JOHN L. CARMAN
AND ASSOCIATES, INC.

Landscape Architecture
Land Planning
Site Engineering

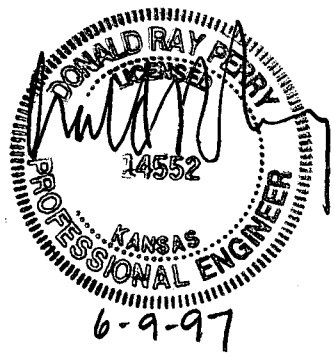
ENGINEERING DESIGN REPORT

Date: June 9, 1997

Subject: **Stormwater Control Facilities**
for Proposed StudioPLUS Hotel
Corporate Hill Drive
Wichita, Kansas
jlc # 97 - 127 (klw)

Prepared for: City of Wichita, Kansas
Engineering Department

Prepared by: John L. Carman and Associates, Inc.
Lexington, Kentucky
consultant to StudioPLUS Hotels



I. Site Description

The 1.774 acre site is located in Wichita, Kansas in Sedgwick County. It is located on Corporate Hill Drive off Webb Road near I-95. It is the west 200.9183 feet of Lot 3, Block 1, Maxwell Second Addition. The site is currently undeveloped but is part of a large planned commercial development. The site is between the post office and another hotel.

The Soil Survey of Sedgwick County, 1979, indicated the soils are Irwin-Goessel-Rosemill Association and classified as Rosehill silty clay on 1%-3% slopes. These are moderately deep, well drained, and very slowly permeable on erosional uplands. These soils relate to Hydrologic Soils Group D per USDA-SCS TR55 "Urban Hydrology for Small Watersheds". As indicated in the Giles Geotechnical Engineering Report dated May 19, 1997 the site has been filled with 6'-9' foreign silty clay. An Environmental Assessment Report prepared by John L. Carman and Associates indicated no aquatic vegetation or standing water that would relate to wetlands.

310 Old East Vine St.
Lexington, Kentucky 40507
606/254-9803
606/255-8625 (fax)

II. Proposed Development Description

A 3 story-73 unit extended stay hotel facility and pool area are proposed for the site with parking spaces for 78 people. Storm drainage will be handled by grated storm water manholes built over existing pipes and new catch basin/pipes in the parking lot which will route the water to a modified junction boxes at Corporate Hill Drive. Apparently, retention may be handled by am existing basin designed for the entire development. Therefore, no retention is being proposed for this site. Concrete curbing will surround the parking area to direct storm water the inlets. The details of the new stormwater manholes and surface inlet modifications to the Corporate Hill curb inlets must be worked out with the City of Wichita Engineering Department.

Note: It is not possible to analyze the exising flows in the existing 42" storm sewer system but only the additional contribution from this site. It is believed based on the size of the existing system that there is capacity for the extra from this site.

III. Design Parameters

Stormwater design parameters were taken from discussion with the City of Wichita, Kansas as follows:

A. Stormwater inlets and piping in parking area.
   1. 5 year storm for design.
   2. Manning Formula used for flow calculation.
   3. Minimum velocity in pipes to be 2.0 fps for the inlets in parking lot.
   4. Pipe materials to comply with City of Wichita Engineering Guidelines. RCP used under curb and paving.
   5. Minimum pipe size 12 inches diameter in parking area and 15" in Public R. O. W.
   6. Rational Formula used for calculation.
   7. 1' minimum cover over pipe.
   8. 15 min. minimum time of concentration.

IV Design Methodology

A. Stormwater Inlets and Piping in Parking Areas.

1. 1" = 20' scale Grading and Drainage Plan by John L. Carman and Associates, Inc. used for subarea delineation and cover type. Base map by Planimeter used to calculate four (4) separate subareas which flow into modified manholes, catch basins, and modified curb inlets. The breakdown of drainage area is shown on layout plan in Appendix B.

2. The Haestad Methods StormCAD computer program was used to model the additional contribution into existing piping and to size the new catch basin/piping in the parking lot. StormCAD utilized the Rational Formula for calculation of flows, using the time of concentration of 15 minutes. I-D-F curves from the City of Wichita were used for rainfall intensities. 'C' coefficients were taken from a Highway Drainage Manual. The 5 year storm was used for analysis. The Manning formula is used by StormCAD for pipe friction analysis and a minimum 2.0 fps was maintained for flushing velocities on the pipes form the grated parking lot inlets. The breakdown of subareas and "C" coefficients are included in Appendix B. The rainfall data, and IDF curves are included in Appendix C. The StormCAD modeling schematics, computer printouts, and reports are included in Appendix D. Total flow from the catch basins and manholes is 4.94 cfs to the existing system. As mentioned this is very negligible to a system capable of carrying approximately 100 cfs. It is believed the exisiting system is adequate to carry the additional flow from this site.

B. Best management practices are to be used in all instances. Temporary silt control and stone construction entrance installed prior to commencing construction. A temporary sediment trap has been designed. The volume of the proposed temporary pond is approximately 3,470 cubic feet. This exceeds recommended EPA/BMP guidelines of 1,800 cubic feet per acre. Strawbales to be placed over inlets of catch basins. All areas to be seeded and mulched or sodded as quickly as possible after final grading. Refer to the specific construction notes on the plans for grading, erosion control, and storm sewer construction, and construction sequencing.

