



Ruggles & Bohm, P.A.

Engineering, Surveying, Land Planning
 924 N. Main
 Wichita, Kansas 67203

JUN 20 2009

MEMO

Date: 7-20-09

To: Scott Lindebak

From: Tom Ruggles

Project: Hunter Health Clinic 2nd Addition
 Drainage Plan

RB Project No.: 3175E

Other Project Reference No.:

Description:

- Confirmation
- Transmittal
- Transmittal under separate cover by

Purpose:

- Approval
- Review & comment
- Use
- Other: _____
- Distribution
- Information
- Record

Enclosures/Attachments:

- Prints
- Originals
- Diskettes containing: _____
- Other: _____
- Change Order
- Shop Drawings

Copies	Description
1	Revised drainage plan
1	Revised drainage report

Remarks: We are submitting this revised plan based on a new site plan for the building. Our original plan had fewer rain garden outlets, so we have re-run the detention to be sure we are not exceeding pre-development conditions.

Copies to:

If checked below, please:

- Acknowledge receipt of enclosures
- Return enclosures to us.

Signed _____

HUNTER HEALTH CLINIC 2ND ADDITION

Project: 3175E Simulation Run: EX 002-YR

Start of Run: 01Jan2009, 12:00 Basin Model: EXIST
End of Run: 02Jan2009, 12:15 Meteorologic Model: 2-YR
Compute Time: 16Jul2009, 14:24:38 Control Specifications: Control 1

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
EXIST	0.00469	7.3	02Jan2009, 00:00	0.7



Project: 3175E Simulation Run: EX 005-YR

Start of Run: 01Jan2009, 12:00 Basin Model: EXIST
End of Run: 02Jan2009, 12:15 Meteorologic Model: 5-YR
Compute Time: 16Jul2009, 14:24:41 Control Specifications: Control 1

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
EXIST	0.00469	9.9	02Jan2009, 00:00	0.9

Project: 3175E Simulation Run: EX 010-YR

Start of Run: 01Jan2009, 12:00 Basin Model: EXIST
End of Run: 02Jan2009, 12:15 Meteorologic Model: 10-YR
Compute Time: 16Jul2009, 14:24:44 Control Specifications: Control 1

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
EXIST	0.00469	11.5	02Jan2009, 00:00	1.0

Project: 3175E Simulation Run: EX 025-YR

Start of Run: 01Jan2009, 12:00 Basin Model: EXIST
End of Run: 02Jan2009, 12:15 Meteorologic Model: 25-YR
Compute Time: 16Jul2009, 14:45:36 Control Specifications: Control 1

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
EXIST	0.00469	14.1	02Jan2009, 00:00	1.3

Project: 3175E Simulation Run: EX 100-YR

Start of Run: 01Jan2009, 12:00 Basin Model: EXIST
End of Run: 02Jan2009, 12:15 Meteorologic Model: 100-YR
Compute Time: 16Jul2009, 14:48:00 Control Specifications: Control 1

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
EXIST	0.00469	18.6	02Jan2009, 00:00	1.7

Project: 3175E Simulation Run: Prop 002-yr

Start of Run: 01Jan2009, 12:00 Basin Model: PROP
End of Run: 02Jan2009, 12:15 Meteorologic Model: 2-YR
Compute Time: 16Jul2009, 14:25:20 Control Specifications: Control 1

Volume Units: AC-FT

A	.00064063	1.2	02Jan2009, 00:00	0.1
B	.000328	0.6	02Jan2009, 00:00	0.1
BYPASS	0.0022346	4.2	02Jan2009, 00:00	0.4
C	.000766	1.4	02Jan2009, 00:00	0.1
D	.0005	0.9	02Jan2009, 00:00	0.1
E	.000203	0.4	02Jan2009, 00:00	0.0
F	.000391	0.7	02Jan2009, 00:00	0.1
G	.0003125	0.6	02Jan2009, 00:00	0.1
H	.000219	0.4	02Jan2009, 00:00	0.0
I	.000219	0.4	02Jan2009, 00:00	0.0
J	.000734	1.4	02Jan2009, 00:00	0.1
K	.000328	0.6	02Jan2009, 00:00	0.1
RG-1	.000203	0.3	02Jan2009, 00:15	0.0
RG-2	.000391	0.5	02Jan2009, 00:15	0.1
RG-3	.0007035	0.9	02Jan2009, 00:15	0.1
RG-4	.000219	0.3	02Jan2009, 00:15	0.0
RG-5	.000219	0.3	02Jan2009, 00:15	0.0
RG-6	.000734	1.0	02Jan2009, 00:15	0.1
RG-7	.000328	0.5	02Jan2009, 00:15	0.1
TOTAL SITE	0.0046411	6.8	02Jan2009, 00:00	0.8

