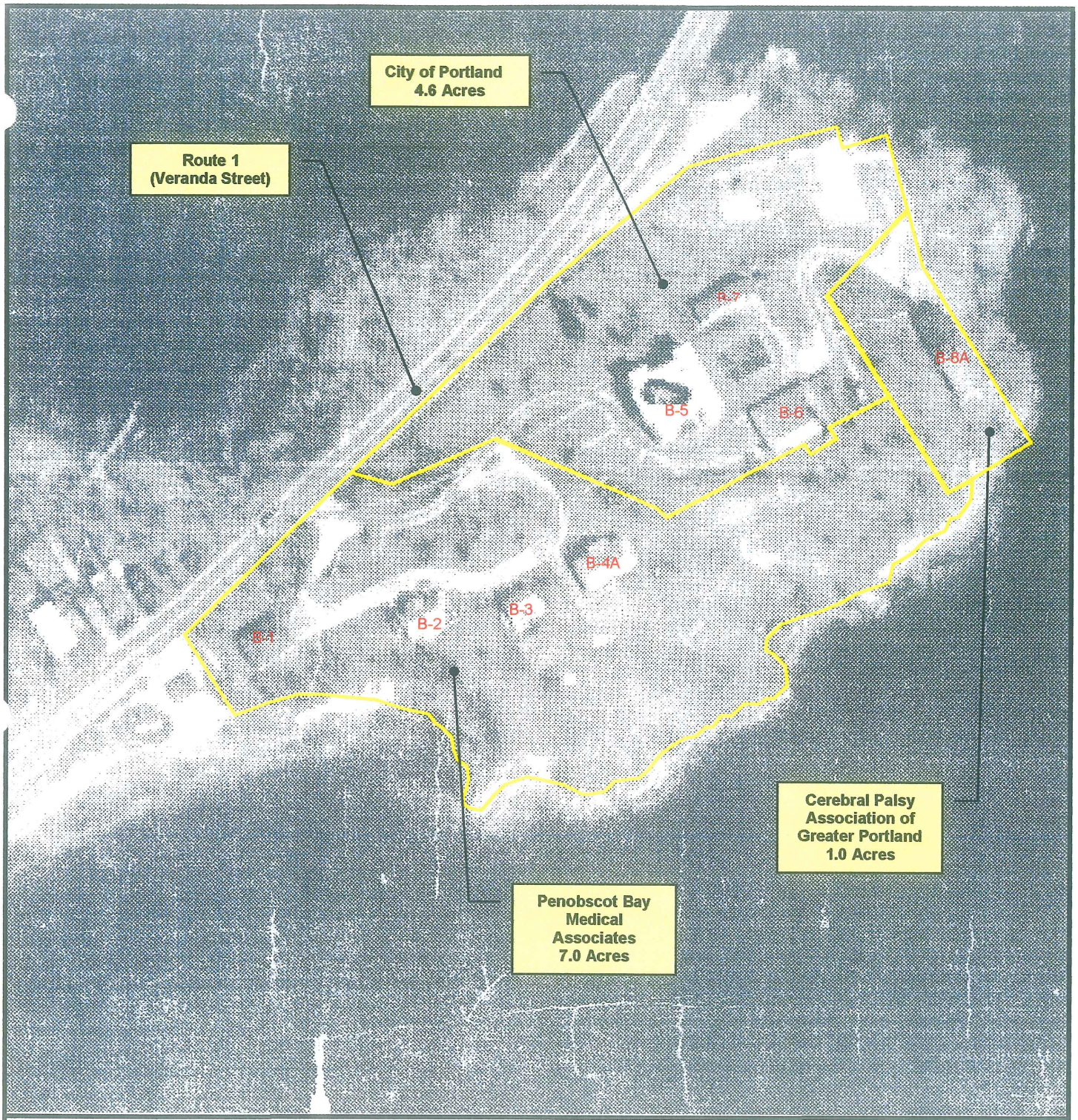
434-C-5
331 Veranda St.
Expansion
Martin's Pt.



YEAR 1976-AERIAL PHOTOGRAPH WITH STRUCTURE I.D.

Martin's Point– Portland, Maine

SOURCE: GREATER PORTLAND COUNCIL OF GOVERNMENTS

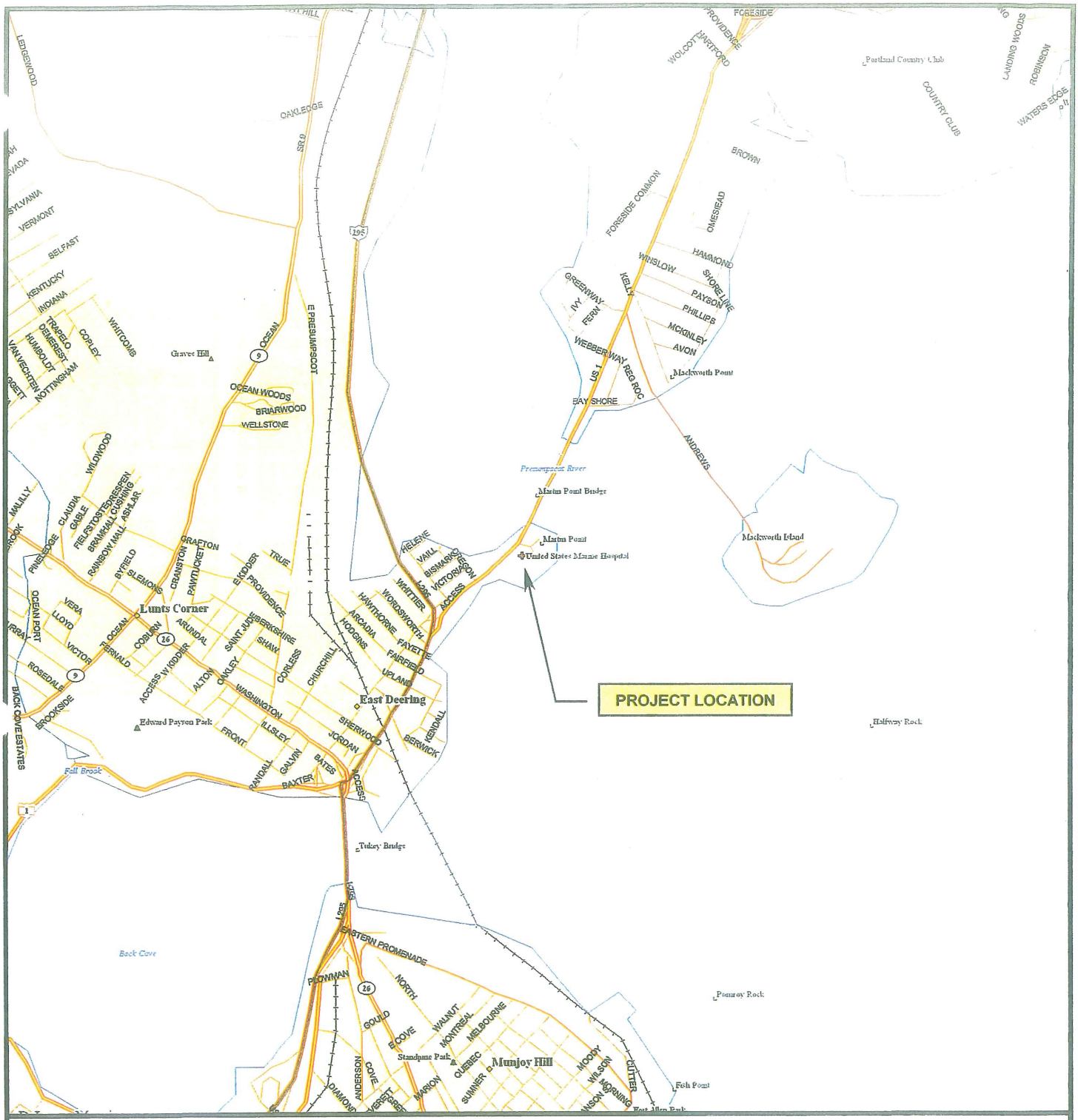
NORTH

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

DESIGNED	DDA	DATE	APRIL 2003
DRAWN	JCS	SCALE	NTS
CHECKED	WGH	JOB NO.	2344

FIGURE

B



DeLORME LOCATION MAP

Martin's Point– Portland, Maine

SOURCE: DeLORME MAPEXPERT; **DATED:** 1993

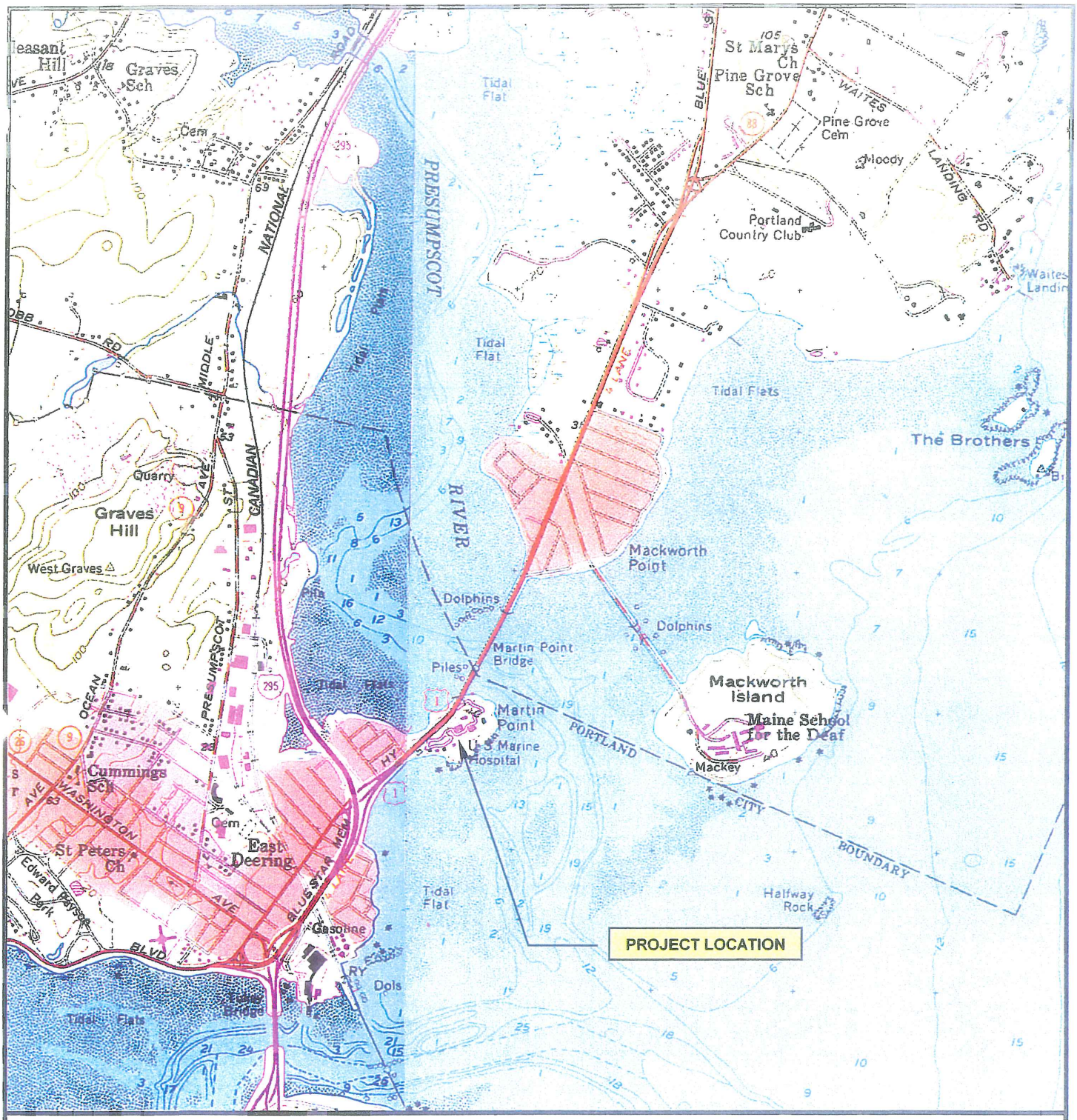
NORTH

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

DESIGNED	WGH	DATE	APRIL 2003
DRAWN	CMD	SCALE	1"=2000'
CHECKED	WGH	JOB NO.	2344

FIGURE

1



USGS TOPOGRAPHIC MAP

Martin's Point– Portland, Maine

SOURCE: TOPOSCOUT; Coastal Maine CD-ROM; USGS Martin's Point Quadrangle, 7.5 Minute Series (Topographic)

NORTH

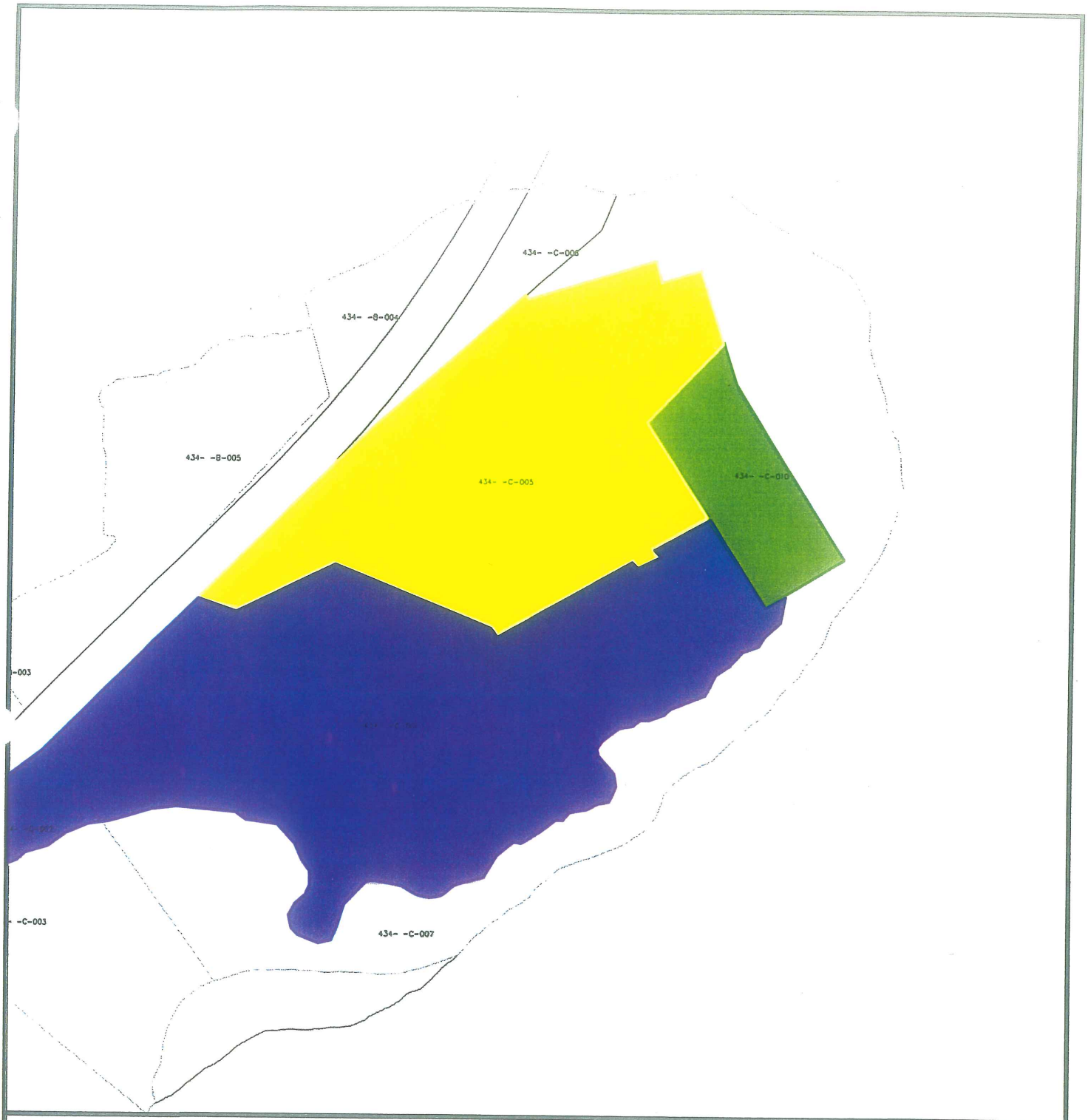
DH

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

DESIGNED	WGH	DATE	APRIL 2003
DRAWN	CMD	SCALE	1"=2000'
CHECKED	WGH	JOB NO.	2344

FIGURE

2



PROPERTY TAX MAP

Martin's Point– Portland, Maine

SOURCE: PROPERTY TAX MAP, CITY OF PORTLAND, CUMBERLAND COUNTY, MAINE

NORTH

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

DESIGNED	DDA	DATE	APRIL 2003
DRAWN	CMD	SCALE	NTS
CHECKED	DDA	JOB NO.	2344

FIGURE

3

AERIAL PHOTOGRAPH

Martin's Point– Portland, Maine

SOURCE: MICROSOFT TERRA SERVER; SCALE: NTS

NORTH

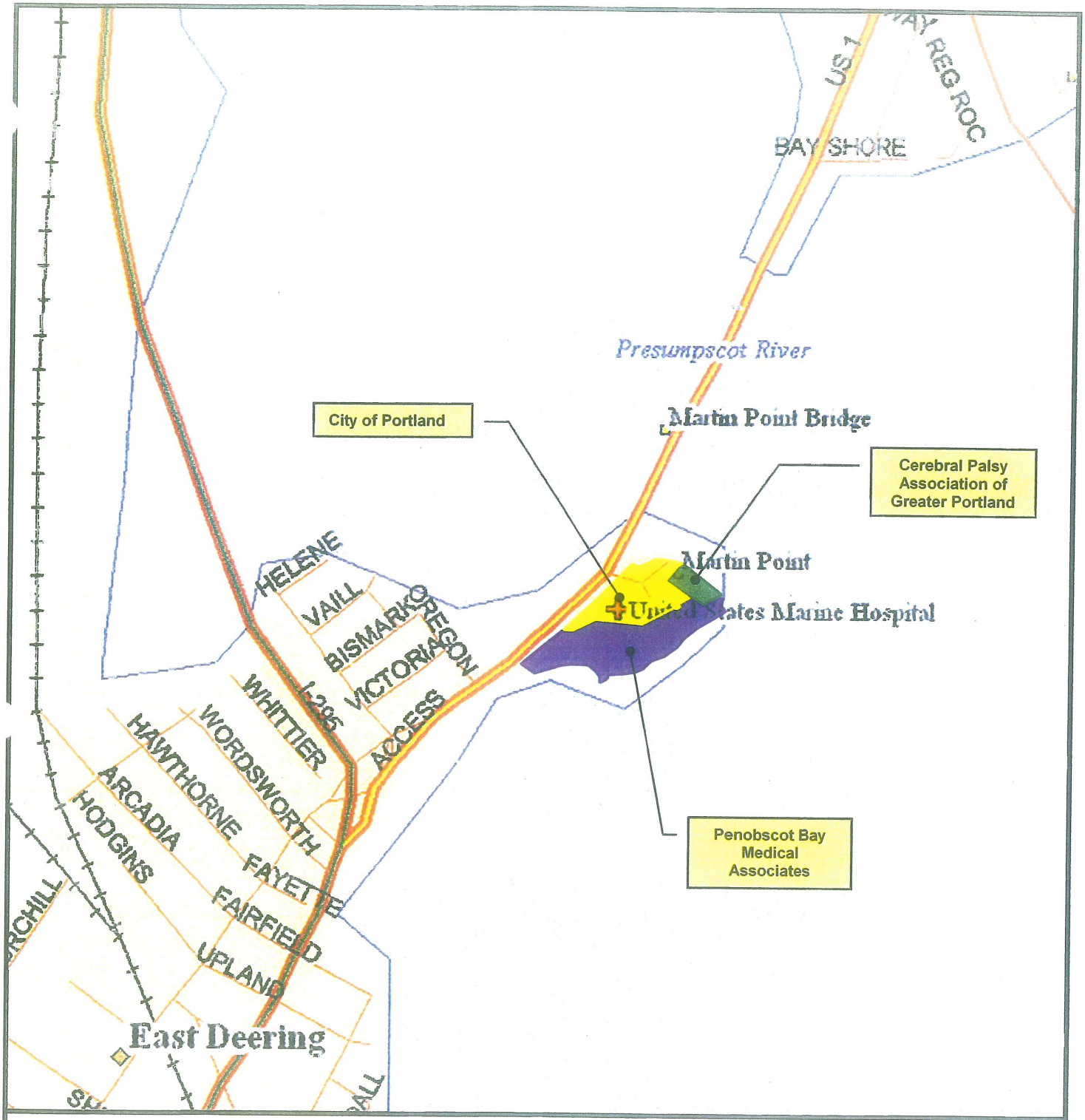
DH

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

DESIGNED	WGH	DATE	APRIL 2003
DRAWN	JCS	SCALE	NTS
CHECKED	WGH	JOB NO.	2344

FIGURE

5



DeLORME ABUTTING LAND USE MAP

Martin's Point– Portland, Maine

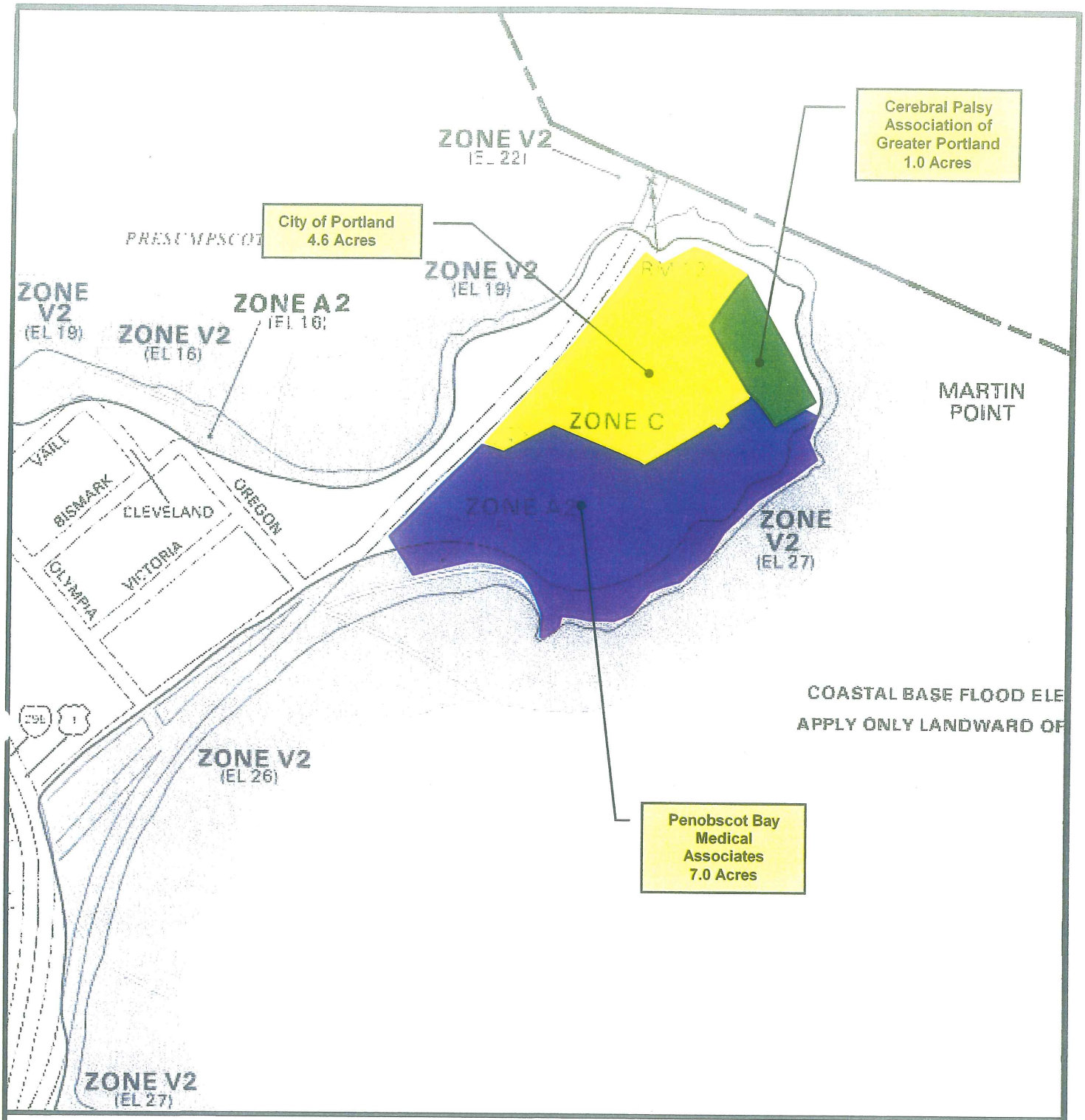
SOURCE: DeLORME MAPEXPERT; **DATED:** 1993

NORTH

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

DESIGNED	DDA	DATE	APRIL 2003
DRAWN	CMD	SCALE	NTS
CHECKED	DDA	JOB NO.	2344

FIGURE 6



FLOOD MAP

Martin's Point – Portland, Mane

SOURCE: FIRM; FLOOD INSURANCE RATE MAP, CITY OF PORTLAND, MAINE – CUMBERLAND COUNTY;
COMMUNITY-PANEL NUMBER: 230051 0008 B; **EFFECTIVE DATE:** July 17, 1986

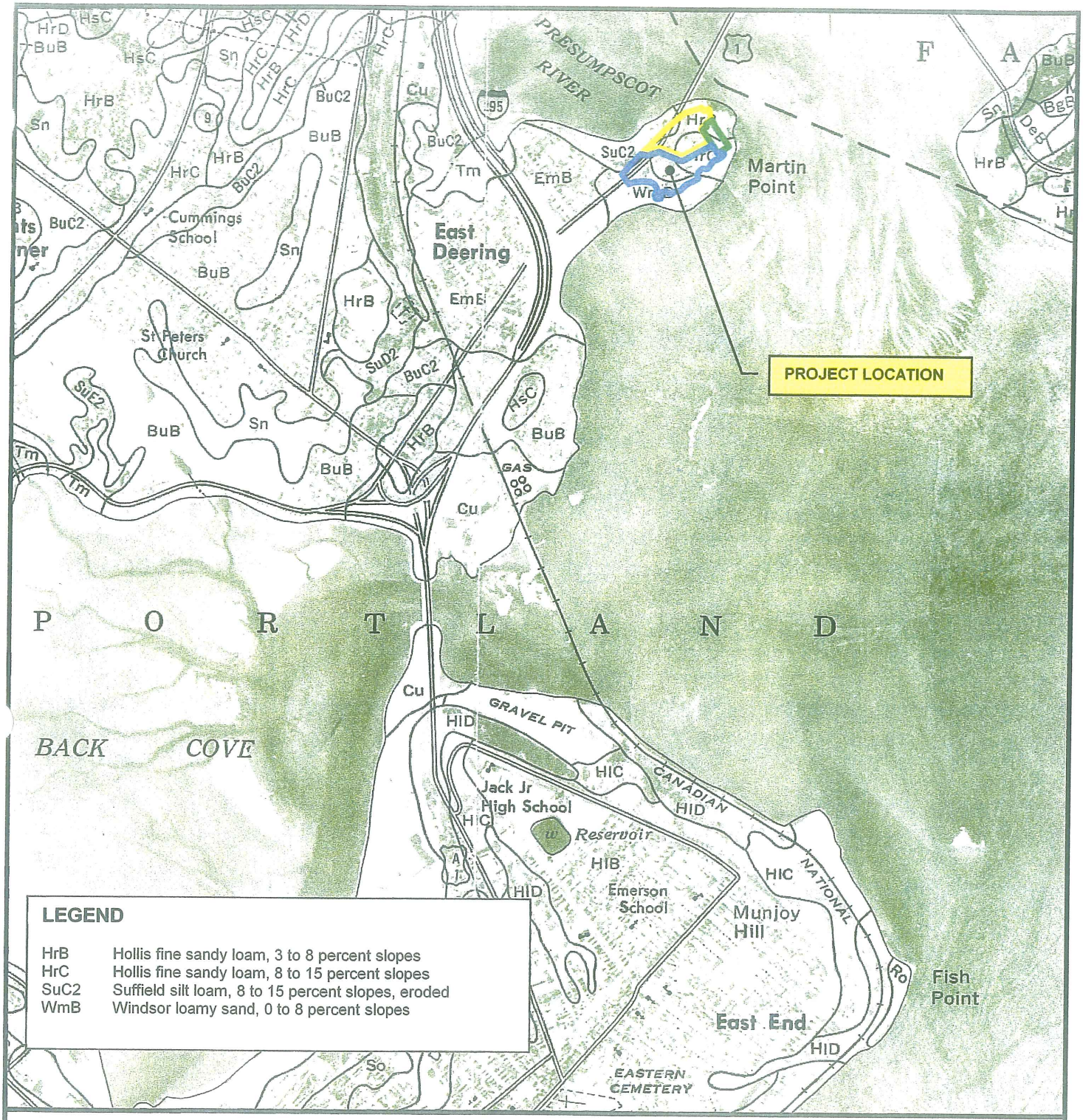
NORTH

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

DESIGNED	DDA	DATE	APRIL 2003
DRAWN	CMD	SCALE	NTS
CHECKED	DDA	JOB NO.	2344

FIGURE

7



LEGEND

HrB	Hollis fine sandy loam, 3 to 8 percent slopes
HrC	Hollis fine sandy loam, 8 to 15 percent slopes
SuC2	Suffield silt loam, 8 to 15 percent slopes, eroded
WmB	Windsor loamy sand, 0 to 8 percent slopes

USDA SOILS MAP

Martin's Point– Portland, Maine

SOURCE: SOIL SURVEY; Cumberland County, Maine: **SHEET NUMBER:** 82

NORTH

DeLUCA-HOFFMAN ASSOCIATES, INC.
CONSULTING ENGINEERS
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, MAINE 04106
TEL. 207-775-1121
FAX: 207-879-0896
E-MAIL: dhai@delucahoffman.com

DESIGNED	DDA	DATE	APRIL 2003
DRAWN	CMD	SCALE	1" = 1667'+
CHECKED	DDA	JOB NO.	2344

FIGURE 8

Reach R9: (new Reach) Peak Depth=0.31' Max Vel=3.8 fps Inflow=0.60 cfs 0.041 af
D=8.0" n=0.012 L=35.0' S=0.0111 '/' Capacity=1.38 cfs Outflow=0.59 cfs 0.041 af

Total Runoff Area = 8.249 ac Runoff Volume = 0.979 af Average Runoff Depth = 1.42"

Subcatchment 100: (new Subcat)

Runoff = 1.00 cfs @ 12.03 hrs, Volume= 0.069 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
7,441	98	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	95	0.0100	1.0		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.5	60	0.0100	2.0		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.1	155	Total			

Subcatchment 100A: (new Subcat)

Runoff = 3.32 cfs @ 12.03 hrs, Volume= 0.213 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
17,480	98	
10,143	74	>75% Grass cover, Good, HSG C
27,623	89	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0400	1.7		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.2	45	0.0400	4.1		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.1	50	0.2000	6.7		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.7	160	0.0400	4.1		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.8	330	Total			

Subcatchment 120: (new Subcat)

Runoff = 1.70 cfs @ 12.04 hrs, Volume= 0.110 af, Depth> 4.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
9,504	98	
4,124	74	>75% Grass cover, Good, HSG C
13,628	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	45	0.2500	0.4		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.2	85	0.0800	5.7		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	85	0.0300	3.5		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.5	215	Total			

Subcatchment 130: (new Subcat)

Runoff = 2.14 cfs @ 12.02 hrs, Volume= 0.131 af, Depth> 3.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
7,144	98	
12,877	74	>75% Grass cover, Good, HSG C
20,021	83	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0300	1.4		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.2	85	0.2700	7.8		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	130	0.0600	5.0		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.2	265	Total			

