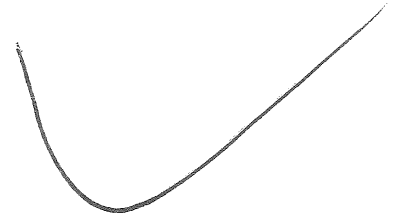


189-A-31

50 Sewall St.

Medical Bld. (Contract Zone)

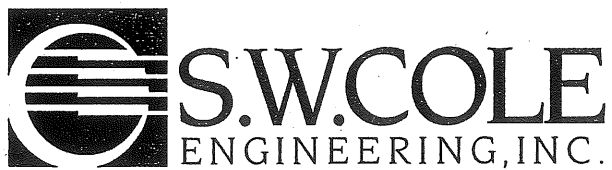
Olympia Equity



**GEOTECHNICAL ENGINEERING SERVICES  
PRELIMINARY ASSESSMENT  
PROPOSED MEDICAL OFFICE BUILDING  
SEWALL STREET  
PORTLAND, MAINE**

**04-0983      OCTOBER 20, 2004**

**RECEIVED  
OCT 22 2004  
SMRT, INC.**



**● Geotechnical Engineering ● Field & Laboratory Testing ● Scientific & Environmental Consulting**

**GEOTECHNICAL ENGINEERING SERVICES  
PRELIMINARY ASSESSMENT  
PROPOSED MEDICAL OFFICE BUILDING  
SEWALL STREET  
PORTLAND, MAINE**

**04-0983      OCTOBER 20, 2004**

**PREPARED FOR:**

**Olympia Equity Investors LLC  
Attention: Jim Brady  
50 Monument Square  
Portland, Maine 04101**

**PREPARED BY:**



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1.0 PROPOSED CONSTRUCTION.....	1
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### Attachment A - Limitations

Sheet 1 - Exploration Location Plan

Sheet 1A - Interpretive Subsurface Profile

Sheets 2 through 18 - Boring Logs

Sheet 19 - Key to the Notes and Symbols

Sheets 20 through 24- Consolidation Tests



**S.W. COLE**  
ENGINEERING, INC.

• Geotechnical Engineering • Field & Lab Testing • Scientific & Environmental Consulting

04-0983

October 20, 2004

Olympia Equity Investors II, LLC  
Attention: Jim Brady  
50 Monument Square  
Portland, Maine 04101

Subject: Geotechnical Engineering Services-Preliminary Assessment  
Proposed Medical Office Building  
Sewall Street  
Portland, Maine

Dear Jim,

As requested, we have prepared this preliminary geotechnical engineering assessment for the proposed medical office building. The purpose of our work was to review existing subsurface information and make a geotechnical evaluation relative to suitable foundation options.

### **1.0 PROPOSED CONSTRUCTION**

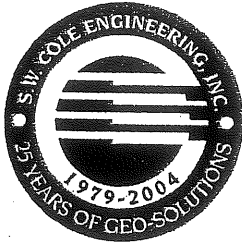
The site of the proposed structure is on the easterly side of Sewall Street and just south of the existing Double Tree Hotel. The grass-surfaced lot is approximately 100 feet wide (parallel to Sewall Street) and about 560 feet long. Based on the concept plan provided, a majority of the site is relatively level, varying from about elevation 37 feet near Sewall Street down to elevation 27 feet near the easterly end. The existing grade drops sharply at the easterly end from about elevation 27 feet to the bottom of an existing drainage ditch at about elevation 12 feet.

The proposed structure will be situated at the southeasterly end of the site, adjacent to the ditch. We understand that initially the structure was proposed to have a footprint of about 160 by 60 feet in plan dimension and be three stories. We understand the proposed structure concept has and continues to evolve. More recently, we understand that the structure will be 4 stories and be about 120 by 66 feet in plan dimensions. We understand that finish floor elevation will be at about 30 feet (project datum). At this

GRAY, ME OFFICE

286 Portland Road, Gray, ME 04039-9586 ■ Tel (207) 657-2866 ■ Fax (207) 657-2840 ■ E-Mail [infogray@swcole.com](mailto:infogray@swcole.com) ■ [www.swcole.com](http://www.swcole.com)

Other offices in Augusta, Bangor, and Caribou, Maine & Somersworth, New Hampshire



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time, consideration is being given to a basement on the easterly portion of the building. The structure is proposed to have steel framing with masonry walls. Based on information provided by Becker Structural Engineers (for an earlier 4-story concept), interior and perimeter column loads could be on the order of 456 Kips and 351 Kips, respectively, and perimeter wall loads could be on the order of 1.0 klf

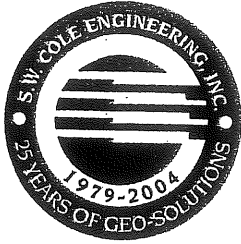
## **2.0 EXPLORATION AND LABORATORY TESTING**

In 1997, twelve test boring explorations were coordinated at the site by S. W. COLE ENGINEERING, INC. for a previously proposed project. Exploration locations are shown on the "Exploration Location Plan", attached as Sheet 1. The boring logs are attached as Sheets 2 through 18. A key to the notes and symbols used on the logs is attached as Sheet 19.

Four one-dimensional consolidation tests were performed during the 1997 investigation. The results of the consolidation testing are included as Sheets 20 through 24. Atterberg Limits and moisture content testing were also performed on selected samples recovered from the test borings. The results of these tests are shown on the logs.

## **3.0 SUBSURFACE CONDITIONS**

In general, most explorations encountered 8 to 14 feet of stiff brown silty clay overlying a softer gray silty clay. Seven of the explorations were advanced to a refusal surface (probable bedrock). Refusal depths varied from about 39 to 53 feet below the existing ground surface. Borings B-7 and B-8 conducted near the top of the slope on the easterly portion of the property encountered clayey fill soils to depths of about 9 and 24 feet respectively. Borings B-9 and B-12, both conducted about 50 feet west of the top of slope, did not encounter fill soils. This indicates that a gully, or low area may have previously existed in the southeast corner of the site. The gully was likely filled with uncontrolled clayey fill to construct the existing slope on the easterly portion of the property.



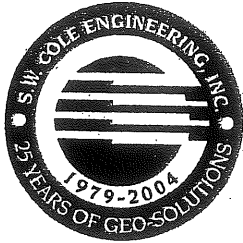
## 4.0 PRELIMINARY FOUNDATION RECOMMENDATIONS

### 4.1 General

The existing fill soil underlying the easterly portion of the proposed structure is not suitable for foundation support. This fill would need to be completely removed and replaced with compacted structural fill. We understand that the design team has considered a basement in the easterly portion of the building to reduce the soil replacement that would be required in this area. The proposed building footprint could also be shifted west about 40 feet to avoid the deep fill area. The following is a short discussion of potential foundation options. At this time a pile supported foundation system does not appear warranted, but we have included the section for information.

### 4.2 Spread Footing Foundations

The upper native brown silty clay is stiff and capable of support of a spread footing foundation system. However, the site is underlain by about 30 feet of compressible gray silty clay. Based on our laboratory testing, the underlying clay soils are overconsolidated which allows the clay to withstand some moderate loading before severe consolidation related settlement becomes an issue. Since the compressible clay stratum is over 30 feet in thickness, long-term settlement is still an issue, however, for this particular site and considering the anticipated heavy column loads. Using an allowable soil bearing capacity of 2 ksf or less, and considering the loading information provided by Becker Structural Engineers, the site plan provided, and the results of the one-dimensional consolidation tests, we estimate that consolidation related settlement beneath an interior column supported on a spread footing to be on the order of 1 to 1½ inches. Estimated settlement beneath a perimeter column would be on the order of ¾ inch. Differential settlements could be on the order of .003in/in. Total and differential settlement appear to be excessive for this type of structure.



#### **4.3 Mat Foundation**

Based on the loading information provided, we estimate that a properly designed reinforced concrete mat foundation would have a contact pressure of about 1ksf (including the self weight of the mat). Based on this assumption, we estimate that a mat foundation would undergo about  $\frac{3}{4}$  to  $1\frac{1}{4}$  inches of total consolidation related settlement. This settlement would be more uniform throughout the building.

A reinforced mat foundation would need to be designed as a rigid structure to allow the building to settle uniformly. Rigid expanded polystyrene insulation would be recommended around the building periphery to prevent frost penetration under the slab.

#### **4.4 Pile Foundation**

Based on the subsurface findings, steel H-piles on the order of 40 to 55 feet could be utilized. Piles should be driven to end bearing on bedrock. Pile capacities over 40 tons will require pile load testing. Below are a few typical pile types and estimated compressive capacities assuming 50 ksi steel piling end bearing on bedrock:

HP 10x42 – 70 Tons

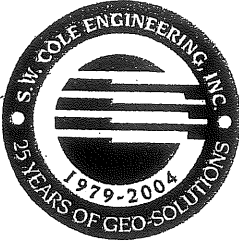
HP 12x53 – 90 Tons

#### **4.5 Conclusions**

Based on our understanding of the project at this time, it appears that total and differential settlements using a spread footing foundation system may be excessive. A rigid mat foundation is likely a good alternative to spread footings.

We recommend that additional test boring explorations be conducted to determine the extent of the underlying fill soils at the easterly end of the site. Once we receive new structural loading information based on a current building location and footprint size additional settlement estimates will need to be made to further assess spread footings versus a mat foundation. Additional evaluation will also be needed relative to a basement level, if considered.





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## 5.0 CLOSURE

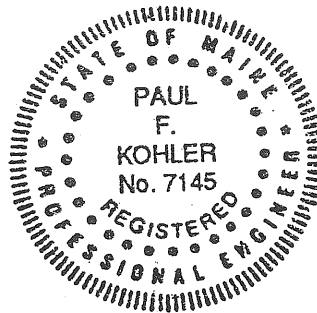
We trust this preliminary information meets your current needs. Please contact us if you have any questions.

Very Truly Yours,

**S. W. COLE ENGINEERING, INC**

Andrew R. Simmons  
E.I.T

Paul F. Kohler, P. E.



PFK: cae

C: Pete Pelletier - Ledgewood Construction  
David Webster - PDT Architects  
George McDonough - SMRT  
Todd Neal - Becker Structural  
Chris Osterrieder - Deluca-Hoffman

**ATTACHMENT A**  
**Limitations**

This report has been prepared for the exclusive use of Olympia Equity Investors for specific application to the proposed Medical Office Building, located on Sewall Street, 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 the changes are reviewed by S. W. COLE ENGINEERING, INC.



# BORING LOG

BORING NO.: B-1  
 SHEET: 1 OF 2  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/27/1997  
 DATE FINISH: 8/27/1997  
 ELEVATION: 32.0'+/-  
 SWC REP. M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

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

## WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA		
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24				
H									6"+/-	TOPSOIL AND ORGANICS		
Y	S-1	24"	24"	2.0'	3	5	7	9	4.0'+/-	qp = 9+ ksf GRAY-BROWN SILTY CLAY WITH SOME FINE SAND ~ HARD ~		
D												
R												
A												
U									8.5'+/-	GRAY BROWN SILTY CLAY qp = 4-6 ksf ~ VERY STIFF TO STIFF ~		
L	S-2	24"	20"	7.0'	3	5	9	6				
I												
C												
P										GRAY SILTY CLAY ~ MEDIUM ~		
U	S-3	24"	24"	12.0'	1	1	2	2				
S												
H												
	1S	30"	30"	17.0'	HAND HYDRAULIC PUSH					qu = 1.6 ksf Sv = 0.55/0.03 ksf Sv = 0.63/0.03 ksf	W = 43.3% WI = 45.4 Wp = 22.4	qp = 1.5 ksf
	3.5"X7" VANE			17.8'								
	3.5"X7" VANE			18.4'								
	S-4	24"	24"	22.0'	WOH	WOH	WOH	WOH				
	S-5	24"		27.0'	WOR	WOR	WOH	WOH				
	3.5"X7" VANE			31.5'						Sv = 0.51/0.03 ksf		
	3.5"X7" VANE			32.2'						Sv = 0.59/0.03 ksf		
	2S	30"	30"	37.0'	WO1M					qu = 1.3 ksf	W = 39.7% WI = 37.5 Wp = 18.1	qp = 1.0 ksf
	3.5"X7" VANE			38.8'						Sv = 0.45/0.01 ksf		

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

SOIL CLASSIFIED BY:

<input type="checkbox"/>	DRILLER - VISUALLY
<input checked="" type="checkbox"/>	SOIL TECH. - VISUALLY
<input checked="" type="checkbox"/>	LABORATORY TEST

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

(2)

BORING NO.: B-1

# PRELIMINARY



# BORING LOG

BORING NO.: B-1  
 SHEET: 2 OF 2  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/27/1997  
 DATE FINISH: 8/27/1997  
 ELEVATION: 32.0'+/-  
 SWC REP. M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

CASING: HW 4"  
 SAMPLER: SS 1 3/8" 140 LB 30"  
 CORE BARREL: \_\_\_\_\_

## WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
				41'-48.6'			4		41'+/-	ASSUMED GRAY SILTY CLAY
							4			
							4			
							5		45'+/-	
							6			POSSIBLE GRAY SILTY CLAY AND SAND
							8			
							11		48.6'	
							10/6" 55/2"			
				48.8'-51'						PROBABLE BEDROCK (ROLLER BIT)
				51'-55'					51.0'	BEDROCK QUARTZITE RQD = 17%
	1R	4.0'	41"	55.0'					55.0'	BOTTOM OF EXPLORATION AT 55.0'

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

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

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

(3)

BORING NO.: B-1

# PRELIMINARY



# BORING LOG

BORING NO.: B-2  
 SHEET: 1 OF 1  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/27/1997  
 DATE FINISH: 8/27/1997  
 ELEVATION: 34.5'+/-  
 SWC REP.: M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

CASING: TYPE HSA SIZE I.D. 2 1/2" HAMMER WT. 140 LB HAMMER FALL 30"  
 SAMPLER: TYPE SS SIZE I.D. 1 3/8"

## WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	S-1	24"	20"	2.0'	4	4	5	6	6"+/-	TOPSOIL AND ORGANICS
										GRAY-BROWN SILTY CLAY
										- VERY STIFF -
	S-2	24"	18"	7.0'	4	4	4	4	7.0'	BOTTOM OF EXPLORATION AT 7.0'

SAMPLES: D=SPLIT SPOON C=3" SHELBY TUBE U=3.5" SHELBY TUBE	SOIL CLASSIFIED BY: <input type="checkbox"/> DRILLER - VISUALLY <input checked="" type="checkbox"/> SOIL TECH. - VISUALLY <input checked="" type="checkbox"/> LABORATORY TEST	REMARKS: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.	(4)
---	--	---	-----

BORING NO.: B-2

PRELIMINARY



# BORING LOG

BORING NO.: B-3  
 SHEET: 1 OF 1  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/27/1997  
 DATE FINISH: 8/27/1997  
 ELEVATION: 35.5'+/-  
 SWC REP.: M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

CASING: TYPE HSA SIZE I.D. 2 1/2" HAMMER WT.  HAMMER FALL   
 SAMPLER: SS SIZE I.D. 1 3/8" 140 LB  30"   
 CORE BARREL:

## WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									6"+/-	TOPSOIL AND ORGANICS W = 23.6%
	S-1	24"	18"	2.0'	3	5	8	11		GRAY-BROWN SILTY CLAY ~ HARD TO VERY STIFF ~
	S-2	24"	15"	7.0'	5	6	8	10	7.0'	W = 24.8%      qp = 6-8 ksf
										BOTTOM OF EXPLORATION AT 7.0'

SAMPLES:      SOIL CLASSIFIED BY:

= SPLIT SPOON       DRILLER - VISUALLY  
 = 3" SHELBY TUBE       SOIL TECH. - VISUALLY  
 = 3.5" SHELBY TUBE       LABORATORY TEST

REMARKS:

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



**BORING LOG**

BORING NO.: B-4  
 SHEET: 1 OF 1  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/27/1997  
 DATE FINISH: 8/27/1997  
 ELEVATION: 33.5'+/-  
 SWC REP. M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

CASING: TYPE HSA SIZE I.D. 2 1/2" HAMMER WT. 140 LB HAMMER FALL 30"  
 SAMPLER: SS  
 CORE BARREL:

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									6"+/-	TOPSOIL AND ORGANICS
	S-1	24"	18"	2.0'	2	4	16	18	3'+/-	BROWN SANDY SILT WITH SOME GRAVEL (FILL) ~ MEDIUM DENSE TO DENSE ~
	S-2	24"	24"	7.0'	5	6	7	8	7.0'	GRAY-BROWN SILTY CLAY ~ VERY STIFF ~  qp = 4.5 ksf
										BOTTOM OF EXPLORATION AT 7.0'

SAMPLES:  SPLIT SPOON  
 3" SHELBY TUBE  
 3.5" SHELBY TUBE

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

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

(6)

BORING NO.: B-4



# BORING LOG

BORING NO.: B-5  
 SHEET: 1 OF 1  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/27/1997  
 DATE FINISH: 8/27/1997  
 ELEVATION: 32.0'+/-  
 SWC REP.: M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

CASING: TYPE HSA SIZE I.D. 2 1/2"  
 SAMPLER: SS 1 3/8" 140 LB 30"  
 CORE BARREL: \_\_\_\_\_

### WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE			DEPTH @ BOT	SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.		0-6	6-12	12-18	18-24		
									6'+/-	TOPSOIL AND ORGANICS
	S-1	24"	14"	2.0'	5	4	5	5		W = 5.1%
									4'+/-	BROWN SAND WITH SOME SILT AND GRAVEL (FILL) - MEDIUM DENSE -
										GRAY-BROWN SILTY CLAY - STIFF -
	S-2	24"		7.0'	4	5	4	5	7.0'	W = 35.8% qp = 2 ksf
										BOTTOM OF EXPLORATION AT 7.0'

SAMPLES:  SPLIT SPOON  
 3" SHELBY TUBE  
 3.5" SHELBY TUBE

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

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

(7)

BORING NO.: **B-5**

# PRELIMINARY





# BORING LOG

BORING NO.: B-6  
 SHEET: 1 OF 1  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/27/1997  
 DATE FINISH: 8/27/1997  
 ELEVATION: 30.5'+/-  
 SWC REP. M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

CASING: TYPE HSA SIZE I.D. 2 1/2" HAMMER WT. 140 LB HAMMER FALL 30"  
 SAMPLER: SS  
 CORE BARREL: \_\_\_\_\_

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6'				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									6"+/-	TOPSOIL AND ORGANICS
	S-1	24"	20"	2.0'	3	5	8	15		
									4'+/-	BROWN SAND WITH SOME GRAVEL AND SILT (FILL) - MEDIUM DENSE -
										GRAY-BROWN SILTY CLAY - VERY STIFF -
	S-2	24"	22"	7.0'	5	7	7	7	7.0'	qp = 4.5 ksf
										BOTTOM OF EXPLORATION AT 7.0'

SAMPLES: \_\_\_\_\_ SOIL CLASSIFIED BY: \_\_\_\_\_ REMARKS: \_\_\_\_\_

J=SPLIT SPOON  DRILLER - VISUALLY  
 C=3" SHELBY TUBE  SOIL TECH. - VISUALLY  
 U=3.5" SHELBY TUBE  LABORATORY TEST

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

(8)  
BORING NO.: B-6

PRELIMINARY



# BORING LOG

BORING NO.: B-7  
 SHEET: 1 OF 1  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/27/1997  
 DATE FINISH: 8/27/1997  
 ELEVATION: 28.0'+/-  
 SWC REP.: M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

CASING: TYPE HSA SIZE I.D. 2 1/2" HAMMER WT. 140 LB HAMMER FALL 30"  
 SAMPLER: SS SIZE I.D. 1 3/8" HAMMER WT. 140 LB HAMMER FALL 30"  
 CORE BARREL: \_\_\_\_\_

## WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	S-1	24"	12"	2.0'	2	6	6	7	6"+/-	TOPSOIL WITH ORGANICS
										BROWN SAND WITH SOME GRAVEL AND SILT (FILL)
	S-2	24"	4"	7.0'	3	3	3	2	9'+/-	
	S-3	24"	20"	12.0'	2	5	8	8		BROWN SILTY CLAY ~ HARD BECOMING qp = 7-9 ksf
	S-4	24"	24"	17.0'	4	7	8	9	17.0'	VERY STIFF - qp = 5.5-8.5 ksf
										BOTTOM OF EXPLORATION AT 17.0'

SAMPLES: \_\_\_\_\_ SOIL CLASSIFIED BY: \_\_\_\_\_ REMARKS: \_\_\_\_\_

D=SPLIT SPOON  DRILLER - VISUALLY  
 C=3" SHELBY TUBE  SOIL TECH. - VISUALLY  
 U=3.5" SHELBY TUBE  LABORATORY TEST

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

(9)  
BORING NO.: B-7

# PRELIMINARY



# BORING LOG

BORING NO.: B-8  
 SHEET: 1 OF 2  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/27/1997  
 DATE FINISH: 8/28/1997  
 ELEVATION: 27.0'+/-  
 SWC REP.: M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

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

## WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
H									6'+/-	TOPSOIL AND ORGANICS
Y	S-1	24"	24"	2.0'	7	6	8	12	4'+/-	BROWN SILT WITH SOME FINE SAND (FILL)  ~ LOOSE TO MEDIUM DENSE ~ BROWN SILTY SAND WITH SOME GRAVEL (FILL) W = 12.3%  GRAY CLAYEY SILTY SAND WITH SHELLS (FILL)  W = 25.9% BROWN MEDIUM SAND WITH SOME SILT (FILL)  BROWNISH-GRAY CLAYEY SANDY SILT WITH TRACE OF BRICK (FILL) qp = 9+ ksf
D										
R										
A										
U										
L	S-2	24"	12"	7.0'	4	3	3	2		
I										
C										
P										
U	S-3	24"	20"	12.0'	2	2	2	3		
S										
H									24'+/-	GRAY SILTY CLAY W = 41.2% qp = 0.5 ksf  qp < 0.5 ksf  qu = 1.2 ksf W = 39.1% WI = 33.1 Wp = 17.7 Sv + 0.45/0.01 ksf
	S-4	24"	24"	17.0'	3	4	3	3		
	S-5	24"	18"	22.0'	9	10	13	13		
	S-6	24"	24"	27.0'	WOH	WOH	1	2		
	S-7	24"	24"	32.0'	WOH	WOH	WOH	WOH		
	1S	24"		37.0'	WOM	WOM	WOM	WOM		
	3.5"X7" VANE			37.8'						
	3.5"X7" VANE			38.2'						
									39.0'	BEDROCK

SAMPLES: \_\_\_\_\_ SOIL CLASSIFIED BY: \_\_\_\_\_ REMARKS: \_\_\_\_\_

D=SPLIT SPOON  
 C=3" SHELBY TUBE  
 U=3.5" SHELBY TUBE

DRILLER - VISUALLY  
 SOIL TECH. - VISUALLY  
 LABORATORY TEST

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

(10)

BORING NO.: B-8

# PRELIMINARY



**BORING LOG**

BORING NO.:         B-8          
 SHEET:         2 OF 2          
 PROJECT NO.:         04-0983 S          
 DATE START:         8/27/1997          
 DATE FINISH:         8/28/1997          
 ELEVATION:         27.0'+/-          
 SWC REP.:         M.K.        

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co.          DRILLER :         Pete        

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

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA	
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24			
	1R	4.0'	48"	45.0'					45.0'	QUARTZITE RQD = 56%	
										BOTTOM OF EXPLORATION AT 45.0'	

<b>SAMPLES:</b>  S=SPLIT SPOON C=3" SHELBY TUBE U=3.5" SHELBY TUBE	<b>SOIL CLASSIFIED BY:</b>  <table border="1" style="margin: 0 auto;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px;"></td></tr> <tr><td style="text-align: center;">X</td><td style="width: 20px;"></td></tr> <tr><td style="text-align: center;">X</td><td style="width: 20px;"></td></tr> </table>			X		X		<b>DRILLER - VISUALLY</b> <b>SOIL TECH. - VISUALLY</b> <b>LABORATORY TEST</b>	<b>REMARKS:</b>  STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.	<div style="border: 1px solid black; border-radius: 50%; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin: 0 auto;"> <span style="font-size: 18px;">11</span> </div>
X										
X										
				<b>BORING NO.:</b> <b>B-8</b>						

PRELIMINARY



# BORING LOG

BORING NO.: B-9  
 SHEET: 1 OF 2  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/28/1997  
 DATE FINISH: 8/28/1997  
 ELEVATION: 28.5'+/-  
 SWC REP.: M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

CASING: HSA 2 1/2"  
 SAMPLER: SS 1 3/8" 140 LB 30"  
 CORE BARREL: \_\_\_\_\_

## WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA	
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24			
									6"+/-	TOPSOIL AND ORGANICS	
										BROWN SILT WITH SOME FINE SAND (FILL)	
	S-1	24"	12"	3.0'	3	5	5	8	3'	- HARD - qp = 8 ksf	
	S-2	24"	12"	5.0'	6	6	8	8		BROWN SILTY CLAY	
	S-3	24"	18"	7.0'	6	6	8	9		Y STIFF BECOMING... qp = 5 ksf	
	S-4	24"	18"	9.0'	8	9	9	8		qp = 4 ksf	
	S-5	24"	24"	12.0'	3	2	3	4		qp = 3 ksf	
									14'+/-	...STIFF -	
	S-6	24"	24"	17.0'	1	2	1	2		GRAY SILTY CLAY qp =<0.5 ksf	
	S-7	24"	24"	22.0'	WOH	WOH	WOH	1		- MEDIUM -	
	S-8	24"		27.0'							
	3.5"X7" VANE			27.8'							
	3.5"X7" VANE			28.2'							
	ROD PROBE				30.0'-40.8'				30'+/-		ASSUMED GRAY SILTY CLAY

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

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

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

# PRELIMINARY



# BORING LOG

BORING NO.: B-9  
 SHEET: 2 OF 2  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/28/1997  
 DATE FINISH: 8/28/1997  
 ELEVATION: 28.5'+/-  
 SWC REP.: M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

CASING: TYPE HSA. SIZE I.D. 2 1/2" HAMMER WT. 140 LB HAMMER FALL 30"  
 SAMPLER: SS SIZE I.D. 1 3/8" HAMMER WT. 140 LB HAMMER FALL 30"  
 CORE BARREL: \_\_\_\_\_

### WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE			DEPTH @ BOT	SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.		0-6	6-12	12-18	18-24		
4/6 50/2									40.8'	BOTTOM OF EXPLORATION - REFUSAL

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

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

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

(13)

BORING NO.: B-9

PRELIMINARY



# BORING LOG

BORING NO.: B-10  
 SHEET: 1 OF 2  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/28/1997  
 DATE FINISH: 8/28/1997  
 ELEVATION: 31.0'+/-  
 SWC REP.: M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

CASING: TYPE HSA SIZE I.D. 2 1/2" HAMMER WT. 140 LB HAMMER FALL 30"  
 SAMPLER: TYPE SS SIZE I.D. 1 3/8" HAMMER WT. 140 LB HAMMER FALL 30"  
 CORE BARREL: \_\_\_\_\_

## WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA	
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24			
	S-1	24"	10"	2.0'	3	5	5	6	6"+/-	TOPSOIL AND ORGANICS qp = 7 ksf ~ HARD BECOMING GRAY-BROWN SILTY CLAY	
	S-2	24"	15"	7.0'	4	5	6	8	9.5'+/-	BROWN SILTY CLAY qp = 3 ksf	
	S-3	24"	24"	12.0'	2	2	3	3	14'+/-	MEDIUM - BROWNISH-GRAY SILTY CLAY qp = 1.5 ksf	
	ROD PROBE			14'-53.5'					2	ASSUMED GRAY SILTY CLAY	
									4		
									6		
									6		
									5		
									7		
									6		
									8		
									8		
									8		
									10	25'+/-	POSSIBLE SAND LAYER
									10	ASSUMED GRAY SILTY CLAY	
									10		
									8		
									8		
									12		
									14		
									13		
									11		
									13		
									15		
									17		
									16		
									14		
									16		

SAMPLES:          SOIL CLASSIFIED BY:          REMARKS:         

= SPLIT SPOON       DRILLER - VISUALLY  
 = 3" SHELBY TUBE     SOIL TECH. - VISUALLY  
 = 3.5" SHELBY TUBE    LABORATORY TEST

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

(14)

BORING NO.: B-10

# PRELIMINARY



# BORING LOG

BORING NO.: B-10  
 SHEET: 2 OF 2  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/28/1997  
 DATE FINISH: 8/28/1997  
 ELEVATION: 31.0'+/-  
 SWC REP. M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

CASING: TYPE HSA SIZE I.D. 2 1/2" HAMMER WT. 140 LB HAMMER FALL 30"  
 SAMPLER: SS 1 3/8" 140 LB 30"  
 CORE BARREL:

### WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA	
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24			
									15	43'+/-	
									15		
									16		
									22		
									15		
									20		
									23		
									30		
									43		
									43		
									47	53.6'	POSSIBLE GRAY SILTY CLAY AND SAND
									58		
									51		
									76/6		
											BOTTOM OF EXPLORATION - REFUSAL AT 53.6'

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

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

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

(15)

BORING NO.: **B-10**

# PRELIMINARY





# BORING LOG

BORING NO.: B-11  
 SHEET: 1 OF 2  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/28/1997  
 DATE FINISH: 8/28/1997  
 ELEVATION: 29.5'+/-  
 SWC REP.: M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

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

## WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA	
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24			
H									6"+/-	TOPSOIL WITH ORGANICS	
Y	S-1	24"	10"	2.0'	2	3	5	6	1' +/-	RUST BROWN SILTY SAND	
D											
R										~ HARD BECOMING	
A											
U										BROWN SILTY CLAY	
L	S-2	24"	24"	7.0'	5	5	6	8		... STIFF ~	
I											
C									9'+/-	~ MEDIUM ~	
P										GRAY-BROWN SILTY CLAY	
U	S-3	24"	24"	12.0'	2	5	3	4		qp = 0.5 ksf	
S											
H											
	1S	24"		17.0'	PUSHED TUBE						
				17.8'						qu = 1.1 ksf	
				18.2'						Sv = 0.35/0.04 ksf	
										Sv = 0.65/0.04 ksf	
										W = 43.7%	
	S-4	24"	24"	22.0'	WOH	WOH	1	1		qp = 1.0-1.5 ksf	
				25.8'						Sv = 0.52/0.07 ksf	
				26.2'						Sv = 0.65/0.07 ksf	
	S-5	24"	24"	32.0'	WOH	WOH	WOH	WOH		W = 43.7%	
				35.8'						Sv = 0.35/0.07 ksf	
				36.2'						Sv = 0.46/0.07 ksf	

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

SOIL CLASSIFIED BY:

<input type="checkbox"/>	DRILLER - VISUALLY
<input checked="" type="checkbox"/>	SOIL TECH. - VISUALLY
<input checked="" type="checkbox"/>	LABORATORY TEST

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

(16)

BORING NO.: B-11

# PRELIMINARY



# BORING LOG

BORING NO.: B-11  
 SHEET: 2 OF 2  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/28/1997  
 DATE FINISH: 8/28/1997  
 ELEVATION: 29.0'+/-  
 SWC REP. M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

CASING: TYPE HSA SIZE I.D. 2 1/2" HAMMER WT. 140 LB HAMMER FALL 30"  
 SAMPLER: TYPE SS SIZE I.D. 1 3/8" HAMMER WT. 140 LB HAMMER FALL 30"  
 CORE BARREL: \_\_\_\_\_

WATER LEVEL INFORMATION  
 WATER LEVEL AT 11.8' BELOW GROUND  
 SURFACE ON 10/17/97

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	S-6	24"	24"	42.0'	WOH	WOH	WOH	WOH		GRAY SILTY CLAY
	3.5"X7" VANE								46'+/-	Sv = 0.48/0.08 ksf
									49.1'	PROBABLE SAND
									51.0'	PROBABLE BEDROCK (ROLLER BIT)
									55.0'	BEDROCK CORE
										BOTTOM OF EXPLORATION AT 55.0'
										INSTALLED GROUNDWATER MONITORING WELL AT 30' WITH 5' SCREEN

SAMPLES: \_\_\_\_\_ SOIL CLASSIFIED BY: \_\_\_\_\_ REMARKS: \_\_\_\_\_

D=SPLIT SPOON  DRILLER - VISUALLY  
 C=3" SHELBY TUBE  SOIL TECH. - VISUALLY  
 U=3.5" SHELBY TUBE  LABORATORY TEST

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

(17)

BORING NO.: **B-11**

PRELIMINARY



# BORING LOG

BORING NO.: B-12  
 SHEET: 1 OF 2  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/28/1997  
 DATE FINISH: 8/28/1997  
 ELEVATION: 29.0'+/-  
 SWC REP. M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

CASING: TYPE HSA SIZE I.D. 2 1/2" HAMMER WT. 140 LB HAMMER FALL 30"  
 SAMPLER: TYPE SS SIZE I.D. 1 3/8" HAMMER WT. 140 LB HAMMER FALL 30"  
 CORE BARREL: \_\_\_\_\_

## WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	S-1	24"	10"	2.0'	2	3	4	5	6"+/-	TOPSOIL AND ORGANICS qp = 9+ ksf ~ HARD BECOMING . . . .
	S-2	24"	20"	7.0'	4	8	7	7		BROWN SILTY CLAY qp = 8 ksf GRAYISH-BROWN SILTY CLAY STIFF ~
	S-3	24"	24"	12.0'	3	4	7	8	12.0'	GRAYISH BROWN SILTY CLAY qp = 4 ksf
	ROD PROBE			12'-41.9'				4		
								6		
								9		
								12		
								13		
								13		
								13		
								11		
								12		
								12		
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								12		
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								12		
								12		
								12		
								15		
								18		
								18		
								19		
								20		
								20		
								20		
								17	35.0'	
								23		
								25		
								27		
								33		
								20		

SAMPLES: \_\_\_\_\_ SOIL CLASSIFIED BY: \_\_\_\_\_ REMARKS: \_\_\_\_\_

D=SPLIT SPOON  DRILLER - VISUALLY  
 C=3" SHELBY TUBE  SOIL TECH. - VISUALLY  
 U=3.5" SHELBY TUBE  LABORATORY TEST

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

(17)

BORING NO.: B-12

PRELIMINARY



# BORING LOG

BORING NO.: B-12  
 SHEET: 2 OF 2  
 PROJECT NO.: 04-0983 S  
 DATE START: 8/28/1997  
 DATE FINISH: 8/28/1997  
 ELEVATION: 29.0'+/-  
 SWC REP.: M.K.

PROJECT / CLIENT: Proposed Medical Office Building / Olympia Equity Investors II, LLC  
 LOCATION: Sewall St. Portland, Maine  
 DRILLING FIRM: Great Works Pump & Test Boring Co. DRILLER: Pete

CASING: TYPE HSA SIZE I.D. 2 1/2" HAMMER WT. - HAMMER FALL -  
 SAMPLER: SS SIZE I.D. 1 3/8" WEIGHT 140 LB FALL 30"  
 CORE BARREL: \_\_\_\_\_

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE			DEPTH @ BOT	SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.		0-6	6-12	12-18	18-24		
24									41.9'	BOTTOM OF EXPLORATION - REFUSAL AT 41.9'
25/9 25/0										

SAMPLES: D=SPLIT SPOON    C=3" SHELBY TUBE    U=3.5" SHELBY TUBE    SOIL CLASSIFIED BY:  DRILLER - VISUALLY     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

**PRELIMINARY**



## 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 <sub>u</sub>	-	unconfined compressive strength, kips/sq. ft. - based on laboratory unconfined compressive test
S <sub>v</sub>	-	field vane shear strength, kips/sq. ft.
L <sub>v</sub>	-	lab vane shear strength, kips/sq. ft.
q <sub>p</sub>	-	unconfined compressive strength, kips/sq. ft. based on pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W <sub>L</sub>	-	liquid limit - Atterberg test
W <sub>P</sub>	-	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 <sub>T</sub>	-	total soil weight
γ <sub>B</sub>	-	buoyant soil weight

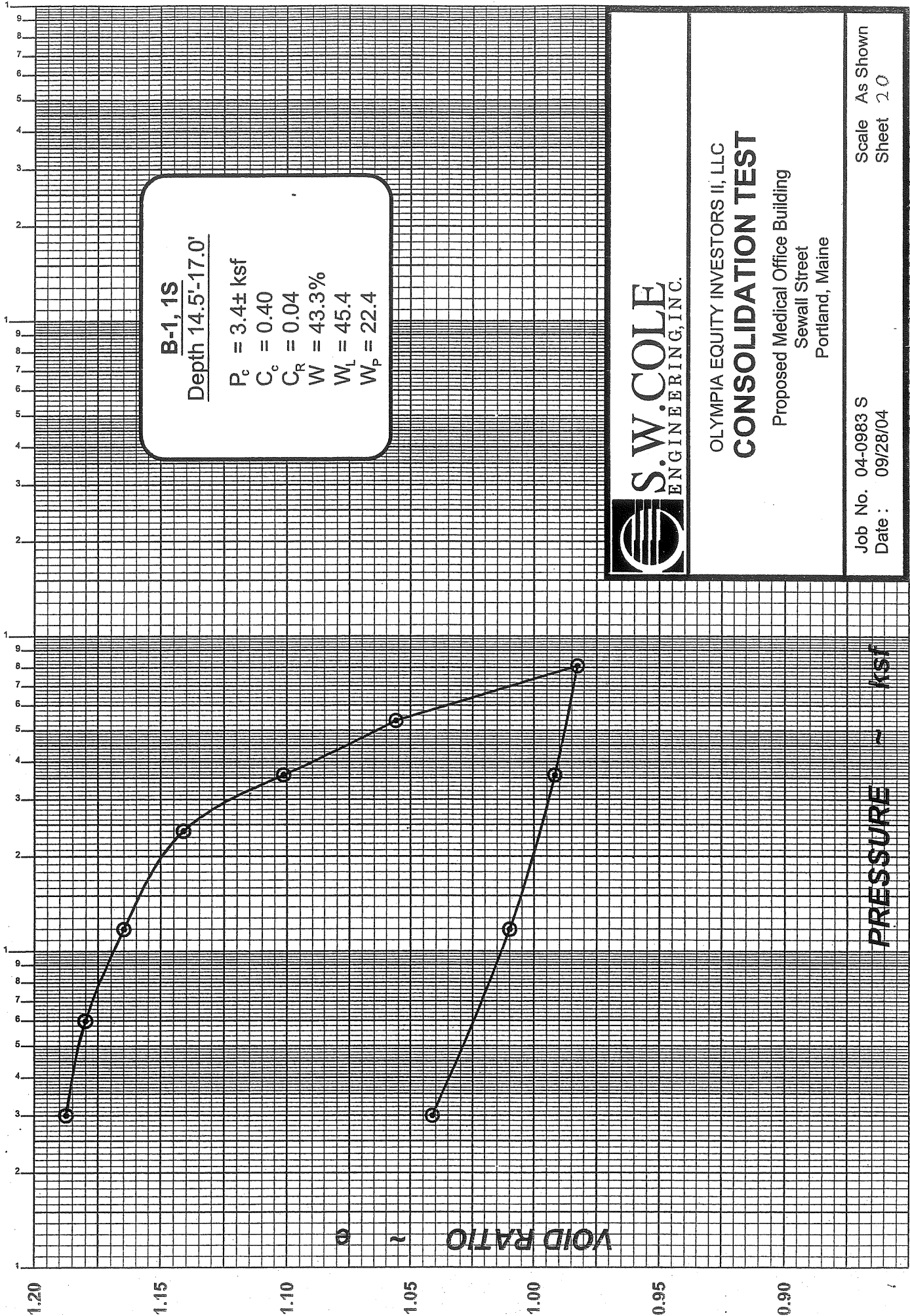
#### Description of Proportions:

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.