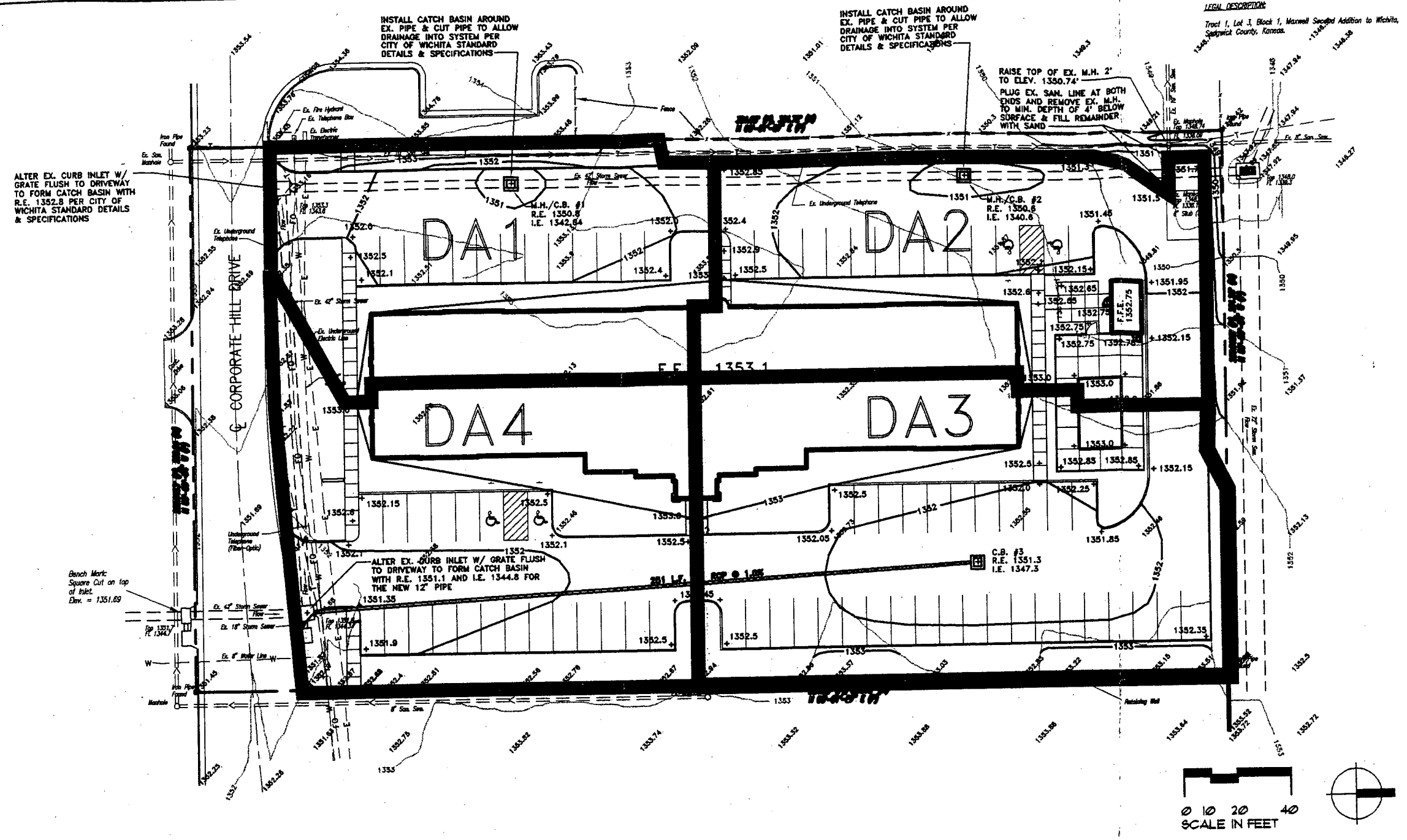
Appendix A

Location Map

* SITE LOCATED BETWEEN US POST OFFICE & FAIRFIELD INN ON NORTH SIDE OF CORPORATE HILL DRIVE.
Minneha
Beech
Radio Towers (KFH)
Wichita Country Club
Beech Lake
Minneha Sch
Mount Carmel Acad
Copeland Landing Strip
Forest Hills
Beech Factory Landing Field
Bonnie Brae
SITE
WICHITA
EAST WICHITA INTERCHANGE
Tollgate
Stoltenham Sch
Harrison Park
Mammoth Cave Sch
CENTRAL AVENUE
KELLOGG AVE
HARRY STREET
KANSAS TURNPIKE
TOLL ROAD
GREENWICH ROAD
BUTLER ROAD
6559 III NE (WICHITA EAST)
WICHITA (COURTHOUSE) 4.8 MI.
KINGMAN 49 MI.
ON INTERCHANGE 28 MI.
HITA INTERCHANGE 6 MI.

Appendix B

Sub Area Drainage Breakdown



LEGAL DESCRIPTION:
Tract 1, Lot 3, Block 1, Maxwell Second Addition to Wichita, Sedgwick County, Kansas.