Subcatchment 140: (new Subcat)

Runoff = 1.11 cfs @ 12.02 hrs, Volume= 0.077 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
8,250	98	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	65	0.0100	0.9		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.3	65	0.0100	3.5	1.21	**Circular Channel (pipe),** Diam= 8.0" Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013
1.5	130	Total			

Subcatchment 141: (new Subcat)

Runoff = 0.04 cfs @ 12.05 hrs, Volume= 0.003 af, Depth> 0.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
307	98	
1,121	39	>75% Grass cover, Good, HSG A
1,428	52	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	15	0.0500	0.2		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.4	25	0.0200	1.0		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.1	25	0.0500	3.4		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.0	65	Total			

Subcatchment 150: (new Subcat)

Runoff = 1.23 cfs @ 12.06 hrs, Volume= 0.081 af, Depth> 3.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
8,965	98	
1,813	39	>75% Grass cover, Good, HSG A
10,778	88	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	35	0.0300	0.2		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.3	85	0.0400	4.1		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	120	Total			

Subcatchment 160: (new Subcat)

Runoff = 0.24 cfs @ 12.01 hrs, Volume= 0.016 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
1,769	98	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	35	0.0100	0.8		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.2	40	0.0100	2.9	0.56	**Circular Channel (pipe),** Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013
0.9	75	Total			

Subcatchment 170:

Runoff = 0.39 cfs @ 12.02 hrs, Volume= 0.027 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
2,888	98	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	70	0.0100	0.9		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.2	30	0.0100	2.9	0.56	**Circular Channel (pipe),** Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013
1.4	100	Total			

Subcatchment 200: (new Subcat)

Runoff = 1.01 cfs @ 12.02 hrs, Volume= 0.070 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
7,512	98	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.9		**Sheet Flow,** Smooth surfaces . n= 0.011 P2= 3.00"
0.7	90	0.0100	2.0		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	140	Total			

Subcatchment 200A: (new Subcat)

Runoff = 5.95 cfs @ 12.04 hrs, Volume= 0.366 af, Depth> 3.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
33,647	98	
14,100	74	>75% Grass cover, Good, HSG C
9,905	39	>75% Grass cover, Good, HSG A
57,652	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0300	1.4		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.3	105	0.1600	6.0		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.6	380	0.0400	4.1		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.6	540	Total			

Subcatchment 210: (new Subcat)

Runoff = 0.44 cfs @ 12.08 hrs, Volume= 0.029 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
3,391	98	
1,799	39	>75% Grass cover, Good, HSG A
5,190	78	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	36	0.0200	0.1		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.6	120	0.0250	3.2		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.1	156	Total			

Subcatchment 220: (new Subcat)

Runoff = 0.85 cfs @ 12.03 hrs, Volume= 0.059 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
6,320	98	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0250	1.5		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.7	90	0.0100	2.0		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.8	190	Total			

Subcatchment 230: (new Subcat)

Runoff = 1.10 cfs @ 12.11 hrs, Volume= 0.078 af, Depth> 1.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
9,452	98	
750	74	>75% Grass cover, Good, HSG C
16,638	39	>75% Grass cover, Good, HSG A
26,840	61	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	80	0.0750	0.3		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.1	35	0.0750	4.1		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.0	220	0.0300	3.5		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	50	0.0500	3.4		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.1	25	0.0500	4.5		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.4	410	Total			

Subcatchment 240: (new Subcat)

Runoff = 2.16 cfs @ 12.04 hrs, Volume= 0.134 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
10,116	98	
1,100	39	>75% Grass cover, Good, HSG A
8,728	74	>75% Grass cover, Good, HSG C
19,944	84	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	45	0.0700	1.9		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
1.3	410	0.0700	5.4		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.7	210	0.0600	5.0		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	665	Total			

Subcatchment 250: (new Subcat)

Runoff = 0.31 cfs @ 12.08 hrs, Volume= 0.021 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
2,727	98	
5,789	39	>75% Grass cover, Good, HSG A
8,516	58	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	40	0.0500	0.2		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
1.0	210	0.0300	3.5		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.4	250	Total			

Subcatchment 260: (new Subcat)

Runoff = 1.30 cfs @ 12.04 hrs, Volume= 0.080 af, Depth> 1.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
1,600	98	
7,200	39	>75% Grass cover, Good, HSG A
13,899	74	>75% Grass cover, Good, HSG C
22,699	65	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	70	0.0900	2.3		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.5	155	0.1100	5.0		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	140	0.0200	2.9		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.8	365	Total			

Subcatchment 270: (new Subcat)

Runoff = 2.01 cfs @ 12.02 hrs, Volume= 0.119 af, Depth> 2.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
3,059	98	
20,333	72	Woods/grass comb., Good, HSG C
23,392	75	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	40	0.0400	1.5		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.4	130	0.1700	6.2		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.9	170	Total			

Subcatchment 280: (new Subcat)

Runoff = 4.02 cfs @ 12.03 hrs, Volume= 0.246 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
12,375	98	
28,765	72	Woods/grass comb., Good, HSG C
41,140	80	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	40	0.0300	1.3		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
1.2	150	0.1700	2.1		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	10	0.0400	4.1		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.7	200	Total			

Subcatchment 290: (new Subcat)

Runoff = 5.24 cfs @ 12.03 hrs, Volume= 0.353 af, Depth> 4.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
34,361	98	
5,597	74	>75% Grass cover, Good, HSG C
39,958	95	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	80	0.0400	1.7		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.7	330	0.1400	7.6		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	60	0.0200	2.9		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.8	470	Total			

Subcatchment 300: (new Subcat)

Runoff = 0.28 cfs @ 12.02 hrs, Volume= 0.019 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
2,046	98	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	60	0.0100	0.9		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.1	30	0.0100	3.8	1.31	**Circular Channel (pipe),** Diam= 8.0" Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
1.2	90	Total			

Subcatchment 310: (new Subcat)

Runoff = 0.54 cfs @ 12.01 hrs, Volume= 0.034 af, Depth> 4.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
2,857	98	
33	39	>75% Grass cover, Good, HSG A
1,389	74	>75% Grass cover, Good, HSG C
4,279	90	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	2.0		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.5	150	0.0650	5.2		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	200	Total			

Reach POI 1: (new Reach)

Inflow Area = 0.313 ac, Inflow Depth > 4.23"
Inflow = 1.69 cfs @ 12.04 hrs, Volume= 0.110 af
Outflow = 1.69 cfs @ 12.04 hrs, Volume= 0.110 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 10: (new Reach)

Inflow Area = 0.537 ac, Inflow Depth > 2.67"
Inflow = 2.01 cfs @ 12.02 hrs, Volume= 0.119 af
Outflow = 2.01 cfs @ 12.02 hrs, Volume= 0.119 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 11: (new Reach)

Inflow Area = 0.944 ac, Inflow Depth > 3.12"
Inflow = 4.02 cfs @ 12.03 hrs, Volume= 0.246 af
Outflow = 4.02 cfs @ 12.03 hrs, Volume= 0.246 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 12: (new Reach)

Inflow Area = 0.917 ac, Inflow Depth > 4.62"
Inflow = 5.24 cfs @ 12.03 hrs, Volume= 0.353 af
Outflow = 5.24 cfs @ 12.03 hrs, Volume= 0.353 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 2: (new Reach)

Inflow Area = 0.390 ac, Inflow Depth > 4.87"
Inflow = 2.21 cfs @ 12.04 hrs, Volume= 0.158 af
Outflow = 2.21 cfs @ 12.04 hrs, Volume= 0.158 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 3: (new Reach)

Inflow Area = 1.094 ac, Inflow Depth > 3.77"
Inflow = 5.39 cfs @ 12.03 hrs, Volume= 0.343 af
Outflow = 5.39 cfs @ 12.03 hrs, Volume= 0.343 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 4: (new Reach)

Inflow Area = 0.247 ac, Inflow Depth > 3.92"
Inflow = 1.23 cfs @ 12.06 hrs, Volume= 0.081 af
Outflow = 1.23 cfs @ 12.06 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 5: (new Reach)

Inflow Area = 1.324 ac, Inflow Depth > 3.31"
Inflow = 5.95 cfs @ 12.05 hrs, Volume= 0.366 af
Outflow = 5.95 cfs @ 12.05 hrs, Volume= 0.366 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 6: (new Reach)

Inflow Area = 0.329 ac, Inflow Depth > 4.48"
Inflow = 1.73 cfs @ 12.04 hrs, Volume= 0.123 af
Outflow = 1.73 cfs @ 12.04 hrs, Volume= 0.123 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 7: (new Reach)

Inflow Area = 0.119 ac, Inflow Depth > 2.93"
Inflow = 0.44 cfs @ 12.08 hrs, Volume= 0.029 af
Outflow = 0.44 cfs @ 12.08 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 8: (new Reach)

Inflow Area = 0.957 ac, Inflow Depth > 1.99"
Inflow = 2.06 cfs @ 12.07 hrs, Volume= 0.159 af
Outflow = 2.06 cfs @ 12.07 hrs, Volume= 0.159 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 9: (new Reach)

Inflow Area = 1.077 ac, Inflow Depth > 2.75"
Inflow = 3.94 cfs @ 12.04 hrs, Volume= 0.247 af
Outflow = 3.94 cfs @ 12.04 hrs, Volume= 0.247 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach R1: (new Reach)

Inflow Area = 0.313 ac, Inflow Depth > 4.23"
Inflow = 1.70 cfs @ 12.04 hrs, Volume= 0.110 af
Outflow = 1.69 cfs @ 12.04 hrs, Volume= 0.110 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.0 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.3 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.50' @ 12.04 hrs
Capacity at bank full= 1.85 cfs
8.0" Diameter Pipe, n= 0.012
Length= 18.0' Slope= 0.0200 '/'

Reach R10: (new Reach)

Inflow Area = 0.041 ac, Inflow Depth > 4.87"
Inflow = 0.24 cfs @ 12.01 hrs, Volume= 0.016 af
Outflow = 0.24 cfs @ 12.01 hrs, Volume= 0.016 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.7 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.4 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.16' @ 12.01 hrs
Capacity at bank full= 1.85 cfs
8.0" Diameter Pipe, n= 0.012
Length= 30.0' Slope= 0.0200 '/'

Reach R11: (new Reach)

Inflow Area = 0.263 ac, Inflow Depth > 4.38"
Inflow = 1.36 cfs @ 12.03 hrs, Volume= 0.096 af
Outflow = 1.35 cfs @ 12.04 hrs, Volume= 0.096 af, Atten= 1%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.4 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.5 fps, Avg. Travel Time= 0.8 min

Peak Depth= 0.39' @ 12.03 hrs
Capacity at bank full= 2.13 cfs
8.0" Diameter Pipe, n= 0.012
Length= 125.0' Slope= 0.0264 '/'

Reach R12: (new Reach)

Inflow Area = 0.329 ac, Inflow Depth > 4.48"
Inflow = 1.73 cfs @ 12.04 hrs, Volume= 0.123 af
Outflow = 1.73 cfs @ 12.04 hrs, Volume= 0.123 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.7 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.4 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.37' @ 12.04 hrs
Capacity at bank full= 2.93 cfs
8.0" Diameter Pipe, n= 0.012
Length= 20.0' Slope= 0.0500 '/'

Reach R13: (new Reach)

Inflow Area = 1.324 ac, Inflow Depth > 3.31"
Inflow = 5.95 cfs @ 12.04 hrs, Volume= 0.366 af
Outflow = 5.95 cfs @ 12.05 hrs, Volume= 0.366 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 21.9 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 7.8 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.38' @ 12.04 hrs
Capacity at bank full= 19.68 cfs
12.0" Diameter Pipe, n= 0.012
Length= 25.0' Slope= 0.2600 '/'

Reach R14: (new Reach)

Inflow Area = 0.066 ac, Inflow Depth > 4.87"
Inflow = 0.39 cfs @ 12.02 hrs, Volume= 0.027 af
Outflow = 0.38 cfs @ 12.03 hrs, Volume= 0.027 af, Atten= 3%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.7 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.4 fps, Avg. Travel Time= 0.9 min

Peak Depth= 0.26' @ 12.03 hrs
Capacity at bank full= 0.71 cfs
6.0" Diameter Pipe, n= 0.012
Length= 80.0' Slope= 0.0138 '/'

Reach R3: (new Reach)

Inflow Area = 0.172 ac, Inflow Depth > 4.87"
Inflow = 1.01 cfs @ 12.02 hrs, Volume= 0.070 af
Outflow = 0.98 cfs @ 12.04 hrs, Volume= 0.070 af, Atten= 3%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.9 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.5 fps, Avg. Travel Time= 1.5 min

Peak Depth= 0.47' @ 12.04 hrs
Capacity at bank full= 1.21 cfs
8.0" Diameter Pipe, n= 0.013
Length= 140.0' Slope= 0.0100 '/'

Reach R4: (new Reach)

Inflow Area = 0.343 ac, Inflow Depth > 4.87"
Inflow = 1.98 cfs @ 12.04 hrs, Volume= 0.139 af
Outflow = 1.97 cfs @ 12.04 hrs, Volume= 0.139 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.4 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.0 fps, Avg. Travel Time= 0.2 min

Peak Depth= 0.48' @ 12.04 hrs
Capacity at bank full= 2.29 cfs
8.0" Diameter Pipe, n= 0.013
Length= 30.0' Slope= 0.0360 '/'

Reach R5: (new Reach)

Inflow Area = 0.390 ac, Inflow Depth > 4.87"
Inflow = 2.23 cfs @ 12.04 hrs, Volume= 0.158 af
Outflow = 2.22 cfs @ 12.04 hrs, Volume= 0.158 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.8 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.6 fps, Avg. Travel Time= 0.3 min

Peak Depth= 0.36' @ 12.04 hrs
Capacity at bank full= 4.01 cfs
8.0" Diameter Pipe, n= 0.013
Length= 90.0' Slope= 0.1100 '/'

Reach R15: (new Reach)

Inflow Area = 0.145 ac, Inflow Depth > 4.87"
Inflow = 0.85 cfs @ 12.03 hrs, Volume= 0.059 af
Outflow = 0.84 cfs @ 12.03 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.4 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.4 fps, Avg. Travel Time= 0.3 min

Peak Depth= 0.24' @ 12.03 hrs
Capacity at bank full= 4.60 cfs
10.0" Diameter Pipe, n= 0.013
Length= 45.0' Slope= 0.0440 '/'

Reach R16: (new Reach)

Inflow Area = 0.458 ac, Inflow Depth > 3.51"
Inflow = 2.16 cfs @ 12.04 hrs, Volume= 0.134 af
Outflow = 2.16 cfs @ 12.04 hrs, Volume= 0.134 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.3 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.9 fps, Avg. Travel Time= 0.2 min

Peak Depth= 0.33' @ 12.04 hrs
Capacity at bank full= 14.00 cfs
15.0" Diameter Pipe, n= 0.012
Length= 40.0' Slope= 0.0400 '/'

Reach R17: (new Reach)

Inflow Area = 0.556 ac, Inflow Depth > 3.62"
Inflow = 2.65 cfs @ 12.04 hrs, Volume= 0.168 af
Outflow = 2.64 cfs @ 12.04 hrs, Volume= 0.168 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.0 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.4 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.40' @ 12.04 hrs
Capacity at bank full= 17.07 cfs
18.0" Diameter Pipe, n= 0.012
Length= 20.0' Slope= 0.0225 '/'

Reach R9: (new Reach)

Inflow Area = 0.222 ac, Inflow Depth > 4.29"
Inflow = 1.14 cfs @ 12.02 hrs, Volume= 0.079 af
Outflow = 1.13 cfs @ 12.03 hrs, Volume= 0.079 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.4 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.8 fps, Avg. Travel Time= 0.3 min

Peak Depth= 0.46' @ 12.03 hrs
Capacity at bank full= 1.38 cfs
8.0" Diameter Pipe, n= 0.012
Length= 35.0' Slope= 0.0111 '/'

Reach R6: (new Reach)

Inflow Area = 0.390 ac, Inflow Depth > 4.87"
Inflow = 2.22 cfs @ 12.04 hrs, Volume= 0.158 af
Outflow = 2.21 cfs @ 12.04 hrs, Volume= 0.158 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.1 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.3 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.42' @ 12.04 hrs
Capacity at bank full= 9.14 cfs
15.0" Diameter Pipe, n= 0.013
Length= 50.0' Slope= 0.0200 '/'

Reach R7: (new Reach)

Inflow Area = 0.634 ac, Inflow Depth > 4.02"
Inflow = 3.32 cfs @ 12.03 hrs, Volume= 0.213 af
Outflow = 3.31 cfs @ 12.03 hrs, Volume= 0.212 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 13.2 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.7 fps, Avg. Travel Time= 0.3 min

Peak Depth= 0.36' @ 12.03 hrs
Capacity at bank full= 12.28 cfs
12.0" Diameter Pipe, n= 0.012
Length= 80.0' Slope= 0.1012 '/'

Reach R8: (new Reach)

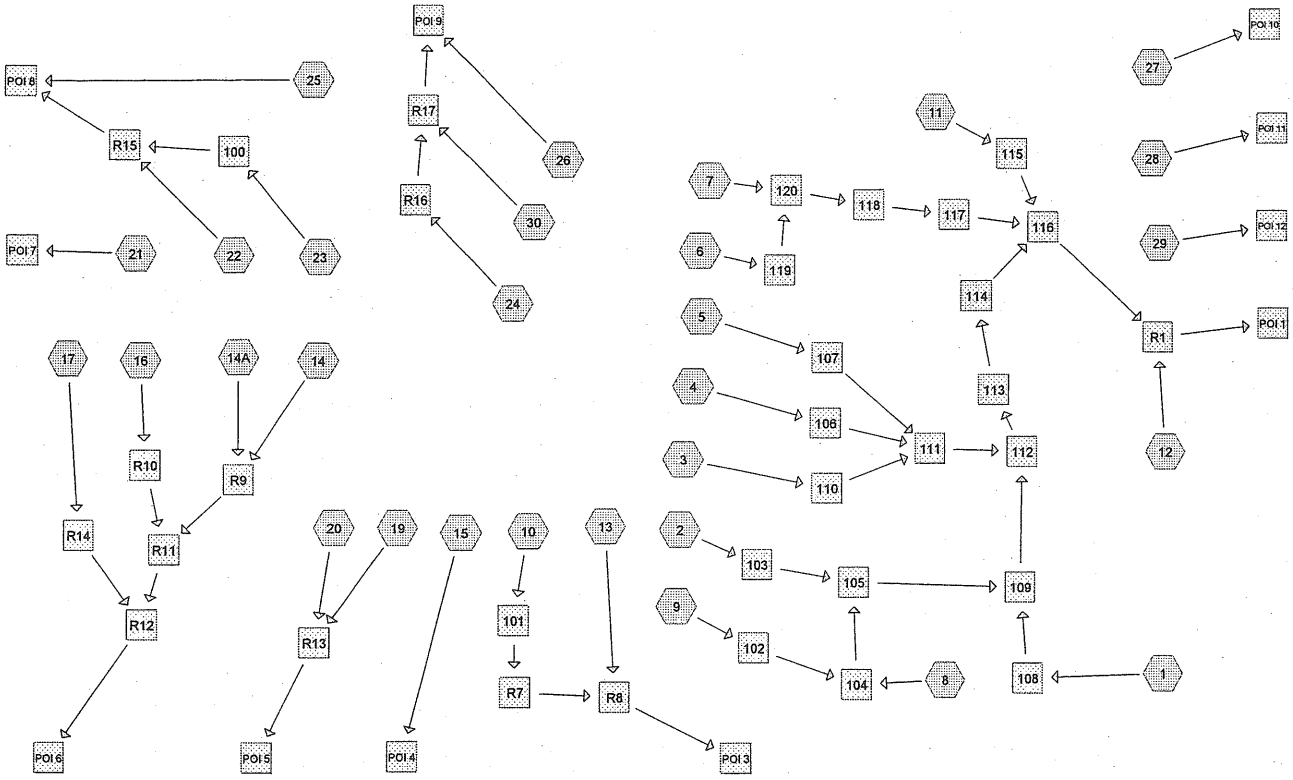
Inflow Area = 1.094 ac, Inflow Depth > 3.77"
Inflow = 5.40 cfs @ 12.03 hrs, Volume= 0.343 af
Outflow = 5.39 cfs @ 12.03 hrs, Volume= 0.343 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.5 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.2 fps, Avg. Travel Time= 0.2 min

Peak Depth= 0.75' @ 12.03 hrs
Capacity at bank full= 5.90 cfs
12.0" Diameter Pipe, n= 0.012
Length= 30.0' Slope= 0.0233 '/'

ATTACHMENT B

Postdevelopment Runoff Calculations



Subcat Reach Pond Link

Drainage Diagram for JN2344.03 Post
Prepared by DELUCA-HOFFMAN 4/10/2006
HydroCAD® 7.10 s/n 000734 © 2005 HydroCAD Software Solutions LLC

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1: (new Subcat) Runoff Area=27,000 sf Runoff Depth>2.59"
Flow Length=280' Tc=3.2 min CN=98 Runoff=1.94 cfs 0.134 af

Subcatchment 2: (new Subcat) Runoff Area=7,512 sf Runoff Depth>2.59"
Flow Length=140' Tc=1.6 min CN=98 Runoff=0.54 cfs 0.037 af

Subcatchment 3: (new Subcat) Runoff Area=9,084 sf Runoff Depth>2.13"
Flow Length=200' Tc=1.6 min CN=93 Runoff=0.58 cfs 0.037 af

Subcatchment 4: (new Subcat) Runoff Area=2,314 sf Runoff Depth>1.63"
Flow Length=50' Tc=2.9 min CN=87 Runoff=0.12 cfs 0.007 af

Subcatchment 5: (new Subcat) Runoff Area=12,770 sf Runoff Depth>2.22"
Flow Length=130' Tc=4.4 min CN=94 Runoff=0.80 cfs 0.054 af

Subcatchment 6: (new Subcat) Runoff Area=13,513 sf Runoff Depth>2.13"
Flow Length=200' Tc=2.4 min CN=93 Runoff=0.87 cfs 0.055 af

Subcatchment 7: (new Subcat) Runoff Area=21,164 sf Runoff Depth>2.22"
Flow Length=400' Tc=2.3 min CN=94 Runoff=1.40 cfs 0.090 af

Subcatchment 8: (new Subcat) Runoff Area=2,767 sf Runoff Depth>1.87"
Flow Length=25' Tc=3.3 min CN=90 Runoff=0.16 cfs 0.010 af

Subcatchment 9: (new Subcat) Runoff Area=7,374 sf Runoff Depth>1.04"
Flow Length=55' Tc=4.1 min CN=78 Runoff=0.23 cfs 0.015 af

Subcatchment 10: (new Subcat) Runoff Area=22,566 sf Runoff Depth>2.59"
Flow Length=240' Tc=2.0 min CN=98 Runoff=1.64 cfs 0.112 af

Subcatchment 11: (new Subcat) Runoff Area=9,004 sf Runoff Depth>1.41"
Flow Length=125' Tc=1.8 min CN=84 Runoff=0.40 cfs 0.024 af

Subcatchment 12: (new Subcat) Runoff Area=15,968 sf Runoff Depth>1.95"
Flow Length=185' Tc=1.9 min CN=91 Runoff=0.96 cfs 0.060 af

Subcatchment 13: (new Subcat) Runoff Area=7,882 sf Runoff Depth>1.34"
Flow Length=165' Tc=3.1 min CN=83 Runoff=0.33 cfs 0.020 af

Subcatchment 14: (new Subcat) Runoff Area=8,250 sf Runoff Depth>2.59"
Flow Length=130' Tc=1.5 min CN=98 Runoff=0.60 cfs 0.041 af

Subcatchment 14A: (new Subcat) Runoff Area=1,428 sf Runoff Depth>0.10"
Flow Length=65' Tc=2.0 min CN=52 Runoff=0.00 cfs 0.000 af

Reach 102: (new Reach) Peak Depth=0.19' Max Vel=2.2 fps Inflow=0.23 cfs 0.015 af
D=12.0" n=0.012 L=85.0' S=0.0059 '/' Capacity=2.96 cfs Outflow=0.22 cfs 0.015 af

Reach 103: (new Reach) Peak Depth=0.25' Max Vel=3.4 fps Inflow=0.54 cfs 0.037 af
D=12.0" n=0.012 L=40.0' S=0.0100 '/' Capacity=3.86 cfs Outflow=0.54 cfs 0.037 af

Reach 104: (new Reach) Peak Depth=0.21' Max Vel=2.9 fps Inflow=0.36 cfs 0.024 af
D=12.0" n=0.012 L=45.0' S=0.0089 '/' Capacity=3.64 cfs Outflow=0.36 cfs 0.024 af

Reach 105: (new Reach) Peak Depth=0.29' Max Vel=4.5 fps Inflow=0.86 cfs 0.062 af
D=12.0" n=0.012 L=130.0' S=0.0146 '/' Capacity=4.67 cfs Outflow=0.84 cfs 0.062 af

Reach 106: (new Reach) Peak Depth=0.08' Max Vel=3.9 fps Inflow=0.12 cfs 0.007 af
D=12.0" n=0.012 L=20.0' S=0.0500 '/' Capacity=8.63 cfs Outflow=0.12 cfs 0.007 af

Reach 107: (new Reach) Peak Depth=0.23' Max Vel=5.9 fps Inflow=0.80 cfs 0.054 af
D=12.0" n=0.012 L=30.0' S=0.0333 '/' Capacity=7.05 cfs Outflow=0.80 cfs 0.054 af

Reach 108: (new Reach) Peak Depth=0.48' Max Vel=5.3 fps Inflow=1.94 cfs 0.134 af
D=12.0" n=0.012 L=42.0' S=0.0119 '/' Capacity=4.21 cfs Outflow=1.92 cfs 0.134 af

Reach 109: (new Reach) Peak Depth=0.42' Max Vel=8.7 fps Inflow=2.76 cfs 0.195 af
D=12.0" n=0.012 L=52.0' S=0.0365 '/' Capacity=7.38 cfs Outflow=2.74 cfs 0.195 af

Reach 110: (new Reach) Peak Depth=0.29' Max Vel=3.0 fps Inflow=0.58 cfs 0.037 af
D=12.0" n=0.012 L=30.0' S=0.0067 '/' Capacity=3.15 cfs Outflow=0.58 cfs 0.037 af

Reach 111: (new Reach) Peak Depth=0.24' Max Vel=10.0 fps Inflow=1.47 cfs 0.098 af
D=12.0" n=0.012 L=17.0' S=0.0882 '/' Capacity=11.47 cfs Outflow=1.46 cfs 0.098 af

Reach 112: (new Reach) Peak Depth=0.59' Max Vel=7.3 fps Inflow=4.21 cfs 0.294 af
D=15.0" n=0.012 L=52.0' S=0.0173 '/' Capacity=9.21 cfs Outflow=4.17 cfs 0.294 af

Reach 113: (new Reach) Peak Depth=0.24' Max Vel=25.1 fps Inflow=4.17 cfs 0.294 af
D=15.0" n=0.012 L=42.0' S=0.5374 '/' Capacity=51.30 cfs Outflow=4.16 cfs 0.294 af

Reach 114: (new Reach) Peak Depth=0.35' Max Vel=14.8 fps Inflow=4.16 cfs 0.294 af
D=15.0" n=0.012 L=45.0' S=0.1222 '/' Capacity=24.47 cfs Outflow=4.15 cfs 0.294 af

Reach 115: (new Reach) Peak Depth=0.20' Max Vel=3.6 fps Inflow=0.40 cfs 0.024 af
D=12.0" n=0.012 L=35.0' S=0.0143 '/' Capacity=4.61 cfs Outflow=0.40 cfs 0.024 af

Reach 116: (new Reach) Peak Depth=0.74' Max Vel=7.7 fps Inflow=6.74 cfs 0.463 af
D=18.0" n=0.012 L=132.0' S=0.0144 '/' Capacity=13.65 cfs Outflow=6.59 cfs 0.463 af

Reach 117: (new Reach) Peak Depth=0.48' Max Vel=5.2 fps Inflow=2.25 cfs 0.145 af
D=15.0" n=0.012 L=85.0' S=0.0106 '/' Capacity=7.20 cfs Outflow=2.21 cfs 0.145 af

Reach 118: (new Reach) Peak Depth=0.34' Max Vel=9.8 fps Inflow=2.27 cfs 0.145 af
D=12.0" n=0.012 L=102.0' S=0.0588 '/' Capacity=9.36 cfs Outflow=2.25 cfs 0.145 af

Reach R13: (new Reach) Peak Depth=0.24' Max Vel=17.1 fps Inflow=2.48 cfs 0.170 af
D=12.0" n=0.012 L=25.0' S=0.2600 '/' Capacity=19.68 cfs Outflow=2.48 cfs 0.170 af

Reach R14: (new Reach) Peak Depth=0.19' Max Vel=3.1 fps Inflow=0.21 cfs 0.014 af
D=6.0" n=0.012 L=80.0' S=0.0138 '/' Capacity=0.71 cfs Outflow=0.21 cfs 0.014 af

Reach R15: (new Reach) Peak Depth=0.23' Max Vel=6.3 fps Inflow=0.79 cfs 0.065 af
D=10.0" n=0.013 L=45.0' S=0.0440 '/' Capacity=4.60 cfs Outflow=0.78 cfs 0.065 af

Reach R16: (new Reach) Peak Depth=0.17' Max Vel=5.6 fps Inflow=0.58 cfs 0.039 af
D=15.0" n=0.012 L=40.0' S=0.0400 '/' Capacity=14.00 cfs Outflow=0.58 cfs 0.039 af

Reach R17: (new Reach) Peak Depth=0.20' Max Vel=6.6 fps Inflow=0.94 cfs 0.068 af
D=18.0" n=0.012 L=10.0' S=0.0450 '/' Capacity=24.14 cfs Outflow=0.94 cfs 0.068 af

Reach R7: (new Reach) Peak Depth=0.25' Max Vel=10.8 fps Inflow=1.63 cfs 0.112 af
D=12.0" n=0.012 L=80.0' S=0.1012 '/' Capacity=12.28 cfs Outflow=1.62 cfs 0.112 af

Reach R8: (new Reach) Peak Depth=0.40' Max Vel=6.7 fps Inflow=1.95 cfs 0.132 af
D=12.0" n=0.012 L=30.0' S=0.0233 '/' Capacity=5.90 cfs Outflow=1.94 cfs 0.132 af

Reach R9: (new Reach) Peak Depth=0.31' Max Vel=3.8 fps Inflow=0.60 cfs 0.041 af
D=8.0" n=0.012 L=35.0' S=0.0111 '/' Capacity=1.38 cfs Outflow=0.59 cfs 0.041 af

Total Runoff Area = 8.557 ac Runoff Volume = 1.193 af Average Runoff Depth = 1.67"

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1: (new Subcat) Runoff Area=27,000 sf Runoff Depth>4.15"
Flow Length=280' Tc=3.2 min CN=98 Runoff=3.07 cfs 0.214 af

Subcatchment 2: (new Subcat) Runoff Area=7,512 sf Runoff Depth>4.15"
Flow Length=140' Tc=1.6 min CN=98 Runoff=0.86 cfs 0.060 af

Subcatchment 3: (new Subcat) Runoff Area=9,084 sf Runoff Depth>3.69"
Flow Length=200' Tc=1.6 min CN=93 Runoff=0.98 cfs 0.064 af

Subcatchment 4: (new Subcat) Runoff Area=2,314 sf Runoff Depth>3.10"
Flow Length=50' Tc=2.9 min CN=87 Runoff=0.22 cfs 0.014 af

Subcatchment 5: (new Subcat) Runoff Area=12,770 sf Runoff Depth>3.79"
Flow Length=130' Tc=4.4 min CN=94 Runoff=1.33 cfs 0.093 af