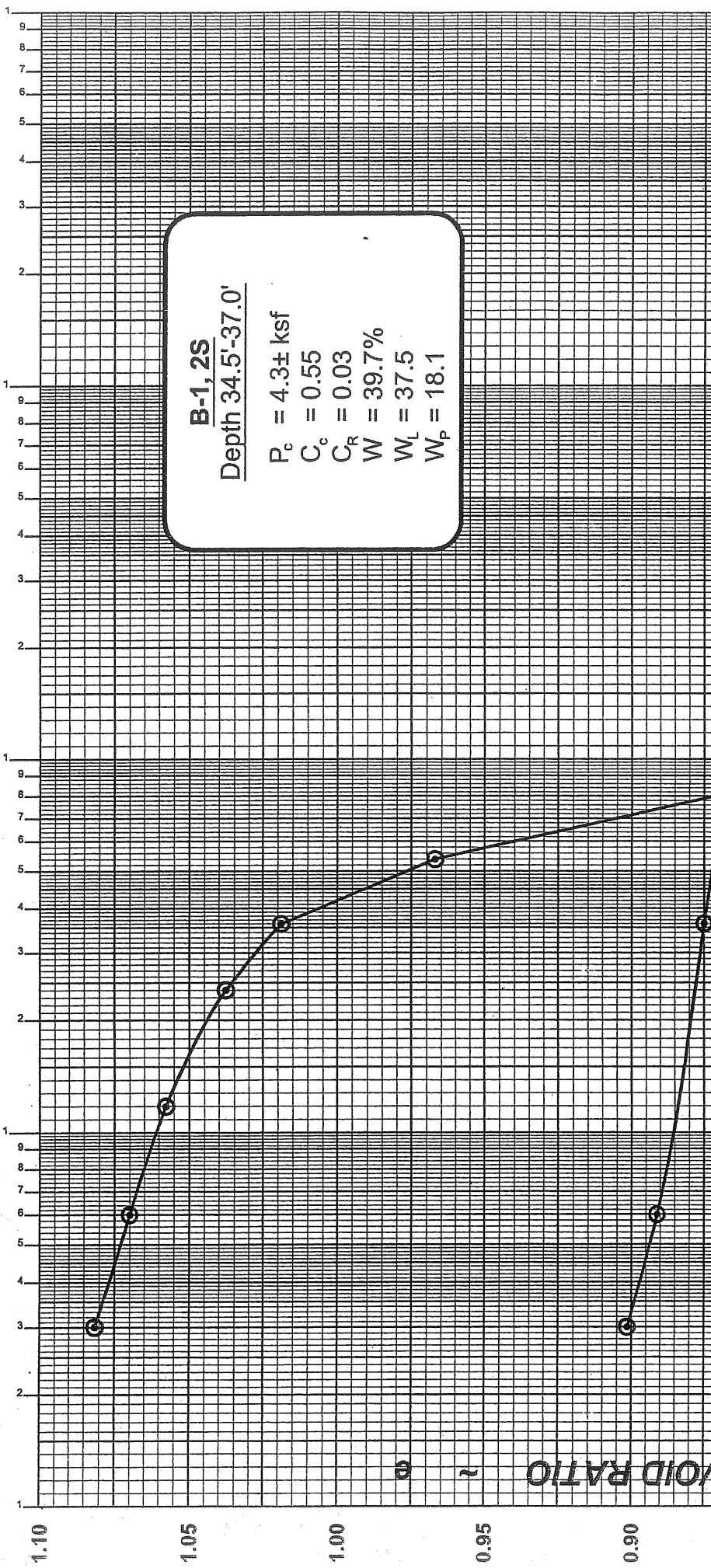


OLYMPIA EQUITY INVESTORS II, LLC  
**CONSOLIDATION TEST**  
 Proposed Medical Office Building  
 Sewall Street  
 Portland, Maine

Job No. 04-0983 S  
 Date: 09/28/04

Scale As Shown  
 Sheet 20

**PRELIMINARY**



**B-1, 2S**  
Depth 34.5'-37.0'  
 $P_c = 4.3 \pm$  ksf  
 $C_c = 0.55$   
 $C_R = 0.03$   
 $W = 39.7\%$   
 $W_L = 37.5$   
 $W_P = 18.1$



**S.W. COLE**  
 ENGINEERING, INC.

OLYMPIA EQUITY INVESTORS II, LLC  
**CONSOLIDATION TEST**

Proposed Medical Office Building  
 Sewall Street  
 Portland, Maine

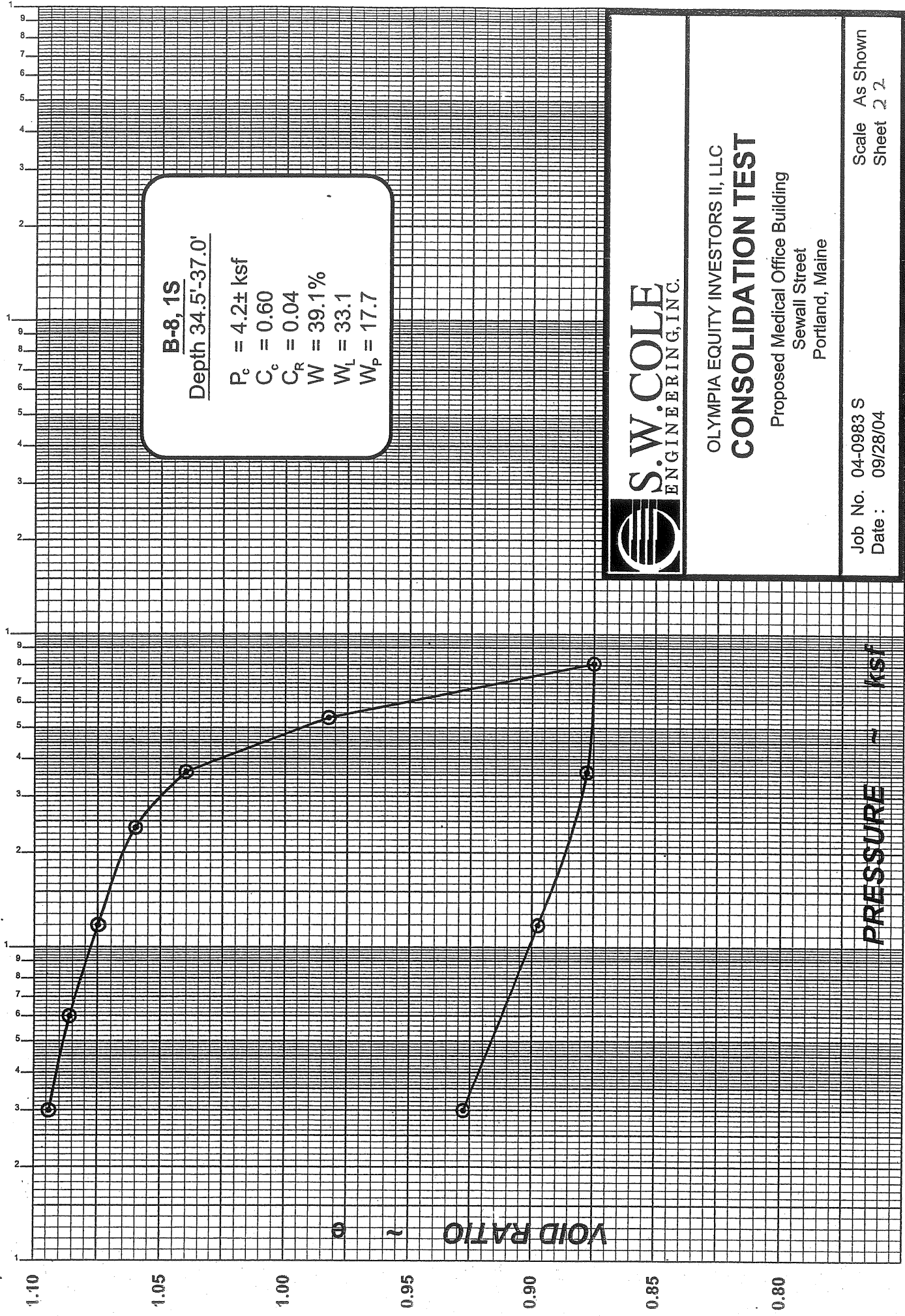
Job No. 04-0983 S  
 Date: 09/28/04

Scale As Shown  
 Sheet 21

1.00 10.00

VOID RATIO  
 PRESSURE - ksf

**PRELIMINARY**



**B-8, 1S**  
Depth 34.5'-37.0'  
 $P_c = 4.2 \pm$  ksf  
 $C_c = 0.60$   
 $C_R = 0.04$   
 $W = 39.1\%$   
 $W_L = 33.1$   
 $W_P = 17.7$



OLYMPIA EQUITY INVESTORS II, LLC  
**CONSOLIDATION TEST**  
 Proposed Medical Office Building  
 Sewall Street  
 Portland, Maine

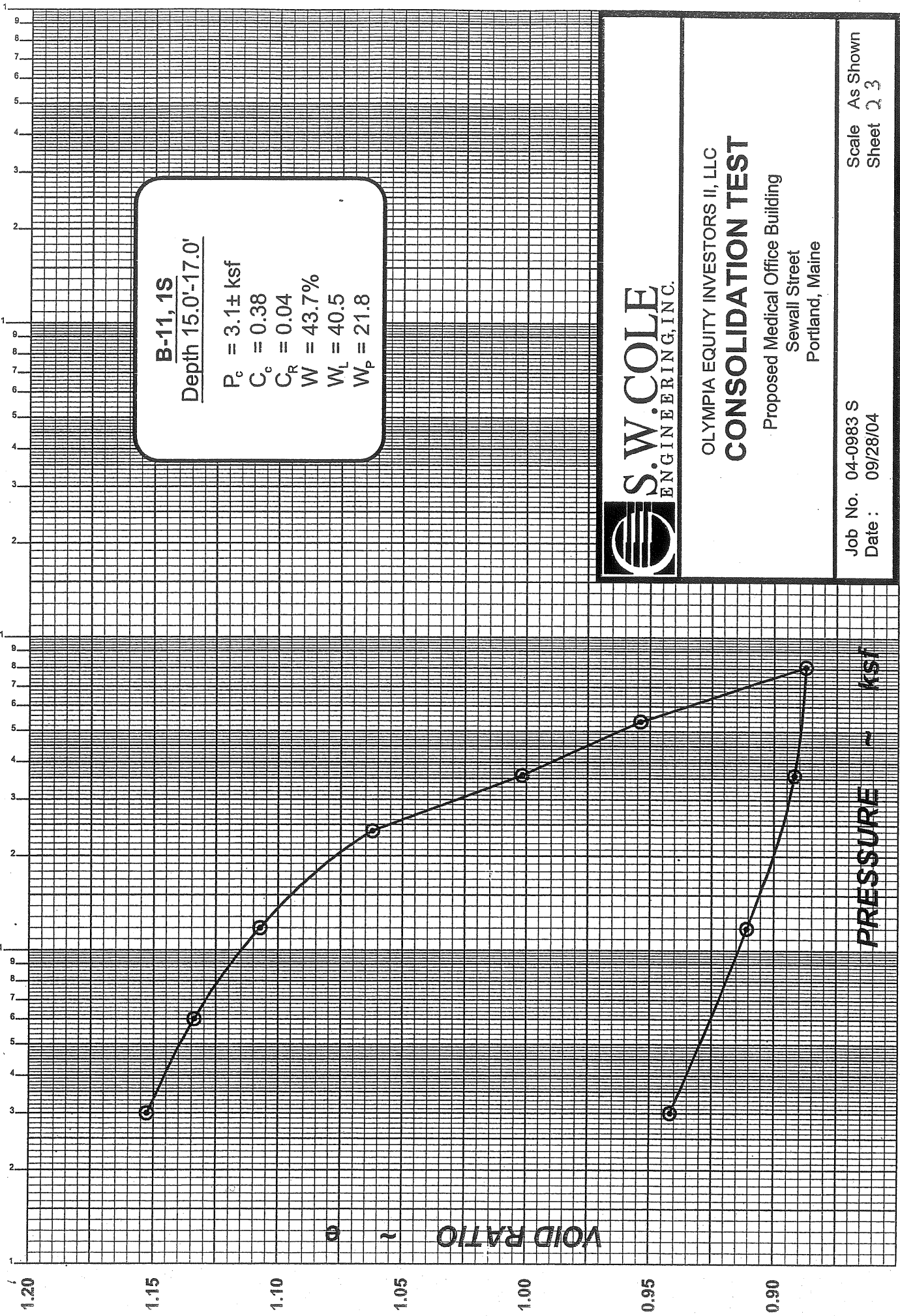
Job No. 04-0983 S  
 Date: 09/28/04

Scale As Shown  
 Sheet 2 2

**PRELIMINARY**

1.00 10.00





**B-11, 1S**  
Depth 15.0'-17.0'  
 $P_c = 3.1 \pm$  ksf  
 $C_c = 0.38$   
 $C_R = 0.04$   
 $W = 43.7\%$   
 $W_L = 40.5$   
 $W_P = 21.8$



OLYMPIA EQUITY INVESTORS II, LLC  
**CONSOLIDATION TEST**  
 Proposed Medical Office Building  
 Sewall Street  
 Portland, Maine

Job No. 04-0983 S  
 Date: 09/28/04

Scale As Shown  
 Sheet 2 3

**PRELIMINARY**

**STORMWATER MANAGEMENT REPORT**  
**SEWALL STREET PROPOSED OFFICE BUILDING**  
**PORTLAND, MAINE**

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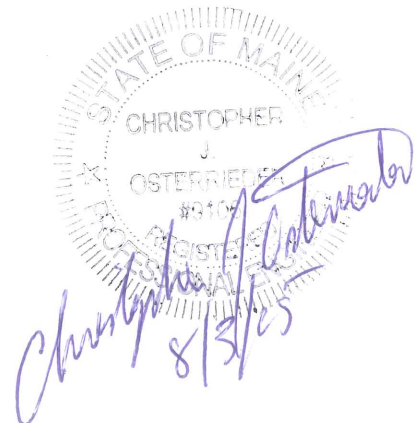
**Prepared for:**

**Olympia Equity Investors, LLC**  
**280 Fore Street**  
**Portland, ME 04101**

**Prepared by:**

**DeLuca-Hoffman Associates, Inc.**  
**778 Main Street, Suite 8**  
**South Portland, ME 04106**

**April 2005**



# SEWALL STREET PROPOSED OFFICE BUILDING STORMWATER MANAGEMENT REPORT

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## I. INTRODUCTION

Olympia Equity Investors II, LLC has retained DeLuca-Hoffman Associates, Inc. to assist in the preparation of civil site development plans and permit applications associated with the development of a proposed 44,000 square foot office building. The proposed building will have a base 11,096 square foot footprint and is to be sited on a 1.7-acre tract of land off of Sewall Street between the Downeaster train station parking facility and the existing Doubletree Hotel. A second remote parking lot is proposed adjacent to the Norway Savings Bank building as part of a shared parking arrangement.

This stormwater management report addresses the following stormwater impacts associated with the proposed development:

- Pre and Postdevelopment Drainage Patterns and Peak Rates of Runoff
- Changes in Stormwater Discharge
- Stormwater Quality Treatment
- Erosion & Sedimentation Control Associated with the Changes to Stormwater

## II. BACKGROUND

The proposed office building and associated surface parking facilities will occupy a 1.7-acre parcel that currently serves as a secondary entrance to the Doubletree Hotel from Sewall Street. Approximately 49.6% of this lot is currently paved, and the balance is a combination of overgrown field and light woods.

The soils in the area are comprised of 'B' soils (Belgrade) which are considered to have moderate runoff potential.

The portion of the site adjacent to the Norway Savings Bank consists of a 36" storm drain outfall which transects this site and discharges into the gully which begins near the current drive-thru exit from the bank. This area is symptomatic of urban fill material, given the debris present, existence of the storm drain outfall, topography, and non-native bamboo which is prolific in these areas.

## III. EXISTING SITE DRAINAGE

The overall watershed for the project is essentially bounded by Sewall Street, Congress Street, and the ravine which traverses north to south along the southbound I-295 on ramps.

The onsite portion of the watershed currently consists of 4.76 acres, which from review of aerial photographs has existed since at least June of 1975, when the photograph was taken.

An existing subsurface collection system serves all of the parking lots associated with the Doubletree Hotel and the Norway Savings Bank building. The drainage has a single

18" outfall which discharges to the existing ravine on the southeasterly corner of the project. Drainage from this ravine is directly connected to the Fore River and no formal stormwater quantity controls are currently in place.

Review of the site reveals the existence of a water quality unit which serves the drainage emanating from the Norway Savings Bank parking lot.

No evidence of erosion was discovered during previous visits to the site, through the 18" storm drain outfall does not have any type of energy dissipating device at its outlet.

#### **IV. PROPOSED SITE DRAINAGE**

The proposed office building and associated parking lot, as well as the new parking lot to be constructed nearest the current westerly driveway of the Doubletree Hotel, will be collected and discharge through the existing 18" storm drain outfall. A new 6' diameter Downstream Defender water quality unit will be installed as a water quality treatment measure. The two areas represent approximately 1.10 acres of new impervious area, although the Doubletree lot will be reconstructed in the location of the current westerly entrance driveway.

The second parking facility located between the Norway Savings Bank building, Congress Street and the MDOT on ramps will consist of approximately 0.62 acres of new impervious area and will be served by a proposed subsurface collection system. The existing 36" storm drain will be extended beyond the limits of the fill slope. A new 6' diameter Downstream Defender water quality unit will treat the runoff from this proposed parking lot prior to discharge into the 36" storm drain.

A new rip rap apron will be installed at the outlet of the 18" outfall. This apron will consist of  $D_{50} = 24$ " rip rap sized to accommodate the existing velocity from the 25-year storm event.

#### **V. CONCLUSIONS**

The proposed development will result in the creation of approximately 1.72 acres of impervious surface that will discharge to an existing drainage ravine directly connected to the Fore River. The proposed development will result in a minimal increase in runoff during the 25-year storm event for the proposed office building and parking facility. The MDOT lot to become parking will nearly double in runoff from 2.34 to 5.05 cfs, but will be discharged in a stable manner and due to the proximity in the watershed, no stormwater management is warranted. Due to the proximity of this development relative to the Fore River and the fact that the downstream areas will be subject to flooding as a result of this development, no formal stormwater quantity control is required.

Water quality devices will be installed in the two new main parking lots and both temporary and permanent erosion and sedimentation control devices will be employed to control construction and post-construction runoff.

The proposed development will not have an adverse impact on stormwater quantity or quality during or after construction, nor will it affect any downstream properties.

## Attachments

- A - Predevelopment Calculations
- B - Postdevelopment Calculations
- C - Riprap Sizing
  
- W-1 - Predevelopment Watershed Plan
- W-2 - Postdevelopment Watershed Plan

# **ATTACHMENT A**

## **Predevelopment Calculations**

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

<b>Subcatchment 1S: N. RES. &amp; ENTRANCE</b>	Runoff Area=0.822 ac Runoff Depth=0.64" Flow Length=257' Tc=25.3 min CN=70 Runoff=0.36 cfs 0.044 af
<b>Subcatchment 2A: RES./ PAVED LOT &amp; NW HOTEL</b>	Runoff Area=0.652 ac Runoff Depth=1.48" Flow Length=192' Tc=10.8 min CN=85 Runoff=1.03 cfs 0.080 af
<b>Subcatchment 2B: ( new Subcat)</b>	Runoff Area=0.712 ac Runoff Depth=1.21" Flow Length=171' Tc=20.5 min CN=81 Runoff=0.72 cfs 0.072 af
<b>Subcatchment 3S: MOBIL STATION LOT</b>	Runoff Area=0.248 ac Runoff Depth=2.22" Flow Length=103' Tc=1.1 min CN=94 Runoff=0.73 cfs 0.046 af
<b>Subcatchment 4S: NE HOTEL QUAD &amp; PARKING</b>	Runoff Area=0.659 ac Runoff Depth=2.59" Flow Length=301' Tc=19.8 min CN=98 Runoff=1.31 cfs 0.142 af
<b>Subcatchment 5S: SW HOTEL QUAD &amp; LOT</b>	Runoff Area=1.125 ac Runoff Depth=1.27" Flow Length=197' Tc=10.6 min CN=82 Runoff=1.53 cfs 0.119 af
<b>Subcatchment 6B: SEWALL ST ENTRANCE</b>	Runoff Area=0.266 ac Runoff Depth=1.28" Flow Length=99' Tc=5.7 min CN=82 Runoff=0.42 cfs 0.028 af
<b>Subcatchment 6S: SE HOTEL QUAD &amp; PARKING</b>	Runoff Area=1.371 ac Runoff Depth=2.41" Flow Length=297' Tc=5.0 min CN=96 Runoff=3.86 cfs 0.275 af
<b>Subcatchment 7S: NORWAY SAVINGS &amp; LOT</b>	Runoff Area=1.238 ac Runoff Depth=2.50" Flow Length=333' Tc=3.3 min CN=97 Runoff=3.80 cfs 0.258 af
<b>Subcatchment 8S: Existing Site</b>	Runoff Area=1.354 ac Runoff Depth=0.23" Flow Length=541' Tc=37.5 min CN=58 Runoff=0.11 cfs 0.026 af
<b>Subcatchment 9S: ADDITION W OF NORWAY BANK</b>	Runoff Area=1.628 ac Runoff Depth=0.29" Flow Length=506' Tc=11.3 min CN=60 Runoff=0.27 cfs 0.039 af
<b>Pond 1P:</b>	Peak Elev=28.38' Storage=7 cf Inflow=0.78 cfs 0.090 af 10.0" x 90.0' Culvert Outflow=0.78 cfs 0.089 af
<b>Pond 2AP:</b>	Peak Elev=28.46' Storage=12 cf Inflow=1.49 cfs 0.170 af 10.0" x 162.0' Culvert Outflow=1.49 cfs 0.170 af
<b>Pond 2BP:</b>	Peak Elev=28.60' Storage=2 cf Inflow=0.72 cfs 0.072 af 10.0" x 142.0' Culvert Outflow=0.72 cfs 0.072 af
<b>Pond 3P:</b>	Peak Elev=28.97' Storage=6 cf Inflow=0.73 cfs 0.046 af 10.0" x 35.0' Culvert Outflow=0.73 cfs 0.046 af

2498-Pre Development

Type III 24-hr 2-YR Rainfall=3.00"

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**Pond 4P:** Peak Elev=29.83' Storage=35 cf Inflow=2.69 cfs 0.312 af  
10.0" x 169.0' Culvert Outflow=2.69 cfs 0.312 af

**Pond 5P:** Peak Elev=28.55' Storage=20 cf Inflow=2.06 cfs 0.191 af  
10.0" x 117.0' Culvert Outflow=2.09 cfs 0.191 af

**Pond 6BP:** Peak Elev=27.47' Storage=10 cf Inflow=2.39 cfs 0.219 af  
12.0" x 313.0' Culvert Outflow=2.39 cfs 0.219 af

**Pond 6P: Existing Outfall** Peak Elev=24.53' Storage=20 cf Inflow=9.99 cfs 1.063 af  
Primary=9.98 cfs 1.063 af Secondary=0.00 cfs 0.000 af Outflow=9.98 cfs 1.063 af

**Pond 7P:** Peak Elev=30.19' Storage=763 cf Inflow=5.93 cfs 0.570 af  
Primary=4.21 cfs 0.569 af Secondary=0.00 cfs 0.000 af Outflow=4.21 cfs 0.569 af

**Pond POI-1: Ravine** Inflow=10.06 cfs 1.128 af  
Primary=10.06 cfs 1.128 af

**Total Runoff Area = 10.075 ac Runoff Volume = 1.129 af Average Runoff Depth = 1.34"**



**Subcatchment 1S: N. RES. & ENTRANCE**

Runoff = 0.36 cfs @ 12.41 hrs, Volume= 0.044 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.197	98	BLDGS & PAVMENT
0.625	61	>75% Grass cover, Good, HSG B
0.822	70	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0	219	0.0100	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.3	38	0.0090	1.9		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
25.3	257	Total			

**Subcatchment 2A: RES./ PAVED LOT & NW HOTEL**

Runoff = 1.03 cfs @ 12.15 hrs, Volume= 0.080 af, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.423	98	RES./PARKING LOT & HOTEL
0.229	61	>75% Grass cover, Good, HSG B
0.652	85	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	119	0.0370	0.2		Sheet Flow, A-B Cultivated: Residue>20% n= 0.170 P2= 3.00"
0.7	73	0.0080	1.8		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
10.8	192	Total			

**Subcatchment 2B: ( new Subca)**

Runoff = 0.72 cfs @ 12.30 hrs, Volume= 0.072 af, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.382	98	PAVEMENT & BUILDING
0.330	61	>75% Grass cover, Good, HSG B
0.712	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	128	0.0060	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.5	43	0.0060	1.6		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
20.5	171	Total			

**Subcatchment 3S: MOBIL STATION LOT**

Runoff = 0.73 cfs @ 12.02 hrs, Volume= 0.046 af, Depth= 2.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.206	98	PARKING & BUILDING
0.042	74	>75% Grass cover, Good, HSG C
0.248	94	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	49	0.0240	1.2		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.4	54	0.0130	2.3		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
1.1	103	Total			

**Subcatchment 4S: NE HOTEL QUAD & PARKING**

Runoff = 1.31 cfs @ 12.26 hrs, Volume= 0.142 af, Depth= 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.659	98	HOTEL & PARKING

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.1	171	0.0120	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.7	130	0.0220	3.0		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
19.8	301	Total			

**Subcatchment 5S: SW HOTEL QUAD & LOT**

Runoff = 1.53 cfs @ 12.15 hrs, Volume= 0.119 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.647	98	RES. / HOTEL & LOT
0.478	61	>75% Grass cover, Good, HSG B
1.125	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	124	0.0300	0.2		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.4	73	0.0230	3.1		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
10.6	197	Total			

**Subcatchment 6B: SEWALL ST ENTRANCE**

Runoff = 0.42 cfs @ 12.09 hrs, Volume= 0.028 af, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.154	98	PAVED ENTRANCE
0.112	61	>75% Grass cover, Good, HSG B
0.266	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	37	0.0940	0.1		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.00"
0.3	62	0.0260	3.3		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
5.7	99	Total			

**Subcatchment 6S: SE HOTEL QUAD & PARKING**

Runoff = 3.86 cfs @ 12.07 hrs, Volume= 0.275 af, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

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Type III 24-hr 2-YR Rainfall=3.00"

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Area (ac)	CN	Description
1.256	98	HOTEL PAVED LOT
0.115	74	>75% Grass cover, Good, HSG C
1.371	96	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	92	0.0010	0.4		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
1.1	205	0.0250	3.2		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
5.0	297	Total			

Subcatchment 7S: NORWAY SAVINGS & LOT

Runoff = 3.80 cfs @ 12.05 hrs, Volume= 0.258 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
1.169	98	BANK & LOT
0.069	74	>75% Grass cover, Good, HSG C
1.238	97	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	136	0.0088	1.0		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.2	39	0.0400	4.1		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.2	42	0.0250	3.2		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.7	116	0.0177	2.7		Shallow Concentrated Flow, D-E Paved Kv= 20.3 fps
3.3	333	Total			

Subcatchment 8S: Existing Site

Runoff = 0.11 cfs @ 12.76 hrs, Volume= 0.026 af, Depth= 0.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
1.354	58	Woods/grass comb., Good, HSG B

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Type III 24-hr 2-YR Rainfall=3.00"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	94	0.0090	0.1		Sheet Flow, A-B Range n= 0.130 P2= 3.00"
7.6	74	0.0042	0.2		Shallow Concentrated Flow, B-C Forest w/Heavy Litter Kv= 2.5 fps
18.1	373	0.0189	0.3		Shallow Concentrated Flow, C-D Forest w/Heavy Litter Kv= 2.5 fps
37.5	541	Total			

Subcatchment 9S: ADDITION W OF NORWAY BANK

Runoff = 0.27 cfs @ 12.31 hrs, Volume= 0.039 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
1.481	56	Brush, Fair, HSG B
0.147	98	Paved parking & roofs
1.628	60	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	118	0.0850	0.2		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.00"
0.1	56	0.3030	8.9		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
0.1	29	0.3100	9.0		Shallow Concentrated Flow, C-D Unpaved Kv= 16.1 fps
1.7	303	0.0130	3.0	6.46	Trap/Vee/Rect Channel Flow, D-E Bot.W=4.00' D=0.50' Z= 0.5 ' n= 0.031
11.3	506	Total			

Pond 1P:

Inflow Area = 1.070 ac, Inflow Depth = 1.00" for 2-YR event  
 Inflow = 0.78 cfs @ 12.02 hrs, Volume= 0.090 af  
 Outflow = 0.78 cfs @ 12.02 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.1 min  
 Primary = 0.78 cfs @ 12.02 hrs, Volume= 0.089 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 28.38' @ 12.02 hrs Surf.Area= 13 sf Storage= 7 cf  
 Flood Elev= 32.31' Surf.Area= 17 sf Storage= 56 cf  
 Plug-Flow detention time= 0.4 min calculated for 0.089 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.3 min ( 800.2 - 800.0)

2498-Pre Development

Type III 24-hr 2-YR Rainfall=3.00"

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#	Invert	Avail.Storage	Storage Description
1	27.81'	56 cf	4.00'D x 4.45'H Vertical Cone/Cylinder
2	32.31'	1,381 cf	Custom Stage Data (Prismatic) Listed below
		1,437 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.31	4	0	0
33.00	4,000	1,381	1,381

#	Routing	Invert	Outlet Devices
1	Primary	27.81'	10.0" x 90.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.47' S= 0.0038 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=0.75 cfs @ 12.02 hrs HW=28.36' (Free Discharge)

1=Culvert (Barrel Controls 0.75 cfs @ 2.7 fps)

Pond 2AP:

Inflow Area = 1.722 ac, Inflow Depth = 1.18" for 2-YR event  
 Inflow = 1.49 cfs @ 12.15 hrs, Volume= 0.170 af  
 Outflow = 1.49 cfs @ 12.15 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.2 min  
 Primary = 1.49 cfs @ 12.15 hrs, Volume= 0.170 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 28.46' @ 12.15 hrs Surf.Area= 13 sf Storage= 12 cf  
 Flood Elev= 31.97' Surf.Area= 17 sf Storage= 57 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.170 af (100% of inflow)  
 Center-of-Mass det. time= 0.2 min (798.7 - 798.5)

#	Invert	Avail.Storage	Storage Description
1	27.47'	57 cf	4.00'D x 4.50'H Vertical Cone/Cylinder
2	31.97'	75 cf	Custom Stage Data (Prismatic) Listed below
		132 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
31.97	4	0	0
32.00	5,000	75	75

#	Routing	Invert	Outlet Devices
1	Primary	27.47'	10.0" x 162.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.05' S= 0.0026 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=1.49 cfs @ 12.15 hrs HW=28.46' (Free Discharge)

1=Culvert (Barrel Controls 1.49 cfs @ 2.9 fps)

**Pond 2BP:**

Inflow Area = 0.712 ac, Inflow Depth = 1.21" for 2-YR event  
 Inflow = 0.72 cfs @ 12.30 hrs, Volume= 0.072 af  
 Outflow = 0.72 cfs @ 12.30 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.1 min  
 Primary = 0.72 cfs @ 12.30 hrs, Volume= 0.072 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 28.60' @ 12.30 hrs Surf.Area= 13 sf Storage= 2 cf  
 Flood Elev= 32.34' Surf.Area= 17 sf Storage= 49 cf  
 Plug-Flow detention time= 0.0 min calculated for 0.071 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.0 min ( 815.0 - 815.0)

#	Invert	Avail.Storage	Storage Description
1	28.44'	49 cf	4.00'D x 3.90'H Vertical Cone/Cylinder
2	32.34'	1,420 cf	Custom Stage Data ( Prismatic) Listed below
		1,469 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.34	4	0	0
33.00	4,300	1,420	1,420

#	Routing	Invert	Outlet Devices
1	Primary	28.14'	10.0" x 142.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 26.99' S= 0.0081 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=0.72 cfs @ 12.30 hrs HW=28.60' (Free Discharge)

1=Culvert (Inlet Controls 0.72 cfs @ 2.3 fps)

**Pond 3P:**

Inflow Area = 0.248 ac, Inflow Depth = 2.22" for 2-YR event  
 Inflow = 0.73 cfs @ 12.02 hrs, Volume= 0.046 af  
 Outflow = 0.73 cfs @ 12.02 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.1 min  
 Primary = 0.73 cfs @ 12.02 hrs, Volume= 0.046 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 28.97' @ 12.02 hrs Surf.Area= 13 sf Storage= 6 cf  
 Flood Elev= 35.31' Surf.Area= 13 sf Storage= 86 cf  
 Plug-Flow detention time= 0.4 min calculated for 0.046 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.3 min ( 756.0 - 755.7)

#	Invert	Avail.Storage	Storage Description
1	28.50'	86 cf	4.00'D x 6.81'H Vertical Cone/Cylinder

#	Routing	Invert	Outlet Devices
1	Primary	28.50'	10.0" x 35.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.87' S= 0.0180 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=0.69 cfs @ 12.02 hrs HW=28.95' (Free Discharge)

↑1=Culvert (Inlet Controls 0.69 cfs @ 2.3 fps)

**Pond 4P:**

Inflow Area = 2.381 ac, Inflow Depth = 1.57" for 2-YR event  
 Inflow = 2.69 cfs @ 12.21 hrs, Volume= 0.312 af  
 Outflow = 2.69 cfs @ 12.22 hrs, Volume= 0.312 af, Atten= 0%, Lag= 0.4 min  
 Primary = 2.69 cfs @ 12.22 hrs, Volume= 0.312 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 29.83' @ 12.22 hrs Surf.Area= 13 sf Storage= 35 cf  
 Flood Elev= 32.75' Surf.Area= 13 sf Storage= 72 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.312 af (100% of inflow)  
 Center-of-Mass det. time= 0.2 min (776.5 - 776.3)

#	Invert	Avail.Storage	Storage Description
1	27.05'	72 cf	4.00'D x 5.70'H Vertical Cone/Cylinder

#	Routing	Invert	Outlet Devices
1	Primary	27.05'	10.0' x 169.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 26.60' S= 0.0027 ' n= 0.011 Cc= 0.900

Primary OutFlow Max=2.67 cfs @ 12.22 hrs HW=29.80' (Free Discharge)

↑1=Culvert (Barrel Controls 2.67 cfs @ 4.9 fps)

**Pond 5P:**

Inflow Area = 1.837 ac, Inflow Depth = 1.25" for 2-YR event  
 Inflow = 2.06 cfs @ 12.18 hrs, Volume= 0.191 af  
 Outflow = 2.09 cfs @ 12.17 hrs, Volume= 0.191 af, Atten= 0%, Lag= 0.0 min  
 Primary = 2.09 cfs @ 12.17 hrs, Volume= 0.191 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 28.55' @ 12.17 hrs Surf.Area= 13 sf Storage= 20 cf  
 Flood Elev= 32.64' Surf.Area= 17 sf Storage= 71 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.190 af (100% of inflow)  
 Center-of-Mass det. time= 0.2 min (808.7 - 808.5)

#	Invert	Avail.Storage	Storage Description
1	26.99'	71 cf	4.00'D x 5.65'H Vertical Cone/Cylinder
2	32.64'	398 cf	Custom Stage Data (Prismatic) Listed below
		469 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.64	4	0	0
33.00	2,207	398	398



#	Routing	Invert	Outlet Devices
1	Primary	26.99'	10.0" x 117.0' long Culvert RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 26.71' S= 0.0024 ' n= 0.011 Cc= 0.900

Primary OutFlow Max=2.04 cfs @ 12.17 hrs HW=28.51' (Free Discharge)

↑1=Culvert (Barrel Controls 2.04 cfs @ 3.7 fps)

### Pond 6BP:

Inflow Area = 2.103 ac, Inflow Depth = 1.25" for 2-YR event  
 Inflow = 2.39 cfs @ 12.16 hrs, Volume= 0.219 af  
 Outflow = 2.39 cfs @ 12.16 hrs, Volume= 0.219 af, Atten= 0%, Lag= 0.0 min  
 Primary = 2.39 cfs @ 12.16 hrs, Volume= 0.219 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 27.47' @ 12.16 hrs Surf.Area= 13 sf Storage= 10 cf  
 Flood Elev= 32.58' Surf.Area= 17 sf Storage= 74 cf  
 Plug-Flow detention time= 0.2 min calculated for 0.219 af (100% of inflow)  
 Center-of-Mass det. time= 0.1 min ( 807.8 - 807.7)

