

August 25, 2022

Ms. Renee Brissitte, PE CFM
Senior Engineer
City of Albuquerque
Planning Department, Development Review Services
600 2nd Street NW
Albuquerque, NM 87103

Subject: Arroyo Vista Median Swale

Dear Renee:

In speaking with Curtis, he would like me to work directly with hydrology on this issue. It my understanding that he has had some conversations with you on this issue. See below and enclosed enclosures I prepared previously to send to Curtis. Please give me a call so we can discuss.

Please find enclosed the re-evaluation of the Arroyo Vista drainage. With some minor discrepancies, I stand by the basin contribution to Arroyo Vista and to the inlet. The report has a total Q100=27.99cfs getting to inlet in the interim condition. With the re-evaluation, there is a total Q100=29.29cfs in the interim condition. It was determined there was minor discrepancies in previous total (26.89cfs) and then the addition of the 14% of OS-2 (0.29cfs) and then the interim condition of the south half of the Arroyo Vista (2.11cfs) being added. The delta is an increase of 1.3cfs.

Enclosed is the Inlet Schematic 7 from the report marked up with the revised/added flows. Also enclosed is the Proposed Basin Map show the portion of OS-2 and interm Basin AR South as well as the basins boxed which contribute to the total flow. Inlet analysis ins also included which show the ultimate\future as well as the interim condition.

To speak to OS-1, Curtis was correct in that the written portion of the report does not speak to OS-1's discharge location, however, in the HEC-HMS model output which is located in the report Appendix D it does show that OS-1 was analyzed to discharge to the arroyo to the south of Arroyo Vista. I have included this page for reference. In addition, we did double checked the model to confirm this.

Also included is the analysis for the earth berm to the west to ensure the OS-1 does not go in Arroyo Vista and into the Arroyo. A one and half foot berm is sufficient.

Please let me know if you have any questions.

