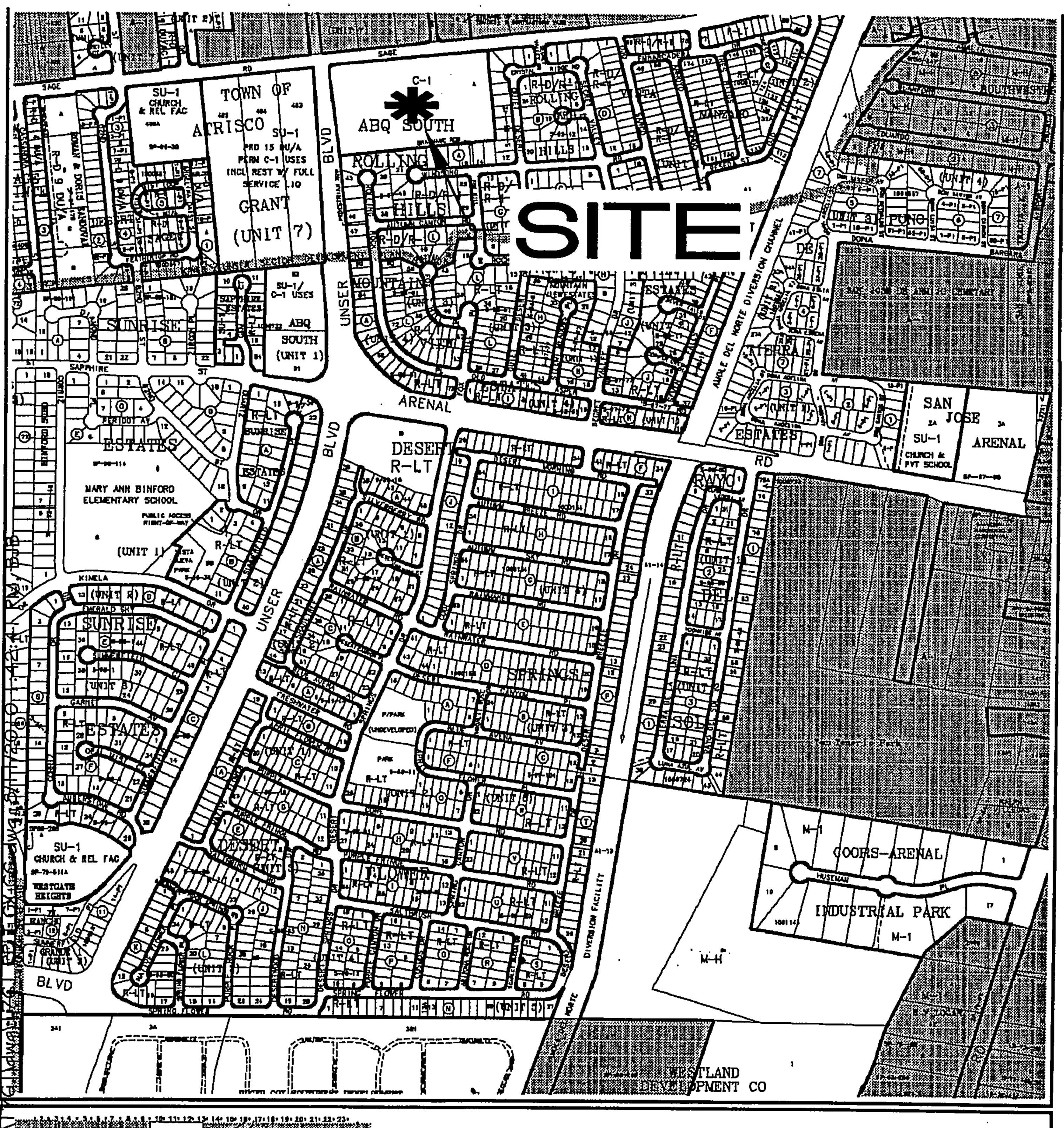
Sub-basin Peak Discharge Rate: (see formula above)

