

GUILLOU & ASSOCIATES, INC.

124 MAPLE GROVE LANE • SPRINGFIELD, ILLINOIS 62707-9567 • (217) 529-5549 • FAX (217) 529-7562

September 21, 2004

Mr. Joe Albers
Albers Engineering, Inc.
2925 South Meadowbrook Road, Suite E
Springfield, Illinois 62707

Dear Mr. Albers:

Per your request, we have completed a review of the storm water storage conditions in Pond #5 detention basin, located between Hedley Road to the north, Westgate Drive to the south and near the east property line of Cobblestone Estates in Springfield, Illinois.

A review of the as-built basin configuration of Pond #5, which was provided by your office, indicates the basin is capable of providing approximately 46.1 acre feet of storm water storage at Elevation 606.0 feet NGVD, the design high water at the time of the 100-year event. According to the approved plans submitted to the City of Springfield in March 2000, the design storm water storage capacity for Pond #5 was to be 58.0 acre feet at Elevation 606.0. The as-built shortfall in storage amounts to 11.9 acre feet (58.0 - 46.1).

In order to correct the Pond #5 storage situation we suggest the following modifications:

1. Lower the normal water level from 606.0 to 599.9 - Since the approved outlet structure of Pond #5 has not been constructed, it is a relatively simple matter to lower the elevation of the low level outlet to the desired elevation and modify the size of the restrictor.
2. Extend the as-built basin to the south approximately 200 feet to near the Westgate Drive right of way line. See the attached Figure. This extension will be at the expense of a commercial lot. However, with the remaining area surrounding the basin having been fully developed, there is no other choice but to expand the basin to the south.
3. Include the entrance ditch storage in the total storage calculations.

These modifications will increase the Pond #5 100-year storage from 46.1 to 52.61 acre feet.

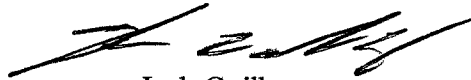
Storage volume calculations are attached for your convenience.

Preliminary drainage calculations received from Crawford, Murphy & Tilly, Inc. indicate the current design for the Wal-Mart Store site provides 5.42 acre feet of storm water storage at the time of the 100-year event.

The combination of the modified Pond #5 100-year storage and that being provided by the Wal-Mart site results in a total system storm water storage of 58.03 acre feet (52.61 + 5.42). This is comparable to the approved March 2000 storage volume.

If you have any questions regarding these calculations or would like to explore other options for providing the necessary storage, please call.