Subcatchment 6: (new Subcat) Runoff Area=13,513 sf Runoff Depth>3.69"
Flow Length=200' Tc=2.4 min CN=93 Runoff=1.46 cfs 0.095 af

Subcatchment 7: (new Subcat) Runoff Area=21,164 sf Runoff Depth>3.79"
Flow Length=400' Tc=2.3 min CN=94 Runoff=2.32 cfs 0.153 af

Subcatchment 8: (new Subcat) Runoff Area=2,767 sf Runoff Depth>3.39"
Flow Length=25' Tc=3.3 min CN=90 Runoff=0.28 cfs 0.018 af

Subcatchment 9: (new Subcat) Runoff Area=7,374 sf Runoff Depth>2.29"
Flow Length=55' Tc=4.1 min CN=78 Runoff=0.51 cfs 0.032 af

Subcatchment 10: (new Subcat) Runoff Area=22,566 sf Runoff Depth>4.15"
Flow Length=240' Tc=2.0 min CN=98 Runoff=2.58 cfs 0.179 af

Subcatchment 11: (new Subcat) Runoff Area=9,004 sf Runoff Depth>2.81"
Flow Length=125' Tc=1.8 min CN=84 Runoff=0.79 cfs 0.048 af

Subcatchment 12: (new Subcat) Runoff Area=15,968 sf Runoff Depth>3.49"
Flow Length=185' Tc=1.9 min CN=91 Runoff=1.66 cfs 0.107 af

Subcatchment 13: (new Subcat) Runoff Area=7,882 sf Runoff Depth>2.72"
Flow Length=165' Tc=3.1 min CN=83 Runoff=0.67 cfs 0.041 af

Subcatchment 14: (new Subcat) Runoff Area=8,250 sf Runoff Depth>4.15"
Flow Length=130' Tc=1.5 min CN=98 Runoff=0.95 cfs 0.065 af

Subcatchment 14A: (new Subcat) Runoff Area=1,428 sf Runoff Depth>0.59"
Flow Length=65' Tc=2.0 min CN=52 Runoff=0.02 cfs 0.002 af

Reach 102: (new Reach) Peak Depth=0.28' Max Vel=2.8 fps Inflow=0.51 cfs 0.032 af
D=12.0" n=0.012 L=85.0' S=0.0059 '/' Capacity=2.96 cfs Outflow=0.49 cfs 0.032 af

Reach 103: (new Reach) Peak Depth=0.32' Max Vel=3.9 fps Inflow=0.86 cfs 0.060 af
D=12.0" n=0.012 L=40.0' S=0.0100 '/' Capacity=3.86 cfs Outflow=0.85 cfs 0.060 af

Reach 104: (new Reach) Peak Depth=0.31' Max Vel=3.6 fps Inflow=0.75 cfs 0.050 af
D=12.0" n=0.012 L=45.0' S=0.0089 '/' Capacity=3.64 cfs Outflow=0.74 cfs 0.050 af

Reach 105: (new Reach) Peak Depth=0.40' Max Vel=5.3 fps Inflow=1.55 cfs 0.110 af
D=12.0" n=0.012 L=130.0' S=0.0146 '/' Capacity=4.67 cfs Outflow=1.51 cfs 0.110 af

Reach 106: (new Reach) Peak Depth=0.11' Max Vel=4.7 fps Inflow=0.22 cfs 0.014 af
D=12.0" n=0.012 L=20.0' S=0.0500 '/' Capacity=8.63 cfs Outflow=0.22 cfs 0.014 af

Reach 107: (new Reach) Peak Depth=0.29' Max Vel=6.9 fps Inflow=1.33 cfs 0.093 af
D=12.0" n=0.012 L=30.0' S=0.0333 '/' Capacity=7.05 cfs Outflow=1.32 cfs 0.093 af

Reach 108: (new Reach) Peak Depth=0.63' Max Vel=5.8 fps Inflow=3.07 cfs 0.214 af
D=12.0" n=0.012 L=42.0' S=0.0119 '/' Capacity=4.21 cfs Outflow=3.04 cfs 0.214 af

Reach 109: (new Reach) Peak Depth=0.57' Max Vel=9.9 fps Inflow=4.55 cfs 0.324 af
D=12.0" n=0.012 L=52.0' S=0.0365 '/' Capacity=7.38 cfs Outflow=4.52 cfs 0.324 af

Reach 110: (new Reach) Peak Depth=0.38' Max Vel=3.5 fps Inflow=0.98 cfs 0.064 af
D=12.0" n=0.012 L=30.0' S=0.0067 '/' Capacity=3.15 cfs Outflow=0.97 cfs 0.064 af

Reach 111: (new Reach) Peak Depth=0.31' Max Vel=11.6 fps Inflow=2.47 cfs 0.170 af
D=12.0" n=0.012 L=17.0' S=0.0882 '/' Capacity=11.47 cfs Outflow=2.46 cfs 0.170 af

Reach 112: (new Reach) Peak Depth=0.81' Max Vel=8.2 fps Inflow=6.98 cfs 0.494 af
D=15.0" n=0.012 L=52.0' S=0.0173 '/' Capacity=9.21 cfs Outflow=6.93 cfs 0.494 af

Reach 113: (new Reach) Peak Depth=0.31' Max Vel=29.1 fps Inflow=6.93 cfs 0.494 af
D=15.0" n=0.012 L=42.0' S=0.5374 '/' Capacity=51.30 cfs Outflow=6.92 cfs 0.494 af

Reach 114: (new Reach) Peak Depth=0.45' Max Vel=17.1 fps Inflow=6.92 cfs 0.494 af
D=15.0" n=0.012 L=45.0' S=0.1222 '/' Capacity=24.47 cfs Outflow=6.89 cfs 0.494 af

Reach 115: (new Reach) Peak Depth=0.28' Max Vel=4.4 fps Inflow=0.79 cfs 0.048 af
D=12.0" n=0.012 L=35.0' S=0.0143 '/' Capacity=4.61 cfs Outflow=0.79 cfs 0.048 af

Reach 116: (new Reach) Peak Depth=1.04' Max Vel=8.6 fps Inflow=11.34 cfs 0.791 af
D=18.0" n=0.012 L=132.0' S=0.0144 '/' Capacity=13.65 cfs Outflow=11.12 cfs 0.791 af

Reach 117: (new Reach) Peak Depth=0.64' Max Vel=5.9 fps Inflow=3.74 cfs 0.249 af
D=15.0" n=0.012 L=85.0' S=0.0106 '/' Capacity=7.20 cfs Outflow=3.69 cfs 0.249 af

Reach 118: (new Reach) Peak Depth=0.44' Max Vel=11.3 fps Inflow=3.77 cfs 0.249 af
D=12.0" n=0.012 L=102.0' S=0.0588 '/' Capacity=9.36 cfs Outflow=3.74 cfs 0.249 af

Reach R13: (new Reach) Peak Depth=0.34' Max Vel=20.7 fps Inflow=4.83 cfs 0.337 af
D=12.0" n=0.012 L=25.0' S=0.2600 '/' Capacity=19.68 cfs Outflow=4.83 cfs 0.337 af

Reach R14: (new Reach) Peak Depth=0.24' Max Vel=3.5 fps Inflow=0.33 cfs 0.023 af
D=6.0" n=0.012 L=80.0' S=0.0138 '/' Capacity=0.71 cfs Outflow=0.32 cfs 0.023 af

Reach R15: (new Reach) Peak Depth=0.35' Max Vel=7.7 fps Inflow=1.69 cfs 0.131 af
D=10.0" n=0.013 L=45.0' S=0.0440 '/' Capacity=4.60 cfs Outflow=1.67 cfs 0.131 af

Reach R16: (new Reach) Peak Depth=0.26' Max Vel=7.0 fps Inflow=1.29 cfs 0.084 af
D=15.0" n=0.012 L=40.0' S=0.0400 '/' Capacity=14.00 cfs Outflow=1.27 cfs 0.084 af

Reach R17: (new Reach) Peak Depth=0.28' Max Vel=8.1 fps Inflow=1.84 cfs 0.131 af
D=18.0" n=0.012 L=10.0' S=0.0450 '/' Capacity=24.14 cfs Outflow=1.84 cfs 0.131 af

Reach R7: (new Reach) Peak Depth=0.31' Max Vel=12.3 fps Inflow=2.58 cfs 0.179 af
D=12.0" n=0.012 L=80.0' S=0.1012 '/' Capacity=12.28 cfs Outflow=2.57 cfs 0.179 af

Reach R8: (new Reach) Peak Depth=0.53' Max Vel=7.7 fps Inflow=3.23 cfs 0.220 af
D=12.0" n=0.012 L=30.0' S=0.0233 '/' Capacity=5.90 cfs Outflow=3.22 cfs 0.220 af

Reach R9: (new Reach) Peak Depth=0.41' Max Vel=4.2 fps Inflow=0.96 cfs 0.067 af
D=8.0" n=0.012 L=35.0' S=0.0111 '/' Capacity=1.38 cfs Outflow=0.95 cfs 0.067 af

Total Runoff Area = 8.557 ac Runoff Volume = 2.180 af Average Runoff Depth = 3.06"

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1: (new Subcat) Runoff Area=27,000 sf Runoff Depth>4.87"
Flow Length=280' Tc=3.2 min CN=98 Runoff=3.59 cfs 0.252 af

Subcatchment 2: (new Subcat) Runoff Area=7,512 sf Runoff Depth>4.87"
Flow Length=140' Tc=1.6 min CN=98 Runoff=1.01 cfs 0.070 af

Subcatchment 3: (new Subcat) Runoff Area=9,084 sf Runoff Depth>4.43"
Flow Length=200' Tc=1.6 min CN=93 Runoff=1.16 cfs 0.077 af

Subcatchment 4: (new Subcat) Runoff Area=2,314 sf Runoff Depth>3.81"
Flow Length=50' Tc=2.9 min CN=87 Runoff=0.27 cfs 0.017 af

Subcatchment 5: (new Subcat) Runoff Area=12,770 sf Runoff Depth>4.53"
Flow Length=130' Tc=4.4 min CN=94 Runoff=1.57 cfs 0.111 af

Subcatchment 6: (new Subcat) Runoff Area=13,513 sf Runoff Depth>4.43"
Flow Length=200' Tc=2.4 min CN=93 Runoff=1.73 cfs 0.114 af

Subcatchment 7: (new Subcat) Runoff Area=21,164 sf Runoff Depth>4.53"
Flow Length=400' Tc=2.3 min CN=94 Runoff=2.75 cfs 0.183 af

Subcatchment 8: (new Subcat) Runoff Area=2,767 sf Runoff Depth>4.12"
Flow Length=25' Tc=3.3 min CN=90 Runoff=0.33 cfs 0.022 af

Subcatchment 9: (new Subcat) Runoff Area=7,374 sf Runoff Depth>2.93"
Flow Length=55' Tc=4.1 min CN=78 Runoff=0.65 cfs 0.041 af

Subcatchment 10: (new Subcat) Runoff Area=22,566 sf Runoff Depth>4.87"
Flow Length=240' Tc=2.0 min CN=98 Runoff=3.03 cfs 0.210 af

Subcatchment 11: (new Subcat) Runoff Area=9,004 sf Runoff Depth>3.51"
Flow Length=125' Tc=1.8 min CN=84 Runoff=0.97 cfs 0.060 af

Subcatchment 12: (new Subcat) Runoff Area=15,968 sf Runoff Depth>4.23"
Flow Length=185' Tc=1.9 min CN=91 Runoff=1.99 cfs 0.129 af

Subcatchment 13: (new Subcat) Runoff Area=7,882 sf Runoff Depth>3.41"
Flow Length=165' Tc=3.1 min CN=83 Runoff=0.83 cfs 0.051 af

Subcatchment 14: (new Subcat) Runoff Area=8,250 sf Runoff Depth>4.87"
Flow Length=130' Tc=1.5 min CN=98 Runoff=1.11 cfs 0.077 af

Subcatchment 14A: (new Subcat) Runoff Area=1,428 sf Runoff Depth>0.92"
Flow Length=65' Tc=2.0 min CN=52 Runoff=0.04 cfs 0.003 af

Subcatchment 15: (new Subcat) Runoff Area=10,777 sf Runoff Depth>1.78"
Flow Length=120' Tc=4.0 min CN=89 Runoff=0.58 cfs 0.037 af

Subcatchment 16: (new Subcat) Runoff Area=1,769 sf Runoff Depth>2.59"
Flow Length=75' Tc=0.9 min CN=98 Runoff=0.13 cfs 0.009 af

Subcatchment 17: Runoff Area=2,888 sf Runoff Depth>2.59"
Flow Length=100' Tc=1.4 min CN=98 Runoff=0.21 cfs 0.014 af

Subcatchment 19: (new Subcat) Runoff Area=36,506 sf Runoff Depth>1.70"
Flow Length=430' Tc=6.7 min CN=88 Runoff=1.72 cfs 0.119 af

Subcatchment 20: (new Subcat) Runoff Area=26,056 sf Runoff Depth>1.04"
Flow Length=325' Tc=4.5 min CN=78 Runoff=0.79 cfs 0.052 af

Subcatchment 21: (new Subcat) Runoff Area=8,648 sf Runoff Depth>1.70"
Flow Length=156' Tc=5.1 min CN=88 Runoff=0.42 cfs 0.028 af

Subcatchment 22: (new Subcat) Runoff Area=6,320 sf Runoff Depth>2.59"
Flow Length=190' Tc=1.8 min CN=98 Runoff=0.46 cfs 0.031 af

Subcatchment 23: (new Subcat) Runoff Area=22,420 sf Runoff Depth>0.78"
Flow Length=315' Tc=6.1 min CN=73 Runoff=0.47 cfs 0.033 af

Subcatchment 24: (new Subcat) Runoff Area=18,522 sf Runoff Depth>1.09"
Flow Length=420' Tc=4.8 min CN=79 Runoff=0.58 cfs 0.039 af

Subcatchment 25: (new Subcat) Runoff Area=7,697 sf Runoff Depth>0.21"
Flow Length=200' Tc=4.4 min CN=57 Runoff=0.02 cfs 0.003 af

Subcatchment 26: (new Subcat) Runoff Area=21,452 sf Runoff Depth>0.35"
Flow Length=385' Tc=3.9 min CN=62 Runoff=0.15 cfs 0.014 af

Subcatchment 27: (new Subcat) Runoff Area=11,136 sf Runoff Depth>0.98"
Flow Length=195' Tc=3.8 min CN=77 Runoff=0.33 cfs 0.021 af

Subcatchment 28: (new Subcat) Runoff Area=16,134 sf Runoff Depth>1.22"
Flow Length=120' Tc=1.7 min CN=81 Runoff=0.62 cfs 0.038 af

Subcatchment 29: (new Subcat) Runoff Area=7,880 sf Runoff Depth>1.95"
Flow Length=155' Tc=1.8 min CN=91 Runoff=0.47 cfs 0.029 af

Subcatchment 30: (new Subcat) Runoff Area=5,945 sf Runoff Depth>2.59"
Flow Length=260' Tc=1.1 min CN=98 Runoff=0.44 cfs 0.029 af

Reach 100: (new Reach) Peak Depth=0.25' Max Vel=4.0 fps Inflow=0.47 cfs 0.033 af
D=8.0" n=0.012 L=120.0' S=0.0150 '/' Capacity=1.60 cfs Outflow=0.46 cfs 0.033 af

Reach 101: (new Reach) Peak Depth=0.38' Max Vel=6.0 fps Inflow=1.64 cfs 0.112 af
D=12.0" n=0.012 L=30.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=1.63 cfs 0.112 af

Subcatchment 15: (new Subcat) Runoff Area=10,777 sf Runoff Depth>3.29"
Flow Length=120' Tc=4.0 min CN=89 Runoff=1.03 cfs 0.068 af

Subcatchment 16: (new Subcat) Runoff Area=1,769 sf Runoff Depth>4.15"
Flow Length=75' Tc=0.9 min CN=98 Runoff=0.21 cfs 0.014 af

Subcatchment 17: Runoff Area=2,888 sf Runoff Depth>4.15"
Flow Length=100' Tc=1.4 min CN=98 Runoff=0.33 cfs 0.023 af

Subcatchment 19: (new Subcat) Runoff Area=36,506 sf Runoff Depth>3.19"
Flow Length=430' Tc=6.7 min CN=88 Runoff=3.13 cfs 0.223 af

Subcatchment 20: (new Subcat) Runoff Area=26,056 sf Runoff Depth>2.29"
Flow Length=325' Tc=4.5 min CN=78 Runoff=1.77 cfs 0.114 af

Subcatchment 21: (new Subcat) Runoff Area=8,648 sf Runoff Depth>3.19"
Flow Length=156' Tc=5.1 min CN=88 Runoff=0.77 cfs 0.053 af

Subcatchment 22: (new Subcat) Runoff Area=6,320 sf Runoff Depth>4.15"
Flow Length=190' Tc=1.8 min CN=98 Runoff=0.72 cfs 0.050 af

Subcatchment 23: (new Subcat) Runoff Area=22,420 sf Runoff Depth>1.89"
Flow Length=315' Tc=6.1 min CN=73 Runoff=1.20 cfs 0.081 af

Subcatchment 24: (new Subcat) Runoff Area=18,522 sf Runoff Depth>2.37"
Flow Length=420' Tc=4.8 min CN=79 Runoff=1.29 cfs 0.084 af

Subcatchment 25: (new Subcat) Runoff Area=7,697 sf Runoff Depth>0.85"
Flow Length=200' Tc=4.4 min CN=57 Runoff=0.16 cfs 0.012 af

Subcatchment 26: (new Subcat) Runoff Area=21,452 sf Runoff Depth>1.14"
Flow Length=385' Tc=3.9 min CN=62 Runoff=0.69 cfs 0.047 af

Subcatchment 27: (new Subcat) Runoff Area=11,136 sf Runoff Depth>2.21"
Flow Length=195' Tc=3.8 min CN=77 Runoff=0.75 cfs 0.047 af

Subcatchment 28: (new Subcat) Runoff Area=16,134 sf Runoff Depth>2.55"
Flow Length=120' Tc=1.7 min CN=81 Runoff=1.29 cfs 0.079 af

Subcatchment 29: (new Subcat) Runoff Area=7,880 sf Runoff Depth>3.49"
Flow Length=155' Tc=1.8 min CN=91 Runoff=0.82 cfs 0.053 af

Subcatchment 30: (new Subcat) Runoff Area=5,945 sf Runoff Depth>4.15"
Flow Length=260' Tc=1.1 min CN=98 Runoff=0.70 cfs 0.047 af

Reach 100: (new Reach) Peak Depth=0.43' Max Vel=5.0 fps Inflow=1.20 cfs 0.081 af
D=8.0" n=0.012 L=120.0' S=0.0150 '/' Capacity=1.60 cfs Outflow=1.18 cfs 0.081 af

Reach 101: (new Reach) Peak Depth=0.49' Max Vel=6.8 fps Inflow=2.58 cfs 0.179 af
D=12.0" n=0.012 L=30.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=2.58 cfs 0.179 af

Subcatchment 15: (new Subcat) Runoff Area=10,777 sf Runoff Depth>4.02"
Flow Length=120' Tc=4.0 min CN=89 Runoff=1.25 cfs 0.083 af

Subcatchment 16: (new Subcat) Runoff Area=1,769 sf Runoff Depth>4.87"
Flow Length=75' Tc=0.9 min CN=98 Runoff=0.24 cfs 0.016 af

Subcatchment 17: Runoff Area=2,888 sf Runoff Depth>4.87"
Flow Length=100' Tc=1.4 min CN=98 Runoff=0.39 cfs 0.027 af

Subcatchment 19: (new Subcat) Runoff Area=36,506 sf Runoff Depth>3.91"
Flow Length=430' Tc=6.7 min CN=88 Runoff=3.80 cfs 0.273 af

Subcatchment 20: (new Subcat) Runoff Area=26,056 sf Runoff Depth>2.93"
Flow Length=325' Tc=4.5 min CN=78 Runoff=2.26 cfs 0.146 af

Subcatchment 21: (new Subcat) Runoff Area=8,648 sf Runoff Depth>3.92"
Flow Length=156' Tc=5.1 min CN=88 Runoff=0.94 cfs 0.065 af

Subcatchment 22: (new Subcat) Runoff Area=6,320 sf Runoff Depth>4.87"
Flow Length=190' Tc=1.8 min CN=98 Runoff=0.85 cfs 0.059 af

Subcatchment 23: (new Subcat) Runoff Area=22,420 sf Runoff Depth>2.48"
Flow Length=315' Tc=6.1 min CN=73 Runoff=1.58 cfs 0.107 af

Subcatchment 24: (new Subcat) Runoff Area=18,522 sf Runoff Depth>3.03"
Flow Length=420' Tc=4.8 min CN=79 Runoff=1.63 cfs 0.107 af

Subcatchment 25: (new Subcat) Runoff Area=7,697 sf Runoff Depth>1.25"
Flow Length=200' Tc=4.4 min CN=57 Runoff=0.26 cfs 0.018 af

Subcatchment 26: (new Subcat) Runoff Area=21,452 sf Runoff Depth>1.60"
Flow Length=385' Tc=3.9 min CN=62 Runoff=1.01 cfs 0.066 af

Subcatchment 27: (new Subcat) Runoff Area=11,136 sf Runoff Depth>2.84"
Flow Length=195' Tc=3.8 min CN=77 Runoff=0.97 cfs 0.061 af

Subcatchment 28: (new Subcat) Runoff Area=16,134 sf Runoff Depth>3.22"
Flow Length=120' Tc=1.7 min CN=81 Runoff=1.62 cfs 0.099 af

Subcatchment 29: (new Subcat) Runoff Area=7,880 sf Runoff Depth>4.23"
Flow Length=155' Tc=1.8 min CN=91 Runoff=0.98 cfs 0.064 af

Subcatchment 30: (new Subcat) Runoff Area=5,945 sf Runoff Depth>4.87"
Flow Length=260' Tc=1.1 min CN=98 Runoff=0.82 cfs 0.055 af

Reach 100: (new Reach) Peak Depth=0.54' Max Vel=5.2 fps Inflow=1.58 cfs 0.107 af
D=8.0" n=0.012 L=120.0' S=0.0150 '/' Capacity=1.60 cfs Outflow=1.55 cfs 0.107 af

Reach 119: (new Reach) Peak Depth=0.24' Max Vel=6.0 fps Inflow=0.87 cfs 0.055 af
D=12.0" n=0.012 L=32.0' S=0.0313 '/' Capacity=6.82 cfs Outflow=0.87 cfs 0.055 af

Reach 120: (new Reach) Peak Depth=0.20' Max Vel=21.0 fps Inflow=2.27 cfs 0.145 af
D=12.0" n=0.012 L=35.0' S=0.4971 '/' Capacity=27.21 cfs Outflow=2.27 cfs 0.145 af

Reach POI 1: (new Reach) Inflow=7.48 cfs 0.522 af
Outflow=7.48 cfs 0.522 af

Reach POI 10: (new Reach) Inflow=0.33 cfs 0.021 af
Outflow=0.33 cfs 0.021 af

Reach POI 11: (new Reach) Inflow=0.62 cfs 0.038 af
Outflow=0.62 cfs 0.038 af

Reach POI 12: (new Reach) Inflow=0.47 cfs 0.029 af
Outflow=0.47 cfs 0.029 af

Reach POI 3: (new Reach) Inflow=1.94 cfs 0.132 af
Outflow=1.94 cfs 0.132 af

Reach POI 4: (new Reach) Inflow=0.58 cfs 0.037 af
Outflow=0.58 cfs 0.037 af

Reach POI 5: (new Reach) Inflow=2.48 cfs 0.170 af
Outflow=2.48 cfs 0.170 af

Reach POI 6: (new Reach) Inflow=0.91 cfs 0.064 af
Outflow=0.91 cfs 0.064 af

Reach POI 7: (new Reach) Inflow=0.42 cfs 0.028 af
Outflow=0.42 cfs 0.028 af

Reach POI 8: (new Reach) Inflow=0.79 cfs 0.068 af
Outflow=0.79 cfs 0.068 af

Reach POI 9: (new Reach) Inflow=1.06 cfs 0.082 af
Outflow=1.06 cfs 0.082 af

Reach R1: (new Reach) Peak Depth=0.72' Max Vel=8.9 fps Inflow=7.50 cfs 0.522 af
D=18.0" n=0.012 L=18.0' S=0.0200 '/' Capacity=16.09 cfs Outflow=7.48 cfs 0.522 af

Reach R10: (new Reach) Peak Depth=0.12' Max Vel=3.1 fps Inflow=0.13 cfs 0.009 af
D=8.0" n=0.012 L=30.0' S=0.0200 '/' Capacity=1.85 cfs Outflow=0.13 cfs 0.009 af

Reach R11: (new Reach) Peak Depth=0.27' Max Vel=5.5 fps Inflow=0.72 cfs 0.050 af
D=8.0" n=0.012 L=125.0' S=0.0264 '/' Capacity=2.13 cfs Outflow=0.71 cfs 0.050 af

Reach R12: (new Reach) Peak Depth=0.26' Max Vel=7.4 fps Inflow=0.91 cfs 0.064 af
D=8.0" n=0.012 L=20.0' S=0.0500 '/' Capacity=2.93 cfs Outflow=0.91 cfs 0.064 af

Reach 119: (new Reach) Peak Depth=0.31' Max Vel=6.9 fps Inflow=1.46 cfs 0.095 af
D=12.0" n=0.012 L=32.0' S=0.0313 '/' Capacity=6.82 cfs Outflow=1.45 cfs 0.095 af

Reach 120: (new Reach) Peak Depth=0.25' Max Vel=24.3 fps Inflow=3.78 cfs 0.249 af
D=12.0" n=0.012 L=35.0' S=0.4971 '/' Capacity=27.21 cfs Outflow=3.77 cfs 0.249 af

Reach POI 1: (new Reach) Inflow=12.67 cfs 0.897 af
Outflow=12.67 cfs 0.897 af

Reach POI 10: (new Reach) Inflow=0.75 cfs 0.047 af
Outflow=0.75 cfs 0.047 af

Reach POI 11: (new Reach) Inflow=1.29 cfs 0.079 af
Outflow=1.29 cfs 0.079 af

Reach POI 12: (new Reach) Inflow=0.82 cfs 0.053 af
Outflow=0.82 cfs 0.053 af

Reach POI 3: (new Reach) Inflow=3.22 cfs 0.220 af
Outflow=3.22 cfs 0.220 af

Reach POI 4: (new Reach) Inflow=1.03 cfs 0.068 af
Outflow=1.03 cfs 0.068 af

Reach POI 5: (new Reach) Inflow=4.83 cfs 0.337 af
Outflow=4.83 cfs 0.337 af

Reach POI 6: (new Reach) Inflow=1.46 cfs 0.104 af
Outflow=1.46 cfs 0.104 af

Reach POI 7: (new Reach) Inflow=0.77 cfs 0.053 af
Outflow=0.77 cfs 0.053 af

Reach POI 8: (new Reach) Inflow=1.83 cfs 0.144 af
Outflow=1.83 cfs 0.144 af

Reach POI 9: (new Reach) Inflow=2.52 cfs 0.178 af
Outflow=2.52 cfs 0.178 af

Reach R1: (new Reach) Peak Depth=1.00' Max Vel=10.1 fps Inflow=12.70 cfs 0.897 af
D=18.0" n=0.012 L=18.0' S=0.0200 '/' Capacity=16.09 cfs Outflow=12.67 cfs 0.897 af

Reach R10: (new Reach) Peak Depth=0.15' Max Vel=3.5 fps Inflow=0.21 cfs 0.014 af
D=8.0" n=0.012 L=30.0' S=0.0200 '/' Capacity=1.85 cfs Outflow=0.21 cfs 0.014 af

Reach R11: (new Reach) Peak Depth=0.35' Max Vel=6.2 fps Inflow=1.15 cfs 0.081 af
D=8.0" n=0.012 L=125.0' S=0.0264 '/' Capacity=2.13 cfs Outflow=1.14 cfs 0.081 af

Reach R12: (new Reach) Peak Depth=0.33' Max Vel=8.4 fps Inflow=1.46 cfs 0.104 af
D=8.0" n=0.012 L=20.0' S=0.0500 '/' Capacity=2.93 cfs Outflow=1.46 cfs 0.104 af

Reach 101: (new Reach) Peak Depth=0.53' Max Vel=7.1 fps Inflow=3.03 cfs 0.210 af
D=12.0" n=0.012 L=30.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=3.02 cfs 0.210 af

Reach 102: (new Reach) Peak Depth=0.32' Max Vel=3.0 fps Inflow=0.65 cfs 0.041 af
D=12.0" n=0.012 L=85.0' S=0.0059 '/' Capacity=2.96 cfs Outflow=0.62 cfs 0.041 af

Reach 103: (new Reach) Peak Depth=0.35' Max Vel=4.1 fps Inflow=1.01 cfs 0.070 af
D=12.0" n=0.012 L=40.0' S=0.0100 '/' Capacity=3.86 cfs Outflow=1.00 cfs 0.070 af

Reach 104: (new Reach) Peak Depth=0.35' Max Vel=3.9 fps Inflow=0.95 cfs 0.063 af
D=12.0" n=0.012 L=45.0' S=0.0089 '/' Capacity=3.64 cfs Outflow=0.93 cfs 0.063 af

Reach 105: (new Reach) Peak Depth=0.44' Max Vel=5.6 fps Inflow=1.88 cfs 0.133 af
D=12.0" n=0.012 L=130.0' S=0.0146 '/' Capacity=4.67 cfs Outflow=1.83 cfs 0.133 af

Reach 106: (new Reach) Peak Depth=0.12' Max Vel=5.0 fps Inflow=0.27 cfs 0.017 af
D=12.0" n=0.012 L=20.0' S=0.0500 '/' Capacity=8.63 cfs Outflow=0.27 cfs 0.017 af

Reach 107: (new Reach) Peak Depth=0.32' Max Vel=7.2 fps Inflow=1.57 cfs 0.111 af
D=12.0" n=0.012 L=30.0' S=0.0333 '/' Capacity=7.05 cfs Outflow=1.57 cfs 0.111 af

Reach 108: (new Reach) Peak Depth=0.71' Max Vel=6.0 fps Inflow=3.59 cfs 0.252 af
D=12.0" n=0.012 L=42.0' S=0.0119 '/' Capacity=4.21 cfs Outflow=3.56 cfs 0.252 af

Reach 109: (new Reach) Peak Depth=0.63' Max Vel=10.3 fps Inflow=5.39 cfs 0.385 af
D=12.0" n=0.012 L=52.0' S=0.0365 '/' Capacity=7.38 cfs Outflow=5.36 cfs 0.385 af

Reach 110: (new Reach) Peak Depth=0.42' Max Vel=3.7 fps Inflow=1.16 cfs 0.077 af
D=12.0" n=0.012 L=30.0' S=0.0067 '/' Capacity=3.15 cfs Outflow=1.16 cfs 0.077 af

Reach 111: (new Reach) Peak Depth=0.34' Max Vel=12.2 fps Inflow=2.93 cfs 0.204 af
D=12.0" n=0.012 L=17.0' S=0.0882 '/' Capacity=11.47 cfs Outflow=2.93 cfs 0.204 af

Reach 112: (new Reach) Peak Depth=0.93' Max Vel=8.5 fps Inflow=8.29 cfs 0.589 af
D=15.0" n=0.012 L=52.0' S=0.0173 '/' Capacity=9.21 cfs Outflow=8.22 cfs 0.589 af

Reach 113: (new Reach) Peak Depth=0.34' Max Vel=30.6 fps Inflow=8.22 cfs 0.589 af
D=15.0" n=0.012 L=42.0' S=0.5374 '/' Capacity=51.30 cfs Outflow=8.21 cfs 0.589 af