Sincerely,



Yolanda Padilla Moyer, P.E.
Vice President
Community Development and Planning

Cc: Kevin Patton\Pulte Homes

Engineering ▲
Spatial Data ▲
Advanced Technologies ▲

INSPIRATION SUBDIVISION
PROPOSED BASINS MAP

MAY 2019



DEVELOPED BASIN SUMMARY											
BASIN I.D.	AREA (AC)	% LAND TREATMENT				DISCHARGE (CFS)		VOLUME (AC-FT)		VOLUME (AC-FT)	
		A	B	C	D	100 yr	100 yr	10 yr	100 yr	10 yr	100 yr
U1-A	3.01	0.00%	30.00%	30.00%	40.00%	8.2	9.7	0.17	0.32		
U1-B	2.95	0.00%	30.00%	30.00%	40.00%	8.0	9.5	0.17	0.32		
U1-C	2.65	0.00%	0.00%	85.00%	15.00%	6.7	8.2	0.12	0.25		
U1-D	0.54	0.00%	0.00%	90.00%	10.00%	1.3	1.6	0.02	0.05		
U1-E	0.23	0.00%	0.00%	10.00%	90.00%	1.0	1.0	0.02	0.04		
U1-F	3.79	0.00%	30.00%	30.00%	40.00%	10.4	12.2	0.22	0.41		
U1-G	0.67	0.00%	0.00%	90.00%	10.00%	1.6	2.0	0.03	0.06		
U1-H	0.97	0.00%	30.00%	30.00%	40.00%	2.6	3.1	0.05	0.10		
U1-I	2.88	0.00%	30.00%	30.00%	40.00%	7.8	9.2	0.17	0.31		
U1-J	0.86	0.00%	30.00%	30.00%	40.00%	2.4	2.8	0.05	0.09		
U1-K	1.12	0.00%	30.00%	30.00%	40.00%	3.1	3.6	0.06	0.12		
U1-L	2.73	0.00%	30.00%	30.00%	40.00%	7.5	8.8	0.16	0.29		
U1-M	0.94	0.00%	0.00%	10.00%	90.00%	3.9	4.0	0.09	0.15		
U2-A	2.04	0.00%	30.00%	30.00%	40.00%	5.6	6.6	0.12	0.22		
U2-B	2.71	0.00%	0.00%	90.00%	10.00%	6.6	8.2	0.12	0.25		
U2-C	1.23	0.00%	30.00%	30.00%	40.00%	3.4	4.0	0.07	0.13		
U2-D	1.27	0.00%	30.00%	30.00%	40.00%	3.5	4.1	0.07	0.14		
U2-E	1.67	0.00%	30.00%	30.00%	40.00%	4.6	5.4	0.10	0.18		
U2-F	1.89	0.00%	30.00%	30.00%	40.00%	5.2	6.1	0.11	0.20		
U2-G	4.83	0.00%	30.00%	30.00%	40.00%	13.2	15.5	0.28	0.52		
U2-H	0.91	0.00%	0.00%	90.00%	10.00%	2.2	2.7	0.04	0.08		
U2-I	1.43	0.00%	30.00%	30.00%	40.00%	3.9	4.6	0.08	0.15		
U2-J	1.19	0.00%	30.00%	30.00%	40.00%	3.2	3.8	0.07	0.13		
U2-K	0.87	0.00%	30.00%	30.00%	40.00%	1.8	2.1	0.04	0.07		
U2-L	1.25	0.00%	30.00%	30.00%	40.00%	3.4	4.0	0.07	0.13		
U2-M	0.78	0.00%	0.00%	10.00%	90.00%	3.2	3.3	0.08	0.12		
U2-N	0.19	0.00%	0.00%	10.00%	90.00%	0.8	0.8	0.02	0.03		
U3-A	1.36	0.00%	0.00%	90.00%	10.00%	3.3	4.1	0.06	0.12		
U3-B	4.89	0.00%	30.00%	30.00%	40.00%	13.3	15.7	0.28	0.52		
U3-B	0.71	0.00%	30.00%	30.00%	40.00%	1.9	2.3	0.04	0.08		
U3-C	1.08	0.00%	30.00%	30.00%	40.00%	2.9	3.5	0.06	0.12		
U3-D	7.11	0.00%	30.00%	30.00%	40.00%	19.4	22.9	0.41	0.76		
U3-E	7.65	0.00%	30.00%	30.00%	40.00%	20.9	24.6	0.44	0.82		
U3-F	7.28	0.00%	30.00%	30.00%	40.00%	19.9	23.4	0.42	0.78		
U3-G	9.76	0.00%	30.00%	30.00%	40.00%	26.6	31.4	0.56	1.05		
U3-H	0.99	0.00%	30.00%	30.00%	40.00%	2.7	3.2	0.06	0.11		
U3-I	0.72	0.00%	30.00%	30.00%	40.00%	2.0	2.3	0.04	0.08		
U3-J	1.74	0.00%	30.00%	30.00%	40.00%	4.7	5.6	0.10	0.19		
TOTAL	88.66					242.6	285.6	5.1	9.5		

AR-South (interim basin)

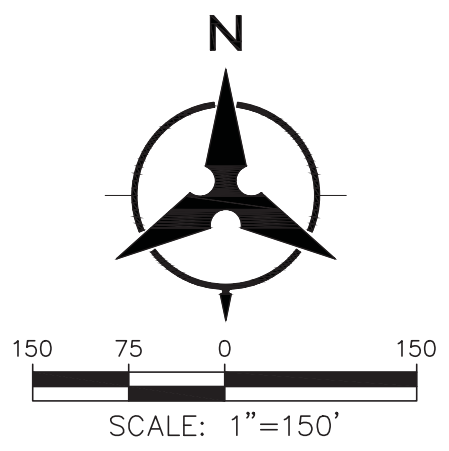
EXISTING BASIN SUMMARY									
BASIN I.D.	AREA (AC)	% LAND TREATMENT				DISCHARGE (CFS)		VOLUME (AC-FT)	
		A	B	C	D	10 yr	100 yr	10 yr	100 yr
OS-1	10.34	50.00%	25.00%	25.00%	0.00%	15.8	18.8	0.66	0.86
OS-2	1.36	50.00%	25.00%	25.00%	0.00%	2.1	2.1	0.08	0.08
OS-3	1.99	50.00%	25.00%	25.00%	0.00%	2.9	2.9	0.12	0.12
OS-4	3.54	50.00%	25.00%	25.00%	0.00%	5.4	5.4	0.23	0.23
OS-5	3.35	50.00%	25.00%	25.00%	0.00%	5.1	5.1	0.21	0.21
OS-6	14.50	50.00%	25.00%	25.00%	0.00%	22.1	22.1	0.92	0.92
OS-7	3.21	50.00%	25.00%	25.00%	0.00%	4.9	4.9	0.20	0.20
TOTAL	34.99					58.3	58.3	2.4	2.4