Sincerely,



Jack Guillou

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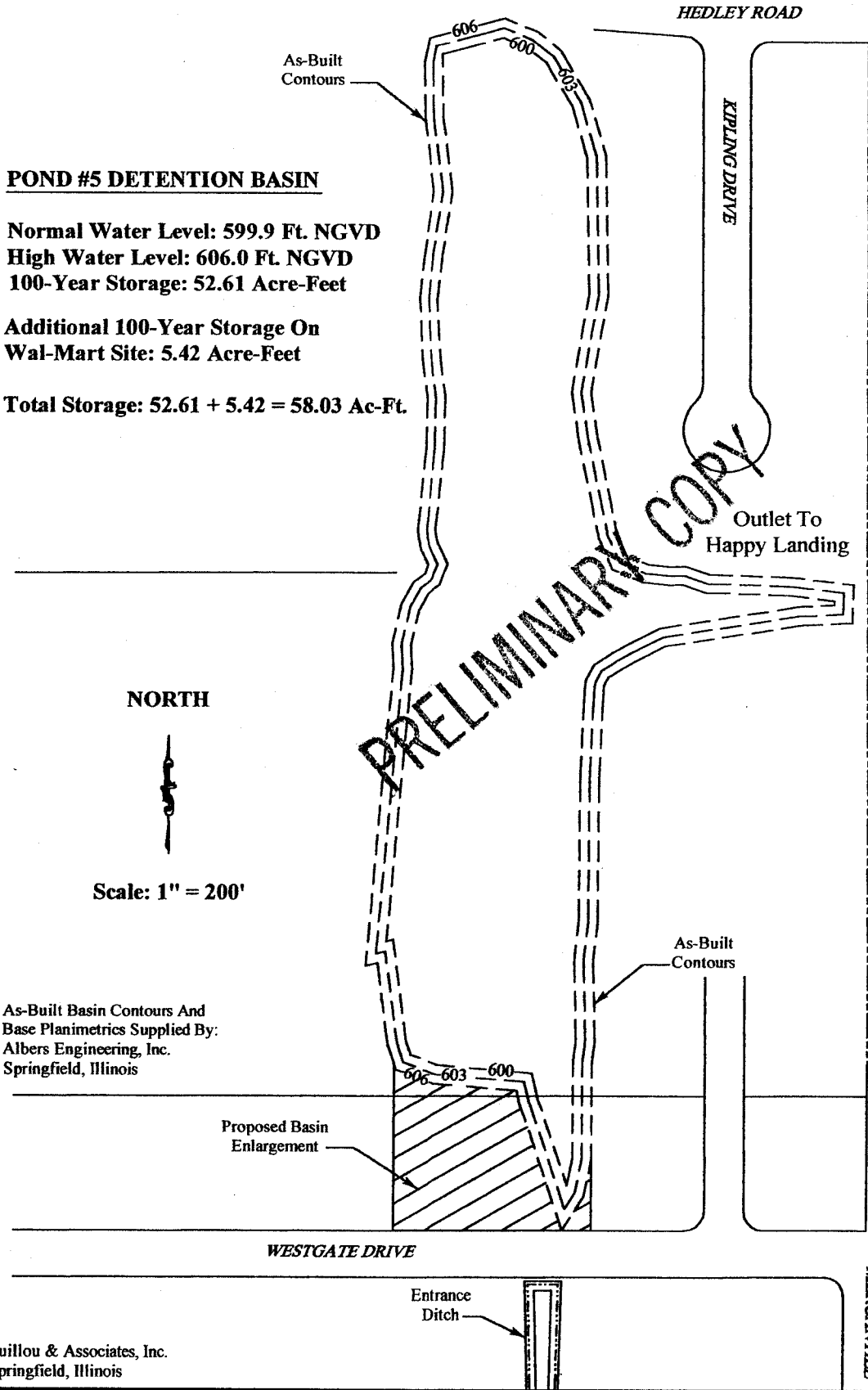
**PROPOSED MODIFICATIONS
POND #5 DETENTION BASIN
Cobblestone Estates, Springfield, Illinois**

POND #5 DETENTION BASIN

**Normal Water Level: 599.9 Ft. NGVD
High Water Level: 606.0 Ft. NGVD
100-Year Storage: 52.61 Acre-Feet**

**Additional 100-Year Storage On
Wal-Mart Site: 5.42 Acre-Feet**

Total Storage: 52.61 + 5.42 = 58.03 Ac-Ft.



As-Built Basin Contours And
Base Planimetrics Supplied By:
Albers Engineering, Inc.
Springfield, Illinois

Guillou & Associates, Inc.
Springfield, Illinois

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Elevation (ft)	Planimeter (sq.in)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	Volume (ac-ft)	Volume Sum (ac-ft)
600.00	-----	6.6210	.0000	.000	.000
603.00	-----	7.6760	21.4260	21.426	21.426
606.00	-----	8.7610	24.6376	24.638	46.064

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

$$\text{Volume} = (1/3) * (\text{EL2}-\text{EL1}) * (\text{Area1} + \text{Area2} + \text{sq.rt.}(\text{Area1}*\text{Area2}))$$

where: EL1, EL2 = Lower and upper elevations of the increment
Area1, Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