Project: 3175E Simulation Run: Prop 005-yr

Start of Run: 01Jan2009, 12:00 Basin Model: PROP
End of Run: 02Jan2009, 12:15 Meteorologic Model: 5-YR
Compute Time: 16Jul2009, 14:25:52 Control Specifications: Control 1

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
A	.00064063	1.5	02Jan2009, 00:00	0.1
B	.000328	0.8	02Jan2009, 00:00	0.1
BYPASS	0.0022346	5.4	02Jan2009, 00:00	0.5
C	.000766	1.8	02Jan2009, 00:00	0.2
D	.0005	1.2	02Jan2009, 00:00	0.1
E	.000203	0.5	02Jan2009, 00:00	0.0
F	.000391	0.9	02Jan2009, 00:00	0.1
G	.0003125	0.8	02Jan2009, 00:00	0.1
H	.000219	0.5	02Jan2009, 00:00	0.0
I	.000219	0.5	02Jan2009, 00:00	0.0
J	.000734	1.8	02Jan2009, 00:00	0.2
K	.000328	0.8	02Jan2009, 00:00	0.1
RG-1	.000203	0.4	02Jan2009, 00:15	0.0
RG-2	.000391	0.6	02Jan2009, 00:15	0.1
RG-3	.0007035	1.1	02Jan2009, 00:15	0.2
RG-4	.000219	0.4	02Jan2009, 00:15	0.1
RG-5	.000219	0.4	02Jan2009, 00:15	0.1
RG-6	.000734	1.3	02Jan2009, 00:15	0.2
RG-7	.000328	0.6	02Jan2009, 00:15	0.1
TOTAL SITE	0.0046411	8.9	02Jan2009, 00:00	1.1

Project: 3175E Simulation Run: Prop 010-yr

Start of Run: 01Jan2009, 12:00 Basin Model: PROP
End of Run: 02Jan2009, 12:15 Meteorologic Model: 10-YR
Compute Time: 16Jul2009, 14:26:29 Control Specifications: Control 1

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
A	.00064063	1.8	02Jan2009, 00:00	0.2
B	.000328	0.9	02Jan2009, 00:00	0.1
BYPASS	0.0022346	6.1	02Jan2009, 00:00	0.6
C	.000766	2.1	02Jan2009, 00:00	0.2
D	.0005	1.4	02Jan2009, 00:00	0.1
E	.000203	0.6	02Jan2009, 00:00	0.1
F	.000391	1.1	02Jan2009, 00:00	0.1
G	.0003125	0.9	02Jan2009, 00:00	0.1
H	.000219	0.6	02Jan2009, 00:00	0.1
I	.000219	0.6	02Jan2009, 00:00	0.1
J	.000734	2.0	02Jan2009, 00:00	0.2
K	.000328	0.9	02Jan2009, 00:00	0.1
RG-1	.000203	0.4	02Jan2009, 00:15	0.1
RG-2	.000391	0.7	02Jan2009, 00:15	0.1
RG-3	.0007035	1.3	02Jan2009, 00:15	0.2
RG-4	.000219	0.5	02Jan2009, 00:15	0.1
RG-5	.000219	0.5	02Jan2009, 00:15	0.1
RG-6	.000734	1.5	02Jan2009, 00:15	0.2
RG-7	.000328	0.7	02Jan2009, 00:15	0.1
TOTAL SITE	0.0046411	10.1	02Jan2009, 00:00	1.2

Project: 3175E Simulation Run: Prop 025-yr

Start of Run: 01Jan2009, 12:00 Basin Model: PROP
End of Run: 02Jan2009, 12:15 Meteorologic Model: 25-YR
Compute Time: 16Jul2009, 14:46:08 Control Specifications: Control 1