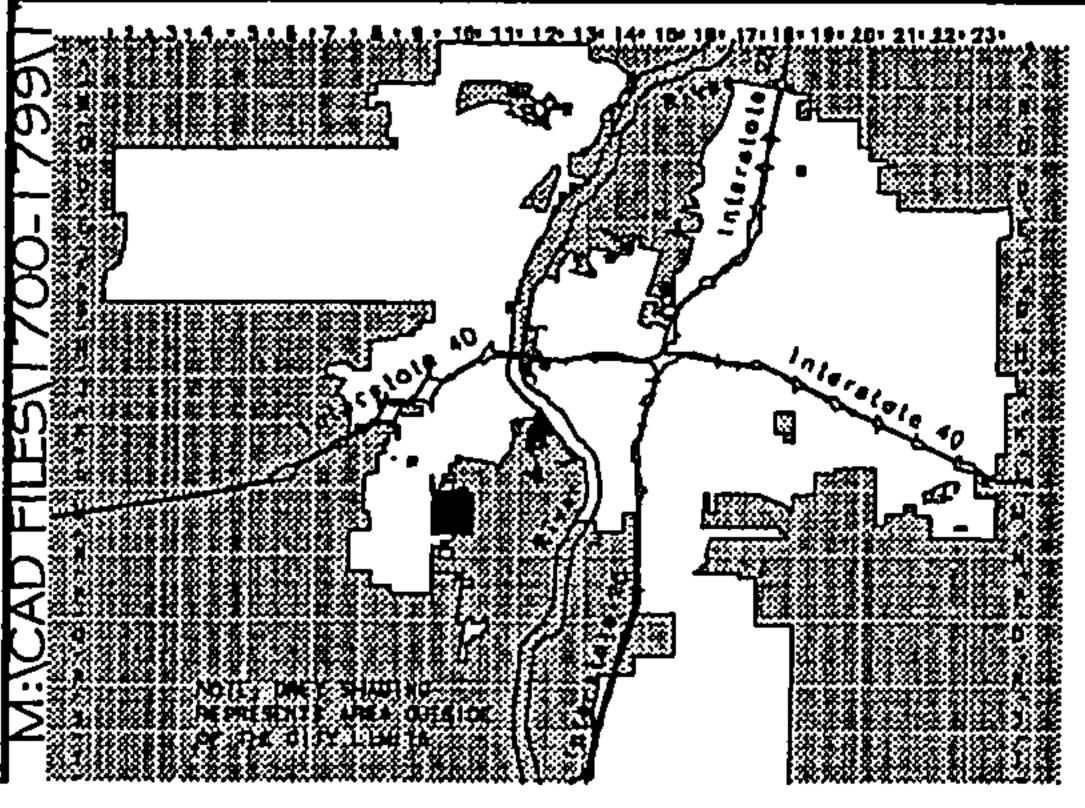


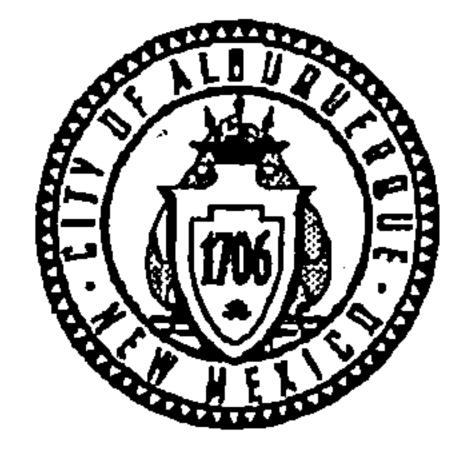
Thomas O. Isaacson, PE & LS * Fred C. Arfman, PE * Åsa Nilsson-Weber, PE

EXHIBITS

- City of Albuquerque Vicinity Map M-10
- Aerial photograph of site and surrounding area
- Flood Plain exhibit
- Rolling Hills Subdivision Master Drainage Plan referencing allowable PROPERTY discharge
- Rolling Hills Subdivision Unit Three Plat (recorded June 20, 1997) with 15' drainage R/W granted
- Sage and Unser Marketplace Preliminary Plat
- Master Drainage Plan

