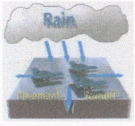


APPENDIX D

Stormwater Management  
Report





**RA Associates • CONSULTING ENGINEERS / PLANNER**

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# **STORMWATER MANAGEMENT REPORT & DRAINAGE SYSTEM DESIGN**

Prepared For:

## **MINISCEONGO PARK**

**ROUTE 202  
TOWN OF HAVERSTRAW, TOWN OF RAMAPO  
ROCKLAND COUNTY, NEW YORK**



**Date: October 14, 2005  
Job No. 1560**

**Ray Ahmadi, Ph.D., P.E. NYS#59392  
New York State Professional Engineer**

**227 South Mountain Road • New City, New York 10956 • Tel. (845) 634-1351 • Fax (845) 634-1351  
E-Mail: [RAAssoc@optonline.net](mailto:RAAssoc@optonline.net) • Web Site: [RA-Engineers.com](http://RA-Engineers.com)**

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# RA Associates

CONSULTING ENGINEERS / PLANNER

---

**Ray Ahmadi, Ph.D., P.E.**  
227 South Mountain Road  
New City, New York 10956  
Tel.: (845) 634-1351  
Fax/Ans. 634-1351  
E-Mail: [RAAssoc@optonline.net](mailto:RAAssoc@optonline.net)  
[RA-Engineers.com](http://RA-Engineers.com)

## INTRODUCTION:

The hydrology and hydraulics study for the project, Minisceongo Park has been undertaken to examine the pre and post construction drainage conditions. The study will also provide the impact of the proposed impervious area to the drainage system.

In general, the runoff from a basin depends on the precipitation, type of the soil, and characteristic of the terrain, type of land cover and geographic location of the property. The hydrology of a site changes during the initial clearing and grading that occur during construction. Trees and vegetated land covers that have intercepted rainfall are removed, and natural depressions that had absorbed rainfall is scarped off, eroded or severely compacted. The impervious areas such as rooftops, roads, parking lots, driveways, etc. surfaces do not allow rainfall to soak into the ground. Consequently, most of the rainfall is converted into storm water runoff. Therefore, the volume of runoff from a developed site will increase sharply with increment of impervious cover. This is due to decrease inability of rainfall to percolate into the ground and recharge the aquifer. As the result, the increase in storm water runoff can be too much for the existing drainage system to handle. Post- developed runoff is attenuated to pre- developed runoff and diverted to the existing drainage system with or without improvement. The "Zero Net Increase of Peak Flow" is referring to the above techniques, which is mandated by local and state regulation.

Impervious surfaces accumulate pollutants deposited from the atmosphere, leaked from vehicles, or windblown in from adjacent areas. During the storm events, these pollutants quickly wash off, and are rapidly delivered to downstream waters.

The source of sediment includes wash off of particles that are deposited on impervious surfaces, erosion from stream banks and site construction.

The frequency and magnitude of storm will increase dramatically per increase of impervious areas due to developments. In addition, the discharge associated bank full

**MINISCEONGO PARK  
ROUTE 202, TOWN OF HAVERSTRAW-TOWN OF RAMAPO, NY**

storm event reaches beyond the "critical erosive velocity" and flow's velocity increases substantially after development occurs. The impacts to the stream channel must be addressed in this report.

Flow events that exceed the capacity of the stream channel spill out into the adjacent floodplain. The "Over bank" flooding will be maintained to pre-development peak discharge rates for both the two-year and ten-year frequency storm after developments, thus keeping the level of over bank flooding the same over time. This management technique prevents costly damage or maintenance for culverts, drainage structures, and swales.

As with over bank floods, development sharply increases the peak discharge rate associated with the 100-year design storm. As a consequence, the elevation stream's 100-year floodplain becomes higher and the boundaries of its floodplain expand. In some instances, property and structures that had not previously been subject to flooding are now at risk. Additionally, such a shift in a floodplain's hydrology can degrade wetland and forest. To minimize the impact, the 100-year storm will be routed through a proposed pond to match the peak developed flow with pre-developed.

The decline in the physical habitat of the stream, coupled with lower base flows and higher storm water pollutant loads, has a severe impact on aquatic community. To meet water quality treatment goals, reduced secondary environmental impacts of facilities and maximum pollutant removal, permanent pools and landscaping are necessary.

The following report provide a comprehensive of the site for the pre-developed, during the fill placement phase and post development per New York State Stormwater Management Design Manuel dated August 2003 and New York Guidelines for Urban Erosion & Sediment Control dated April 1997.

#### **SITE OVERVIEW:**

The project is located at Route 202 on the Northwest side of Palisades Interstate Parkway and Westerly side of Quaker Road. The watershed area consists of 50.9 acres as shown on a subdivision plat prepared by Atzl, Scatassa & Zigler P.C. South Minisceongo Creek is flowing from South to North at the west corner of the property. There are patches of wetlands both side of the stream.

The site is a former sand and gravel pits. The site is forty feet (40') lower than Quaker Road and approximately two feet above the 100-year flood elevation at South Minisceongo Creek. The site fairly flat, less than 1% slopes from Quaker Road to the stream.

## **DRAINAGE STUDY:**

### **Section 1:**

#### Existing Condition:

The pre-developed (existing condition) drainage study shows the current peak flows at a point of interest (P.O.I.) located at Northwest corner of the watershed on Minisceongo Creek. These data are required to compare with the post developed (developed condition).

#### Developed Condition:

The revised conceptual plans show 271 town houses & two commercial building sites to be developed. The runoff will be increased due to the proposed impervious area.

In terms of mitigation of the developed (New houses, road, driveways etc) site, drainage facility (detention Pond) is proposed to prevent downstream flooding. Three detention ponds are proposed at the site, which will function as sediment control basins during construction.

#### Water Quality:

The purpose of water quality study is to control the flow and treat runoff's chemical constituents, hydrocarbons, bacteria, debris etc. before released to local water body as outlined in the New York State Stormwater Management Design Manual dated August 2003.

### **Section 2:**

#### Hydrology/Hydraulic during Fill Placement:

The grading plan shows that a considerable some of fill material to be brought up to the site. Hydrology of the site during fill placement is studied and designed soil erosion devices to trap sediments eroding from the stockpile. Ponds are over excavated during the fill placement by two feet. The extra room is for accumulated sediments laden.



