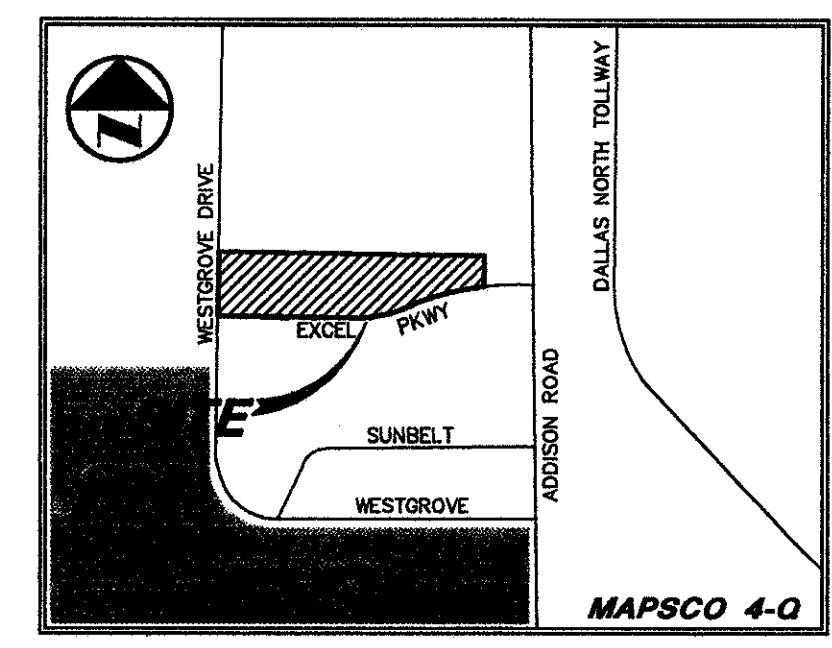


LEGEND

- B. BOLLARD
- E. ELECTRIC METER
- PP. POWER POLE
- LS. LIGHT STANDARD
- WM. WATER METER
- WV. WATER VALVE
- ICV. IRRIGATION CONTROL VALVE
- FH. FIRE HYDRANT
- CH. CLEANOUT
- WH. MANHOLE
- GM. GAS METER
- TSC. TRAFFIC SIGNAL CONTROL
- TS. TRAFFIC SIGNAL POLE
- TE. TELEPHONE BOX
- TV. TV BOX
- FP. FLAG POLE
- EM. ELECTRIC METER
- TS. TRAFFIC SIGNAL
- P. PROPERTY LINE
- O.H. O.H. POWER LINE
- TEL. U/G TELEPHONE LINE
- W. U/G WATER LINE
- G. U/G GAS LINE
- F. FENCE
- B.F.R. BARRIER FREE RAMP
- D. DRAINAGE DIVIDE



DALLAS HARLINGEN
703 McKinney Avenue, Suite 401
Dallas, TX 75202-0052
Facsimile: 214-954-0855
Web Page: www.rodaw.com

