

**OLSSON**  
ASSOCIATES

May 22, 2007

Mr. Curtis A. Cherne  
City of Albuquerque – Planning Dept.  
PO Box 1293  
Albuquerque, NM 87103

Re: McMahon Marketplace Drainage Design  
Summary of Design

Dear Mr. Cherne:

This letter serves as a summary of the enclosed drainage design calculations for the McMahon Marketplace. The enclosed calculations are intended to supplement the plan & profile drawings included in the accompanying submittal to the City of Albuquerque.

The allowable site release rate was determined in the *McMahon Marketplace Conceptual Grading and Drainage Plan, Engineer's stamp dated 03/22/07 (A11/D11)*, prepared by Olsson Associates. Per the approved plan, the Marketplace is allowed to release 45.34 CFS into the existing stormwater infrastructure located within McMahon Boulevard.

The computer programs Hydraflow Hydrographs® and Hydraflow Storm Sewers® were both used in the preparation of the Marketplace drainage design. These programs were used to model the drainage basins, determine 100-year storm runoff rates, and model detention pond 100-year water surface elevations. Per the enclosed calculations, the combined (routed) discharge of Pond A, Pond B and off-site flows is 45.31 CFS (for the full build-out condition).

Since the Marketplace's proposed site runoff is less than its allowable release rate, the proposed development will not adversely affect downstream drainage facilities.

Sincerely,



Wyatt E. Popp, PE  
Olsson Associates



# Pond Report

Hydraflow Hydrographs by Intelisolve

Monday, May 21 2007, 1:17 PM

## Pond No. 1 - POND A

### Pond Data

Pond storage is based on known contour areas. Average end area method used.

### Stage / Storage Table

*30 mps at 4.91*

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	5290.29	00	0	0
1.00	5291.00	450	225	225
2.00	5292.00	2,007	1,229	1,454
3.00	5293.00	2,580	2,294	3,747
4.00	5294.00	3,166	2,873	6,620

### Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise (in)	= 29.00	0.00	0.00	0.00
Span (in)	= 29.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 5290.29	0.00	0.00	0.00
Length (ft)	= 69.92	0.00	0.00	0.00
Slope (%)	= 4.35	0.00	0.00	0.00
N-Value	= .013	.013	.013	.013
Orif. Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 0.00	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.