# **MINISCEONGO PARK**

**N. Y. S. ROUTE 202  
TOWN OF HAVERSTRAW  
TOWN OF RAMAPO  
ROCKLAND COUNTY  
NEW YORK**

## **HYDROLOGY & HYDRAULIC OF EXISTING & DEVELOPED CONDITION**

**BY**

**RA ASSOCIATE CONSULTING ENGINEERS  
227 SOUTH MOUNTAIN ROAD  
NEW CITY, NEW YORK  
TEL / FAX (845)634-1351**

**DATE OF REPORT  
JULY 07, 2005**

**REVISED  
OCTOBER 14, 2005**

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# RA Associates

CONSULTING ENGINEERS / PLANNER

---

**Ray Ahmadi, Ph.D., P.E.**  
227 South Mountain Road  
New City, New York 10956  
Tel.: (845) 634-1351  
Fax/Ans. 634-1351  
E-Mail: [RAAssoc@optonline.net](mailto:RAAssoc@optonline.net)  
[RA-Engineers.com](http://RA-Engineers.com)

Revision October 14, 2005

July 7, 2005

Town of Haverstraw  
Town Hall  
One Rosman Rd.  
Haverstraw, NY 10920

Att.: Mr. Joseph Caruso, P.E.  
Village Engineer  
Maser Consulting Engineering

Re: Minisceongo Park  
Town of Haverstraw  
Town of Ramapo  
Rockland County, New York

Sub: Preliminary Hydraulic and Hydrological Study approximate required volume of storage for "zero net increase of peak flow".

## INTRODUCTION:

The following drainage study has been prepared for Minisceonge Park in order to design a system to provide a zero net increase of peak runoff as well as water quality for a proposed townhouses in the town of Haverstraw, town of Ramapo, New York. The project is located at Route 202 on the Northwest side of Palisades Interstate Parkway and Westerly side of Quaker Road. The watershed area consists of 50.9 acres as shown on a subdivision plat prepared by Atzl, Scatassa & Zigler P.C.

**MINISCEONGO PARK  
ROUTE 202, TOWN OF HAVERSTRAW-TOWN OF RAMAPO, NY**

The revised conceptual plans show 271 town houses & two commercial buildings to be developed. The disturbed areas' runoff will flow into proposed pond#1 southwest of the project next to Minisceongo Creek, pond#2 northwest of the Quaker Road close to Barr Laboratories, Inc. and pond#3 northwest of Palisades Interstate Parkway next to northeast property line. Those ponds are designed to function as water quality ponds as well as detention basins.

#### **WATERSHEDS AND DRAINAGE PATTERNS:**

The existing site is located on two watersheds (WS#1 & WS#2). At the present, the direction of the runoff from the WS#1 is from east to west toward the wetland. The runoff from WS#2 flows almost parallel to the north property line toward the Minisceongo Creek. The direction of the runoff is shown in the existing condition of the watershed map.

The proposed developed areas are located on six different watersheds (WS#1, 2, 3, 4, 5 & 6). The WS#1 contains the central portion of the site. The runoff from WS#1 drains into the Pond#1. The WS#2 consists of northeast portion of the site, which the runoff drains into the Pond#2. The WS#3 consists of east portion of the developed areas, which the runoff drains into the pond#3. The WS#4 consists of the slope areas between Barr Lab and north property line. The runoff flows along a proposed berm. The accumulated runoff from WS#4 flows through WS#5 and then flows to the outlet. The WS#5 is located at the northwest wetland area. The runoff from WS#5 will drain into Minisceongo Creek. The WS#6 consists southeast portion of the site. The runoff flows to the west toward Minisceongo Creek. The direction of the runoff is shown in the developed condition of the watershed map.

The outflow from the pond#1, pond#2 and pond#3 will be routed and then released to outlet (Minisceongo Creek). The schematic reach flow is shown in page 1-39.

#### **HYDROLOGICAL SOIL GROUP:**

The soil at the site is "Pits" with soil map symbols of "Pt" and Hydrological Soil Group of "C". See sheet 35 of Soil Survey of Rockland County, New York, United States Department of Agriculture Soil Conservation Service, in cooperation with Cornell University Agricultural Experiment Station dated October 1990.

The soil at the site is gravel. This unit consists of areas that have been excavated for sand and gravel. The areas are irregular in shape or rectangular and range from 5 to 100 acres. Many of the pits have short steep slopes along the edges.

The rate of permeability in this unit is rapid or very rapid. In some areas the water table is at or near the surface most of the year. A few areas are adjacent to streams and are subject to periodic flooding.

Included with this unit in mapping are small areas of undisturbed soils, mainly excessively drained Hinckley soils and well drained Riverhead soils. Spots of wetter fredon soils are in some areas. Also included areas of spoils consisting of sandy or gravelly overburden, areas of exposed bedrock, and a few small ponds.

#### **DRAINAGE STUDY:**

We have prepared the attached Hydrological – Hydraulics analysis for the existing and developed areas. The existing site consists of two watersheds. With the exception of the edge of property lines, the entire area is flat. The area used to be a sand pits, which the materials were excavated and used elsewhere.

As the result of developing the site, the runoff from the developed area will be increased due to the proposed impervious areas. The 100-years peak runoff storm from the combined watersheds will increase from 135.97 CFS to  $230 \pm$  CFS. Three detention ponds are proposed in the site in order to attenuate the peak runoffs from post development to pre-developed condition. The 100-years peak runoff storm for the developed condition (after the flow is released from ponds) is 92.6 CFS, which is much less than the existing runoff (135.97 CFS).

The location of the ponds is shown in the drainage map. The storage volume of the pond#1, pond#2 and pond#3 are 3.57 acs-ft., 1.14 acs-ft. and 1.94 acs-ft respectively (See page 1-21 to 1-23 for detail calculation).

The summary flow table and hydrographs of 1, 2, 5, 10, 25, 50 and 100-year storms for existing and developed conditions and preliminary calculations are attached for your reference.

Very truly yours,

Ray Ahmadi, Ph.D., P.E.

C: Primary share\Hydrology TR-55\1560\Drainage Report\Revised Drainage Study

**SUMMARY OF FLOW**  
**1-YEAR STORM FREQUENCY**

Q (CFS)	WS#1	WS#2	WS#3	WS#4	WS#5	WS#6	REMARK
Q <sub>i</sub>	26.68	8.50	9.50	0.48	3.44	2.84	ΣQ <sub>i</sub> = 51.44
Q <sub>o</sub>	3.79	2.78	2.09	0.48	3.44	2.84	Q <sub>Existing</sub> = 15.42 CFS

**SUMMARY OF FLOW**  
**2-YEARS STORM FREQUENCY**

Q (CFS)	WS#1	WS#2	WS#3	WS#4	WS#5	WS#6	REMARK
Q <sub>i</sub>	39.06	12.64	14.31	0.95	6.75	5.45	ΣQ <sub>i</sub> = 79.16
Q <sub>o</sub>	10.48	4.19	3.32	0.95	6.75	5.45	Q <sub>Existing</sub> = 31.14 CFS

**MINISCEONGO PARK**  
**ROUTE 202, TOWN OF HAVERSTRAW-TOWN OF RAMAPO, NY**

**SUMMARY OF FLOW**  
**5-YEARS STORM FREQUENCY**

Q (CFS)	WS#1	WS#2	WS#3	WS#4	WS#5	WS#6	REMARK
Q <sub>i</sub>	54.88	17.95	20.51	1.63	11.58	9.19	ΣQ <sub>i</sub> = 115.74
Q <sub>o</sub>	21.29	5.83	4.82	1.63	11.58	9.19	Q <sub>Existing</sub> = 54.34 CFS