DRAINAGE SUBAREA SCHEMATIC
STORMWATER CONTROL FACILITY DESIGN

StudioPLUS Properties, Inc
9450 E. Corporate Hill Drive
Wichita, Kansas 67207

JOHN L. GARMAN & ASSOCIATES, INC.
310 Old East Vine Street
Lexington, Kentucky 40507 606/254-9803
Landscape Architecture • Planning • Site Engineering

DRAWN KLW
DATE 5/28/97
CHECKED
REVISED 6/5/97
6/9/97

SHEET

StudioPLUS Hotel
Corporate Hill Drive
Wichita, Kansas
SubArea Drainage Breakdown
Using Rational Formula
for Pipe System Design
June, 1997

	Cover Description	Area (SF)	Area (Ac)	Runoff Coefficient 'C'
DA-1	Roof	3440	0.08 ac	0.95
	Pavement	6238	0.14	0.90
	Concrete	300	0.007	0.95
	Turf	3466	0.08	0.30
DA-2	Roof	3440	0.08	0.95
	Pavement	7892	0.18	0.90
	Concrete	1435	0.03	0.95
	Turf	1376	0.03	0.30
DA-3	Roof	3596	0.08	0.95
	Pavement	10874	0.25	0.90
	Concrete	880	0.02	0.95
	Turf	2486	0.06	0.30
DA-4	Roof	3596	0.08	0.95
	Pavement	7203	0.17	0.90
	Concrete	275	0.006	0.95
	Turf	3981	0.09	0.30

Appendix C

Rainfall I. D. F. Curves

Wichita, Kansas

THE CITY OF WICHITA

CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202
(316) 268-4501
(316) 268-4114 FAX

February 5, 1997

To: Contractors
Consultants

Gentlemen:

Subject: Policy Governing Privately Owned and Maintained Storm Water Sewer Projects

Private storm water sewer project plans submitted for plan review after March 1, 1997 must include televising of 36" or smaller lines. Upon completion of the improvement, the engineering firm responsible for the inspection will be required to submit as-builts, television log and tape, and Certificate of Completion. The City Engineer's Office will not release the project through a Letter of Acceptance if these requirements are not met.

If you should have any questions regarding this matter, please contact Janice Briggs at 268-4574.

Yours truly,

Mike Lindebak, P.E.
City Engineer

JKB

cc: Gene Rath, P.E., Assistant City Engineer
Chris Breitenstein, P.E., Storm Water Management
Vicky Huang, P.E., Subdivision Engineer
Rob Younkin, P.E., Civil Engineer
Mike Stump, I.E., Engineer
Gary Janzen, I.E., Engineer

April 15, 1986

ATTACHMENT A
DRAINAGE CRITERIA MANUAL

CITY OF WICHITA, KANSAS

RAINFALL INTENSITY TABLE FOR SEDGWICK COUNTY, KANSAS

The following tabulation contains rainfall intensity in inches per hour as derived from ESSA Weather Bureau Technical Paper 40 Modified to NWS Hydro-35, 1977 During First Hour

DURATION IN MINUTES	RETURN PERIODS OF 1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
5	4.18	5.57	6.53	7.41	8.52	9.48	10.32
6	3.99	5.32	6.25	7.09	8.16	9.09	9.89
7	3.81	5.09	5.99	6.81	7.84	8.74	9.50
8	3.66	4.89	5.75	6.55	7.55	8.42	9.15
9	3.52	4.70	5.54	6.31	7.28	8.13	8.83
10	3.39	4.52	5.34	6.09	7.04	7.86	8.54
11	3.27	4.36	5.16	5.89	6.81	7.61	8.27
12	3.18	4.21	4.99	5.71	6.60	7.38	8.02
13	3.05	4.08	4.84	5.53	6.41	7.17	7.79
14	2.96	3.95	4.69	5.37	6.23	6.97	7.57
15	2.87	3.83	4.56	5.22	6.06	6.78	7.37
16	2.78	3.72	4.43	5.08	5.90	6.60	7.18
17	2.71	3.61	4.31	4.95	5.75	6.44	7.00
18	2.63	3.51	4.20	4.83	5.61	6.29	6.84
19	2.56	3.42	4.10	4.71	5.47	6.14	6.68
20	2.50	3.33	4.00	4.60	5.35	6.00	6.53
21	2.44	3.25	3.90	4.50	5.23	5.87	6.39
22	2.38	3.17	3.81	4.40	5.12	5.75	6.26
23	2.32	3.10	3.73	4.31	5.01	5.63	6.13
24	2.27	3.03	3.65	4.22	4.91	5.52	6.01
25	2.22	2.96	3.57	4.13	4.81	5.41	5.90
26	2.20	2.90	3.50	4.05	4.72	5.31	5.79
27	2.16	2.84	3.43	3.98	4.63	5.21	5.69
28	2.14	2.78	3.37	3.90	4.55	5.12	5.59
29	2.11	2.72	3.30	3.83	4.47	5.03	5.49
30	2.08	2.67	3.24	3.76	4.39	4.94	5.40
31	2.05	2.62	3.19	3.70	4.32	4.86	5.32
32	2.02	2.57	3.10	3.63	4.25	4.79	5.22
33	1.99	2.52	3.05	3.57	4.18	4.71	5.14
34	1.96	2.48	3.01	3.51	4.11	4.63	5.07
35	1.93	2.44	2.98	3.46	4.05	4.56	5.00
36	1.91	2.39	2.93	3.41	3.99	4.50	4.93
37	1.89	2.35	2.88	3.36	3.93	4.43	4.86
38	1.87	2.32	2.84	3.31	3.87	4.37	4.79
39	1.85	2.28	2.80	3.26	3.82	4.31	4.73
40	1.83	2.24	2.76	3.22	3.76	4.25	4.66
41	1.81	2.21	2.72	3.17	3.71	4.19	4.60
42	1.79	2.18	2.68	3.13	3.66	4.13	4.54
43	1.77	2.14	2.64	3.09	3.61	4.08	4.49
44	1.75	2.11	2.61	3.05	3.57	4.03	4.43
45	1.73	2.08	2.57	3.01	3.52	3.98	4.38