ARROYO VISTA BASIN SUMMARY									
BASIN I.D.	AREA (AC)	% LAND TREATMENT				DISCHARGE (CFS)		VOLUME (AC-FT)	
		A	B	C	D	10 yr	100 yr	10 yr	100 yr
AR-1	4.21	0.00%	0.00%	15.00%	85.00%	16.9	17.5	0.39	0.64
AR-2	2.01	0.00%	0.00%	10.00%	90.00%	8.3	8.5	0.19	0.31
AR-3	2.82	0.00%	0.00%	10.00%	90.00%	11.6	11.9	0.27	0.44
AR-4	2.59	0.00%	0.00%	10.00%	90.00%	10.7	10.9	0.25	0.40
AR-5	2.61	0.00%	0.00%	10.00%	90.00%	10.7	11.0	0.25	0.41
AR-6	2.01	0.00%	0.00%	10.00%	90.00%	8.3	8.5	0.19	0.31
TOTAL	16.26					66.4	68.3	1.6	2.5

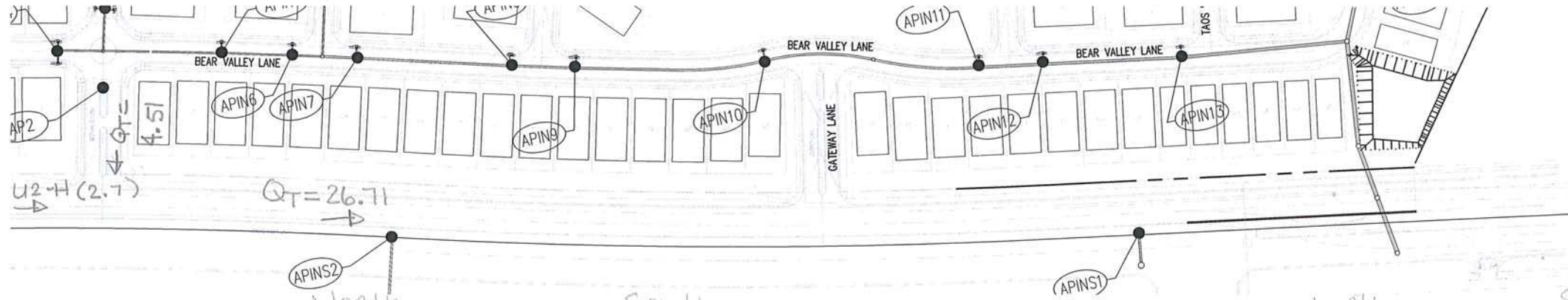
AR-SOUTH	2.11	0.00%	0.00%	100%	0.00%	1.6	2.11		
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LEGEND

- BASIN BOUNDARY
- FLOW ARROW
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- PROPOSED STREET SLOPE OR FLOW PATH
- PROPOSED STORM DRAIN MANHOLE
- PROPOSED STORM DRAIN INLET
- ANALYSIS POINT



**ARROYO VISTA MEDIAN SWALE
(INTERIM CONDITION WITH
ONLY NORTH SIDE OF
ROADWAY BUILT)**



North
 $Q_{100} =$ U2-H (2.7)
 U2-O (1.8)
 Bear Valley (3.71) (AP2)
 AR-6 (8.5) 8.3

~~15.71~~ 15.51

14%OS-2=0.29cfs
 Tot=15.8cfs

North Half
 $Q_{10} =$ U2-H (2.2)
 U2-O (1.8)
 AR-6 (8.3)
 Bear Valley (3.71)
 15.01 cfs

South
 Q_{100}
 AR-5 (11)
 11 cfs

South Half
 AR-5 (10.7 cfs)
 10.7 cfs

**AR-South
(Interim) =
2.11cfs**

Q100total=29.29cfs

ARROYO VISTA

North
 $Q_{100} =$ U1G (2.0 cfs)
 U1E (1.0 cfs)
 TSAR4 (8.10) 8.03
 TSUID (1.2) 0.80
 AR-3 (11.9)

0.50

$Q_T = 12.28$ cfs

11.38

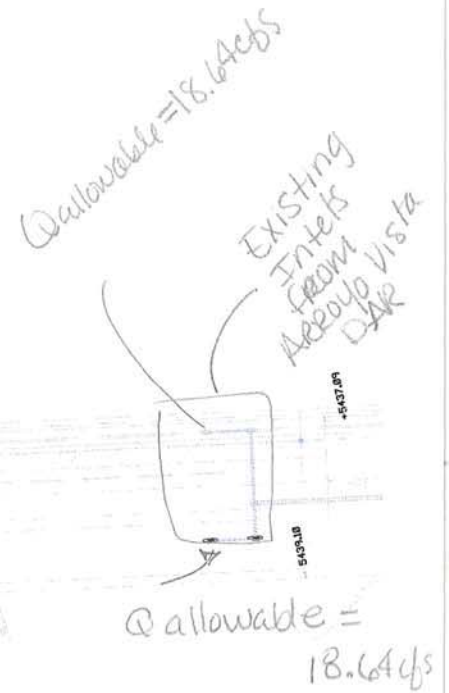
Q_{10} North Half
 U1G (1.6)
 U1E (1.0)
 TSAR4 (8.03)
 TSUID (0.98)
 $Q_T = 11.61$