#	Invert	Avail.Storage	Storage Description
1	26.71'	75 cf	4.00'D x 6.00'H Vertical Cone/Cylinder
2	32.58'	337 cf	Custom Stage Data (Prismatic) Listed below
		412 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.58	4	0	0
33.00	1,600	337	337

#	Routing	Invert	Outlet Devices
1	Primary	26.71'	12.0" x 313.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 23.10' S= 0.0115 ' n= 0.011 Cc= 0.900

Primary OutFlow Max=2.36 cfs @ 12.16 hrs HW=27.47' (Free Discharge)

↑1=Culvert (Inlet Controls 2.36 cfs @ 3.7 fps)

### Pond 6P: Existing Outfall

Inflow Area = 7.093 ac, Inflow Depth = 1.80" for 2-YR event  
 Inflow = 9.99 cfs @ 12.09 hrs, Volume= 1.063 af  
 Outflow = 9.98 cfs @ 12.09 hrs, Volume= 1.063 af, Atten= 0%, Lag= 0.0 min  
 Primary = 9.98 cfs @ 12.09 hrs, Volume= 1.063 af  
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 24.53' @ 12.09 hrs Surf.Area= 13 sf Storage= 20 cf  
 Flood Elev= 27.80' Surf.Area= 17 sf Storage= 62 cf  
 Plug-Flow detention time= 0.2 min calculated for 1.063 af (100% of inflow)  
 Center-of-Mass det. time= 0.1 min ( 768.4 - 768.3)

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Type III 24-hr 2-YR Rainfall=3.00"

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#	Invert	Avail.Storage	Storage Description
1	22.90'	62 cf	4.00'D x 4.90'H Vertical Cone/Cylinder
2	27.80'	3,320 cf	Custom Stage Data ( Prismatic) Listed below
		3,382 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
27.80	4	0	0
28.00	400	40	40
29.00	6,160	3,280	3,320

#	Routing	Invert	Outlet Devices
1	Primary	22.90'	18.0" x 78.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 19.52' S= 0.0433 '/' n= 0.011 Cc= 0.900
2	Secondary	27.80'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=9.92 cfs @ 12.09 hrs HW=24.52' (Free Discharge)

↑1=Culvert (Inlet Controls 9.92 cfs @ 5.6 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=22.93' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7P:

Inflow Area = 3.619 ac, Inflow Depth = 1.89" for 2-YR event  
 Inflow = 5.93 cfs @ 12.06 hrs, Volume= 0.570 af  
 Outflow = 4.21 cfs @ 12.22 hrs, Volume= 0.569 af, Atten= 29%, Lag= 9.6 min  
 Primary = 4.21 cfs @ 12.22 hrs, Volume= 0.569 af  
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 30.19' @ 12.22 hrs Surf.Area= 2,796 sf Storage= 763 cf  
 Flood Elev= 30.50' Surf.Area= 5,613 sf Storage= 1,776 cf  
 Plug-Flow detention time= 2.1 min calculated for 0.569 af (100% of inflow)  
 Center-of-Mass det. time= 1.3 min (762.5 - 761.1)

#	Invert	Avail.Storage	Storage Description
1	23.60'	79 cf	4.00'D x 6.25'H Vertical Cone/Cylinder
2	29.91'	6,598 cf	Custom Stage Data ( Prismatic) Listed below
		6,676 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
29.91	4	0	0
30.00	1,008	46	46
30.50	5,600	1,652	1,698
31.00	14,000	4,900	6,598

#	Routing	Invert	Outlet Devices
1	Primary	26.50'	10.0" x 195.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 22.81' S= 0.0189 '/' n= 0.011 Cc= 0.900
2	Secondary	30.50'	55.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.21 cfs @ 12.22 hrs HW=30.19' (Free Discharge)

↑1=Culvert (Barrel Controls 4.21 cfs @ 7.7 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=23.83' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

**Pond POI-1: Ravine**

Inflow Area = 10.075 ac, Inflow Depth = 1.34" for 2-YR event

Inflow = 10.06 cfs @ 12.10 hrs, Volume= 1.128 af

Primary = 10.06 cfs @ 12.10 hrs, Volume= 1.128 af, Atten= 0%, Lag= 0.0 min

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

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Type III 24-hr 10-YR Rainfall=4.70"

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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 1S: N. RES. & ENTRANCE

Runoff Area=0.822 ac Runoff Depth=1.66"  
Flow Length=257' Tc=25.3 min CN=70 Runoff=1.04 cfs 0.113 af

Subcatchment 2A: RES./ PAVED LOT & NW HOTEL

Runoff Area=0.652 ac Runoff Depth=2.90"  
Flow Length=192' Tc=10.8 min CN=85 Runoff=1.98 cfs 0.158 af

Subcatchment 2B: ( new Subcat)

Runoff Area=0.712 ac Runoff Depth=2.53"  
Flow Length=171' Tc=20.5 min CN=81 Runoff=1.51 cfs 0.150 af

Subcatchment 3S: MOBIL STATION LOT

Runoff Area=0.248 ac Runoff Depth=3.79"  
Flow Length=103' Tc=1.1 min CN=94 Runoff=1.21 cfs 0.078 af

Subcatchment 4S: NE HOTEL QUAD & PARKING

Runoff Area=0.659 ac Runoff Depth=4.14"  
Flow Length=301' Tc=19.8 min CN=98 Runoff=2.07 cfs 0.227 af

Subcatchment 5S: SW HOTEL QUAD & LOT

Runoff Area=1.125 ac Runoff Depth=2.63"  
Flow Length=197' Tc=10.6 min CN=82 Runoff=3.15 cfs 0.246 af

Subcatchment 6B: SEWALL ST ENTRANCE

Runoff Area=0.266 ac Runoff Depth=2.63"  
Flow Length=99' Tc=5.7 min CN=82 Runoff=0.86 cfs 0.058 af

Subcatchment 6S: SE HOTEL QUAD & PARKING

Runoff Area=1.371 ac Runoff Depth=3.98"  
Flow Length=297' Tc=5.0 min CN=96 Runoff=6.23 cfs 0.455 af

Subcatchment 7S: NORWAY SAVINGS & LOT

Runoff Area=1.238 ac Runoff Depth=4.07"  
Flow Length=333' Tc=3.3 min CN=97 Runoff=6.06 cfs 0.420 af

Subcatchment 8S: Existing Site

Runoff Area=1.354 ac Runoff Depth=0.89"  
Flow Length=541' Tc=37.5 min CN=58 Runoff=0.68 cfs 0.100 af

Subcatchment 9S: ADDITION W OF NORWAY BANK

Runoff Area=1.628 ac Runoff Depth=1.01"  
Flow Length=506' Tc=11.3 min CN=60 Runoff=1.54 cfs 0.138 af

Pond 1P:

Peak Elev=28.68' Storage=11 cf Inflow=1.50 cfs 0.192 af  
10.0" x 90.0' Culvert Outflow=1.48 cfs 0.192 af

Pond 2AP:

Peak Elev=30.88' Storage=43 cf Inflow=3.07 cfs 0.349 af  
10.0" x 162.0' Culvert Outflow=3.06 cfs 0.349 af

Pond 2BP:

Peak Elev=28.88' Storage=6 cf Inflow=1.51 cfs 0.150 af  
10.0" x 142.0' Culvert Outflow=1.51 cfs 0.150 af

Pond 3P:

Peak Elev=29.13' Storage=8 cf Inflow=1.21 cfs 0.078 af  
10.0" x 35.0' Culvert Outflow=1.21 cfs 0.078 af

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Type III 24-hr 10-YR Rainfall=4.70"

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Pond 4P: Peak Elev=35.74' Storage=72 cf Inflow=5.00 cfs 0.577 af  
10.0" x 169.0' Culvert Outflow=5.01 cfs 0.577 af

Pond 5P: Peak Elev=31.83' Storage=61 cf Inflow=4.33 cfs 0.396 af  
10.0" x 117.0' Culvert Outflow=4.29 cfs 0.396 af

Pond 6BP: Peak Elev=29.06' Storage=29 cf Inflow=4.93 cfs 0.455 af  
12.0" x 313.0' Culvert Outflow=4.89 cfs 0.455 af

Pond 6P: Existing Outfall Peak Elev=26.26' Storage=42 cf Inflow=17.24 cfs 1.904 af  
Primary=17.20 cfs 1.904 af Secondary=0.00 cfs 0.000 af Outflow=17.20 cfs 1.904 af

Pond 7P: Peak Elev=30.58' Storage=2,578 cf Inflow=9.92 cfs 0.996 af  
Primary=4.33 cfs 0.909 af Secondary=3.85 cfs 0.086 af Outflow=8.18 cfs 0.995 af

Pond POI-1: Ravine Inflow=18.79 cfs 2.142 af  
Primary=18.79 cfs 2.142 af

Total Runoff Area = 10.075 ac Runoff Volume = 2.143 af Average Runoff Depth = 2.55"

**Subcatchment 1S: N. RES. & ENTRANCE**

Runoff = 1.04 cfs @ 12.37 hrs, Volume= 0.113 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.197	98	BLDGS & PAVMENT
0.625	61	>75% Grass cover, Good, HSG B
0.822	70	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0	219	0.0100	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.3	38	0.0090	1.9		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
25.3	257	Total			

**Subcatchment 2A: RES./ PAVED LOT & NW HOTEL**

Runoff = 1.98 cfs @ 12.15 hrs, Volume= 0.158 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.423	98	RES./PARKING LOT & HOTEL
0.229	61	>75% Grass cover, Good, HSG B
0.652	85	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	119	0.0370	0.2		Sheet Flow, A-B Cultivated: Residue>20% n= 0.170 P2= 3.00"
0.7	73	0.0080	1.8		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
10.8	192	Total			

**Subcatchment 2B: ( new Subcat)**

Runoff = 1.51 cfs @ 12.28 hrs, Volume= 0.150 af, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

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Type III 24-hr 10-YR Rainfall=4.70"

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Area (ac)	CN	Description
0.382	98	PAVEMENT & BUILDING
0.330	61	>75% Grass cover, Good, HSG B
0.712	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	128	0.0060	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.5	43	0.0060	1.6		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
20.5	171	Total			

**Subcatchment 3S: MOBIL STATION LOT**

Runoff = 1.21 cfs @ 12.01 hrs, Volume= 0.078 af, Depth= 3.79"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.206	98	PARKING & BUILDING
0.042	74	>75% Grass cover, Good, HSG C
0.248	94	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	49	0.0240	1.2		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.4	54	0.0130	2.3		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
1.1	103	Total			

**Subcatchment 4S: NE HOTEL QUAD & PARKING**

Runoff = 2.07 cfs @ 12.26 hrs, Volume= 0.227 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.659	98	HOTEL & PARKING

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.1	171	0.0120	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.7	130	0.0220	3.0		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
19.8	301	Total			

**Subcatchment 5S: SW HOTEL QUAD & LOT**

Runoff = 3.15 cfs @ 12.15 hrs, Volume= 0.246 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.647	98	RES. / HOTEL & LOT
0.478	61	>75% Grass cover, Good, HSG B
1.125	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	124	0.0300	0.2		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.4	73	0.0230	3.1		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
10.6	197	Total			

**Subcatchment 6B: SEWALL ST ENTRANCE**

Runoff = 0.86 cfs @ 12.09 hrs, Volume= 0.058 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.154	98	PAVED ENTRANCE
0.112	61	>75% Grass cover, Good, HSG B
0.266	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	37	0.0940	0.1		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.00"
0.3	62	0.0260	3.3		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
5.7	99	Total			

**Subcatchment 6S: SE HOTEL QUAD & PARKING**

Runoff = 6.23 cfs @ 12.07 hrs, Volume= 0.455 af, Depth= 3.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 10-YR Rainfall=4.70"



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Type III 24-hr 10-YR Rainfall=4.70"

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Area ( ac)	CN	Description
1.256	98	HOTEL PAVED LOT
0.115	74	>75% Grass cover, Good, HSG C
1.371	96	Weighted Average

Tc ( min)	Length ( feet)	Slope ( ft/ft)	Velocity ( ft/sec)	Capacity ( cfs)	Description
3.9	92	0.0010	0.4		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
1.1	205	0.0250	3.2		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
5.0	297	Total			

**Subcatchment 7S: NORWAY SAVINGS & LOT**

Runoff = 6.06 cfs @ 12.05 hrs, Volume= 0.420 af, Depth= 4.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area ( ac)	CN	Description
1.169	98	BANK & LOT
0.069	74	>75% Grass cover, Good, HSG C
1.238	97	Weighted Average

Tc ( min)	Length ( feet)	Slope ( ft/ft)	Velocity ( ft/sec)	Capacity ( cfs)	Description
2.2	136	0.0088	1.0		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.2	39	0.0400	4.1		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.2	42	0.0250	3.2		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.7	116	0.0177	2.7		Shallow Concentrated Flow, D-E Paved Kv= 20.3 fps
3.3	333	Total			

**Subcatchment 8S: Existing Site**

Runoff = 0.68 cfs @ 12.61 hrs, Volume= 0.100 af, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area ( ac)	CN	Description
1.354	58	Woods/grass comb., Good, HSG B

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Type III 24-hr 10-YR Rainfall=4.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	94	0.0090	0.1		Sheet Flow, A-B Range n= 0.130 P2= 3.00"
7.6	74	0.0042	0.2		Shallow Concentrated Flow, B-C Forest w/Heavy Litter Kv= 2.5 fps
18.1	373	0.0189	0.3		Shallow Concentrated Flow, C-D Forest w/Heavy Litter Kv= 2.5 fps
37.5	541	Total			

Subcatchment 9S: ADDITION W OF NORWAY BANK

Runoff = 1.54 cfs @ 12.18 hrs, Volume= 0.138 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
1.481	56	Brush, Fair, HSG B
0.147	98	Paved parking & roofs
1.628	60	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	118	0.0850	0.2		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.00"
0.1	56	0.3030	8.9		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
0.1	29	0.3100	9.0		Shallow Concentrated Flow, C-D Unpaved Kv= 16.1 fps
1.7	303	0.0130	3.0	6.46	Trap/Vee/Rect Channel Flow, D-E Bot.W=4.00' D=0.50' Z= 0.5 ' n= 0.031
11.3	506	Total			

Pond 1P:

Inflow Area = 1.070 ac, Inflow Depth = 2.15" for 10-YR event  
 Inflow = 1.50 cfs @ 12.02 hrs, Volume= 0.192 af  
 Outflow = 1.48 cfs @ 12.03 hrs, Volume= 0.192 af, Atten= 1%, Lag= 0.2 min  
 Primary = 1.48 cfs @ 12.03 hrs, Volume= 0.192 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 28.68' @ 12.03 hrs Surf.Area= 13 sf Storage= 11 cf  
 Flood Elev= 32.31' Surf.Area= 17 sf Storage= 56 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.191 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 792.8 - 792.6)

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Type III 24-hr 10-YR Rainfall=4.70"

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#	Invert	Avail.Storage	Storage Description
1	27.81'	56 cf	4.00'D x 4.45'H Vertical Cone/Cylinder
2	32.31'	1,381 cf	Custom Stage Data ( Prismatic) Listed below
		1,437 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.31	4	0	0
33.00	4,000	1,381	1,381

#	Routing	Invert	Outlet Devices
1	Primary	27.81'	10.0" x 90.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.47' S= 0.0038 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=1.44 cfs @ 12.03 hrs HW=28.67' (Free Discharge)

1=Culvert (Barrel Controls 1.44 cfs @ 3.2 fps)

Pond 2AP:

Inflow Area = 1.722 ac, Inflow Depth = 2.43" for 10-YR event  
 Inflow = 3.07 cfs @ 12.16 hrs, Volume= 0.349 af  
 Outflow = 3.06 cfs @ 12.17 hrs, Volume= 0.349 af, Atten= 0%, Lag= 0.6 min  
 Primary = 3.06 cfs @ 12.17 hrs, Volume= 0.349 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 30.88' @ 12.17 hrs Surf.Area= 13 sf Storage= 43 cf  
 Flood Elev= 31.97' Surf.Area= 17 sf Storage= 57 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.349 af (100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 787.6 - 787.5)

#	Invert	Avail.Storage	Storage Description
1	27.47'	57 cf	4.00'D x 4.50'H Vertical Cone/Cylinder
2	31.97'	75 cf	Custom Stage Data ( Prismatic) Listed below
		132 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
31.97	4	0	0
32.00	5,000	75	75

#	Routing	Invert	Outlet Devices
1	Primary	27.47'	10.0" x 162.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.05' S= 0.0026 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=3.04 cfs @ 12.17 hrs HW=30.85' (Free Discharge)

1=Culvert (Barrel Controls 3.04 cfs @ 5.6 fps)

**Pond 2BP:**

Inflow Area = 0.712 ac, Inflow Depth = 2.53" for 10-YR event  
 Inflow = 1.51 cfs @ 12.28 hrs, Volume= 0.150 af  
 Outflow = 1.51 cfs @ 12.29 hrs, Volume= 0.150 af, Atten= 0%, Lag= 0.1 min  
 Primary = 1.51 cfs @ 12.29 hrs, Volume= 0.150 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 28.88' @ 12.29 hrs Surf.Area= 13 sf Storage= 6 cf  
 Flood Elev= 32.34' Surf.Area= 17 sf Storage= 49 cf  
 Plug-Flow detention time= 0.0 min calculated for 0.150 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.0 min ( 798.5 - 798.4)

#	Invert	Avail.Storage	Storage Description
1	28.44'	49 cf	4.00'D x 3.90'H Vertical Cone/Cylinder
2	32.34'	1,420 cf	Custom Stage Data ( Prismatic) Listed below
		1,469 cf	Total Available Storage

Elevation ( feet)	Surf.Area ( sq-ft)	Inc.Store ( cubic-feet)	Cum.Store ( cubic-feet)
32.34	4	0	0
33.00	4,300	1,420	1,420

#	Routing	Invert	Outlet Devices
1	Primary	28.14'	10.0" x 142.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 26.99' S= 0.0081 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=1.50 cfs @ 12.29 hrs HW=28.88' ( Free Discharge)  
 1=Culvert ( Inlet Controls 1.50 cfs @ 2.9 fps)

**Pond 3P:**

Inflow Area = 0.248 ac, Inflow Depth = 3.79" for 10-YR event  
 Inflow = 1.21 cfs @ 12.01 hrs, Volume= 0.078 af  
 Outflow = 1.21 cfs @ 12.02 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.1 min  
 Primary = 1.21 cfs @ 12.02 hrs, Volume= 0.078 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 29.13' @ 12.02 hrs Surf.Area= 13 sf Storage= 8 cf  
 Flood Elev= 35.31' Surf.Area= 13 sf Storage= 86 cf  
 Plug-Flow detention time= 0.4 min calculated for 0.078 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 745.8 - 745.6)

#	Invert	Avail.Storage	Storage Description
1	28.50'	86 cf	4.00'D x 6.81'H Vertical Cone/Cylinder

#	Routing	Invert	Outlet Devices
1	Primary	28.50'	10.0" x 35.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.87' S= 0.0180 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=1.15 cfs @ 12.02 hrs HW=29.12' (Free Discharge)

↑1=Culvert (Inlet Controls 1.15 cfs @ 2.7 fps)

**Pond 4P:**

Inflow Area = 2.381 ac, Inflow Depth = 2.91" for 10-YR event  
 Inflow = 5.00 cfs @ 12.21 hrs, Volume= 0.577 af  
 Outflow = 5.01 cfs @ 12.21 hrs, Volume= 0.577 af, Atten= 0%, Lag= 0.0 min  
 Primary = 5.01 cfs @ 12.21 hrs, Volume= 0.577 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 35.74' @ 12.21 hrs Surf.Area= 13 sf Storage= 72 cf  
 Flood Elev= 32.75' Surf.Area= 13 sf Storage= 72 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.577 af (100% of inflow)  
 Center-of-Mass det. time= 0.2 min (771.3 - 771.1)

#	Invert	Avail.Storage	Storage Description
1	27.05'	72 cf	4.00'D x 5.70'H Vertical Cone/Cylinder

#	Routing	Invert	Outlet Devices
1	Primary	27.05'	10.0" x 169.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 26.60' S= 0.0027 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=4.98 cfs @ 12.21 hrs HW=35.65' (Free Discharge)

↑1=Culvert (Barrel Controls 4.98 cfs @ 9.1 fps)

**Pond 5P:**

Inflow Area = 1.837 ac, Inflow Depth = 2.59" for 10-YR event  
 Inflow = 4.33 cfs @ 12.17 hrs, Volume= 0.396 af  
 Outflow = 4.29 cfs @ 12.18 hrs, Volume= 0.396 af, Atten= 1%, Lag= 0.5 min  
 Primary = 4.29 cfs @ 12.18 hrs, Volume= 0.396 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 31.83' @ 12.18 hrs Surf.Area= 13 sf Storage= 61 cf  
 Flood Elev= 32.64' Surf.Area= 17 sf Storage= 71 cf  
 Plug-Flow detention time= 0.2 min calculated for 0.396 af (100% of inflow)  
 Center-of-Mass det. time= 0.2 min (792.3 - 792.1)

#	Invert	Avail.Storage	Storage Description
1	26.99'	71 cf	4.00'D x 5.65'H Vertical Cone/Cylinder
2	32.64'	398 cf	Custom Stage Data (Prismatic) Listed below

469 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.64	4	0	0
33.00	2,207	398	398

**2498-Pre Development**

Type III 24-hr 10-YR Rainfall=4.70"

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#	Routing	Invert	Outlet Devices
1	Primary	26.99'	10.0" x 117.0' long Culvert RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 26.71' S= 0.0024 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=4.25 cfs @ 12.18 hrs HW=31.74' (Free Discharge)  
 ↑1=Culvert (Barrel Controls 4.25 cfs @ 7.8 fps)

**Pond 6BP:**

Inflow Area = 2.103 ac, Inflow Depth = 2.59" for 10-YR event  
 Inflow = 4.93 cfs @ 12.16 hrs, Volume= 0.455 af  
 Outflow = 4.89 cfs @ 12.17 hrs, Volume= 0.455 af, Atten= 1%, Lag= 0.7 min  
 Primary = 4.89 cfs @ 12.17 hrs, Volume= 0.455 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 29.06' @ 12.17 hrs Surf.Area= 13 sf Storage= 29 cf  
 Flood Elev= 32.58' Surf.Area= 17 sf Storage= 74 cf  
 Plug-Flow detention time= 0.1 min calculated for 0.453 af (100% of inflow)  
 Center-of-Mass det. time= 0.1 min (791.4 - 791.3)

#	Invert	Avail.Storage	Storage Description
1	26.71'	75 cf	4.00'D x 6.00'H Vertical Cone/Cylinder
2	32.58'	337 cf	Custom Stage Data (Prismatic) Listed below
			412 cf Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.58	4	0	0
33.00	1,600	337	337

#	Routing	Invert	Outlet Devices
1	Primary	26.71'	12.0" x 313.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 23.10' S= 0.0115 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=4.84 cfs @ 12.17 hrs HW=28.96' (Free Discharge)  
 ↑1=Culvert (Barrel Controls 4.84 cfs @ 6.2 fps)

**Pond 6P: Existing Outfall**

Inflow Area = 7.093 ac, Inflow Depth = 3.22" for 10-YR event  
 Inflow = 17.24 cfs @ 12.14 hrs, Volume= 1.904 af  
 Outflow = 17.20 cfs @ 12.14 hrs, Volume= 1.904 af, Atten= 0%, Lag= 0.0 min  
 Primary = 17.20 cfs @ 12.14 hrs, Volume= 1.904 af  
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 26.26' @ 12.14 hrs Surf.Area= 13 sf Storage= 42 cf  
 Flood Elev= 27.80' Surf.Area= 17 sf Storage= 62 cf  
 Plug-Flow detention time= (not calculated: outflow precedes inflow)  
 Center-of-Mass det. time= (not calculated)

2498-Pre Development

Type III 24-hr 10-YR Rainfall=4.70"

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#	Invert	Avail.Storage	Storage Description
1	22.90'	62 cf	4.00'D x 4.90'H Vertical Cone/Cylinder
2	27.80'	3,320 cf	Custom Stage Data ( Prismatic) Listed below
		3,382 cf	Total Available Storage

Elevation ( feet)	Surf.Area ( sq-ft)	Inc.Store ( cubic-feet)	Cum.Store ( cubic-feet)
27.80	4	0	0
28.00	400	40	40
29.00	6,160	3,280	3,320

#	Routing	Invert	Outlet Devices
1	Primary	22.90'	18.0" x 78.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 19.52' S= 0.0433 '/' n= 0.011 Cc= 0.900
2	Secondary	27.80'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=17.03 cfs @ 12.14 hrs HW=26.21' (Free Discharge)

↑1=Culvert (Inlet Controls 17.03 cfs @ 9.6 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=22.96' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 7P:

Inflow Area = 3.619 ac, Inflow Depth = 3.30" for 10-YR event  
 Inflow = 9.92 cfs @ 12.06 hrs, Volume= 0.996 af  
 Outflow = 8.18 cfs @ 12.17 hrs, Volume= 0.995 af, Atten= 18%, Lag= 6.5 min  
 Primary = 4.33 cfs @ 12.17 hrs, Volume= 0.909 af  
 Secondary = 3.85 cfs @ 12.17 hrs, Volume= 0.086 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 30.58' @ 12.17 hrs Surf.Area= 6,987 sf Storage= 2,578 cf  
 Flood Elev= 30.50' Surf.Area= 5,613 sf Storage= 1,776 cf  
 Plug-Flow detention time= (not calculated: outflow precedes inflow)  
 Center-of-Mass det. time= (not calculated)

#	Invert	Avail.Storage	Storage Description
1	23.60'	79 cf	4.00'D x 6.25'H Vertical Cone/Cylinder
2	29.91'	6,598 cf	Custom Stage Data ( Prismatic) Listed below
		6,676 cf	Total Available Storage

Elevation ( feet)	Surf.Area ( sq-ft)	Inc.Store ( cubic-feet)	Cum.Store ( cubic-feet)
29.91	4	0	0
30.00	1,008	46	46
30.50	5,600	1,652	1,698
31.00	14,000	4,900	6,598

#	Routing	Invert	Outlet Devices
1	Primary	26.50'	10.0" x 195.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 22.81' S= 0.0189 '/' n= 0.011 Cc= 0.900
2	Secondary	30.50'	55.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.33 cfs @ 12.17 hrs HW=30.58' (Free Discharge)

↑1=Culvert (Barrel Controls 4.33 cfs @ 7.9 fps)

Secondary OutFlow Max=3.39 cfs @ 12.17 hrs HW=30.58' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 3.39 cfs @ 0.8 fps)

**Pond POI-1: Ravine**

Inflow Area = 10.075 ac, Inflow Depth = 2.55" for 10-YR event  
 Inflow = 18.79 cfs @ 12.14 hrs, Volume= 2.142 af  
 Primary = 18.79 cfs @ 12.14 hrs, Volume= 2.142 af, Atten= 0%, Lag= 0.0 min

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



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 1S: N. RES. & ENTRANCE**Runoff Area=0.822 ac Runoff Depth=2.21"  
Flow Length=257' Tc=25.3 min CN=70 Runoff=1.40 cfs 0.152 af**Subcatchment 2A: RES./ PAVED LOT & NW HOTEL**Runoff Area=0.652 ac Runoff Depth=3.60"  
Flow Length=192' Tc=10.8 min CN=85 Runoff=2.44 cfs 0.196 af**Subcatchment 2B: ( new Subca)**Runoff Area=0.712 ac Runoff Depth=3.20"  
Flow Length=171' Tc=20.5 min CN=81 Runoff=1.90 cfs 0.190 af**Subcatchment 3S: MOBIL STATION LOT**Runoff Area=0.248 ac Runoff Depth=4.53"  
Flow Length=103' Tc=1.1 min CN=94 Runoff=1.43 cfs 0.094 af**Subcatchment 4S: NE HOTEL QUAD & PARKING**Runoff Area=0.659 ac Runoff Depth=4.87"  
Flow Length=301' Tc=19.8 min CN=98 Runoff=2.43 cfs 0.268 af**Subcatchment 5S: SW HOTEL QUAD & LOT**Runoff Area=1.125 ac Runoff Depth=3.31"  
Flow Length=197' Tc=10.6 min CN=82 Runoff=3.94 cfs 0.310 af**Subcatchment 6B: SEWALL ST ENTRANCE**Runoff Area=0.266 ac Runoff Depth=3.31"  
Flow Length=99' Tc=5.7 min CN=82 Runoff=1.08 cfs 0.073 af**Subcatchment 6S: SE HOTEL QUAD & PARKING**Runoff Area=1.371 ac Runoff Depth=4.71"  
Flow Length=297' Tc=5.0 min CN=96 Runoff=7.33 cfs 0.539 af**Subcatchment 7S: NORWAY SAVINGS & LOT**Runoff Area=1.238 ac Runoff Depth=4.80"  
Flow Length=333' Tc=3.3 min CN=97 Runoff=7.12 cfs 0.495 af**Subcatchment 8S: Existing Site**Runoff Area=1.354 ac Runoff Depth=1.29"  
Flow Length=541' Tc=37.5 min CN=58 Runoff=1.06 cfs 0.146 af**Subcatchment 9S: ADDITION W OF NORWAY BANK**Runoff Area=1.628 ac Runoff Depth=1.45"  
Flow Length=506' Tc=11.3 min CN=60 Runoff=2.34 cfs 0.197 af**Pond 1P:**Peak Elev=29.03' Storage=15 cf Inflow=1.86 cfs 0.245 af  
10.0" x 90.0' Culvert Outflow=1.84 cfs 0.245 af**Pond 2AP:**Peak Elev=32.36' Storage=132 cf Inflow=3.86 cfs 0.441 af  
10.0" x 162.0' Culvert Outflow=3.74 cfs 0.441 af**Pond 2BP:**Peak Elev=29.08' Storage=8 cf Inflow=1.90 cfs 0.190 af  
10.0" x 142.0' Culvert Outflow=1.90 cfs 0.190 af**Pond 3P:**Peak Elev=29.21' Storage=9 cf Inflow=1.43 cfs 0.094 af  
10.0" x 35.0' Culvert Outflow=1.43 cfs 0.094 af

2498-Pre Development

Type III 24-hr 25-YR Rainfall=5.50"

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Pond 4P: Peak Elev=39.77' Storage=72 cf Inflow=6.09 cfs 0.708 af  
10.0" x 169.0' Culvert Outflow=6.10 cfs 0.708 af

Pond 5P: Peak Elev=32.85' Storage=305 cf Inflow=5.43 cfs 0.500 af  
10.0" x 117.0' Culvert Outflow=4.78 cfs 0.500 af

Pond 6BP: Peak Elev=30.80' Storage=51 cf Inflow=5.74 cfs 0.573 af  
12.0" x 313.0' Culvert Outflow=5.69 cfs 0.573 af

Pond 6P: Existing Outfall Peak Elev=27.94' Storage=89 cf Inflow=22.70 cfs 2.314 af  
Primary=22.06 cfs 2.311 af Secondary=0.38 cfs 0.002 af Outflow=22.41 cfs 2.313 af

Pond 7P: Peak Elev=30.61' Storage=2,857 cf Inflow=12.01 cfs 1.204 af  
Primary=4.34 cfs 1.042 af Secondary=6.30 cfs 0.160 af Outflow=10.64 cfs 1.203 af

Pond POI-1: Ravine Inflow=24.65 cfs 2.655 af  
Primary=24.65 cfs 2.655 af

Total Runoff Area = 10.075 ac Runoff Volume = 2.658 af Average Runoff Depth = 3.17"

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Type III 24-hr 25-YR Rainfall=5.50"

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**Subcatchment 1S: N. RES. & ENTRANCE**

Runoff = 1.40 cfs @ 12.37 hrs, Volume= 0.152 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 25-YR Rainfall=5.50"

Area ( ac)	CN	Description
0.197	98	BLDGS & PAVMENT
0.625	61	>75% Grass cover, Good, HSG B
0.822	70	Weighted Average

Tc ( min)	Length ( feet)	Slope ( ft/ft)	Velocity ( ft/sec)	Capacity ( cfs)	Description
25.0	219	0.0100	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.3	38	0.0090	1.9		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
25.3	257	Total			

**Subcatchment 2A: RES./ PAVED LOT & NW HOTEL**

Runoff = 2.44 cfs @ 12.15 hrs, Volume= 0.196 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 25-YR Rainfall=5.50"

Area ( ac)	CN	Description
0.423	98	RES./PARKING LOT & HOTEL
0.229	61	>75% Grass cover, Good, HSG B
0.652	85	Weighted Average

Tc ( min)	Length ( feet)	Slope ( ft/ft)	Velocity ( ft/sec)	Capacity ( cfs)	Description
10.1	119	0.0370	0.2		Sheet Flow, A-B Cultivated: Residue>20% n= 0.170 P2= 3.00"
0.7	73	0.0080	1.8		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
10.8	192	Total			

**Subcatchment 2B: ( new Subcat)**

Runoff = 1.90 cfs @ 12.28 hrs, Volume= 0.190 af, Depth= 3.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 25-YR Rainfall=5.50"

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Type III 24-hr 25-YR Rainfall=5.50"

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Area (ac)	CN	Description
0.382	98	PAVEMENT & BUILDING
0.330	61	>75% Grass cover, Good, HSG B
0.712	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	128	0.0060	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.5	43	0.0060	1.6		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
20.5	171	Total			

**Subcatchment 3S: MOBIL STATION LOT**

Runoff = 1.43 cfs @ 12.01 hrs, Volume= 0.094 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 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.206	98	PARKING & BUILDING
0.042	74	>75% Grass cover, Good, HSG C
0.248	94	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	49	0.0240	1.2		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.4	54	0.0130	2.3		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
1.1	103	Total			

**Subcatchment 4S: NE HOTEL QUAD & PARKING**

Runoff = 2.43 cfs @ 12.26 hrs, Volume= 0.268 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 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.659	98	HOTEL & PARKING

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.1	171	0.0120	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.7	130	0.0220	3.0		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
19.8	301	Total			

**Subcatchment 5S: SW HOTEL QUAD & LOT**

Runoff = 3.94 cfs @ 12.15 hrs, Volume= 0.310 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 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.647	98	RES. / HOTEL & LOT
0.478	61	>75% Grass cover, Good, HSG B
1.125	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	124	0.0300	0.2		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.4	73	0.0230	3.1		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
10.6	197	Total			

**Subcatchment 6B: SEWALL ST ENTRANCE**

Runoff = 1.08 cfs @ 12.09 hrs, Volume= 0.073 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 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.154	98	PAVED ENTRANCE
0.112	61	>75% Grass cover, Good, HSG B
0.266	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	37	0.0940	0.1		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.00"
0.3	62	0.0260	3.3		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
5.7	99	Total			

**Subcatchment 6S: SE HOTEL QUAD & PARKING**

Runoff = 7.33 cfs @ 12.07 hrs, Volume= 0.539 af, Depth= 4.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

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Type III 24-hr 25-YR Rainfall=5.50"

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Area (ac)	CN	Description
1.256	98	HOTEL PAVED LOT
0.115	74	>75% Grass cover, Good, HSG C
1.371	96	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	92	0.0010	0.4		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
1.1	205	0.0250	3.2		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
5.0	297	Total			

Subcatchment 7S: NORWAY SAVINGS & LOT

Runoff = 7.12 cfs @ 12.05 hrs, Volume= 0.495 af, Depth= 4.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
1.169	98	BANK & LOT
0.069	74	>75% Grass cover, Good, HSG C
1.238	97	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	136	0.0088	1.0		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.2	39	0.0400	4.1		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.2	42	0.0250	3.2		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.7	116	0.0177	2.7		Shallow Concentrated Flow, D-E Paved Kv= 20.3 fps
3.3	333	Total			

Subcatchment 8S: Existing Site

Runoff = 1.06 cfs @ 12.58 hrs, Volume= 0.146 af, Depth= 1.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
1.354	58	Woods/grass comb., Good, HSG B

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Type III 24-hr 25-YR Rainfall=5.50"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.8	94	0.0090	0.1		Sheet Flow, A-B Range n= 0.130 P2= 3.00"
7.6	74	0.0042	0.2		Shallow Concentrated Flow, B-C Forest w/Heavy Litter Kv= 2.5 fps
18.1	373	0.0189	0.3		Shallow Concentrated Flow, C-D Forest w/Heavy Litter Kv= 2.5 fps
37.5	541	Total			

Subcatchment 9S: ADDITION W OF NORWAY BANK

Runoff = 2.34 cfs @ 12.17 hrs, Volume= 0.197 af, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
1.481	56	Brush, Fair, HSG B
0.147	98	Paved parking & roofs
1.628	60	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	118	0.0850	0.2		Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.00"
0.1	56	0.3030	8.9		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
0.1	29	0.3100	9.0		Shallow Concentrated Flow, C-D Unpaved Kv= 16.1 fps
1.7	303	0.0130	3.0	6.46	Trap/Vee/Rect Channel Flow, D-E Bot.W=4.00' D=0.50' Z= 0.5 ' n= 0.031
11.3	506	Total			

Pond 1P:

Inflow Area = 1.070 ac, Inflow Depth = 2.75" for 25-YR event  
 Inflow = 1.86 cfs @ 12.02 hrs, Volume= 0.245 af  
 Outflow = 1.84 cfs @ 12.03 hrs, Volume= 0.245 af, Atten= 1%, Lag= 0.5 min  
 Primary = 1.84 cfs @ 12.03 hrs, Volume= 0.245 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 29.03' @ 12.03 hrs Surf.Area= 13 sf Storage= 15 cf  
 Flood Elev= 32.31' Surf.Area= 17 sf Storage= 56 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.245 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 789.9 - 789.7)

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Type III 24-hr 25-YR Rainfall=5.50"

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#	Invert	Avail.Storage	Storage Description
1	27.81'	56 cf	4.00'D x 4.45'H Vertical Cone/Cylinder
2	32.31'	1,381 cf	Custom Stage Data ( Prismatic) Listed below
		1,437 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.31	4	0	0
33.00	4,000	1,381	1,381