Orifice

$$Q = C_d A \sqrt{64.4 h}$$

$$= 0.6 (4.91) \sqrt{64.4 (93.16 - 90.20)}$$

$$= 39.9 \text{ cfs}$$

*100 yr WSE 5293.16*

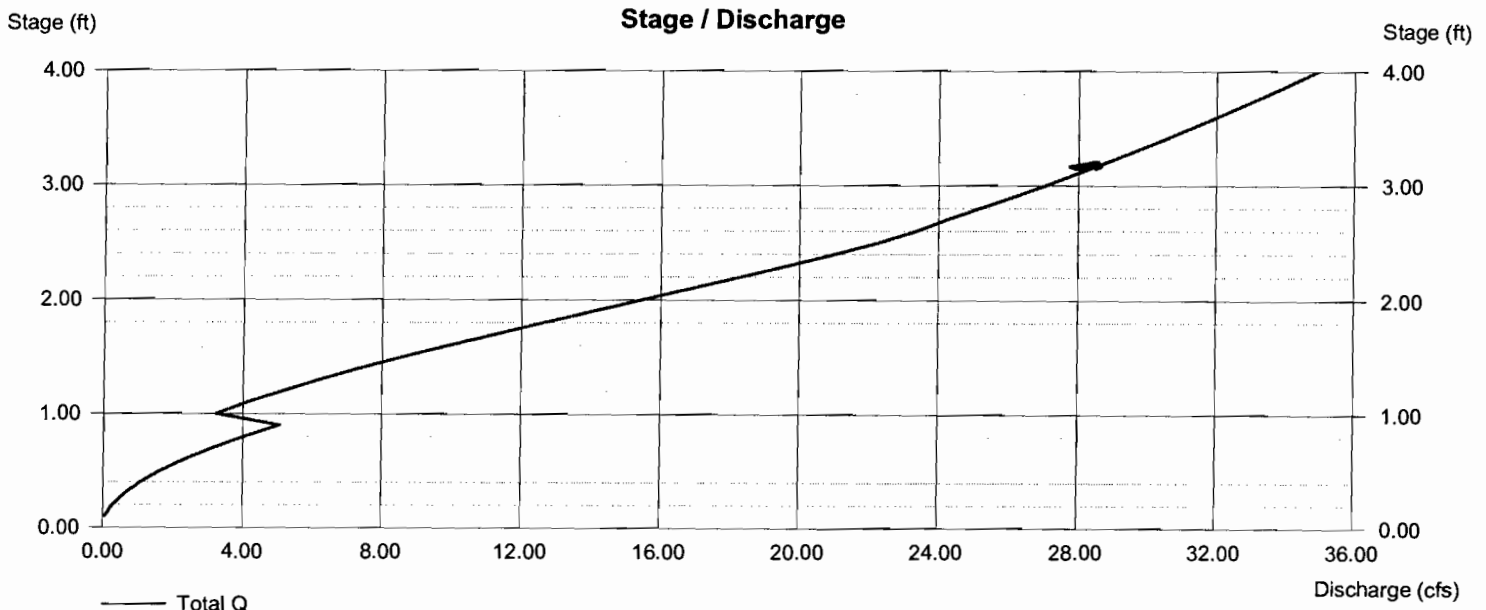
*20 cfs at 100 yr WSE*

*if h mid of the 104.33*

$$0.6 (4.91) \sqrt{64.4 \times (93.16 - 91.54)}$$

$$= 30.1 \text{ cfs}$$

$$90.20 + 1.25 = 91.54$$



# Pond Report

Hydraflow Hydrographs by Intelisolve

Monday, May 21 2007, 1:17 PM

## Pond No. 2 - POND B

### Pond Data

Pond storage is based on known contour areas. Average end area method used.

### Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	5290.30	01	0	0
1.00	5291.00	321	161	161
2.00	5292.00	1,217	769	930
3.00	5293.00	1,981	1,599	2,529
4.00	5294.00	2,842	2,412	4,941
5.00	5295.00	3,758	3,300	8,241
6.00	5296.00	4,550	4,154	12,395

### Culvert / Orifice Structures

	[A]	[B]	[C]	[D]
Rise (in)	= 18.00	0.00	0.00	0.00
Span (in)	= 18.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 5290.30	0.00	0.00	0.00
Length (ft)	= 45.23	0.00	0.00	0.00
Slope (%)	= 1.79	0.00	0.00	0.00
N-Value	= .013	.013	.013	.013
Orif. Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