Reach 114: (new Reach) Peak Depth=0.50' Max Vel=17.9 fps Inflow=8.21 cfs 0.589 af
D=15.0" n=0.012 L=45.0' S=0.1222 '/' Capacity=24.47 cfs Outflow=8.19 cfs 0.589 af

Reach 115: (new Reach) Peak Depth=0.31' Max Vel=4.6 fps Inflow=0.97 cfs 0.060 af
D=12.0" n=0.012 L=35.0' S=0.0143 '/' Capacity=4.61 cfs Outflow=0.97 cfs 0.060 af

Reach 116: (new Reach) Peak Depth=1.21' Max Vel=8.8 fps Inflow=13.50 cfs 0.947 af
D=18.0" n=0.012 L=132.0' S=0.0144 '/' Capacity=13.65 cfs Outflow=13.23 cfs 0.947 af

Reach 117: (new Reach) Peak Depth=0.71' Max Vel=6.2 fps Inflow=4.44 cfs 0.298 af
D=15.0" n=0.012 L=85.0' S=0.0106 '/' Capacity=7.20 cfs Outflow=4.38 cfs 0.298 af

Reach 118: (new Reach) Peak Depth=0.49' Max Vel=11.8 fps Inflow=4.47 cfs 0.298 af
D=12.0" n=0.012 L=102.0' S=0.0588 '/' Capacity=9.36 cfs Outflow=4.44 cfs 0.298 af

Reach 119: (new Reach) Peak Depth=0.34' Max Vel=7.2 fps Inflow=1.73 cfs 0.114 af
D=12.0" n=0.012 L=32.0' S=0.0313 '/' Capacity=6.82 cfs Outflow=1.73 cfs 0.114 af

Reach 120: (new Reach) Peak Depth=0.27' Max Vel=25.5 fps Inflow=4.48 cfs 0.298 af
D=12.0" n=0.012 L=35.0' S=0.4971 '/' Capacity=27.21 cfs Outflow=4.47 cfs 0.298 af

Reach POI 1: (new Reach) Inflow=15.09 cfs 1.076 af
Outflow=15.09 cfs 1.076 af

Reach POI 10: (new Reach) Inflow=0.97 cfs 0.061 af
Outflow=0.97 cfs 0.061 af

Reach POI 11: (new Reach) Inflow=1.62 cfs 0.099 af
Outflow=1.62 cfs 0.099 af

Reach POI 12: (new Reach) Inflow=0.98 cfs 0.064 af
Outflow=0.98 cfs 0.064 af

Reach POI 3: (new Reach) Inflow=3.82 cfs 0.262 af
Outflow=3.82 cfs 0.262 af

Reach POI 4: (new Reach) Inflow=1.25 cfs 0.083 af
Outflow=1.25 cfs 0.083 af

Reach POI 5: (new Reach) Inflow=5.96 cfs 0.420 af
Outflow=5.96 cfs 0.420 af

Reach POI 6: (new Reach) Inflow=1.73 cfs 0.123 af
Outflow=1.73 cfs 0.123 af

Reach POI 7: (new Reach) Inflow=0.94 cfs 0.065 af
Outflow=0.94 cfs 0.065 af

Reach POI 8: (new Reach) Inflow=2.38 cfs 0.184 af
Outflow=2.38 cfs 0.184 af

Reach POI 9: (new Reach) Inflow=3.29 cfs 0.228 af
Outflow=3.29 cfs 0.228 af

Reach R1: (new Reach) Peak Depth=1.15' Max Vel=10.4 fps Inflow=15.12 cfs 1.076 af
D=18.0" n=0.012 L=18.0' S=0.0200 '/' Capacity=16.09 cfs Outflow=15.09 cfs 1.076 af

Reach R10: (new Reach) Peak Depth=0.16' Max Vel=3.7 fps Inflow=0.24 cfs 0.016 af
D=8.0" n=0.012 L=30.0' S=0.0200 '/' Capacity=1.85 cfs Outflow=0.24 cfs 0.016 af

Reach R11: (new Reach) Peak Depth=0.39' Max Vel=6.4 fps Inflow=1.36 cfs 0.096 af
D=8.0" n=0.012 L=125.0' S=0.0264 '/' Capacity=2.13 cfs Outflow=1.35 cfs 0.096 af

Reach R12: (new Reach) Peak Depth=0.37' Max Vel=8.7 fps Inflow=1.73 cfs 0.123 af
D=8.0" n=0.012 L=20.0' S=0.0500 '/' Capacity=2.93 cfs Outflow=1.73 cfs 0.123 af

Reach R13: (new Reach) Peak Depth=0.38' Max Vel=21.9 fps Inflow=5.97 cfs 0.420 af
D=12.0" n=0.012 L=25.0' S=0.2600 '/' Capacity=19.68 cfs Outflow=5.96 cfs 0.420 af

Reach R14: (new Reach) Peak Depth=0.26' Max Vel=3.7 fps Inflow=0.39 cfs 0.027 af
D=6.0" n=0.012 L=80.0' S=0.0138 '/' Capacity=0.71 cfs Outflow=0.38 cfs 0.027 af

Reach R15: (new Reach) Peak Depth=0.40' Max Vel=8.2 fps Inflow=2.15 cfs 0.165 af
D=10.0" n=0.013 L=45.0' S=0.0440 '/' Capacity=4.60 cfs Outflow=2.13 cfs 0.165 af

Reach R16: (new Reach) Peak Depth=0.29' Max Vel=7.5 fps Inflow=1.63 cfs 0.107 af
D=15.0" n=0.012 L=40.0' S=0.0400 '/' Capacity=14.00 cfs Outflow=1.61 cfs 0.107 af

Reach R17: (new Reach) Peak Depth=0.31' Max Vel=8.6 fps Inflow=2.29 cfs 0.163 af
D=18.0" n=0.012 L=10.0' S=0.0450 '/' Capacity=24.14 cfs Outflow=2.29 cfs 0.163 af

Reach R7: (new Reach) Peak Depth=0.34' Max Vel=12.9 fps Inflow=3.02 cfs 0.210 af
D=12.0" n=0.012 L=80.0' S=0.1012 '/' Capacity=12.28 cfs Outflow=3.01 cfs 0.210 af

Reach R8: (new Reach) Peak Depth=0.59' Max Vel=8.0 fps Inflow=3.83 cfs 0.262 af
D=12.0" n=0.012 L=30.0' S=0.0233 '/' Capacity=5.90 cfs Outflow=3.82 cfs 0.262 af

Reach R9: (new Reach) Peak Depth=0.46' Max Vel=4.4 fps Inflow=1.14 cfs 0.079 af
D=8.0" n=0.012 L=35.0' S=0.0111 '/' Capacity=1.38 cfs Outflow=1.13 cfs 0.079 af

Total Runoff Area = 8.557 ac Runoff Volume = 2.665 af Average Runoff Depth = 3.74"

Subcatchment 1: (new Subcat)

Runoff = 3.59 cfs @ 12.05 hrs, Volume= 0.252 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
27,000	98	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	100	0.0100	1.0		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
1.5	180	0.0100	2.0		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.2	280	Total			

Subcatchment 2: (new Subcat)

Runoff = 1.01 cfs @ 12.02 hrs, Volume= 0.070 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
7,512	98	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.9		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.7	90	0.0100	2.0		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	140	Total			

Subcatchment 3: (new Subcat)

Runoff = 1.16 cfs @ 12.02 hrs, Volume= 0.077 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
7,221	98	
1,863	74	>75% Grass cover, Good, HSG C
9,084	93	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.9		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.7	150	0.0350	3.8		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	200	Total			

Subcatchment 4: (new Subcat)

Runoff = 0.27 cfs @ 12.05 hrs, Volume= 0.017 af, Depth> 3.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
1,276	98	
1,038	74	>75% Grass cover, Good, HSG C
2,314	87	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.8	25	0.0300	0.1		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.1	25	0.0400	4.1		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.9	50	Total			

Subcatchment 5: (new Subcat)

Runoff = 1.57 cfs @ 12.06 hrs, Volume= 0.111 af, Depth> 4.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
10,445	98	
2,325	74	>75% Grass cover, Good, HSG C
12,770	94	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	30	0.0200	0.1		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.5	100	0.0300	3.5		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.4	130	Total			

Subcatchment 6: (new Subcat)

Runoff = 1.73 cfs @ 12.04 hrs, Volume= 0.114 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
10,521	98	
2,992	74	>75% Grass cover, Good, HSG C
13,513	93	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	30	0.1500	0.3		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.7	170	0.0400	4.1		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.4	200	Total			

Subcatchment 7: (new Subcat)

Runoff = 2.75 cfs @ 12.04 hrs, Volume= 0.183 af, Depth> 4.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
17,573	98	
3,591	74	>75% Grass cover, Good, HSG C
21,164	94	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	50	0.0200	1.2		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
1.6	350	0.0340	3.7		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.3	400	Total			

Subcatchment 8: (new Subcat)

Runoff = 0.33 cfs @ 12.05 hrs, Volume= 0.022 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
1,841	98	
926	74	>75% Grass cover, Good, HSG C
2,767	90	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	25	0.0200	0.1		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"

Subcatchment 9: (new Subcat)

Runoff = 0.65 cfs @ 12.06 hrs, Volume= 0.041 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
1,216	98	
6,158	74	>75% Grass cover, Good, HSG C
7,374	78	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	30	0.0200	0.1		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.2	25	0.0200	2.1		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.1	55	Total			

Subcatchment 10: (new Subcat)

Runoff = 3.03 cfs @ 12.03 hrs, Volume= 0.210 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
22,566	98	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.9		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
1.1	190	0.0200	2.9		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.0	240	Total			

Subcatchment 11: (new Subcat)

Runoff = 0.97 cfs @ 12.03 hrs, Volume= 0.060 af, Depth> 3.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
3,840	98	
5,164	74	>75% Grass cover, Good, HSG C
9,004	84	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	45	0.6600	0.6		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.5	80	0.0200	2.9		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.8	125	Total			

Subcatchment 12: (new Subcat)

Runoff = 1.99 cfs @ 12.03 hrs, Volume= 0.129 af, Depth> 4.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
11,043	98	
4,925	74	>75% Grass cover, Good, HSG C
15,968	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	40	0.5000	0.5		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.1	55	0.2000	6.7		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	90	0.0200	2.9		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.9	185	Total			

Subcatchment 13: (new Subcat)

Runoff = 0.83 cfs @ 12.05 hrs, Volume= 0.051 af, Depth> 3.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
3,110	98	
4,772	74	>75% Grass cover, Good, HSG C
7,882	83	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	50	0.1400	0.3		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.2	55	0.0700	4.0		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.2	60	0.0400	4.1		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.1	165	Total			

Subcatchment 14: (new Subcat)

Runoff = 1.11 cfs @ 12.02 hrs, Volume= 0.077 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
8,250	98	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	65	0.0100	0.9		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.3	65	0.0100	3.5	1.21	**Circular Channel (pipe),** Diam= 8.0" Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.013
1.5	130	Total			

Subcatchment 14A: (new Subcat)

Runoff = 0.04 cfs @ 12.05 hrs, Volume= 0.003 af, Depth> 0.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
307	98	
1,121	39	>75% Grass cover, Good, HSG A
1,428	52	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	15	0.0500	0.2		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.4	25	0.0200	1.0		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.1	25	0.0500	3.4		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
2.0	65	Total			

Subcatchment 15: (new Subcat)

Runoff = 1.25 cfs @ 12.06 hrs, Volume= 0.083 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
9,096	98	
1,681	39	>75% Grass cover, Good, HSG A
10,777	89	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	35	0.0300	0.2		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.3	85	0.0400	4.1		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.0	120	Total			

Subcatchment 16: (new Subcat)

Runoff = 0.24 cfs @ 12.01 hrs, Volume= 0.016 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
1,769	98	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	35	0.0100	0.8		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.2	40	0.0100	2.9	0.56	**Circular Channel (pipe),** Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013
0.9	75	Total			

Subcatchment 17:

Runoff = 0.39 cfs @ 12.02 hrs, Volume= 0.027 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
2,888	98	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	70	0.0100	0.9		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.2	30	0.0100	2.9	0.56	**Circular Channel (pipe),** Diam= 6.0" Area= 0.2 sf Perim= 1.6' r= 0.13' n= 0.013
1.4	100	Total			

Subcatchment 19: (new Subcat)

Runoff = 3.80 cfs @ 12.10 hrs, Volume= 0.273 af, Depth> 3.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
20,989	98	
200	39	>75% Grass cover, Good, HSG A
15,317	74	>75% Grass cover, Good, HSG C
36,506	88	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	55	0.0400	0.2		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.9	105	0.0160	1.9		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.2	40	0.0500	3.4		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.8	230	0.0500	4.5		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.7	430	Total			

Subcatchment 20: (new Subcat)

Runoff = 2.26 cfs @ 12.07 hrs, Volume= 0.146 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
16,864	98	
400	74	>75% Grass cover, Good, HSG C
8,792	39	>75% Grass cover, Good, HSG A
26,056	78	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	50	0.0800	0.2		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.2	35	0.0400	3.0		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.0	240	0.0400	4.1		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.5	325	Total			

Subcatchment 21: (new Subcat)

Runoff = 0.94 cfs @ 12.07 hrs, Volume= 0.065 af, Depth> 3.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
7,229	98	
1,419	39	>75% Grass cover, Good, HSG A
8,648	88	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	36	0.0200	0.1		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.6	120	0.0250	3.2		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.1	156	Total			

Subcatchment 22: (new Subcat)

Runoff = 0.85 cfs @ 12.03 hrs, Volume= 0.059 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
6,320	98	

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0250	1.5		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.7	90	0.0100	2.0		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.8	190	Total			

Subcatchment 23: (new Subcat)

Runoff = 1.58 cfs @ 12.10 hrs, Volume= 0.107 af, Depth> 2.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
12,316	98	
1,100	74	>75% Grass cover, Good, HSG C
9,004	39	>75% Grass cover, Good, HSG A
22,420	73	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	80	0.0750	0.3		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.1	30	0.0750	4.1		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.0	205	0.0300	3.5		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.1	315	Total			

Subcatchment 24: (new Subcat)

Runoff = 1.63 cfs @ 12.07 hrs, Volume= 0.107 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
6,374	98	
1,800	39	>75% Grass cover, Good, HSG A
10,348	74	>75% Grass cover, Good, HSG C
18,522	79	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.5	50	0.0700	0.2		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.6	160	0.0900	4.5		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.7	210	0.0600	5.0		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.8	420	Total			

Subcatchment 25: (new Subcat)

Runoff = 0.26 cfs @ 12.08 hrs, Volume= 0.018 af, Depth> 1.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
2,397	98	
5,300	39	>75% Grass cover, Good, HSG A
7,697	57	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.7	45	0.0500	0.2		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.7	155	0.0300	3.5		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.4	200	Total			

Subcatchment 26: (new Subcat)

Runoff = 1.01 cfs @ 12.07 hrs, Volume= 0.066 af, Depth> 1.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
1,310	98	
8,500	39	>75% Grass cover, Good, HSG A
11,642	74	>75% Grass cover, Good, HSG C
21,452	62	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	35	0.1000	0.3		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.2	75	0.0900	6.1		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	100	0.1000	4.7		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.0	175	0.0200	2.9		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.9	385	Total			

Subcatchment 27: (new Subcat)

Runoff = 0.97 cfs @ 12.06 hrs, Volume= 0.061 af, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
1,285	98	
9,851	74	>75% Grass cover, Good, HSG C
11,136	77	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	25	0.0600	0.2		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.2	20	0.0600	1.5		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
1.0	15	0.1500	0.3		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.1	45	0.1000	6.4		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.3	90	0.0900	4.5		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.8	195	Total			

Subcatchment 28: (new Subcat)

Runoff = 1.62 cfs @ 12.03 hrs, Volume= 0.099 af, Depth> 3.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
4,664	98	
11,470	74	>75% Grass cover, Good, HSG C
16,134	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	45	0.6600	0.6		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.4	75	0.0300	3.5		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.7	120	Total			

Subcatchment 29: (new Subcat)

Runoff = 0.98 cfs @ 12.03 hrs, Volume= 0.064 af, Depth> 4.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
5,448	98	
2,432	74	>75% Grass cover, Good, HSG C
7,880	91	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	45	0.6600	0.6		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
0.1	35	0.1400	5.6		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	75	0.0200	2.9		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.8	155	Total			

Subcatchment 30: (new Subcat)

Runoff = 0.82 cfs @ 12.01 hrs, Volume= 0.055 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr Rainfall=5.50"

Area (sf)	CN	Description
5,912	98	
33	39	>75% Grass cover, Good, HSG A
5,945	98	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	50	0.0800	2.0		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
0.7	210	0.0650	5.2		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.1	260	Total			

Reach 100: (new Reach)

Inflow Area = 0.515 ac, Inflow Depth > 2.48"
Inflow = 1.58 cfs @ 12.10 hrs, Volume= 0.107 af
Outflow = 1.55 cfs @ 12.11 hrs, Volume= 0.107 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.2 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.3 fps, Avg. Travel Time= 0.9 min

Peak Depth= 0.54' @ 12.10 hrs
Capacity at bank full= 1.60 cfs
8.0" Diameter Pipe, n= 0.012
Length= 120.0' Slope= 0.0150 '/'

Reach 101: (new Reach)

Inflow Area = 0.518 ac, Inflow Depth > 4.87"
Inflow = 3.03 cfs @ 12.03 hrs, Volume= 0.210 af
Outflow = 3.02 cfs @ 12.03 hrs, Volume= 0.210 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.1 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.8 fps, Avg. Travel Time= 0.2 min

Peak Depth= 0.53' @ 12.03 hrs
Capacity at bank full= 5.46 cfs
12.0" Diameter Pipe, n= 0.012
Length= 30.0' Slope= 0.0200 '/'

Reach 102: (new Reach)

Inflow Area = 0.169 ac, Inflow Depth > 2.93"
Inflow = 0.65 cfs @ 12.06 hrs, Volume= 0.041 af
Outflow = 0.62 cfs @ 12.08 hrs, Volume= 0.041 af, Atten= 4%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.0 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.1 fps, Avg. Travel Time= 1.3 min

Peak Depth= 0.32' @ 12.07 hrs
Capacity at bank full= 2.96 cfs
12.0" Diameter Pipe, n= 0.012
Length= 85.0' Slope= 0.0059 '/'

Reach 103: (new Reach)

Inflow Area = 0.172 ac, Inflow Depth > 4.87"
Inflow = 1.01 cfs @ 12.02 hrs, Volume= 0.070 af
Outflow = 1.00 cfs @ 12.03 hrs, Volume= 0.070 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.1 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.6 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.35' @ 12.03 hrs
Capacity at bank full= 3.86 cfs
12.0" Diameter Pipe, n= 0.012
Length= 40.0' Slope= 0.0100 '/'

Reach 104: (new Reach)

Inflow Area = 0.233 ac, Inflow Depth > 3.26"
Inflow = 0.95 cfs @ 12.07 hrs, Volume= 0.063 af
Outflow = 0.93 cfs @ 12.07 hrs, Volume= 0.063 af, Atten= 2%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.9 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.3 fps, Avg. Travel Time= 0.6 min

Peak Depth= 0.35' @ 12.07 hrs
Capacity at bank full= 3.64 cfs
12.0" Diameter Pipe, n= 0.012
Length= 45.0' Slope= 0.0089 '/'

Reach 105: (new Reach)

Inflow Area = 0.405 ac, Inflow Depth > 3.94"
Inflow = 1.88 cfs @ 12.05 hrs, Volume= 0.133 af
Outflow = 1.83 cfs @ 12.06 hrs, Volume= 0.133 af, Atten= 2%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.6 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.1 fps, Avg. Travel Time= 1.0 min

Peak Depth= 0.44' @ 12.05 hrs
Capacity at bank full= 4.67 cfs
12.0" Diameter Pipe, n= 0.012
Length= 130.0' Slope= 0.0146 '/'

Reach 106: (new Reach)

Inflow Area = 0.053 ac, Inflow Depth > 3.81"
Inflow = 0.27 cfs @ 12.05 hrs, Volume= 0.017 af
Outflow = 0.27 cfs @ 12.05 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.0 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.7 fps, Avg. Travel Time= 0.2 min

Peak Depth= 0.12' @ 12.05 hrs
Capacity at bank full= 8.63 cfs
12.0" Diameter Pipe, n= 0.012
Length= 20.0' Slope= 0.0500 '/'

Reach 107: (new Reach)

Inflow Area = 0.293 ac, Inflow Depth > 4.53"
Inflow = 1.57 cfs @ 12.06 hrs, Volume= 0.111 af
Outflow = 1.57 cfs @ 12.06 hrs, Volume= 0.111 af, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.2 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.7 fps, Avg. Travel Time= 0.2 min

Peak Depth= 0.32' @ 12.06 hrs
Capacity at bank full= 7.05 cfs
12.0" Diameter Pipe, n= 0.012
Length= 30.0' Slope= 0.0333 '/'

Reach 108: (new Reach)

Inflow Area = 0.620 ac, Inflow Depth > 4.87"
Inflow = 3.59 cfs @ 12.05 hrs, Volume= 0.252 af
Outflow = 3.56 cfs @ 12.05 hrs, Volume= 0.252 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.0 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.4 fps, Avg. Travel Time= 0.3 min

Peak Depth= 0.71' @ 12.05 hrs
Capacity at bank full= 4.21 cfs
12.0" Diameter Pipe, n= 0.012
Length= 42.0' Slope= 0.0119 '/'

Reach 109: (new Reach)

Inflow Area = 1.025 ac, Inflow Depth > 4.50"
Inflow = 5.39 cfs @ 12.05 hrs, Volume= 0.385 af
Outflow = 5.36 cfs @ 12.06 hrs, Volume= 0.385 af, Atten= 1%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.3 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.0 fps, Avg. Travel Time= 0.2 min

Peak Depth= 0.63' @ 12.05 hrs
Capacity at bank full= 7.38 cfs
12.0" Diameter Pipe, n= 0.012
Length= 52.0' Slope= 0.0365 '/'

Reach 110: (new Reach)

Inflow Area = 0.209 ac, Inflow Depth > 4.43"
Inflow = 1.16 cfs @ 12.02 hrs, Volume= 0.077 af
Outflow = 1.16 cfs @ 12.03 hrs, Volume= 0.077 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.7 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.4 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.42' @ 12.03 hrs
Capacity at bank full= 3.15 cfs
12.0" Diameter Pipe, n= 0.012
Length= 30.0' Slope= 0.0067 '/'

Reach 111: (new Reach)

Inflow Area = 0.555 ac, Inflow Depth > 4.42"
Inflow = 2.93 cfs @ 12.05 hrs, Volume= 0.204 af
Outflow = 2.93 cfs @ 12.05 hrs, Volume= 0.204 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 12.2 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.5 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.34' @ 12.05 hrs
Capacity at bank full= 11.47 cfs
12.0" Diameter Pipe, n= 0.012
Length= 17.0' Slope= 0.0882 '/'

Reach 112: (new Reach)

Inflow Area = 1.580 ac, Inflow Depth > 4.47"
Inflow = 8.29 cfs @ 12.05 hrs, Volume= 0.589 af
Outflow = 8.22 cfs @ 12.06 hrs, Volume= 0.589 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.5 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.4 fps, Avg. Travel Time= 0.3 min

Peak Depth= 0.93' @ 12.05 hrs
Capacity at bank full= 9.21 cfs
15.0" Diameter Pipe, n= 0.012
Length= 52.0' Slope= 0.0173 '/'

Reach 113: (new Reach)

Inflow Area = 1.580 ac, Inflow Depth > 4.47"
Inflow = 8.22 cfs @ 12.06 hrs, Volume= 0.589 af
Outflow = 8.21 cfs @ 12.06 hrs, Volume= 0.589 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 30.6 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 11.4 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.34' @ 12.06 hrs
Capacity at bank full= 51.30 cfs
15.0" Diameter Pipe, n= 0.012
Length= 42.0' Slope= 0.5374 '/'

Reach 114: (new Reach)

Inflow Area = 1.580 ac, Inflow Depth > 4.47"
Inflow = 8.21 cfs @ 12.06 hrs, Volume= 0.589 af
Outflow = 8.19 cfs @ 12.06 hrs, Volume= 0.589 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 17.9 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 6.8 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.50' @ 12.06 hrs
Capacity at bank full= 24.47 cfs
15.0" Diameter Pipe, n= 0.012
Length= 45.0' Slope= 0.1222 '/'

Reach 115: (new Reach)

Inflow Area = 0.207 ac, Inflow Depth > 3.51"
Inflow = 0.97 cfs @ 12.03 hrs, Volume= 0.060 af
Outflow = 0.97 cfs @ 12.04 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.6 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.6 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.31' @ 12.03 hrs
Capacity at bank full= 4.61 cfs
12.0" Diameter Pipe, n= 0.012
Length= 35.0' Slope= 0.0143 '/'

Reach 116: (new Reach)

Inflow Area = 2.583 ac, Inflow Depth > 4.40"
Inflow = 13.50 cfs @ 12.05 hrs, Volume= 0.947 af
Outflow = 13.23 cfs @ 12.06 hrs, Volume= 0.947 af, Atten= 2%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.8 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.6 fps, Avg. Travel Time= 0.6 min

Peak Depth= 1.21' @ 12.06 hrs
Capacity at bank full= 13.65 cfs
18.0" Diameter Pipe, n= 0.012
Length= 132.0' Slope= 0.0144 '/'

Reach 117: (new Reach)

Inflow Area = 0.796 ac, Inflow Depth > 4.49"
Inflow = 4.44 cfs @ 12.04 hrs, Volume= 0.298 af
Outflow = 4.38 cfs @ 12.05 hrs, Volume= 0.298 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.2 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.3 fps, Avg. Travel Time= 0.6 min

Peak Depth= 0.71' @ 12.05 hrs
Capacity at bank full= 7.20 cfs
15.0" Diameter Pipe, n= 0.012
Length= 85.0' Slope= 0.0106 '/'

Reach 118: (new Reach)

Inflow Area = 0.796 ac, Inflow Depth > 4.49"
Inflow = 4.47 cfs @ 12.04 hrs, Volume= 0.298 af
Outflow = 4.44 cfs @ 12.04 hrs, Volume= 0.298 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.8 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.4 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.49' @ 12.04 hrs
Capacity at bank full= 9.36 cfs
12.0" Diameter Pipe, n= 0.012
Length= 102.0' Slope= 0.0588 '/'

Reach 119: (new Reach)

Inflow Area = 0.310 ac, Inflow Depth > 4.43"
Inflow = 1.73 cfs @ 12.04 hrs, Volume= 0.114 af
Outflow = 1.73 cfs @ 12.04 hrs, Volume= 0.114 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.2 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.6 fps, Avg. Travel Time= 0.2 min

Peak Depth= 0.34' @ 12.04 hrs
Capacity at bank full= 6.82 cfs
12.0" Diameter Pipe, n= 0.012
Length= 32.0' Slope= 0.0313 '/'

Reach 120: (new Reach)

Inflow Area = 0.796 ac, Inflow Depth > 4.49"
Inflow = 4.48 cfs @ 12.04 hrs, Volume= 0.298 af
Outflow = 4.47 cfs @ 12.04 hrs, Volume= 0.298 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 25.5 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 9.2 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.27' @ 12.04 hrs
Capacity at bank full= 27.21 cfs
12.0" Diameter Pipe, n= 0.012
Length= 35.0' Slope= 0.4971 '/'

Reach POI 1: (new Reach)

Inflow Area = 2.949 ac, Inflow Depth > 4.38"
Inflow = 15.09 cfs @ 12.06 hrs, Volume= 1.076 af
Outflow = 15.09 cfs @ 12.06 hrs, Volume= 1.076 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 10: (new Reach)

Inflow Area = 0.256 ac, Inflow Depth > 2.84"
Inflow = 0.97 cfs @ 12.06 hrs, Volume= 0.061 af
Outflow = 0.97 cfs @ 12.06 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 11: (new Reach)

Inflow Area = 0.370 ac, Inflow Depth > 3.22"
Inflow = 1.62 cfs @ 12.03 hrs, Volume= 0.099 af
Outflow = 1.62 cfs @ 12.03 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 12: (new Reach)

Inflow Area = 0.181 ac, Inflow Depth > 4.23"
Inflow = 0.98 cfs @ 12.03 hrs, Volume= 0.064 af
Outflow = 0.98 cfs @ 12.03 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 3: (new Reach)

Inflow Area = 0.699 ac, Inflow Depth > 4.49"
Inflow = 3.82 cfs @ 12.04 hrs, Volume= 0.262 af
Outflow = 3.82 cfs @ 12.04 hrs, Volume= 0.262 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 4: (new Reach)

Inflow Area = 0.247 ac, Inflow Depth > 4.02"
Inflow = 1.25 cfs @ 12.06 hrs, Volume= 0.083 af
Outflow = 1.25 cfs @ 12.06 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 5: (new Reach)

Inflow Area = 1.436 ac, Inflow Depth > 3.51"
Inflow = 5.96 cfs @ 12.09 hrs, Volume= 0.420 af
Outflow = 5.96 cfs @ 12.09 hrs, Volume= 0.420 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 6: (new Reach)

Inflow Area = 0.329 ac, Inflow Depth > 4.48"
Inflow = 1.73 cfs @ 12.04 hrs, Volume= 0.123 af
Outflow = 1.73 cfs @ 12.04 hrs, Volume= 0.123 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 7: (new Reach)

Inflow Area = 0.199 ac, Inflow Depth > 3.92"
Inflow = 0.94 cfs @ 12.07 hrs, Volume= 0.065 af
Outflow = 0.94 cfs @ 12.07 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 8: (new Reach)

Inflow Area = 0.836 ac, Inflow Depth > 2.64"
Inflow = 2.38 cfs @ 12.08 hrs, Volume= 0.184 af
Outflow = 2.38 cfs @ 12.08 hrs, Volume= 0.184 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach POI 9: (new Reach)

Inflow Area = 1.054 ac, Inflow Depth > 2.60"
Inflow = 3.29 cfs @ 12.06 hrs, Volume= 0.228 af
Outflow = 3.29 cfs @ 12.06 hrs, Volume= 0.228 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach R1: (new Reach)

Inflow Area = 2.949 ac, Inflow Depth > 4.38" .
Inflow = 15.12 cfs @ 12.06 hrs, Volume= 1.076 af
Outflow = 15.09 cfs @ 12.06 hrs, Volume= 1.076 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.4 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.2 fps, Avg. Travel Time= 0.1 min

Peak Depth= 1.15' @ 12.06 hrs
Capacity at bank full= 16.09 cfs
18.0" Diameter Pipe, n= 0.012
Length= 18.0' Slope= 0.0200 '/'

Reach R10: (new Reach)

Inflow Area = 0.041 ac, Inflow Depth > 4.87"
Inflow = 0.24 cfs @ 12.01 hrs, Volume= 0.016 af
Outflow = 0.24 cfs @ 12.01 hrs, Volume= 0.016 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.7 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.4 fps, Avg. Travel Time= 0.4 min

Peak Depth= 0.16' @ 12.01 hrs
Capacity at bank full= 1.85 cfs
8.0" Diameter Pipe, n= 0.012
Length= 30.0' Slope= 0.0200 '/'

Reach R11: (new Reach)

Inflow Area = 0.263 ac, Inflow Depth > 4.38"
Inflow = 1.36 cfs @ 12.03 hrs, Volume= 0.096 af
Outflow = 1.35 cfs @ 12.04 hrs, Volume= 0.096 af, Atten= 1%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.4 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.5 fps, Avg. Travel Time= 0.8 min

Peak Depth= 0.39' @ 12.03 hrs
Capacity at bank full= 2.13 cfs
8.0" Diameter Pipe, n= 0.012
Length= 125.0' Slope= 0.0264 '/'

Reach R12: (new Reach)