#	Routing	Invert	Outlet Devices
1	Primary	27.81'	10.0" x 90.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.47' S= 0.0038 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=1.79 cfs @ 12.03 hrs HW=28.99' (Free Discharge)

1=Culvert (Barrel Controls 1.79 cfs @ 3.3 fps)

Pond 2AP:

Inflow Area = 1.722 ac, Inflow Depth = 3.07" for 25-YR event  
 Inflow = 3.86 cfs @ 12.16 hrs, Volume= 0.441 af  
 Outflow = 3.74 cfs @ 12.20 hrs, Volume= 0.441 af, Atten= 3%, Lag= 2.4 min  
 Primary = 3.74 cfs @ 12.20 hrs, Volume= 0.441 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 32.36' @ 12.20 hrs Surf.Area= 5,013 sf Storage= 132 cf  
 Flood Elev= 31.97' Surf.Area= 17 sf Storage= 57 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.439 af (100% of inflow)  
 Center-of-Mass det. time= 0.2 min (783.9 - 783.6)

#	Invert	Avail.Storage	Storage Description
1	27.47'	57 cf	4.00'D x 4.50'H Vertical Cone/Cylinder
2	31.97'	75 cf	Custom Stage Data ( Prismatic) Listed below
		132 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
31.97	4	0	0
32.00	5,000	75	75

#	Routing	Invert	Outlet Devices
1	Primary	27.47'	10.0" x 162.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.05' S= 0.0026 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=3.73 cfs @ 12.20 hrs HW=32.35' (Free Discharge)

1=Culvert (Barrel Controls 3.73 cfs @ 6.8 fps)



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Type III 24-hr 25-YR Rainfall=5.50"

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**Pond 2BP:**

Inflow Area = 0.712 ac, Inflow Depth = 3.20" for 25-YR event  
 Inflow = 1.90 cfs @ 12.28 hrs, Volume= 0.190 af  
 Outflow = 1.90 cfs @ 12.28 hrs, Volume= 0.190 af, Atten= 0%, Lag= 0.1 min  
 Primary = 1.90 cfs @ 12.28 hrs, Volume= 0.190 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 29.08' @ 12.28 hrs Surf.Area= 13 sf Storage= 8 cf  
 Flood Elev= 32.34' Surf.Area= 17 sf Storage= 49 cf  
 Plug-Flow detention time= 0.0 min calculated for 0.190 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.0 min ( 793.1 - 793.0)

#	Invert	Avail.Storage	Storage Description
1	28.44'	49 cf	4.00'D x 3.90'H Vertical Cone/Cylinder
2	32.34'	1,420 cf	Custom Stage Data ( Prismatic) Listed below
		1,469 cf	Total Available Storage

Elevation ( feet)	Surf.Area ( sq-ft)	Inc.Store ( cubic-feet)	Cum.Store ( cubic-feet)
32.34	4	0	0
33.00	4,300	1,420	1,420

#	Routing	Invert	Outlet Devices
1	Primary	28.14'	10.0" x 142.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 26.99' S= 0.0081 ' /' n= 0.011 Cc= 0.900

Primary OutFlow Max=1.89 cfs @ 12.28 hrs HW=29.07' ( Free Discharge)  
 1=Culvert ( Inlet Controls 1.89 cfs @ 3.5 fps)

**Pond 3P:**

Inflow Area = 0.248 ac, Inflow Depth = 4.53" for 25-YR event  
 Inflow = 1.43 cfs @ 12.01 hrs, Volume= 0.094 af  
 Outflow = 1.43 cfs @ 12.02 hrs, Volume= 0.094 af, Atten= 0%, Lag= 0.1 min  
 Primary = 1.43 cfs @ 12.02 hrs, Volume= 0.094 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 29.21' @ 12.02 hrs Surf.Area= 13 sf Storage= 9 cf  
 Flood Elev= 35.31' Surf.Area= 13 sf Storage= 86 cf  
 Plug-Flow detention time= 0.4 min calculated for 0.094 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 743.0 - 742.7)

#	Invert	Avail.Storage	Storage Description
1	28.50'	86 cf	4.00'D x 6.81'H Vertical Cone/Cylinder

#	Routing	Invert	Outlet Devices
1	Primary	28.50'	10.0" x 35.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.87' S= 0.0180 ' /' n= 0.011 Cc= 0.900

Primary OutFlow Max=1.37 cfs @ 12.02 hrs HW=29.19' (Free Discharge)

↑1=Culvert (Inlet Controls 1.37 cfs @ 2.8 fps)

#### Pond 4P:

Inflow Area = 2.381 ac, Inflow Depth = 3.57" for 25-YR event  
 Inflow = 6.09 cfs @ 12.22 hrs, Volume= 0.708 af  
 Outflow = 6.10 cfs @ 12.24 hrs, Volume= 0.708 af, Atten= 0%, Lag= 1.3 min  
 Primary = 6.10 cfs @ 12.24 hrs, Volume= 0.708 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 39.77' @ 12.24 hrs Surf.Area= 13 sf Storage= 72 cf  
 Flood Elev= 32.75' Surf.Area= 13 sf Storage= 72 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.708 af (100% of inflow)  
 Center-of-Mass det. time= 0.2 min (769.3 - 769.1)

#	Invert	Avail.Storage	Storage Description
1	27.05'	72 cf	4.00'D x 5.70'H Vertical Cone/Cylinder

#	Routing	Invert	Outlet Devices
1	Primary	27.05'	10.0' x 169.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 26.60' S= 0.0027 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=6.08 cfs @ 12.24 hrs HW=39.69' (Free Discharge)

↑1=Culvert (Barrel Controls 6.08 cfs @ 11.2 fps)

#### Pond 5P:

Inflow Area = 1.837 ac, Inflow Depth = 3.27" for 25-YR event  
 Inflow = 5.43 cfs @ 12.17 hrs, Volume= 0.500 af  
 Outflow = 4.78 cfs @ 12.26 hrs, Volume= 0.500 af, Atten= 12%, Lag= 5.4 min  
 Primary = 4.78 cfs @ 12.26 hrs, Volume= 0.500 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 32.85' @ 12.26 hrs Surf.Area= 1,312 sf Storage= 305 cf  
 Flood Elev= 32.64' Surf.Area= 17 sf Storage= 71 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.500 af (100% of inflow)  
 Center-of-Mass det. time= 0.3 min (787.0 - 786.8)

#	Invert	Avail.Storage	Storage Description
1	26.99'	71 cf	4.00'D x 5.65'H Vertical Cone/Cylinder
2	32.64'	398 cf	Custom Stage Data (Prismatic) Listed below
		469 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.64	4	0	0
33.00	2,207	398	398

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Type III 24-hr 25-YR Rainfall=5.50"

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#	Routing	Invert	Outlet Devices
1	Primary	26.99'	10.0" x 117.0' long Culvert RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 26.71' S= 0.0024 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=4.78 cfs @ 12.26 hrs HW=32.85' (Free Discharge)

↑1=Culvert (Barrel Controls 4.78 cfs @ 8.8 fps)

**Pond 6BP:**

Inflow Area = 2.103 ac, Inflow Depth = 3.27" for 25-YR event  
 Inflow = 5.74 cfs @ 12.12 hrs, Volume= 0.573 af  
 Outflow = 5.69 cfs @ 12.15 hrs, Volume= 0.573 af, Atten= 1%, Lag= 1.6 min  
 Primary = 5.69 cfs @ 12.15 hrs, Volume= 0.573 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 30.80' @ 12.15 hrs Surf.Area= 13 sf Storage= 51 cf  
 Flood Elev= 32.58' Surf.Area= 17 sf Storage= 74 cf  
 Plug-Flow detention time= 0.1 min calculated for 0.571 af (100% of inflow)  
 Center-of-Mass det. time= 0.1 min (786.1 - 786.0)

#	Invert	Avail.Storage	Storage Description
1	26.71'	75 cf	4.00'D x 6.00'H Vertical Cone/Cylinder
2	32.58'	337 cf	Custom Stage Data (Prismatic) Listed below
		412 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.58	4	0	0
33.00	1,600	337	337

#	Routing	Invert	Outlet Devices
1	Primary	26.71'	12.0" x 313.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 23.10' S= 0.0115 '/' n= 0.011 Cc= 0.900

Primary OutFlow Max=5.68 cfs @ 12.15 hrs HW=30.78' (Free Discharge)

↑1=Culvert (Barrel Controls 5.68 cfs @ 7.2 fps)

**Pond 6P: Existing Outfall**

Inflow Area = 7.093 ac, Inflow Depth = 3.92" for 25-YR event  
 Inflow = 22.70 cfs @ 12.11 hrs, Volume= 2.314 af  
 Outflow = 22.41 cfs @ 12.11 hrs, Volume= 2.313 af, Atten= 1%, Lag= 0.1 min  
 Primary = 22.06 cfs @ 12.11 hrs, Volume= 2.311 af  
 Secondary = 0.38 cfs @ 12.10 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 27.94' @ 12.11 hrs Surf.Area= 287 sf Storage= 89 cf  
 Flood Elev= 27.80' Surf.Area= 17 sf Storage= 62 cf  
 Plug-Flow detention time= 0.5 min calculated for 2.313 af (100% of inflow)  
 Center-of-Mass det. time= 0.1 min (760.7 - 760.6)

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Type III 24-hr 25-YR Rainfall=5.50"

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#	Invert	Avail.Storage	Storage Description
1	22.90'	62 cf	4.00'D x 4.90'H Vertical Cone/Cylinder
2	27.80'	3,320 cf	Custom Stage Data ( Prismatic) Listed below
		3,382 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
27.80	4	0	0
28.00	400	40	40
29.00	6,160	3,280	3,320

#	Routing	Invert	Outlet Devices
1	Primary	22.90'	18.0" x 78.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 19.52' S= 0.0433 '/' n= 0.011 Cc= 0.900
2	Secondary	27.80'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=21.52 cfs @ 12.11 hrs HW=27.75' (Free Discharge)

1=Culvert (Inlet Controls 21.52 cfs @ 12.2 fps)

Secondary OutFlow Max=0.35 cfs @ 12.10 hrs HW=27.86' (Free Discharge)

2=Broad-Crested Rectangular Weir (Weir Controls 0.35 cfs @ 0.7 fps)

Pond 7P:

Inflow Area = 3.619 ac, Inflow Depth = 3.99" for 25-YR event  
 Inflow = 12.01 cfs @ 12.06 hrs, Volume= 1.204 af  
 Outflow = 10.64 cfs @ 12.12 hrs, Volume= 1.203 af, Atten= 11%, Lag= 3.9 min  
 Primary = 4.34 cfs @ 12.10 hrs, Volume= 1.042 af  
 Secondary = 6.30 cfs @ 12.12 hrs, Volume= 0.160 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 30.61' @ 12.10 hrs Surf.Area= 7,466 sf Storage= 2,857 cf  
 Flood Elev= 30.50' Surf.Area= 5,613 sf Storage= 1,776 cf  
 Plug-Flow detention time= 3.0 min calculated for 1.202 af (100% of inflow)  
 Center-of-Mass det. time= 2.5 min (757.8 - 755.3)

#	Invert	Avail.Storage	Storage Description
1	23.60'	79 cf	4.00'D x 6.25'H Vertical Cone/Cylinder
2	29.91'	6,598 cf	Custom Stage Data ( Prismatic) Listed below
		6,676 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
29.91	4	0	0
30.00	1,008	46	46
30.50	5,600	1,652	1,698
31.00	14,000	4,900	6,598

#	Routing	Invert	Outlet Devices
1	Primary	26.50'	10.0" x 195.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 22.81' S= 0.0189 ' n= 0.011 Cc= 0.900
2	Secondary	30.50'	55.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.34 cfs @ 12.10 hrs HW=30.61' (Free Discharge)

↳1=Culvert (Barrel Controls 4.34 cfs @ 8.0 fps)

Secondary OutFlow Max=5.60 cfs @ 12.12 hrs HW=30.61' (Free Discharge)

↳2=Broad-Crested Rectangular Weir (Weir Controls 5.60 cfs @ 0.9 fps)

**Pond POI-1: Ravine**

Inflow Area = 10.075 ac, Inflow Depth = 3.16" for 25-YR event

Inflow = 24.65 cfs @ 12.12 hrs, Volume= 2.655 af

Primary = 24.65 cfs @ 12.12 hrs, Volume= 2.655 af, Atten= 0%, Lag= 0.0 min

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

## **ATTACHMENT B**

### **Postdevelopment Calculations**

2498-Post Development

Type III 24-hr 2-YR Rainfall=3.00"

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Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: N. RES. & ENTRANCE

Runoff Area=0.822 ac Runoff Depth=0.71"  
Flow Length=257' Tc=25.3 min CN=70 Runoff=0.37 cfs 0.049 af

Subcatchment 2A: RES./ PAVED LOT & NW HOTEL

Runoff Area=0.652 ac Runoff Depth=1.59"  
Flow Length=192' Tc=10.8 min CN=85 Runoff=1.03 cfs 0.086 af

Subcatchment 2B: ( new Subcat)

Runoff Area=0.712 ac Runoff Depth=1.31"  
Flow Length=171' Tc=20.5 min CN=81 Runoff=0.72 cfs 0.078 af

Subcatchment 3S: MOBIL STATION LOT

Runoff Area=0.248 ac Runoff Depth=2.35"  
Flow Length=103' Tc=1.1 min CN=94 Runoff=0.78 cfs 0.049 af

Subcatchment 4S: NE HOTEL QUAD & PARKING

Runoff Area=0.659 ac Runoff Depth=2.77"  
Flow Length=301' Tc=19.8 min CN=98 Runoff=1.31 cfs 0.152 af

Subcatchment 5S: SW HOTEL QUAD & LOT

Runoff Area=1.125 ac Runoff Depth=1.38"  
Flow Length=197' Tc=10.6 min CN=82 Runoff=1.55 cfs 0.129 af

Subcatchment 6A: SE HOTEL QUAD & PARKING

Runoff Area=1.257 ac Runoff Depth=2.66"  
Flow Length=305' Tc=2.0 min CN=97 Runoff=4.15 cfs 0.278 af

Subcatchment 6B: SEWALL ST ENTRANCE

Runoff Area=0.428 ac Runoff Depth=1.74"  
Flow Length=160' Tc=8.3 min CN=87 Runoff=0.81 cfs 0.062 af

Subcatchment 6C:

Runoff Area=0.217 ac Runoff Depth=2.35"  
Tc=0.0 min CN=94 Runoff=0.70 cfs 0.042 af

Subcatchment 7S: NORWAY SAVINGS & LOT

Runoff Area=1.238 ac Runoff Depth=2.66"  
Flow Length=333' Tc=3.3 min CN=97 Runoff=3.90 cfs 0.274 af

Subcatchment 8A: Proposed Parking & Building

Runoff Area=0.518 ac Runoff Depth=2.77"  
Flow Length=580' Tc=53.6 min CN=98 Runoff=0.65 cfs 0.119 af

Subcatchment 8B: Proposed Parking

Runoff Area=0.195 ac Runoff Depth=1.82"  
Flow Length=337' Tc=2.3 min CN=88 Runoff=0.47 cfs 0.030 af

Subcatchment 8C: Undeveloped Portion of Site

Runoff Area=0.365 ac Runoff Depth=1.19"  
Tc=0.0 min CN=79 Runoff=0.61 cfs 0.036 af

Subcatchment 9: Proposed Parking Lot

Runoff Area=1.019 ac Runoff Depth=1.66"  
Flow Length=260' Tc=3.5 min CN=86 Runoff=2.18 cfs 0.141 af

Subcatchment 9A: Existing Parking Lot

Runoff Area=0.618 ac Runoff Depth=1.98"  
Flow Length=220' Tc=1.8 min CN=90 Runoff=1.66 cfs 0.102 af

## Reach POI-1: Ravine

Inflow=15.38 cfs 1.627 af

Outflow=15.38 cfs 1.627 af

## Pond 1P:

Peak Elev=28.38' Storage=7 cf Inflow=0.83 cfs 0.097 af

Primary=0.83 cfs 0.097 af Secondary=0.00 cfs 0.000 af Outflow=0.83 cfs 0.097 af

## Pond 2AP:

Peak Elev=28.48' Storage=13 cf Inflow=1.50 cfs 0.183 af

Primary=1.50 cfs 0.183 af Secondary=0.00 cfs 0.000 af Outflow=1.50 cfs 0.183 af

## Pond 2BP:

Peak Elev=28.60' Storage=2 cf Inflow=0.72 cfs 0.078 af

Primary=0.72 cfs 0.078 af Secondary=0.00 cfs 0.000 af Outflow=0.72 cfs 0.078 af

## Pond 3P:

Peak Elev=31.79' Storage=41 cf Inflow=0.78 cfs 0.049 af

Primary=0.78 cfs 0.048 af Secondary=0.00 cfs 0.000 af Outflow=0.78 cfs 0.048 af

## Pond 4P:

Peak Elev=29.84' Storage=35 cf Inflow=2.70 cfs 0.335 af

Primary=2.70 cfs 0.335 af Secondary=0.00 cfs 0.000 af Outflow=2.70 cfs 0.335 af

## Pond 5P:

Peak Elev=28.55' Storage=20 cf Inflow=2.09 cfs 0.207 af

Primary=2.08 cfs 0.207 af Secondary=0.00 cfs 0.000 af Outflow=2.08 cfs 0.207 af

## Pond 6BP:

Peak Elev=27.56' Storage=11 cf Inflow=2.81 cfs 0.269 af

Primary=2.81 cfs 0.269 af Secondary=0.00 cfs 0.000 af Outflow=2.81 cfs 0.269 af

## Pond 6P: Existing Outfall

Peak Elev=24.75' Storage=23 cf Inflow=11.16 cfs 1.347 af

Primary=11.15 cfs 1.347 af Secondary=0.00 cfs 0.000 af Outflow=11.15 cfs 1.347 af

## Pond 7P:

Peak Elev=30.20' Storage=779 cf Inflow=5.99 cfs 0.609 af

Primary=4.21 cfs 0.608 af Secondary=0.00 cfs 0.000 af Outflow=4.21 cfs 0.608 af

## Pond CB 3:

Peak Elev=27.92' Storage=30 cf Inflow=0.70 cfs 0.149 af

Primary=0.70 cfs 0.148 af Secondary=0.00 cfs 0.000 af Outflow=0.70 cfs 0.148 af

## Pond CB1:

Peak Elev=29.12' Storage=0.000 af Inflow=2.18 cfs 0.141 af

Primary=2.17 cfs 0.141 af Secondary=0.00 cfs 0.000 af Outflow=2.17 cfs 0.141 af

## Pond CB2:

Peak Elev=30.03' Storage=9 cf Inflow=2.18 cfs 0.141 af

Primary=2.18 cfs 0.141 af Secondary=0.00 cfs 0.000 af Outflow=2.18 cfs 0.141 af

## Pond DMH2: ( new Pond)

Peak Elev=26.96' Inflow=2.17 cfs 0.141 af

Primary=2.17 cfs 0.141 af Secondary=0.00 cfs 0.000 af Outflow=2.17 cfs 0.141 af

## Pond DMH2A:

Peak Elev=26.61' Inflow=2.17 cfs 0.141 af

24.0" x 36.0' Culvert Outflow=2.17 cfs 0.141 af

## Pond DMH4:

Peak Elev=26.02' Inflow=2.17 cfs 0.141 af

36.0" x 78.0' Culvert Outflow=2.17 cfs 0.141 af



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Type III 24-hr 2-YR Rainfall=3.00"

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Pond DMH6:

Peak Elev=25.16' Inflow=0.70 cfs 0.148 af  
Primary=0.00 cfs 0.000 af Secondary=0.70 cfs 0.148 af Outflow=0.70 cfs 0.148 af

Pond DMH6A:

Peak Elev=24.33' Inflow=0.70 cfs 0.148 af  
24.0" x 18.0' Culvert Outflow=0.70 cfs 0.148 af

Pond WQ1: ( new Pond)

Peak Elev=26.98' Inflow=2.17 cfs 0.141 af  
18.0" x 18.0' Culvert Outflow=2.17 cfs 0.141 af

Pond WQ2:

Peak Elev=24.68' Inflow=0.00 cfs 0.000 af  
18.0" x 6.5' Culvert Outflow=0.00 cfs 0.000 af

Total Runoff Area = 10.073 ac Runoff Volume = 1.629 af Average Runoff Depth = 1.94"

**2498-Post Development**

Type III 24-hr 2-YR Rainfall=3.00"

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**Subcatchment 1S: N. RES. & ENTRANCE**

Runoff = 0.37 cfs @ 12.40 hrs, Volume= 0.049 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.197	98	BLDGS & PAVMENT
0.625	61	>75% Grass cover, Good, HSG B
0.822	70	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0	219	0.0100	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.3	38	0.0090	1.9		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
25.3	257	Total			

**Subcatchment 2A: RES./ PAVED LOT & NW HOTEL**

Runoff = 1.03 cfs @ 12.15 hrs, Volume= 0.086 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.423	98	RES./PARKING LOT & HOTEL
0.229	61	>75% Grass cover, Good, HSG B
0.652	85	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	119	0.0370	0.2		Sheet Flow, A-B Cultivated: Residue>20% n= 0.170 P2= 3.00"
0.7	73	0.0080	1.8		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
10.8	192	Total			

**Subcatchment 2B: ( new Subcat)**

Runoff = 0.72 cfs @ 12.28 hrs, Volume= 0.078 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

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Type III 24-hr 2-YR Rainfall=3.00"

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Area (ac)	CN	Description
0.382	98	PAVEMENT & BUILDING
0.330	61	>75% Grass cover, Good, HSG B
0.712	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	128	0.0060	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.5	43	0.0060	1.6		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
20.5	171	Total			

**Subcatchment 3S: MOBIL STATION LOT**

Runoff = 0.78 cfs @ 12.02 hrs, Volume= 0.049 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.206	98	PARKING & BUILDING
0.042	74	>75% Grass cover, Good, HSG C
0.248	94	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	49	0.0240	1.2		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.4	54	0.0130	2.3		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
1.1	103	Total			

**Subcatchment 4S: NE HOTEL QUAD & PARKING**

Runoff = 1.31 cfs @ 12.26 hrs, Volume= 0.152 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.659	98	HOTEL & PARKING

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.1	171	0.0120	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.7	130	0.0220	3.0		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
19.8	301	Total			

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Type III 24-hr 2-YR Rainfall=3.00"

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**Subcatchment 5S: SW HOTEL QUAD & LOT**

Runoff = 1.55 cfs @ 12.15 hrs, Volume= 0.129 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.647	98	RES. / HOTEL & LOT
0.478	61	>75% Grass cover, Good, HSG B
1.125	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	124	0.0300	0.2		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.4	73	0.0230	3.1		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
10.6	197	Total			

**Subcatchment 6A: SE HOTEL QUAD & PARKING**

Runoff = 4.15 cfs @ 12.03 hrs, Volume= 0.278 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
1.216	98	HOTEL PAVED LOT
0.041	61	>75% Grass cover, Good, HSG B
1.257	97	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0200	0.9		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
1.7	290	0.0200	2.9		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
2.0	305	Total			

**Subcatchment 6B: SEWALL ST ENTRANCE**

Runoff = 0.81 cfs @ 12.12 hrs, Volume= 0.062 af, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Type III 24-hr 2-YR Rainfall=3.00"

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Type III 24-hr 2-YR Rainfall=3.00"

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Area (ac)	CN	Description
0.302	98	PAVED ENTRANCE
0.126	61	>75% Grass cover, Good, HSG B
0.428	87	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	30	0.0260	0.1		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.00"
0.7	130	0.0260	3.3		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
8.3	160	Total			

**Subcatchment 6C:**

Runoff = 0.70 cfs @ 12.00 hrs, Volume= 0.042 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.194	98	Paved roads w/curbs & sewers
0.023	61	>75% Grass cover, Good, HSG B
0.217	94	Weighted Average

**Subcatchment 7S: NORWAY SAVINGS & LOT**

Runoff = 3.90 cfs @ 12.05 hrs, Volume= 0.274 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
1.169	98	BANK & LOT
0.069	74	>75% Grass cover, Good, HSG C
1.238	97	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	136	0.0088	1.0		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.2	39	0.0400	4.1		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.2	42	0.0250	3.2		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.7	116	0.0177	2.7		Shallow Concentrated Flow, D-E Paved Kv= 20.3 fps
3.3	333	Total			

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Type III 24-hr 2-YR Rainfall=3.00"

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**Subcatchment 8A: Proposed Parking & Building**

Runoff = 0.65 cfs @ 12.69 hrs, Volume= 0.119 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.518	98	PAVED PARKING & BUILDING

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.2	90	0.0089	0.1		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.00"
7.2	70	0.0042	0.2		Shallow Concentrated Flow, B-C Forest w/Heavy Litter Kv= 2.5 fps
17.9	370	0.0189	0.3		Shallow Concentrated Flow, C-D Forest w/Heavy Litter Kv= 2.5 fps
0.3	50	0.2200	3.3		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
53.6	580	Total			

**Subcatchment 8B: Proposed Parking**

Runoff = 0.47 cfs @ 12.04 hrs, Volume= 0.030 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.163	98	Paved parking & roofs
0.032	39	>75% Grass cover, Good, HSG A
0.195	88	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.9		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.8	174	0.0050	3.8	2.98	Circular Channel ( pipe) , C-D Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011
0.6	113	0.0205	2.9		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
2.3	337	Total			

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Type III 24-hr 2-YR Rainfall=3.00"

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**Subcatchment 8C: Undeveloped Portion of Site**

Runoff = 0.61 cfs @ 12.00 hrs, Volume= 0.036 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.365	79	50-75% Grass cover, Fair, HSG C

**Subcatchment 9: Proposed Parking Lot**

Runoff = 2.18 cfs @ 12.05 hrs, Volume= 0.141 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.599	98	Paved parking & roofs
0.420	69	50-75% Grass cover, Fair, HSG B
1.019	86	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	40	0.2700	0.4		Sheet Flow, A-B
					Grass: Short n= 0.150 P2= 3.00"
1.8	220	0.0182	2.0		Shallow Concentrated Flow, B-C
					Grassed Waterway Kv= 15.0 fps
3.5	260	Total			

**Subcatchment 9A: Existing Parking Lot**

Runoff = 1.66 cfs @ 12.03 hrs, Volume= 0.102 af, Depth= 1.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Type III 24-hr 2-YR Rainfall=3.00"

Area (ac)	CN	Description
0.448	98	PARKING LOT
0.170	69	50-75% Grass cover, Fair, HSG B
0.618	90	Weighted Average

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Type III 24-hr 2-YR Rainfall=3.00"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	127	0.0500	2.0		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.3	57	0.0300	3.5		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.4	36	0.3300	1.4		Shallow Concentrated Flow, C-D Forest w/Heavy Litter Kv= 2.5 fps
1.8	220	Total			

Reach POI-1: Ravine

Inflow Area = 10.073 ac, Inflow Depth = 1.94" for 2-YR event  
 Inflow = 15.38 cfs @ 12.04 hrs, Volume= 1.627 af  
 Outflow = 15.38 cfs @ 12.04 hrs, Volume= 1.627 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Pond 1P:

Inflow Area = 1.070 ac, Inflow Depth = 1.08" for 2-YR event  
 Inflow = 0.83 cfs @ 12.02 hrs, Volume= 0.097 af  
 Outflow = 0.83 cfs @ 12.02 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.1 min  
 Primary = 0.83 cfs @ 12.02 hrs, Volume= 0.097 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 28.38' @ 12.02 hrs Surf.Area= 13 sf Storage= 7 cf  
 Flood Elev= 32.31' Surf.Area= 17 sf Storage= 56 cf  
 Plug-Flow detention time= 0.4 min calculated for 0.097 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.4 min ( 846.3 - 845.9)

#	Invert	Avail.Storage	Storage Description
1	27.81'	56 cf	4.00'D x 4.45'H Vertical Cone/Cylinder
2	32.31'	6,381 cf	Custom Stage Data ( Prismatic) Listed below
		6,437 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.31	4	0	0
33.00	4,000	1,381	1,381
34.00	6,000	5,000	6,381

#	Routing	Invert	Outlet Devices
1	Primary	27.81'	10.0" x 90.0' long Culvert RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 27.47' S= 0.0038 '/' n= 0.011 Cc= 0.900
2	Secondary	32.50'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32



Primary OutFlow Max=0.83 cfs @ 12.02 hrs HW=28.38' (Free Discharge)

↳1=Culvert (Barrel Controls 0.83 cfs @ 2.9 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.81' (Free Discharge)

↳2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

**Pond 2AP:**

Inflow Area = 1.722 ac, Inflow Depth = 1.28" for 2-YR event  
 Inflow = 1.50 cfs @ 12.16 hrs, Volume= 0.183 af  
 Outflow = 1.50 cfs @ 12.16 hrs, Volume= 0.183 af, Atten= 0%, Lag= 0.2 min  
 Primary = 1.50 cfs @ 12.16 hrs, Volume= 0.183 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 28.48' @ 12.16 hrs Surf.Area= 13 sf Storage= 13 cf  
 Flood Elev= 31.97' Surf.Area= 17 sf Storage= 57 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.183 af (100% of inflow)  
 Center-of-Mass det. time= 0.3 min (840.6 - 840.2)

#	Invert	Avail.Storage	Storage Description
1	27.47'	57 cf	4.00'D x 4.50'H Vertical Cone/Cylinder
2	31.97'	75 cf	Custom Stage Data (Prismatic) Listed below
		132 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
31.97	4	0	0
32.00	5,000	75	75

#	Routing	Invert	Outlet Devices
1	Primary	27.47'	10.0" x 162.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.05' S= 0.0026 '/' n= 0.011 Cc= 0.900
2	Secondary	32.25'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.50 cfs @ 12.16 hrs HW=28.48' (Free Discharge)

↳1=Culvert (Barrel Controls 1.50 cfs @ 2.9 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.47' (Free Discharge)

↳2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

**Pond 2BP:**

Inflow Area = 0.712 ac, Inflow Depth = 1.31" for 2-YR event  
 Inflow = 0.72 cfs @ 12.28 hrs, Volume= 0.078 af  
 Outflow = 0.72 cfs @ 12.29 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.3 min  
 Primary = 0.72 cfs @ 12.29 hrs, Volume= 0.078 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 28.60' @ 12.29 hrs Surf.Area= 13 sf Storage= 2 cf  
 Flood Elev= 32.34' Surf.Area= 17 sf Storage= 49 cf  
 Plug-Flow detention time= 0.0 min calculated for 0.078 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.0 min ( 856.3 - 856.3)

#	Invert	Avail.Storage	Storage Description
1	28.44'	49 cf	4.00'D x 3.90'H Vertical Cone/Cylinder
2	32.34'	7,770 cf	Custom Stage Data ( Prismatic) Listed below
		7,819 cf	Total Available Storage

Elevation ( feet)	Surf.Area ( sq-ft)	Inc.Store ( cubic-feet)	Cum.Store ( cubic-feet)
32.34	4	0	0
33.00	4,300	1,420	1,420
34.00	8,400	6,350	7,770

#	Routing	Invert	Outlet Devices
1	Primary	28.14'	10.0" x 142.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 26.99' S= 0.0081 ' / n= 0.011 Cc= 0.900
2	Secondary	32.50'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. ( English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.72 cfs @ 12.29 hrs HW=28.60' ( Free Discharge)  
 ↑1=Culvert ( Inlet Controls 0.72 cfs @ 2.3 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.44' ( Free Discharge)  
 ↑2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

**Pond 3P:**

Inflow Area = 0.248 ac, Inflow Depth = 2.35" for 2-YR event  
 Inflow = 0.78 cfs @ 12.02 hrs, Volume= 0.049 af  
 Outflow = 0.78 cfs @ 12.02 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.1 min  
 Primary = 0.78 cfs @ 12.02 hrs, Volume= 0.048 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 31.79' @ 12.02 hrs Surf.Area= 13 sf Storage= 41 cf  
 Flood Elev= 35.31' Surf.Area= 17 sf Storage= 86 cf  
 Plug-Flow detention time= 17.5 min calculated for 0.048 af ( 98% of inflow)  
 Center-of-Mass det. time= 7.1 min ( 791.8 - 784.7)

#	Invert	Avail.Storage	Storage Description
1	28.50'	86 cf	4.00'D x 6.81'H Vertical Cone/Cylinder
2	35.31'	4,015 cf	Custom Stage Data ( Prismatic) Listed below
		4,101 cf	Total Available Storage

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.31	4	0	0
36.00	1,200	415	415
37.00	6,000	3,600	4,015

#	Routing	Invert	Outlet Devices
1	Primary	31.31'	10.0" x 35.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.87' S= 0.0983 '/' n= 0.011 Cc= 0.900
2	Secondary	35.50'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.77 cfs @ 12.02 hrs HW=31.79' (Free Discharge)

1=Culvert (Inlet Controls 0.77 cfs @ 2.4 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.50' (Free Discharge)

2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 4P:

Inflow Area = 2.381 ac, Inflow Depth = 1.69" for 2-YR event  
 Inflow = 2.70 cfs @ 12.21 hrs, Volume= 0.335 af  
 Outflow = 2.70 cfs @ 12.21 hrs, Volume= 0.335 af, Atten= 0%, Lag= 0.3 min  
 Primary = 2.70 cfs @ 12.21 hrs, Volume= 0.335 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 29.84' @ 12.21 hrs Surf.Area= 13 sf Storage= 35 cf  
 Flood Elev= 32.75' Surf.Area= 17 sf Storage= 72 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.335 af (100% of inflow)  
 Center-of-Mass det. time= 0.3 min ( 809.1 - 808.8)

#	Invert	Avail.Storage	Storage Description
1	27.05'	72 cf	4.00'D x 5.70'H Vertical Cone/Cylinder
2	32.75'	5,751 cf	Custom Stage Data ( Prismatic) Listed below
		5,822 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.75	4	0	0
33.00	2,000	251	251
34.00	9,000	5,500	5,751

#	Routing	Invert	Outlet Devices
1	Primary	27.05'	10.0" x 169.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 26.60' S= 0.0027 '/' n= 0.011 Cc= 0.900
2	Secondary	32.75'	20.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

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Primary OutFlow Max=2.70 cfs @ 12.21 hrs HW=29.84' (Free Discharge)

↑1=Culvert (Barrel Controls 2.70 cfs @ 4.9 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.05' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 5P:

Inflow Area = 1.837 ac, Inflow Depth = 1.35" for 2-YR event  
 Inflow = 2.09 cfs @ 12.17 hrs, Volume= 0.207 af  
 Outflow = 2.08 cfs @ 12.17 hrs, Volume= 0.207 af, Atten= 0%, Lag= 0.2 min  
 Primary = 2.08 cfs @ 12.17 hrs, Volume= 0.207 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 28.55' @ 12.17 hrs Surf.Area= 13 sf Storage= 20 cf  
 Flood Elev= 32.64' Surf.Area= 17 sf Storage= 71 cf  
 Plug-Flow detention time= 0.4 min calculated for 0.207 af (100% of inflow)  
 Center-of-Mass det. time= 0.3 min (848.7 - 848.4)

#	Invert	Avail.Storage	Storage Description
1	26.99'	71 cf	4.00'D x 5.65'H Vertical Cone/Cylinder
2	32.64'	4,001 cf	Custom Stage Data (Prismatic) Listed below
		4,072 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.64	4	0	0
33.00	2,207	398	398
34.00	5,000	3,604	4,001

#	Routing	Invert	Outlet Devices
1	Primary	26.99'	10.0" x 117.0' long Culvert RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 26.71' S= 0.0024 '/' n= 0.011 Cc= 0.900
2	Secondary	32.64'	40.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.08 cfs @ 12.17 hrs HW=28.55' (Free Discharge)

↑1=Culvert (Barrel Controls 2.08 cfs @ 3.8 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=26.99' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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**Pond 6BP:**

Inflow Area = 2.265 ac, Inflow Depth = 1.43" for 2-YR event  
 Inflow = 2.81 cfs @ 12.15 hrs, Volume= 0.269 af  
 Outflow = 2.81 cfs @ 12.15 hrs, Volume= 0.269 af, Atten= 0%, Lag= 0.0 min  
 Primary = 2.81 cfs @ 12.15 hrs, Volume= 0.269 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 27.56' @ 12.15 hrs Surf.Area= 13 sf Storage= 11 cf  
 Flood Elev= 32.58' Surf.Area= 17 sf Storage= 74 cf  
 Plug-Flow detention time= 0.2 min calculated for 0.269 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 843.1 - 843.0)

#	Invert	Avail.Storage	Storage Description
1	26.71'	75 cf	4.00'D x 6.00'H Vertical Cone/Cylinder
2	32.58'	337 cf	Custom Stage Data ( Prismatic) Listed below
		412 cf	Total Available Storage

Elevation ( feet)	Surf.Area ( sq-ft)	Inc.Store ( cubic-feet)	Cum.Store ( cubic-feet)
32.58	4	0	0
33.00	1,600	337	337

#	Routing	Invert	Outlet Devices
1	Primary	26.71'	12.0" x 313.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 23.10' S= 0.0115 '/' n= 0.011 Cc= 0.900
2	Secondary	33.00'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.81 cfs @ 12.15 hrs HW=27.56' ( Free Discharge)  
 ↳1=Culvert ( Inlet Controls 2.81 cfs @ 3.9 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=26.71' ( Free Discharge)  
 ↳2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

**Pond 6P: Existing Outfall**

Inflow Area = 8.071 ac, Inflow Depth = 2.00" for 2-YR event  
 Inflow = 11.16 cfs @ 12.04 hrs, Volume= 1.347 af  
 Outflow = 11.15 cfs @ 12.04 hrs, Volume= 1.347 af, Atten= 0%, Lag= 0.1 min  
 Primary = 11.15 cfs @ 12.04 hrs, Volume= 1.347 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 24.75' @ 12.04 hrs Surf.Area= 13 sf Storage= 23 cf  
 Flood Elev= 27.80' Surf.Area= 17 sf Storage= 62 cf  
 Plug-Flow detention time= 0.1 min calculated for 1.347 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.1 min ( 797.4 - 797.3)