GRADING AND DRAINAGE GENERAL NOTES

1. REFER TO GEOTECHNICAL REPORT FOR REQUIREMENTS REGARDING FILL COMPACTION AND MOISTURE CONTENT.
2. UNLESS NOTED, ALL FILL IS TO BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY WITHIN 3% OF OPTIMUM MOISTURE CONTENT. FILL TO BE PLACED IN A MAXIMUM OF 6" LIFTS.
3. ALL WALKS TO HAVE A MAXIMUM CROSS SLOPE OF 2%.
4. GRADING OF ALL HANDICAPPED SPACES AND ROUTES TO CONFORM TO STATE, LOCAL AND FEDERAL GUIDELINES.
5. UNLESS NOTED, STORM DRAIN LINES MAY BE OF THE FOLLOWING MATERIALS:
 - A. RCP C-76, CLASS III
 - B. ADS N-12
 - C. HANCOCK HI-Q
- AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
6. UNLESS NOTED, GRATE INLET TO BE "AMERICAN INDUSTRIAL PRE-CAST PRODUCTS, INC." PRECAST CATCH BASIN, SIZED AS SHOWN, OF APPROVED EQUAL.
7. FINAL PAVING, CURB AND SIDEWALK ELEVATIONS WILL BE PLACED AT PLUS OR MINUS 0.03 FOOT.
8. REFER TO LANDSCAPE SPECIFICATION FOR SEEDING AND SODDING REQUIREMENTS.
9. ANY CONCRETE, ROCK OR MATERIAL DEEMED UNSUITABLE FOR SUBGRADE, BY ENGINEER, SHALL BE DISPOSED OF OFFSITE AT CONTRACTOR'S EXPENSE.
10. TRENCH BACKFILL MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF NCTCOG ITEM 6.2.10, AND SHALL BE MECHANICALLY COMPACTED IN ACCORDANCE WITH NCTCOG ITEM 6.2.9 TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN THE STANDARD CITY SPECIFICATIONS.
11. EMBEDMENT SHALL CONFORM TO THE REQUIREMENTS OF NCTCOG ITEM 6.2.9 UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN THE STANDARD CITY SPECIFICATIONS.
12. A ROUND MANHOLE COVER MEETING CITY SPECIFICATIONS SHALL BE PLACED IN ALL INLET TOPS. THE MANHOLE COVER SHALL BE PLACED NEAR THE OUTLET PIPE.
13. ALL CONCRETE FOR INLETS AND DRAINAGE STRUCTURES SHALL CONFORM TO NCTCOG ITEM 7.4.5, CLASS "A" UNLESS OTHERWISE SHOWN ON THESE PLANS OR STATED IN STANDARD CITY SPECIFICATIONS.
14. CRUSHED STONE BEDDING OR APPROVED EQUAL SHALL BE PROVIDED BY THE CONTRACTOR WHEN ROCK IS ENCOUNTERED IN TRENCHES. THERE SHALL BE NO ADDITIONAL PAY ITEM OF THE CRUSHED STONE BEDDING.
15. IF REQUIRED DUE TO CONSTRUCTION, POWER POLES TO BE BRACED OR RELOCATED AT CONTRACTORS EXPENSE.
16. EXACT FLOW LINE ELEVATIONS OF STUBOUTS WERE UNABLE TO BE DETERMINED FROM CITY DRAWINGS. CONTRACTOR IS TO VERIFY EXACT ELEVATIONS AND CONTACT THE ENGINEER.

DRAINAGE CRITERIA

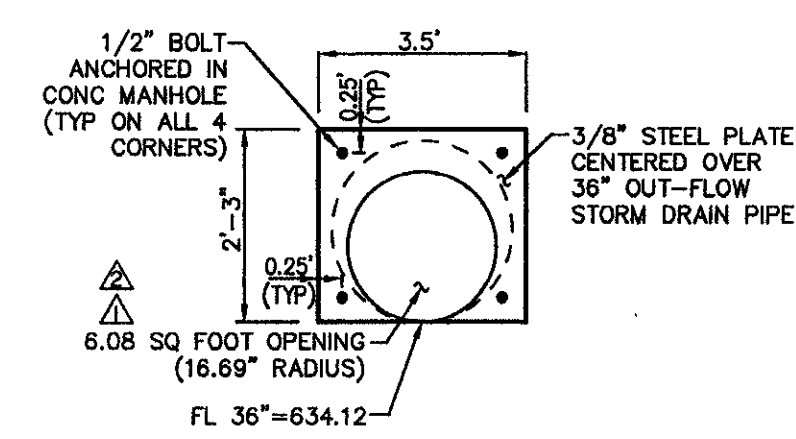
Q = cfs
C = 0.80
Tc = 10
I₁₀₀ = 8.74

INLET SIZE CALCULATIONS

Q = CA²gh
C = 0.65 (discharge coefficient)
A = AREA INLET OPENING (sq ft)
g = 32.2 ft/sec
h = 0.25' (depth of water)
AREA GRATE INLET No.30 = 4.23 sq ft
MAX Q GRATE INLET No.30 = 16.80 cfs