**SUMMARY OF FLOW**  
**10-YEARS STORM FREQUENCY**

Q (CFS)	WS#1	WS#2	WS#3	WS#4	WS#5	WS#6	REMARK
Q <sub>i</sub>	62.85	20.62	23.64	1.99	14.18	11.18	ΣQ <sub>i</sub> = 134.46
Q <sub>o</sub>	27.2	6.66	5.55	1.99	14.18	11.18	Q <sub>Existing</sub> = 66.76 CFS

**MINISCEONGO PARK**  
**ROUTE 202, TOWN OF HAVERSTRAW-TOWN OF RAMAPO, NY**

**SUMMARY OF FLOW**  
**25-YEARS STORM FREQUENCY**

Q (CFS)	WS#1	WS#2	WS#3	WS#4	WS#5	WS#6	REMARK
Q <sub>i</sub>	78.70	25.95	29.97	2.75	19.63	15.36	ΣQ <sub>i</sub> = 172.36
Q <sub>o</sub>	40.17	8.34	7.03	2.75	19.63	15.36	Q <sub>Existing</sub> = 93.28 CFS

**SUMMARY OF FLOW**  
**50-YEARS STORM FREQUENCY**

Q (CFS)	WS#1	WS#2	WS#3	WS#4	WS#5	WS#6	REMARK
Q <sub>i</sub>	94.47	31.28	36.28	3.54	25.30	19.71	ΣQ <sub>i</sub> = 210.58
Q <sub>o</sub>	53.87	10.03	8.52	3.54	25.30	19.71	Q <sub>Existing</sub> = 120.97 CFS

**SUMMARY OF FLOW**  
**100-YEARS STORM FREQUENCY**

Q (CFS)	WS#1	WS#2	WS#3	WS#4	WS#5	WS#6	REMARK
Q <sub>i</sub>	102.35	33.97	39.42	3.94	28.23	21.93	ΣQ <sub>i</sub> = 229.84
Q <sub>o</sub>	61.72	10.88	9.27	3.94	28.23	21.93	Q <sub>Existing</sub> = 135.97 CFS



# **MINISCEONGO PARK**

**N. Y. S. ROUTE 202  
TOWN OF HAVERSTRAW  
ROCKLAND COUNTY  
NEW YORK**

## **LOCATION MAPS**

**BY**

**RA ASSOCIATE CONSULTING ENGINEERS  
227 SOUTH MOUNTAIN ROAD  
NEW CITY, NEW YORK  
TEL / FAX (845)634-1351**

**DATE OF REPORT  
JULY 05, 2005**

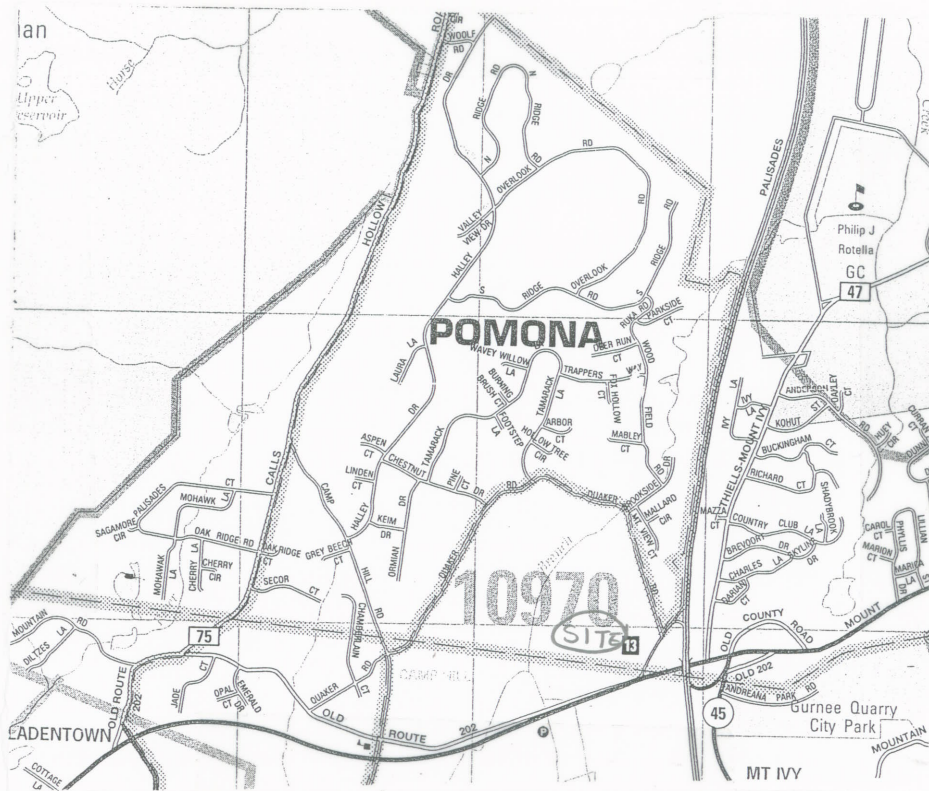
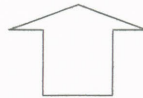
**REVISED  
JULY 07, 2005**

# RA Associates

CONSULTING ENGINEERS / PLANNER

Ray Ahmadi, Ph.D., P.E.  
227 South Mountain Road  
New City, New York 10956  
Tel Fax/Ans.: (845)634-1351  
E-Mail: RAAssoc@optonline.net

NORTH



## WATERSHED STREET MAP TOWN OF HAVERSTRAW ROCKLAND COUNTY NEW YORK

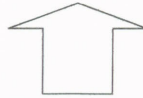
REF: SOIL SURVEY OF ROCKLAND COUNTY, NY, DATED OCT. 1990

# RA Associates

CONSULTING ENGINEERS / PLANNER

**Ray Ahmadi, Ph.D., P.E.**  
227 South Mountain Road  
New City, New York 10956  
Tel Fax/Ans.: (845)634-1351  
E-Mail: RAAssoc@optonline.net

**NORTH**



**WATERSHED SOIL MAP  
SCALE: 1"=2,000' +/-  
TOWN OF HAVERSTRAW  
ROCKLAND COUNTY  
NEW YORK**

REF: SOIL SURVEY OF ROCKLAND COUNTY, NY, DATED OCT. 1990

**MINISCEONGO PARK**

**N. Y. S. ROUTE 202  
TOWN OF HAVERSTRAW  
ROCKLAND COUNTY  
NEW YORK**

**TR-55 INPUT DATA  
FOR  
EXISTING CONDITION  
AND  
SITE DEVELOPED CONDITION**

**BY**

**RA ASSOCIATE CONSULTING ENGINEERS  
227 SOUTH MOUNTAIN ROAD  
NEW CITY, NEW YORK  
TEL / FAX (845)634-1351**

**DATE OF REPORT  
JULY 05, 2005**

**REVISED  
JULY 07, 2005**

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956

914 634-1351  
634-4106

JOB 1560

SHEET NO. 1 OF 1

CALCULATED BY RA DATE 6/29/05

CHECKED BY DATE

SCALE

LOCATION: NORTH-WEST OF THE INTERSECTION OF RTE 202 WITH PIP, IN THE TOWN OF HAVERSTRAW, NY.