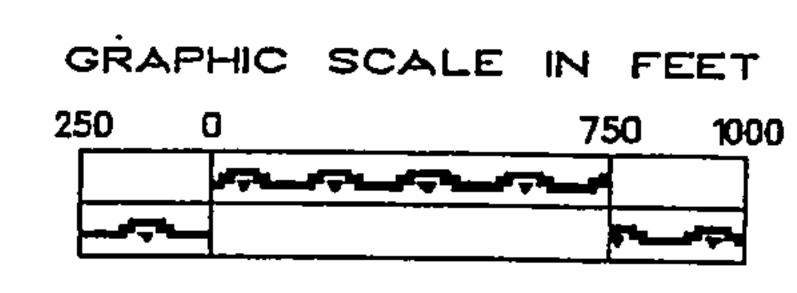






Abujurque Geographic Information System
PLANNING DEPARTMENT

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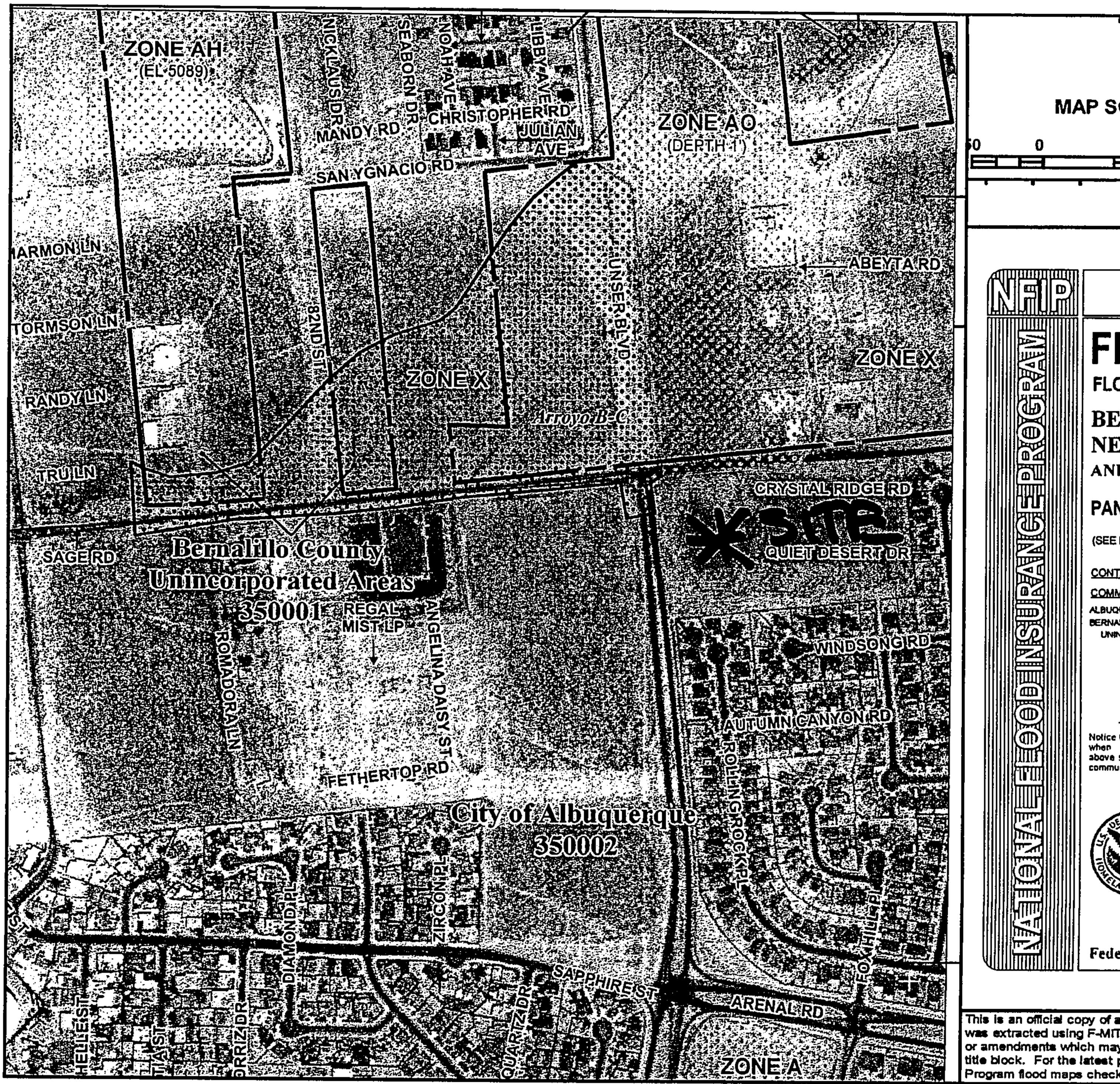