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Elevation (ft)	Planimeter (sq.in)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	Volume (ac-ft)	Volume Sum (ac-ft)
599.00	-----	6.7000	.0000	.000	.000
600.00	-----	7.4000	21.1413	7.047	7.047
603.00	-----	8.4900	23.8163	23.816	30.863
604.00	-----	9.0900	26.3649	8.788	39.652
606.00	-----	10.1900	28.9043	19.270	58.921

Elevations With Areas Interpolated From
 The Closest Two Planimeter Readings

Elevation (ft)	Planimeter (sq.in)	Area (acres)	A1+A2+sqr(A1*A2) (acres)	Volume (ac-ft)	Volume Sum (ac-ft)
599.90	-----	7.3285	21.0356	6.311	6.311

POND VOLUME EQUATIONS

* Incremental volume computed by the Conic Method for Reservoir Volumes.

$$\text{Volume} = (1/3) * (\text{EL2}-\text{EL1}) * (\text{Areal} + \text{Area2} + \text{sq.rt.}(\text{Areal}*\text{Area2}))$$

where: EL1, EL2 = Lower and upper elevations of the increment
 Areal, Area2 = Areas computed for EL1, EL2, respectively
 Volume = Incremental volume between EL1 and EL2

Interpolated area from closest two given contour areas
 is computed using the relationship:

$$\text{IA} = (\text{sq.rt}(\text{Areal}) + ((\text{Ei}-\text{E1})/(\text{E2}-\text{E1})) * (\text{sq.rt}(\text{Area2})-\text{sq.rt}(\text{Areal})))^2$$

where: E1, E2 = Closest two elevations with planimeter data
 Ei = Elevation at which to interpolate area
 Areal, Area2 = Areas computed for E1, E2, respectively
 IA = Interpolated area for Ei

58.921

- 6.311

52.61 AC-FT AT ELEV 606.0

GUILLOU & ASSOCIATES, INC.

124 MAPLE GROVE LANE • SPRINGFIELD, ILLINOIS 62707-9567 • (217) 529-5549 • FAX (217) 529-7562

March 4, 2000

VIA FEDERAL EXPRESS

Mr. Joe Albers
President, Albers Engineering
Bermuda Greens, 13131 Castle Harbour Dr., M-6
Naples, Florida 34110

Dear Joe:

Herewith is a drawing that indicates proposed changes to the storm water storage area at Pond 5 which is the only pond located south of the "line of demarcation". We propose to accommodate the 100-year storage requirement in Pond 5, and in improvements to the existing ditch which runs east from Archer Elevator Road.

We have devoted considerable time to a structure at Hedley Road which would be capable of delivering water from the south area to the north area before the north area was flooded, and would not deliver water from the south to the north at the time of the 100-year event, and which would not allow water from the north to flow into the south area. We believe that the three requirements can not be satisfied by a gravity system that does not require considerable expense and regular maintenance.

The proposed plan does not contemplate south waters moving to the north area, nor does it anticipate any waters moving from the north area to the south area.

In order to properly utilize the existing storage west of Archer Elevator Road we are considering that area, 16.8 acres, as a part of "south of the line of demarcation", and are designating the 18.5 cfs bypass flow from west of Archer Elevator Road as allowable "release flow" from the southern area. We are taking credit for the 1.3 acre-feet of existing storage west of Archer Elevator Road.

As indicated by the attached Rational Method calculation sheet, the required 100-year storage, with bypass flow equal to an average of 8 cu ft per sec, is 56.12 acre-feet. Deducting the existing storage west of Archer Elevator Road, the storage requirement on Cobblestone is 54.82 acre-feet. The scheme shown on the attached drawing develops 57.9 acre-feet when the 100-year water level is 606.0, see attached computation summary.

The present plan eliminates the special structure at Hedley Road. There is a special structure at the outlet to Happy Landings Farm. We have completed sketches of that structure which include appropriate pipe sizes, elevations, and overflow features, but will wait to finalize the drawing until we know whether you approve of the proposed plan.

