

page 1 of 3

Station	Meridian Outlet Mall	Area (acres)	Area (sq. ft.)	C	T ₀ (min)	L ₀ (ft)	L ₁₀₀ (ft)	Q ₅ (cfs)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)	Area Slope	Pipe Size	Inlets
1	A	7.00		0.95	15	5.21	6.08	8.98	36.7	42.8	59.7	0.16%	42"
2	B	0.40		0.70	15	5.21	6.08	8.98	1.5	1.7	2.5		
3	C	0.39		0.70	15	5.21	6.08	8.98	1.8	2.1	3.2		
4	D	0.82	0.79	0.82	17	4.97	5.79	8.55	3.1	3.7	5.4	0.24%	15"
5	E	0.37	7.79	0.93	20	4.66	5.44	8.23	39.8	39.4	58.2	0.16%	42"
6	F	0.54	8.16	0.93	22	4.49	5.24	8.08	1.7	2.0	3.0		
7	G	8.76		0.70	15	5.21	6.08	8.98	2.0	2.3	3.4		
8	H	7.06		0.62	28	4.09	4.77	7.04	17.3	20.2	29.8	0.12%	36"
9	I	1.12	8.24	0.61	28	4.09	4.77	7.04	20.6	24.0	35.4	0.12%	36"
10	J	8.54	16.78	0.60	30	3.92	4.56	6.79	39.5	45.9	68.4	0.20%	42"
11	K	12.60	23.59	0.60	32	3.73	4.33	6.45	31.4	36.7	54.1	0.26%	48"
12	L	9.19	92.19	0.60	28	4.09	4.77	7.04	30.9	36.1	53.2	0.28%	36"
13	M	3.90		0.70	19	4.76	5.55	8.19	13.0	15.2	22.4		
14	N	7.16		0.70	24	4.34	5.07	7.48	21.8	25.4	37.5		
15	O	4.79		0.80	15	5.21	6.08	8.98	24.0	28.3	41.8		
16			84.46	0.18	35	3.55	4.13	6.16	244.4	277.8	354.6		

Detention basin

Per KHB memo of 5/30/87, Calculations are as follows:
 The proposed lake has a planned surface area of 5.5 acres.
 A 100 year 6 hour storm event is stated as 5.95" of rainfall.
 The C.U.P. contains 2535' x 1290' = 73.6 acres.
 5.95"/12" x 73.6 = 36.5 acre-ft of water if all the storm water were to be contained with no runoff.
 The lake would contain approximately 36 acre-feet along with storage in parking lot, apartment site, and internal street. However, the system is not "closed". Depending on the soil conditions and ground cover, water does percolate. Up to 10% in a development such as proposed.

*NOTE: Present Drainage Plan shows a surface area of 4.8 acres

Per FBN drainage calc's, it will take approximately 35 min. for the peak runoff to arrive at the detention basin.

A = 84.7 acres
 T₀ = 35 min.
 Ignore Temporary Storage
 Composite Runoff Coef. of Area, C = 0.60

Q₁₀₀ = 0.18 x 616 x 84.7 = 354.6 cfs

Total Rainfall 6.16" x 36.5 = 3.59 inches?

Ignore infiltration & other losses

Q₁₀ = 84.7 acres x 2.5% = 2.12 acre-feet runoff volume to detention pond

Meridian Outlet Mall
 FBN 1/14/85

Box Culverts - 1

Design Date

West Side of Meridian

Q₁₀₀ = 200 cfs

TW = 4' x 4'

L = 110 feet

Concrete Box Culvert w/ 95' Flared Wing Wall, entrance crown edge rounded, & n = 0.012

Allowable HW = 5'

Max. box rise = 3'

A. Inlet Control

For Q = 600 cfs, Rise = 3', HW/Rise = 1.67

Figure 3 indicates Q/Spn = 27. ∴ Spn = 22.2'

Assuming 3 8'x8' culverts. Spn = 24' & Q/Spn = 25

From Fig. 3, HW/Rise = 1.60 ⇒ HW = 4.8' < 5' OK

B. Outlet Control

From Table 5, K_e = 0.2 A = 24' x 3' = 72.0'

For Rise = 3', Spn = 24', Q = 600 cfs, K_e = 0.2, Fig. 4.5 H = 1.5'

TW = 4' x 4' Rise = 3' ∴ Culverts are Outlet Controlled

HW/Rise = 1.5' ∴ H = 1.5' + 1.0(0.012) = 1.57'