South
 AR-3 (11.9)
 $Q_T = 11.9$ cfs

South Half
 AR-3 (11.4)
 $Q_T = 11.4$

North
 Q_{100}
 AR-2 8.5
 (2S) AR-4 2.72
 (2S) UID 0.4 cfs
 11.62

Q_{10}
 AR2 8.3
 2SAR4 2.67
 2SUID 0.33
 11.3



Inlet Schematic 7

Double Type "A" Sump- Inlet A

ANALYSIS OF AN INLET IN A SUMP CONDITION - INLET INS1 INS2 ARROYO VISTA

INLET TYPE: Double Gate Type "A" with curb opening wings on both sides on inlet.

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

Wing opening

C= 3.0

L= 4.0 ft

$Q=3.0(4.0)H^{1.5}= 12.0H^{1.5}$

Grate opening

C=3.0

$L(\text{double grate})=[2(2.67')+2(1.8')]=8.94 \text{ ft}$

$Q=3.0(8.94)H^{1.5}=26.82*H^{1.5}$

ORIFICE: $Q=C*A*(2*G*H)^{0.5}$

Grate opening

C=0.6

$A(\text{double grate})=7.14 \text{ sf}$

$Q=4.194*(64.4*H)^{0.5}$

Wing opening

C=0.6

A=2.0 sf

$Q=1.2*(64.4*H)^{0.5}$

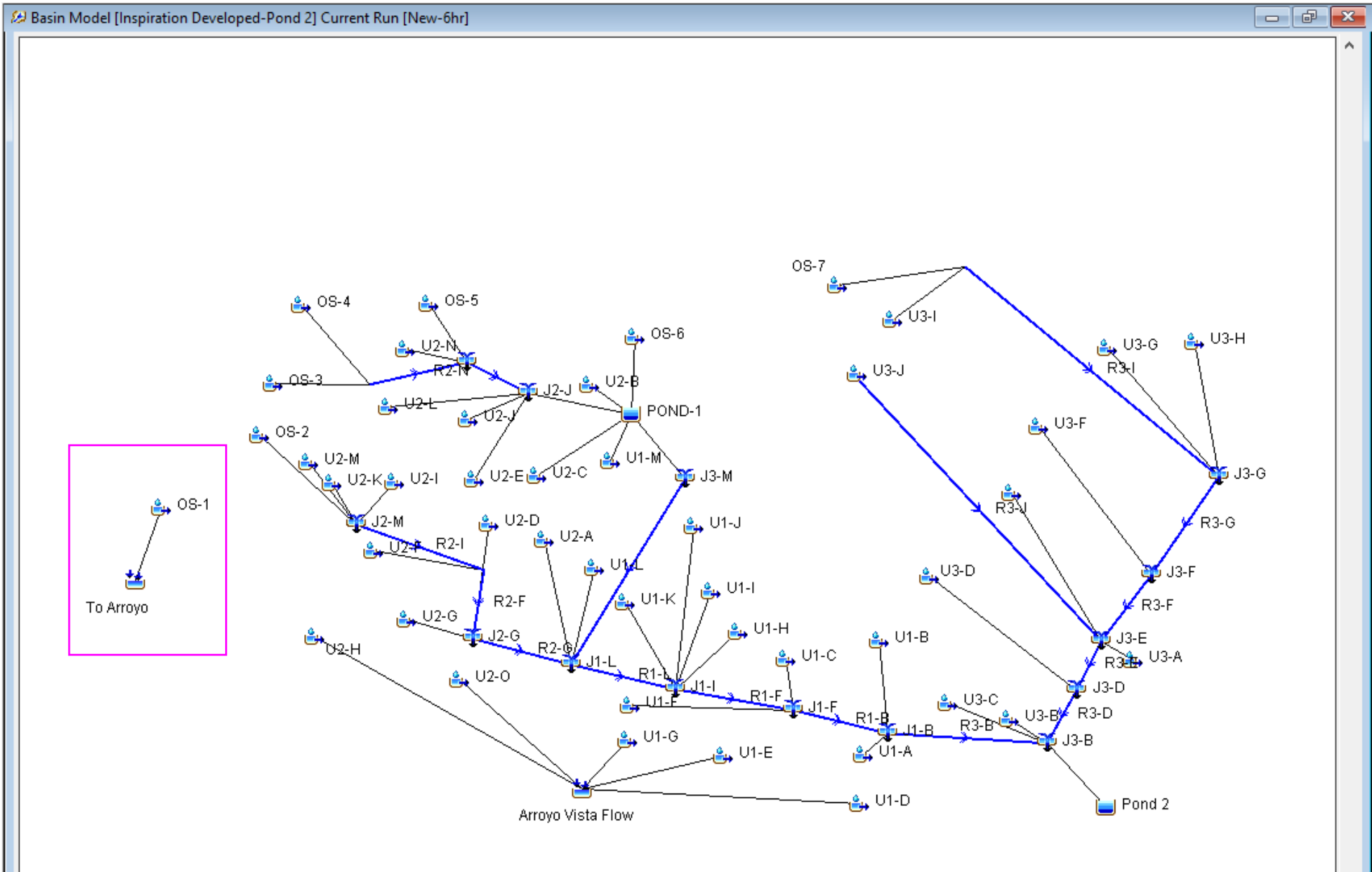
	WS ELEVATION	HEIGHT ABOVE INLET	Q (CFS) WEIR "A" OPENING	Q (CFS) WEIR DOUBLE GRATE	Q (CFS) ORIFICE DOUBLE GRATE	TOTAL Q (CFS)	COMMENTS:
~FL @ INLET	0.00	0.00	0.00	0.00	0.00	0.00	Flow at double "A" inlet w/ two wing openings
	0.10	0.10	0.38	0.85	10.87	1.61	Weir controls on grate analysis
	0.20	0.20	1.07	2.40	15.37	4.55	
	0.30	0.30	1.97	4.41	18.83	8.35	
	0.40	0.40	3.04	6.78	21.74	12.86	
	0.50	0.50	4.24	9.48	24.31	17.97	
	0.60	0.60	5.58	12.46	26.63	23.62	IN S1 Q(100 yr) = 24.18 cfs is provided at this depth