If you do approve, we will meet with Rich Berning and obtain his comments, and then finalize our work for Lee. We believe there may be discussion with Happy Landings, but have done exactly what the City said we should do relative to the delivery of a maximum flow of 18.5 cu ft per sec from west of Archer Elevator Road. That flow will commingle with Cobblestone water on the east side of Archer Elevator Road.

We will leave a copy of this material with Lee on Monday morning so you can confer with him if you wish.

Sincerely,



Jack Guillou

cc: Lee Woodward, with attach.

PRELIMINARY COPY

POND-2 Version: 5.20
S/N:

Albers - Cobblestone #9809
Cobblestone Estates, Springfield, Illinois
Calculation Of Storage Volume In POND16

CALCULATED 03-03-2000 17:45:25
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Planimeter scale: 1 inch = 200 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (acres)	$A1+A2+\text{sq}r(A1*A2)$ (acres)	* Volume (acre-ft)	Volume Sum (acre-ft)
600.00	9.06	8.32	0.00	0.00	0.00
602.00	9.84	9.03	26.02	17.35	17.35
604.00	10.91	10.02	28.56	19.04	36.39
606.00	12.53	11.51	32.26	21.51	57.90
607.00	13.42	12.32	35.73	11.91	69.81

* Incremental volume computed by the Conic Method for Reservoir Volumes.

$$\text{Volume} = (1/3) * (\text{EL2}-\text{EL1}) * (\text{Area1} + \text{Area2} + \text{sq. rt.}(\text{Area1}*\text{Area2}))$$

where: EL1, EL2 = Lower and upper elevations of the increment
Area1, Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2

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GUILLOU & ASSOCIATES, INC.
 124 MAPLE GROVE
 SPRINGFIELD, IL 62707
 217/529-5549

JOB: Albers - Cobblestone #9808
 DATE: March 3, 2000
 CMPTD: JCGJr.

STORM WATER DETENTION CALCULATIONS
Rational Method
100-Year Event

Project Name: Cobblestone Estates, Springfield, Sangamon County, Illinois
Location: North Of Wabash Ave. & West Of Archer Elevator Road
Remarks: That Portion Located South Of The City Of Springfield's "Line Of Demarcation"

I. Determination Of Allowable Release Rate - Undeveloped Site:

- | | |
|--|-------------|
| 1. Area of Site | 211.5 Acres |
| 2. Average Ground Slope | Foot/Foot |
| 3. Overland Flow Distance | Feet |
| 4. Overland Flow Time Of Concentration | Minutes |
| 5. Average Slope of Channelized Flow | Foot/Foot |
| 6. Channelized Flow Distance | Feet |
| 7. Channelized Flow Time Of Concentration | Minutes |
| 8. Total Time Of Concentration (line 4 + line 7) | Minutes |
| 9. Rainfall Intensity 100-Year Event - B-70 West Southwest, IL | In./Hr. |
| 10. Runoff Coefficient | |
| 11. Allowable Release Rate (line 1 x line 9 x line 10) | 8.0 Cfs |

II. Determination Of Reservoir Size - Developed Site:

- | | |
|----------------------------------|----------------|
| 12. Impervious Drainage Area | Acres |
| 13. Pervious Drainage Area | Acres |
| 14. Composite Runoff Coefficient | 0.55 |
| 15. Required Reservoir Capacity | 56.12 Acre-Ft. |