Zone Atlas Page

M-10-Z

Map Amended through February 01, 2005





MAP SCALE 1" = 500'

1000

PANEL 0336G

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 336 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY ALBUQUERQUE, CITY OF BERNALILLO COUNTY UNINCORPORATED AREAS 350001

when placing map orders; the Community Number shown above should be used on insurance applications for the subject

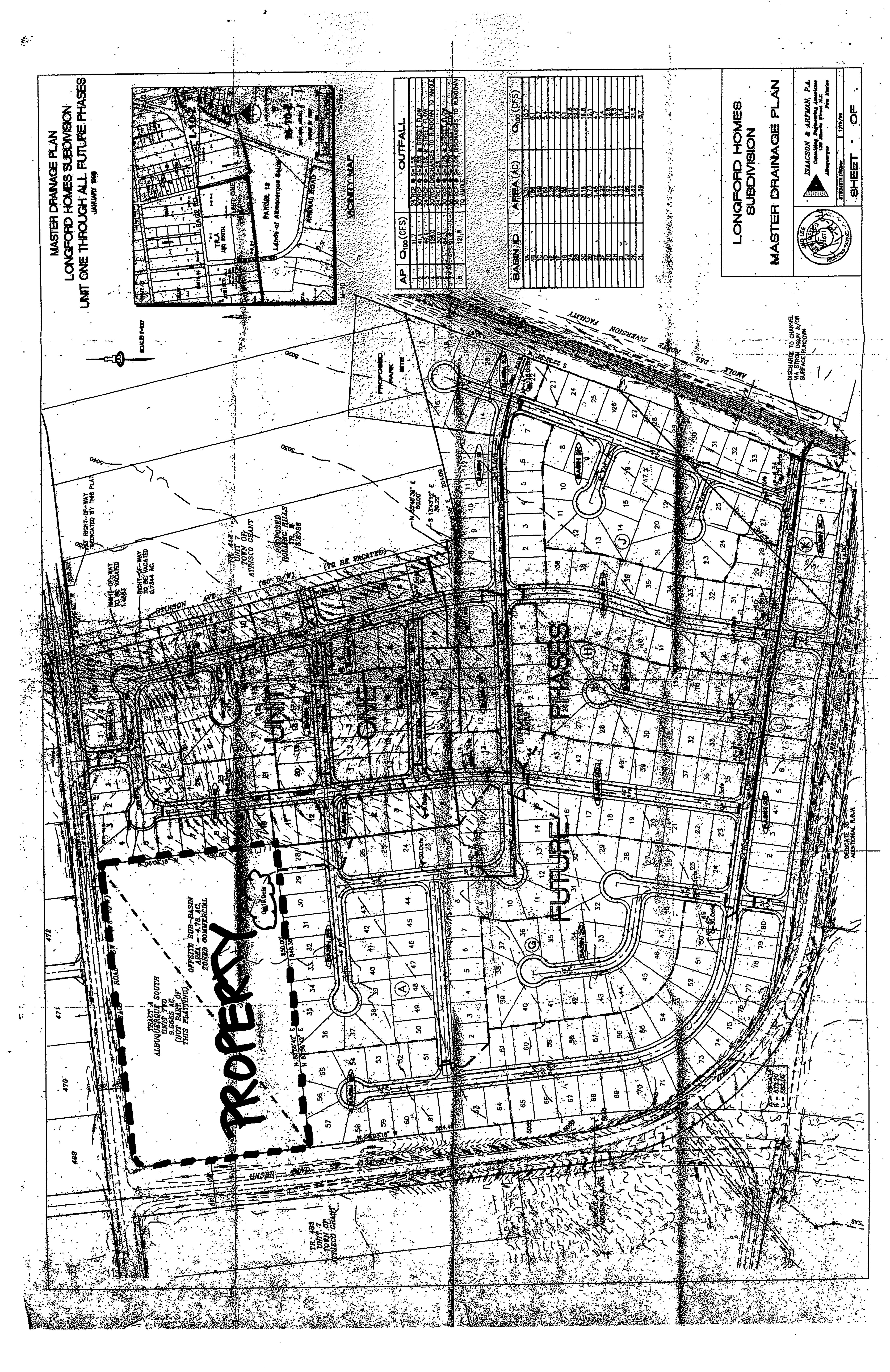


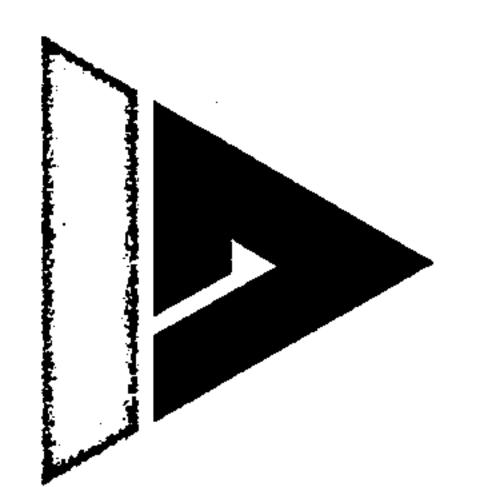
MAP NUMBER 35001C0336G

MAP REVISED **SEPTEMBER 26, 2008**

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov





Isaacson & Arfman, P.A.

Consulting Engineering Associates

Thomas O. Isaacson, PE & LS * Fred C. Arfman, PE * Åsa Nilsson-Weber, PE

October 12, 2010

Mr. Curtis Cherne, P.E.
Senior Engineer, Planning Department
Development and Building Services
City of Albuquerque, New Mexico

RE: SAGE & UNSER MARKETPLACE MASTER DRAINAGE STUDY (M10/D019)

Dear Mr. Cherne,

Attached with this letter is a copy of our revised Master Drainage Study for the above referenced project for your review. Revisions were made based on your comments dated September 27, 2010 as follows:

- 1. Preliminary Plan showing Tracts A-1 through A-5 is included.
- 2. The storm drain in Sage Road has been constructed as part of the Unser Blvd. SW Improvements. Copies of the as-built plans were provided for your files under separate cover.
- 3. An On-site Basin Map has been added with associated Basin Calculations.
- 4. Individual tract areas have been reviewed and corrected.
- 5. The entirety of Tract A is 9.1 acres. Based on the Rolling Hills Subdivision Unit 3 Master Drainage Plan dated January 19, 1996, Tract A was identified as an off-site adjacent property. The 'dashed' diagonal line shown through Tract A is a basin line which divided the property into two triangular areas. The northwest triangle was to discharge to Sage Road and the southeast triangle was to discharge 19.9 cfs through the public 15' wide Drainage R.O.W. dedicated to the City of Albuquerque by the Plat for Rolling Hills Subdivision, Unit Three, dated March 1997 (see attached copy of plat) located near the southeast portion of PROPERTY..