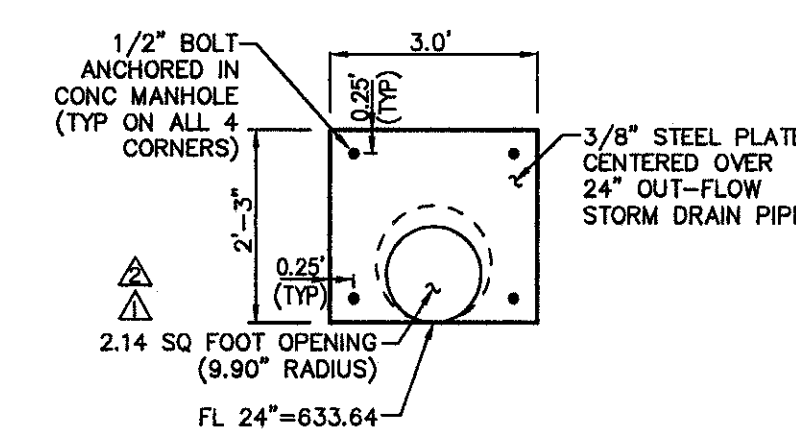
REQUIRED DETENTION VOLUME:

(USING MODIFIED RATIONAL METHOD TO DETERMINE VOLUMES)
Q₂₅ (NET ALLOWABLE RELEASE) = 27.06 cfs
Q₁₀₀ (BYPASS) = 11.19 cfs
Allowable Q out Detention = 15.87 cfs
TOTAL REQUIRED DETENTION VOLUME = 6,196 cubic feet
VOLUME PROVIDED IN PIPE = 1,875 cubic feet
TOTAL ON GROUND STORAGE REQUIRED = 4,321 cubic feet
VOLUME PROVIDED ON GROUND = 5,196 cubic feet



FLOW REDUCER PLATE DETAIL "A"

ORIFACE PLATE CALCS
Q = CA²gh = 44.05 cfs
C = 0.65 (discharge coefficient)
A = AREA OPENING (sq ft)
g = 32.2 ft/sec
h = 1.93' (depth of water)
A = 6.08 SQUARE FOOT



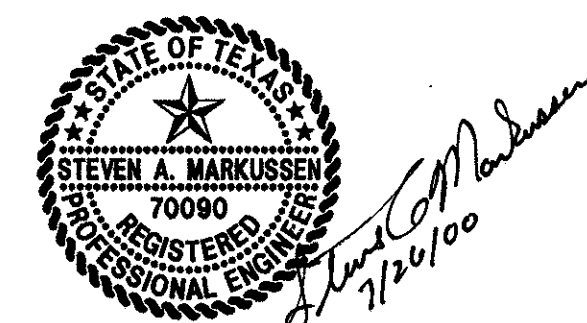
FLOW REDUCER PLATE DETAIL "B"

ORIFACE PLATE CALCS
Q = CA²gh = 15.87 cfs
C = 0.65 (discharge coefficient)
A = AREA OPENING (sq ft)
g = 32.2 ft/sec
h = 2.03' (depth of water)
A = 2.14 SQUARE FOOT

RECORD DRAWING
THIS DRAWING HAS BEEN REVISED TO REFLECT CONSTRUCTION RECORDS MAINTAINED AND PROVIDED BY THE CONTRACTOR FOR THIS PROJECT.
CONTRACTOR: HILL & WILKINSON
DATE REVISED: 05/04/01

BENCHMARKS

BM 1	"m" CUT SET ON THE BACK OF CURB ON THE SOUTH SIDE OF EXCEL, ±950' WEST OF ADDISON ROAD.	ELEV.=642.97
BM 2	60 D NAIL SET IN PP 2203 478 7763, ±500' NORTH OF THE CENTERLINE OF EXCEL.	ELEV.=648.07
BM 3	"m" CUT SET ON THE EAST SIDEWALK OF WESTGROVE, ±190' SOUTH OF AIRBORN DR.	ELEV.=651.73
BM 4	"m" CUT SET ON THE NOSE MEDIAN AT THE INTERSECTION OF EXCEL & WESTGROVE, ±45' EAST OF Q OF WESTGROVE	ELEV.=645.69



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY STEVEN A. MARKUSSEN, P.E. 70090 ON 07/26/00. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