Duration Time (Min)	Rainfall Intensity (In./Hr.)	Inflow Rate (Cfs)	Stored Rate (Cfs)	Required Storage (Ac-Ft.)
5	10.68	1242	1234	8.57
10	9.84	1145	1137	15.79
15	8.04	935	927	19.32
20	7.00	814	806	22.40
25	6.25	727	719	24.97
30	5.50	640	632	26.32
40	4.68	544	536	29.80
50	4.00	465	457	31.76
60	3.50	407	399	33.26
75	3.01	350	342	35.64
90	2.65	308	300	37.53
105	2.38	277	269	39.21
120	2.20	256	248	41.32
150	1.81	211	203	42.20
180	1.59	185	177	44.24
210	1.42	165	157	45.84
240	1.28	149	141	46.97
270	1.16	135	127	47.60
300	1.08	126	118	49.01
360	0.93	108	100	50.09
720	0.54	63	55	54.82
1080	0.38	44	36	54.31
1440	0.31	36	28	56.12
2880	0.17	20	12	47.10

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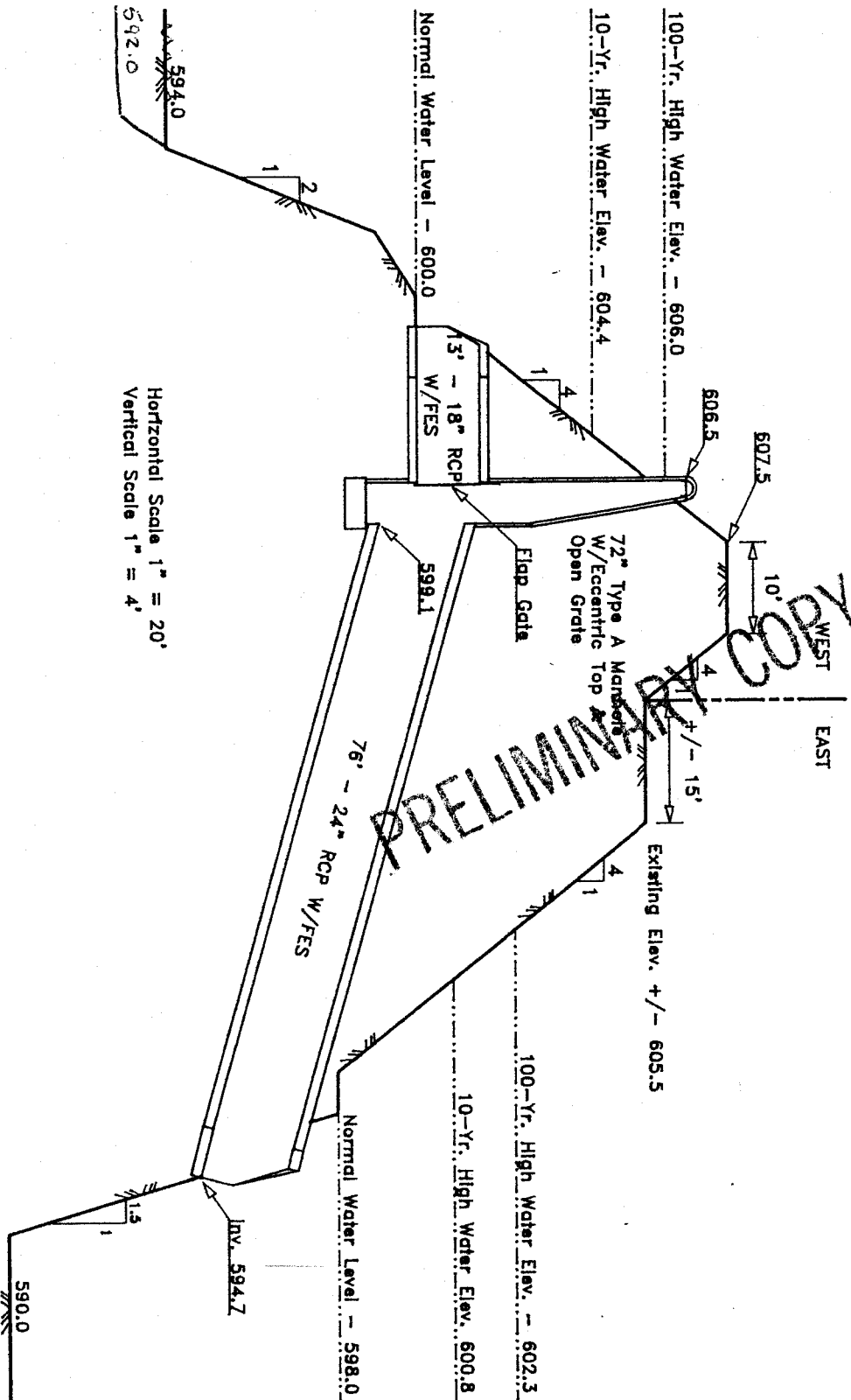
SOUTHERN DETENTION BASIN OUTLET
COBBLESTONE ESTATES
SPRINGFIELD, ILLINOIS