Inflow Area = 0.329 ac, Inflow Depth > 4.48"
Inflow = 1.73 cfs @ 12.04 hrs, Volume= 0.123 af
Outflow = 1.73 cfs @ 12.04 hrs, Volume= 0.123 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.7 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.4 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.37' @ 12.04 hrs
Capacity at bank full= 2.93 cfs
8.0" Diameter Pipe, n= 0.012
Length= 20.0' Slope= 0.0500 '/'

Reach R13: (new Reach)

Inflow Area = 1.436 ac, Inflow Depth > 3.51"
Inflow = 5.97 cfs @ 12.09 hrs, Volume= 0.420 af
Outflow = 5.96 cfs @ 12.09 hrs, Volume= 0.420 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 21.9 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 7.8 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.38' @ 12.09 hrs
Capacity at bank full= 19.68 cfs
12.0" Diameter Pipe, n= 0.012
Length= 25.0' Slope= 0.2600 '/'

Reach R14: (new Reach)

Inflow Area = 0.066 ac, Inflow Depth > 4.87"
Inflow = 0.39 cfs @ 12.02 hrs, Volume= 0.027 af
Outflow = 0.38 cfs @ 12.03 hrs, Volume= 0.027 af, Atten= 3%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.7 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.4 fps, Avg. Travel Time= 0.9 min

Peak Depth= 0.26' @ 12.03 hrs
Capacity at bank full= 0.71 cfs
6.0" Diameter Pipe, n= 0.012
Length= 80.0' Slope= 0.0138 '/'

Reach R15: (new Reach)

Inflow Area = 0.660 ac, Inflow Depth > 3.01"
Inflow = 2.15 cfs @ 12.07 hrs, Volume= 0.165 af
Outflow = 2.13 cfs @ 12.08 hrs, Volume= 0.165 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.2 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.1 fps, Avg. Travel Time= 0.2 min

Peak Depth= 0.40' @ 12.08 hrs
Capacity at bank full= 4.60 cfs
10.0" Diameter Pipe, n= 0.013
Length= 45.0' Slope= 0.0440 '/'

Reach R16: (new Reach)

Inflow Area = 0.425 ac, Inflow Depth > 3.03"
Inflow = 1.63 cfs @ 12.07 hrs, Volume= 0.107 af
Outflow = 1.61 cfs @ 12.08 hrs, Volume= 0.107 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.5 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.8 fps, Avg. Travel Time= 0.2 min

Peak Depth= 0.29' @ 12.07 hrs
Capacity at bank full= 14.00 cfs
15.0" Diameter Pipe, n= 0.012
Length= 40.0' Slope= 0.0400 '/'

Reach R17: (new Reach)

Inflow Area = 0.562 ac, Inflow Depth > 3.48"
Inflow = 2.29 cfs @ 12.06 hrs, Volume= 0.163 af
Outflow = 2.29 cfs @ 12.06 hrs, Volume= 0.163 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.6 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.1 fps, Avg. Travel Time= 0.1 min

Peak Depth= 0.31' @ 12.06 hrs
Capacity at bank full= 24.14 cfs
18.0" Diameter Pipe, n= 0.012
Length= 10.0' Slope= 0.0450 '/'

Reach R7: (new Reach)

Inflow Area = 0.518 ac, Inflow Depth > 4.87"
Inflow = 3.02 cfs @ 12.03 hrs, Volume= 0.210 af
Outflow = 3.01 cfs @ 12.04 hrs, Volume= 0.210 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 12.9 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.9 fps, Avg. Travel Time= 0.3 min

Peak Depth= 0.34' @ 12.04 hrs
Capacity at bank full= 12.28 cfs
12.0" Diameter Pipe, n= 0.012
Length= 80.0' Slope= 0.1012 '/'

Reach R8: (new Reach)

Inflow Area = 0.699 ac, Inflow Depth > 4.49"
Inflow = 3.83 cfs @ 12.04 hrs, Volume= 0.262 af
Outflow = 3.82 cfs @ 12.04 hrs, Volume= 0.262 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.0 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.1 fps, Avg. Travel Time= 0.2 min

Peak Depth= 0.59' @ 12.04 hrs
Capacity at bank full= 5.90 cfs
12.0" Diameter Pipe, n= 0.012
Length= 30.0' Slope= 0.0233 '/'

Reach R9: (new Reach)

Inflow Area = 0.222 ac, Inflow Depth > 4.29"
Inflow = 1.14 cfs @ 12.02 hrs, Volume= 0.079 af
Outflow = 1.13 cfs @ 12.03 hrs, Volume= 0.079 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.4 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.8 fps, Avg. Travel Time= 0.3 min

Peak Depth= 0.46' @ 12.03 hrs
Capacity at bank full= 1.38 cfs
8.0" Diameter Pipe, n= 0.012
Length= 35.0' Slope= 0.0111 '/'

ATTACHMENT C

Water Quality Calculations

Water Quality Calculations
Martin's Point Redevelopment Project

Treatment Area 1 SUBCATCHMENT	PAVED AREA	TREATMENT VOLUME (1) FT^3	# OF STORMTREATS AT 0.75 gal/min. (2)	Stormcell for Storage Area Ft^2	Width	Length	# of Stormtreats	Storage in Units FT^3	100 % Storage Volume With Reduced Area for StormTreat Storage Area Ft^2	Width	Length	For Volume multiply Storage area by 2 95% Storage Volume With Reduced Area for StormTreat Storage Area Ft^2	Width	Length
6	10,521	842	1.5	420.84	20	21								
7	17,573	1,406	2.4	702.92	20	35								
TOTAL	28,094	2,248	3.9	1123.76	20	56	4.0	740	753.76	20	38	793	20	40

Treatment Area 2 SUBCATCHMENT	PAVED AREA	TREATMENT VOLUME (1) FT^3	# OF STORMTREATS AT 0.75 gal/min. (2)	Stormcell for Storage Area Ft^2	Width	Length			Stormcell for Storage Area Ft^2	Width	Length	Stormcell for Storage Area Ft^2	Width	Length
3and4	8,497	680	1.2	339.88	20	17								
5	10,445	836	1.4	417.8	20	21								
TOTAL	18,942	1,515	2.6	757.68	20	38	3.0	555	480.18	20	24	505	20	25

Treatment Area 3 SUBCATCHMENT	PAVED AREA	TREATMENT VOLUME (1) FT^3	# OF STORMTREATS AT 0.75 gal/min. (2)	Stormcell for Storage Area Ft^2	Width	Length			Stormcell for Storage Area Ft^2	Width	Length	Stormcell for Storage Area Ft^2	Width	Length
10and13	25,676	2,054	3.6	1027.04	20	51								
15	9,096	728	1.3	363.84	20	18								
TOTAL	34,772	2,782	4.8	1390.88	20	70	5.0	925	928.38	20	46	977	20	49

Treatment Area 4 SUBCATCHMENT	PAVED AREA	TREATMENT VOLUME (1) FT^3	# OF STORMTREATS AT 0.75 gal/min. (2)	Stormcell for Storage Area Ft^2	Width	Length			Stormcell for Storage Area Ft^2	Width	Length	Stormcell for Storage Area Ft^2	Width	Length
19	20,989	1,679	2.9	839.56	20	42								
20	16,864	1,349	2.3	674.56	20	34								
TOTAL	37,853	3,028	5.2	1514.12	20	76	6.0	1110	959.12	20	48	1010	20	50

TOTAL PAVED AREA TREATED sf	119,661
TOTAL PAVED AREA TREATED ac	2.75

(1) CALCULATED AT 1" PER ACRE OF IMPERVIUOS AREA, ADDITIONAL LAWN AREA NOT INCLUDED PER CONVERSATION WITH JEFF DENNIS ON 2-23-06
(2) Based upon system draining in 96 hrs, see 2-15-06 e-mail from Jeff Dennis. It is a conservative rate but all that is approved at this time.

ATTACHMENT D

Miscellaneous Supporting Documents

Exhibit A-1, continued: Hydrologic soil groups for United States soils

MESCH	B	HILLSBORO	B	HOLDERMAN	C	HOODVIEW	B	HOWELL	C
MESPER	B	HILLSDALE	B	HOLDERNESS	C	HOOGDAL	C	HOWLAND	C
MESPERIA	B	HILLTO	B	HOLDINGFORD	C	HOOKS	B	HOWSON	C
MESPERUS	B	HILLWOOD	B	HOLDREGE	B	HOOKSAN	A	HOYE	B
MESSEL	B/D	HILMAR	D	HOLILLIPAH	A	HOOKTON	C	HOYLETON	C
MESSELBERG	D	HILMAR, DRAINED	B	HOLLAND	B	HOOLEHUA	B	HOYPUS	A
MESSELTINE	B	HILMOE	C	HOLLANDLAKE	B	HOOLY	C	HOYTVILLE	C/D
MESSING	B	HILO	A	HOLLINGER	B	HOOPAL	D	HUACHUCA	D
MESSLAN	C	HILOLO	D	HOLLIS	C/D	HOOPER	D	HUALAPAI	C
MESSON	C	HILT	B	HOLLISTER	D	HOOPESTON	B	HUE	B
METERWA	C	HILTON	B	HOLLOMAN	D	HOOPLITE	D	HUBBARD	A
METTINGER	C/D	HINCKLEY	A	HOLLOMEX	B	HOOSAN	B	HUBBARDTON	D
MEUSSER	C	HINDES	C	HOLLOW	C	HOOSEGOW	B	HUBBELL	B
MEUVELTON	C	HINESBURG	C	HOLLOWAY	B	HOOSIC	A	HUBERLY	D
MEVITT	D	HINKER	C	HOLLOWTREE	C	HOOSIERVILLE	C	HUBERT	B
MEXT	B	HINKLE	D	HOLLY	B/D	HOOSIMBIM	B	HUBLERSBURG	B
MEYDER	B	HINMAN	C	HOLLY, PONDED	D	HOOT	D	HUCKLEBERRY	C
MEYDLAUFF	B	HINSDALE	D	HOLLY SPRINGS	D	HOOTEN	D	HUCKLEBERRY, HIGH RAINFALL	B
MEYTOU	B	HIRAMSBURG	C	HOLLYWELL	B	HOPCO	C		
MEZEL	B	HIRIDGE	D	HOLLYWOOD	D	HOPDRAW	A	HUDNUT	B
MI VISTA	C	HIRSCHDALE	C	HOLMAN	A	HOPEKA	D	HUDSON	C
MIARC	C	HISEGA	C	HOLMDEL	C	HOPKINS	B	HUECO	C
MIBAR	C	HISKEY	B	HOLMES	B	HOPLAND	B	HUEL	A
MIBBARD	C	HISLE	D	HOLOHAN	B	HOPLEY	B	HUENEME	C
MIBBING	C	HITCHCOCK	B	HOLOMUA	B	HOPSONVILLE	C	HUENEME, MODERATELY WET	B
MIBERNIA	C	HITILO	A	HOLOPAW	B/D	HOQUIAM	B		
MIBRITEN	B	HITT	B	HOLOPAW, DEPRESSIONAL	C	HORD	B	HUENEME, DRAINED	B
MICKMAN	B	HIVAL	D			HOREB	C	HUERFANO	D
MICKORY	C	HIWAN	D	HOLOPAW, FREQUENTLY FLOODED	D	HOREB, GRAVELLY SUBSTRATUM	B	HUEY	D
MICKS	B	HIWASSEE	B					HUFFINE	B
MICKSVILLE	B	HIWOOD	A			HORNELL	D	HUFFMAN	B
MICKSVILLE, BEDROCK SUBSTRATUM	C	HIXTON	B	HOLSINE	B	HORNING	B	HUFFTON	B
		HOADLY	C	HOLSTEIN	B	HORNITOS	D	HUGGINS	C
		HOBACKER	B	HOLSTON	B	HORNSBY	C	HUGHES	B
MICOTA	B	HOBAN	B	HOLT	B	HORNSVILLE	C	HUGHESVILLE	C
MIDALGO	B	HOBBS	B	HOLTER	B	HORROCKS	B	HUGO	B
MIDATSA	B	HOBCAW	D	HOLTLE	B	HORSECAMP	D	HUGUS	B
MIDEAWAY	D	HOBE	A	HOLTON	C	HORSERIDGE	B	HUGUSTON	D
MIDEWOOD	B/D	HOBERG	C	HOLTVILLE	C	HORSESHOE	B	HUICHICA	C
MIERRO	B	HOBIT	C	HOLYOKE	C/D	HORSETHIEF	B	HUICHICA, PONDED	D
MIGGINS	D	HOBO	D	HOMA	C	HORSLEY	D	HUIKAU	A
MIGGINSVILLE	C	HOBOG	D	HOME CAMP	C	HORST	B	HUKILL	B
MIGH GAP	C	HOBONNY	D	HOMELAKE	B	HORTONVILLE	B	HULETT	B
MIGHAMS	D	HOBSON	C	HOMELAND	C	HOSKIN	C	HULLS	C
MIGHBANK	C	HOBUCKEN	D	HOMER	B	HOSKINNINI	D	HULLT	B
MIGHCAMP	B	HOCAR	D	HOMESTAKE	C	HOSLEY	D	HULUA	D
MIGHFIELD	B	HOCHHEIM	B	HOMESTEAD	B	HOSMER	C	HUM	B
MIGHHORN	B	HOCKINSON	D	HOMEWOOD	C	HOSSICK	B	HUMACAO	B
MIGHMORE	B	HOCKINSON, MODERATELY WET	C	HOMME	C	HOSTAGE	B	HUMATAS	C
MIGHPOINT	D			HOMME, MODERATELY WET	B	HOT LAKE	C	HUMBARGER	B
MIGHROCK	D	HOCKINSON, DRAINED	B			HOTAW	C	HUMBIG	C
MIGHTOWER	C	HOCKLEY	C	HOMOSASSA	D	HOTCREEK	D	HUMBIRD	B
MIGHWOOD	C	HOCKLEY, GRADED	D	HONAUNAU	C	HOTEL	C	HUMBOLDT	D
MIHIMANU	B	HODA	C	HONCUT	B	HOTSPRINGS	B	HUMBOLDT, MODERATELY WET, SALINE-ALKALI	B
MIIBNER	C	HODEDO	C	HONDALE	D	HOUDEK	B		
MIKO PEAK	B	HODENPYL	B	HONDOHO	B	HOUGH	B		
MIKO SPRINGS	B	HODGE	A	HONEOYE	B	HOUGHTON	A/D	HUMBOLDT, MODERATELY WET, SALINE	B
MILAIRE	B	HODGINS	B	HONEYDEW	C	HOUGHTON, PONDED	D		
MILAND	B	HODGSON	C	HONEYGROVE	B	HOUGHTONVILLE	C		
MILDEBRECHT	C	HOEHNE	A	HONEYJONES	B	HOUK	C	HUMBOLDT, DRAINED, STRONGLY SALINE	B
MILDRETH	D	HOFFLAND	D	HONEYVILLE	C	HOULA	B		
MILEA	D	HOFFMANVILLE	C	HONKER	D	HOULKA	D	HUMBOLDT, DRAINED, NONSALINE	B
MILES	B	HOFFSTADT	B	HONLAK	C	HOURGLASS	B		
MILGER	B	HOFLY	C	HONLAK, DRAINED	B	HOUSE MOUNTAIN	D	HUMBOLDT, MODERATELY WET	B
MILGRAVE	B	HOGADERO	B	HONLU	B	HOUSER	D		
MILIGHT	D	HOGANSBURG	B	HONN	B	HOUSEROCK	D	HUMBOLDT, DRAINED	B
MILINE	D	HOGBACK	C	HONOBIA	C	HOUSTAKE	C	HUMDUN	B
MILLBRICK	D	HOGG	C	HONOKAA	A	HOUSTON	D	HUME	C
MILLCO	B	HOGMALAT	D	HONOLUA	B	HOUSTON BLACK	D	HUMESTON	C/D
MILLEMANN	C	HOGRIS	B	HONOMANU	A	HOVDE	D	HUMKER	C
MILLERY	C	HOH	B	HONONEGAH	A	HOVEN	D	HUMMINGTON	C
MILLET	B/D	HOHMANN	C	HONOULIULI	B	HOVENWEEP	C	HUMPHREYS	B
MILLFIELD	B	HOKO	C	HONTAS	B	HOVERT	D	HUMPTULIPS	B
MILLGATE	D	HOLBORN	C	HONTOON	B/D	HOVEY	C	HUMSKEL	C
MILLIARD	B	HOLBROOK	B	HONUAULU	A	HOWARD	A	HUN	B
MILLIARD, MODERATELY WELL DRAINED	C	HOLCOMB	D	HOOD	B	HOWARDSVILLE	A	HUNCHBACK	D
		HOLDAWAY	D	HOODLE	B	HOWCAN	B	HUNDRAW	D
		HOLDEN	B	HOODOO	D	HOWCREE	C	HUNEWILL	B
HILLON	C	HOLDER	B	HOODSPORT	C	HOWE	C	HUNGRY	C

NOTES: TWO HYDROLOGIC SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION. MODIFIERS SHOWN, E.G., BEDROCK SUBSTRATUM, REFER TO A SPECIFIC SOIL SERIES PHASE FOUND IN SOIL MAP LEGEND.

Exhibit A-1, continued: Hydrologic soil groups for United States soils

SODNAKER	C	SPINEKOP	B	STABLER	B	STEUBER	B	STRELNA, SILTY	B
SODSAP	C	SPINEKOP, SALINE	C	STADY	B	STEVENS	B	SUBSTRATUM	
SOPER	C	SPINEKOP,	C	STAFFORD	C	STEVENSON	B	STREVELL	B
SOQUEL	B	MODERATELY WET		STAGECOACH	B	STEWART	D	STRICKER	B
SORENSEN	B	SPINKS	A	STAHL	C	STEWVAL	D	STRICKLAND	C
SORF	C	SPINLIN	C	STAKE	C	STICKNEY	C	STRINGAM	B
SORRENTO	B	SPINNEY	B	STALEY	B	STIDHAM	B	STRINGTOWN	B
SORTER	D	SPIRES	D	STALLINGS	C	STIEN	B	STRINGTOWN, GRADED	C
SORUM	D	SPIRIT	C	STAMBAUGH	B	STIGLER	D	STROLE	C
SOSA	C	SPIRO	B	STAMFORD	D	STILES	C	STROM	C
SOSTIEN	D	SPIVEY	B	STAMP	D	STILGAR	B	STROMAL	B
SOTIN	B	SPLAWN	C	STAMPEDE	D	STILL	B	STRONGHOLD	B
SOUGHE	D	SPLENDORA	C	STAN	B	STILLMAN	B	STRONGHURST	B
SOULAJULE	C	SPLITEN	D	STANDLEY	C	STILLWATER	D	STROUPE	C
SOUTHACE	B	SPLITRO	D	STANDUP	B	STILSKIN	C	STROZI	C
SOUTHAM	D	SPLITTOP	C	STANEY	D	STILSON	B	STRYCH	B
SOUTHFORK	D	SPOFFORD	D	STANFIELD	C	STIMCA	B	STRYKER	C
SOUTHGATE	D	SPOFMORE	C	STANISLAUS	C	STIMSON	D	STUBBLEFIELD	C
SOUTHMOUNT	C	SPOKANE	C	STANISLAUS, WET	D	STINES	B	STUBBS	C
SOUTHRIDGE	B	SPOKEL	B	STANROD	C	STINGAL	B	STUCKY	B
SOUTHWICK	C	SPONSELLER	B	STAPALOOP	B	STINGDORN	D	STUDEBAKER	B
SOWCAN	B	SPOOL	D	STAPLES	B/D	STIPE	C	STUKEL	D
SOWCAN, SOMEWHAT POORLY DRAINED	C	SPOONER	C/D	STAPLETON	B	STIRK	D	STUMBLE	A
		SPOTSYLVANIA	C	STAPP	C	STIRRUP	B	STUMPP	D
SPAA	D	SPOTTSWOOD	B	STARBUCK	D	STIRUM	B/D	STUMPTOWN	B
SPACE CITY	A	SPRABAT	B	STARGO	B	STIRUM, PONDED	D	STUNNER	B
SPADE	B	SPRAY	B	STARHOPE	D	STISSING	C	STUNTZ	C
SPADRA	B	SPRECKELS	C	STARICHKOF	D	STIVERSVILLE	B	STURGEON	B
SPAGER	D	SPRIGGS	C	STARKEY	C	STOCKADE	B/D	STURGILL	D
SPALDING	D	SPRING	C	STARKS	C	STOCKBRIDGE	C	STURKIE	B
SPANA	D	SPRINGDALE	A	STARLEY	D	STOCKEL	D	STUTTGART	D
SPANAWAY	A	SPRINGDALE, STONY	B	STARMAN	D	STOCKLAND	B	STUTZMAN	C
SPANEL	D	SPRINGER	B	STARR	C	STOCKPEN	D	STUTZMAN, WET	D
SPANG	B	SPRINGERVILLE	D	STARVEOUT	B	STODA	B	STUTZVILLE	C
SPANGENBURG	C	SPRINGFIELD	D	STASER	B	STODICK	D	STYERS	D
SPANGENBURG, PONDED	D	SPRINGGULCH	B	STATE	B	STOHLMAN	D	STYX	B
		SPRINGLAKE	A	STATELINE	D	STOKES	D	SUAK	C
SPANGLER	C	SPRINGMEYER	B	STATLER	B	STOKLY	B	SUBACO	D
SPARANK	D	SPRINGSTEEN	C	STATZ	D	STOMAR	C	SUBLETTE	B
SPARHAM	D	SPRINGWATER	C	STAVELY	B	STONEBERGER	D	SUBLIGNA	B
SPARKHULE	D	SPROUL	D	STAYTON	D	STONEBURG	B	SUBWELL	B
SPARNO	B	SPRUCEDALE	D	STEARNS	D	STONEHAM	B	SUCARNOOCHEE	D
SPARR	C	SPUD	C	STECOAH	B	STONEHEAD	C	SUCCESS	A
SPARTA, SILTY CLAY LOAM SUBSTRATUM	B	SPUDROCK	C	STECUM	C	STONELICK	B	SUCCOR	D
		SPUKWUSH	B	STEED	A	STONELL	B	SUCHES	B
SPARTA, LOAMY SUBSTRATUM	A	SPUR	B	STEEDMAN	D	STONER	B	SUDBURY	B
		SPURGER	C	STEEDMAN, STONY	C	STONEVILLE	B	SUDDUTH	C
SPARTA, MAAT>50	A	SPURLOCK	B	STEEKEE	C	STONEWALL	C	SUDLEY	B
SPARTA, MAAT<50	A	SQUALICUM	B	STEELE	C	STONEWELL	A	SUDWORTH	B
SPARTA, BEDROCK SUBSTRATUM	A	SQUALLY	B	STEENS	C	STONO	B/D	SUEPERT	C
		SQUAW	B	STEEPCAN	D	STONYFORD	D	SUEY	B
SPASPREY	C	SQUAWCREEK	D	STEESE	B	STOOKMOOR	C	SUFFIELD	C
SPEAKER	C	SQUAWROCK	C	STEEVER	B	STORDEN	B	SUFFOLK	B
SPEAKS	A	SQUAWTIP	C	STEFF	C	STORLA	B	SUGAKOOL	B
SPEARFISH	D	SQUIRES	C	STEGALL	C	STORMITT	B	SUGARBOWL	B
SPEARHEAD	B	ST. ALBANS	B	STEIGER	A	STOTT	C	SUGARDEE	B
SPEARMAN	B	ST. ANTHONY	B	STEILACOOM	C	STOUGH	C	SUGARLOAF	B
SPEARVILLE	C	ST. AUGUSTINE	C	STEINAUER	B	STOUT	D	SUGLO	B
SPECIE	B	ST. AUGUSTINE,	B	STEINBECK	B	STOVHO	C	SUISUN	D
SPECK	D	ORGANIC		STEINSBURG	C	STOWE	C	SULA	B
SPECTACLE	C	SUBSTRATUM		STEIVER	C	STOWELL	D	SULLIVAN	B
SPECTER	C	ST. CHARLES	B	STELLA	C	STOY	C	SULLY	B
SPEELYAI	D	ST. CLAIR	D	STELLAR	C	STRABER	C	SULOAF	B
SPEER	B	ST. ELMO	A	STEMEER	C	STRAHAN	B	SULPHURA	D
SPEIGLE	B	ST. GEORGE	B	STEMILT	B	STRAIGHT	C	SULSAVAR	B
SPENARD	D	ST. GEORGE, SALINE	C	STENLEY	C	STRANDLINE	B	SULTAN	C
SPENCER	B	ST. GEORGE, WET	D	STEPPLE	B	STRANDQUIST	B/D	SUMAN	B/D
SPENLO	B	ST. HELENS	B	STENDAL	C	STRAT	B	SUMAS	D
SPENS	A	ST. IGNACE	D	STEPHEN	C	STRATFORD	B	SUMATRA	B
SPERRY	C/D	ST. JOHNS	B/D	STEPHENVILLE	B	STRATTON	C	SUMINE	C
SPEXARTH	C	ST. JOHNS,	D	STEPROCK	B	STRAW	B	SUMMERFIELD	D
SPMINX	D	DEPRESSIONAL		STEPSTONE	B	STRAWN	B	SUMMERS	B
SPICER	B/D	ST. LUCIE	A	STEPTOE	B	STREATOR	B/D	SUMMERTON	B
SPICERTON	D	ST. MARTIN	D	STERLING	B	STRELNA	C	SUMMERVILLE	D
SPICEWOOD	C	ST. MARYS	B	STERLINGTON	B	STRELNA,	B	SUMMIT	C
SPIKE	B	ST. NICHOLAS	D	STERRETT	D	LACUSTRINE		SUMMITVILLE	C
SPILLCO	B	ST. ONGE	B	STETSON	B	SUBSTRATUM		SUMPF	D
SPILLVILLE	B	ST. PAUL	B	STETTER	D	STRELNA, TILL	B	SUMTER	C
SPILOCK	D	ST. THOMAS	D	STEUBEN	B	SUBSTRATUM		SUNTERVILLE	C

NOTES: TWO HYDROLOGIC SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION.
MODIFIERS SHOWN, E.G., BEDROCK SUBSTRATUM, REFER TO A SPECIFIC SOIL SERIES PHASE FOUND IN SOIL MAP LEGEND.

Exhibit A-1, continued: Hydrologic soil groups for United States soils

WILSON	D	WISHARD	C	WOODS CROSS	D	WYNDOOSE	D	YEGEN	B
WILSONGULCH	B	WISHBONE	B	WOODSEYE	D	WYOCENA	B	YEGUAS	C
WILSONVILLE	D	WISHEYLU	C	WOODSFIELD	C	WYOMING	A	YELJACK	B
WILSOR	B	WISHKAH	D	WOODSIDE	B	WYRENE	B	YELLOWBAY	B
WILST	C	WISHKAH, DRAINED	C	WOODSLAKE	D	WYSOCKING	C/D	YELLOWHOUND	B
WILTON	B	WISKAN	C	WOODSON	D	XANA	E	YELLOWROCK	A
WINADA	C	WISKIFLAT	B	WOODSTOCK	C/D	XANADU	B	YELLOWSTONE	D
WINBERRY	C	WISNER	B/D	WOODSTOWN	C	XAVIER	B	YELM	C
WINCHESTER	A	WISTER	C	WOODTELL	D	XENIA	B	YEMASSEE	C
WINCHUCK	C	WITBECK	B/D	WOODVILLE	D	XENO	B	YENCE	C
WIND RIVER	B	WITEFELS	B	WOODWARD	B	XERTA	C	YENLO	B
WINDCOAT	D	WITHAM	D	WOODWEST	C	XERXES	D	YENRAB	A
WINDER	B/D	WITHEE	C	WOOFUS	D	XICA	C	YEDMAN	B
WINDER,	D	WITHERBEE	A/D	WOOLPER	C	XINE	C	YEOPIN	B
DEPRESSIONAL		WITHERELL	D	WOOLSEY	B	XIPE	D	YERINGTON	A
WINDHAM	B	WITHERS	C	WOOLSTALF	B	XIPE, MODERATELY	C	YERMO	B
WINDICREEK	A	WITT	B	WOOLSTED	B	WET		YESUM	B
WINDMILL	B	WITTEN	D	WOONSOCKET	B	XMAN	D	YETTEM	B
WINDSOR	A	WITTENBERG	B	WOOSLEY	C	YACOLT	B	YETULL	A
WINDTHORST	C	WITZEL	D	WOOSTER	C	YAGO	C	YIGO	B
WINDWHISTLE	C	WIX	C	WORCESTER	C	YAHANA	C	YIPOR	B
WINDWHISTLE, WARM	B	WIXOM	B	WORDEN	C	YAHARA	C	YLIG	C
WINDY	B	WOCKLEY	C	WORF	D	YAHNE	C	YOBE	C
WINDYPOINT	B	WODA	D	WORFKA	D	YAHOLA	B	YOCHUM	C
WINEG	B	WODEN	B	WORFMAN	D	YAHOO	D	YOCKEY	C
WINEMA	C	WODSKOW	C	WORFSTONE	C	YAINAX	B	YODER	B
WINETTI	B	WODSKOW, DRAINED	B	WORK	C	YAKI	D	YODY	C
WINEVADA	C	WOHLY	B	WORK, GRAVELLY	B	YAKIMA	B	YOHURT	D
WINFALL	B	WOLCO	C	WORLAND	C	YAKUS	D	YOKAYD	D
WINFIELD	B	WOLCOTT	B/D	WORLEY	D	YAKUTAT	A	YOKOHL	D
WING	D	WOLDALE	D	WORNSER	C	YALELAKE	B	YOKUT	B
WINGATE	B	WOLDALE, DRAINED	C	WOROCK	B	YALESVILLE	C	YOLLABOLLY	D
WINGER	B/D	WOLF	B	WORSHAM	D	YALLANI	B	YOLO	B
WINGINAW	D	WOLF POINT	C	WORTH	C	YALMER	B	YOLOGO	D
WINGVILLE	D	WOLFCREEK	B	WORTHEN	B	YAMAC	B	YOMBA	B
WINIFRED	C	WOLFESON	C	WORTHING	D	YAMHILL	C	YOMONT	B
WINK	B	WOLFESON, WET	D	WORTMAN	D	YAMO	B	YONGES	D
WINKEL	D	WOLFEY	C	WORTMAN, SANDY	A	YAMSAY	D	YONNA	D
WINKLEMAN	C	WOLFPEN	A	WOYOKA	C	YANA	B	YORBA	D
WINKLEMAN, WET	D	WOLFTEVER	C	WRANGELL	D	YANCY	D	YORK	C
WINKLER	B	WOLLARD	C	WRANGO	A	YANKEE	D	YORKTOWN	D
WINLER	D	WOLLENT	D	WRAYHA	D	YANKTON	B	YORKTREE	C
WINLO	D	WOLOT	B	WREDAM	B	YANUSH	B	YORKVILLE	D
WINN	C	WOLVERINE	A	WRENCOE	D	YAP	B	YOST	D
WINNEBAGO	B	WOMACK	C	WRENMAN	C	YAPOAH	B	YOST, DRAINED	C
WINNECONNE	C	WOO	B	WRENTHAM	C	YAQUI	B	YOUD	D
WINNECOOK	C	WOO, OVERWASH	C	WRIGHT	C	YAQUINA	D	YOUGA	B
WINNEMUCCA	B	WOO, WET	C	WRIGHTMAN	C	YAQUINA, DRAINED	C	YOUGA, SANDY	D
WINNESHIEK	B	WOOD RIVER	D	WRIGHTSBORO	C	YARCO	D	SUBSTRATUM	
WINNETT	D	WOODBECK	B	WRIGHTSVILLE	D	YARDLEY	C	YOUJAY	D
WINNSBORO	D	WOODBINE	B	WRIGHTWOOD	B	YARTS	B	YOUMAN	C
WINOM	D	WOODBRIDGE	C	WUKOKI	B	YATAHONEY	C	YOUNGSTON	B
WINONA	D	WOODBURN	C	WUKSI	A	YATAHONEY, STONY	D	YOUNGSTON, WET	C
WINOOSKI	B	WOODBURY	D	WULFERT	D	YATES	D	YOURAME	B
WINOPEE	B	WOODCOCK	B	WUNJEY	B	YAUCO	C	YOUTLKUE	D
WINRIDGE	D	WOODFORD	D	WUPATKI	D	YAUHANNAH	B	YOVIMPA	D
WINSHIP	C	WOODGULCH	A	WURNO	C	YAUPON	D	YPSI	C
WINSPECT	B	WOODHALL	C	WURSTEN	B	YAWDIM	D	YRIBARREN	D
WINSTON	B	WOODHURST	C	WURTSBORO	C	YAWHEE	B	YSIDORA	C
WINT	D	WOODIN	C	WYALUSING	D	YAWKEY	B	YTURBIDE	A
WINTERFIELD	A/D	WOODINGTON	B/D	WYANDOTTE	D	YAXON	B	YTURRIA	A
WINTERHAVEN	B	WOODINVILLE	D	WYANT	C	YEAGER	A	YUBA	D
WINTERIDGE	B	WOODINVILLE,	C	WYARD	E	YFARY	C	YUKO	D
WINTERS	C	DRAINED		WYARNO	B	YEATES HOLLOW	B	YUKON	D
WINTERSBURG	C	WOODLAWN	B	WYATT	C	YEATES HOLLOW,	C	YULEE	D
WINTERSET	C	WOODLEAF	C	WYCOLO	C	LOAMY SUBSTRATUM,		YUNES	D
WINTHROP	A	WOODLY	B	WYE	B	STONY		YUNQUE	C
WINTLEY	B	WOODLYN	D	WYEAST	D	YEATES HOLLOW,	C	YURM	D
WINTON	C	WOODMANSIE	B	WYETH	B	LOAMY SUBSTRATUM		YUTRUE	D
WINTONER	B	WOODMERE	E	WYEVILLE	C	YEATES HOLLOW,	C	YUVAS	D
WINU	C	WOODMONT	C	WYICK	D	STONY		ZAAR	D
WINZ	D	WOODPASS	B	WYKEHAM	B	YEATES HOLLOW,	C	ZABA	B
WIOTA	B	WOODROCK	C	WYKOFF	B	NONSTONY		ZACA	D
WIPPLE	C	WOODROW	B	WYMAN	E	YEATES HOLLOW, DRY	C	ZACHARIAS	B
WIRT	B	WOODROW,	C	WYMORE	D	YEATES HOLLOW,	C	ZACHARY	C
WISCOW	D	SALINE-ALKALI		WYNDMERE	B	COBBLY		ZACK	D
WISE	C	WOODROW,	C	WYNN	B	YEATON	C	ZADOG	A/D
WISEMAN	A	OCCASIONALLY		WYNNVILLE	C	YECROSS	A	ZADVAR	D
WISFLAT	D	FLOODED		WYNONA	C	YEDLICK	B	ZAFRA	B

NOTES: TWO HYDROLOGIC SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION.
MODIFIERS SHOWN, E.G., BEDROCK SUBSTRATUM, REFER TO A SPECIFIC SOIL SERIES PHASE FOUND IN SOIL MAP LEGEND.