SOILS: SAND PIT, HYDROLOGICAL SOIL GROUP OF "C".

WATERSHEDS: THE SITE USED TO BE A SAND PIT. THEREFORE, THE EAST & SOUTH EDGES OF THE PROPERTY HAVE STEEP SLOPES AND THE REST OF THE AREAS ARE FLAT UP TO THE SO. MINICEONGO CREEK.

THE DEVELOPED AREA WILL BE RAISED @ A SLOPE OF 1% SOUTH WEST TO NORTH EAST OF THE SITE.

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956

914 634-1351  
634-4106

JOB 1560  
SHEET NO. (2) OF \_\_\_\_\_  
CALCULATED BY \_\_\_\_\_ DATE \_\_\_\_\_  
CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
SCALE \_\_\_\_\_

EXISTING CONDITION

THE LIMIT OF THE WATERSHED IS SHOWN ON THE DRAINAGE MAP.

WS # 1

THE AREA OF THE WS # 1

$$\Rightarrow A = 34.85 \text{ ACS} \begin{cases} 0.24 \text{ GRAVEL RD.} \\ 34.61 \end{cases}$$

$$L_1 = 100 \text{ FT (OVER LAND FLOW)}$$

$$S_1 = \frac{449 - 411.8}{100} = 0.372$$

$$L_2 = 350 \text{ FT (CONCENTRATED FLOW)}$$

$$S_2 = \frac{411.8 - 406}{350} = 0.0166$$

$$L_3 = 1525 \text{ FT (CONCENTRATED FLOW)}$$

$$S_3 = \frac{406 - 396}{1525} = 0.0065$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

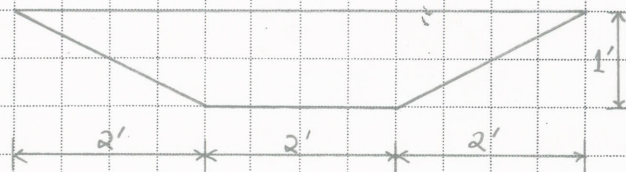
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914 634-1351  
634-4106

JOB 1560  
SHEET NO. (2) OF \_\_\_\_\_  
CALCULATED BY RH DATE \_\_\_\_\_  
CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
SCALE \_\_\_\_\_

$$L_4 = 120 \text{ FT (CHANNEL FLOW)}$$

$$S_4 = \frac{396 - 392}{120} = 0.033$$



THE CROSS SECTIONAL AREA OF THE CHANNEL

$$A = \frac{1}{2} (2 + 6) \times 1$$

$$\Rightarrow A = 4 \text{ SQ. FT.}$$

$$WP = 6 + 2 \times (\sqrt{2^2 + 1^2})$$

$$\Rightarrow WP = 6.5 \text{ FT.}$$

$$n = 0.035$$

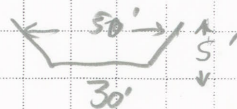
$L_5 = 1,250 \text{ LF To P.O. I in MINICEONGO CRK}$

$$S_5 = 0.001$$

$$A_{\text{CHL}} = 200$$

$$WP = 52.4$$

$$n = 0.035$$



Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
914 634-1351  
634-4106

JOB 1560

SHEET NO. (A) OF

CALCULATED BY RN DATE

CHECKED BY DATE

SCALE

WS #2

THE AREA OF THE WS#2,

$$A = 16.02 \text{ ACS}$$

$$L_1 = 100 \text{ FT (OVER LAND FLOW)}$$

$$S_1 = \frac{440 - 407}{100} = 0.33$$

$$L_2 = 330 \text{ FT (CONCENTRATED FLOW)}$$

$$S_2 = \frac{407 - 402}{330} = 0.0094$$

$$L_3 = 925 \text{ FT. (CONCENTRATED FLOW)}$$

$$S_3 = \frac{402 - 400.1}{925} = 0.0021$$

$$L_4 = 140 \text{ FT. (CHANNEL FLOW)}$$

$$S_4 = \frac{400.1 - 392}{140} = 0.0579$$

$$A = 4 \text{ #} \quad W_p = 6.5 \text{ FT} \quad n = 0.035$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956

914 634-1351  
634-4106

JOB \_\_\_\_\_

SHEET NO. 5 \_\_\_\_\_ OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE \_\_\_\_\_

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

$L_5 = 100$  FT. TO P.O.I ALONG MINICONGO CRK

$S_5 = 0.001$

$A = 200$  S.F.

$WP = 52.4$  FT

$n = 0.035$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINISCEONGO PARK (1560)

SHEET NO. 8 OF

CALCULATED BY RN DATE 10/12/05

CHECKED BY DATE

SCALE

DEVELOPED CONDITION

WS #1

$$A = 19.13 \text{ ACS}$$

$$A_{\text{IMP}} = 10.13 \text{ ACS "C"}$$

$$A_{\text{LAWN}} = 9.0 \text{ ACS "C" GOOD CONDITION}$$

$$L_1 = 100 \text{ LF (OVERLAND FLOW)}$$

$$S_1 = \frac{419 - 416.3}{100} = 0.027$$

$$L_2 = 75 \text{ LF (SHALLOW CONCENTRATED FLOW)}$$

$$S_2 = \frac{416.3 - 414.9}{75} = 0.0186$$

$$L_3 = 1025 \text{ LF (PIPE FLOW)}$$

$$S_3 = \frac{411.9 - 396}{1025} = 0.0155$$

DIAMETER OF THE PIPE.

$$D = 24" \text{ (RCP)}$$

$$A = \frac{\pi}{4} \times \left(\frac{24}{12}\right)^2 = 3.14 \text{ SQ. FT.}$$

$$W_p = \pi \times \frac{24}{12} = 6.28 \text{ LF}$$

$$n = 0.015$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINISCEONGO PARK (1560)