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#	Invert	Avail.Storage	Storage Description
1	22.90'	62 cf	4.00'D x 4.90'H Vertical Cone/Cylinder
2	27.80'	3,320 cf	Custom Stage Data ( Prismatic) Listed below
		3,382 cf	Total Available Storage

Elevation ( feet)	Surf.Area ( sq-ft)	Inc.Store ( cubic-feet)	Cum.Store ( cubic-feet)
27.80	4	0	0
28.00	400	40	40
29.00	6,160	3,280	3,320

#	Routing	Invert	Outlet Devices
1	Primary	22.90'	18.0" x 78.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 19.52' S= 0.0433 ' / n= 0.011 Cc= 0.900
2	Secondary	27.80'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head ( feet) 0.20 0.40 0.60 0.80 1.00 Coef. ( English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=11.14 cfs @ 12.04 hrs HW=24.75' ( Free Discharge)

↑1=Culvert ( Inlet Controls 11.14 cfs @ 6.3 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=22.90' ( Free Discharge)

↑2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

Pond 7P:

Inflow Area = 3.619 ac, Inflow Depth = 2.02" for 2-YR event  
 Inflow = 5.99 cfs @ 12.05 hrs, Volume= 0.609 af  
 Outflow = 4.21 cfs @ 12.22 hrs, Volume= 0.608 af, Atten= 30%, Lag= 10.1 min  
 Primary = 4.21 cfs @ 12.22 hrs, Volume= 0.608 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 30.20' @ 12.22 hrs Surf.Area= 2,841 sf Storage= 779 cf  
 Flood Elev= 30.50' Surf.Area= 5,613 sf Storage= 1,776 cf  
 Plug-Flow detention time= 2.5 min calculated for 0.608 af ( 100% of inflow)  
 Center-of-Mass det. time= 1.6 min ( 790.9 - 789.3)

#	Invert	Avail.Storage	Storage Description
1	23.60'	79 cf	4.00'D x 6.25'H Vertical Cone/Cylinder
2	29.91'	6,598 cf	Custom Stage Data ( Prismatic) Listed below
		6,676 cf	Total Available Storage

Elevation ( feet)	Surf.Area ( sq-ft)	Inc.Store ( cubic-feet)	Cum.Store ( cubic-feet)
29.91	4	0	0
30.00	1,008	46	46
30.50	5,600	1,652	1,698
31.00	14,000	4,900	6,598

#	Routing	Invert	Outlet Devices
1	Primary	26.50'	10.0" x 195.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 22.81' S= 0.0189 '/' n= 0.011 Cc= 0.900
2	Secondary	30.50'	55.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.21 cfs @ 12.22 hrs HW=30.20' (Free Discharge)

↳1=Culvert (Barrel Controls 4.21 cfs @ 7.7 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=23.60' (Free Discharge)

↳2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

**Pond CB 3:**

Inflow Area = 0.713 ac, Inflow Depth = 2.51" for 2-YR event  
 Inflow = 0.70 cfs @ 12.68 hrs, Volume= 0.149 af  
 Outflow = 0.70 cfs @ 12.69 hrs, Volume= 0.148 af, Atten= 0%, Lag= 0.1 min  
 Primary = 0.70 cfs @ 12.69 hrs, Volume= 0.148 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 27.92' @ 12.69 hrs Surf.Area= 13 sf Storage= 30 cf  
 Flood Elev= 29.80' Surf.Area= 13 sf Storage= 50 cf  
 Plug-Flow detention time= 5.2 min calculated for 0.148 af (100% of inflow)  
 Center-of-Mass det. time= 2.6 min (807.0 - 804.4)

#	Invert	Avail.Storage	Storage Description
1	25.54'	50 cf	4.00'D x 4.00'H Vertical Cone/Cylinder
2	30.64'	84 cf	Custom Stage Data (Prismatic) Listed below
		134 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.64	4	0	0
31.00	460	84	84

#	Routing	Invert	Outlet Devices
1	Primary	27.54'	12.0" x 113.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 26.18' S= 0.0120 '/' n= 0.012 Cc= 0.900
2	Secondary	30.64'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.70 cfs @ 12.69 hrs HW=27.92' (Free Discharge)

↳1=Culvert (Barrel Controls 0.70 cfs @ 3.8 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.54' (Free Discharge)

↳2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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**Pond CB1:**

Inflow Area = 1.019 ac, Inflow Depth = 1.66" for 2-YR event  
 Inflow = 2.18 cfs @ 12.05 hrs, Volume= 0.141 af  
 Outflow = 2.17 cfs @ 12.06 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min  
 Primary = 2.17 cfs @ 12.06 hrs, Volume= 0.141 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 29.12' @ 12.06 hrs Surf.Area= 0.000 ac Storage= 0.000 af  
 Plug-Flow detention time= 0.2 min calculated for 0.141 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 823.5 - 823.3)

#	Invert	Avail.Storage	Storage Description
1	28.40'	0.002 af	4.00'D x 5.65'H Vertical Cone/Cylinder
2	34.50'	1,626.000 af	Custom Stage Data ( Prismatic) Listed below
		1,626.002 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
34.50	4.000	0.000	0.000
35.00	6,500.000	1,626.000	1,626.000

#	Routing	Invert	Outlet Devices
1	Primary	28.40'	12.0" x 30.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 27.74' S= 0.0220 '/' n= 0.012 Cc= 0.900
2	Secondary	34.05'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.17 cfs @ 12.06 hrs HW=29.12' ( Free Discharge)  
 ↖1=Culvert ( Inlet Controls 2.17 cfs @ 3.6 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.40' ( Free Discharge)  
 ↖2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

**Pond CB2:**

Inflow Area = 1.019 ac, Inflow Depth = 1.66" for 2-YR event  
 Inflow = 2.18 cfs @ 12.05 hrs, Volume= 0.141 af  
 Outflow = 2.18 cfs @ 12.05 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min  
 Primary = 2.18 cfs @ 12.05 hrs, Volume= 0.141 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 30.03' @ 12.05 hrs Surf.Area= 13 sf Storage= 9 cf  
 Flood Elev= 33.31' Surf.Area= 13 sf Storage= 50 cf  
 Plug-Flow detention time= 0.2 min calculated for 0.141 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 823.3 - 823.1)



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#	Invert	Avail.Storage	Storage Description
1	29.31'	50 cf	4.00'D x 4.00'H Vertical Cone/Cylinder
2	33.81'	95 cf	Custom Stage Data ( Prismatic) Listed below
		145 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.81	4	0	0
34.00	994	95	95

#	Routing	Invert	Outlet Devices
1	Primary	29.31'	12.0" x 37.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 28.50' S= 0.0219 '/' n= 0.012 Cc= 0.900
2	Secondary	33.81'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.17 cfs @ 12.05 hrs HW=30.03' (Free Discharge)

↑1=Culvert (Inlet Controls 2.17 cfs @ 3.6 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=29.31' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond DMH2: (new Pond)

Inflow Area = 1.019 ac, Inflow Depth = 1.66" for 2-YR event  
 Inflow = 2.17 cfs @ 12.06 hrs, Volume= 0.141 af  
 Outflow = 2.17 cfs @ 12.06 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min  
 Primary = 2.17 cfs @ 12.06 hrs, Volume= 0.141 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 26.96' @ 12.06 hrs

Flood Elev= 34.89'

Plug-Flow detention time= 0.0 min calculated for 0.141 af (100% of inflow)

Center-of-Mass det. time= (not calculated: outflow precedes inflow)

#	Routing	Invert	Outlet Devices
1	Primary	26.24'	12.0" x 18.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 25.24' S= 0.0556 '/' n= 0.012 Cc= 0.900
2	Secondary	29.00'	4.0' long x 0.7' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32

Primary OutFlow Max=2.17 cfs @ 12.06 hrs HW=26.96' (Free Discharge)

↑1=Culvert (Inlet Controls 2.17 cfs @ 3.6 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=26.24' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 2-YR Rainfall=3.00"

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Pond DMH2A:

Inflow Area = 1.019 ac, Inflow Depth = 1.66" for 2-YR event
Inflow = 2.17 cfs @ 12.06 hrs, Volume= 0.141 af
Outflow = 2.17 cfs @ 12.06 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min
Primary = 2.17 cfs @ 12.06 hrs, Volume= 0.141 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 26.61' @ 12.06 hrs
Flood Elev= 34.89'
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated)

Table with 4 columns: #, Routing, Invert, Outlet Devices. Row 1: 1 Primary, 26.00', 24.0" x 36.0' long Culvert RCP, groove end w/headwall, Ke= 0.200, Outlet Invert= 25.64' S= 0.0100 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=2.17 cfs @ 12.06 hrs HW=26.61' (Free Discharge)
1=Culvert (Barrel Controls 2.17 cfs @ 4.0 fps)

Pond DMH4:

Inflow Area = 1.019 ac, Inflow Depth = 1.66" for 2-YR event
Inflow = 2.17 cfs @ 12.06 hrs, Volume= 0.141 af
Outflow = 2.17 cfs @ 12.06 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min
Primary = 2.17 cfs @ 12.06 hrs, Volume= 0.141 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs
Peak Elev= 26.02' @ 12.06 hrs
Flood Elev= 34.19'
Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= (not calculated)

Table with 4 columns: #, Routing, Invert, Outlet Devices. Row 1: 1 Primary, 25.54', 36.0" x 78.0' long Culvert RCP, groove end w/headwall, Ke= 0.200, Outlet Invert= 18.80' S= 0.0864 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=2.15 cfs @ 12.06 hrs HW=26.02' (Free Discharge)
1=Culvert (Inlet Controls 2.15 cfs @ 2.9 fps)

Pond DMH6:

Inflow Area = 0.713 ac, Inflow Depth = 2.50" for 2-YR event
Inflow = 0.70 cfs @ 12.69 hrs, Volume= 0.148 af
Outflow = 0.70 cfs @ 12.69 hrs, Volume= 0.148 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.70 cfs @ 12.69 hrs, Volume= 0.148 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

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Type III 24-hr 2-YR Rainfall=3.00"

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Peak Elev= 25.16' @ 12.69 hrs

Flood Elev= 31.90'

Plug-Flow detention time= ( not calculated: outflow precedes inflow)

Center-of-Mass det. time= ( not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	26.08'	12.0" x 6.5' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 23.68' S= 0.3692 '/' n= 0.012 Cc= 0.900
2	Secondary	25.00'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.00' (Free Discharge)

↑1=Culvert (Controls 0.00 cfs)

Secondary OutFlow Max=0.69 cfs @ 12.69 hrs HW=25.16' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 0.69 cfs @ 1.1 fps)

**Pond DMH6A:**

Inflow Area = 0.713 ac, Inflow Depth = 2.50" for 2-YR event  
 Inflow = 0.70 cfs @ 12.69 hrs, Volume= 0.148 af  
 Outflow = 0.70 cfs @ 12.69 hrs, Volume= 0.148 af, Atten= 0%, Lag= 0.0 min  
 Primary = 0.70 cfs @ 12.69 hrs, Volume= 0.148 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 24.33' @ 12.69 hrs

Flood Elev= 31.90'

Plug-Flow detention time= ( not calculated: outflow precedes inflow)

Center-of-Mass det. time= ( not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	24.00'	24.0" x 18.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 23.78' S= 0.0122 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=0.69 cfs @ 12.69 hrs HW=24.33' (Free Discharge)

↑1=Culvert (Barrel Controls 0.69 cfs @ 3.1 fps)

**Pond WQ1: ( new Pond)**

Inflow Area = 1.019 ac, Inflow Depth = 1.66" for 2-YR event  
 Inflow = 2.17 cfs @ 12.06 hrs, Volume= 0.141 af  
 Outflow = 2.17 cfs @ 12.06 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min  
 Primary = 2.17 cfs @ 12.06 hrs, Volume= 0.141 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 26.98' @ 12.06 hrs

Flood Elev= 34.40'

Plug-Flow detention time= ( not calculated: outflow precedes inflow)

Center-of-Mass det. time= ( not calculated)

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Type III 24-hr 2-YR Rainfall=3.00"

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#	Routing	Invert	Outlet Devices
1	Primary	26.24'	18.0" x 18.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 26.10' S= 0.0078 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=2.17 cfs @ 12.06 hrs HW=26.98' (Free Discharge)

↑1=Culvert (Barrel Controls 2.17 cfs @ 3.6 fps)

Pond WQ2:

Inflow Area = 0.713 ac, Inflow Depth = 0.00" for 2-YR event  
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 24.68' @ 0.00 hrs

Flood Elev= 31.68'

Plug-Flow detention time= (not calculated)

Center-of-Mass det. time= (not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	24.68'	18.0" x 6.5' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 24.10' S= 0.0892 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=24.68' (Free Discharge)

↑1=Culvert (Controls 0.00 cfs)

**2498-Post Development***Type III 24-hr 10-YR Rainfall=4.70"*

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Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>Subcatchment 1S: N. RES. &amp; ENTRANCE</b>	Runoff Area=0.822 ac Flow Length=257' Tc=25.3 min CN=70 Runoff=1.04 cfs 0.124 af
<b>Subcatchment 2A: RES./ PAVED LOT &amp; NW HOTEL</b>	Runoff Area=0.652 ac Flow Length=192' Tc=10.8 min CN=85 Runoff=2.00 cfs 0.168 af
<b>Subcatchment 2B: ( new Subcat)</b>	Runoff Area=0.712 ac Flow Length=171' Tc=20.5 min CN=81 Runoff=1.52 cfs 0.161 af
<b>Subcatchment 3S: MOBIL STATION LOT</b>	Runoff Area=0.248 ac Flow Length=103' Tc=1.1 min CN=94 Runoff=1.29 cfs 0.083 af
<b>Subcatchment 4S: NE HOTEL QUAD &amp; PARKING</b>	Runoff Area=0.659 ac Flow Length=301' Tc=19.8 min CN=98 Runoff=2.08 cfs 0.245 af
<b>Subcatchment 5S: SW HOTEL QUAD &amp; LOT</b>	Runoff Area=1.125 ac Flow Length=197' Tc=10.6 min CN=82 Runoff=3.18 cfs 0.264 af
<b>Subcatchment 6A: SE HOTEL QUAD &amp; PARKING</b>	Runoff Area=1.257 ac Flow Length=305' Tc=2.0 min CN=97 Runoff=6.61 cfs 0.455 af
<b>Subcatchment 6B: SEWALL ST ENTRANCE</b>	Runoff Area=0.428 ac Flow Length=160' Tc=8.3 min CN=87 Runoff=1.50 cfs 0.117 af
<b>Subcatchment 6C:</b>	Runoff Area=0.217 ac Tc=0.0 min CN=94 Runoff=1.16 cfs 0.073 af
<b>Subcatchment 7S: NORWAY SAVINGS &amp; LOT</b>	Runoff Area=1.238 ac Flow Length=333' Tc=3.3 min CN=97 Runoff=6.21 cfs 0.449 af
<b>Subcatchment 8A: Proposed Parking &amp; Building</b>	Runoff Area=0.518 ac Flow Length=580' Tc=53.6 min CN=98 Runoff=1.03 cfs 0.193 af
<b>Subcatchment 8B: Proposed Parking</b>	Runoff Area=0.195 ac Flow Length=337' Tc=2.3 min CN=88 Runoff=0.87 cfs 0.055 af
<b>Subcatchment 8C: Undeveloped Portion of Site</b>	Runoff Area=0.365 ac Tc=0.0 min CN=79 Runoff=1.33 cfs 0.077 af
<b>Subcatchment 9: Proposed Parking Lot</b>	Runoff Area=1.019 ac Flow Length=260' Tc=3.5 min CN=86 Runoff=4.12 cfs 0.271 af
<b>Subcatchment 9A: Existing Parking Lot</b>	Runoff Area=0.618 ac Flow Length=220' Tc=1.8 min CN=90 Runoff=2.93 cfs 0.185 af

## Reach POI-1: Ravine

Inflow=24.31 cfs 2.918 af

Outflow=24.31 cfs 2.918 af

## Pond 1P:

Peak Elev=28.69' Storage=11 cf Inflow=1.58 cfs 0.207 af

Primary=1.57 cfs 0.207 af Secondary=0.00 cfs 0.000 af Outflow=1.57 cfs 0.207 af

## Pond 2AP:

Peak Elev=30.95' Storage=44 cf Inflow=3.10 cfs 0.375 af

Primary=3.09 cfs 0.375 af Secondary=0.00 cfs 0.000 af Outflow=3.09 cfs 0.375 af

## Pond 2BP:

Peak Elev=28.89' Storage=6 cf Inflow=1.52 cfs 0.161 af

Primary=1.52 cfs 0.161 af Secondary=0.00 cfs 0.000 af Outflow=1.52 cfs 0.161 af

## Pond 3P:

Peak Elev=31.97' Storage=44 cf Inflow=1.29 cfs 0.083 af

Primary=1.29 cfs 0.082 af Secondary=0.00 cfs 0.000 af Outflow=1.29 cfs 0.082 af

## Pond 4P:

Peak Elev=32.81' Storage=137 cf Inflow=5.00 cfs 0.620 af

Primary=4.03 cfs 0.604 af Secondary=0.95 cfs 0.016 af Outflow=4.98 cfs 0.620 af

## Pond 5P:

Peak Elev=31.91' Storage=62 cf Inflow=4.34 cfs 0.425 af

Primary=4.34 cfs 0.425 af Secondary=0.00 cfs 0.000 af Outflow=4.34 cfs 0.425 af

## Pond 6BP:

Peak Elev=30.75' Storage=51 cf Inflow=5.68 cfs 0.542 af

Primary=5.66 cfs 0.542 af Secondary=0.00 cfs 0.000 af Outflow=5.66 cfs 0.542 af

## Pond 6P: Existing Outfall

Peak Elev=26.31' Storage=43 cf Inflow=17.36 cfs 2.385 af

Primary=17.35 cfs 2.385 af Secondary=0.00 cfs 0.000 af Outflow=17.35 cfs 2.385 af

## Pond 7P:

Peak Elev=30.58' Storage=2,512 cf Inflow=10.02 cfs 1.068 af

Primary=4.33 cfs 0.981 af Secondary=3.38 cfs 0.087 af Outflow=7.71 cfs 1.067 af

## Pond CB 3:

Peak Elev=28.04' Storage=31 cf Inflow=1.16 cfs 0.248 af

Primary=1.16 cfs 0.247 af Secondary=0.00 cfs 0.000 af Outflow=1.16 cfs 0.247 af

## Pond CB1:

Peak Elev=29.66' Storage=0.000 af Inflow=4.12 cfs 0.271 af

Primary=4.12 cfs 0.271 af Secondary=0.00 cfs 0.000 af Outflow=4.12 cfs 0.271 af

## Pond CB2:

Peak Elev=30.57' Storage=16 cf Inflow=4.12 cfs 0.271 af

Primary=4.12 cfs 0.271 af Secondary=0.00 cfs 0.000 af Outflow=4.12 cfs 0.271 af

## Pond DMH2: ( new Pond)

Peak Elev=27.50' Inflow=4.12 cfs 0.271 af

Primary=4.12 cfs 0.271 af Secondary=0.00 cfs 0.000 af Outflow=4.12 cfs 0.271 af

## Pond DMH2A:

Peak Elev=26.88' Inflow=4.12 cfs 0.271 af

24.0" x 36.0' Culvert Outflow=4.12 cfs 0.271 af

## Pond DMH4:

Peak Elev=26.21' Inflow=4.12 cfs 0.271 af

36.0" x 78.0' Culvert Outflow=4.12 cfs 0.271 af

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Type III 24-hr 10-YR Rainfall=4.70"

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Pond DMH6:

Peak Elev=25.22' Inflow=1.16 cfs 0.247 af  
Primary=0.00 cfs 0.000 af Secondary=1.16 cfs 0.247 af Outflow=1.16 cfs 0.247 af

Pond DMH6A:

Peak Elev=24.44' Inflow=1.16 cfs 0.247 af  
24.0" x 18.0' Culvert Outflow=1.16 cfs 0.247 af

Pond WQ1: (new Pond)

Peak Elev=27.32' Inflow=4.12 cfs 0.271 af  
18.0" x 18.0' Culvert Outflow=4.12 cfs 0.271 af

Pond WQ2:

Peak Elev=24.68' Inflow=0.00 cfs 0.000 af  
18.0" x 6.5' Culvert Outflow=0.00 cfs 0.000 af

Total Runoff Area = 10.073 ac Runoff Volume = 2.920 af Average Runoff Depth = 3.48"

**Subcatchment 1S: N. RES. & ENTRANCE**

Runoff = 1.04 cfs @ 12.37 hrs, Volume= 0.124 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.197	98	BLDGS & PAVMENT
0.625	61	>75% Grass cover, Good, HSG B
0.822	70	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0	219	0.0100	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.3	38	0.0090	1.9		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
25.3	257	Total			

**Subcatchment 2A: RES./ PAVED LOT & NW HOTEL**

Runoff = 2.00 cfs @ 12.15 hrs, Volume= 0.168 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.423	98	RES./PARKING LOT & HOTEL
0.229	61	>75% Grass cover, Good, HSG B
0.652	85	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	119	0.0370	0.2		Sheet Flow, A-B Cultivated: Residue>20% n= 0.170 P2= 3.00"
0.7	73	0.0080	1.8		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
10.8	192	Total			

**Subcatchment 2B: ( new Subcat)**

Runoff = 1.52 cfs @ 12.28 hrs, Volume= 0.161 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"



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Type III 24-hr 10-YR Rainfall=4.70"

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Area (ac)	CN	Description
0.382	98	PAVEMENT & BUILDING
0.330	61	>75% Grass cover, Good, HSG B
0.712	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	128	0.0060	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.5	43	0.0060	1.6		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
20.5	171	Total			

**Subcatchment 3S: MOBIL STATION LOT**

Runoff = 1.29 cfs @ 12.02 hrs, Volume= 0.083 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.206	98	PARKING & BUILDING
0.042	74	>75% Grass cover, Good, HSG C
0.248	94	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	49	0.0240	1.2		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.4	54	0.0130	2.3		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
1.1	103	Total			

**Subcatchment 4S: NE HOTEL QUAD & PARKING**

Runoff = 2.08 cfs @ 12.26 hrs, Volume= 0.245 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.659	98	HOTEL & PARKING

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.1	171	0.0120	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.7	130	0.0220	3.0		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
19.8	301	Total			

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Type III 24-hr 10-YR Rainfall=4.70"

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**Subcatchment 5S: SW HOTEL QUAD & LOT**

Runoff = 3.18 cfs @ 12.15 hrs, Volume= 0.264 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.647	98	RES. / HOTEL & LOT
0.478	61	>75% Grass cover, Good, HSG B
1.125	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	124	0.0300	0.2		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.4	73	0.0230	3.1		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
10.6	197	Total			

**Subcatchment 6A: SE HOTEL QUAD & PARKING**

Runoff = 6.61 cfs @ 12.03 hrs, Volume= 0.455 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
1.216	98	HOTEL PAVED LOT
0.041	61	>75% Grass cover, Good, HSG B
1.257	97	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0200	0.9		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
1.7	290	0.0200	2.9		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
2.0	305	Total			

**Subcatchment 6B: SEWALL ST ENTRANCE**

Runoff = 1.50 cfs @ 12.11 hrs, Volume= 0.117 af, Depth= 3.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

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Type III 24-hr 10-YR Rainfall=4.70"

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Area (ac)	CN	Description
0.302	98	PAVED ENTRANCE
0.126	61	>75% Grass cover, Good, HSG B
0.428	87	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	30	0.0260	0.1		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.00"
0.7	130	0.0260	3.3		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
8.3	160	Total			

Subcatchment 6C:

Runoff = 1.16 cfs @ 12.00 hrs, Volume= 0.073 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.194	98	Paved roads w/curbs & sewers
0.023	61	>75% Grass cover, Good, HSG B
0.217	94	Weighted Average

Subcatchment 7S: NORWAY SAVINGS & LOT

Runoff = 6.21 cfs @ 12.05 hrs, Volume= 0.449 af, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
1.169	98	BANK & LOT
0.069	74	>75% Grass cover, Good, HSG C
1.238	97	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	136	0.0088	1.0		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.2	39	0.0400	4.1		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.2	42	0.0250	3.2		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.7	116	0.0177	2.7		Shallow Concentrated Flow, D-E Paved Kv= 20.3 fps
3.3	333	Total			

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Type III 24-hr 10-YR Rainfall=4.70"

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**Subcatchment 8A: Proposed Parking & Building**

Runoff = 1.03 cfs @ 12.69 hrs, Volume= 0.193 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.518	98	PAVED PARKING & BUILDING

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.2	90	0.0089	0.1		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.00"
7.2	70	0.0042	0.2		Shallow Concentrated Flow, B-C Forest w/Heavy Litter Kv= 2.5 fps
17.9	370	0.0189	0.3		Shallow Concentrated Flow, C-D Forest w/Heavy Litter Kv= 2.5 fps
0.3	50	0.2200	3.3		Shallow Concentrated Flow, D-E Short Grass Pasture Kv= 7.0 fps
53.6	580	Total			

**Subcatchment 8B: Proposed Parking**

Runoff = 0.87 cfs @ 12.03 hrs, Volume= 0.055 af, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.163	98	Paved parking & roofs
0.032	39	>75% Grass cover, Good, HSG A
0.195	88	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.9		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.8	174	0.0050	3.8	2.98	Circular Channel ( pipe ) , C-D Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011
0.6	113	0.0205	2.9		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
2.3	337	Total			

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Type III 24-hr 10-YR Rainfall=4.70"

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**Subcatchment 8C: Undeveloped Portion of Site**

Runoff = 1.33 cfs @ 12.00 hrs, Volume= 0.077 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.365	79	50-75% Grass cover, Fair, HSG C

**Subcatchment 9: Proposed Parking Lot**

Runoff = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af, Depth= 3.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.599	98	Paved parking & roofs
0.420	69	50-75% Grass cover, Fair, HSG B
1.019	86	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	40	0.2700	0.4		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
1.8	220	0.0182	2.0		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
3.5	260	Total			

**Subcatchment 9A: Existing Parking Lot**

Runoff = 2.93 cfs @ 12.03 hrs, Volume= 0.185 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-YR Rainfall=4.70"

Area (ac)	CN	Description
0.448	98	PARKING LOT
0.170	69	50-75% Grass cover, Fair, HSG B
0.618	90	Weighted Average

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	127	0.0500	2.0		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.3	57	0.0300	3.5		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.4	36	0.3300	1.4		Shallow Concentrated Flow, C-D Forest w/Heavy Litter Kv= 2.5 fps
1.8	220	Total			

Reach POI-1: Ravine

Inflow Area = 10.073 ac, Inflow Depth = 3.48" for 10-YR event  
 Inflow = 24.31 cfs @ 12.04 hrs, Volume= 2.918 af  
 Outflow = 24.31 cfs @ 12.04 hrs, Volume= 2.918 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Pond 1P:

Inflow Area = 1.070 ac, Inflow Depth = 2.32" for 10-YR event  
 Inflow = 1.58 cfs @ 12.02 hrs, Volume= 0.207 af  
 Outflow = 1.57 cfs @ 12.02 hrs, Volume= 0.207 af, Atten= 0%, Lag= 0.1 min  
 Primary = 1.57 cfs @ 12.02 hrs, Volume= 0.207 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 28.69' @ 12.02 hrs Surf.Area= 13 sf Storage= 11 cf  
 Flood Elev= 32.31' Surf.Area= 17 sf Storage= 56 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.207 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.3 min ( 832.3 - 832.0)

#	Invert	Avail.Storage	Storage Description
1	27.81'	56 cf	4.00'D x 4.45'H Vertical Cone/Cylinder
2	32.31'	6,381 cf	Custom Stage Data ( Prismatic) Listed below
		6,437 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.31	4	0	0
33.00	4,000	1,381	1,381
34.00	6,000	5,000	6,381

#	Routing	Invert	Outlet Devices
1	Primary	27.81'	10.0" x 90.0' long Culvert RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 27.47' S= 0.0038 ' n= 0.011 Cc= 0.900
2	Secondary	32.50'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.57 cfs @ 12.02 hrs HW=28.68' (Free Discharge)

↳1=Culvert (Barrel Controls 1.57 cfs @ 3.4 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.81' (Free Discharge)

↳2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

**Pond 2AP:**

Inflow Area = 1.722 ac, Inflow Depth = 2.61" for 10-YR event  
 Inflow = 3.10 cfs @ 12.16 hrs, Volume= 0.375 af  
 Outflow = 3.09 cfs @ 12.17 hrs, Volume= 0.375 af, Atten= 0%, Lag= 0.5 min  
 Primary = 3.09 cfs @ 12.17 hrs, Volume= 0.375 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 30.95' @ 12.17 hrs Surf.Area= 13 sf Storage= 44 cf  
 Flood Elev= 31.97' Surf.Area= 17 sf Storage= 57 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.374 af (100% of inflow)  
 Center-of-Mass det. time= 0.3 min (824.5 - 824.2)

#	Invert	Avail.Storage	Storage Description
1	27.47'	57 cf	4.00'D x 4.50'H Vertical Cone/Cylinder
2	31.97'	75 cf	Custom Stage Data (Prismatic) Listed below
		132 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
31.97	4	0	0
32.00	5,000	75	75

#	Routing	Invert	Outlet Devices
1	Primary	27.47'	10.0" x 162.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.05' S= 0.0026 '/' n= 0.011 Cc= 0.900
2	Secondary	32.25'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=3.09 cfs @ 12.17 hrs HW=30.95' (Free Discharge)

↳1=Culvert (Barrel Controls 3.09 cfs @ 5.7 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.47' (Free Discharge)

↳2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

**Pond 2BP:**

Inflow Area = 0.712 ac, Inflow Depth = 2.72" for 10-YR event  
 Inflow = 1.52 cfs @ 12.28 hrs, Volume= 0.161 af  
 Outflow = 1.52 cfs @ 12.28 hrs, Volume= 0.161 af, Atten= 0%, Lag= 0.1 min  
 Primary = 1.52 cfs @ 12.28 hrs, Volume= 0.161 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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Type III 24-hr 10-YR Rainfall=4.70"

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Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 28.89' @ 12.28 hrs Surf.Area= 13 sf Storage= 6 cf

Flood Elev= 32.34' Surf.Area= 17 sf Storage= 49 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= (not calculated)

#	Invert	Avail.Storage	Storage Description
1	28.44'	49 cf	4.00'D x 3.90'H Vertical Cone/Cylinder
2	32.34'	7,770 cf	Custom Stage Data ( Prismatic) Listed below
		7,819 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.34	4	0	0
33.00	4,300	1,420	1,420
34.00	8,400	6,350	7,770

#	Routing	Invert	Outlet Devices
1	Primary	28.14'	10.0" x 142.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 26.99' S= 0.0081 ' / n= 0.011 Cc= 0.900
2	Secondary	32.50'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.52 cfs @ 12.28 hrs HW=28.89' (Free Discharge)

↳1=Culvert (Inlet Controls 1.52 cfs @ 2.9 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.44' (Free Discharge)

↳2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P:

Inflow Area =	0.248 ac, Inflow Depth = 4.01" for 10-YR event
Inflow =	1.29 cfs @ 12.02 hrs, Volume= 0.083 af
Outflow =	1.29 cfs @ 12.02 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.1 min
Primary =	1.29 cfs @ 12.02 hrs, Volume= 0.082 af
Secondary =	0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 31.97' @ 12.02 hrs Surf.Area= 13 sf Storage= 44 cf

Flood Elev= 35.31' Surf.Area= 17 sf Storage= 86 cf

Plug-Flow detention time= 11.5 min calculated for 0.082 af (99% of inflow)

Center-of-Mass det. time= 5.2 min ( 775.9 - 770.7)

#	Invert	Avail.Storage	Storage Description
1	28.50'	86 cf	4.00'D x 6.81'H Vertical Cone/Cylinder
2	35.31'	4,015 cf	Custom Stage Data ( Prismatic) Listed below
		4,101 cf	Total Available Storage



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Type III 24-hr 10-YR Rainfall=4.70"

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.31	4	0	0
36.00	1,200	415	415
37.00	6,000	3,600	4,015

#	Routing	Invert	Outlet Devices
1	Primary	31.31'	10.0" x 35.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.87' S= 0.0983 '/' n= 0.011 Cc= 0.900
2	Secondary	35.50'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.28 cfs @ 12.02 hrs HW=31.97' (Free Discharge)

1=Culvert (Inlet Controls 1.28 cfs @ 2.8 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.50' (Free Discharge)

2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 4P:

Inflow Area = 2.381 ac, Inflow Depth = 3.12" for 10-YR event  
 Inflow = 5.00 cfs @ 12.21 hrs, Volume= 0.620 af  
 Outflow = 4.98 cfs @ 12.22 hrs, Volume= 0.620 af, Atten= 0%, Lag= 1.1 min  
 Primary = 4.03 cfs @ 12.22 hrs, Volume= 0.604 af  
 Secondary = 0.95 cfs @ 12.22 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 32.81' @ 12.22 hrs Surf.Area= 534 sf Storage= 137 cf

Flood Elev= 32.75' Surf.Area= 17 sf Storage= 72 cf

Plug-Flow detention time= 0.3 min calculated for 0.620 af (100% of inflow)

Center-of-Mass det. time= 0.3 min (800.0 - 799.7)

#	Invert	Avail.Storage	Storage Description
1	27.05'	72 cf	4.00'D x 5.70'H Vertical Cone/Cylinder
2	32.75'	5,751 cf	Custom Stage Data (Prismatic) Listed below
		5,822 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.75	4	0	0
33.00	2,000	251	251
34.00	9,000	5,500	5,751

#	Routing	Invert	Outlet Devices
1	Primary	27.05'	10.0" x 169.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 26.60' S= 0.0027 '/' n= 0.011 Cc= 0.900
2	Secondary	32.75'	20.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

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Type III 24-hr 10-YR Rainfall=4.70"

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Primary OutFlow Max=4.03 cfs @ 12.22 hrs HW=32.81' (Free Discharge)

↑1=Culvert (Barrel Controls 4.03 cfs @ 7.4 fps)

Secondary OutFlow Max=0.92 cfs @ 12.22 hrs HW=32.81' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 0.92 cfs @ 0.7 fps)

Pond 5P:

Inflow Area = 1.837 ac, Inflow Depth = 2.78" for 10-YR event  
 Inflow = 4.34 cfs @ 12.17 hrs, Volume= 0.425 af  
 Outflow = 4.34 cfs @ 12.17 hrs, Volume= 0.425 af, Atten= 0%, Lag= 0.4 min  
 Primary = 4.34 cfs @ 12.17 hrs, Volume= 0.425 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 31.91' @ 12.17 hrs Surf.Area= 13 sf Storage= 62 cf  
 Flood Elev= 32.64' Surf.Area= 17 sf Storage= 71 cf  
 Plug-Flow detention time= 0.2 min calculated for 0.425 af (100% of inflow)  
 Center-of-Mass det. time= 0.2 min (828.0 - 827.7)

#	Invert	Avail.Storage	Storage Description
1	26.99'	71 cf	4.00'D x 5.65'H Vertical Cone/Cylinder
2	32.64'	4,001 cf	Custom Stage Data (Prismatic) Listed below
		4,072 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.64	4	0	0
33.00	2,207	398	398
34.00	5,000	3,604	4,001

#	Routing	Invert	Outlet Devices
1	Primary	26.99'	10.0" x 117.0' long Culvert RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 26.71' S= 0.0024 '/ n= 0.011 Cc= 0.900
2	Secondary	32.64'	40.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.33 cfs @ 12.17 hrs HW=31.91' (Free Discharge)

↑1=Culvert (Barrel Controls 4.33 cfs @ 7.9 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=26.99' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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**Pond 6BP:**

Inflow Area = 2.265 ac, Inflow Depth = 2.87" for 10-YR event  
 Inflow = 5.66 cfs @ 12.15 hrs, Volume= 0.542 af  
 Outflow = 5.66 cfs @ 12.16 hrs, Volume= 0.542 af, Atten= 0%, Lag= 0.5 min  
 Primary = 5.66 cfs @ 12.16 hrs, Volume= 0.542 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 30.75' @ 12.16 hrs Surf.Area= 13 sf Storage= 51 cf

Flood Elev= 32.58' Surf.Area= 17 sf Storage= 74 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= (not calculated)

#	Invert	Avail.Storage	Storage Description
1	26.71'	75 cf	4.00'D x 6.00'H Vertical Cone/Cylinder
2	32.58'	337 cf	Custom Stage Data (Prismatic) Listed below
		412 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.58	4	0	0
33.00	1,600	337	337

#	Routing	Invert	Outlet Devices
1	Primary	26.71'	12.0' x 313.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 23.10' S= 0.0115 ' n= 0.011 Cc= 0.900
2	Secondary	33.00'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.66 cfs @ 12.16 hrs HW=30.75' (Free Discharge)

↑1=Culvert (Barrel Controls 5.66 cfs @ 7.2 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=26.71' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

**Pond 6P: Existing Outfall**

Inflow Area = 8.071 ac, Inflow Depth = 3.55" for 10-YR event  
 Inflow = 17.36 cfs @ 12.12 hrs, Volume= 2.385 af  
 Outflow = 17.35 cfs @ 12.13 hrs, Volume= 2.385 af, Atten= 0%, Lag= 0.1 min  
 Primary = 17.35 cfs @ 12.13 hrs, Volume= 2.385 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 26.31' @ 12.13 hrs Surf.Area= 13 sf Storage= 43 cf

Flood Elev= 27.80' Surf.Area= 17 sf Storage= 62 cf

Plug-Flow detention time= 0.1 min calculated for 2.384 af (100% of inflow)

Center-of-Mass det. time= 0.1 min (787.7 - 787.6)

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Type III 24-hr 10-YR Rainfall=4.70"

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#	Invert	Avail.Storage	Storage Description
1	22.90'	62 cf	4.00'D x 4.90'H Vertical Cone/Cylinder
2	27.80'	3,320 cf	Custom Stage Data ( Prismatic) Listed below
		3,382 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
27.80	4	0	0
28.00	400	40	40
29.00	6,160	3,280	3,320