ATTACHMENT A CONTINUED
Page 2

DURATION IN MINUTES	RETURN PERIODS OF 1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
46	1.70	2.05	2.54	2.97	3.48	3.93	4.33
47	1.67	2.02	2.50	2.93	3.44	3.88	4.28
48	1.66	2.00	2.47	2.90	3.39	3.84	4.23
49	1.64	1.97	2.44	2.86	3.35	3.79	4.18
50	1.61	1.95	2.41	2.83	3.32	3.75	4.13
51	1.59	1.92	2.38	2.79	3.28	3.71	4.09
52	1.56	1.89	2.35	2.76	3.24	3.67	4.05
53	1.54	1.86	2.33	2.73	3.20	3.63	4.00
54	1.52	1.84	2.30	2.70	3.17	3.59	3.96
55	1.50	1.81	2.27	2.67	3.14	3.55	3.92
56	1.47	1.79	2.25	2.64	3.10	3.51	3.88
57	1.45	1.76	2.22	2.61	3.07	3.48	3.84
58	1.43	1.74	2.20	2.59	3.04	3.44	3.81
59	1.42	1.72	2.18	2.56	3.01	3.41	3.77
60	1.40	1.69	2.15	2.53	2.98	3.37	3.73
61	1.38	1.67	2.13	2.51	2.95	3.34	3.70
62	1.36	1.65	2.11	2.48	2.92	3.31	3.67
63	1.34	1.63	2.09	2.46	2.89	3.28	3.63
64	1.33	1.61	2.07	2.44	2.86	3.25	3.60
65	1.31	1.59	2.05	2.41	2.84	3.22	3.57
66	1.30	1.57	2.03	2.39	2.81	3.19	3.54
67	1.28	1.56	2.01	2.37	2.79	3.16	3.51
68	1.26	1.54	1.99	2.35	2.76	3.13	3.48
69	1.25	1.52	1.97	2.33	2.74	3.10	3.45
70	1.24	1.50	1.95	2.31	2.71	3.08	3.42
71	1.22	1.49	1.93	2.28	2.69	3.05	3.39
72	1.21	1.47	1.92	2.26	2.67	3.02	3.36
73	1.20	1.46	1.90	2.25	2.64	3.00	3.34
74	1.18	1.44	1.88	2.23	2.63	2.98	3.31
75	1.17	1.43	1.86	2.21	2.61	2.95	3.29
76	1.16	1.41	1.85	2.19	2.58	2.93	3.26
77	1.15	1.40	1.83	2.17	2.55	2.90	3.24
78	1.13	1.38	1.82	2.15	2.53	2.88	3.22
79	1.12	1.37	1.80	2.14	2.50	2.86	3.19
80	1.11	1.36	1.79	2.12	2.48	2.84	3.16
81	1.10	1.34	1.77	2.10	2.46	2.82	3.13
82	1.09	1.33	1.76	2.08	2.43	2.79	3.10
83	1.08	1.32	1.74	2.06	2.41	2.76	3.07
84	1.07	1.31	1.73	2.04	2.39	2.74	3.04
85	1.06	1.30	1.72	2.02	2.37	2.71	3.01
86	1.05	1.28	1.70	2.00	2.34	2.69	2.99
87	1.04	1.27	1.69	1.99	2.32	2.66	2.96
88	1.03	1.26	1.68	1.97	2.30	2.64	2.93
89	1.02	1.25	1.68	1.95	2.28	2.62	2.91
90	1.01	1.24	1.66	1.93	2.26	2.59	2.88

DURATION IN MINUTES	RETURN PERIODS OF 1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
91	1.00	1.23	1.65	1.92	2.24	2.57	2.86
92	1.00	1.22	1.63	1.90	2.22	2.55	2.83
93	0.99	1.21	1.62	1.89	2.20	2.53	2.81
94	0.98	1.20	1.61	1.87	2.19	2.51	2.79
95	0.97	1.19	1.59	1.85	2.17	2.49	2.76
96	0.96	1.18	1.58	1.84	2.15	2.46	2.74
97	0.96	1.17	1.57	1.82	2.13	2.44	2.72
98	0.95	1.16	1.56	1.81	2.12	2.42	2.70
99	0.94	1.15	1.54	1.80	2.10	2.41	2.67
100	0.93	1.14	1.53	1.78	2.08	2.39	2.65
101	0.93	1.13	1.52	1.77	2.07	2.39	2.65
102	0.92	1.13	1.51	1.75	2.05	2.35	2.61
103	0.91	1.12	1.50	1.74	2.04	2.33	2.59
104	0.90	1.11	1.49	1.73	2.02	2.31	2.57
105	0.90	1.10	1.47	1.72	2.01	2.30	2.55
106	0.89	1.09	1.46	1.70	1.99	2.28	2.54
107	0.88	1.09	1.45	1.69	1.98	2.26	2.52
108	0.88	1.08	1.44	1.68	1.96	2.25	2.50
109	0.87	1.07	1.43	1.67	1.95	2.23	2.48
110	0.87	1.06	1.42	1.65	1.93	2.21	2.46
111	0.86	1.06	1.41	1.64	1.92	2.20	2.45
112	0.85	1.05	1.40	1.63	1.91	2.18	2.43
113	0.85	1.04	1.39	1.62	1.89	2.17	2.41
114	0.84	1.03	1.38	1.61	1.88	2.15	2.40
115	0.84	1.03	1.37	1.60	1.87	2.14	2.38
116	0.83	1.02	1.36	1.59	1.86	2.12	2.36
117	0.82	1.01	1.36	1.58	1.84	2.11	2.35
118	0.82	1.01	1.35	1.57	1.83	2.09	2.33
119	0.81	1.00	1.34	1.56	1.82	2.08	2.32
120	0.81	0.99	1.33	1.55	1.81	2.07	2.30