6. Master Plan Pond will be constructed as part of the first tract to develop.

Please don't hesitate to call with any questions or concerns.

Sincerely,

ISAACSON & ARFMAN P.A.

39.4 545

OCT 1 2 2010

HYDROLOGY
SECTION

Fred C. Arfman, PE FCA / bjb

Attachments

CITY OF ALBUQUERQUE

September 27, 2010

Fred C. Arfman, PE Isaacson & Arfman, PA Albuquerque, NM 87108

Sage & Unser Marketplace Re:

Master Drainage Study

Engineer's Stamp dated 08/12/10 (M10/D019)

Dear Mr. Arfman,

Based upon the information provided in your submittal received 08-13-10, the above referenced Study can not be approved for Preliminary Plat Action by DRB until the following comments are addressed.

The Preliminary Plat showing Tracts A-1 through A-5 is missing.

Proposed improvements should include the storm drain in Sage Rd. — las beau.

A Basin Map is needed and its calculations.

A Basin Map is needed and its calculations.

Is Tract A 9.55 acres or is this the Sub-Basin at 4.78 acres? What is the dashed Unser Outpursers.

The Tracts and their areas are different from one page to the other.

Why an impervious acreage of 4.5 acres for the Master Pond Plan?

How and why is a discharge of 19.9 cfs allowed to leave the site via an easement? What does this easement consist of? Please verify that this easement is still maintained and operable.

How big is the minor basin discharging into Sage Road?

If you have any questions, you can contact me at 924-3695.

Sincerely,

Curtis Cherne, P.E.

Senior Engineer, Planning Department. Development and Building Services

Bradley Bingham File

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