#	Routing	Invert	Outlet Devices
1	Primary	22.90'	18.0" x 78.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 19.52' S= 0.0433 '/' n= 0.011 Cc= 0.900
2	Secondary	27.80'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=17.34 cfs @ 12.13 hrs HW=26.31' (Free Discharge)

↑1=Culvert (Inlet Controls 17.34 cfs @ 9.8 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=22.90' (Free Discharge)

↑2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

Pond 7P:

Inflow Area = 3.619 ac, Inflow Depth = 3.54" for 10-YR event  
 Inflow = 10.02 cfs @ 12.05 hrs, Volume= 1.068 af  
 Outflow = 7.71 cfs @ 12.15 hrs, Volume= 1.067 af, Atten= 23%, Lag= 6.0 min  
 Primary = 4.33 cfs @ 12.15 hrs, Volume= 0.981 af  
 Secondary = 3.38 cfs @ 12.15 hrs, Volume= 0.087 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 30.58' @ 12.15 hrs Surf.Area= 6,874 sf Storage= 2,512 cf  
 Flood Elev= 30.50' Surf.Area= 5,613 sf Storage= 1,776 cf  
 Plug-Flow detention time= 3.1 min calculated for 1.067 af ( 100% of inflow)  
 Center-of-Mass det. time= 2.5 min ( 783.5 - 780.9)

#	Invert	Avail.Storage	Storage Description
1	23.60'	79 cf	4.00'D x 6.25'H Vertical Cone/Cylinder
2	29.91'	6,598 cf	Custom Stage Data ( Prismatic) Listed below
		6,676 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
29.91	4	0	0
30.00	1,008	46	46
30.50	5,600	1,652	1,698
31.00	14,000	4,900	6,598

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Type III 24-hr 10-YR Rainfall=4.70"

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#	Routing	Invert	Outlet Devices
1	Primary	26.50'	10.0" x 195.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 22.81' S= 0.0189 '/' n= 0.011 Cc= 0.900
2	Secondary	30.50'	55.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.33 cfs @ 12.15 hrs HW=30.58' (Free Discharge)

↑1=Culvert (Barrel Controls 4.33 cfs @ 7.9 fps)

Secondary OutFlow Max=3.17 cfs @ 12.15 hrs HW=30.58' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 3.17 cfs @ 0.8 fps)

Pond CB 3:

Inflow Area = 0.713 ac, Inflow Depth = 4.17" for 10-YR event  
 Inflow = 1.16 cfs @ 12.04 hrs, Volume= 0.248 af  
 Outflow = 1.16 cfs @ 12.04 hrs, Volume= 0.247 af, Atten= 0%, Lag= 0.1 min  
 Primary = 1.16 cfs @ 12.04 hrs, Volume= 0.247 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 28.04' @ 12.04 hrs Surf.Area= 13 sf Storage= 31 cf  
 Flood Elev= 29.80' Surf.Area= 13 sf Storage= 50 cf  
 Plug-Flow detention time= 3.3 min calculated for 0.247 af (100% of inflow)  
 Center-of-Mass det. time= 1.7 min (795.7 - 794.0)

#	Invert	Avail.Storage	Storage Description
1	25.54'	50 cf	4.00'D x 4.00'H Vertical Cone/Cylinder
2	30.64'	84 cf	Custom Stage Data (Prismatic) Listed below
134 cf			Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.64	4	0	0
31.00	460	84	84

#	Routing	Invert	Outlet Devices
1	Primary	27.54'	12.0" x 113.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 26.18' S= 0.0120 '/' n= 0.012 Cc= 0.900
2	Secondary	30.64'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.16 cfs @ 12.04 hrs HW=28.04' (Free Discharge)

↑1=Culvert (Barrel Controls 1.16 cfs @ 4.3 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.54' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

2498-Post Development

Type III 24-hr 10-YR Rainfall=4.70"

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Pond CB1:

Inflow Area = 1.019 ac, Inflow Depth = 3.19" for 10-YR event  
 Inflow = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af  
 Outflow = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.1 min  
 Primary = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 29.66' @ 12.05 hrs Surf.Area= 0.000 ac Storage= 0.000 af  
 Plug-Flow detention time= 0.2 min calculated for 0.271 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 804.8 - 804.7)

#	Invert	Avail.Storage	Storage Description
1	28.40'	0.002 af	4.00'D x 5.65'H Vertical Cone/Cylinder
2	34.50'	1,626.000 af	Custom Stage Data ( Prismatic) Listed below
		1,626.002 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
34.50	4.000	0.000	0.000
35.00	6,500.000	1,626.000	1,626.000

#	Routing	Invert	Outlet Devices
1	Primary	28.40'	12.0" x 30.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 27.74' S= 0.0220 '/' n= 0.012 Cc= 0.900
2	Secondary	34.05'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.11 cfs @ 12.05 hrs HW=29.66' (Free Discharge)  
 ↳1=Culvert (Inlet Controls 4.11 cfs @ 5.2 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.40' (Free Discharge)  
 ↳2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond CB2:

Inflow Area = 1.019 ac, Inflow Depth = 3.19" for 10-YR event  
 Inflow = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af  
 Outflow = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.1 min  
 Primary = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 30.57' @ 12.05 hrs Surf.Area= 13 sf Storage= 16 cf  
 Flood Elev= 33.31' Surf.Area= 13 sf Storage= 50 cf  
 Plug-Flow detention time= 0.2 min calculated for 0.271 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 804.7 - 804.5)

2498-Post Development

Type III 24-hr 10-YR Rainfall=4.70"

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#	Invert	Avail.Storage	Storage Description
1	29.31'	50 cf	4.00'D x 4.00'H Vertical Cone/Cylinder
2	33.81'	95 cf	Custom Stage Data (Prismatic) Listed below
		145 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.81	4	0	0
34.00	994	95	95

#	Routing	Invert	Outlet Devices
1	Primary	29.31'	12.0" x 37.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 28.50' S= 0.0219 '/' n= 0.012 Cc= 0.900
2	Secondary	33.81'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.11 cfs @ 12.05 hrs HW=30.57' (Free Discharge)

↑1=Culvert (Inlet Controls 4.11 cfs @ 5.2 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=29.31' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond DMH2: (new Pond)

Inflow Area = 1.019 ac, Inflow Depth = 3.19" for 10-YR event  
 Inflow = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af  
 Outflow = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.0 min  
 Primary = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 27.50' @ 12.05 hrs

Flood Elev= 34.89'

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= (not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	26.24'	12.0" x 18.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 25.24' S= 0.0556 '/' n= 0.012 Cc= 0.900
2	Secondary	29.00'	4.0' long x 0.7' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32

Primary OutFlow Max=4.11 cfs @ 12.05 hrs HW=27.50' (Free Discharge)

↑1=Culvert (Inlet Controls 4.11 cfs @ 5.2 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=26.24' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

**Pond DMH2A:**

Inflow Area = 1.019 ac, Inflow Depth = 3.19" for 10-YR event  
 Inflow = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af  
 Outflow = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.0 min  
 Primary = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 26.88' @ 12.05 hrs

Flood Elev= 34.89'

Plug-Flow detention time= 0.0 min calculated for 0.271 af ( 100% of inflow)

Center-of-Mass det. time= 0.0 min ( 804.8 - 804.8)

#	Routing	Invert	Outlet Devices
1	Primary	26.00'	24.0" x 36.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 25.64' S= 0.0100 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=4.11 cfs @ 12.05 hrs HW=26.87' (Free Discharge)

↑1=Culvert (Barrel Controls 4.11 cfs @ 4.6 fps)

**Pond DMH4:**

Inflow Area = 1.019 ac, Inflow Depth = 3.19" for 10-YR event  
 Inflow = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af  
 Outflow = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.0 min  
 Primary = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 26.21' @ 12.05 hrs

Flood Elev= 34.19'

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= (not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	25.54'	36.0" x 78.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 18.80' S= 0.0864 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=4.10 cfs @ 12.05 hrs HW=26.21' (Free Discharge)

↑1=Culvert (Inlet Controls 4.10 cfs @ 3.5 fps)

**Pond DMH6:**

Inflow Area = 0.713 ac, Inflow Depth = 4.16" for 10-YR event  
 Inflow = 1.16 cfs @ 12.04 hrs, Volume= 0.247 af  
 Outflow = 1.16 cfs @ 12.04 hrs, Volume= 0.247 af, Atten= 0%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
 Secondary = 1.16 cfs @ 12.04 hrs, Volume= 0.247 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs



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Type III 24-hr 10-YR Rainfall=4.70"

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Peak Elev= 25.22' @ 12.04 hrs

Flood Elev= 31.90'

Plug-Flow detention time= ( not calculated: outflow precedes inflow)

Center-of-Mass det. time= ( not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	26.08'	12.0" x 6.5' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 23.68' S= 0.3692 '/' n= 0.012 Cc= 0.900
2	Secondary	25.00'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.00' (Free Discharge)

↑1=Culvert (Controls 0.00 cfs)

Secondary OutFlow Max=1.15 cfs @ 12.04 hrs HW=25.22' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 1.15 cfs @ 1.3 fps)

**Pond DMH6A:**

Inflow Area = 0.713 ac, Inflow Depth = 4.16" for 10-YR event

Inflow = 1.16 cfs @ 12.04 hrs, Volume= 0.247 af

Outflow = 1.16 cfs @ 12.04 hrs, Volume= 0.247 af, Atten= 0%, Lag= 0.0 min

Primary = 1.16 cfs @ 12.04 hrs, Volume= 0.247 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 24.44' @ 12.04 hrs

Flood Elev= 31.90'

Plug-Flow detention time= ( not calculated: outflow precedes inflow)

Center-of-Mass det. time= ( not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	24.00'	24.0" x 18.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 23.78' S= 0.0122 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=1.15 cfs @ 12.04 hrs HW=24.44' (Free Discharge)

↑1=Culvert (Barrel Controls 1.15 cfs @ 3.4 fps)

**Pond WQ1: ( new Pond)**

Inflow Area = 1.019 ac, Inflow Depth = 3.19" for 10-YR event

Inflow = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af

Outflow = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.0 min

Primary = 4.12 cfs @ 12.05 hrs, Volume= 0.271 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 27.32' @ 12.05 hrs

Flood Elev= 34.40'

Plug-Flow detention time= ( not calculated: outflow precedes inflow)

Center-of-Mass det. time= ( not calculated)

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Type III 24-hr 10-YR Rainfall=4.70"

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#	Routing	Invert	Outlet Devices
1	Primary	26.24'	18.0" x 18.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 26.10' S= 0.0078 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=4.11 cfs @ 12.05 hrs HW=27.32' (Free Discharge)

↑1=Culvert (Barrel Controls 4.11 cfs @ 4.2 fps)

**Pond WQ2:**

Inflow Area = 0.713 ac, Inflow Depth = 0.00" for 10-YR event  
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 24.68' @ 0.00 hrs

Flood Elev= 31.68'

Plug-Flow detention time= (not calculated)

Center-of-Mass det. time= (not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	24.68'	18.0" x 6.5' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 24.10' S= 0.0892 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=24.68' (Free Discharge)

↑1=Culvert (Controls 0.00 cfs)

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Type III 24-hr 25-YR Rainfall=5.50"

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Time span=0.00-50.00 hrs, dt=0.01 hrs, 5001 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: N. RES. & ENTRANCE

Runoff Area=0.822 ac Runoff Depth=2.41"  
Flow Length=257' Tc=25.3 min CN=70 Runoff=1.40 cfs 0.165 af

Subcatchment 2A: RES./ PAVED LOT & NW HOTEL

Runoff Area=0.652 ac Runoff Depth=3.83"  
Flow Length=192' Tc=10.8 min CN=85 Runoff=2.46 cfs 0.208 af

Subcatchment 2B: ( new Subcat)

Runoff Area=0.712 ac Runoff Depth=3.43"  
Flow Length=171' Tc=20.5 min CN=81 Runoff=1.91 cfs 0.204 af

Subcatchment 3S: MOBIL STATION LOT

Runoff Area=0.248 ac Runoff Depth=4.80"  
Flow Length=103' Tc=1.1 min CN=94 Runoff=1.53 cfs 0.099 af

Subcatchment 4S: NE HOTEL QUAD & PARKING

Runoff Area=0.659 ac Runoff Depth=5.26"  
Flow Length=301' Tc=19.8 min CN=98 Runoff=2.44 cfs 0.289 af

Subcatchment 5S: SW HOTEL QUAD & LOT

Runoff Area=1.125 ac Runoff Depth=3.53"  
Flow Length=197' Tc=10.6 min CN=82 Runoff=3.98 cfs 0.331 af

Subcatchment 6A: SE HOTEL QUAD & PARKING

Runoff Area=1.257 ac Runoff Depth=5.15"  
Flow Length=305' Tc=2.0 min CN=97 Runoff=7.76 cfs 0.539 af

Subcatchment 6B: SEWALL ST ENTRANCE

Runoff Area=0.428 ac Runoff Depth=4.04"  
Flow Length=160' Tc=8.3 min CN=87 Runoff=1.83 cfs 0.144 af

Subcatchment 6C:

Runoff Area=0.217 ac Runoff Depth=4.80"  
Tc=0.0 min CN=94 Runoff=1.38 cfs 0.087 af

Subcatchment 7S: NORWAY SAVINGS & LOT

Runoff Area=1.238 ac Runoff Depth=5.15"  
Flow Length=333' Tc=3.3 min CN=97 Runoff=7.30 cfs 0.531 af

Subcatchment 8A: Proposed Parking & Building

Runoff Area=0.518 ac Runoff Depth=5.26"  
Flow Length=580' Tc=53.6 min CN=98 Runoff=1.20 cfs 0.227 af

Subcatchment 8B: Proposed Parking

Runoff Area=0.195 ac Runoff Depth=4.15"  
Flow Length=337' Tc=2.3 min CN=88 Runoff=1.05 cfs 0.067 af

Subcatchment 8C: Undeveloped Portion of Site

Runoff Area=0.365 ac Runoff Depth=3.24"  
Tc=0.0 min CN=79 Runoff=1.69 cfs 0.098 af

Subcatchment 9: Proposed Parking Lot

Runoff Area=1.019 ac Runoff Depth=3.94"  
Flow Length=260' Tc=3.5 min CN=86 Runoff=5.05 cfs 0.334 af

Subcatchment 9A: Existing Parking Lot

Runoff Area=0.618 ac Runoff Depth=4.36"  
Flow Length=220' Tc=1.8 min CN=90 Runoff=3.52 cfs 0.225 af

## Reach POI-1: Ravine

Inflow=30.72 cfs 3.547 af

Outflow=30.72 cfs 3.547 af

## Pond 1P:

Peak Elev=29.04' Storage=15 cf Inflow=1.95 cfs 0.264 af

Primary=1.95 cfs 0.264 af Secondary=0.00 cfs 0.000 af Outflow=1.95 cfs 0.264 af

## Pond 2AP:

Peak Elev=32.26' Storage=132 cf Inflow=3.89 cfs 0.472 af

Primary=3.70 cfs 0.471 af Secondary=0.39 cfs 0.001 af Outflow=4.09 cfs 0.472 af

## Pond 2BP:

Peak Elev=29.09' Storage=8 cf Inflow=1.91 cfs 0.204 af

Primary=1.91 cfs 0.204 af Secondary=0.00 cfs 0.000 af Outflow=1.91 cfs 0.204 af

## Pond 3P:

Peak Elev=32.06' Storage=45 cf Inflow=1.53 cfs 0.099 af

Primary=1.53 cfs 0.098 af Secondary=0.00 cfs 0.000 af Outflow=1.53 cfs 0.098 af

## Pond 4P:

Peak Elev=32.86' Storage=179 cf Inflow=6.35 cfs 0.761 af

Primary=4.05 cfs 0.712 af Secondary=2.05 cfs 0.049 af Outflow=6.10 cfs 0.761 af

## Pond 5P:

Peak Elev=32.67' Storage=108 cf Inflow=5.45 cfs 0.535 af

Primary=4.70 cfs 0.528 af Secondary=0.74 cfs 0.006 af Outflow=5.44 cfs 0.535 af

## Pond 6BP:

Peak Elev=32.77' Storage=228 cf Inflow=7.05 cfs 0.679 af

Primary=6.47 cfs 0.679 af Secondary=0.00 cfs 0.000 af Outflow=6.47 cfs 0.679 af

## Pond 6P: Existing Outfall

Peak Elev=27.90' Storage=82 cf Inflow=22.72 cfs 2.889 af

Primary=21.93 cfs 2.887 af Secondary=0.74 cfs 0.003 af Outflow=22.68 cfs 2.889 af

## Pond 7P:

Peak Elev=30.61' Storage=2,849 cf Inflow=11.83 cfs 1.292 af

Primary=4.34 cfs 1.131 af Secondary=5.78 cfs 0.160 af Outflow=10.12 cfs 1.291 af

## Pond CB 3:

Peak Elev=28.10' Storage=32 cf Inflow=1.40 cfs 0.295 af

Primary=1.40 cfs 0.294 af Secondary=0.00 cfs 0.000 af Outflow=1.40 cfs 0.294 af

## Pond CB1:

Peak Elev=30.04' Storage=0.000 af Inflow=5.05 cfs 0.334 af

Primary=5.05 cfs 0.334 af Secondary=0.00 cfs 0.000 af Outflow=5.05 cfs 0.334 af

## Pond CB2:

Peak Elev=30.95' Storage=21 cf Inflow=5.05 cfs 0.334 af

Primary=5.05 cfs 0.334 af Secondary=0.00 cfs 0.000 af Outflow=5.05 cfs 0.334 af

## Pond DMH2: ( new Pond)

Peak Elev=27.88' Inflow=5.05 cfs 0.334 af

Primary=5.05 cfs 0.334 af Secondary=0.00 cfs 0.000 af Outflow=5.05 cfs 0.334 af

## Pond DMH2A:

Peak Elev=26.99' Inflow=5.05 cfs 0.334 af

24.0" x 36.0' Culvert Outflow=5.05 cfs 0.334 af

## Pond DMH4:

Peak Elev=26.29' Inflow=5.05 cfs 0.334 af

36.0" x 78.0' Culvert Outflow=5.05 cfs 0.334 af

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Type III 24-hr 25-YR Rainfall=5.50"

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Pond DMH6:

Peak Elev=25.25' Inflow=1.40 cfs 0.294 af  
Primary=0.00 cfs 0.000 af Secondary=1.40 cfs 0.294 af Outflow=1.40 cfs 0.294 af

Pond DMH6A:

Peak Elev=24.49' Inflow=1.40 cfs 0.294 af  
24.0" x 18.0' Culvert Outflow=1.40 cfs 0.294 af

Pond WQ1: (new Pond)

Peak Elev=27.46' Inflow=5.05 cfs 0.334 af  
18.0" x 18.0' Culvert Outflow=5.05 cfs 0.334 af

Pond WQ2:

Peak Elev=24.68' Inflow=0.00 cfs 0.000 af  
18.0" x 6.5' Culvert Outflow=0.00 cfs 0.000 af

Total Runoff Area = 10.073 ac Runoff Volume = 3.549 af Average Runoff Depth = 4.23"

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Type III 24-hr 25-YR Rainfall=5.50"

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**Subcatchment 1S: N. RES. & ENTRANCE**

Runoff = 1.40 cfs @ 12.36 hrs, Volume= 0.165 af, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.197	98	BLDGS & PAVMENT
0.625	61	>75% Grass cover, Good, HSG B
0.822	70	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.0	219	0.0100	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.3	38	0.0090	1.9		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
25.3	257	Total			

**Subcatchment 2A: RES./ PAVED LOT & NW HOTEL**

Runoff = 2.46 cfs @ 12.15 hrs, Volume= 0.208 af, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.423	98	RES./PARKING LOT & HOTEL
0.229	61	>75% Grass cover, Good, HSG B
0.652	85	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	119	0.0370	0.2		Sheet Flow, A-B Cultivated: Residue>20% n= 0.170 P2= 3.00"
0.7	73	0.0080	1.8		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
10.8	192	Total			

**Subcatchment 2B: ( new Subca)**

Runoff = 1.91 cfs @ 12.28 hrs, Volume= 0.204 af, Depth= 3.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

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Type III 24-hr 25-YR Rainfall=5.50"

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Area (ac)	CN	Description
0.382	98	PAVEMENT & BUILDING
0.330	61	>75% Grass cover, Good, HSG B
0.712	81	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	128	0.0060	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.5	43	0.0060	1.6		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
20.5	171	Total			

**Subcatchment 3S: MOBIL STATION LOT**

Runoff = 1.53 cfs @ 12.02 hrs, Volume= 0.099 af, Depth= 4.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.206	98	PARKING & BUILDING
0.042	74	>75% Grass cover, Good, HSG C
0.248	94	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	49	0.0240	1.2		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.4	54	0.0130	2.3		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
1.1	103	Total			

**Subcatchment 4S: NE HOTEL QUAD & PARKING**

Runoff = 2.44 cfs @ 12.26 hrs, Volume= 0.289 af, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.659	98	HOTEL & PARKING

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.1	171	0.0120	0.1		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.7	130	0.0220	3.0		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
19.8	301	Total			

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Type III 24-hr 25-YR Rainfall=5.50"

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**Subcatchment 5S: SW HOTEL QUAD & LOT**

Runoff = 3.98 cfs @ 12.14 hrs, Volume= 0.331 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.647	98	RES. / HOTEL & LOT
0.478	61	>75% Grass cover, Good, HSG B
1.125	82	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.2	124	0.0300	0.2		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
0.4	73	0.0230	3.1		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
10.6	197	Total			

**Subcatchment 6A: SE HOTEL QUAD & PARKING**

Runoff = 7.76 cfs @ 12.03 hrs, Volume= 0.539 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
1.216	98	HOTEL PAVED LOT
0.041	61	>75% Grass cover, Good, HSG B
1.257	97	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0200	0.9		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
1.7	290	0.0200	2.9		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
2.0	305	Total			

**Subcatchment 6B: SEWALL ST ENTRANCE**

Runoff = 1.83 cfs @ 12.11 hrs, Volume= 0.144 af, Depth= 4.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"



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Type III 24-hr 25-YR Rainfall=5.50"

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Area (ac)	CN	Description
0.302	98	PAVED ENTRANCE
0.126	61	>75% Grass cover, Good, HSG B
0.428	87	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.6	30	0.0260	0.1		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.00"
0.7	130	0.0260	3.3		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
8.3	160	Total			

**Subcatchment 6C:**

Runoff = 1.38 cfs @ 12.00 hrs, Volume= 0.087 af, Depth= 4.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.194	98	Paved roads w/curbs & sewers
0.023	61	>75% Grass cover, Good, HSG B
0.217	94	Weighted Average

**Subcatchment 7S: NORWAY SAVINGS & LOT**

Runoff = 7.30 cfs @ 12.05 hrs, Volume= 0.531 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
1.169	98	BANK & LOT
0.069	74	>75% Grass cover, Good, HSG C
1.238	97	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.2	136	0.0088	1.0		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.2	39	0.0400	4.1		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.2	42	0.0250	3.2		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.7	116	0.0177	2.7		Shallow Concentrated Flow, D-E Paved Kv= 20.3 fps
3.3	333	Total			

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Type III 24-hr 25-YR Rainfall=5.50"

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**Subcatchment 8A: Proposed Parking & Building**

Runoff = 1.20 cfs @ 12.69 hrs, Volume= 0.227 af, Depth= 5.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.518	98	PAVED PARKING & BUILDING

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.2	90	0.0089	0.1		<b>Sheet Flow, A-B</b> Woods: Light underbrush n= 0.400 P2= 3.00"
7.2	70	0.0042	0.2		<b>Shallow Concentrated Flow, B-C</b> Forest w/Heavy Litter Kv= 2.5 fps
17.9	370	0.0189	0.3		<b>Shallow Concentrated Flow, C-D</b> Forest w/Heavy Litter Kv= 2.5 fps
0.3	50	0.2200	3.3		<b>Shallow Concentrated Flow, D-E</b> Short Grass Pasture Kv= 7.0 fps
53.6	580	Total			

**Subcatchment 8B: Proposed Parking**

Runoff = 1.05 cfs @ 12.03 hrs, Volume= 0.067 af, Depth= 4.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area (ac)	CN	Description
0.163	98	Paved parking & roofs
0.032	39	>75% Grass cover, Good, HSG A
0.195	88	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	50	0.0100	0.9		<b>Sheet Flow, A-B</b> Smooth surfaces n= 0.011 P2= 3.00"
0.8	174	0.0050	3.8	2.98	<b>Circular Channel (pipe) , C-D</b> Diam= 12.0" Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.011
0.6	113	0.0205	2.9		<b>Shallow Concentrated Flow, B-C</b> Paved Kv= 20.3 fps
2.3	337	Total			

**Subcatchment 8C: Undeveloped Portion of Site**

Runoff = 1.69 cfs @ 12.00 hrs, Volume= 0.098 af, Depth= 3.24"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area ( ac)	CN	Description
0.365	79	50-75% Grass cover, Fair, HSG C

**Subcatchment 9: Proposed Parking Lot**

Runoff = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area ( ac)	CN	Description
0.599	98	Paved parking & roofs
0.420	69	50-75% Grass cover, Fair, HSG B
1.019	86	Weighted Average

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.7	40	0.2700	0.4		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.00"
1.8	220	0.0182	2.0		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
3.5	260	Total			

**Subcatchment 9A: Existing Parking Lot**

Runoff = 3.52 cfs @ 12.03 hrs, Volume= 0.225 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-YR Rainfall=5.50"

Area ( ac)	CN	Description
0.448	98	PARKING LOT
0.170	69	50-75% Grass cover, Fair, HSG B
0.618	90	Weighted Average

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Type III 24-hr 25-YR Rainfall=5.50"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	127	0.0500	2.0		Sheet Flow, A-B Smooth surfaces n= 0.011 P2= 3.00"
0.3	57	0.0300	3.5		Shallow Concentrated Flow, B-C Paved Kv= 20.3 fps
0.4	36	0.3300	1.4		Shallow Concentrated Flow, C-D Forest w/Heavy Litter Kv= 2.5 fps
1.8	220	Total			

Reach POI-1: Ravine

Inflow Area = 10.073 ac, Inflow Depth = 4.23" for 25-YR event  
 Inflow = 30.72 cfs @ 12.06 hrs, Volume= 3.547 af  
 Outflow = 30.72 cfs @ 12.06 hrs, Volume= 3.547 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Pond 1P:

Inflow Area = 1.070 ac, Inflow Depth = 2.96" for 25-YR event  
 Inflow = 1.95 cfs @ 12.02 hrs, Volume= 0.264 af  
 Outflow = 1.95 cfs @ 12.02 hrs, Volume= 0.264 af, Atten= 0%, Lag= 0.2 min  
 Primary = 1.95 cfs @ 12.02 hrs, Volume= 0.264 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 29.04' @ 12.02 hrs Surf.Area= 13 sf Storage= 15 cf  
 Flood Elev= 32.31' Surf.Area= 17 sf Storage= 56 cf  
 Plug-Flow detention time= 0.4 min calculated for 0.264 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.3 min ( 827.4 - 827.1)

#	Invert	Avail.Storage	Storage Description
1	27.81'	56 cf	4.00'D x 4.45'H Vertical Cone/Cylinder
2	32.31'	6,381 cf	Custom Stage Data ( Prismatic) Listed below
		6,437 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.31	4	0	0
33.00	4,000	1,381	1,381
34.00	6,000	5,000	6,381

#	Routing	Invert	Outlet Devices
1	Primary	27.81'	10.0" x 90.0' long Culvert RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 27.47' S= 0.0038 '/ n= 0.011 Cc= 0.900
2	Secondary	32.50'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.94 cfs @ 12.02 hrs HW=29.02' (Free Discharge)

↑1=Culvert (Barrel Controls 1.94 cfs @ 3.6 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.81' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

**Pond 2AP:**

Inflow Area = 1.722 ac, Inflow Depth = 3.29" for 25-YR event  
 Inflow = 3.89 cfs @ 12.16 hrs, Volume= 0.472 af  
 Outflow = 4.09 cfs @ 12.19 hrs, Volume= 0.472 af, Atten= 0%, Lag= 1.7 min  
 Primary = 3.70 cfs @ 12.19 hrs, Volume= 0.471 af  
 Secondary = 0.39 cfs @ 12.19 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 32.26' @ 12.19 hrs Surf.Area= 5,013 sf Storage= 132 cf  
 Flood Elev= 31.97' Surf.Area= 17 sf Storage= 57 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.472 af (100% of inflow)  
 Center-of-Mass det. time= 0.3 min (819.3 - 819.0)

#	Invert	Avail.Storage	Storage Description
1	27.47'	57 cf	4.00'D x 4.50'H Vertical Cone/Cylinder
2	31.97'	75 cf	Custom Stage Data (Prismatic) Listed below
		132 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
31.97	4	0	0
32.00	5,000	75	75

#	Routing	Invert	Outlet Devices
1	Primary	27.47'	10.0" x 162.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.05' S= 0.0026 '/ n= 0.011 Cc= 0.900
2	Secondary	32.25'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=3.70 cfs @ 12.19 hrs HW=32.26' (Free Discharge)

↑1=Culvert (Barrel Controls 3.70 cfs @ 6.8 fps)

Secondary OutFlow Max=0.20 cfs @ 12.19 hrs HW=32.26' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 0.20 cfs @ 0.3 fps)

**Pond 2BP:**

Inflow Area = 0.712 ac, Inflow Depth = 3.43" for 25-YR event  
 Inflow = 1.91 cfs @ 12.28 hrs, Volume= 0.204 af  
 Outflow = 1.91 cfs @ 12.28 hrs, Volume= 0.204 af, Atten= 0%, Lag= 0.1 min  
 Primary = 1.91 cfs @ 12.28 hrs, Volume= 0.204 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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Type III 24-hr 25-YR Rainfall=5.50"

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Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 29.09' @ 12.28 hrs Surf.Area= 13 sf Storage= 8 cf

Flood Elev= 32.34' Surf.Area= 17 sf Storage= 49 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= (not calculated)

#	Invert	Avail.Storage	Storage Description
1	28.44'	49 cf	4.00'D x 3.90'H Vertical Cone/Cylinder
2	32.34'	7,770 cf	Custom Stage Data ( Prismatic) Listed below
		7,819 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.34	4	0	0
33.00	4,300	1,420	1,420
34.00	8,400	6,350	7,770

#	Routing	Invert	Outlet Devices
1	Primary	28.14'	10.0" x 142.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 26.99' S= 0.0081 '/' n= 0.011 Cc= 0.900
2	Secondary	32.50'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.91 cfs @ 12.28 hrs HW=29.09' (Free Discharge)

1=Culvert (Inlet Controls 1.91 cfs @ 3.5 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.44' (Free Discharge)

2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P:

Inflow Area = 0.248 ac, Inflow Depth = 4.80" for 25-YR event  
 Inflow = 1.53 cfs @ 12.02 hrs, Volume= 0.099 af  
 Outflow = 1.53 cfs @ 12.02 hrs, Volume= 0.098 af, Atten= 0%, Lag= 0.1 min  
 Primary = 1.53 cfs @ 12.02 hrs, Volume= 0.098 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2

Peak Elev= 32.06' @ 12.02 hrs Surf.Area= 13 sf Storage= 45 cf

Flood Elev= 35.31' Surf.Area= 17 sf Storage= 86 cf

Plug-Flow detention time= 9.9 min calculated for 0.098 af (99% of inflow)

Center-of-Mass det. time= 4.6 min ( 770.9 - 766.3)

#	Invert	Avail.Storage	Storage Description
1	28.50'	86 cf	4.00'D x 6.81'H Vertical Cone/Cylinder
2	35.31'	4,015 cf	Custom Stage Data ( Prismatic) Listed below
		4,101 cf	Total Available Storage

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Type III 24-hr 25-YR Rainfall=5.50"

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Elevation ( feet)	Surf.Area ( sq-ft)	Inc.Store ( cubic-feet)	Cum.Store ( cubic-feet)
35.31	4	0	0
36.00	1,200	415	415
37.00	6,000	3,600	4,015

#	Routing	Invert	Outlet Devices
1	Primary	31.31'	10.0" x 35.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 27.87' S= 0.0983 '/' n= 0.011 Cc= 0.900
2	Secondary	35.50'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.52 cfs @ 12.02 hrs HW=32.06' (Free Discharge)

↑1=Culvert (Inlet Controls 1.52 cfs @ 2.9 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.50' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 4P:

Inflow Area = 2.381 ac, Inflow Depth = 3.84" for 25-YR event  
 Inflow = 6.35 cfs @ 12.19 hrs, Volume= 0.761 af  
 Outflow = 6.10 cfs @ 12.22 hrs, Volume= 0.761 af, Atten= 4%, Lag= 1.7 min  
 Primary = 4.05 cfs @ 12.22 hrs, Volume= 0.712 af  
 Secondary = 2.05 cfs @ 12.22 hrs, Volume= 0.049 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 32.86' @ 12.22 hrs Surf.Area= 875 sf Storage= 179 cf  
 Flood Elev= 32.75' Surf.Area= 17 sf Storage= 72 cf  
 Plug-Flow detention time= 0.3 min calculated for 0.761 af (100% of inflow)  
 Center-of-Mass det. time= 0.3 min (796.8 - 796.5)

#	Invert	Avail.Storage	Storage Description
1	27.05'	72 cf	4.00'D x 5.70'H Vertical Cone/Cylinder
2	32.75'	5,751 cf	Custom Stage Data (Prismatic) Listed below
		5,822 cf	Total Available Storage

Elevation ( feet)	Surf.Area ( sq-ft)	Inc.Store ( cubic-feet)	Cum.Store ( cubic-feet)
32.75	4	0	0
33.00	2,000	251	251
34.00	9,000	5,500	5,751

#	Routing	Invert	Outlet Devices
1	Primary	27.05'	10.0" x 169.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 26.60' S= 0.0027 '/' n= 0.011 Cc= 0.900
2	Secondary	32.75'	20.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

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Type III 24-hr 25-YR Rainfall=5.50"

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Primary OutFlow Max=4.05 cfs @ 12.22 hrs HW=32.86' (Free Discharge)

↑1=Culvert (Barrel Controls 4.05 cfs @ 7.4 fps)

Secondary OutFlow Max=1.97 cfs @ 12.22 hrs HW=32.86' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 1.97 cfs @ 0.9 fps)

Pond 5P:

Inflow Area = 1.837 ac, Inflow Depth = 3.49" for 25-YR event  
 Inflow = 5.45 cfs @ 12.17 hrs, Volume= 0.535 af  
 Outflow = 5.44 cfs @ 12.17 hrs, Volume= 0.535 af, Atten= 0%, Lag= 0.5 min  
 Primary = 4.70 cfs @ 12.17 hrs, Volume= 0.528 af  
 Secondary = 0.74 cfs @ 12.17 hrs, Volume= 0.006 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 32.67' @ 12.17 hrs Surf.Area= 220 sf Storage= 108 cf  
 Flood Elev= 32.64' Surf.Area= 17 sf Storage= 71 cf  
 Plug-Flow detention time= 0.2 min calculated for 0.534 af (100% of inflow)  
 Center-of-Mass det. time= 0.3 min (821.4 - 821.2)

#	Invert	Avail.Storage	Storage Description
1	26.99'	71 cf	4.00'D x 5.65'H Vertical Cone/Cylinder
2	32.64'	4,001 cf	Custom Stage Data (Prismatic) Listed below
		4,072 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.64	4	0	0
33.00	2,207	398	398
34.00	5,000	3,604	4,001

#	Routing	Invert	Outlet Devices
1	Primary	26.99'	10.0" x 117.0' long Culvert RCP, rounded edge headwall, Ke= 0.100 Outlet Invert= 26.71' S= 0.0024 '/' n= 0.011 Cc= 0.900
2	Secondary	32.64'	40.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.70 cfs @ 12.17 hrs HW=32.67' (Free Discharge)

↑1=Culvert (Barrel Controls 4.70 cfs @ 8.6 fps)

Secondary OutFlow Max=0.67 cfs @ 12.17 hrs HW=32.67' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 0.67 cfs @ 0.5 fps)



2498-Post Development

Type III 24-hr 25-YR Rainfall=5.50"

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**Pond 6BP:**

Inflow Area = 2.265 ac, Inflow Depth = 3.60" for 25-YR event  
 Inflow = 7.05 cfs @ 12.16 hrs, Volume= 0.679 af  
 Outflow = 6.47 cfs @ 12.22 hrs, Volume= 0.679 af, Atten= 8%, Lag= 3.5 min  
 Primary = 6.47 cfs @ 12.22 hrs, Volume= 0.679 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 32.77' @ 12.22 hrs Surf.Area= 741 sf Storage= 228 cf  
 Flood Elev= 32.58' Surf.Area= 17 sf Storage= 74 cf  
 Plug-Flow detention time= 0.2 min calculated for 0.678 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 817.0 - 816.9)

#	Invert	Avail.Storage	Storage Description
1	26.71'	75 cf	4.00'D x 6.00'H Vertical Cone/Cylinder
2	32.58'	337 cf	Custom Stage Data ( Prismatic) Listed below
		412 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.58	4	0	0
33.00	1,600	337	337

#	Routing	Invert	Outlet Devices
1	Primary	26.71'	12.0" x 313.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 23.10' S= 0.0115 ' n= 0.011 Cc= 0.900
2	Secondary	33.00'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=6.47 cfs @ 12.22 hrs HW=32.77' ( Free Discharge)  
 1=Culvert ( Barrel Controls 6.47 cfs @ 8.2 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=26.71' ( Free Discharge)  
 2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

**Pond 6P: Existing Outfall**

Inflow Area = 8.071 ac, Inflow Depth = 4.30" for 25-YR event  
 Inflow = 22.72 cfs @ 12.09 hrs, Volume= 2.889 af  
 Outflow = 22.68 cfs @ 12.10 hrs, Volume= 2.889 af, Atten= 0%, Lag= 0.3 min  
 Primary = 21.93 cfs @ 12.10 hrs, Volume= 2.887 af  
 Secondary = 0.74 cfs @ 12.10 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs / 2  
 Peak Elev= 27.90' @ 12.10 hrs Surf.Area= 221 sf Storage= 82 cf  
 Flood Elev= 27.80' Surf.Area= 17 sf Storage= 62 cf  
 Plug-Flow detention time= 0.1 min calculated for 2.889 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.1 min ( 784.3 - 784.2)