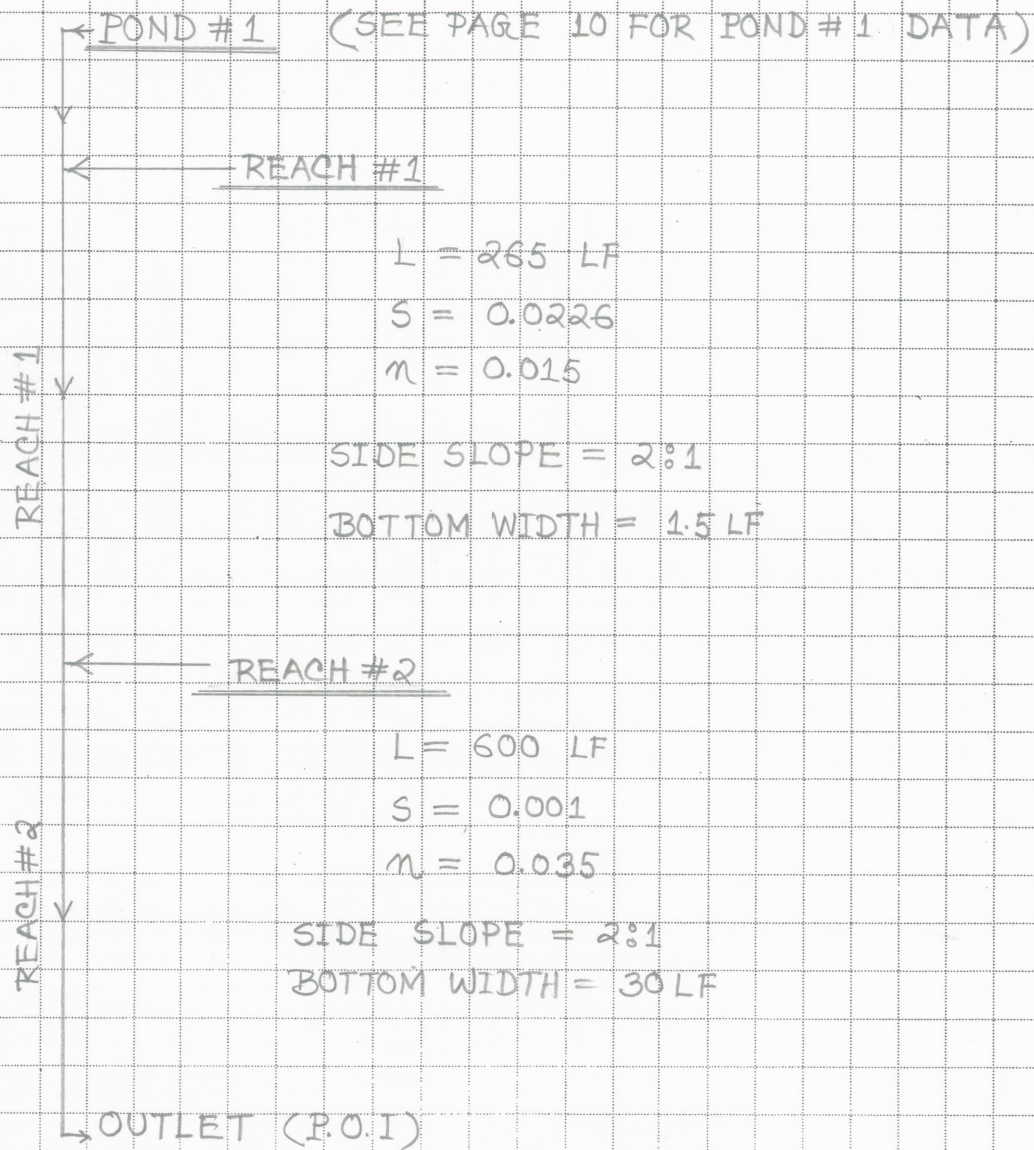
SHEET NO. 9 OF \_\_\_\_\_

CALCULATED BY RN DATE 10/12/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

THE FLOW IS RECEIVED BY POND #1 AND ROUTED THROUGH REACH #1 AND REACH #2 RESPECTIVELY. FINALLY IT GOES TO OUTLET.



Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINISCEONGO PARK (1560)

SHEET NO. 10 OF \_\_\_\_\_

CALCULATED BY RN DATE 10/12/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

WS #2

$$A = 6.65 \text{ ACS}$$

$$A_{\text{IMP}} = 3.42 \text{ ACS "C"}$$

$$A_{\text{LAWN}} = 3.23 \text{ ACS "C" GOOD CONDITION}$$

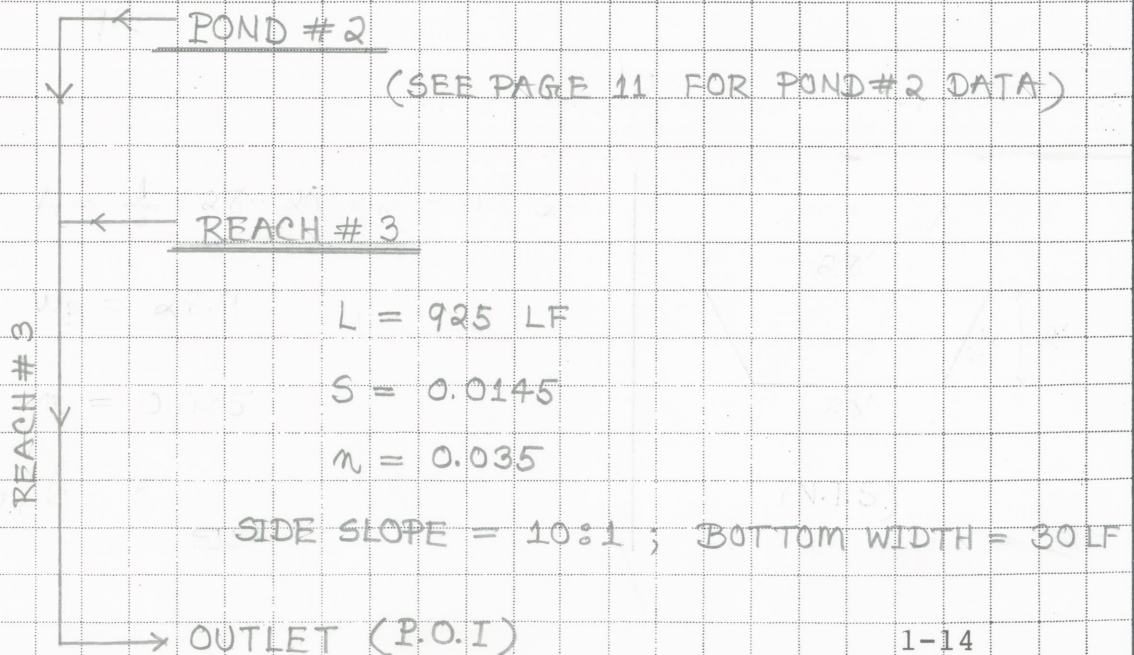
$$L_1 = 100 \text{ LF (OVERLAND FLOW)}$$

$$S_1 = \frac{417.5 - 416.5}{100} = 0.01$$

$$L_2 = 125 \text{ LF (SHALLOW CONCENTRATED FLOW)}$$

$$S_2 = \frac{416.5 - 408}{125} = 0.068$$

THE FLOW IS RECEIVED BY POND #2 AND ROUTED THROUGH REACH #3. FINALLY, IT GOES TO THE OUTLET (P.O.I).



Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINISCEONGO PARK (1560)

SHEET NO. 11 OF \_\_\_\_\_

CALCULATED BY RN DATE 10/12/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

WS#3

$$A = 8.05 \text{ ACS} \left\{ \begin{array}{l} A_{\text{IMP}} = 3.72 \text{ ACS "C"} \\ A_{\text{NATURAL}} = 0.69 \text{ ACS "C"} \text{ FAIR} \\ A_{\text{LAWN}} = 3.64 \text{ ACS "C"} \end{array} \right. \text{ GOOD CONDITION}$$

$$L_1 = 100 \text{ LF (OVERLAND FLOW)}$$

$$S_1 = \frac{420.1 - 419.1}{100} = 0.01$$

$$L_2 = 80 \text{ LF (SHALLOW CONCENTRATED FLOW)}$$

$$S_2 = \frac{419.1 - 418.5}{80} = 0.0075$$

$$L_3 = 480 \text{ LF (PIPE FLOW)}$$

$$S_3 = \frac{415.5 - 408}{480} = 0.0156$$

DIAMETER,  $D = 18''$  (RCP)

$$A = \frac{\pi}{4} \times \left(\frac{18}{12}\right)^2 = 1.77 \text{ S.F.}$$

$$W_p = \pi \times \frac{18}{12} = 4.71 \text{ LF}$$

$$n = 0.015$$

THE ACCUMULATED FLOW IS RECEIVED BY POND #3 AND ROUTED THROUGH REACH # 4, REACH # 5 RESPECTIVELY. THEN IT FLOWS

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINISCEONGO PARK (1560)

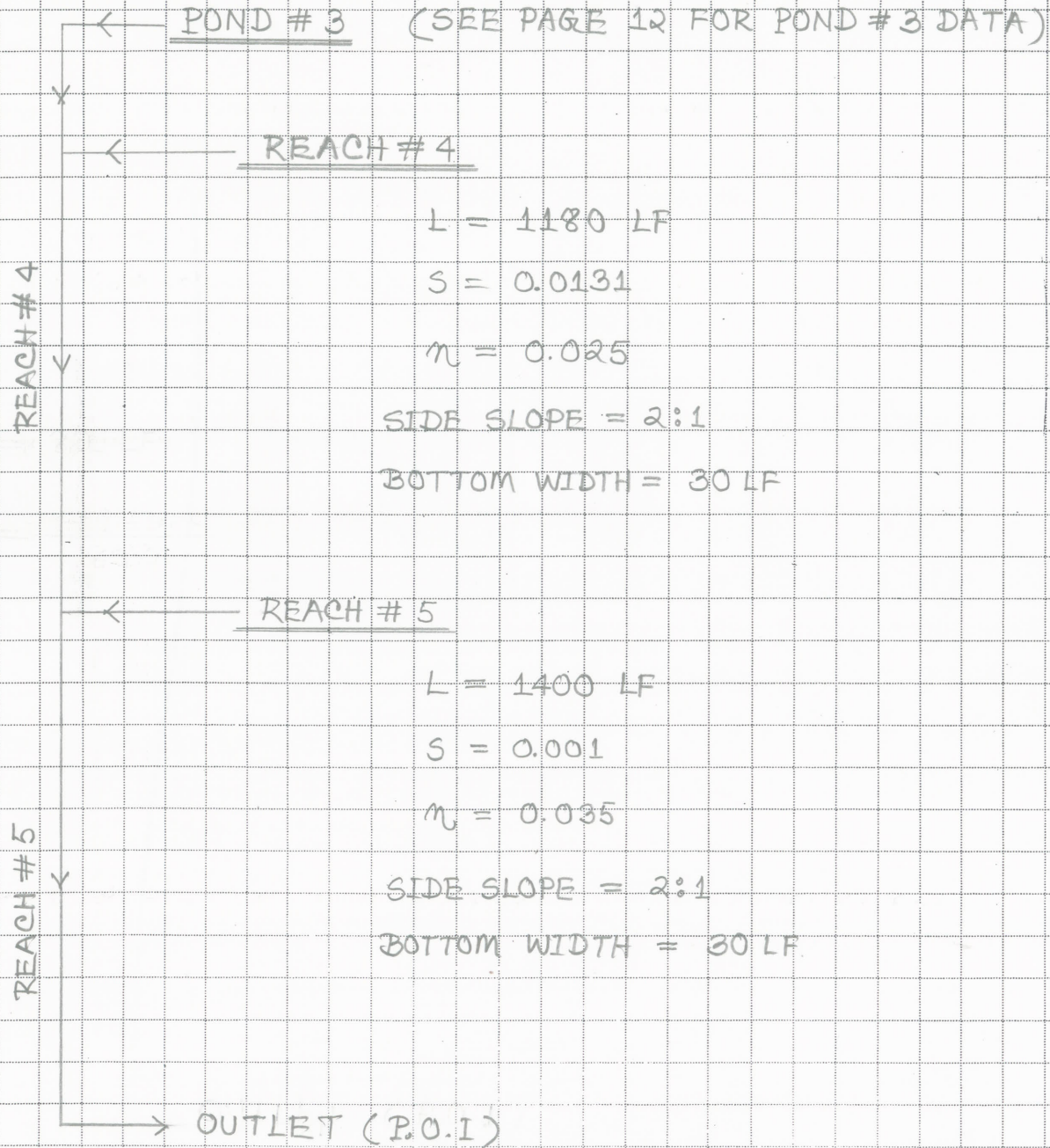
SHEET NO. 12 OF \_\_\_\_\_

CALCULATED BY RN DATE 10/12/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

TO THE OUTLET (POINT OF INTEREST)



Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINISCEONGO PARK (1560)

SHEET NO. 13 OF \_\_\_\_\_

CALCULATED BY RN DATE 10/12/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

WS #4

$$A = 0.95 \text{ ACS "C"}$$

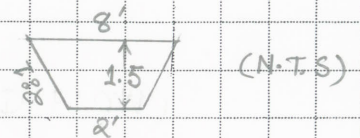
(SHURBS, FAIR CONDITION)

$$L_1 = 85 \text{ LF (OVERLAND FLOW)}$$

$$S_1 = \frac{440 - 408}{85} = 0.3765$$

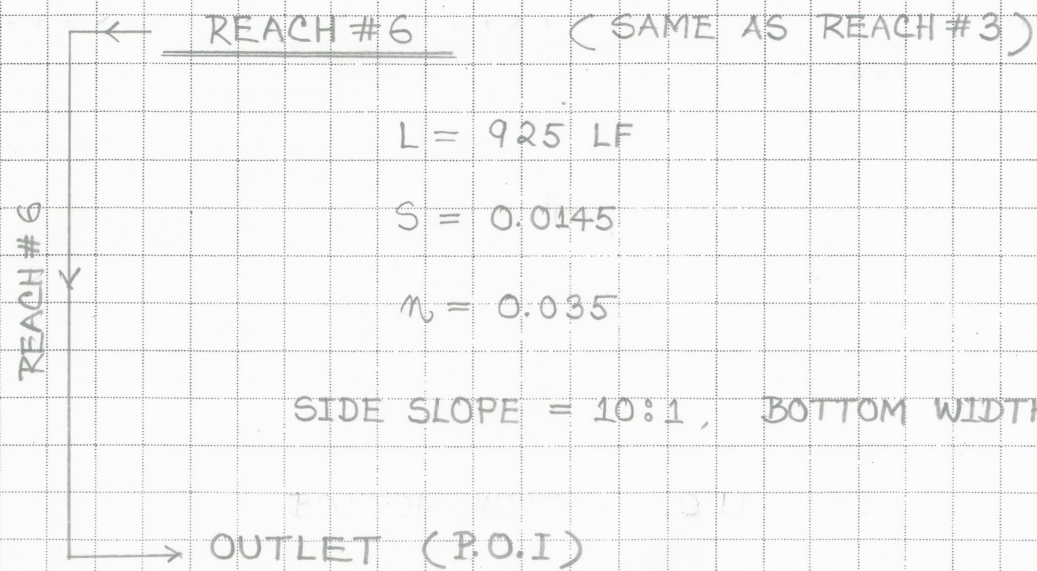
$$L_2 = 740 \text{ LF (CHANNEL FLOW)}$$

$$S_2 = \frac{408 - 402}{740} = 0.0081$$



$A = 7.50 \text{ S.F}$   
 $W_p = 8.7 \text{ LF}$   
 $n = 0.035$

THE FLOW FROM WS #4 GOES TO OUTLET THROUGH REACH # 6.