DURATION IN HOURS	RETURN PERIODS OF 1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
2	0.81	0.99	1.33	1.55	1.81	2.07	2.30
3	0.59	0.72	0.97	1.13	1.32	1.51	1.68
4	0.47	0.58	0.78	0.91	1.06	1.21	1.35
5	0.40	0.49	0.66	0.77	0.89	1.02	1.14
6	0.35	0.42	0.57	0.67	0.78	0.89	0.99
8	0.28	0.34	0.46	0.53	0.62	0.71	0.79
10	0.23	0.29	0.39	0.45	0.52	0.60	0.67
12	0.20	0.25	0.33	0.39	0.45	0.52	0.58
18	0.15	0.18	0.24	0.28	0.33	0.38	0.42
24	0.12	0.15	0.20	0.23	0.27	0.31	0.34

Appendix D

StormCAD Modeling Schematics,

Computer Printouts and Profiles

DA3->New CB1 in Parking Area

Mod. Curb Inlet

Wichita StudioPLUS
Stormwater Facilities
Design Schematic
NTS 6/97

------------------ Beginning Calculation Cycle -------------------
Discharge: 1.55 cfs at node CB1
Discharge: 1.52 cfs at node Outlet
Beginning iteration 1
Discharge: 1.55 cfs at node CB1
Discharge: 1.52 cfs at node Outlet
Discharge Convergence Achieved in 1 iterations: relative error: 0.45798852e-8
--------------------- Calculations Complete ----------------------

** Analysis Options **
Friction method: Manning's Formula
HGL Convergence Test: 0.001000
Maximum Network Traversals: 5
Number of Pipe Profile Steps: 5
Discharge Convergence Test: 0.001000
Maximum Design Passes: 3

---------------- Network Quick View -----------------------

Label	Length	Size	Discharge	Hydraulic Grade Upstream	Hydraulic Grade Downstream
P-1	251.00	12 inch	1.55	1,347.83	1,345.33

Label	Discharge	Elevations Ground	Elevations Upstream HGL	Elevations Downstream HGL
CB1	1.55	1,351.30	1,347.83	1,347.83
Outlet	1.52	1,351.80	1,345.33	1,345.33

Elapsed: 0 minute(s) 1 second(s)

Combined Pipe/Node Report

Pipe	Upstream Node	Downstream Node	Length (ft)	Inlet Area (acres)	Inlet C	Inlet CA (acres)	Total CA (acres)	Inlet Discharge (cfs)	Section Size	Capacity (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)
P-1	CB1	Outlet	251.00	0.41	0.82	0.34	0.34	1.55	12 inch	3.56	3.69	1,347.30	1,344.80

DOT Report

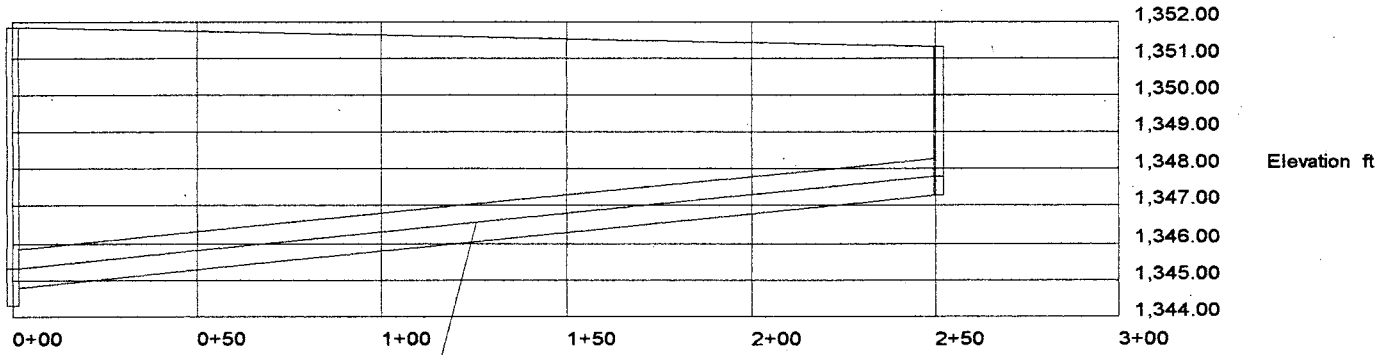
Pipe	-Node- Upstream Downstream	Inlet Area (acres)	Inlet CA (acres)	Total CA (acres)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	-Section- Shape Size	Length (ft)	Average Velocity (ft/s)	Description
P-1	CB1	0.41	0.34	0.34	1,351.30	1,347.83	0.009960	1.55	Circular	251.00	3.69	
	Outlet				1,351.80	1,345.33	0.009960	3.56	12 inch			