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Type III 24-hr 25-YR Rainfall=5.50"

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#	Invert	Avail.Storage	Storage Description
1	22.90'	62 cf	4.00'D x 4.90'H Vertical Cone/Cylinder
2	27.80'	3,320 cf	Custom Stage Data ( Prismatic) Listed below
		3,382 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
27.80	4	0	0
28.00	400	40	40
29.00	6,160	3,280	3,320

#	Routing	Invert	Outlet Devices
1	Primary	22.90'	18.0" x 78.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 19.52' S= 0.0433 '/' n= 0.011 Cc= 0.900
2	Secondary	27.80'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=21.93 cfs @ 12.10 hrs HW=27.90' (Free Discharge)

↑1=Culvert (Inlet Controls 21.93 cfs @ 12.4 fps)

Secondary OutFlow Max=0.72 cfs @ 12.10 hrs HW=27.90' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 0.72 cfs @ 0.9 fps)

Pond 7P:

Inflow Area = 3.619 ac, Inflow Depth = 4.28" for 25-YR event  
 Inflow = 11.83 cfs @ 12.05 hrs, Volume= 1.292 af  
 Outflow = 10.12 cfs @ 12.12 hrs, Volume= 1.291 af, Atten= 14%, Lag= 3.8 min  
 Primary = 4.34 cfs @ 12.12 hrs, Volume= 1.131 af  
 Secondary = 5.78 cfs @ 12.12 hrs, Volume= 0.160 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 30.61' @ 12.12 hrs Surf.Area= 7,452 sf Storage= 2,849 cf  
 Flood Elev= 30.50' Surf.Area= 5,613 sf Storage= 1,776 cf  
 Plug-Flow detention time= 3.0 min calculated for 1.291 af (100% of inflow)  
 Center-of-Mass det. time= 2.5 min (780.6 - 778.1)

#	Invert	Avail.Storage	Storage Description
1	23.60'	79 cf	4.00'D x 6.25'H Vertical Cone/Cylinder
2	29.91'	6,598 cf	Custom Stage Data ( Prismatic) Listed below
		6,676 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
29.91	4	0	0
30.00	1,008	46	46
30.50	5,600	1,652	1,698
31.00	14,000	4,900	6,598

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Type III 24-hr 25-YR Rainfall=5.50"

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#	Routing	Invert	Outlet Devices
1	Primary	26.50'	10.0" x 195.0' long Culvert RCP, square edge headwall, Ke= 0.500 Outlet Invert= 22.81' S= 0.0189 '/' n= 0.011 Cc= 0.900
2	Secondary	30.50'	55.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.34 cfs @ 12.12 hrs HW=30.61' (Free Discharge)

↑1=Culvert (Barrel Controls 4.34 cfs @ 8.0 fps)

Secondary OutFlow Max=5.57 cfs @ 12.12 hrs HW=30.61' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 5.57 cfs @ 0.9 fps)

Pond CB 3:

Inflow Area = 0.713 ac, Inflow Depth = 4.96" for 25-YR event  
 Inflow = 1.40 cfs @ 12.04 hrs, Volume= 0.295 af  
 Outflow = 1.40 cfs @ 12.04 hrs, Volume= 0.294 af, Atten= 0%, Lag= 0.1 min  
 Primary = 1.40 cfs @ 12.04 hrs, Volume= 0.294 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 28.10' @ 12.04 hrs Surf.Area= 13 sf Storage= 32 cf  
 Flood Elev= 29.80' Surf.Area= 13 sf Storage= 50 cf  
 Plug-Flow detention time= 2.9 min calculated for 0.294 af (100% of inflow)  
 Center-of-Mass det. time= 1.5 min (792.2 - 790.7)

#	Invert	Avail.Storage	Storage Description
1	25.54'	50 cf	4.00'D x 4.00'H Vertical Cone/Cylinder
2	30.64'	84 cf	Custom Stage Data (Prismatic) Listed below
		134 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.64	4	0	0
31.00	460	84	84

#	Routing	Invert	Outlet Devices
1	Primary	27.54'	12.0" x 113.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 26.18' S= 0.0120 '/' n= 0.012 Cc= 0.900
2	Secondary	30.64'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.39 cfs @ 12.04 hrs HW=28.10' (Free Discharge)

↑1=Culvert (Barrel Controls 1.39 cfs @ 4.5 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.54' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 25-YR Rainfall=5.50"

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**Pond CB1:**

Inflow Area = 1.019 ac, Inflow Depth = 3.94" for 25-YR event  
 Inflow = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af  
 Outflow = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.1 min  
 Primary = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 30.04' @ 12.05 hrs Surf.Area= 0.000 ac Storage= 0.000 af  
 Plug-Flow detention time= 0.2 min calculated for 0.334 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 798.9 - 798.7)

#	Invert	Avail.Storage	Storage Description
1	28.40'	0.002 af	4.00'D x 5.65'H Vertical Cone/Cylinder
2	34.50'	1,626.000 af	Custom Stage Data ( Prismatic) Listed below
		1,626.002 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
34.50	4.000	0.000	0.000
35.00	6,500.000	1,626.000	1,626.000

#	Routing	Invert	Outlet Devices
1	Primary	28.40'	12.0" x 30.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 27.74' S= 0.0220 '/' n= 0.012 Cc= 0.900
2	Secondary	34.05'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.03 cfs @ 12.05 hrs HW=30.03' ( Free Discharge)  
 ↑1=Culvert ( Inlet Controls 5.03 cfs @ 6.4 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=28.40' ( Free Discharge)  
 ↑2=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

**Pond CB2:**

Inflow Area = 1.019 ac, Inflow Depth = 3.94" for 25-YR event  
 Inflow = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af  
 Outflow = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.1 min  
 Primary = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 30.95' @ 12.05 hrs Surf.Area= 13 sf Storage= 21 cf  
 Flood Elev= 33.31' Surf.Area= 13 sf Storage= 50 cf  
 Plug-Flow detention time= 0.2 min calculated for 0.334 af ( 100% of inflow)  
 Center-of-Mass det. time= 0.2 min ( 798.7 - 798.6)

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Type III 24-hr 25-YR Rainfall=5.50"

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#	Invert	Avail.Storage	Storage Description
1	29.31'	50 cf	4.00'D x 4.00'H Vertical Cone/Cylinder
2	33.81'	95 cf	Custom Stage Data (Prismatic) Listed below
		145 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
33.81	4	0	0
34.00	994	95	95

#	Routing	Invert	Outlet Devices
1	Primary	29.31'	12.0" x 37.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 28.50' S= 0.0219 '/' n= 0.012 Cc= 0.900
2	Secondary	33.81'	50.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.04 cfs @ 12.05 hrs HW=30.94' (Free Discharge)

↑1=Culvert (Inlet Controls 5.04 cfs @ 6.4 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=29.31' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond DMH2: (new Pond)

Inflow Area = 1.019 ac, Inflow Depth = 3.94" for 25-YR event  
 Inflow = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af  
 Outflow = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.0 min  
 Primary = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af  
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 27.88' @ 12.05 hrs

Flood Elev= 34.89'

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= (not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	26.24'	12.0" x 18.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 25.24' S= 0.0556 '/' n= 0.012 Cc= 0.900
2	Secondary	29.00'	4.0' long x 0.7' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32

Primary OutFlow Max=5.03 cfs @ 12.05 hrs HW=27.87' (Free Discharge)

↑1=Culvert (Inlet Controls 5.03 cfs @ 6.4 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=26.24' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 25-YR Rainfall=5.50"

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Pond DMH2A:

Inflow Area = 1.019 ac, Inflow Depth = 3.94" for 25-YR event  
 Inflow = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af  
 Outflow = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.0 min  
 Primary = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 26.99' @ 12.05 hrs  
 Flood Elev= 34.89'  
 Plug-Flow detention time= (not calculated: outflow precedes inflow)  
 Center-of-Mass det. time= (not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	26.00'	24.0" x 36.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 25.64' S= 0.0100 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=5.03 cfs @ 12.05 hrs HW=26.98' (Free Discharge)  
 ↑1=Culvert (Barrel Controls 5.03 cfs @ 4.8 fps)

Pond DMH4:

Inflow Area = 1.019 ac, Inflow Depth = 3.94" for 25-YR event  
 Inflow = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af  
 Outflow = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.0 min  
 Primary = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs  
 Peak Elev= 26.29' @ 12.05 hrs  
 Flood Elev= 34.19'  
 Plug-Flow detention time= (not calculated: outflow precedes inflow)  
 Center-of-Mass det. time= (not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	25.54'	36.0" x 78.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 18.80' S= 0.0864 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=5.02 cfs @ 12.05 hrs HW=26.28' (Free Discharge)  
 ↑1=Culvert (Inlet Controls 5.02 cfs @ 3.7 fps)

Pond DMH6:

Inflow Area = 0.713 ac, Inflow Depth = 4.95" for 25-YR event  
 Inflow = 1.40 cfs @ 12.04 hrs, Volume= 0.294 af  
 Outflow = 1.40 cfs @ 12.04 hrs, Volume= 0.294 af, Atten= 0%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
 Secondary = 1.40 cfs @ 12.04 hrs, Volume= 0.294 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

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Type III 24-hr 25-YR Rainfall=5.50"

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Peak Elev= 25.25' @ 12.04 hrs

Flood Elev= 31.90'

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= (not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	26.08'	12.0" x 6.5' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 23.68' S= 0.3692 '/' n= 0.012 Cc= 0.900
2	Secondary	25.00'	4.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.00' (Free Discharge)

↑1=Culvert (Controls 0.00 cfs)

Secondary OutFlow Max=1.38 cfs @ 12.04 hrs HW=25.25' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 1.38 cfs @ 1.4 fps)

Pond DMH6A:

Inflow Area = 0.713 ac, Inflow Depth = 4.95" for 25-YR event

Inflow = 1.40 cfs @ 12.04 hrs, Volume= 0.294 af

Outflow = 1.40 cfs @ 12.04 hrs, Volume= 0.294 af, Atten= 0%, Lag= 0.0 min

Primary = 1.40 cfs @ 12.04 hrs, Volume= 0.294 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 24.49' @ 12.04 hrs

Flood Elev= 31.90'

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= (not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	24.00'	24.0" x 18.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 23.78' S= 0.0122 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=1.39 cfs @ 12.04 hrs HW=24.49' (Free Discharge)

↑1=Culvert (Barrel Controls 1.39 cfs @ 3.5 fps)

Pond WQ1: (new Pond)

Inflow Area = 1.019 ac, Inflow Depth = 3.94" for 25-YR event

Inflow = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af

Outflow = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.0 min

Primary = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 27.46' @ 12.05 hrs

Flood Elev= 34.40'

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= (not calculated)

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Type III 24-hr 25-YR Rainfall=5.50"

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#	Routing	Invert	Outlet Devices
1	Primary	26.24'	18.0" x 18.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 26.10' S= 0.0078 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=5.03 cfs @ 12.05 hrs HW=27.46' (Free Discharge)

↑1=Culvert (Barrel Controls 5.03 cfs @ 4.5 fps)

Pond WQ2:

Inflow Area = 0.713 ac, Inflow Depth = 0.00" for 25-YR event  
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af  
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min  
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 24.68' @ 0.00 hrs

Flood Elev= 31.68'

Plug-Flow detention time= (not calculated)

Center-of-Mass det. time= (not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	24.68'	18.0" x 6.5' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 24.10' S= 0.0892 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=24.68' (Free Discharge)

↑1=Culvert (Controls 0.00 cfs)



# **ATTACHMENT C**

## **Riprap Sizing**

Pond DMH4:

Inflow Area = 1.019 ac, Inflow Depth = 3.94" for 25-YR event  
 Inflow = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af  
 Outflow = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.0 min  
 Primary = 5.05 cfs @ 12.05 hrs, Volume= 0.334 af

Routing by Stor-Ind method, Time Span= 0.00-50.00 hrs, dt= 0.01 hrs

Peak Elev= 20.03' @ 12.05 hrs

Flood Elev= 34.19'

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= (not calculated)

#	Routing	Invert	Outlet Devices
1	Primary	19.07'	36.0" x 78.0' long Culvert RCP, groove end w/headwall, Ke= 0.200 Outlet Invert= 18.80' S= 0.0035 '/' n= 0.012 Cc= 0.900

Primary OutFlow Max=5.01 cfs @ 12.05 hrs HW=20.03' (Free Discharge)

↑1=Culvert (Barrel Controls 5.01 cfs @ 3.8 fps)

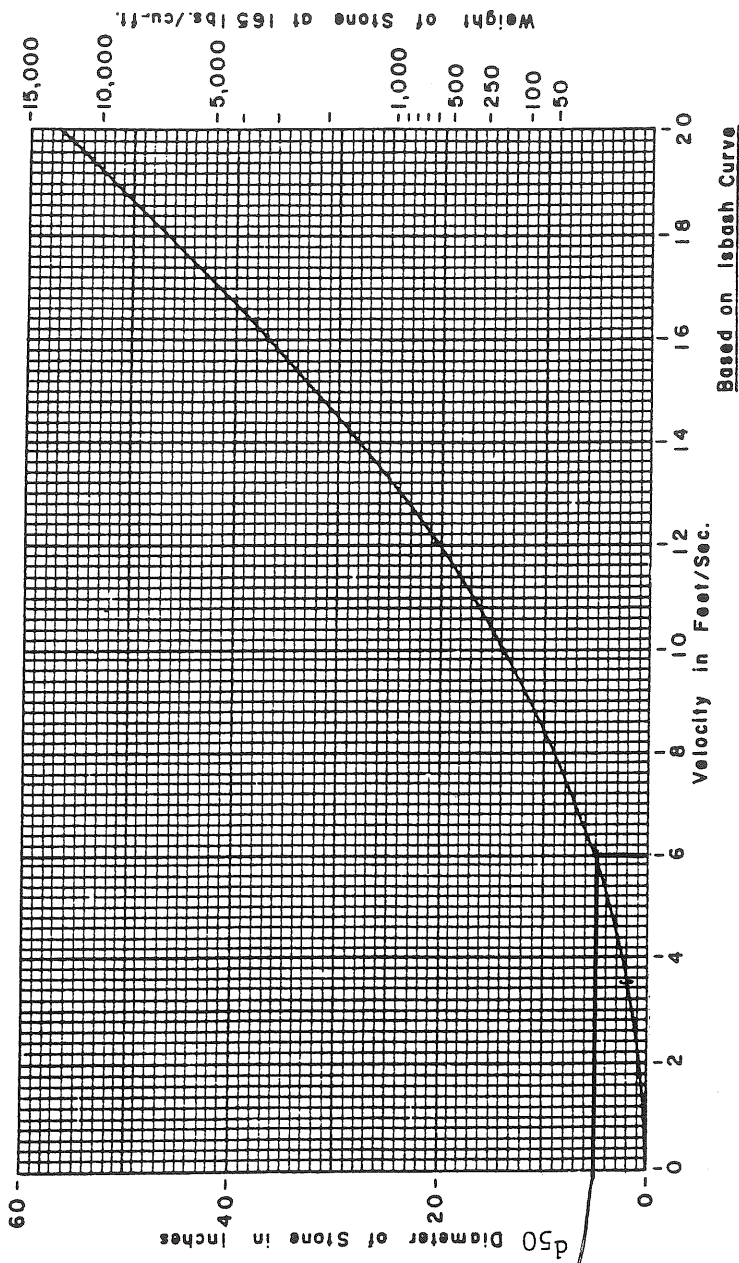
NOTE:

THIS ONLY LOOKS AT FLOW FROM MDOT LOT. USE  
 SAME SIZE RIP RAP AS OTHER OUTLET, ALTHOUGH  
 NO EROSION IS CURRENTLY EVIDENT.

Figure 70.1 STONE SIZE FOR RIPRAP (USDA Soil Conservation Service)

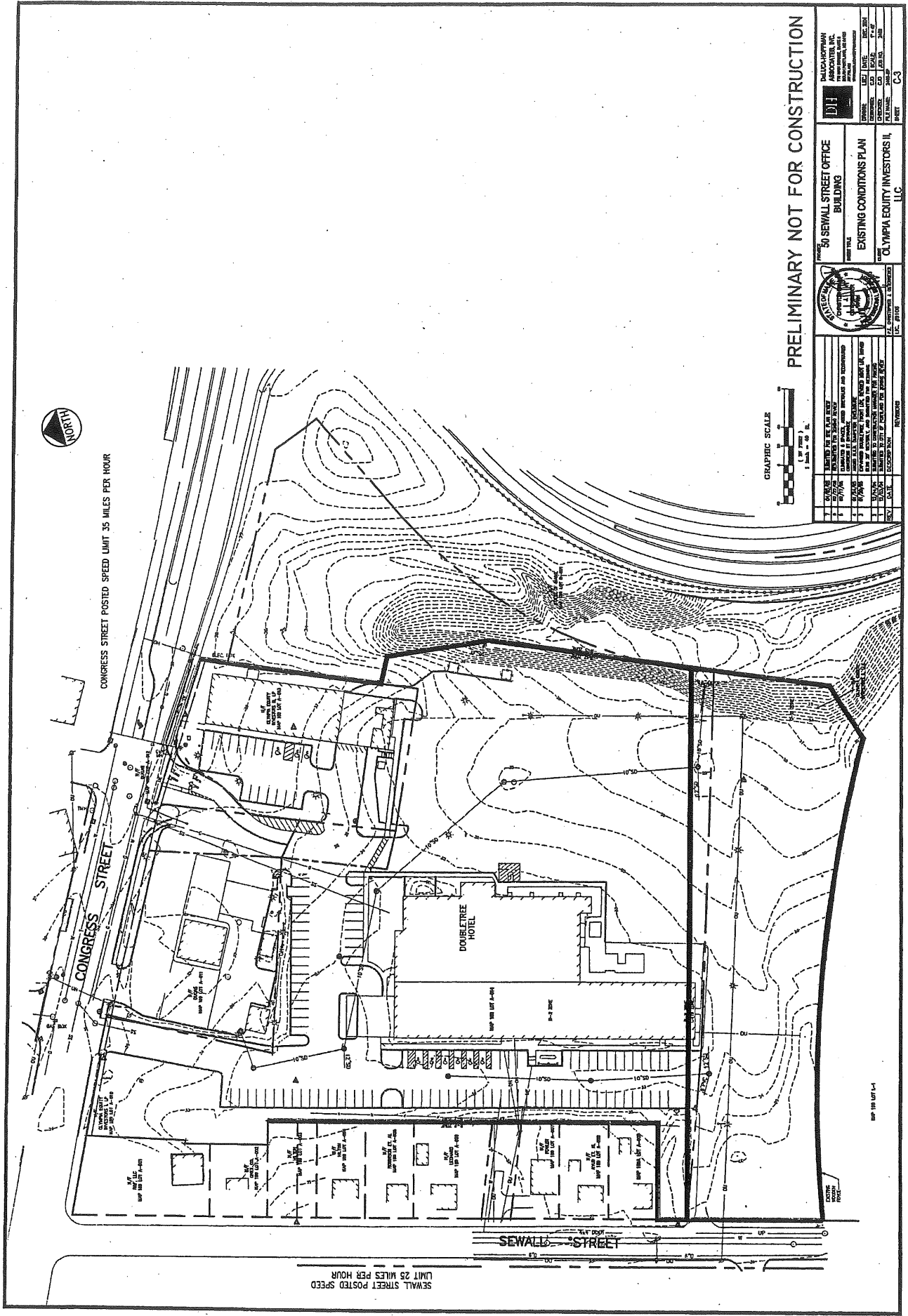
$Q_{25} = 5.05 \text{ cfs}$

EXIT  $V = 6.05 \text{ FPS}$



$D_{50} = 5"$

USE 24" TO MATCH PROTECTION OF 18" OUTFALL



PRELIMINARY NOT FOR CONSTRUCTION



30 SEWALL STREET OFFICE BUILDING	
EXISTING CONDITIONS PLAN	
OLYMPIA EQUITY INVESTORS II, LLC	
SHEET C-3	

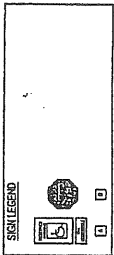
E9

APPROVAL - CITY OF PORTLAND  
PLANNING BOARD

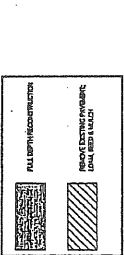
DATE	
COMMISSION	

LAYOUT TABLE

POINT	COORDINATES	EASTING	NORTHING
1	8,177,829	10,135,220	
2	8,177,829	10,135,220	
3	8,177,829	10,135,220	
4	8,177,829	10,135,220	
5	8,177,829	10,135,220	



1. ALL TYPES OF PAVEMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PORTLAND STANDARD SPECIFICATIONS FOR PAVEMENTS, 2011 EDITION, AS AMENDED, AND OTHER TYPES OF PAVEMENT SHALL BE APPROVED BY THE CITY ENGINEER.



LINE DATA TABLE

LINE	DESCRIPTION	BEARING	LENGTH	PC STATION	PT STATION
1	1	0+00	3.25	4414.00	4417.25
2	2	14+00	0.00	4417.25	4417.25
3	3	20+00	0.00	4417.25	4417.25
4	4	26+00	0.00	4417.25	4417.25
5	5	32+00	0.00	4417.25	4417.25
6	6	38+00	0.00	4417.25	4417.25

CURVE DATA TABLE

LINE	PC STATION	PT STATION	PI STATION	ANGLE	LENGTH	PC STATION	PT STATION
1	4414.00	4417.25	4415.625	90.00	3.25	4414.00	4417.25
2	4417.25	4417.25	4417.25	0.00	0.00	4417.25	4417.25
3	4417.25	4417.25	4417.25	0.00	0.00	4417.25	4417.25
4	4417.25	4417.25	4417.25	0.00	0.00	4417.25	4417.25
5	4417.25	4417.25	4417.25	0.00	0.00	4417.25	4417.25
6	4417.25	4417.25	4417.25	0.00	0.00	4417.25	4417.25

- 1. OWNER RESERVES THE RIGHT TO CONSTRUCT A 42'-0" WIDE PARKING GARAGE WITH A NET INCREASE OF 28 PARKING SPACES.
- 2. SEE PARKING PLAN FOR SPACE ALLOCATION AND PARKING DEMAND.

- ZONING DISTRICT: CONTRACT ZONE (C-3) OFFICE BUILDING (R-5) BANG
- PERMITTED USES: GENERAL BUSINESS AND PROFESSIONAL OFFICES
- SPACE AND DIMENSION REQUIREMENTS:
- MINIMUM LOT SIZE: 10,000 SQ. FT.
  - MINIMUM STREET FRONTAGE: 100 FEET
  - MINIMUM SETBACK: 10 FEET
  - MINIMUM LOT COVERAGE: 20%
- (1) BASED UPON BUILDING
- (2) WITH PUBLIC WATER AND SANITARY SEWER
- (3) BASED UPON RATIO OF TOTAL BUILDING AREA TO LOT AREA



CONGRESS STREET POSTED SPEED LIMIT 35 MILES PER HOUR

CONGRESS STREET

SEWALL STREET

SEWALL STREET POSTED SPEED LIMIT 25 MILES PER HOUR

PRELIMINARY NOT FOR CONSTRUCTION

50 SEWALL STREET OFFICE BUILDING

SITE PLAN

OLYMPIA EQUITY INVESTORS II, LLC

DATE: 11/11/2011

BY: [Signature]

PROJECT NO: 11-094-SF (4 STORIES)

REVISIONS:

NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

E10



RECEIVED  
APR 27 2005  
SMRT, INC.

April 25, 2005

George McDonough  
SMRT  
144 Fore Street  
P.O. Box 618  
Portland, ME 04104

**Subject: Wetland Delineation and GPS Survey, Congress Street and Sewall Street  
Portland, Maine**

Dear George:

As requested, Woodlot Alternatives, Inc. (Woodlot) conducted a wetland delineation at the site of a proposed parking area located off Congress and Sewall Streets in Portland, Maine. The delineation was completed on December 9, 2004. Because this delineation was completed between November 15 and April 15, wetland boundaries were verified on April 19, 2005. Wetland boundaries were determined using the technical criteria established by the U.S. Army Corps of Engineers (ACOE) and the Maine Department of Environmental Protection (MDEP). Wetland boundaries were marked with pink flags, and the boundaries were sketched onto the survey map of the property. Wetland boundary points were recorded with a Global Positioning System (GPS) Trimble® Pro-XR receiver, and the GPS coordinates were used to produce Figure 1 (attached). Representative site photographs were taken and are available upon request.

#### Site Description

The project area is located east of the Olympia Equity Investors building and parking lot. Congress Street is located north of the project area and an Interstate-295 off-ramp is located to the east. The portion of the project area adjacent to Congress Street is flat to gently sloping and consists of a partially mowed lawn with patches of Japanese knotweed (*Fallopia japonica*), an invasive plant species.<sup>1</sup> The southern portion of the project area consists primarily of a steeply banked swale that flows south between the I-295 off-ramp and the parking lot located to the west. Vegetation on the swale-associated upland banks consists of weedy species including black locust (*Robinia pseudoacacia*), Morrow's honeysuckle (*Lonicera morrowii*), multiflora rose (*Rosa multiflora*), and Japanese knotweed. Topography associated with the swale banks is relatively steep.

#### Wetland Description

A storm water culvert is located at the head of the swale associated with the project area. At the time of the survey, the culvert contained moderate flows. Flows from this culvert drain into a scoured channel with depths that range from a few inches to over a foot. The water sources for the culvert appear limited to runoff from adjacent roads and parking areas. Because of the presence of well-defined banks and a mineral bottom in the channel, MDEP was contacted to determine if the channel meets the definition of a stream. Woodlot met with MDEP on-site on April 11, 2005, and it was determined that the channel does

<sup>1</sup> An invasive plant species is an introduced or non-native plant species that aggressively colonizes or is detrimental to economic crops or native plant communities.

(FI)

not meet the definition of a stream (see attached form). However, because of the presence of surface water for more than two weeks during the growing season, the ACOE may regulate this channels as a wetland.

A narrow vegetated palustrine wetland is associated with the central and southern portion of the swale. The wetland adjacent to the channel is primarily palustrine emergent wetland with a few scattered shrubs. Dominant herbs in this wetland include common cattail (*Typha latifolia*), soft rush (*Juncus effusus*), purple loosestrife (*Lythrum salicaria*), and a burreed (*Sparganium* sp.). Scattered shrubs include speckled alder (*Alnus incana*) and red-osier dogwood (*Cornus Canadensis*). Soils in this wetland consist of alluvial sands and silts washed into the wetland from adjacent urban areas.

### Agency Contacts

The Maine Department of Conservation Natural Areas Program and the Maine Department of Inland Fisheries and Wildlife have been contacted concerning rare and exemplary botanical features and significant wildlife resources on the property. Their responses will be forwarded upon receipt.

### State and Federal Regulations

The MDEP and ACOE regulate impacts to wetlands identified within the project area. Projects resulting in minor wetland impacts are reviewed jointly by both agencies through the Natural Resources Protection Act Tier review process. In general, projects that are not located within a wetland, or projects that alter less than 4,300 square feet of wetland and are not *Wetlands of Special Significance*, are exempt from the Tier permitting requirements. Typically, projects with cumulative impacts to wetlands between 4,300 and 15,000 square feet are eligible for review under the Tier 1 review process. The Tier 2 review process applies to alterations that affect between 15,000 and 43,560 square feet (i.e., 1 acre). Cumulative project impacts that exceed 1 acre and/or impacts to *Wetlands of Special Significance* typically require a Tier 3 review process. Based on Woodlot's field survey, the wetland on the property does not meet the definition of *Wetland of Special Significance*. Full identification of *Wetlands of Special Significance* will involve receiving responses from natural resource agencies to determine if there are any known rare species or features at the site.

### Local Regulations

The freshwater wetland located on-site does not meet the City of Portland's definition of a freshwater wetland; therefore, the city does not regulate this resource.

Please contact our office if you have any questions regarding the information presented in this report or if we can be of further assistance.

Sincerely,  
Woodlot Alternatives, Inc.



Michael Johnson  
Project Manager

Enclosures: Figure 1: Wetland Delineation Map  
MDEP Stream Field Determination Form

File 104205 02



John E. Baklacci  
Governor

Roland D. Martin  
Commissioner

DEPARTMENT OF INLAND FISHERIES AND WILDLIFE

Wildlife Division -- Region A  
358 Shaker Rd.  
Gray, ME 04039  
Phone: (207) - 657-2345 x 109  
Fax: (207) - 657-2980

April 21, 2005

Jessica Haider  
Woodlot Alternatives  
30 Park Drive  
Topsham, ME 04086

Dear Jessica,

You contacted this office requesting a search of any known wildlife habitats within a parcel of land just west of I-295 at exit 5 in the City of Portland.

Based upon a review of our most current wildlife habitat data, I am not aware of any known essential or significant wildlife habitats, nor any documented occurrences of rare, threatened or endangered species at or adjacent to this site.

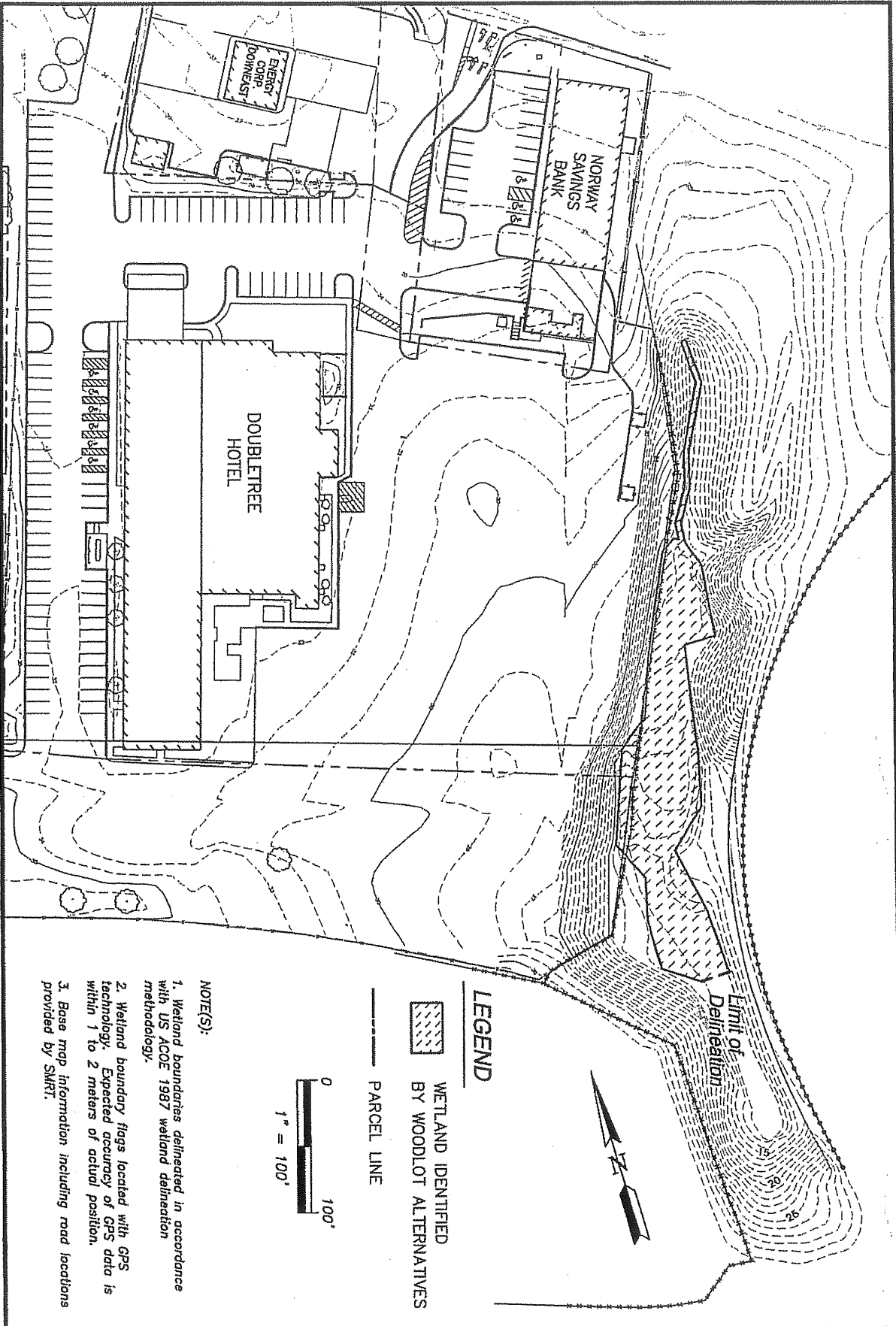
Sincerely,

*Scott Lindsay*


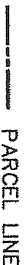
Scott Lindsay  
Asst. Regional Wildlife Biologist

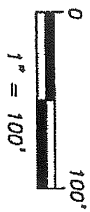
F3






**LEGEND**

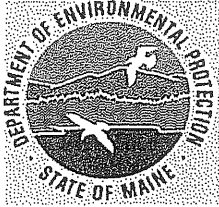
 WETLAND IDENTIFIED BY WOODLOT ALTERNATIVES  
 PARCEL LINE



- NOTE(S):**
1. Wetland boundaries delineated in accordance with US ACOE 1987 wetland delineation methodology.
  2. Wetland boundary flags located with GPS technology. Expected accuracy of GPS data is within 1 to 2 meters of actual position.
  3. Base map information including road locations provided by SMRT.

PREPARED BY:  <b>WOODLOT</b> ALTERNATIVES, INC. ENVIRONMENTAL CONSULTANTS		DRAWING NAME: <b>Wetland Delineation Map</b>		FIGURE NO. <b>1</b>
DESIGN: DRAFT: CHECKED: FILE NAME: parking_wetmap.dwg	DATE: December 2004 JOB NO: 104205 SCALE: 1" = 100'	PROJECT: <b>Congress St. - Portland, Maine</b>		

F4



DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF LAND AND WATER QUALITY

FIELD DETERMINATION ID 3644

### Field Determination Form

CONTACT

MICHAEL JOHNSON  
WOODLOT ALTERNATIVES  
30 PARK DRIVE  
TOPSHAM ME 04086  
TELEPHONE

DIRECTIONS

Congress Street west of Interstate I95 off  
ramp.

PROPERTY OWNER

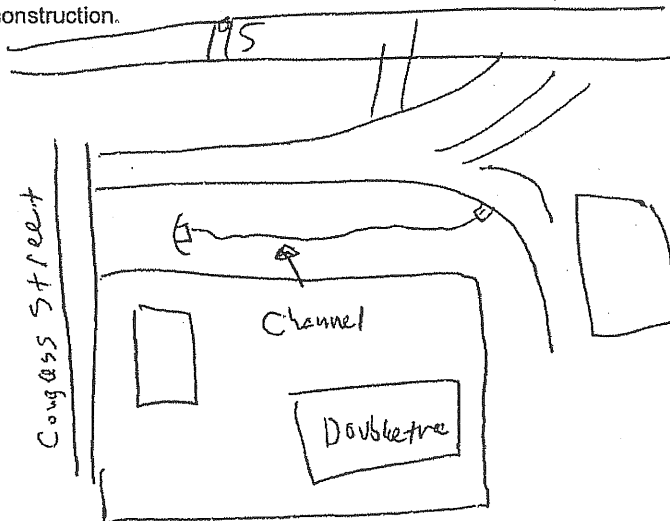
OLYMPIA EQUITY INVESTORS III  
  
PORTLAND ME

TOWN PORTLAND  
MAP 181 LOT A-013

STAFF GALLANT II, FRED  
RESOURCE RSB

MEMO

The channel that occurs on this property does not meet the current definition of a stream under the Natural Resources Protection Act. Erosion control devices must be installed and maintained on the project site during any soil disturbance activity. A Maine Construction General Permit "NOI" and "NOT" must be filed with the Department if more than 1 acre of area is going to be disturbed on the project site at any given time during construction.



Name: \_\_\_\_\_

*[Signature]* / Fred Gallant II

RECEIVED 4/6/2005

SITE VISIT 4/11/2005

COMPLETED 4/12/2005

(G)



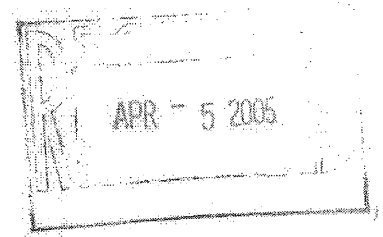
# PORTLAND MAINE

*Strengthening a Remarkable City, Building a Community for Life* • [www.portlandmaine.gov](http://www.portlandmaine.gov)

Public Works Department  
Michael J. Bobinsky, Director

31 March 2005

Mr. Christopher J. Osterrieder, P.E.,  
Senior Engineer,  
DeLuca-Hoffman Associates,  
778 Main Street, Suite 8,  
South Portland, Maine 04106-1339



**RE: The Capacity to Handle the Anticipated Wastewater Flows,  
from a Proposed Medical Office Building, at 50 Sewall Street.**

Dear Mr. Osterrieder:

The existing thirty-inch diameter asbestos-cement sanitary sewer pipe, located in Sewall Street, has adequate capacity to **transport**, while The Portland Water District sewage treatment facilities, located off Marginal Way, have adequate capacity to **treat** the anticipated wastewater flows of **5,283 G.P.D.**, from the proposed medical office building.

<b>Anticipated Wastewater Flows from the Proposed Medical Office Building:</b>	
Proposed 44,384 S.F. Building, @ .117 G.P.D./S.F.	= 5,193 GPD
90 Proposed Parking Spaces, @ 1 G.P.D./Parking Space	= 90 GPD
<b>Total Proposed Increase in Wastewater Flows for this Project</b>	<b>= 5,283 GPD</b>

The City combined sewer overflow (C.S.O.) abatement consent agreement, with the U.S.E.P.A. and with the Maine D.E.P., requires C.S.O. abatement, as well as storm water mitigation, from all projects, in order to offset any increase in sanitary flows.

If The City can be of further assistance, please call 874-8832.