Volume Units: AC-FT

Hydrologic Element	Drainage Area (MI ²)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
A	.00064063	2.1	02Jan2009, 00:00	0.2
B	.000328	1.1	02Jan2009, 00:00	0.1
BYPASS	0.0022346	7.4	02Jan2009, 00:00	0.7
C	.000766	2.5	02Jan2009, 00:00	0.2
D	.0005	1.7	02Jan2009, 00:00	0.2
E	.000203	0.7	02Jan2009, 00:00	0.1
F	.000391	1.3	02Jan2009, 00:00	0.1
G	.0003125	1.0	02Jan2009, 00:00	0.1
H	.000219	0.7	02Jan2009, 00:00	0.1
I	.000219	0.7	02Jan2009, 00:00	0.1
J	.000734	2.4	02Jan2009, 00:00	0.2
K	.000328	1.1	02Jan2009, 00:00	0.1
RG-1	.000203	0.5	02Jan2009, 00:15	0.1
RG-2	.000391	0.8	02Jan2009, 00:15	0.1
RG-3	.0007035	1.5	02Jan2009, 00:15	0.2
RG-4	.000219	0.5	02Jan2009, 00:15	0.1
RG-5	.000219	0.5	02Jan2009, 00:15	0.1
RG-6	.000734	1.5	02Jan2009, 00:15	0.2
RG-7	.000328	0.8	02Jan2009, 00:15	0.1
TOTAL SITE	0.0046411	12.2	02Jan2009, 00:00	1.4

Project: 3175E Simulation Run: Prop 100-YR

Start of Run: 01Jan2009, 12:00 Basin Model: PROP
End of Run: 02Jan2009, 12:15 Meteorologic Model: 100-YR
Compute Time: 16Jul2009, 14:51:00 Control Specifications: Control 1

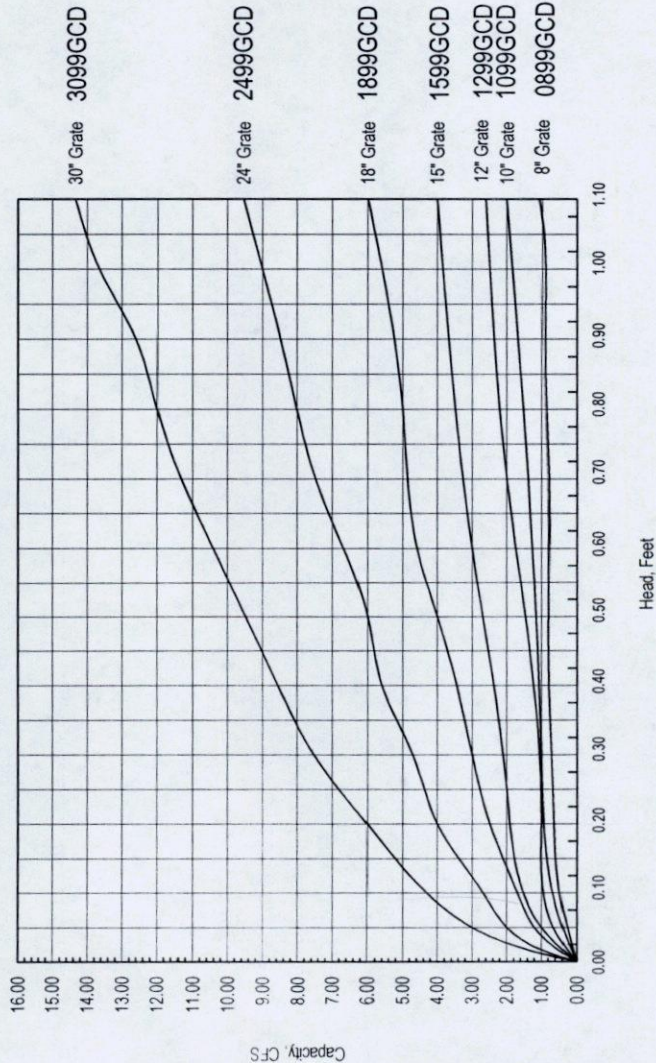
Volume Units: AC-FT

A	.00064064	2.7	02Jan2009, 00:00	0.3
B	.000328	1.4	02Jan2009, 00:00	0.1
BYPASS	0.0022346	9.5	02Jan2009, 00:00	0.9
C	.000766	3.3	02Jan2009, 00:00	0.3
D	.0005	2.1	02Jan2009, 00:00	0.2
E	.000203	0.9	02Jan2009, 00:00	0.1
F	.000391	1.7	02Jan2009, 00:00	0.2
G	.0003125	1.3	02Jan2009, 00:00	0.1
H	.000219	0.9	02Jan2009, 00:00	0.1
I	.000219	0.9	02Jan2009, 00:00	0.1
J	.000734	3.1	02Jan2009, 00:00	0.3
K	.000328	1.4	02Jan2009, 00:00	0.1
RG-1	.000203	0.6	02Jan2009, 00:15	0.1
RG-2	.000391	1.0	02Jan2009, 00:15	0.2
RG-3	.0007035	1.8	02Jan2009, 00:15	0.3
RG-4	.000219	0.7	02Jan2009, 00:15	0.1
RG-5	.000219	0.7	02Jan2009, 00:15	0.1
RG-6	.000734	1.7	02Jan2009, 00:15	0.3
RG-7	.000328	1.0	02Jan2009, 00:15	0.1
TOTAL SITE	0.0046411	15.2	02Jan2009, 00:00	1.9