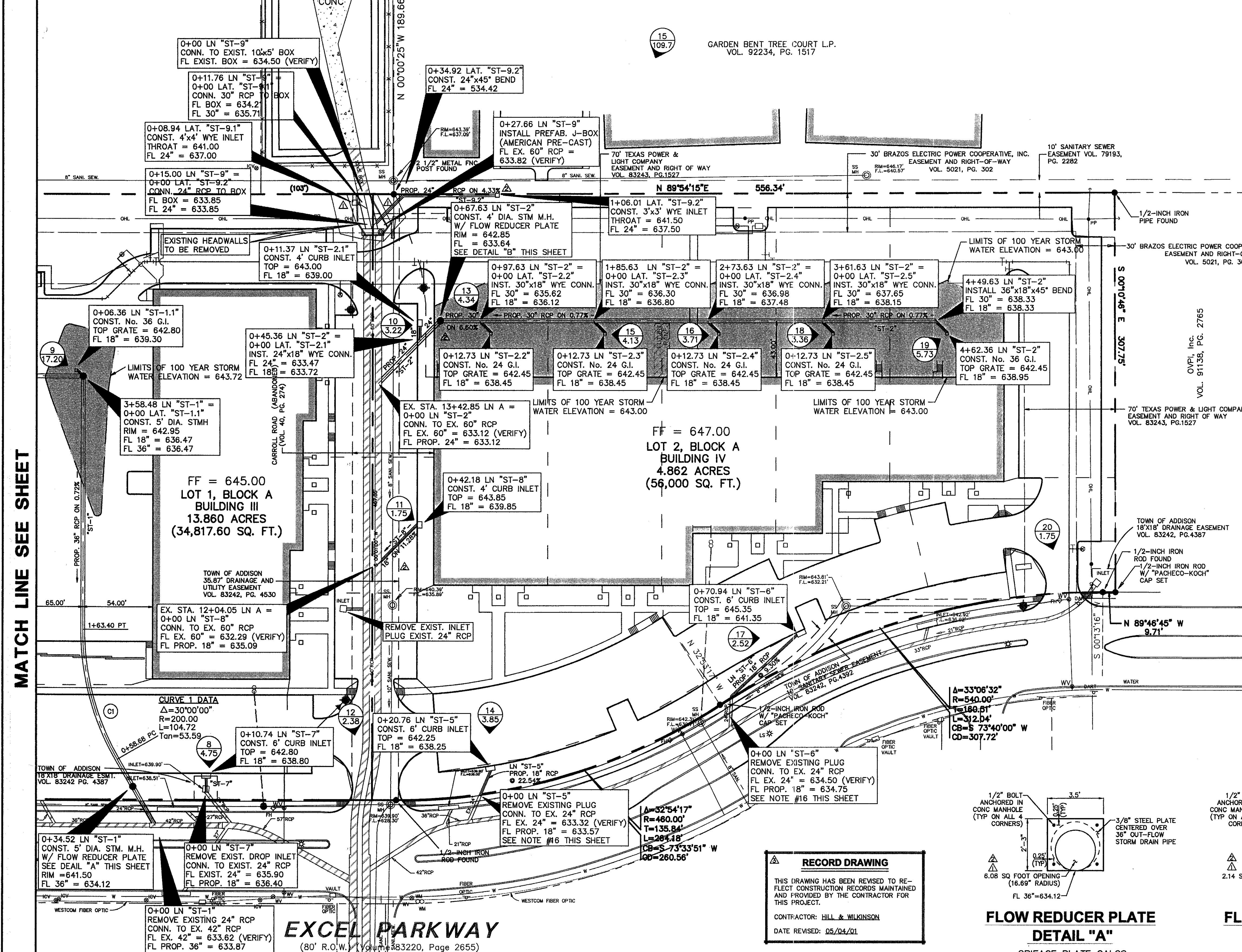
Pacheco Koch Consulting Engineers
9401 LBJ FREEWAY SUITE 300 DALLAS, TEXAS 75243 972.235.3031

DRAINAGE PLAN
ADDISON OFFICE / WAREHOUSE COMPLEX
LOTS 1 & 2, BLOCK A
WESTGROVE/BENT TREE PLAZA ADDITION
TOWN OF ADDISON, TEXAS

DESIGN	DRAWN	DATE	SCALE	NOTES	FILE	NO.
CJE	JLM	JULY 26, 2000	1"=40'			C4.3

PROJECT NO.: 9956
PREPARED BY: JLM
CHECKED BY: CJE
DATE: 7/26/00
REVISIONS:
SHEET NO. + TITLE: **C4.3**
DRAINAGE PLAN

MATCH LINE SEE SHEET



FF = 645.00
LOT 1, BLOCK A
BUILDING III
13.860 ACRES
(34,817.60 SQ. FT.)