$$L = 925 \text{ LF}$$

$$S = 0.0145$$

$$n = 0.035$$

SIDE SLOPE = 10:1, BOTTOM WIDTH = 30 LF

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINISCEONGO PARK (1560)

SHEET NO. 14 OF \_\_\_\_\_

CALCULATED BY RN DATE 10/12/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

WS#5

$$A = 9.98 \text{ ACS} \left\{ \begin{array}{l} A_{\text{IMP}} = 0.35 \text{ ACS "C"} \\ A_{\text{LAWN}} = 0.36 \text{ ACS "C"} \text{ GOOD} \\ A_{\text{NATURAL}} = 9.27 \text{ ACS "C"} \text{ FAIR} \end{array} \right.$$

$$L_1 = 100 \text{ LF (OVERLAND FLOW)}$$

$$S_1 = \frac{402.5 - 402}{100} = 0.005$$

$$L_2 = 650 \text{ LF (SHALLOW CONCENTRATED FLOW)}$$

$$S_2 = \frac{402 - 400}{650} = 0.003$$

$$L_3 = 75 \text{ LF (SHALLOW CONCENTRATED FLOW)}$$

$$S_3 = \frac{400 - 392}{75} = 0.106$$

$$L_4 = 75 \text{ LF (CHANNEL FLOW)}$$

$$S_4 = 0.001$$

$$A = 200 \text{ S.F.}$$

$$W_p = 52.4 \text{ LF}$$

$$n = 0.035$$



THE ACCUMULATED FLOW GOES TO  
THE OUTLET (P.O.I)

(N.T.S)

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINISCEONGO PARK (1560)

SHEET NO. 15 OF \_\_\_\_\_

CALCULATED BY RN DATE 10/12/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

WS# 6

$$A = 6.14 \text{ ACS}$$

$$A_{\text{IMP}} = 0.26 \text{ ACS "C"}$$

$$A_{\text{LAWN}} = 0.68 \text{ ACS "C" (GOOD)}$$

$$A_{\text{NATURAL}} = 5.2 \text{ ACS "C" (FAIR)}$$

$$L_1 = 100 \text{ LF (OVERLAND FLOW)}$$

$$S_1 = \frac{409 - 406}{100} = 0.03$$

$$L_2 = 85 \text{ LF (SHALLOW CONCENTRATED FLOW)}$$

$$S_2 = \frac{406 - 398}{85} = 0.0941 \text{ (TOP C.B)}$$

$$L_3 = 925 \text{ LF (CHANNEL + PIPE FLOW)}$$

$$S_3 = \frac{395 - 391}{925} = 0.0043$$

$$A = \frac{1}{2} (7+1) \times 1.5$$

$$\Rightarrow A = 6 \text{ S.F}$$

$$W_p = 7.71 \text{ LF}$$

$$n = 0.025$$



(N.T.S)

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINISCEONGO PARK (1560)

SHEET NO. 16 OF \_\_\_\_\_

CALCULATED BY RN DATE 10/12/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

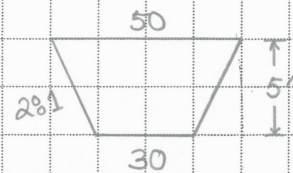
$$L_4 = 775 \text{ LF (CHANNEL FLOW)}$$

$$S_4 = 0.001$$

$$A = 200 \text{ S.F.}$$

$$W_p = 52.4 \text{ LF}$$

$$n = 0.035$$



THE ACCUMULATED FLOW FROM WS #6 IS RECEIVED BY REACH #7 AND GOES TO THE POINT OF INTEREST (OUTLET)

← REACH #7 (SAME AS REACH #2)

$$L = 600$$

$$S = 0.001$$

$$n = 0.035$$

SIDE SLOPE = 2:1

BOTTOM WIDTH = 30 LF

REACH #7

→ OUTLET (P.O.I)

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINISCEONGO PARK (1560)

SHEET NO. 17 OF \_\_\_\_\_

CALCULATED BY RN DATE 10/12/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

## STORAGE CALCULATION

IN ORDER TO PROVIDE ZERO NET INCREASE OF PEAK RUNOFF,  
THREE DETENTION PONDS ARE PROPOSED AT WS#1, WS#2 & WS#3  
RESPECTIVELY. THOSE PONDS ARE DESIGNED TO FUNCTION AS WATER QUALITY  
PONDS AS WELL AS DETENTION BASINS.

### POND #1

THE BOTTOM AREA @ 396 FT. EL. = 19166 S.F

THE TOP AREA @ 402 FT. EL. = 32670 S.F

THE STORAGE VOLUME,

$$V = \left( \frac{19166 + 32670}{2} \right) \times 6$$

$$\Rightarrow \boxed{V = 3.57 \text{ ACS FT}}$$

THE POND #1 IS CONNECTED REACH #1.

(SEE PAGE 2 FOR REACH #1 DATA)

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINISCEONGO PARK (1560)

SHEET NO. 18 OF \_\_\_\_\_

CALCULATED BY RN DATE 10/12/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

POND # 2

THE BOTTOM AREA @ 402 FT. EL. = 4185 S.F.

THE TOP AREA @ 406 FT. EL. = 20653 S.F.

THE STORAGE

$$V = \left( \frac{4185 + 20653}{2} \right) \times 4$$

$$\Rightarrow \boxed{V = 1.14 \text{ AC.FT}}$$

THE ACCUMULATED FLOW FROM WS#2 IS RECEIVED BY POND #2. THE REACH #3 IS CONNECTED TO THE POND #2. THIS IS THE WAY THE FLOW GOES TO THE P.O.I.

(SEE PAGE 3 FOR REACH #3 DATA)

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINISCEONGO PARK (1560)

SHEET NO. 19 OF \_\_\_\_\_

CALCULATED BY RN DATE 10/12/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

POND #3

THE BOTTOM AREA @ 406 FT. EL. = 8254 S.F.

THE TOP AREA @ 410 FT. EL. = 34022 S.F.

THE STORAGE VOLUME,

$$V = \left( \frac{8254 + 34022}{2} \right) \times 4$$

$$\Rightarrow V = 1.94 \text{ AC.FT.}$$

THE FLOW FROM WS #3 GOES TO POND #3. THE REACH #4 IS CONNECTED TO THE POND #3. THE FLOW GOES THROUGH REACH #4, REACH #5 AND OUTLET RESPECTIVELY.