TOP OF CURB	0.70	0.70	7.03	15.71	28.76	29.76	IN S2 Q(100 yr) = 26.71 cfs is provided at this depth
	0.80	0.80	8.59	19.19	30.75	36.36	IN S2 Q(100YR) 29.29 CFS (INTERIM)
	0.90	0.90	10.25	22.90	32.61	43.39	
ROW LIMIT	1.00	1.00	12.00	26.82	34.38	50.82	

NOTE:

The total runoff intercepted by the inlet at the low point in the road is:

$Q_r(100) = 2*[(\text{runoff of the wing opening}) + (\text{the lesser of the weir or orifice amount taken by the double grate})]$.

HEC-HMS (v4.2) Schematic:



ARROYO VISTA BERM AT WEST END

MANNING'S N = 0.025 SLOPE = 0.048

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	0.6	2.0	20.0	0.0	3.0	24.5	1.5
WSEL	DEPTH	FLOW	FLOW	WETTED	FLOW	TOPWID	TOTAL	
FT.	INC	AREA	RATE	PER	VEL	PLUS	ENERGY	
		SQ.FT.	(CFS)	(FT)	(FPS)	OBSTRUCTIONS	(FT)	
0.050	0.050	0.045	0.050	1.826	1.105	1.817	0.069	
0.100	0.100	0.182	0.319	3.651	1.754	3.633	0.148	
0.150	0.150	0.409	0.940	5.477	2.299	5.450	0.232	
0.200	0.200	0.727	2.024	7.302	2.785	7.267	0.321	
0.250	0.250	1.135	3.669	9.128	3.232	9.083	0.412	
0.300	0.300	1.635	5.966	10.953	3.649	10.900	0.507	
0.350	0.350	2.225	9.000	12.779	4.044	12.717	0.604	
0.400	0.400	2.907	12.850	14.604	4.421	14.533	0.704	
0.450	0.450	3.679	17.591	16.430	4.782	16.350	0.806	
0.500	0.500	4.542	23.298	18.255	5.130	18.167	0.909	
0.550	0.550	5.495	30.040	20.081	5.466	19.983	1.015	
0.600	0.600	6.540	37.885	21.906	5.793	21.800	1.122	

OS-1 = 15.8cfs