Try 3 8'x8', A = 24' x 3' = 72.0' Fig. 4.5 H = 1.1'

HW = 1.1' + 4' = 5.1' < 5' OK

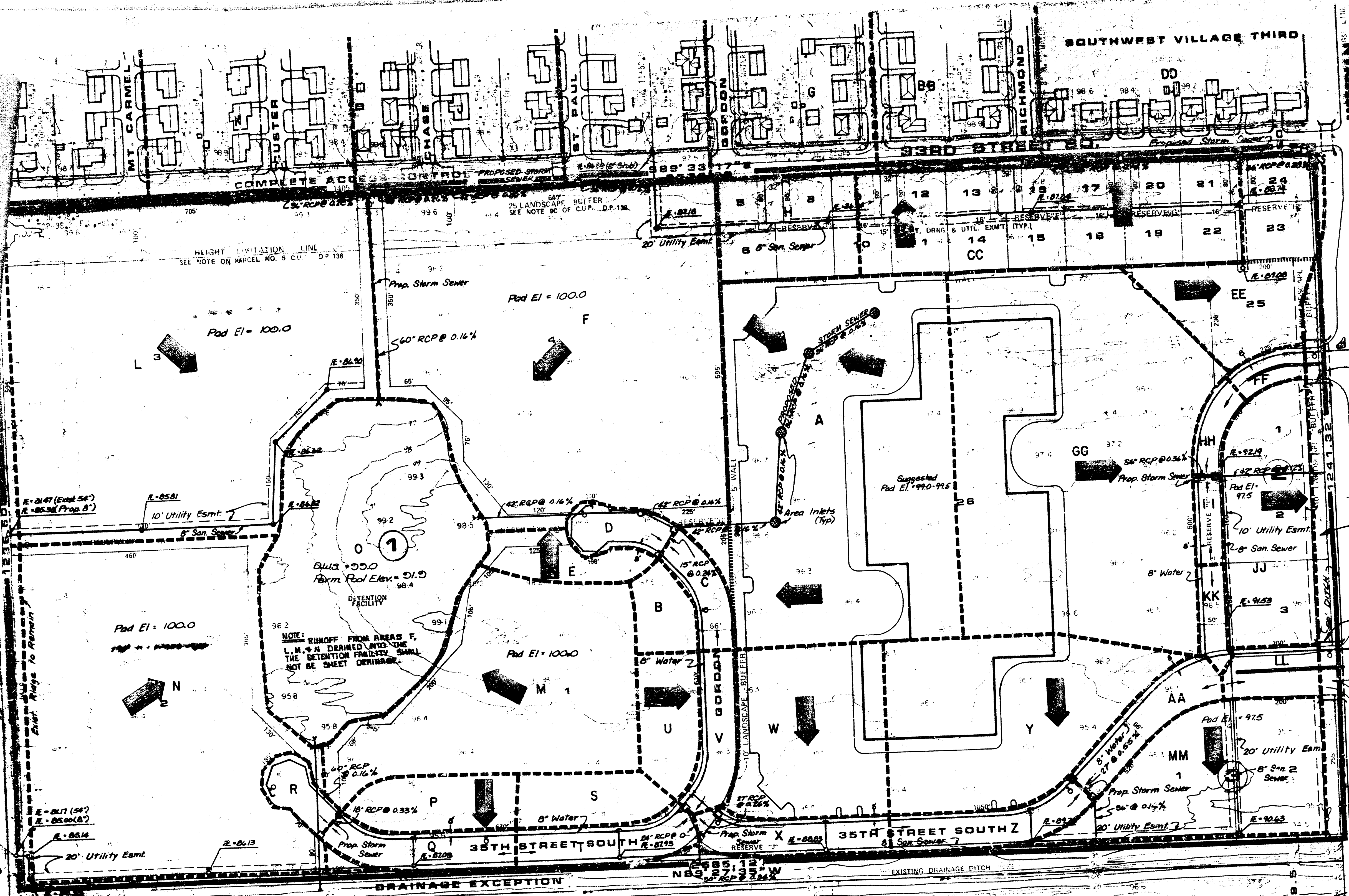
Meridian & I-235

The area served by the detention basin and the area draining to the Big Slough will not contribute to the peak flow in the Big Slough since they will all have flap gates.