Node Report

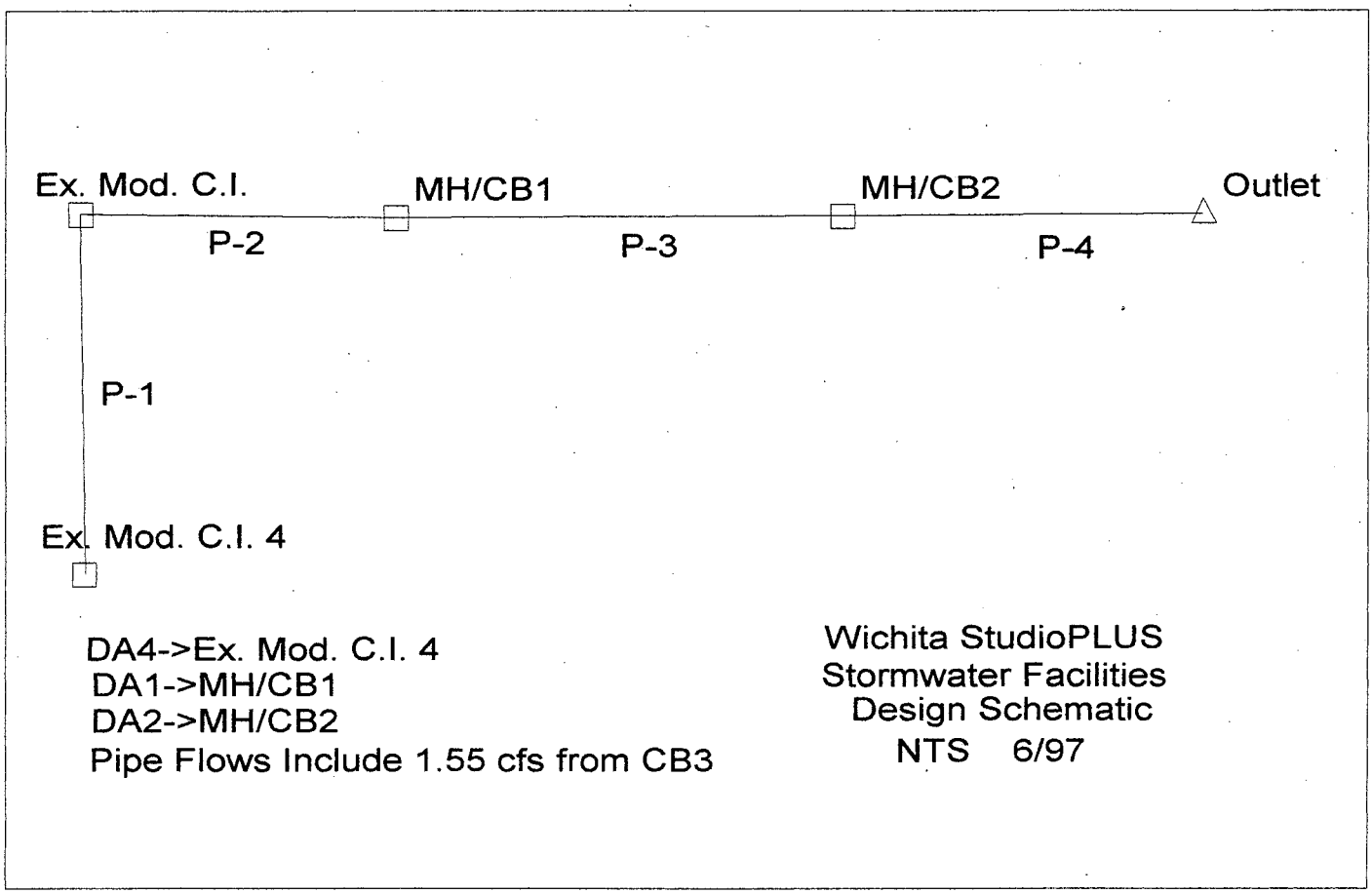
Node	Inlet Area (acres)	Inlet C	Inlet CA (acres)	External CA (acres)	Total CA (acres)	Inlet TC (min)	External TC (min)	Upstream Flow Time (min)	System Flow Time (min)	System Intensity (in/hr)	Total Watershed (CIA) (cfs)	Additional Flow (cfs)	Carryover (cfs)	Known Flow (cfs)
CB1	0.41	0.82	0.34	0.00	0.34	15.00	0.00	0.00	15.00	4.56	1.55	0.00	0.00	0.00
Outlet	N/A	N/A	N/A	N/A	0.34	N/A	0.00	16.14	16.14	4.46	1.52	N/A	N/A	N/A

Outlet: Outlet
Rim: 1,351.80 ft
Sump: 1,344.30 ft

Inlet: CB1
Rim: 1,351.30 ft
Sump: 1,347.30 ft



Pipe: P-1
Up Invert: 1,347.30 ft
Dn Invert: 1,344.80 ft
Length: 251.00 ft
Section Size: 12 inch