MAY 12, 2000

COBBLESTONE ESTATES

PROPERTY LINE

HAPPY LANDING



Horizontal Scale 1" = 20'
 Vertical Scale 1" = 4'

Culvert Calculator Report

Meadowbrook Culvert

Tailwater Elevation = 606.00

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	607.00 ft	Headwater Depth/Height	1.45
Computed Headwater Elevation	607.00 ft	Discharge	80.99 cfs
Inlet Control HW Elev.	606.32 ft	Tailwater Elevation	606.00 ft
Outlet Control HW Elev.	607.00 ft	Control Type	Outlet Control

Grades			
Upstream Invert	603.53 ft	Downstream Invert	603.46 ft
Length	100.00 ft	Constructed Slope	0.000700 ft/ft

Hydraulic Profile			
Profile	Pressure Profile	Depth, Downstream	2.54 ft
Slope Type	N/A	Normal Depth	N/A ft
Flow Regime	N/A	Critical Depth	1.68 ft
Velocity Downstream	5.47 ft/s	Critical Slope	0.004235 ft/ft

Section			
Section Shape	Horizontal Ellipse	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.79 ft
Section Size	29.43 inch	Rise	2.40 ft
Number Sections	2		

Outlet Control Properties			
Outlet Control HW Elev.	607.00 ft	Upstream Velocity Head	0.47 ft
Ke	0.50	Entrance Loss	0.23 ft

Inlet Control Properties			
Inlet Control HW Elev.	606.32 ft	Flow Control	Transition
Inlet Type	Square edge with headwall (horizontal ellipse)	Area Full	14.8 ft ²
K	0.01000	HDS 5 Chart	29
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

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CRAWFORD, MURPHY & TILLY, INC.
CONSULTING ENGINEERS

PROJECT: Wal-Mart 1602-02 - Springfield (W), IL
 JOB CODE: 03009-20
 DESIGNED: AJG CHECKED: SKS
 DATE: 20-Sep-04 DATE: 20-Sep-04

Preliminary Drainage Calculations
Wal-Mart Store #1602-02 Springfield (West), IL
For Approval Only - Not for Unauthorized Distribution

AVERAGE RUN-OFF COEFFICIENT

EXISTING

Watershed	Acres	C	Product
Sub-Area E	6.2	0.30	1.86
Sub-Area F	6.9	0.30	2.07
Sub-Area G	24.6	0.30	7.38
Archer	2.3	0.90	2.07
Westgate	1.1	0.90	0.99
		Sum	14.37
Total Acres	41.1		
C Average	0.35		

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PROPOSED

Watershed	Acres	C	Product
Sub-Area E	6.2	0.80	4.96
Sub-Area F	6.9	0.80	5.52
Sub-Area G	24.6	0.80	19.68
Archer	2.3	0.90	2.07
Westgate	1.1	0.90	0.99
		Sum	33.22
Total Acres	41.1		
C Average	0.81		

Sub-Area E Area North of Westgate
 Sub-Area F Area North of Existing Drainage Ditch and South of Westgate
 Sub-Area G Wal-Mart Lot