Box Culverts - 2

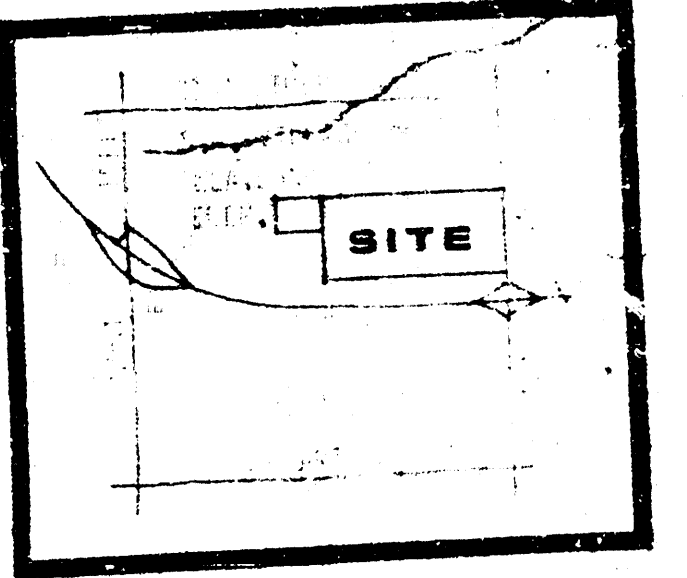
Meridian & I-235 (cont.)

Additional flow will be added by Areas 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 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NOTES:

TOPOGRAPHY PREPARED FROM Aerial PHOTO DEC 1983
ALL UNDEVELOPED AREAS ARE TO BE PLANTED WITH GRASS OR SOY BEANS TO MINIMIZE BLOWING OF DUST AND SOIL FROM SITE.
THE MAINTENANCE OF NON-PUBLIC OPEN-SPACE INTERNAL DRIVE, PARKING AREAS, DRAINAGE IMPROVEMENTS, WALLS, BUFFER STRIPS AND EROSION CONTROL SHALL BE PROVIDED BY A MANAGEMENT COMPANY OF THE COMMON WEALTH OF KANSAS.
SEE C.U.P. D.P. 138, NOTE NO. 9, FOR LIMITATIONS ON WALLS WITH LANDSCAPE BUFFERS.
LOTS 124 BLOCK 1 ARE ZONED R-6.
LOTS 20 & 25 BLOCK 1 AND LOTS 1, 2 & 3 OF BLOCK 2, LOTS 1 & 2 BLOCK 3 ARE ZONED L.C.
SOUTH HALF OF 33RD ST. SO. TO BE CONSTRUCTED FROM LOT 124 TO LOT 125. CLIMBERHEAD TURNAROUNDS ARE TO BE CONSTRUCTED AT ST. PAUL ST. AND "CLUSTER" STREETS.
DRAINAGE PLAN TO BE SUBMITTED SEPARATELY BY INDICATED ENGINEERING CONSULTANTS.
DESIGN OF MERIDIAN AS PER SHEET 1 DATED 10/18/84 BY "A" ASSOCIATES CONSULTING ENGINEERS.
COMPLETE ACCESS CONTROL ALONG LOTS 3 & 4 OF BLOCK 1 IS TO ALLOW FOR ONE 20' EMERGENCY ACCESS EASEMENT.
RESERVE "A" IS FOR LAKE, DRAINAGE, UTILITIES, LANDSCAPING AND RECREATION FACILITIES.
RESERVES "B", "C", "D", "E", "F", "G", "H", "I", "J", "K", "L", "M", "N", "O", "P", "Q", "R", "S", "T", "U", "V", "W", "X", "Y", "Z" ARE FOR DRAINAGE, UTILITIES AND LANDSCAPING.
RESERVES "D" THRU "I" ARE FOR PRIVATE STREETS, DRAINAGE AND UTILITIES.



DRAINAGE CONCEPT AND UTILITY PLAN

MERIDIAN OUTLET MALL

OWNER: BUILDERS COMMERCIAL, INC., 1005 PARKLANE, WICHITA, KANSAS

SHEET 1 OF 2

BILL G. YUNG DESIGN
8225 E. 35TH ST. NORTH, WICHITA, KS 67226
316-583-5561

FINAL PLAT OF MERIDIAN OUTLET MALL

AN ADDITION TO WICHITA, SEDGWICK COUNTY, KANSAS