Ex. Mod. C.I.
MH/CB1
MH/CB2
Outlet
P-2
P-3
P-4
P-1
Ex. Mod. C.I. 4
DA4->Ex. Mod. C.I. 4
DA1->MH/CB1
DA2->MH/CB2
Pipe Flows Include 1.55 cfs from CB3
Wichita StudioPLUS
Stormwater Facilities
Design Schematic
NTS 6/97

```
------------------ Beginning Calculation Cycle -------------------
Discharge: 2.75 cfs  at node Ex. Mod. C.I. 4
Discharge: 2.74 cfs  at node  Ex. Mod. C.I.
Discharge: 3.77 cfs  at node MH/CB1
Discharge: 4.97 cfs  at node MH/CB2
Discharge: 4.94 cfs  at node Outlet
Beginning iteration 1
Discharge: 2.75 cfs  at node Ex. Mod. C.I. 4
Discharge: 2.73 cfs  at node  Ex. Mod. C.I.
Discharge: 3.77 cfs  at node MH/CB1
Discharge: 4.94 cfs  at node MH/CB2
Discharge: 4.91 cfs  at node Outlet
Completed iteration 1
Current discharge convergence relative error:  0.52196585e-2
Target discharge convergence relative error:  0.001
Beginning iteration 2
Discharge: 2.75 cfs  at node Ex. Mod. C.I. 4
Discharge: 2.73 cfs  at node  Ex. Mod. C.I.
Discharge: 3.77 cfs  at node MH/CB1
Discharge: 4.94 cfs  at node MH/CB2
Discharge: 4.91 cfs  at node Outlet
Discharge Convergence Achieved in 2 iterations: relative error:  0.36455461e-4
-------------------- Calculations Complete ---------------------

** Analysis Options **
Friction method:  Manning's Formula
HGL Convergence Test:  0.001000
Maximum Network Traversals:  5
Number of Pipe Profile Steps:  5
Discharge Convergence Test:  0.001000
Maximum Design Passes:  3

 ---------------- Network Quick View -----------------------
```

Label	Length	Size	Discharge	Hydraulic Grade Upstream	Hydraulic Grade Downstream
P-1	156.00	42 inch	2.75	1,344.80	1,344.09
P-2	86.00	42 inch	2.73	1,344.09	1,343.22
P-3	170.00	42 inch	3.77	1,343.22	1,341.27
P-4	106.00	42 inch	4.94	1,341.27	1,339.97

Label	Discharge	Elevations Ground	Elevations Upstream HGL	Elevations Downstream HGL
MH/CB1	3.77	1,350.80	1,343.22	1,343.22
MH/CB2	4.94	1,350.60	1,341.27	1,341.27
Outlet	4.91	1,348.00	1,339.97	1,339.97
Ex. Mod.	2.73	1,352.80	1,344.09	1,344.09
Ex. Mod.	2.75	1,351.20	1,344.80	1,344.80

Elapsed: 0 minute(s) 5 second(s)

Combined Pipe/Node Report

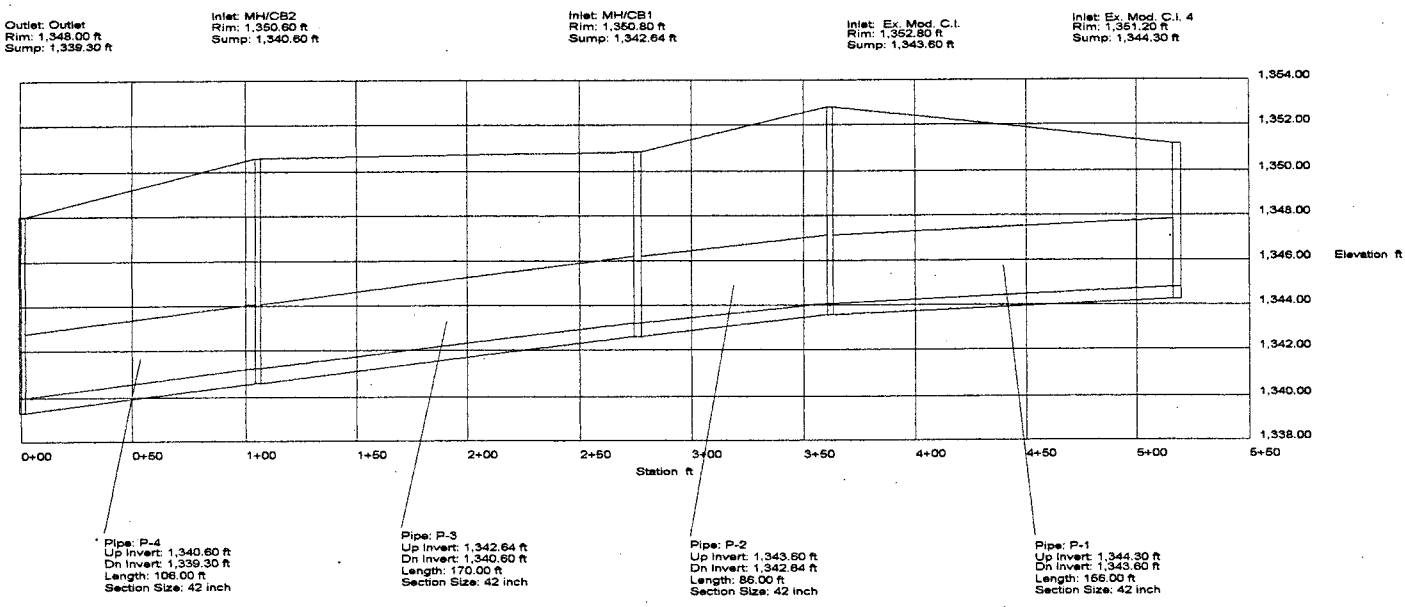
Pipe	Upstream Node	Downstream Node	Length (ft)	Inlet Area (acres)	Inlet C	Inlet CA (acres)	Total CA (acres)	Inlet Discharge (cfs)	Section Size	Capacity (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)
P-1	Ex. Mod. C.I. 4	Ex. Mod. C.I.	156.00	0.35	0.76	0.26	0.26	1.20	42 inch	67.39	3.32	1,344.30
P-2	Ex. Mod. C.I.	MH/CB1	86.00	0.00	0.00	0.00	0.26	0.00	42 inch	106.29	2.96	1,343.60
P-3	MH/CB1	MH/CB2	170.00	0.31	0.76	0.23	0.49	1.07	42 inch	110.21	3.27	1,342.64
P-4	MH/CB2	Outlet	106.00	0.32	0.86	0.28	0.77	1.27	42 inch	111.41	3.87	1,340.60