From: Dennis, Jeff
Sent: Wednesday, February 15, 2006 4:37 PM
To: Viola, Ben
Subject: RE: Stormtreat System

I haven't written that part of the manual yet. They are approved as alternative filters provided:

- the discharge orifice for each Stormtreat tank is set to discharge at 0.75 gal/min (the only data we've seen from Stormtreat was with disharge rates of 0.5 gal/min/tank (we stretched it to 0.75), and that data is what we've based our approval on. I've asked them many times in the past to give us data at a higher discharge rate because I expect they'll work virtually as well at 1 gal/min, or even 2 gal/min, but I have yet to see any data)
- the required volume (1.0" for imp, 0.4 for landscaped) is stored and slowly bled through the system at the above rate of 0.75 gal/min/tank (i.e. 4 tanks would be 3.0 gal/min for the whoe system)
- the system drains within 96 hours to be ready for the next storm

If you do the math, that means you need at least 6 stormtreat tanks per acre of impervious area in order to be able to treat 1.0" of runoff in 4 days. I personally think this is overkill but need some data from Stormtreat to support raising the discharge rate above 0.75 gal/min/tank. I'm hoping we can approve them at 2 gal/min/tank with a minimum treatment time of 72 hours (we're stretcheng to let them have 96 hours), which would bring it down to 3 tanks per acre of impervious and would make them more economically viable.

Jeff

From: Viola, Ben
Sent: Wednesday, February 15, 2006 3:50 PM
To: Dennis, Jeff
Subject: Stormtreat System

In a meeting with Dwight Anderson of Deluca Hoffman the Stormtreat System was proposed as possible quality treatment. Do you have an approval letter for these units and what sizing criterion is appropriate for these units?

Ben Viola

Reach POI 8: (new Reach) Inflow=0.51 cfs 0.051 af
Outflow=0.51 cfs 0.051 af

Reach POI 9: (new Reach) Inflow=1.37 cfs 0.089 af
Outflow=1.37 cfs 0.089 af

Reach R1: (new Reach) Peak Depth=0.31' Max Vel=5.1 fps Inflow=0.82 cfs 0.051 af
D=8.0" n=0.012 L=18.0' S=0.0200 '/' Capacity=1.85 cfs Outflow=0.82 cfs 0.051 af

Reach R10: (new Reach) Peak Depth=0.12' Max Vel=3.1 fps Inflow=0.13 cfs 0.009 af
D=8.0" n=0.012 L=30.0' S=0.0200 '/' Capacity=1.85 cfs Outflow=0.13 cfs 0.009 af

Reach R11: (new Reach) Peak Depth=0.27' Max Vel=5.5 fps Inflow=0.72 cfs 0.050 af
D=8.0" n=0.012 L=125.0' S=0.0264 '/' Capacity=2.13 cfs Outflow=0.71 cfs 0.050 af

Reach R12: (new Reach) Peak Depth=0.26' Max Vel=7.4 fps Inflow=0.91 cfs 0.064 af
D=8.0" n=0.012 L=20.0' S=0.0500 '/' Capacity=2.93 cfs Outflow=0.91 cfs 0.064 af

Reach R13: (new Reach) Peak Depth=0.23' Max Vel=16.8 fps Inflow=2.33 cfs 0.141 af
D=12.0" n=0.012 L=25.0' S=0.2600 '/' Capacity=19.68 cfs Outflow=2.33 cfs 0.141 af

Reach R14: (new Reach) Peak Depth=0.19' Max Vel=3.1 fps Inflow=0.21 cfs 0.014 af
D=6.0" n=0.012 L=80.0' S=0.0138 '/' Capacity=0.71 cfs Outflow=0.21 cfs 0.014 af

Reach R15: (new Reach) Peak Depth=0.18' Max Vel=5.3 fps Inflow=0.46 cfs 0.031 af
D=10.0" n=0.013 L=45.0' S=0.0440 '/' Capacity=4.60 cfs Outflow=0.46 cfs 0.031 af

Reach R16: (new Reach) Peak Depth=0.21' Max Vel=6.4 fps Inflow=0.89 cfs 0.054 af
D=15.0" n=0.012 L=40.0' S=0.0400 '/' Capacity=14.00 cfs Outflow=0.89 cfs 0.054 af

Reach R17: (new Reach) Peak Depth=0.26' Max Vel=5.4 fps Inflow=1.12 cfs 0.069 af
D=18.0" n=0.012 L=20.0' S=0.0225 '/' Capacity=17.07 cfs Outflow=1.12 cfs 0.069 af

Reach R3: (new Reach) Peak Depth=0.31' Max Vel=3.4 fps Inflow=0.54 cfs 0.037 af
D=8.0" n=0.013 L=140.0' S=0.0100 '/' Capacity=1.21 cfs Outflow=0.53 cfs 0.037 af

Reach R4: (new Reach) Peak Depth=0.32' Max Vel=6.4 fps Inflow=1.06 cfs 0.074 af
D=8.0" n=0.013 L=30.0' S=0.0360 '/' Capacity=2.29 cfs Outflow=1.06 cfs 0.074 af

Reach R5: (new Reach) Peak Depth=0.25' Max Vel=10.0 fps Inflow=1.20 cfs 0.084 af
D=8.0" n=0.013 L=90.0' S=0.1100 '/' Capacity=4.01 cfs Outflow=1.19 cfs 0.084 af

Reach R6: (new Reach) Peak Depth=0.31' Max Vel=5.1 fps Inflow=1.19 cfs 0.084 af
D=15.0" n=0.013 L=50.0' S=0.0200 '/' Capacity=9.14 cfs Outflow=1.19 cfs 0.084 af

Reach R7: (new Reach) Peak Depth=0.24' Max Vel=10.6 fps Inflow=1.54 cfs 0.094 af
D=12.0" n=0.012 L=80.0' S=0.1012 '/' Capacity=12.28 cfs Outflow=1.53 cfs 0.094 af

Reach R8: (new Reach) Peak Depth=0.44' Max Vel=7.1 fps Inflow=2.37 cfs 0.146 af
D=12.0" n=0.012 L=30.0' S=0.0233 '/' Capacity=5.90 cfs Outflow=2.36 cfs 0.146 af

Reach R9: (new Reach) Peak Depth=0.31' Max Vel=3.8 fps Inflow=0.60 cfs 0.041 af
D=8.0" n=0.012 L=35.0' S=0.0111 '/' Capacity=1.38 cfs Outflow=0.59 cfs 0.041 af

Total Runoff Area = 8.249 ac Runoff Volume = 0.979 af Average Runoff Depth = 1.42"

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

JOHN ELIAS BALDACCI
GOVERNOR

EARLE G. SHETTLEWORTH, JR.
DIRECTOR

April 7, 2006

David C. Webster, AIA
PDT Architects
49 Dartmouth Street
Portland, Maine 04101

Re: Martin's Point Redevelopment Project

Dear David:

I am writing to follow-up on our March 31, 2006 meeting at which you reviewed with me and Kirk Mohney of my staff the revised site plan, architectural renderings, and several site simulation views (variously dated February 24, March 7, 14, 22, and 29, 2006) for the proposed Martin's Point development that includes the Portland Marine Hospital.

As I indicated to you during our meeting, I am pleased with the effort that you and your client have made to explore alternative design approaches in order to minimize the project's impact on the Marine Hospital and its site. Based on the material that we reviewed on the 31st, I am comfortable with the overall development concept and site design. Please submit for the Commission's review and approval the construction documents for work on the Marine Hospital. We will also need to review the subsequent phases of the project as they are planned.

Please do not hesitate to contact Kirk if you have any questions at this time..

Sincerely,

Earle G. Shettleworth, Jr.
Director

PHONE: (207) 287-2132

FAX: (207) 287-2335

GEOTECHNICAL ENGINEERING SERVICES
PROPOSED MARTIN'S POINT
FACILITY REDEVELOPMENT
VERANDA STREET
PORTLAND, MAINE

05-0927 **January 12, 2006**

PREPARED FOR:

Martin's Point Healthcare
Attention: Ms. Ann Tucker, Director of Support Services
331 Veranda Street
Portland, Maine 04104

PREPARED BY:

TABLE OF CONTENTS

S.W.COLE ENGINEERING, INC. • Geotechnical Engineering • Field & Lab Testing • Scientific & Environmental Consulting

05-0927

January 12, 2006

Martin's Point Healthcare
Attention: Ms. Ann Tucker, Director of Support Services
331 Veranda Street
Portland, ME 04104

Subject: Geotechnical Engineering Services
Proposed Martin's Point Facility Redevelopment
Veranda Street
Portland, Maine

Dear Ann:

In accordance with our Agreement dated October 31, 2005, we have made a geotechnical investigation at your facility on Veranda Street in Portland, Maine. This report summarizes our findings and provides recommendations regarding geotechnical aspects of the project. We issued a Draft report on December 19, 2005. This report supersedes that report. The contents of this report are subject to the limitations set forth in Attachment A.

1.0 INTRODUCTION

1.1 Scope of Work

The purpose of the work was to explore the subsurface conditions at the site in order to provide geotechnical recommendations relative to foundation design and earthwork associated with the proposed facilities redevelopment. The investigation has included explorations, laboratory testing, and a geotechnical evaluation of the findings.

1.2 Proposed Construction

Based on information provided by DeLuca-Hoffman Associates (project civil), we understand that the existing masonry boiler building (current maintenance shop) will be razed to allow for a new office structure. The new office structure will be about 150 by 180 feet in plan dimensions and have two levels. We anticipate the structure will be steel-framed with masonry veneer. Structural loading information is not available at this time.

The northerly portion of the structure will have a ground floor elevation of about 55 feet and a second floor at 67± feet. The southerly portion of the structure will have these same floor elevations, but will also have a lower level for parking space. We anticipate this level will be about elevation 44 feet and have assumed this parking area will be open (unheated) and have asphalt pavement. Additionally, a parking deck having a plan area of about 130 by 150 will be attached to the westerly side of the structure. The deck surface will vary from about elevation 50 up to 54 to access the office building. We anticipate the existing southerly on-grade parking (elevation 44± feet) will be reconstructed beneath the deck. We have assumed this area will also be open (unheated) and have asphalt pavement.

A new on-grade paved parking area is planned on the northerly side of the site that will be on the order of 60 by 360 feet in plan dimensions. Proposed grades will vary from about 55 to 61 feet. This parking area will lead to a proposed rotunda at the northerly main entrance with grades of about 62 to 66 feet. Some minor regrading and new pavements are proposed in the central portion of the site.

Based on recent site regrading information, the proposed construction will include four new retaining walls. Wall No. 1 will be constructed along the northerly side of the proposed northerly parking lot and will be about 560 feet long; retaining up to 15± feet of soil. Wall No. 2 will be about 270 feet long and be situated along the northerly side of the proposed on-grade parking proposed beneath the parking deck retaining up to 12± feet of soil. Wall No. 3 will be about 120 feet long and will be located on the westerly side of the proposed on-grade parking located beneath the proposed parking deck area; retaining up to 8± feet of soil. Wall No. 4 will be about 225 feet long and located on the easterly side of the on-grade parking proposed in the northeasterly site area; retaining up to 10± feet of soil.

2.0 EXPLORATION AND TESTING

2.1 Exploration

Sixteen test boring explorations (B-1 through B-16) and seventeen test probes (P-1 through P-17) were coordinated at the site by S. W. COLE ENGINEERING, INC. on

November 17, 2005 and November 18, 2005. Great Works Test Boring, Inc. of Rollinsford, NH performed the exploration work. Locations of the explorations were selected by S. W. COLE ENGINEERING, INC. based on a site concept plan provided by DeLuca-Hoffman Associates (project civil engineer) dated November 3, 2005. The explorations were located at the site by S. W. COLE ENGINEERING, INC. by a combination of taped measurements and pacing from site features. The approximate exploration locations are shown on the "Exploration Location Plan", attached as Sheet 1. Logs of the explorations are attached as Sheets 2 through 26. A key to the notes and symbols used on the log sheets is attached as Sheet 27. Sheets 28 through 30 are logs of rock cores obtained at the test borings. The elevations shown on the test boring log sheets were estimated based on interpolation of topographic information shown on Sheet 1.

2.2 Laboratory Testing

Soil and rock core samples collected during exploration work were visually examined and classified at our laboratory. Classifications are noted on the log sheets. The results of four laboratory gradation tests are attached as Sheets 31 through 34. The results of moisture content testing are noted on the log sheets.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Location and Surficial Conditions

The site of the proposed construction is situated on the easterly side of the Martin's Point Healthcare Facility. The land reaches a high elevation of about 67 in the central portion of the site. The ground surface slopes downward in all directions to about elevation 35± feet at the periphery of the construction area on the northerly and southerly sides and to about 45 and 55 feet on the westerly and easterly sides. The multi-story masonry building existing in the central portion of the site will remain. The existing masonry maintenance shop and another small masonry garage structure will be razed. A paved parking area exists on the southerly side of the maintenance shop, varying from about elevation 40 to 45 feet. This existing lower level parking is generally within the new on-grade parking beneath the proposed structure and parking deck.

Based on information shown on a site plan provided by DeLuca-Hoffman, the site is underlain by many utilities and contains several retaining walls (stone and mortar as well as MSE) and sloping access drives. A majority of the site is open and paved except for the southerly and northerly areas where trees and shrubs exist.

3.2 Subsurface Conditions

The site of the proposed facility expansion is underlain by shallow bedrock varying from at or near the ground surface to as deep as 21± feet at the explorations. Depths to refusal are generally greatest on the southerly side of the site, in the area of the existing southerly paved parking area and generally shallowest in the central and northerly portions of the site. Some of the refusal depths indicated on the logs may be within a weathered or disturbed bedrock zone.

Soil overburden varied in gradation and thickness at the explorations, but generally consists of medium dense granular fills overlying either bedrock or native glacial till. The granular fills are generally silty sands with some gravel and were utilized to level site areas for pavements or build slopes. The test borings also encountered what appears to be blast spoil fill and/or highly fractured over-blast at several borings.

Below the fill, several explorations encountered a medium dense to dense brown silty sand with some gravel (glacial till) mantling the bedrock. The till was found to be thickest on the southerly side of the site.

Rock cores obtained at Borings B-2, B-3 and B-5 indicate that the bedrock at the site is a gray sulfidic pelite. In general, the rock core obtained on the southerly side of the proposed structure (B-2 and B-3) exhibit better quality than the core at B-5 (northerly side). Rock Quality Designator (RQD) values obtained from the cores were determined to be about 52 and 62 percent at Borings B-2 and B-3 respectively with fractures from 10 to 25 and 55 degrees from horizontal. The core obtained at Boring B-5 was much more fractured with an RQD of about 13 percent and fractures varying from about 10 to 75 degrees from horizontal. The high degree of fracturing at Boring B-5 may be due to previous blasting to install existing subsurface utilities in the area. Refer to the attached boring logs for a more detailed description of the subsurface findings.

3.3 Groundwater

In general, the soil overburden was found to be moist. Free groundwater was not observed at the explorations, however, due to the short time that the explorations were left open, actual groundwater elevations were not determined. It should be anticipated that groundwater will fluctuate seasonally and in response to precipitation and snow melt. It is likely that groundwater flows along relatively intact bedrock surfaces (where it exists) and flows through existing rock fractures.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General Findings

Based on the subsurface findings and our understanding of the proposed building construction, it is our opinion that the site is suitable for the proposed building construction from a geotechnical standpoint. At this time, structural loading, building material types and settlement tolerances have not been provided to us. Thus, we generally recommend all heavily loaded column and wall foundations derive support from sound, intact bedrock. Lightly loaded columns or bearing wall foundations can be supported on compacted Structural Fill or crushed stone overlying undisturbed, dense glacial till or sound bedrock. Supplemental geotechnical consultation will likely be needed to assess foundation alternatives for areas where bedrock is deeper along the southerly side of the proposed building and parking deck.

4.2 Excavation Work

In general, excavation work at the site will encounter shallow bedrock, particularly in the central and northern portions of the site and granular fills and/or native, glacial till overlying bedrock, being thickest on the flanks of the knoll. The soils that will be encountered are primarily granular fills, including blast spoils, or native soils that were disturbed due to construction activity over the years. Medium dense to dense glacial till will be encountered below the fills in some areas. Excavation of rock will likely encounter undisturbed, relatively hard, fractured, but intact rock; softer, weathered rock; and highly fractured rock that was likely disturbed from previous construction activity. The highly fractured rock will likely be encountered around existing buildings, structures and along subsurface utility routes as well as within the existing lower, southerly parking lot. Based on the findings at

Boring B-1, it appears that either overblast occurred and/or blast spoils were used as fill in the existing lower parking lot.

Thus, excavation will encounter varying bedrock and soil conditions at the site. Some bedrock faces, exposed during excavation may be unstable after excavation due to fracturing, steep dips and weathering of the bedrock, particularly under saturated conditions. We recommend that observations of bedrock slopes be made prior to and during construction to evaluate rock slope stability. Stereographic analysis of the proposed slope relative to the angle of repose of the bedrock may be necessary in order to assess both long- and short-term stability.

Excavations must be properly shored or sloped to prevent sloughing and caving of the sidewalls during construction. Temporary, unsupported soil excavations should be sloped back to 1V to 1½H or flatter. Temporary unsupported rock excavations should be benched and/or sloped back in order to create a stable condition. The degree of benching or sloping will depend on rock fracturing. All excavations should be consistent with the OSHA trenching regulations.

It should be anticipated that there will be seepage from the soils just above the bedrock in lower elevations and from exposed bedrock faces, both during construction and after site development. The amount of seepage will vary depending upon the size and orientation of the intercepted fractures, time of year and amount of recent precipitation.

Groundwater will likely be encountered during excavation work particularly along the northerly side of the existing lower parking lot and within deeper cut areas. Based on the limited groundwater information available, it appears sumping and pumping dewatering techniques should be adequate to control groundwater within foundation excavations.

Based on proposed finish grades and depths to refusal surfaces, drilling and blasting will be required to achieve subgrade elevations. We recommend that an experienced drilling and blasting contractor be engaged to provide rock removal and the contractor be required to submit qualifications, references and a blasting plan prior to commencement of

excavation. S. W. COLE ENGINEERING, INC. is available to develop a blasting plan, if needed.

An owner coordinated preblast survey should be conducted at all structures and wells located within a minimum of 500 feet of the blast area. Vibrations due to blasting should be monitored during construction by qualified personnel. S. W. COLE ENGINEERING, INC. is available to provide these services as part of construction monitoring and testing services.

4.3 Subgrade Preparation

Where loose, fractured, disturbed rock is encountered from previous construction activities or blasting is needed to achieve proposed grades, all loose rock should be excavated to sound, intact rock. For all heavily loaded column and wall foundations, we recommend that a minimum 6-inch thick 3000psi concrete leveling pad be placed on cleaned, sound, intact bedrock. For slab-on-grade areas and lightly loaded column and wall footings, all loose rock should be removed and the subgrade prepared with a layer of densely graded 3/4-inch crushed stone thoroughly compacted to work stone into the fractured surface in order to fill voids. The crushed stone should meet the gradation requirements presented in Section 4.9. A leveling course of concrete may be used below the lightly loaded footings in lieu of the crushed stone, if desired. All soil subgrades should be proof-rolled with a vibratory roller compactor weighing at least 10 tons prior to placing new structural fill. A S. W. COLE ENGINEERING, INC. representative should observe all bedrock and soil subgrades prior to placing crushed stone, concrete or Structural Fill.

Soft, weathered, highly fractured or disturbed bedrock, where encountered at foundation subgrade elevation, should be removed. The excavation should be backfilled with 3000psi concrete below heavily loaded foundations, including shear walls, and either concrete or compacted crushed stone below lightly loaded foundations. The concrete leveling layer should be pinned to the rock if the rock is sloping steeper than 1V to 3H or if additional shear resistance is required (such as shear wall locations). If needed, shear pins need to be installed into the bedrock and extend from the bedrock up through the concrete leveling pad and into the footings. The top of the leveling pad should have a rough surface (not troweled) and extend beyond the footing bottom edges by at least 12 inches.

4.4 Foundation Design

The design freezing index for the Portland, Maine area is approximately 1250-Fahrenheit degree-days. Thus, we recommend exterior perimeter footings and footings in unheated areas be placed at least 4.5 feet below exterior finish grade to provide frost protection. We recommend the following geotechnical parameters for foundation design:

- Net Allowable Bearing Pressure = 8 ksf or less (concrete leveling pad overlying sound, intact bedrock)
- Net Allowable Bearing Pressure = 5 ksf or less (compacted crushed stone overlying sound, intact bedrock)
- Net Allowable Bearing Pressure = 3 ksf or less (compacted Structural Fill overlying undisturbed dense native till or prepared bedrock surface)
- Base Friction Factor (tan δ) = 0.60 (mass concrete to bedrock)
- Base Friction Factor = (tan δ) = 0.40 (mass concrete to compacted crushed stone or Structural Fill)
- Passive Lateral Earth Pressure Coeff. (K_p) = 3.0 (compacted Structural Fill)
- Active Lateral Earth Pressure Coeff. (K_a) = 0.33 (compacted Structural Fill)
- At-Rest Lateral Earth Pressure Coeff. (K_o) = 0.5 (compacted Structural Fill)
- Total Unit Weight of Backfill (γ_t) = 130 pcf (compacted Structural Fill)
- Seismic Soil Class = B (according to IBC 2003) High, central portion of the site
- Seismic Soil Class = C (according to IBC 2003) Southerly side of the site where depths to bedrock are greater.

Cast in place retaining walls, which are restrained from rotation (such as basement walls), should be designed considering at-rest pressures. Foundation and retaining wall design must also account for lateral loads due to traffic loading, sloped backfill and lateral loads caused by backfilling and compaction activities.

4.5 Rock Anchors

Although no structural loads have been provided, we anticipate that rock anchors may be needed beneath certain foundation areas to counteract uplift loads. Design of the rock

anchors will need to assume buoyant rock conditions. We recommend that a dry bedrock unit weight of 150 pcf and buoyant unit weight of 87 pcf for intact rock be considered for design. We recommend that a 30° cone (measured from vertical) be considered for rock pull-out for intact rock. An ultimate bond stress between sound rock and anchor grout of 250 psi can also be considered, depending upon specified grout strength. Consideration will also need to be given to anchor bar spacing where a line or groups of anchors are needed. We recommend an anchor testing program including performance, proof and creep testing be specified. Although not in our scope of work for this phase, S. W. COLE ENGINEERING, INC. can assist with anchor design and testing requirements, if needed.

4.6 Slab-on-Grade Floors

We recommend that the floor slab in heated areas at the on-grade entrance level (first floor FFE=55'±) where shallow bedrock is anticipated, be underlain by at least 12 inches of 3/4-inch compacted crushed stone overlying bedrock. All soil and loose, disturbed rock should be removed prior to placing the crushed stone. The crushed stone should be worked into the underlying bedrock surface utilizing heavy tracked equipment and/or a vibratory roller-impactor.

Concrete slab-on-grade floors may be designed using a subgrade reaction modulus of 200 pci (pounds per cubic inch) provided that the slabs are underlain by at least 12 inches of compacted base overlying prepared subgrades.

A vapor retarder to limit the upward migration of moisture vapors should be considered beneath floor slabs covered with moisture sensitive flooring. The vapor retarder should have a permeance that is less than the floor covering being applied on the slab. We recommend consulting flooring manufacturers relative to selection and installation of acceptable vapor retarder systems for use with their products. The vapor retarder should be underlain with a non-woven geotextile fabric such as Mirafi 160N to help protect the vapor retarder from puncture by the underlying fill materials.

We recommend that control joints be installed within floor slabs to accommodate shrinkage in the concrete as it cures. In general, control joints are typically installed at 10 to 15 foot spacing but the structural engineer should determine spacing. Floor slabs should be wet-

cured for a period of at least 7 days after casting as a measure to reduce the potential for curling of the concrete and excessive drying/shrinkage. We recommend that consideration be given to using curing paper installed over the cast-in-place concrete and that the curing paper remain in place as long as possible to improve the quality of the completed floor. In lieu of curing paper, a curing compound may be utilized; however, care must be taken to prevent scuffing of the compound from the floor during the curing period.

At this time, we do not have information relative to the proposed on-grade parking located below the proposed parking deck and/or office building. It should be noted that protection against frost action is particularly critical in situations with limited overhead clearance, such as in parking garages. The proposed on-grade parking level is underlain by frost-susceptible soils and will be exposed to freezing temperatures. Given these conditions, we recommend the following options for mitigation of potential frost heave beneath unheated asphalt pavement and/or concrete slab areas:

- Option 1 – Full Depth Non-Frost Susceptible Soils

  Pavement – We recommend that Structural Fill or additional MDOT Subbase gravel be placed below the pavement section (Asphalt/base/subbase) to a depth of at least 4.5 feet below finish grade.

  Concrete Slab – We recommend Structural Fill be placed to a depth of at least 4.5 feet below finish grade.

- Option 2 – Insulation

  Pavement – We recommend that the pavement section (asphalt/base/subbase) be underlain with a 2-inch thickness of high density, rigid, extruded, closed-cell, polystyrene insulation overlying prepared subgrades.

  Concrete Slab – We recommend 12 inches of compacted Structural Fill be placed directly below the slab. The Structural fill should be underlain with 2 inches of the rigid insulation overlying another 12 inches of Structural Fill overlying prepared subgrades.

4.7 Entrances, Sidewalks, and Exterior Slabs

Entrance approaches, sidewalks, and exterior slabs should be designed to reduce the

effects of differential frost action. We recommend that exterior concrete slabs be underlain with a minimum of 4.5 feet of compacted crushed stone or Structural Fill. The thickness of crushed stone or Structural Fill may be reduced if sound, intact bedrock is encountered at depths shallower than 4.5 feet, but should be at least 18 inches in thickness. The crushed stone or Structural Fill should extend beneath the entire length and width of entrances, sidewalks, and exterior slabs. The bottom of the crushed stone or Structural Fill adjacent to exterior foundations, below entrance slabs, sidewalks, and exterior slabs, should transition up to adjacent pavement subbase at a 1V to 3H slope or flatter. This is to help avoid abrupt, differential heaving. The lower layer of crushed stone or Structural Fill should be hydraulically connected to the foundation drainage system. All adjacent paved and grassed areas should be sloped to promote drainage away from the buildings.

4.8 Foundation Drainage

We recommend that an exterior perimeter foundation drainage system be provided for the proposed building structure and behind all retaining walls. All underdrains should be placed at least 4.5 feet below finish grades and 4.5 feet behind retaining walls to protect from freezing. Rigid, 4-inch diameter, perforated foundation drainpipe with perforations of ¼ to ½ inch should be utilized. The foundation drain pipes should be enveloped with at least 6 inches of crushed stone bedding and the entire crushed stone layer should be wrapped in a non-woven geotextile filter fabric having and apparent opening size of at least 70. The foundation drains must have positive gravity outlets protected from freezing and/or clogging. Other drains such as roof drains or parking deck drains should be provided in separate, non-perforated pipe, also protected from freezing.

4.9 Backfill and Compaction

The blasted rock generated from mass excavation activities can likely be crushed and mixed with granular soil and reused as compacted fill beneath building and paved areas. MDOT 703.20 Gravel Borrow from off-site sources can also be used. Excavated blast rock, if used, should be crushed and mixed with granular soil to form a well-graded material with a maximum particle size of 4 inches meeting the gradation for Structural Fill as given below.

Crushed stone backfill should meet the gradation requirements below. Fill for use beneath paved areas, as well as for slope and embankment construction should meet the requirements for MDOT Standard Specification 703.20 Gravel Borrow. Compacted fill for use below slab areas and against perimeter foundation walls (both inside and out), should meet the gradation requirements for Structural Fill. Fill below lightly loaded foundations as well as sub-slab fill should meet the gradation requirements for 3/4 inch minus crushed stone. Where Structural Fill is utilized at the site overlying a fractured rock subgrade, a 4 ± inch thick layer of compacted ¾ inch minus crushed stone should be placed upon the bedrock surface prior to placing the Structural Fill.

	Percent Finer by Weight	
Sieve Size	**Structural Fill**	**3/4-inch Crushed Stone**
4-inch	100	
3-inch	90-100	
2-inch		100
1 ½-inch		100
1-inch		20-55
¾-inch		90-100
3/8-inch		20-55
¼-inch	25-90	
No. 4		0-10
No. 8		0-5
No. 40	0-30	
No. 200	0-5	

All fill should be placed in horizontal lifts and be compacted such that the desired density is achieved throughout the lift thickness. We recommend that loose lift thickness for soil and crushed stone fills not exceed 12 inches. The backfill immediately behind retaining walls should be compacted using portable equipment. If heavy equipment is to be allowed within 10 feet of the walls, design must account for these loads. Structural Fill should be

placed for a horizontal distance of at least 4.5-feet behind cast-in-place retaining walls unless backslopes consist of clean, intact, stable bedrock. In this case, the wall designer should determine the appropriate backfill width and material type.