Nyloplast Dome Grate Inlet Capacity Chart

This chart is based on equations from the FAA Airport Drainage AC 150/5320-5B, 1970, Page 35. Certain assumptions have been made and no two installations will necessarily perform the same way. Safety factors should change with site conditions such that a safety factor 1.25 should be used for an inlet in pavement, and a safety factor of 2.0 should be used in turf areas.

Nyloplast Dome Grates 8" - 30"



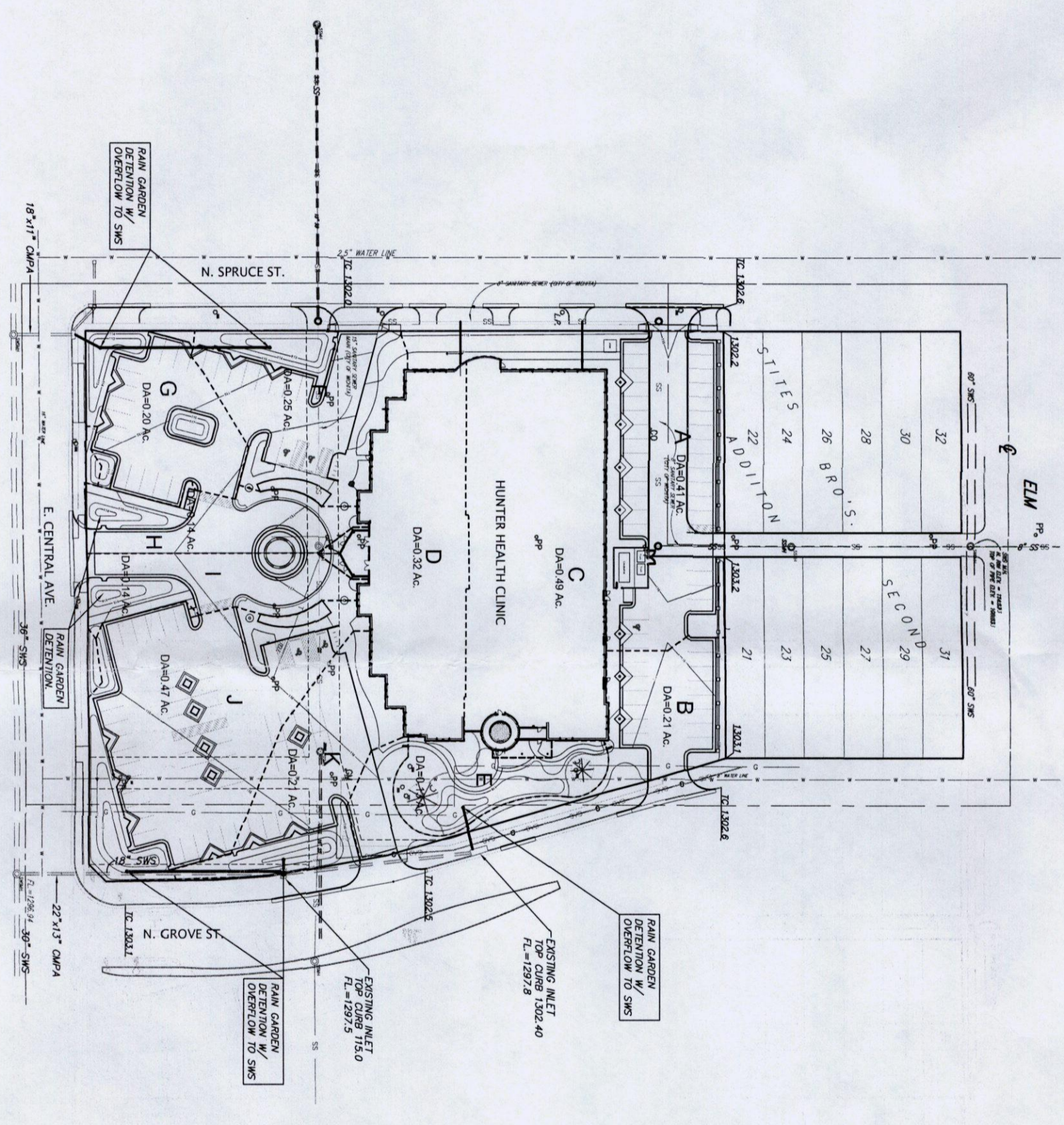
Basin Outlet Pipe Size	Flow Rate CFS *
4"	0.229
6"	0.662
8"	1.441
10"	2.612
12"	4.152
15"	7.126
18"	12.163
24"	25.821
30"	52.173

* Maximum flow capacity before drain basin begins to backfill. Calculation based on an average pipe slope of 1%.