DOT Report

Pipe	-Node- Upstream Downstream	Inlet Area (acres)	Inlet CA (acres)	Total CA (acres)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Slope- Energy Constructed (ft/ft)	-Section- Discharge Capacity (cfs)	-Section- Shape Size	Length (ft)	Average Velocity (ft/s)
P-1	Ex. Mod. C.I. 4	0.35	0.26	0.26	1,351.20	1,344.80	0.004487	2.75	Circular	156.00	3.32
	Ex. Mod. C.I.				1,352.80	1,344.09	0.004487	67.39	42 inch		
P-2	Ex. Mod. C.I.	0.00	0.00	0.26	1,352.80	1,344.09	0.010891	2.73	Circular	86.00	2.96
	MH/CB1				1,350.80	1,343.22	0.011163	106.29	42 inch		
P-3	MH/CB1	0.31	0.23	0.49	1,350.80	1,343.22	0.011882	3.77	Circular	170.00	3.27
	MH/CB2				1,350.60	1,341.27	0.012000	110.21	42 inch		
P-4	MH/CB2	0.32	0.28	0.77	1,350.60	1,341.27	0.012264	4.94	Circular	106.00	3.87
	Outlet				1,348.00	1,339.97	0.012264	111.41	42 inch		

Node Report

Node	Inlet Area (acres)	Inlet C	Inlet CA (acres)	External CA (acres)	Total CA (acres)	Inlet TC (min)	External TC (min)	Upstream Flow Time (min)	System Flow Time (min)	System Intensity (in/hr)	Total Watershed (CIA) (cfs)	Additional Flow (cfs)	Carryover (cfs)
Ex. Mod. C.I. 4	0.35	0.76	0.26	0.00	0.26	15.00	0.00	0.00	15.00	4.56	1.20	1.55	0.00
Ex. Mod. C.I.	0.00	0.00	0.00	0.00	0.26	0.00	0.00	15.78	15.78	4.49	1.18	0.00	0.00
MH/CB1	0.31	0.76	0.23	0.00	0.49	15.00	0.00	16.27	16.27	4.45	2.22	0.00	0.00
MH/CB2	0.32	0.86	0.28	0.00	0.77	15.00	0.00	17.13	17.13	4.37	3.39	0.00	0.00
Outlet	N/A	N/A	N/A	N/A	0.77	N/A	0.00	17.59	17.59	4.33	3.36	N/A	N/A


Outlet: Outlet
Rim: 1,348.00 ft
Sump: 1,339.30 ft
Inlet: MH/CB2
Rim: 1,350.60 ft
Sump: 1,340.60 ft
Inlet: MH/CB1
Rim: 1,350.80 ft
Sump: 1,342.64 ft
Inlet: Ex. Mod. C.I.
Rim: 1,352.80 ft
Sump: 1,343.60 ft
Inlet: Ex. Mod. C.I. 4
Rim: 1,351.20 ft
Sump: 1,344.30 ft
1,354.00
1,352.00
1,350.00
1,348.00
1,346.00
1,344.00
1,342.00
1,340.00
1,338.00
Elevation ft
0+00
0+50
1+00
1+50
2+00
2+50
3+00
3+50
4+00
4+50
5+00
5+50
Station ft
Pipe: P-4
Up Invert: 1,340.60 ft
Dn Invert: 1,339.30 ft
Length: 106.00 ft
Section Size: 42 inch
Pipe: P-3
Up Invert: 1,342.64 ft
Dn Invert: 1,340.60 ft
Length: 170.00 ft
Section Size: 42 inch
Pipe: P-2
Up Invert: 1,343.60 ft
Dn Invert: 1,342.64 ft
Length: 86.00 ft
Section Size: 42 inch
Pipe: P-1
Up Invert: 1,344.30 ft
Dn Invert: 1,343.60 ft
Length: 166.00 ft
Section Size: 42 inch