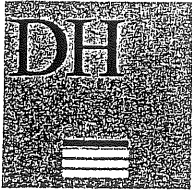
Sincerely,  
**CITY OF PORTLAND**

*Frank Brancely*  
Frank J Brancely, B.A., and M.A.  
Senior Engineering Technician

FJB

cc: Alexander Q. Jaegerman, Director, Department of Planning, and Urban Development, City of Portland  
Ethan Boxer-Macomber, Planner, Department of Planning, and Urban Development, City of Portland  
Eric Labelle, P.E., City Engineer, City of Portland  
Bradley A. Roland, P.E., Environmental Projects Engineer, City of Portland  
Stephen K. Harris, Assistant Engineer, City of Portland  
Jane Ward, Administrative Assistant, City of Portland  
Desk file

H



DeLUCA-HOFFMAN ASSOCIATES, INC.  
CONSULTING ENGINEERS

778 MAIN STREET  
SUITE 8  
SOUTH PORTLAND, MAINE 04106  
TEL. 207 775 1121  
FAX 207 879 0896

- SITE PLANNING AND DESIGN
- ROADWAY DESIGN
- ENVIRONMENTAL ENGINEERING
- PERMITTING
- AIRPORT ENGINEERING
- CONSTRUCTION ADMINISTRATION
- TRAFFIC STUDIES AND MANAGEMENT

February 17, 2005

Mr. Dave Coffin  
Portland Water District  
225 Douglass Street  
P.O. Box 3553  
Portland, Maine 04104-3553

RECEIVED  
FEB 18 2005  
SMRT, INC.

**Subject: Proposed Medical Office Building  
Sewall Street, Portland, Maine  
Letter of Ability to Serve**

Dear Dave:

DeLuca-Hoffman Associates, Inc. has been retained to prepare plans and permit applications/submissions for a proposed 44,384 square foot medical office building. As required by the reviewing authorities, we are writing to request a letter indicating the ability of the Portland Water District to serve the project.

### Project Overview

The project will be located on a 1.7-acre lot on Sewall Street, adjacent to the existing Double Tree Hotel on Congress Street, as shown on the enclosed location map. Construction will include a four-story office with a footprint of approximately 11,096 square feet, associated parking facilities, and landscaping.

### Water Supply Service

Water supply service for the project is proposed to be provided by connection to the existing 12-inch main in Sewall Street. An onsite 8-inch water line from that main will serve building sprinkler and domestic services and site fire hydrants. A preliminary site plan showing the location of the Sewall Street line is enclosed.

### Water Consumption

The proposed building is intended to be leased as medical office space, though tenant occupancy has yet to be finalized. Multiple tenants are anticipated and it is uncertain as to the exact water consumption that will occur. Our office has reviewed the water usage records at several adjacent medical office uses in the area and established a water usage corresponding to the square footage. These ranged from a low of 0.069 gallons/day/square foot to a high of 0.117 gallons/day/square foot, with an average of 0.0882 gallons/day/square foot.

(11)

Mr. Dave Coffin  
February 17, 2005  
Page 2

Using the highest ratio, the proposed medical office is projected to require approximately 5,330 gallons of water per day.

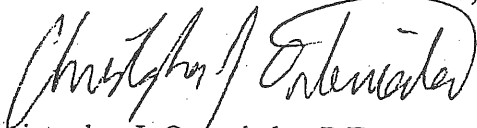
Letter of Ability to Serve

DeLuca-Hoffman Associates, Inc. is presently preparing design review submissions for City of Portland Site Plan Approval. Accordingly, we are requesting a letter from the District indicating the adequacy of the existing off-site water supply infrastructure to serve this project, and a copy of any new construction specifications that the District requires.

Please contact our office with any questions you may have concerning this letter and request for ability to serve. We would like to include your letter of ability to serve with this submission. We appreciate your assistance in this matter and look forward to your response.

Sincerely,

DeLUCA-HOFFMAN ASSOCIATES, INC.



Christopher J. Osterrieder, P.E.  
Senior Engineer

CJO/sq/JN2498/Coffin-2-14-05

Enclosure

c: George McDonough, SMRT, Inc.  
Tim Levine, Olympia Equity Investors, Inc.

I2

PIERCE  
ATWOOD

— LLP —  
ATTORNEYS AT LAW

Matthew D. Manahan

One Monument Square  
Portland, ME 04101

207-791-1189 voice  
207-791-1350 fax  
mmanahan@pierceatwood.com  
pierceatwood.com

May 17, 2005

Penny A. Littell Esq.  
Assistant Corporation Counsel  
City of Portland  
389 Congress Street  
Portland, ME 04101

RE: Olympia Equity Investors II; Doubletree Hotel, Norway Savings Bank, and Medical  
Office Building Properties at Congress and Sewall Streets

Dear Penny:

As you requested in your April 7, 2005 letter to me, I enclose an original executed copy of the  
Conditional Zone Agreement in this matter. On May 11, 2005, an executed copy was recorded  
in the Cumberland County Registry of Deeds at Book 22622, Page 222.

Thanks again for your assistance with this conditional zone agreement.

Sincerely,



Matthew D. Manahan

Enclosures

cc: Sarah Greene Hopkins  
Ethan Boxer-Macomber  
Jack Lufkin

**CONDITIONAL ZONE AGREEMENT  
OLYMPIA EQUITY INVESTORS II, LLC  
50 Sewall Street, Portland, Maine**

This contract made this 4<sup>th</sup> day of April, 2005 by **OLYMPIA EQUITY INVESTORS II, LLC**, a Maine Limited Liability Company with a mailing address at 280 Fore Street, Suite 202, Portland, ME 04101.

**WHEREAS, Olympia Equity Investors I, LP (“OEI I”)** is the owner of property at 1230 Congress Street, Portland, Maine, Chart 189, Block A, Lot 014; and

**WHEREAS, OLYMPIA EQUITY INVESTORS II, LLC (“OEI II”)** is the owner of property at 50 Sewall Street, Portland, Maine, Chart 189, Block A, Lot 31 (hereinafter the **“PROPERTY”**), as shown on Attachment 1; and

**WHEREAS, Olympia Equity Investors III, LLC (“OEI III”)** is the owner of property at 1200 Congress Street, Portland, Maine, Chart 189, Block A, Lot 013; and

**WHEREAS, Olympia Equity Investors XIII (“OEI XIII”)** holds a purchase and sale agreement for the purchase of property from the Maine Department of Transportation (the **“MDOT lot”**) on the southern side of Congress Street adjacent to the southbound I-295 connector road (the **“State Connector Road”**) in Portland, Maine; and

**WHEREAS, the City of Portland (“CITY”) and OEI II** are parties to a contract zone agreement dated October 22, 1997 (hereinafter the **“1997 AGREEMENT”**), which established the C-19 contract zone on the **PROPERTY**; and

**WHEREAS, for purposes of this Agreement the term “Site” shall refer to the combined properties of OEI I, OEI II, OEI III, and OEI XIII** (the latter being the subject of a purchase and sale agreement in **OEI XIII’s** favor), as shown on Attachment 2; and

**WHEREAS, OEI II** requests a rezoning of the **PROPERTY** to permit an office building; and

**WHEREAS,** the **PROPERTY** consists of a long, narrow lot which is not conducive to development of the type proposed by **OEI II** absent conditional rezoning; and

**WHEREAS, OEI II** has entered into private agreements with **OEI I** and **OEI XIII** to facilitate the development of the **PROPERTY** (including the location of market-driven parking demands, as well as a central access point to the **PROPERTY** from Congress Street);

**WHEREAS,** in addition to providing off-site parking amenities, **OEI II** also seeks to modify certain requirements of the C-19 zone and its underlying R-5 zone, as made applicable to the **PROPERTY** by the 1997 AGREEMENT, such that the C-19 zoning designation shall terminate, the underlying **PROPERTY** shall be rezoned from R-5 to B-2, and modifications to the said B-2 zone shall be governed by this Conditional Rezoning Agreement; and

**WHEREAS,** the Portland Planning Board, pursuant to 30-A M.R.S.A. § 4352(8), and after notice and hearing and due deliberations, recommended the rezoning of the **PROPERTY**, subject to certain terms and conditions; and

**WHEREAS,** the **CITY**, by and through its City Council, has determined that the rezoning, with conditions and restrictions, would be pursuant to and consistent with the **CITY's** Comprehensive Plan and would not unreasonably interfere with, and would be consistent with, the existing and permitted uses within the underlying B-2 zone; and



WHEREAS, OEI II has agreed to enter into this Agreement, with its concomitant terms and conditions, which shall hereinafter bind OEI II; and

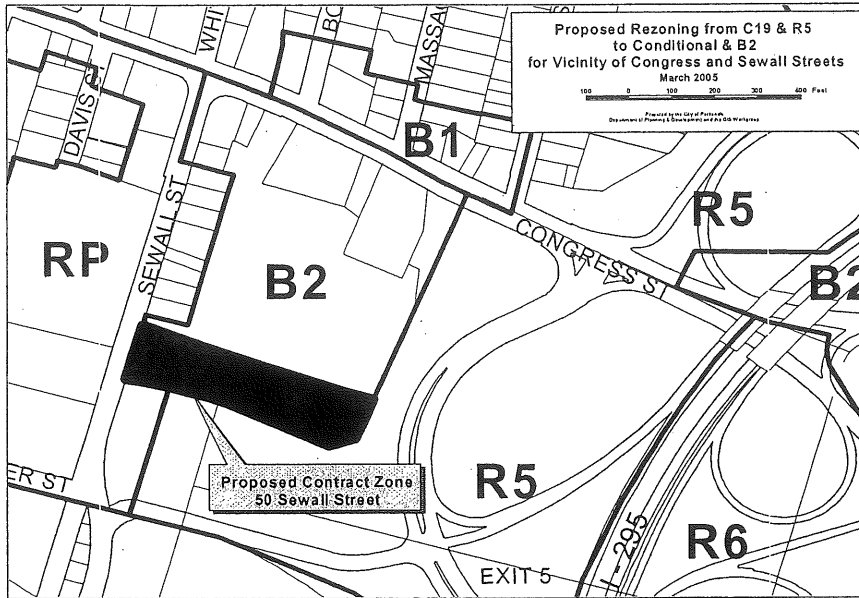
NOW, THEREFORE, in consideration of the rezoning of the PROPERTY, OEI II contracts to be bound by the following terms and conditions:

1. The following exhibits are incorporated into and made a part of this Agreement:

Attachment <u>  1  </u>	PROPERTY depiction
Attachment <u>  2  </u>	Site Plan (for the four properties comprising the Site, Chart 189 Block A Lot 014; Chart 189 Block A Lot 31; Chart 189 Block A Lot 013; and the MDOT Lot)

The Site Plan consists of the Site Plan, prepared by DeLuca-Hoffman Associates, Inc., dated December 2004 "Sheet C-4"; the Grading and Drainage Plan, prepared by DeLuca-Hoffman Associates, Inc., dated November 2004 "Sheet c-5"; the Utility Plan, prepared by DeLuca-Hoffman Associates, Inc., dated November 2004 "Sheet C-6"; the Landscaping Plan, prepared by SMRT, dated 02-22-05 "LP101"; the Enlarged Landscape Plan and Details, prepared by SMRT, dated 02-22-05 "LP102"; the Parking Plan, prepared by SMRT, dated 02-22-05; the Landscaping Plan, prepared by SMRT, dated 02-22-05 "LP101"; the Zoning Identification Plan, prepared by SMRT, dated 02-22-05; and the Building Elevations, prepared by PDT Architects, dated December 17, 2004, revised February 2, 2005 "Sheets A4.1-A4.3".

2. Effective on April 4, 2005, the CITY amends the Zoning Map of the City of Portland, dated December 2000 (as amended from time to time and on file in the Department of Planning and Urban Development, and incorporated by reference into the Zoning Ordinance by § 14-49 of the Code) by adopting the text change and map shown below. OEI II shall record this Agreement at the Cumberland County Registry of Deeds within sixty (60) days of Council action. If this Agreement is not recorded by said date, then this Agreement and the conditional rezoning shall be null and void, and the zoning of the PROPERTY shall revert to the underlying Business-2 zone.



3. *Permitted Uses.* **OEI II** shall be authorized to establish and maintain the following uses on the **PROPERTY**:
  - a. General, business, and professional offices, as defined in section 14-47.
  - b. Retail establishments.
  - c. Restaurants, except that restaurants shall close for all purposes including the service of alcohol no later than 11:00 p.m.
  - d. Health clubs.
  - e. Accessory uses, including, but not limited to, parking facilities and structures, utility services, stormwater management systems, and site amenities.
  
4. *Zoning deviations.* The following zoning deviations from the underlying B-2 zone shall be permitted on the **PROPERTY**.
  - a. The building height for the **PROPERTY** shall not exceed sixty (60) feet, and no corollary increase in side yard setback shall be required.
  - b. Parking in the front yard between the street line and the building shall be permitted. The front yard setback may exceed the average depth of the front yards of the closest developed lots on either side of the **PROPERTY**. The project need not comply with the requirements of the **CITY's** Technical and Design Standards and Guidelines with respect to building placement and street orientation.

5. The **PROPERTY** will be developed substantially in accordance with the Site Plan, including the building elevations and architectural renderings, all as shown on Attachment 2, provided that nothing herein is intended to substitute for the full site plan review and approval by the Portland Planning Board pursuant to the standards contained within the Portland Land Use Code and any other applicable regulations.
6. The curb cut presently located at the northwesterly edge of Chart 189 Block A Map 014 shall be closed as a condition of this Agreement and the area along Congress Street to a depth of at least ten (10) feet shall be bermed and landscaped in accordance with Attachment 2 (or as otherwise recommended by the City arborist during Site Plan Review) prior to the issuance of a Certificate of Occupancy for the **PROPERTY**.
7. The berms along Congress Street and the State Connector Road adjacent to the MDOT Lot, which berms shall be installed and landscaped to a depth of at least ten (10) feet (or as otherwise recommended by the City arborist during Site Plan Review), shall be required to be built prior to the issuance of a Certificate of Occupancy for the **PROPERTY**.
8. The area identified as the area in which "OEI II reserves the right to construct a 42-space parking lot in the future" in the northwesterly corner of the Site (and identified on Attachment 2 by the number "1" inside a circle) need not be built prior to the issuance of a Certificate of Occupancy for the **PROPERTY**.
9. **OEI II** bears the responsibility for ensuring that **OEI I**, **OEI III**, and **OEI XIII** join in applying simultaneously for the site plan changes depicted on Attachment 2. **OEI II** represents that each of the aforementioned entities acknowledge that it is not possible to anticipate the future development or use of the Site or any individual parcel comprising the Site. As a result, the Site Plan may need to be amended from time to time to give **OEI I**, **OEI II**, **OEI III**, or **OEI XIII** reasonable flexibility in the development and/or use of their respective lots. Therefore, the parties agree to work cooperatively with each other and to negotiate, in good faith, any amendments to the site plans governing the Site and, in particular, to acknowledge that the traffic access, parking, lighting, landscaping, and drainage are all in common and interdependent site plan features that must continue to be planned and engineered in a comprehensive manner. Further, **OEI II** agrees that as mortgage terms for **OEI I** and **OEI III** roll over, this provision shall be incorporated in such mortgages to the extent necessary to adhere to the terms of this provision. Such rollover dates are as follows: **OEI I**, June 30, 2008, and **OEI III**, April 30, 2010. **OEI XIII** shall be obligated hereunder upon its acquisition of the MDOT lot.
10. Should the properties designated as Chart 189 Block A Lot 011 and Chart 189 Block A Lot 012 (the "Dugas Property") be redeveloped in the future and subject

to site plan approval from the **CITY**, then **OEI II** by virtue of this Agreement, shall be required to review with **CITY** Planning Staff whether modifications or amendments to the Site Plan are appropriate in order to better address the entrance servicing the **PROPERTY** from Congress Street and the traffic and pedestrian circulation within the **PROPERTY** and the Site. If the City Traffic Engineer determines that such modifications or amendments are reasonable, **OEI II** shall be required to undertake any such modifications on the Site if the owner of the Dugas Property is required to perform complementary work on the Dugas Property as part of the future site plan approval for the Dugas Property redevelopment, but **OEI II** shall not be required to spend more than \$50,000 on such modifications.

11. **OEI II** shall be required to obtain all applicable federal, state, and local permits for construction of the office building project.
12. The landscaping plan as shown on Attachment 2 shall be the least amount of landscaping required during site plan review and nothing herein precludes the Planning Board from requiring increased landscaping in accordance with the site plan standards of the Land Use Code.
13. **OEI II** shall secure a maintenance agreement giving **OEI II** the right to perpetually maintain the landscaped buffer at the entrance to the Site and such agreement shall be provided to the City at the time of Site Plan approval.
14. **OEI II** shall contribute \$60,000.00 toward public improvements in the area, for the purpose of pedestrian access from the site to the Hadlock Baseball Field.
15. All building signs shall receive the approval of the City of Portland.
16. In the event the development described herein is not commenced within two (2) years from the date of this conditional rezoning this Agreement shall become null and void and the Property shall revert to the underlying B-2 zone.

The above stated restrictions, provisions, and conditions are an essential part of the rezoning, shall run with the **PROPERTY**, shall bind and benefit **OEI II**, any of its successors and assigns, and any party in possession or occupancy of said **PROPERTY** or any part thereof, and shall inure to the benefit of and be enforceable by the **CITY**, by and through its duly authorized representatives. **OEI II** shall file a copy of this Agreement in

the Cumberland County Registry of Deeds, along with a reference to the Book and Page locations of the deeds for the **PROPERTY**.

If any of the restrictions, provisions, conditions, or portions thereof set forth herein is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed as a separate, distinct, and independent provision and such determination shall not affect the validity of the remaining portions hereof.

Except as expressly modified herein, the development, use, and occupancy of the subject premises shall be governed by and comply with the provisions of the Land Use Code of the City of Portland and any applicable amendments thereto or replacement thereof.

This conditional rezoning agreement shall be enforced pursuant to the land use enforcement provisions of state law (including 30-A M.R.S.A. § 4452) and City Ordinance. No alleged violation of this rezoning Agreement may be prosecuted, however, until the **CITY** has delivered written notice of the alleged violation(s) to the owner or operator of the **PROPERTY** and given the owner or operator an opportunity to cure the violation(s) within thirty (30) days of receipt of the notice. Following any determination of a zoning violation by the Court, and in addition to any penalties authorized by law and imposed by the Court, either the Portland Planning Board on its own initiative, or at the request of the Planning Authority, may make a recommendation to the City Council that the Conditional Rezoning be modified or the **PROPERTY** rezoned.

WITNESS:

OLYMPIA EQUITY INVESTORS II,  
LLC, by its managing member Erin  
Management Group II

Lisa M. Smith

By James H. Brady  
James H. Brady

STATE OF MAINE  
CUMBERLAND, ss.

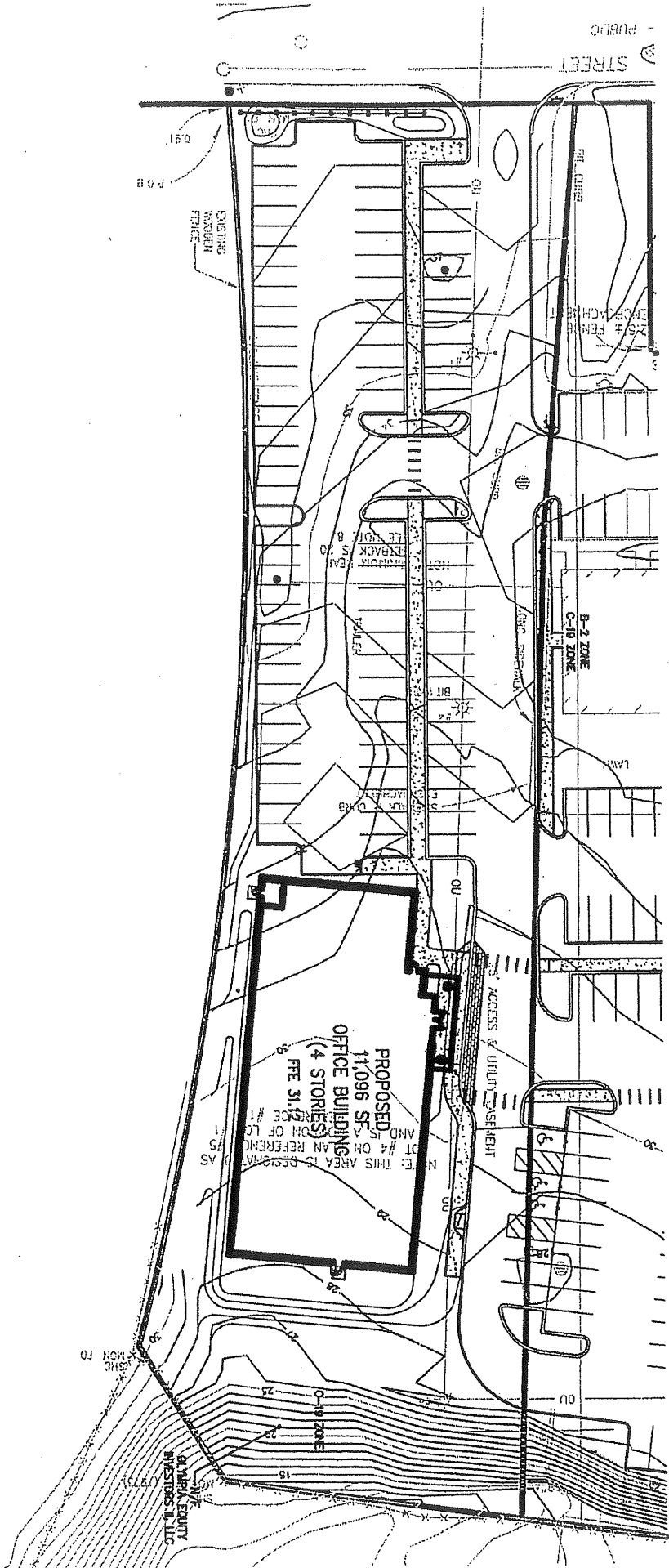
Date: April 28, 2005

Personally appeared before me the above-named James H. Brady, in his said capacity,  
and acknowledged the foregoing instrument to be his free act and deed in his said  
capacity and the free act and deed of Olympia Equity Investors II, LLC.

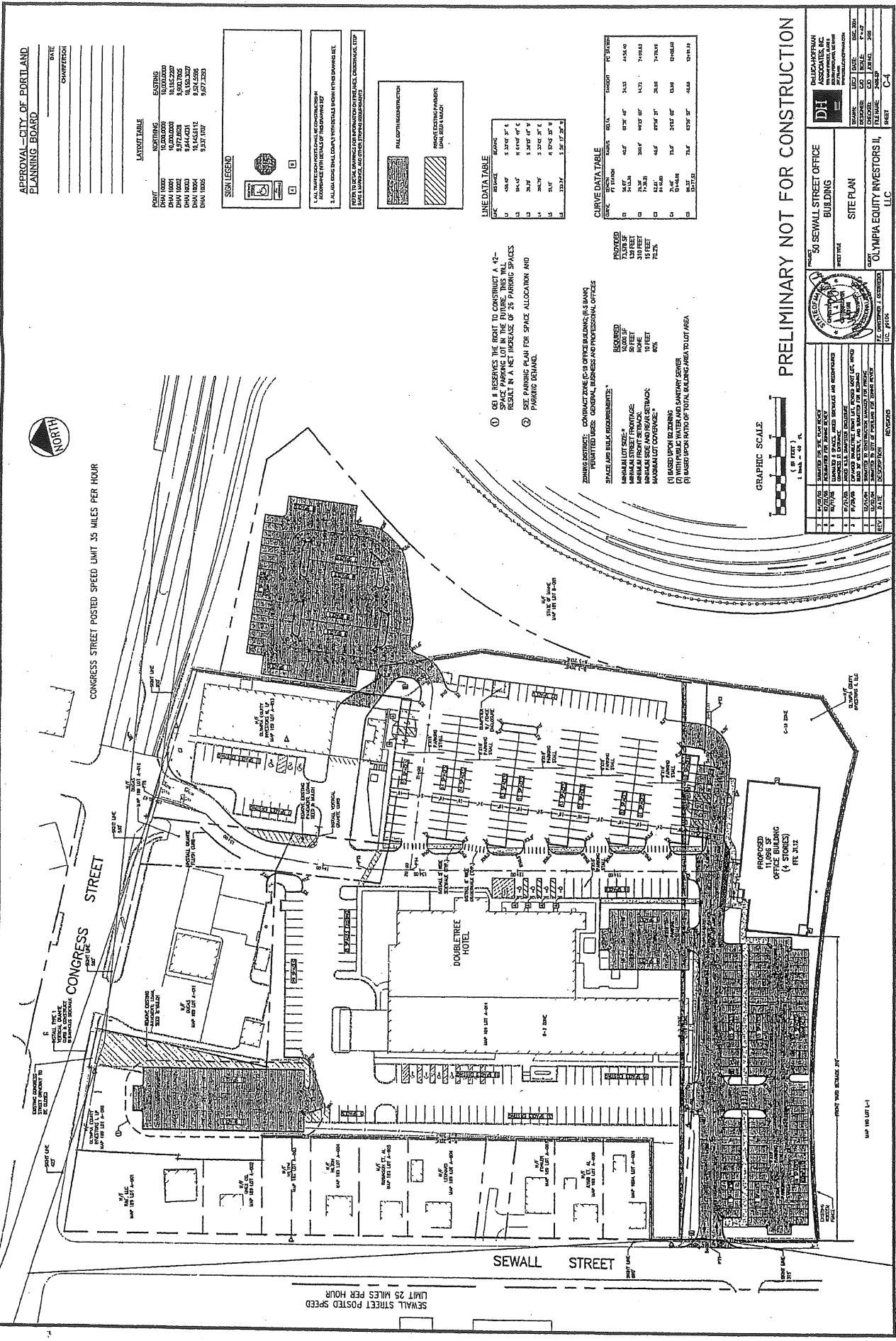
Before me,

Susan J. Devine  
Notary Public/Attorney at Law

**SUSAN J. DEVINE**  
NOTARY PUBLIC, MAINE  
MY COMMISSION EXPIRES MARCH 26, 2011



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APPROVAL - CITY OF PORTLAND PLANNING BOARD

DATE	DESCRIPTION

LAYOUT TABLE

POINT	NORTHING	EASTING
DMH 1000	16,028,000.00	10,105,000.00
DMH 1001	16,028,000.00	10,105,000.00
DMH 1002	16,028,000.00	10,105,000.00
DMH 1003	16,028,000.00	10,105,000.00
DMH 1004	16,028,000.00	10,105,000.00
DMH 1005	16,028,000.00	10,105,000.00

SIGN LEGEND

1. ALL PROPOSED SIGNAGE SHALL BE DESIGNED IN ACCORDANCE WITH THE SIGNAGE REGULATIONS OF THE CITY OF PORTLAND, ME.

2. ALL SIGNAGE SHALL BE DESIGNED IN ACCORDANCE WITH THE SIGNAGE REGULATIONS OF THE CITY OF PORTLAND, ME.

LINE DATA TABLE

LINE NO.	START POINT	END POINT	DESCRIPTION
1	15	16	3.00' SETBACK
2	16	17	6.00' SETBACK
3	17	18	15.00' SETBACK
4	18	19	15.00' SETBACK
5	19	20	15.00' SETBACK

CURVE DATA TABLE

STATION	PC	PT	PVI	TA	EA	CA	CE	EA	TA
1	15	16	15.5	90	0	15	16	15.5	90
2	16	17	16.5	90	0	16	17	16.5	90

- RESERVES THE RIGHT TO CONSTRUCT A 4-LEVEL PARKING LOT IN THE FUTURE. THIS WILL RESULT IN A NET INCREASE OF 25 PARKING SPACES.
- SEE PARKING PLAN FOR SPACE ALLOCATION AND PARKING DEMAND.

ZONING DISTRICT: COMMERCIAL OFFICE BUILDING (C-1) DISTRICT  
 PERMITTED USES: GENERAL BUSINESS AND PROFESSIONAL OFFICES

SPACE AND BULK REQUIREMENTS:  
 MINIMUM LOT SIZE: 6,000 SF  
 MINIMUM FRONT SETBACK: 10 FEET  
 MINIMUM SIDE AND REAR SETBACK: 5 FEET  
 MAXIMUM LOT COVERAGE: 60%

BASED UPON PLZ ZONING: COMMERCIAL OFFICE BUILDING (C-1) DISTRICT  
 BASED UPON WTD OF TOTAL BUILDING AREA TO LOT AREA

GRAPHIC SCALE  
 1" = 20'-0" (HORIZONTAL)  
 1" = 40'-0" (VERTICAL)

**PRELIMINARY NOT FOR CONSTRUCTION**

PROJECT: 50 SEWALL STREET OFFICE BUILDING

OWNER: OLYMPIA EQUITY INVESTORS II, LLC

DATE: 01/20/2019

SCALE: AS SHOWN

PROJECT NUMBER: 19-0001

DRAWN BY: [Name]

CHECKED BY: [Name]

PROJECT LOCATION: PORTLAND, ME

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## Executive Summary

The following Executive Summary is prepared for the reader's convenience, but is not intended to be a substitute for reading the full report.

Gorrill-Palmer Consulting Engineers, Inc. was retained by DeLuca Hoffman Associates, Inc. to prepare this traffic impact study for a proposed 44,384 s.f. office building in Portland, Maine. For purposes of this study, the entire building is assumed to be medical office, which is the highest traffic generating office use. The site is located on southeast corner of the intersection of Congress Street and Sewall Street, behind the Double Tree Hotel. Access to the site would be provided via the existing signalized Double Tree Hotel driveway onto Congress Street and the existing driveway onto Sewall Street. The existing unsignalized Double Tree Hotel driveway to Congress Street would be closed as part of this project. Based on this study, our office has determined the following:

1. The proposed office building is forecast to generate 161 trip ends and 198 trip ends for the weekday AM and PM peak hours, respectively, assuming the entire facility is medical office. A Norway Savings Bank and medical office exist on the site currently, and need to be added for purposes of determining the study area. The existing Norway Savings Bank and medical office are estimated to generate 117 and 218 trip ends during the AM and PM peak hours, respectively. Therefore, for the purposes of permitting, the proposed site is anticipated to generate 278 and 416 trip ends during the AM and PM peak hours, respectively. This level of trip generation requires a State traffic permit which will be administered by the City in the Site Plan Review Process. (Note: A trip end is either a trip in or out of the site. Therefore a single customer making a round trip would equal two trip ends).
2. The unsignalized Double Tree Hotel driveway to Congress Street would be closed as part of this project in order to improve access management and minimize delay on Congress Street, reduce driver confusion entering and exiting the site, and improve pedestrian safety by reducing conflicts. This driveway is currently used by 23 vehicles in the AM peak hour and 18 vehicles in the PM peak hour.
3. The level of service analyses show that all of the study area intersections currently operate at acceptable levels of service during the AM and PM peak hours and will continue to operate at similar levels of service upon completion of the proposed medical office building.
4. The queue analyses show that the queues at the study area intersections are not anticipated to exceed the available storage lengths in the AM and PM peak hours.
5. Gorrill-Palmer Consulting Engineers, Inc. referenced the MaineDOT High Crash listings to determine if there were any high crash locations in the project vicinity. Based on a review of this information, two high crash locations occurred in the vicinity of the project. The collisions occurring along the section of Congress Street from Douglas Street to Massachusetts Avenue do not indicate a particular pattern correctable by engineering measures. At the intersection of Congress Street and the

Exit 5 Ramps, the sun often blocks drivers' vision of the signal heads, causing collisions. Gorrill-Palmer Consulting Engineers, Inc. examined the intersection and found that 4-inch back plates on the signal heads are already in place at this intersection. Therefore, Gorrill-Palmer Consulting Engineers, Inc. recommend installation of flashing strobes on the red signal indications for eastbound traffic.

6. Many of the collisions occurring at the intersection of Congress Street and the I-295 Exit 5B Ramps were rear-end collisions that occurred when a vehicle exiting the I-295 Connector Road stopped to yield to oncoming traffic and was struck by a following vehicle. This type of collision is typical of exit ramps under yield conditions and can be reduced by signaling the right turn movement. Gorrill-Palmer Consulting Engineers, Inc. performed capacity analyses of this intersection assuming signalization of the northbound right turn exiting the I-295 Connector Road. The results indicate that all movements at this intersection are anticipated to operate at acceptable levels of service with signalization of this movement. Therefore, the City should consider making this improvement for this movement that is not affected by the site traffic.
7. The sight lines at the existing driveways exceed Maine DOT requirements. Gorrill-Palmer Consulting Engineers, Inc. recommends that all plantings, which will be located within the right-of-way, not exceed 3 feet in height and be maintained at or below that height. Signage should not interfere with sight lines. In addition, we recommend that during construction, when heavy equipment is entering and exiting the site, that appropriate measures, such as signage and flag persons, be utilized in accordance with the Manual on Uniform Traffic Control Devices.

Based on these findings, it is the opinion of Gorrill-Palmer Consulting Engineers, Inc. that the local street system can accommodate the traffic generated by the proposed office building assuming the most intense use of medical office.



Gorrill-Palmer Consulting Engineers, Inc.

*Traffic and Civil Engineering Services*

PO Box 1237  
15 Shaker Rd.  
Gray, ME 04039

207-657-6910  
FAX: 207-657-6912  
E-Mail: mailbox@gorrillpalmer.com

February 4, 2005

Mr. James Brady  
Olympia Equity Investors  
280 Fore Street, Suite 202  
Portland, ME 04101

RE: Offsite Improvement History  
Congress Street between Sewall and Massachusetts

Dear Jim:

You have asked that we provide a history of the improvements that were completed along Congress Street as part of the Coastal Bank project in 1999. Our records indicate that, as a condition of approval, Olympia participated in the cost of construction of the center left turn lane along Congress Street and the signalization of Congress Street at Massachusetts Avenue and the relocated site driveway to the Double Tree and Mobil. This included working with MaineDOT to allow the relocated driveway, which was necessary to align with Massachusetts Avenue, in an area that was Controlled Access as part of the Exit 5 reconstruction. Olympia contributed \$200,000 to the project that was budgeted for \$350,000 with the balance paid by MaineDOT.

The purpose of these improvements was to address a significant collision problem as well as traffic delays in this section of Congress Street. From 1995 to 1997 there were 91 collisions between Bolton Street and Massachusetts Avenue, and capacity constraints at the intersections. As a result of the project that added the center turn lane and traffic signal at Massachusetts Avenue, the most recent three year collision history shows a reduction to 15 collisions, a dramatic 84% reduction in crashes. This improvement has been enormously beneficial to the general public as well as the City in reduced monetary costs and most likely physical injuries. The improvements also continue to benefit the quality of traffic flow as the current capacity analysis shows that with the addition of the proposed medical office building, all traffic movements at the signalized intersections will operate at level of service "D" or better.

(LI)

Gorrill-Palmer Consulting Engineers, Inc.


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Mr. James Brady  
February 4, 2005  
Page 2 of 2

Please contact us with any questions.

Sincerely,

Gorrill-Palmer Consulting Engineers, Inc.



Thomas L. Gorrill, P.E., PTOE  
President

TLG/pah/jn1109/Brady2-5-04

L2

April 4, 2005

Mr. James Brady  
Olympia Equity Investors  
280 Fore Street, Suite 202  
Portland, ME 04101

RE: Pedestrian Facility Review  
Sewall Street Medical Office

Dear Jim:

The City has requested that we provide a review of the existing pedestrian accommodations along Congress Street in the vicinity of the proposed Sewall Street Medical Office Building. Gorrill-Palmer Consulting Engineers, Inc. completed an on-site review on April 2, 2005 and also reviewed the MaineDOT crash data for the last three years. Based on this review, we have determined the following:

### *Pedestrian Collisions*

The crash summary data from MaineDOT for the years 2001-2003 indicate that there were 2 crashes involving pedestrians along Congress between Stevens Avenue and the northbound I-295 ramp. One occurred in 2001 at Bradley Street (Just east of Steven's Ave.) and the other occurred at Douglass (Just east of Massachusetts/Site Drive). Both of the crashes occurred at locations where there was no crosswalk across Congress, but in proximity to signalized pedestrian crossings of Congress. As discussed below, there are two signalized pedestrian crossings of Congress in the immediate vicinity of the proposed Sewall Street medical office building that will provide a safe means of crossing Congress.

### *Sidewalks*

There are sidewalks on both sides of Congress Street from Sewall Street to the I-295 interchange. Additionally, a sidewalk will be provided on the site leading out to Congress Street at the site driveway.

MI

Mr. James Brady  
April 4, 2005  
Page 2 of 2

### *Crosswalks*

There are crosswalks at the major intersections in the vicinity of the site as follows:

- ◆ All approaches of Sewall Street at Congress Street
- ◆ The easterly approach of Congress at Massachusetts and across the site driveway and Massachusetts Avenue.
- ◆ Across the southbound I-295 off ramp and the Connector Road. There is no crosswalk across Congress Street at this intersection.

### *Pedestrian Signals*

Each of the crosswalks indicated above is located at a signalized intersection with pedestrian signals and push buttons. Their operations are as follows:

- ◆ Sewall Street: Exclusive (all vehicles have a red light) pedestrian phase actuated by pushing the button.
- ◆ Massachusetts/Site Drive: Concurrent (green light for vehicular movement that is parallel to the pedestrian movement) pedestrian phase that comes up automatically with each vehicular phase. It can also be called up by pushing a button.
- ◆ Southbound I-295 off ramp/Connector Road: Concurrent pedestrian phase that is activated by pushing a button.

Based on our review, pedestrians are accommodated well in the vicinity of the site. However, it may be useful to have a pedestrian directional sign at the site driveway to encourage crossing at that location since there is no signalized crossing of Congress between the site and St. John Street. The addition of the onsite sidewalk will provide an effective link to the existing pedestrian system along Congress Street.

Please contact us with any questions.

Sincerely,

Gorrill-Palmer Consulting Engineers, Inc.



Peter A. Hedrich, P.E., PTOE  
Vice President, Transportation

C. George McDonough

M2