FF = 647.00
LOT 2, BLOCK A
BUILDING IV
4.862 ACRES
(56,000 SQ. FT.)

EXCEL PARKWAY
(80' R.O.W.)

RUNOFF CALCULATIONS

DRAINAGE AREA	AREA (ACRES)	Tc (Minutes)	C	I _{as} (in/hr)	I ₁₀₀ (in/hr)	Q ₂₅ (cfs)	Q ₁₀₀ (cfs)
1	0.50	10	0.8	7.29	8.74	2.92	3.50
2	0.41	10	0.8	7.29	8.74	2.39	2.87
3	0.80	10	0.8	7.29	8.74	4.67	5.59
4	3.36	10	0.8	7.29	8.74	19.60	23.49
5	1.45	10	0.8	7.29	8.74	8.46	10.14
6	1.37	10	0.8	7.29	8.74	7.99	9.58
7	0.54	10	0.8	7.29	8.74	3.15	3.78
8	0.68	10	0.8	7.29	8.74	3.97	4.75
9	2.46	10	0.8	7.29	8.74	14.35	17.20
10	0.48	10	0.8	7.29	8.74	2.68	3.22
11	0.25	10	0.8	7.29	8.74	1.46	1.75
12	0.34	10	0.8	7.29	8.74	1.98	2.38
13	0.62	10	0.8	7.29	8.74	3.62	4.34
14	0.55	10	0.8	7.29	8.74	3.21	3.85
15	0.59	10	0.8	7.29	8.74	3.44	4.13
16	0.53	10	0.8	7.29	8.74	3.09	3.71
17	0.36	10	0.8	7.29	8.74	2.10	2.52
18	0.48	10	0.8	7.29	8.74	2.80	3.36
19	0.82	10	0.8	7.29	8.74	4.78	5.73
20	0.25	10	0.8	7.29	8.74	1.46	1.75
21	15.7	10	0.8	7.29	8.74	91.56	109.77

STORM SEWER CALCULATIONS

LINE / STATION	SIZE	Q ₁₀₀ (cfs)	C (cfs)	V (fps)	V ² /2g	S _f
LINE "ST-2" (0+00 - 0+45.36)	24"	19.09	19.85	6.08	0.57	0.007122
LINE "ST-2" (0+45.36 - 0+67.63)	24"	15.87	19.85	5.05	0.40	0.004922
LINE "ST-2" (0+67.63 - 0+97.63)	30"	15.87	105.37	3.23	0.16	0.001457
LINE "ST-2" (0+97.63 - 1+85.63)	30"	15.87	35.99	3.23	0.16	0.001457
LINE "ST-2" (1+85.63 - 2+73.63)	30"	12.80	35.99	2.61	0.11	0.000974
LINE "ST-2" (2+73.63 - 3+61.63)	30"	9.09	35.99	1.85	0.05	0.000491
LINE "ST-2" (3+61.63 - 4+49.63)	30"	5.73	35.99	1.17	0.02	0.000165
LINE "ST-2" (4+49.63 - 4+62.36)	18"	5.73	23.18	3.74	0.16	0.002978
LAT "ST-2-1" (0+00 - 0+11.73)	18"	3.22	56.12	1.82	0.05	0.000940
LAT "ST-2-2" (0+00.00 - 0+12.73)	18"	4.34	44.93	2.46	0.09	0.001707
LAT "ST-2-3" (0+00.00 - 0+12.73)	18"	4.13	37.81	2.34	0.08	0.001546
LAT "ST-2-4" (0+00.00 - 0+12.73)	18"	3.71	28.99	2.10	0.07	0.001248
LAT "ST-2-5" (0+00.00 - 0+12.73)	18"	3.36	16.14	1.90	0.06	0.001023
LINE "ST-5" (0+00.00 - 0+20.76)	18"	3.85	49.87	2.18	0.07	0.001343
LINE "ST-6" (0+00.00 - 0+70.94)	18"	2.52	32.03	1.43	0.03	0.000576
LINE "ST-7" (0+00.00 - 0+10.74)	18"	4.75	49.66	2.69	0.11	0.002045
LINE "ST-8" (0+00.00 - 0+42.18)	18"	1.75	37.71	0.99	0.02	0.000278

JLM
CJE
7/26/00