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DRAWN BY AWA	MATERIAL	PROJECT NO./NAME GRATE / COVER	TITLE 8" - 30" DOME INLET CAPACITY
DATE 07MAR00			
APPD BY CJA	SCALE 1:2	SHEET 1 OF 1	DWG NO. 7001-110-000
DATE 07MAR00			REV C

3130 VERONA AVE
 BUFORD, GA 30518
 PHN (770) 832-2443
 FAX (770) 832-2490
 www.nyloplast-us.com



NOTES:

1. Excess runoff from the 100-year design storm will be detained and/or retained on site by means of parking lot and rain garden detention, rooftop or underground storage, or porous pavement.
2. Parking lot detention will be limited to 9" depth, except that every parking space where 9" depth may be exceeded shall have a post-mounted warning sign at the front of the stall, clearly noting: "WARNING - STORMWATER PONDING AREA".
3. Excess runoff will be calculated on the basis of the change in impervious area from the existing (partly residential) land use to the proposed land use as indicated on the final site plan.
4. Final drainage system design, including runoff and detention calculations, is to be submitted to the Engineering Division for approval, prior to or at the time of building and site plan review by OCI.
5. Peak Discharge to be limited to: 14.6 cfs (100-yr) 7.5 cfs (5-yr), 6.1 cfs (2-yr).

EXISTING CONDITIONS

IMPERVIOUS AREA = 52%

CN = 82

$t_c = 15$ min.

DA = 3.00 acres

2-YR 24-HR STORM (3.5")

$Q_p = 7.3$ cfs

Total Runoff Volume = 0.7 ac-ft.

5-YR 24-HR STORM (4.5")

$Q_p = 9.9$ cfs

Total Runoff Volume = 0.9 ac-ft.

10-YR 24-HR STORM (5.1")

$Q_p = 11.5$ cfs

Total Runoff Volume = 1.0 ac-ft.

25-YR 24-HR STORM (6.1")

$Q_p = 14.1$ cfs

Total Runoff Volume = 1.3 ac-ft.

100-YR 24-HR STORM (7.8")

$Q_p = 18.6$ cfs

Total Runoff Volume = 1.7 ac-ft.

PROPOSED CONDITIONS

IMPERVIOUS AREA = 80%

CN = 90

$T_c = 15$ min.

DA = 3.00 acres

2-YR 24-HR STORM (3.5")

$Q_p = 6.8$ cfs

Total Runoff Volume = 0.8 ac-ft.

5-YR 24-HR STORM (4.5")

$Q_p = 8.9$ cfs

Total Runoff Volume = 1.1 ac-ft.

10-YR 24-HR STORM (5.1")

$Q_p = 10.1$ cfs

Total Runoff Volume = 1.2 ac-ft.

25-YR 24-HR STORM (6.1")

$Q_p = 12.2$ cfs

Total Runoff Volume = 1.4 ac-ft.

100-YR 24-HR STORM (7.8")

$Q_p = 15.2$ cfs

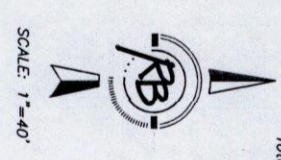
Total Runoff Volume = 1.9 ac-ft.

BENCHMARK:

On Site B.M. - 7.2' cut Top of curb, S curb return at N.E. corner of Center & Spruce

Elev. = 114.55 (70% of Machine Datum)

Elev. = 1301.53 (N.A. V.D. 29)



HUNTER HEALTH CLINIC 2ND ADDITION
DRAINAGE PLAN
WICHITA, KANSAS

Ruegler & Bohm, P.A.
Engineering, Surveying, Land Planning

924 North Main
Wichita, Kansas 67203
www.rbo.com

(316) 264-8008
(316) 264-4821 fax
E-mail: info@rbo.com

DESIGN: TOR
DRAWN: EAB
REVIEW: EAB
DATE: Jan. 21, 2007