Crushed stone should be compacted to 100 percent of its dry rodded unit weight as determined by ASTM C-29. Soil fill beneath foundation areas (where allowed), paved areas, entrance slabs, and adjacent sidewalk areas should be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557. Pavement base and subbase soils should be compacted to 95 percent of ASTM D-1557. Soil fill placed behind proposed MSE walls should be per the wall designer specifications. Soil fill placed behind cast-in-place retaining walls should be compacted to between 92 and 95 percent to help limit excessive lateral earth pressures.

4.10 Re-Use of On-Site Soil and Rock

The existing site soils are silty and frost susceptible. Thus, re-use of existing soil is not recommended as backfill adjacent to foundations or behind retaining walls. Some of the existing granular soil may be suitable for re-use as a compacted subgrade fill below paved areas and slabs. The soil must be workable and at a moisture content at the time of use that is consistent with the required compaction. If used, existing soil should be screened to remove particles of rock which will not pass a 6-inch square mesh. Alternatively, an MDOT 703.20 Gravel Borrow can also be used as grading fill below proposed slab and paved areas. Use of either existing granular soil or Gravel Borrow materials below paved areas should be consistent such that the effects of frost will be relatively uniform.

It is our opinion that blasted rock generated from excavation activities can likely be crushed to meet the gradation requirements for crushed stone and/or mixed with MDOT Gravel Borrow or other clean granular soil to create a more workable, well-graded material.

4.11 Slope Construction

Fill slope faces should be constructed as level benches, which are built beyond finish surface grades to facilitate compaction. The soil slope face should be graded by cutting back into the compacted core. Fill slopes are susceptible to surface erosion, slumping and sloughing, particularity during heavy rain and freeze/thaw events. Where vegetated

surfaces are to be constructed, topsoil and seed should be installed, as soon as practicable, to create a vegetated mat over the entire surface of the slope. For slopes steeper than 2H: 1V, we recommend the use of rip-rap. The rip-rap should be underlain with a non-woven geotextile fabric such as Mirafi 160N where soil subgrades exist. In areas where surface water is concentrated and discharged over the slope, we recommend covering the slope with small diameter rip-rap placed over a layer of crushed stone and a non-woven geotextile fabric.

4.12 Pavements

Although traffic loading information was not made available to us, we anticipate traffic loading to consist of passenger vehicles and light delivery vehicles. Thus, the following pavement section recommendations are based on our experience with similar construction.

FLEXIBLE (ASPHALT) PAVEMENT		
Pavement Layer	Standard Duty	Heavy Duty
Maine DOT 9.5 mm Superpave, (Standard Specifications for Highways and Bridges)	1.25 inches	1.25 inches
Maine DOT 12.5 mm Superpave, (Standard Specifications for Highways and Bridges)	1.75 inches	---
Maine DOT 19.0 mm Superpave, (Standard Specifications for Highways and Bridges)	---	2.75 inches
Maine DOT Crushed Aggregate Base 703.06 Type A, (Standard Specifications for Highways and Bridges)	3 inches	3 inches
Maine DOT Aggregate Subbase 703.06 Type D, (Standard Specifications for Highways and Bridges)	12 inches	15 inches

The bituminous pavement should be compacted to 92 to 97 percent of its theoretical maximum density as determined by ASTM D-2041. Tack coat should be applied between successive lifts of asphalt, as necessary. The base and subbase materials should be compacted to at least 95 percent of their maximum dry densities as determined by ASTM D-1557. We recommend that all fill placed below the base and subbase materials be

compacted to at least 95 percent of ASTM D-1557. Design should consider sloping of the subgrade to enhance drainage to the periphery of the paved areas and/or to proposed foundations and retaining wall underdrains.

4.13 MSE Walls

We understand that four MSE (Mechanically Stabilized Earth) Walls varying in height from about 2 to 15 feet are proposed. We recommend that MSE Walls bear on at least 12 inches of crushed stone base overlying bedrock or dense, undisturbed native soils. Where subgrades consist of soil, the crushed stone base should be underlain within a non-woven geotextile fabric, such as Mirafi 140N. At least 4.5 feet (horizontal measure) of free-draining, non-frost susceptible Structural Fill will be required behind the face of the wall to control potentially adverse frost action.

For MSE Walls constructed on properly prepared subgrades, we recommend the following geotechnical parameters be considered for design:

- Net Allowable Bearing Pressure = 3.0 ksf or less
- Foundation Soil Base Friction Factor = 0.4
- Reinforced Zone Backfill Unit Weight = 130 pcf (Structural Fill)
- Reinforced Zone Internal Friction Angle = 30 degrees (Structural Fill)
- Retained Soil Unit Weight = 130 pcf (Granular Borrow)
- Retained Soil Internal Friction Angle = 30 degrees (Granular Borrow)
- Geogrid Reinforcement Length = at least 70 percent of wall height

Note: Internal friction angle and gradation of wall backfill must be determined with laboratory testing prior to placement of material.

We understand that MSE Wall design will be completed by others including analyses of bearing capacity, overturning and internal stability of the wall (including, but not limited to, vertical spacing of geogrid, geogrid lengths and connection of the wall facing to the geogrid soil reinforcement). MSE Wall design must also consider appropriate embedment considering potential nearby rock faces, negative foreslopes at the toe of the wall and

loads due to surcharge loads, guardrails, and light poles on top of the wall. S. W. COLE ENGINEERING, INC. should be engaged to perform a global stability analysis of the MSE Walls prior to construction.

4.14 Weather Considerations

If foundation construction takes place during cold weather, subgrades, fills, foundations and floor slabs must be protected during freezing conditions. Concrete and pavement must not be placed on frozen material and once placed, the backfill beneath structures must be protected from freezing.

4.15 Additional Evaluation and Geotechnical Design Review

It should be understood that only limited design information has been made available to us at this time. Additionally, this is a complex project with a variety of subsurface conditions including bedrock cuts. As such, supplemental geotechnical engineering work will be needed during design and construction, including assessment of potential foundation options for areas where bedrock is deep. It is recommended that S. W. COLE ENGINEERING, INC. be contracted to review the site work and foundation design drawings to assess if our understanding of the subsurface conditions and our recommendations have been appropriately interpreted and implemented. Our geotechnical recommendations are based significantly on the information provided to us by others regarding the proposed site and development. If changes are made in the site grading or general site layout, modifications to the geotechnical recommendations may be appropriate.

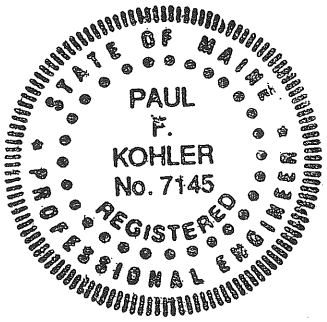
4.16 Construction Testing

S. W. COLE ENGINEERING, INC. should also be contracted to provide geotechnical engineering and testing services during the excavation and foundation phases of the work. This is to observe compliance with the design concepts, specifications, and design recommendations and to allow design changes in the event that subsurface conditions are found to differ from those anticipated prior to the start of construction.

5.0 CLOSURE

It has been a pleasure to be of assistance to you with this phase of your project. We look forward to working with you as the design progresses and during the construction phase.

S. W. COLE ENGINEERING, INC.



Paul F. Kohler, P. E.
Senior Geotechnical Engineer

c: Paul Ureneck – Boulos
Dwight Anderson – DeLuca-Hoffman
Dave Webster – PDT

PFK:pfb
F:\Projects\2005\05-0927_S_Martin's Point Healthcare_Portland_Prop. Bldg and Parking Deck_Veranda St_SSI_PFK\05-0927report.doc

ATTACHMENT A
Limitations

This report has been prepared for the exclusive use of Martin's Point Healthcare for specific application to the proposed Medical Office Building and Parking Deck on Veranda Street in Portland, Maine. S. W. COLE ENGINEERING, INC. has endeavored to conduct the work in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

S. W. COLE ENGINEERING, INC.'s scope of work has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S. W. COLE ENGINEERING, INC. should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless S. W. COLE ENGINEERING, INC. reviews the changes.

ARCHITECTURE
INTERIOR DESIGN
PLANNING

PORTLAND

P D T A R C H I T E C T S

FAX MEMO NOTES TELCON TRANSMITTAL

DATE: April 5, 2006
TO/COMPANY: Dwight Anderson, DeLuca-Hoffman Associates, Inc.
PROJECT: Martin's Point Redevelopment Project
FROM: David Webster
PAGES:
RE: New Clinic Building - heights

The building heights have been established to fall within the 45 foot limit established on the City of Portland's Code of Ordinances for the RP zone.

The submitted documents include elevations of each side of the building and the height of the roof from the proposed grades.

49 DARTMOUTH STREET
PORTLAND, MAINE 04101
207-775-1059
FAX 207-775-2694

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-1
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/17/2005
DATE FINISH: 11/17/2005
ELEVATION: 42+/-
SWC REP.: PFK

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 LB	18"
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
BLAST SPOIL DRAINED
UNDERLYING SOIL MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
HW									2"+/-	ASPHALT PAVEMENT
	S1	24"	10"	2.0'	9	12	15	11	2.0'	DARK BROWN GRAVELLY SAND WITH SOME SILT (FILL)
	S2	24"	10"	4.0'	9	7	15	12		BROWN SAND SOME GRAVEL, SOME SILT AND BLAST SPOILS (FILL) ~ MEDIUM DENSE ~
									5.0'	AUGER REFUSAL AT 5'+/- INSTALLED CASING TO 5'
									6.0'	WASH AHEAD TO 6' PROBABLE BLAST SPOILS (FILL)
	S3	24"	12"	8.0'	16	18	23	28	8.0'	BLAST SPOIL (FILL)
SSA									9.0'	PROBABLE BLAST SPOIL (FILL)
									13.5'	BROWN SILTY SAND WITH SOME GRAVEL (APPEARS TO BE NATIVE SOIL)
										REFUSAL AT 13.5' (PROBABLE BEDROCK)

SAMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
X DRILLER - VISUALLY
X SOIL TECH. - VISUALLY
LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-1

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-2
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/17/2005
DATE FINISH: 11/17/2005
ELEVATION: 44+/-
SWC REP.: PFK

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 LB	18"
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
SSA/HW									2.5"+/-	ASPHALT PAVEMENT
	S1	24"	12"	2.5'	10	15	12	9		BROWN GRAVELLY SAND WITH SOME SILT (FILL) w = 9.5% ~ MEDIUM DENSE ~
									6'+/-	
										BROWN SAND AND SILT WITH SOME GRAVEL (FILL)
									10.5'	~DENSITY~
									12.4'	BROWN SILTY SAND WITH SOME GRAVEL (TILL)
									13.5'	ROLLER CONE 12.4' TO 13.5' PROBABLE ROCK
										ROCK CORE - GRAY SULFIDIC PELITE
	R1	60"	53"	18.5'					18.5'	RQD = 52% FAIR
										BOTTOM OF EXPLORATION AT 18.5'

SAMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
X DRILLER - VISUALLY
X SOIL TECH. - VISUALLY
X LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-2

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-3
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/17/2005
DATE FINISH: 11/17/2005
ELEVATION: 33.5+/-
SWC REP.: PFK

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 LB	18"
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
HW									12"+/-	BLACK ORGANIC TOPSOIL
	S1	24"	6"	2.0'	3	5	5	7		~ LOOSE ~ BROWN SILTY SAND WITH SOME GRAVEL (TILL) ~ MEDIUM DENSE BECOMING ...
	S2	24"	16"	4.0'	13	12	10	13		
	S3	24"	21"	7.0'	9	12	14	21		w = 28.2% ... DENSE ~
	S4	24"	18"	12.0'	18	29	27	15		w = 33.1%
	S5	7"	7"	15.6'	7	25/1"			15.6'	
									16.5'	ROLLER CONE 15.6' TO 16.5' PROBABLE BEDROCK
										ROCK CORE - GRAY SULFIDIC PELITE
	R1	60"	60"	21.5'					21.5'	RQD = 62% FAIR
										BOTTOM OF EXPLORATION AT 21.5'

SAMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
X DRILLER - VISUALLY
X SOIL TECH. - VISUALLY
X LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-3

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-4
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/17/2005
DATE FINISH: 11/17/2005
ELEVATION: 33.5+/-
SWC REP.: PFK

PROJECT: PROPOSED OFFICE BUILDING
CLIENT : MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA			
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									2"+/-	ASPHALT PAVEMENT
	S1	24"	16"	2.0'	1	3	3	3	4'+/-	~ LOOSE ~ BROWN SILTY SAND WITH SOME GRAVEL (POSSIBLE TILL FILL)
	S2	24"	24"	6.5'	17	19	19	40	11.7'	BROWN SILTY SAND WITH SOME GRAVEL (TILL) ~ DENSE ~
	S3	24"	18"	11.5'	17	23	27	29		BOTTOM OF EXPLORATION AT 11.7' - AUGER REFUSAL (PROBABLE BEDROCK)

SAMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[X] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-4

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-5
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/17/2005
DATE FINISH: 11/17/2005
ELEVATION: 59+/-
SWC REP.: PFK

ROJECT: PROPOSED OFFICE BUILDING
CLIENT : MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 LB	18"
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
HW									1.5"+/-	ASPHALT PAVEMENT
	S1	23"	14"	2.0'	13	13	13	50/5"		BLAST SPOILS WITH SOME SAND
	S2	10"	6"	2.8'	15	45/4"				TRANSITIONING TO MOSTLY BLAST SPOILS (PROBABLE FILL)
									5.4'	
										ROCK CORE - GRAY SULFIDIC PELITE
									10.4'	RQD = 13% VERY POOR
	R1	60"	60"	10.4'						BOTTOM OF EXPLORATION AT 10.4'

NOTE :
BORING NEAR EXISTING UTILITY.
BORING MAY BE WITHIN BLASTED TRENCH AREA.

AMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[X] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-5

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-6
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/18/2005
DATE FINISH: 11/18/2005
ELEVATION: 40+/-
SWC REP.: MFB

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									2"+/-	ASPHALT PAVEMENT
	S1	24"	10"	2.0'	10	12	12	10	4'+/-	~ MEDIUM DENSE ~ DARK BROWN AND BROWN GRAVELLY SAND WITH SOME SILT (FILL)
	S2	24"	20"	7.0'	8	11	15	20	9'+/-	~ HARD~ BROWN SILTY CLAY (DESSICATED) qp = 9+ ksf
	S3	24"	20"	12.0'	32	39	37	28	15'+/-	BROWN SILTY SAND WITH SOME GRAVEL (TILL) ~ VERY DENSE ~
									19.0'	PROBABLE WEATHERED ROCK
										BOTTOM OF EXPLORATION AT 19.0' - AUGER REFUSAL (PROBABLE BEDROCK)

AMPLES:

S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

X	DRILLER - VISUALLY
X	SOIL TECH. - VISUALLY
	LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-6

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-7
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/18/2005
DATE FINISH: 11/18/2005
ELEVATION: 43+/-
SWC REP.: MFB

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									2"+/-	ASPHALT PAVEMENT
	S1	24"	14"	2.0'	9	12	12	13		~ MEDIUM DENSE ~ BROWN GRAVELLY SAND WITH SOME SILT (FILL)
									4.0'	W = 11.6%
										BOTTOM OF EXPLORATION AT 4.0' - AUGER REFUSAL (PROBABLE BEDROCK)

SAMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
X DRILLER - VISUALLY
X SOIL TECH. - VISUALLY
X LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-7

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-8
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/18/2005
DATE FINISH: 11/18/2005
ELEVATION: 41+/-
SWC REP.: MFB

PROJECT: PROPOSED OFFICE BUILDING
CLIENT : MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									2"+/-	ASPHALT PAVEMENT
	S1	24"	12"	2.0'	8	13	16	17		~ MEDIUM DENSE ~
									3.0'	BROWN SAND WITH SOME SILT AND GRAVEL (FILL)
										BROWN SILTY SAND WITH SOME GRAVEL (TILL)
	S2	24"	20"	7.0'	14	17	21	25		~ MEDIUM DENSE TO DENSE ~
	S3	24"	16"	12.0'	15	14	11	21		
									21.0'	BOTTOM OF EXPLORATION AT 21.0' - AUGER REFUSAL (PROBABLE BEDROCK)

AMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[X] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-8

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-9
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/18/2005
DATE FINISH: 11/18/2005
ELEVATION: 44+/-
SWC REP.: MFB
WATER LEVEL INFORMATION
SOILS MOIST

ROJECT: PROPOSED OFFICE BUILDING
CLIENT : MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									2"+/-	ASPHALT PAVEMENT
	S1	24"	12"	2.0'	16	20	18	20		~ DENSE ~ BROWN GRAVELLY SAND WITH TRACE SILT (FILL)
	S2	24"	10"	7.0'	8	17	15	14	8'+/-	DARK BROWN SILTY SAND WITH SOME GRAVEL AND ROCK PIECES (POSSIBLE WEATHERED COBBLE) (PROBABLE FILL)
	S3	24"	16"	12.0'	11	15	21	33	16.1'	~ DENSE ~ LIGHT BROWN SILT AND FINE SAND, SOME GRAVEL
										BOTTOM OF EXPLORATION AT 16.1' - AUGER REFUSAL (PROBABLE BEDROCK)

AMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
X DRILLER - VISUALLY
X SOIL TECH. - VISUALLY
LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-9

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-10
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/18/2005
DATE FINISH: 11/18/2005
ELEVATION: 64+/-
SWC REP.: MFB

ROJECT: PROPOSED OFFICE BUILDING
CLIENT : MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									2"+/-	ASPHALT PAVEMENT
	S1	18"	8"	1.5'	10	36	44		2.75'	~ DENSE ~ DARK BROWN SILTY SAND WITH SOME GRAVEL (FILL)
										BOTTOM OF EXPLORATION AT 2.75' - AUGER REFUSAL (PROBABLE BEDROCK)

AMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[X] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-10

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-11
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/18/2005
DATE FINISH: 11/18/2005
ELEVATION: 50+/-
SWC REP.: MFB

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									6"+/-	DARK BROWN ORGANIC TOPSOIL
	S1	24"	8"	2.0'	1	5	7	6		~ LOOSE TO MEDIUM DENSE ~
										BLAST SPOILS, BRICK PIECES AND SAND (FILL)
									4.7'	
										BOTTOM OF EXPLORATION AT 4.7' - AUGER REFUSAL
										(PROBABLE BEDROCK)

SAMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[X] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-11

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-12
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/18/2005
DATE FINISH: 11/18/2005
ELEVATION: 52.5+/-
SWC REP.: MFB

ROJECT: PROPOSED OFFICE BUILDING
CLIENT : MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									12"+/-	DARK BROWN ORGANIC TOPSOIL
	S1	24"	10"	2.0'	3	3	3	5		~ LOOSE ~
										DARK BROWN SAND WITH ORGANICS
									5.0'	
										BOTTOM OF EXPLORATION AT 5.0' - AUGER REFUSAL
										(PROBABLE BEDROCK)

SAMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[X] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-12

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-13
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/18/2005
DATE FINISH: 11/18/2005
ELEVATION: 56.5+/-
SWC REP.: MFB

ROJECT: PROPOSED OFFICE BUILDING
CLIENT : MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									2"+/-	ASPHALT PAVEMENT
	S1	24"	8"	2.0'	3	7	5	5	2.5'	~ MED. DENSE ~ DARK BROWN GRAVELLY SILTY SAND W/ROCK PIECES (FILL)
										BOTTOM OF EXPLORATION AT 2.5' - AUGER REFUSAL (PROBABLE BEDROCK)

SAMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[X] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-13

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-14
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/18/2005
DATE FINISH: 11/18/2005
ELEVATION: 58+/-
SWC REP.: MFB

PROJECT: PROPOSED OFFICE BUILDING
CLIENT : MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									2"+/-	ASPHALT PAVEMENT
	S1	24"	19"	2.0'	10	9	7	5		~ MEDIUM DENSE ~ WEATHERED ROCK OR BLAST SPOILS WITH SILTY SAND (PROBABLE FILL)
									5.0'	BOTTOM OF EXPLORATION AT 5.0' - AUGER REFUSAL (PROBABLE BEDROCK)

SAMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[X] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-14

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-15
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/18/2005
DATE FINISH: 11/18/2005
ELEVATION: 47+/-
SWC REP.: MFB
WATER LEVEL INFORMATION
SOILS MOIST

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									4"+/-	DARK BROWN ORGANIC TOPSOIL
	S1	24"	8"	2.0'	2	7	8	7	4'+/-	~ MEDIUM DENSE ~ BROWN GRAVELLY SILTY SAND (FILL)
	S2	24"	8"	7.0'	7	4	6	4	7.5'	~ MEDIUM DENSE ~ DARK BROWN SILTY SAND WITH SOME GRAVEL (POSSIBLE FILL)
										BOTTOM OF EXPLORATION AT 7.5' - AUGER REFUSAL (PROBABLE BEDROCK)

SAMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[X] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-15

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: B-16
SHEET: 1 OF 1
PROJECT NO.: 05-0927 S
DATE START: 11/18/2005
DATE FINISH: 11/18/2005
ELEVATION: 48+/-
SWC REP.: MFB
WATER LEVEL INFORMATION
SOILS MOIST

ROJECT: PROPOSED OFFICE BUILDING
CLIENT : MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HSA	4"		
SAMPLER:	SS	1 3/8"	140 LB	30"
CORE BARREL:				

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									6"+/-	DARK BROWN ORGANIC TOPSOIL
	S1	24"	10"	2.0'	1	2	2	2		~ LOOSE ~ RUST BROWN SILTY SAND WITH SOME ORGANICS (POSSIBLE FILL)
									4'+/-	
	S2	24"	16"	7.0'	10	14	15	17		~ MEDIUM DENSE TO DENSE ~ BROWN SILTY SAND WITH SOME GRAVEL (TILL)
									8.4'	
										BOTTOM OF EXPLORATION AT 8.4' - AUGER REFUSAL (PROBABLE BEDROCK)

`AMPLES:
S = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[X] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: B-16

S.W.COLE ENGINEERING, INC.

AUGER PROBE LOGS

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

PROJECT NO. 05-0927 S
AUGER PROBE SIZE O.D. SSA

PROBE NO.	P-1
STREET NAME	
GROUND ELEV.	61.5+/-
DATE	11-18-05

DEPTH	STRATUM DESCRIPTION
2"+/-	ASPHALT PAVEMENT
	WEATHERED ROCK OR BLAST SPOILS
5.5'	
	AUGER REFUSAL AT 5.5' (PROBABLE BEDROCK)

PROBE NO.	P-2
STREET NAME	
GROUND ELEV.	67+/-
DATE	11-18-05

DEPTH	STRATUM DESCRIPTION
2"+/-	ASPHALT PAVEMENT
	BLACK GRAVEL AND SAND POSSIBLE ASH (FILL)
4.0'	
	AUGER REFUSAL AT 4.0' (PROBABLE BEDROCK)

X	DRILLER - VISUALLY
X	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS

S.W.COLE ENGINEERING, INC.

AUGER PROBE LOGS

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

PROJECT NO. 05-0927 S
AUGER PROBE SIZE O.D. SSA

PROBE NO. P-3
STREET NAME
GROUND ELEV. 65+/-
DATE 11-18-05

DEPTH	STRATUM DESCRIPTION
2.0'	BROWN GRAVELLY SILTY SAND WITH PIECES OF BRICK (FILL)
	AUGER REFUSAL AT 2.0' (PROBABLE BEDROCK)

PROBE NO. P-4
STREET NAME
GROUND ELEV. 62+/-
DATE 11-18-05

DEPTH	STRATUM DESCRIPTION
4.2'	BROWN SILTY SAND WITH SOME GRAVEL WITH PIECES OF BRICK (FILL)
	AUGER REFUSAL AT 4.2' (PROBABLE BEDROCK)

X	DRILLER - VISUALLY
X	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS

S.W.COLE ENGINEERING, INC.

AUGER PROBE LOGS

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

PROJECT NO. 05-0927 S
AUGER PROBE SIZE O.D. SSA

PROBE NO.	P-5
STREET NAME	
GROUND ELEV.	44.5+/-
DATE	11-18-05

DEPTH	STRATUM DESCRIPTION
2"+/-	ASPHALT PAVEMENT
	LIGHT BROWN FINE SAND AND SILT WITH SOME ROCK
4.0'	(POSSIBLE WEATHERED ROCK)
	AUGER REFUSAL AT 4.0' (PROBABLE BEDROCK)

PROBE NO.	P-6
STREET NAME	
GROUND ELEV.	45.5+/-
DATE	11-18-05

DEPTH	STRATUM DESCRIPTION
2"+/-	ASPHALT PAVEMENT
	PROBABLE BROWN SAND SOME GRAVEL AND SILT (FILL)
5.7'	
	AUGER REFUSAL AT 5.7' (PROBABLE BEDROCK)

X	DRILLER - VISUALLY
X	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS

S.W.COLE ENGINEERING, INC.

AUGER PROBE LOGS

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

PROJECT NO. 05-0927 S
AUGER PROBE SIZE O.D. SSA

PROBE NO.	P-7
STREET NAME	
GROUND ELEV.	65+/-
DATE	11-18-05

DEPTH	STRATUM DESCRIPTION
4"+/-	BROWN ORGANIC TOPSOIL
	PROBABLE GRANULAR FILL
6.0'	
	AUGER REFUSAL AT 6.0' (PROBABLE BEDROCK)

PROBE NO.	P-8
STREET NAME	
GROUND ELEV.	48+/-
DATE	11-18-05

DEPTH	STRATUM DESCRIPTION
4"+/-	BROWN ORGANIC TOPSOIL
	PROBABLE GRANULAR FILL
7.3'	
	AUGER REFUSAL AT 7.3' (PROBABLE BEDROCK)

X	DRILLER - VISUALLY
X	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS

S.W.COLE ENGINEERING, INC.

AUGER PROBE LOGS

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

PROJECT NO. 05-0927 S
AUGER PROBE SIZE O.D. SSA

PROBE NO. P-9
STREET NAME
GROUND ELEV. 49.5+/-
DATE 11-18-05

DEPTH	STRATUM DESCRIPTION
4"+/-	BROWN ORGANIC TOPSOIL
3.7'	PROBABLE GRANULAR FILL
	AUGER REFUSAL AT 3.7' (PROBABLE BEDROCK)

PROBE NO. P-10
STREET NAME
GROUND ELEV. 52+/-
DATE 11-18-05

DEPTH	STRATUM DESCRIPTION
2"+/-	ASPHALT PAVEMENT
6.7'	PROBABLE BLAST SPOIL WITH SILTY SAND AND GRAVEL (FILL)
	AUGER REFUSAL AT 6.7' (PROBABLE BEDROCK)

X	DRILLER - VISUALLY
X	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS

S.W.COLE ENGINEERING, INC.

AUGER PROBE LOGS

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

PROJECT NO. 05-0927 S
AUGER PROBE SIZE O.D. SSA

PROBE NO. P-11
STREET NAME
GROUND ELEV. 48.5+/-
DATE 11-18-05

DEPTH	STRATUM DESCRIPTION
6"+/-	BROWN ORGANIC TOPSOIL
1.2'	PROBABLE GRANULAR FILL
	AUGER REFUSAL AT 1.2' (PROBABLE BEDROCK)

PROBE NO. P-12
STREET NAME
GROUND ELEV. 51+/-
DATE 11-18-05

DEPTH	STRATUM DESCRIPTION
	BROWN SILTY SAND WITH SOME GRAVEL
10.5'	PROBABLE SANDY SILT (WET)
	AUGER REFUSAL AT 10.5' (PROBABLE BEDROCK)

X	DRILLER - VISUALLY
X	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS

S.W.COLE ENGINEERING, INC.

AUGER PROBE LOGS

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

PROJECT NO. 05-0927 S
AUGER PROBE SIZE O.D. SSA

PROBE NO. P-13
STREET NAME
GROUND ELEV. 59.5+/-
DATE 11-18-05

DEPTH	STRATUM DESCRIPTION
6"+/-	BROWN ORGANIC TOPSOIL
2.0'	PROBABLE GRANULAR FILL
	AUGER REFUSAL AT 2.0' (PROBABLE BEDROCK)

PROBE NO. P-14
STREET NAME
GROUND ELEV. 55+/-
DATE 11-18-05

DEPTH	STRATUM DESCRIPTION
5'+/-	BROWN SILTY SAND WITH SOME GRAVEL (POSSIBLE FILL)
10.3'	(POSSIBLE TILL)
	AUGER REFUSAL AT 10.3' (PROBABLE BEDROCK)

X	DRILLER - VISUALLY
X	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS

S.W.COLE ENGINEERING, INC.

AUGER PROBE LOGS

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

PROJECT NO. 05-0927 S
AUGER PROBE SIZE O.D. SSA

PROBE NO. P-15
STREET NAME
GROUND ELEV. 51.5+/-
DATE 11-18-05

DEPTH	STRATUM DESCRIPTION
6"+/-	BROWN ORGANIC TOPSOIL
5.6'	PROBABLE GRANULAR SOIL
	AUGER REFUSAL AT 5.6' (PROBABLE BEDROCK)

PROBE NO. P-16
STREET NAME
GROUND ELEV. 59+/-
DATE 11-18-05

DEPTH	STRATUM DESCRIPTION
6"+/-	BROWN ORGANIC TOPSOIL
8.6'	BROWN SAND WITH SOME SILT SOME GRAVEL
	AUGER REFUSAL AT 8.6' (PROBABLE BEDROCK)

X	DRILLER - VISUALLY
X	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS

S.W.COLE ENGINEERING, INC.

AUGER PROBE LOGS

PROJECT: PROPOSED OFFICE BUILDING
CLIENT: MARTINS POINT HEALTHCARE
LOCATION: 331 VERANDA STREET PORTLAND, MAINE
DRILLING FIRM: GWTB DRILLER: JEFF/WILL

PROJECT NO. 05-0927 S
AUGER PROBE SIZE O.D. SSA

PROBE NO. P-17
STREET NAME
GROUND ELEV. 54+/-
DATE 11-18-05

DEPTH	STRATUM DESCRIPTION
4"+/-	BROWN ORGANIC TOPSOIL
1.0'	PROBABLE GRANULAR SOIL
	AUGER REFUSAL AT 1.0' (PROBABLE BEDROCK)

X	DRILLER - VISUALLY
X	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS

KEY TO THE NOTES & SYMBOLS
Test Boring and Test Pit Explorations

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - based on laboratory unconfined compressive test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. based on pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W_L	-	liquid limit - Atterberg test
W_P	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass. RQD is computed from recovered core samples.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

Description of Proportions:

0 to 5% TRACE
5 to 12% SOME
12 to 35% "Y"
35+% AND

REFUSAL: **Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: **Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT: PROPOSED OFFICE BUILDING — BORING NO.: B-2

CLIENT: MARTINS POINT HEALTHCARE — PROJECT NO.: 05-0927 S

LOCATION: 331 VERANDA STREET PORTLAND, MAINE

LOGGED BY: GWB — DATE: 12/07/05 — SHEET NO.: 1 OF 1

CHECKED BY: PFK — DATE: 12/07/05 — CORE SIZE: NQ-2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (FT)	CORE RECOVERY (FT)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
13.5'	R-1	5.0'	4.4'	31"/60" 52%	FAIR		HIGHLY FRACTURED ZONE PIECES <2" GRAY SULFIDIC PELITE • HIGHLY WEATHERED BECOMING... • HARD • RUST STAINS ON FRACTURE SURFACES • FRACTURES AT 25 TO 55 DEGREES FROM HORIZONTAL • ... MODERATELY WEATHERED
18.5'							ZONE OF CORE LOSS

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT: PROPOSED OFFICE BUILDING — BORING NO.: B-3

CLIENT: MARTINS POINT HEALTHCARE — PROJECT NO.: 05-0927 S

LOCATION: 331 VERANDA STREET PORTLAND, MAINE

LOGGED BY: GWB — DATE: 12/07/05 — SHEET NO.: 1 OF 1

CHECKED BY: PFK — DATE: 12/07/05 — CORE SIZE: NQ-2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (FT)	CORE RECOVERY (FT)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
16.5'	R-1	5.0'	5.0'	37"/60" 62%	FAIR		GRAY SULFIDIC PELITE • MODERATELY WEATHERED • HARD • RUST STAINS ON FRACTURE SURFACES • FRACTURES AT 10 TO 20 AND 55 DEGREES FROM HORIZONTAL
21.5'							

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT: PROPOSED OFFICE BUILDING — BORING NO.: B-5

CLIENT: MARTINS POINT HEALTHCARE — PROJECT NO.: 05-0927 S

LOCATION: 331 VERANDA STREET PORTLAND, MAINE

LOGGED BY: GWB — DATE: 12/07/05 — SHEET NO.: 1 OF 1

CHECKED BY: PFK — DATE: 12/07/05 — CORE SIZE: NQ-2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (FT)	CORE RECOVERY (FT)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
5.0'							
	R-1	5.0'	5.0'	8"/60" 13%	VERY POOR		GRAY SULFIDIC PELITE • HIGHLY WEATHERED • SOFT • VERY RUSTY • (RUST STAINS ON ROCK SURFACE AND FRACTURE SURFACES) • FRACTURES AT 10 TO 75 DEGREES FROM HORIZONTAL HIGHLY FRACTURED ... PIECES <1"
10.0'							

S.W.COLE ENGINEERING, INC.