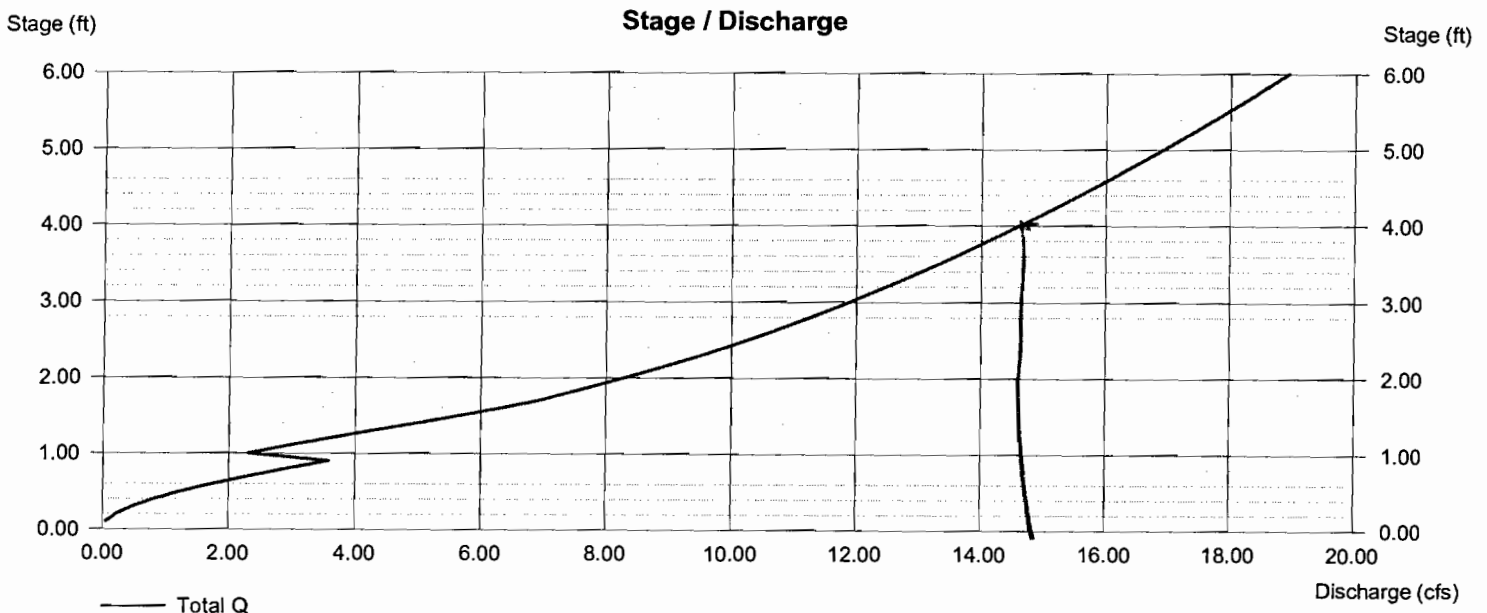
### Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 0.00	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfiltration = 0.000 in/hr (Contour) Tailwater Elev. = 0.00 ft

Note: Culvert/Orifice outflows have been analyzed under inlet and outlet control.

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15615



# Storm Sewer Summary Report

Page 1

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	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.
1	P1	16.86	24 c	6.7	5290.84	5290.88	0.602	5293.98*	5294.02*	0.22	5294.24	End
2	P2	7.40	18 c	251.2	5291.38	5295.93	1.812	5294.42	5296.97	n/a	5296.97 j	1
3	P3	5.47	15 c	125.7	5296.18	5296.81	0.501	5297.43*	5298.33*	0.29	5298.62	2
4	P4	4.01	12 c	98.9	5297.06	5297.55	0.495	5298.62*	5299.88*	0.41	5300.28	3
5	P5	1.46	12 c	103.5	5297.06	5301.80	4.581	5298.88	5302.31	n/a	5302.31 j	3

Unser & McMahon 006-1497

Number of lines: 5

Run Date: 05-21-2007

NOTES: c = cir; e = ellip; b = box; Return period = 100 Yrs. ; \*Surcharged (HGL above crown). ; j - Line contains hyd. jump.

# Storm Sewer Summary Report

Page 1

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	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.
1	EX 36 INCH(1)	56.35	36 c	376.0	5282.90	5286.75	1.024	5288.00*	5290.69*	0.99	5291.67	End
2	EX 36 INCH(2)	27.93	36 c	60.8	5286.75	5287.38	1.036	5292.42*	5292.53*	0.23	5292.76	1
3	EX 24 INCH (N)	5.50	24 c	59.0	5288.38	5289.39	1.712	5292.95*	5292.99*	0.05	5293.03	2
4	EX 24 INCH (S)	22.43	24 c	58.6	5288.38	5289.39	1.725	5292.76*	5293.33*	0.40	5293.73	2
5	OUTLET POND A	28.42	30 c	69.9	5287.25	5290.29	4.348	5292.14	5292.30	0.70	5293.00	1
6	OUTLET POND B	14.55	18 c	45.2	5289.49	5290.30	1.790	5293.73*	5294.60*	1.05	5295.65	4
Unser & McMahon 006-1497							Number of lines: 6			Run Date: 05-21-2007		
NOTES: c = cir; e = ellip; b = box; Return period = 100 Yrs. ; *Surcharged (HGL above crown).												