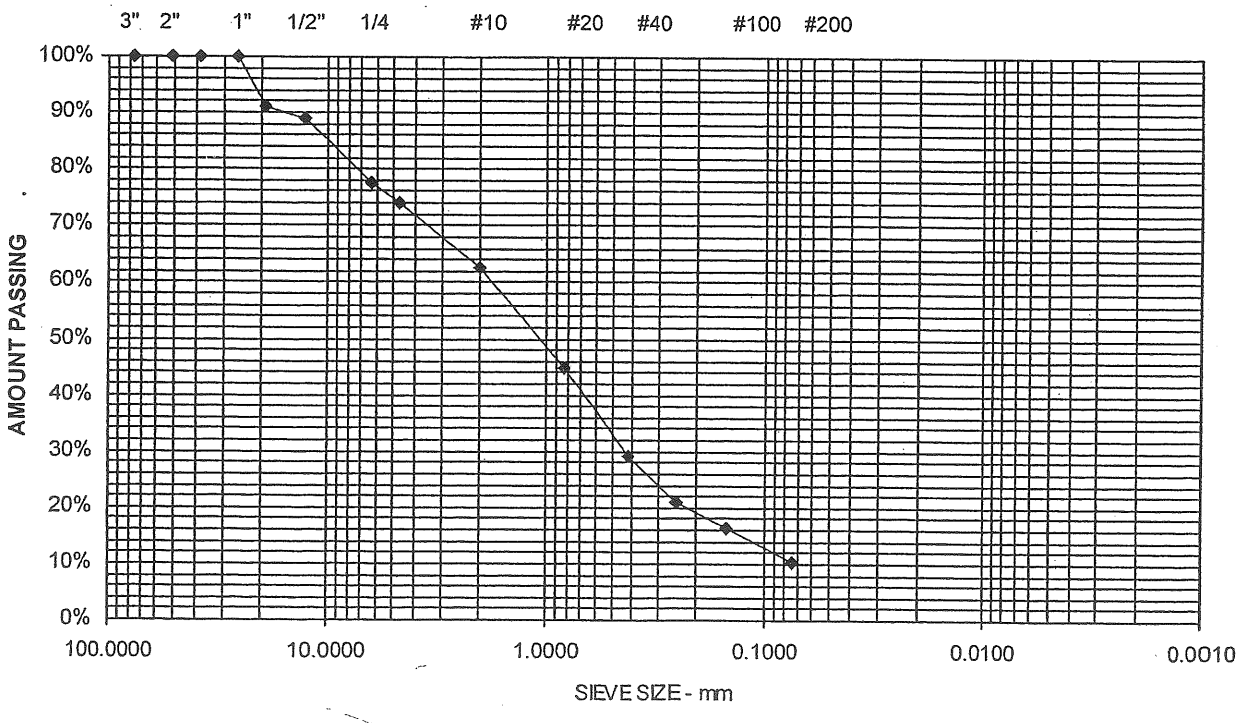
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND - PROPOSED FACILITY EXPANSION - VERANDA STREET - GEOTECHNICAL ENGINEERING SERVICES	Project Number	05-0927
Client	MARTIN'S POINT HEALTHCARE	Lab ID	4557G
Exploration	B-2 S-1	Date Received	12/7/2005
Material Source	0-2'	Date Complete	12/9/2005
		Tested By	

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	91	
12.5 mm	1/2"	89	
6.3 mm	1/4"	78	
4.75 mm	No. 4	74	25.9% Gravel
2.00 mm	No. 10	63	
850 um	No. 20	45	
425 um	No. 40	29	63.6% Sand
250 um	No. 60	21	
150 um	No. 100	16	
75 um	No. 200	10.4	10.4% Fines

GRAVELLY SAND WITH SOME SILT (FILL)



Comments: w = 9.5%

S.W.COLE ENGINEERING, INC.

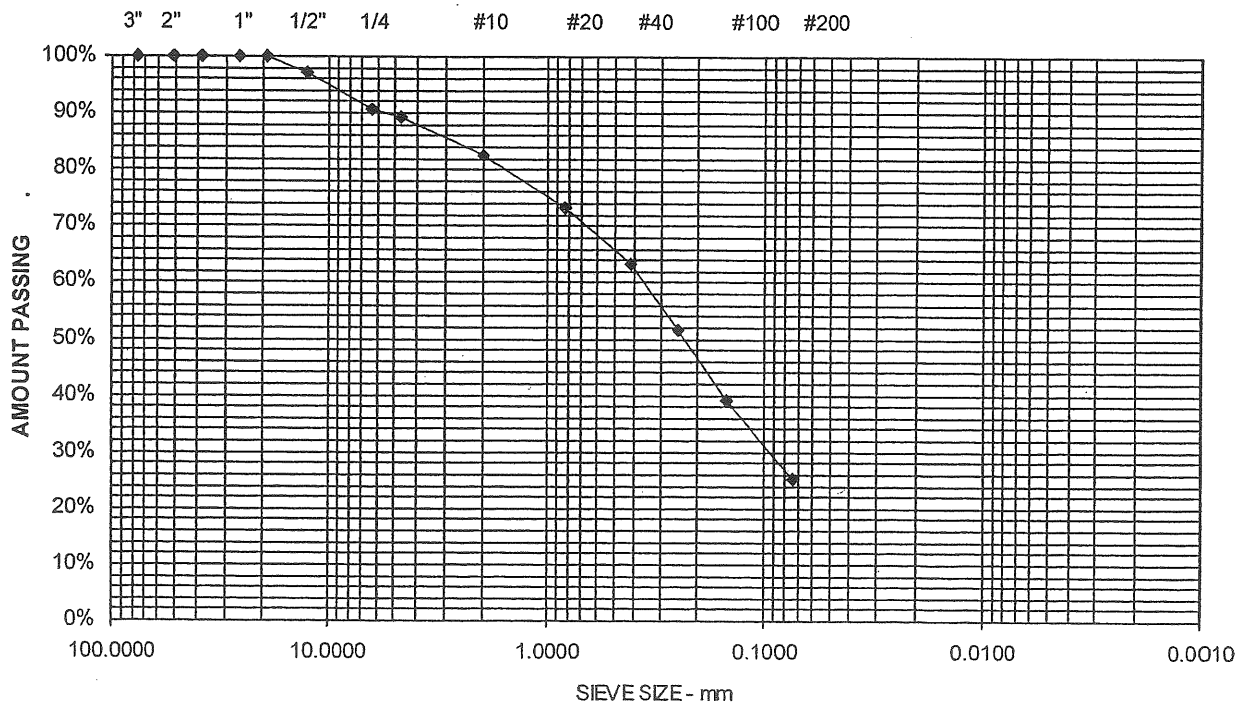
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND - PROPOSED FACILITY EXPANSION - VERANDA STREET - GEOTECHNICAL ENGINEERING SERVICES	Project Number	05-0927
Client	MARTIN'S POINT HEALTHCARE	Lab ID	4558G
Exploration	B-3 S-2	Date Received	12/7/2005
Material Source	5'-7'	Date Complete	12/9/2005
		Tested By	COLIN PATTERSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	97	
6.3 mm	1/4"	91	
4.75 mm	No. 4	89	10.7% Gravel
2.00 mm	No. 10	83	
850 um	No. 20	73	
425 um	No. 40	63	63.9% Sand
250 um	No. 60	51	
150 um	No. 100	39	
75 um	No. 200	25.4	25.4% Fines

SILTY SAND WITH SOME GRAVEL (TILL)



Comments: w = 28.2%

S.W.COLE ENGINEERING, INC.

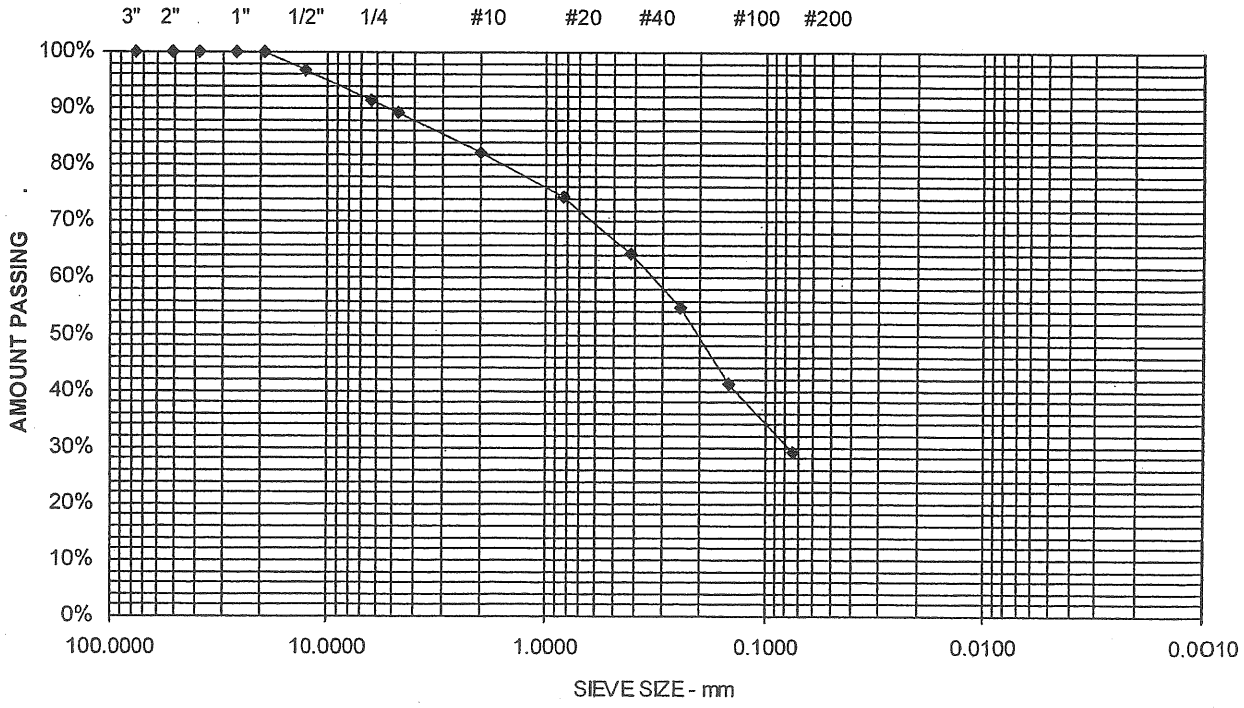
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND - PROPOSED FACILITY EXPANSION - VERANDA STREET - GEOTECHNICAL ENGINEERING SERVICES	Project Number	05-0927
Client	MARTIN'S POINT HEALTHCARE	Lab ID	4559G
Exploration	B-3 S-4	Date Received	12/7/2005
Material Source	10'-12'	Date Complete	12/9/2005
		Tested By	COLIN PATTERSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	97	
6.3 mm	1/4"	91	
4.75 mm	No. 4	89	10.7% Gravel
2.00 mm	No. 10	82	
850 um	No. 20	74	
425 um	No. 40	64	60.2% Sand
250 um	No. 60	55	
150 um	No. 100	41	
75 um	No. 200	29.1	29.1% Fines

SILTY SAND WITH SOME GRAVEL (TILL)



Comments: w = 33.1%

S.W.COLE ENGINEERING, INC.

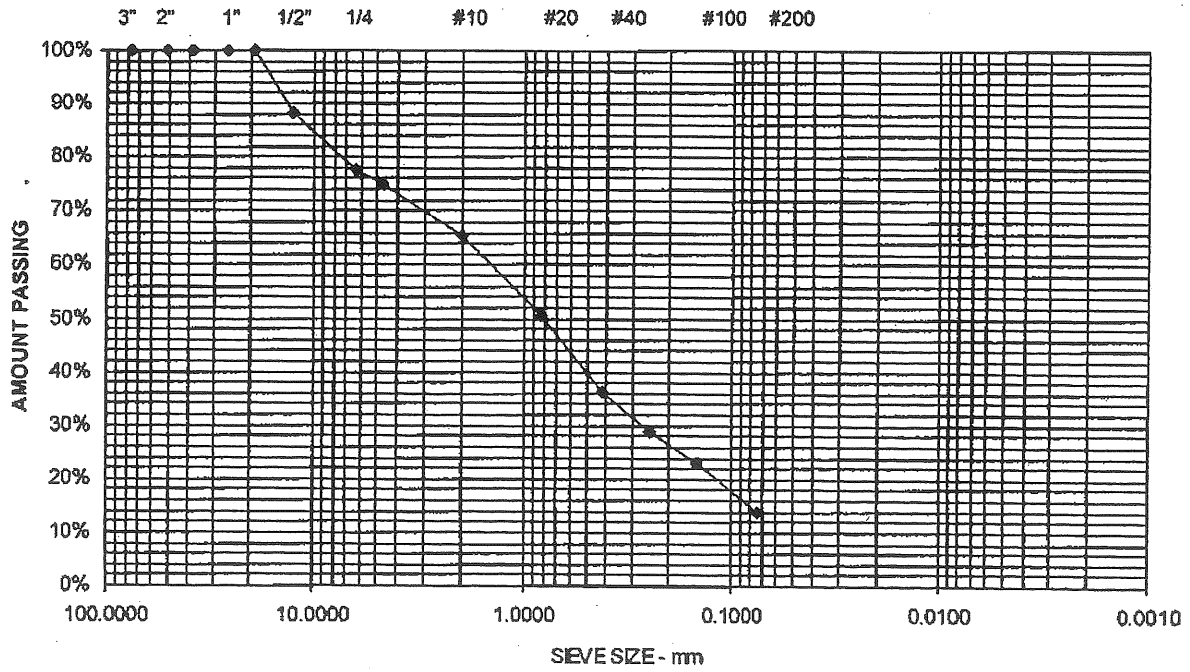
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND - PROPOSED FACILITY EXPANSION - VERANDA STREET - GEOTECHNICAL ENGINEERING SERVICES	Project Number	05-0927
Client	MARTIN'S POINT HEALTHCARE	Lab ID	4560G
Exploration	B-7 S-1	Date Received	12/7/2005
Material Source	0-2'	Date Complete	12/9/2005
		Tested By	COLIN PATTERSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	88	
6.3 mm	1/4"	77	
4.75 mm	No. 4	75	25.1% Gravel
2.00 mm	No. 10	65	
850 um	No. 20	50	
425 um	No. 40	36	60.9% Sand
250 um	No. 60	29	
150 um	No. 100	23	
75 um	No. 200	14.0	14% Fines

SILTY GRAVELY SAND (FILL)



Comments: w = 11.6%

S.W.COLE ENGINEERING, INC. • Geotechnical Engineering • Field & Lab Testing • Scientific & Environmental Consulting

05-0927.1

March 29, 2006

Martin's Point Healthcare
Attention: Ms. Ann Tucker, Director of Support Services
331 Veranda Street
Portland, ME 04104

Subject: Supplemental Geotechnical Engineering Services
Proposed Constructed Embankments –North Side of Facility
Proposed Martin's Point Facility Redevelopment
Veranda Street
Portland, Maine

Dear Ann:

In accordance with our Agreement Addendum No. 1 dated February 9, 2006, we have performed supplemental geotechnical services related to several proposed constructed embankments and retaining wall configurations to be located on the northerly portion of the property. The purpose of the work was to review the geotechnical information contained in our previous report and provide recommendations relative to the embankments. The recommendations contained herein are based on the most recent site plans prepared by Deluca-Hoffman dated November, 2005 (Sheet Title – Site Grading & Drainage Plan Phase 2). We understand that the site Civil Engineer or others will be responsible for the actual design of the retaining wall and reinforcement. This supplemental report is subject to the Limitations set forth in Attachment A included in our January 12, 2006 Geotechnical Report (SWCE Job #05-0927).

Based on the site plan provided, we understand that an L-shaped retaining wall with a maximum height on the order of 9 feet (toe elevation of about 33 feet, top elevation of about 42 feet) and about 63 feet in length will be placed adjacent to the existing northerly parking lot. Above this wall, a constructed embankment with a 1.5H:1V slope will be placed up to an elevation of about 55 to 57 feet. The easterly side of this

proposed embankment/wall system will transition into a 30± ft high constructed embankment at about 1.5H:1V. The westerly portion of the wall will transition into a 20± ft high constructed embankment at about 1.5H:1V which will transition into a constructed embankment that is about 5 to 10 feet high at a slope of 2H:1V. Paved parking areas will be located on top of the constructed embankments. We have included two details showing conceptual layouts of the proposed wall and embankment sections, and approximate conceptual subgrade conditions. It should be noted that subgrade conditions will vary across the length of the embankment/wall system and the subsurface profiles shown are for conceptual purposes only.

Based on the subsurface findings as described in our geotechnical report dated January 12, 2006, and our understanding of the proposed retaining wall and embankment system, we have performed several global stability analyses. Based on our findings, geogrid reinforcement will be required to increase the factor of safety against global stability failure above 1.3. In general a factor of safety of at least 1.3 is required for similar situations. We recommend that the embankment soils be reinforced with a bi-axle geogrid reinforcement, such as Mirafi 2XT or better. For our conceptual estimates, we have assumed a vertical spacing of 2 feet between the geogrid layers. We recommend that geogrid manufacturers be consulted to determine the most economical spacing and geogrid types based on availability and based on the final design specifications for the proposed retaining walls. S. W. COLE ENGINEERING, INC. should be given the opportunity to review the final design parameters of the proposed retaining walls and geogrid reinforced embankments to evaluate global stability.

In general, the geogrid should extend from the face of the wall/embankment at least 25 feet in the area of the proposed new wall and the proposed 30± feet high constructed embankment. In the area where the constructed embankment is only 20± feet high, and at a slope of 1.5H:1V, we recommend that the bi-axle geogrid extend at least 20 feet from the embankment face. The area with a 5 to 10 feet high constructed embankment at a slope of 2H:1V has a factor of safety against deep rotational global stability failure of at least 1.3 without geogrid reinforcement. A conceptual depiction of the

recommended geogrid placement is included on the attached detail. We recommend that S. W. COLE ENGINEERING, INC. be provided the opportunity to review the proposed wall reinforcing design (provided by others). The wall designer should work with the geogrid manufacturer to develop specific geogrid specifications in conjunction with the wall design to help reduce potential conflicts or redundancies. All geogrid should be installed per the manufacturer's recommendations.

Based on the subsurface conditions encountered at the borings, bedrock is generally sloping downward from south to north, but varies in elevation east to west. Bedrock will likely be encountered within the proposed zone of reinforced soil at several locations such that the recommended horizontal length of 20 to 25 feet cannot be achieved. In these cases, the bi-axle geogrid should be placed horizontally to its intersection with the bedrock surface.

The constructed embankment surfaces need to be protected from surficial erosion by placing an erosion control blanket over the slopes after placing the topsoil layer. In general, the erosion control blanket should be durable enough to last for several seasons, so that the proposed vegetative cover can have an opportunity to fully develop, and the erosion control blanket should be embedded into the slope to prevent it from slipping. We recommend an erosion control blanket similar to North American Green S150 or SC150 be considered. General erosion control blanket provisions are included on the attached conceptual detail, however; we understand that others will be responsible for specifying the actual thickness and quality of the topsoil as well as selecting a suitable erosion control blanket based on the vegetative cover to be applied.

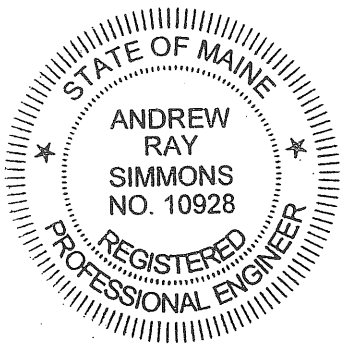
The backfill, compaction, material gradation and subgrade preparation recommendations included in our geotechnical report dated January 12, 2006 still apply to the current proposed construction. In general, the proposed embankment areas should be grubbed and densified prior to placing embankment fills. S. W. COLE ENGINEERING, INC. should be on-site during subgrade preparation to observe subgrade soils during construction. Soils within the reinforced zone should meet the

gradation requirements of an MDOT 703.20 Gravel Borrow with a minimum friction angle of 30 degrees. General site fills placed behind the reinforced soil zone should meet the gradation requirements of an MDOT 703.19 Granular Borrow. In general, the native soils should meet the gradation requirements of a granular borrow and are suitable for reuse as general site fills, provided they are at a suitable moisture content at the time of use. Newly constructed retaining walls should be backfilled with at least 4.5 feet (horizontal measure) of free-draining non-frost susceptible sand and gravel meeting the requirements of Structural Fill. Refer to our geotechnical report dated January 12, 2006 for additional compaction, backfill, gradation and subgrade preparation requirements.

It has been a pleasure to be of assistance to you with this phase of your project.

S. W. COLE ENGINEERING, INC.

Andrew R. Simmons, P. E.
Geotechnical Engineer



c: Dwight Anderson – Deluca-Hoffman
c: Paul Ureneck – Boulos Property Management

ARS-PFK:ars/pfb
P:\2005\05-0927.1 C - Martin's Point Healthcare - Portland, ME - Prop. Building & Parking Deck - Veranda St. - PFK\Reports and Letters\05-0927.1.doc

Attachment: Sheet 1 Conceptual Embankment Details

Dwight Anderson

From: Morse, Michael J [Michael.J.Morse@maine.gov]
nt: Tuesday, April 11, 2006 1:47 PM
: Dwight Anderson
Cc: Burdick, Doug B
Subject: RE: Martin's Point

Dwight,

The Maximum Spring Tide Line (MSTL) on Martin's Point can be identified as elevation 6.3 feet over NGVD29, and that would satisfy the shoreland zoning requirements for identifying the upland edge of the coastal wetland. You are also correct that the structure setback from the MSTL is 75 feet. The flagged line was intended to be a reference for us to determine how close the apparent (visual) line along the shore was to the established elevation. The flagged line is mostly more restrictive than the surveyed elevation line and therefore is not necessary to use unless your intent is to be more conservative in your setbacks.

Please let me know if you have any further questions or comments.

Thanks,

Mike Morse

Mike Morse
Assistant Shoreland Zoning Coordinator
Maine DEP, Southern Maine Regional Office
312 Canco Road
Portland, Maine 04103
l:207-822-6328
ax:207-822-6303

-----Original Message-----
From: Dwight Anderson [mailto:danderson@DelucaHoffman.com]
Sent: Thursday, April 06, 2006 7:43 PM
To: Burdick, Doug B
Cc: Sandi Keef
Subject: Martin's Point

Doug,
Sandi will send you a pdf of a letter from Normandeau regarding the resource boundary. The City has asked if we could get a letter from the State confirming the shoreland setback. We are using a building setback of 75 feet from the resource boundary, and understand an NRPA will be needed for any grading activities within the 75 feet.

Attached is a pdf of the layout plan with the updated resource boundary form your meeting with Normandeau. Are we to use the 6.3 elevation or the flagged line? <<C-4B.pdf>>

Dwight D. Anderson, P.E.
DeLuca-Hoffman Associates, Inc.
778 Main Street Suite 8
South Portland, Maine 04106
Phone 207.775.1121
Facsimile 207.879.0896

NORMANDEAU ASSOCIATES, INC.
25 Nashua Road
Bedford, NH 03110-5500
(603) 472-5191
(603) 472-7052 (Fax)
www.normandeau.com

February 10, 2006

Mr. Dwight Anderson
DeLuca-Hoffman Associates, Inc
778 Main St, Suite 8
South Portland, ME 04106

Re: Agency meeting to resolve location of upper limit of tide, Martins Point, Portland, ME

Dear Mr. Anderson:

This letter is to document a meeting that occurred on February 8, 2006 with Mike Morse (Maine Department of Environmental Protection Shoreland Zoning Administrator), Doug Burdick (DEP Natural Resources) and myself to review Normandeau's field delineation of the upper limit of coastal wetland. John Swan (Owens Haskell Inc (OHI)) was present at the beginning of the meeting. The meeting occurred in response to Mr. Morse's Jan 24, 2006 e-mail expressing concern that the line was too low.

Jennifer West from Normandeau had originally delineated the wetland using debris lines which she observed to be well above a higher-than-average high tide. Mr. Morse and Mr. Burdick explained that they prefer to use elevation data because the debris lines can be highly variable. Mr. Morse agreed with Mr. Swan that 6.3 feet NGVD is an acceptable elevation for Martins Point, however OHI had interpolated the contours on the steep face of the coastal bank, so reliable elevation data was not available on the survey map. Prior to his departure, Mr. Swan agreed to survey both the relocated flags and the 6.3-foot contour for comparison. Mr. Morse, Mr. Burdick and I reviewed the wire flags and relocated those that appeared too low upslope between 1 and 4 feet. The new locations were selected using a combination of vegetation, bank toe and debris lines. The new flags were numbered 1-16 from north to south.

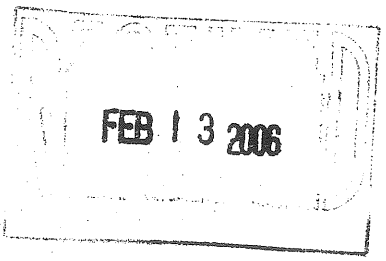
OHI will transfer the survey data onto a site map and provide to Normandeau for verification of the points and the resulting wetlands line and setback. Thank you for the opportunity to provide these services. Please do not hesitate to call with questions.

Sincerely,

NORMANDEAU ASSOCIATES INC

Sarah Allen

Sarah Allen
Senior Wetland Scientist



Mean high water level meeting minutes 2/10/2006

NORMANDEAU ASSOCIATES, INC.
253 Main Street
Yarmouth, ME 04096
(207) 846-3598
(207) 846-6527 (Fax)
www.normandeau.com

November 17, 2005
Dwight Anderson
DeLuca Hoffman Associates, Inc.
778 Main Street
South Portland, ME 04106

RE: Martin's Point Health Care
Normandeau Project # 20400.014

Dear Dwight:

Normandeau Associates reviewed the shoreline for regulated natural resources within 100 feet of grading and construction for the proposed building as well as the area within 50 feet of a proposed stormwater outfall. The following is a summary of our findings.

Steep slopes dominate the shoreline to the south of the project area. Portions of the slopes are eroding as a result of a combination of lack of vegetation and exposure. A narrow upland fringe dominated by witch grass (*Elytrigia repens* or *Agropyron repens*) extends along the toe of slope, except in areas where either the shoreline consists of either sheer bedrock or boulders. The intertidal area consists of patches of sand and gravel or exposed bedrock. *Spartina patens* occur in small patches.

A second area was reviewed for a proposed stormwater outfall from the parking lot along the eastern edge of the project. The area is dominated by steep bedrock controlled, vegetated slopes. Runoff has created a narrow channel, which has neither wetland vegetation nor sufficient hydrology to form a regulated watercourse. The shoreline is dominated by bedrock with a small pocket of sand and gravel at the base of the channel.

The review focused on natural resources under the jurisdiction of the City of Portland (the City) *Code of Ordinance, Chapter 14* (revised June 16, 2005) and the *Maine Natural Resources Protection Act* (NRPA). The coastal shoreline is the most significant and sensitive natural resource within the project area, which is under the jurisdiction of both the City and the NRPA. The City's definition of coastal wetland, which is similar to the NRPA definition, includes:

> "all tidal and subtidal lands; all lands below any identifiable debris line left by tidal action; all lands with vegetation present that is tolerant of salt water and that occurs primarily in a salt water or estuarine habitat; and/or any swamp, marsh, bog, beach, flat or other contiguous low land which is subject to tidal action during the maximum spring tide level as identified in tide tables published by the National Ocean Service. Coastal wetlands may include portions of coastal sand dunes" (Code of Ordinance, Section 14-47).

On the day of the site visit a monthly spring tide occurred with a predicted height of 10.7 feet. A clearly defined debris line, formed by a tide higher than the predicted tide was observed over the

majority of the shoreline within the project area. Normandeau delineated the boundary of the coastal wetland based on the highest well defined debris line observed at the site. The narrow upland fringe was excluded as it is dominated by witch grass, a Facultative Upland minus[1] (FACU-) species that is not noted as being tolerant of salt water[2].

The City measures the 250 foot Shoreland Zone from the Normal High Water Mark of Coastal Waters, which is defined as "that line on the shore of tidal waters reached by the shoreward limit of the rise of the medium tides between the spring and neap (Code of Ordinance, Section 14-47). In addition, the City's Land Use Standards (Section 14-449) requires a 75 foot setback from coastal wetlands for buildings. Based on these criteria, the wetland boundary delineated by Normandeau can be used to establish the 75 foot setback. This boundary is higher than the Normal High Water Mark, which if based on the NOAA mean range[3], is 9.12 feet for Portland Harbor.

Please contact me if you have any questions regarding our review.

Sincerely,
NORMANDEAU ASSOCIATES INC.

Jennifer West
Professional Wetland Scientist
Certified Maine Soil Scientist

[1] Reed, Porter B., Jr. 1988. National List of Plant Species that Occur in Wetlands: 1988, Maine. For National Wetlands Inventory, US Fish and Wildlife Service, St. Petersburg, FL.
[2] Tiner, Ralph, Jr. 1987. A Field Guide to Coastal Wetland Plants of the Northeastern United States. The University of Massachusetts Press, Amherst, MA.
[3] Source: National Tidal Datum Epoch (1983-2001) http://co-ops.nos.noaa.gov/

Martin Point

CBRE | Boulos Property Management
CB RICHARD ELLIS

One Canal Plaza
Portland, ME 04101

T 207.871.1290
F 207.772.2647

www.boulos.com

March 20, 2006

RE: Martin's Point Redevelopment Project

Dear Neighbor:

Please join us for a neighborhood meeting to discuss our plans for the redevelopment of Martin's Point located at 331 Veranda St. Portland, Me.

Meeting Location: St. Peter's Episcopal Church, 678 Washington Ave., Portland
Meeting Date: April 3, 2006
Meeting Time: 6:00 pm

The City code requires that property owners within 500 feet of the proposed development and residents on an "interested parties list" be invited to participate in a neighborhood meeting. A sign-in sheet will be circulated and minutes of the meeting will be taken. Both the sign in sheet and the minutes will be submitted to the Planning Board.

If you have any questions, please contact Paul Ureneck, Boulos Property Management, 871 1290 (consultant representing Martin's Point).

Thank you.

Sincerely,

Paul Ureneck

Paul Ureneck
Vice President
Project Management