( SEE PAGE 5 FOR REACH #4 DATA )



# **MINISCEONGO PARK**

**N.Y.S. ROUTE 202  
TOWN OF HAVERSTRAW  
ROCKLAND COUNTY  
NEW YORK**

**TR-55 OUTPUT DATA  
AND  
HYDROGRAPHS  
FOR  
EXISTING CONDITION  
(1, 2, 5, 10, 25, 50 & 100-YEAR STORMS)**

**BY**

**RA ASSOCIATE CONSULTING ENGINEERS  
227 SOUTH MOUNTAIN ROAD  
NEW CITY, NEW YORK  
TEL / FAX (845)634-1351**

**DATE OF REPORT  
JULY 05, 2005**

**REVISED  
JULY 07, 2005**

WinTR-55 Current Data Description

--- Identification Data ---

User: RA Assoc. Date: 7/8/2005  
 Project: Miniceongo Park (1560) Units: English  
 SubTitle: Existing Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms Areal Units: Acres  
 State: New York  
 County: Rockland  
 Filename: \\Server\primary share\hydrology TR-55\1560\Existing Condition.w55

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
WS#1	Watershed #1	Outlet	34.85	70	.533
WS#2	Watershed #2	Outlet	16.02	70	.506

Total area: 50.87 (ac)

--- Storm Data ---

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.5	4.5	5.0	6.0	7.0	7.5	2.7

Storm Data Source: Rockland County, NY (NRCS)  
 Rainfall Distribution Type: Type III  
 Dimensionless Unit Hydrograph: <standard>

RA Assoc.

Miniceongo Park (1560)  
Existing Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
Rockland County, New York

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.5	4.5	5.0	6.0	7.0	7.5	2.7

Storm Data Source: Rockland County, NY (NRCS)  
Rainfall Distribution Type: Type III  
Dimensionless Unit Hydrograph: <standard>

RA Assoc.

Miniceongo Park (1560)  
Existing Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
Rockland County, New York

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period						
	2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)	1-Yr (cfs)
-----							
SUBAREAS							
WS#1	21.24	36.95	45.53	63.57	82.49	92.06	10.51
WS#2	9.99	17.39	21.43	29.90	38.79	43.35	4.94
REACHES							
OUTLET	31.14	54.34	66.76	93.28	120.97	135.14	15.42

RA Assoc.

Miniceongo Park (1560)  
Existing Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
Rockland County, New York

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period						
	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)	1-Yr (cfs) (hr)
-----							
SUBAREAS							
WS#1	21.24 12.41	36.95 12.39	45.53 12.39	63.57 12.39	82.49 12.38	92.06 12.39	10.51 12.45
WS#2	9.99 12.40	17.39 12.39	21.43 12.37	29.90 12.37	38.79 12.36	43.35 12.36	4.94 12.44
REACHES							
OUTLET	31.14	54.34	66.76	93.28	120.97	135.14	15.42

RA Assoc.

Miniceongo Park (1560)  
Existing Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
Rockland County, New York

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
WS#1	34.85	0.533	70	Outlet	Watershed #1
WS#2	16.02	0.506	70	Outlet	Watershed #2

Total Area: 50.87 (ac)

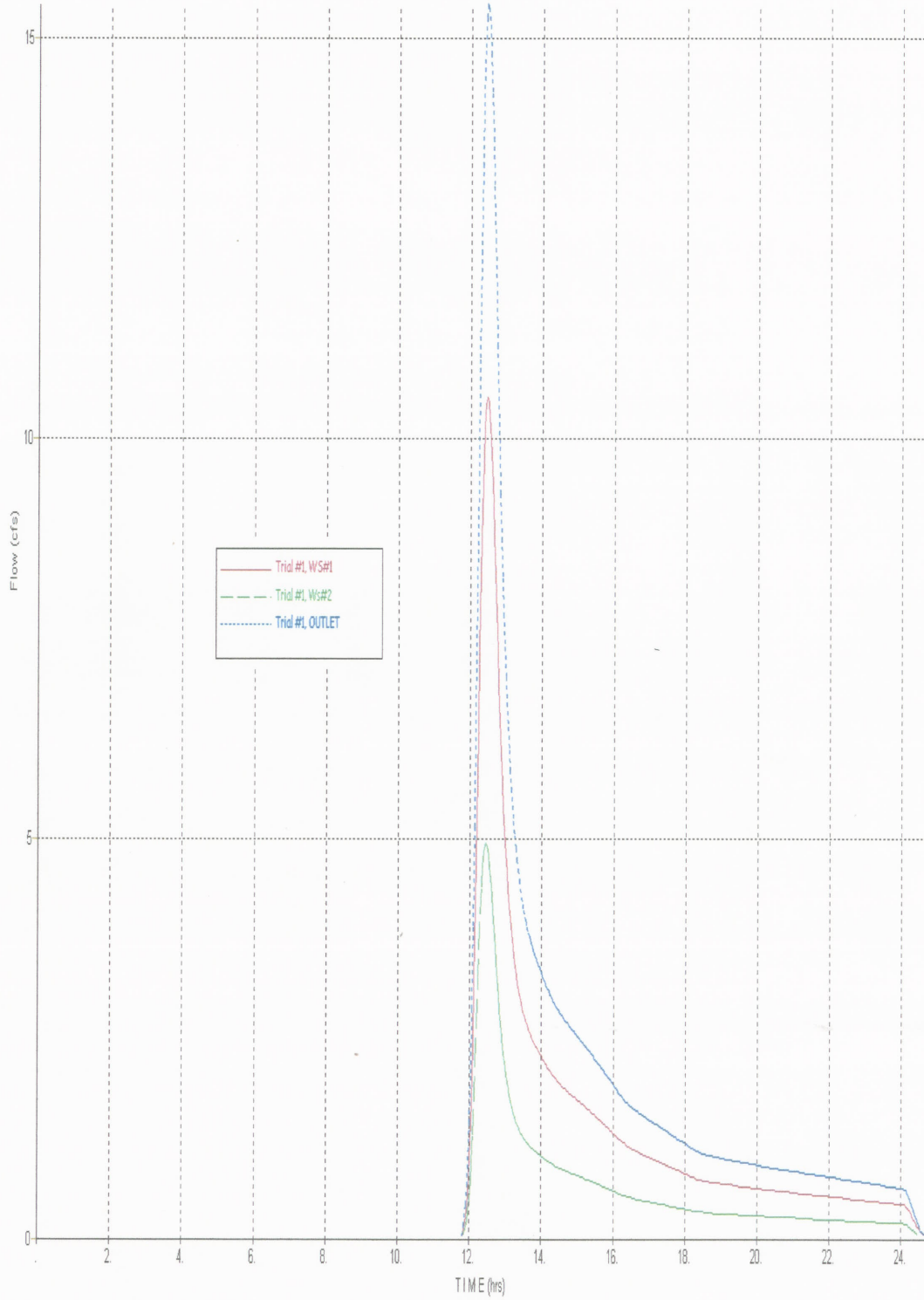


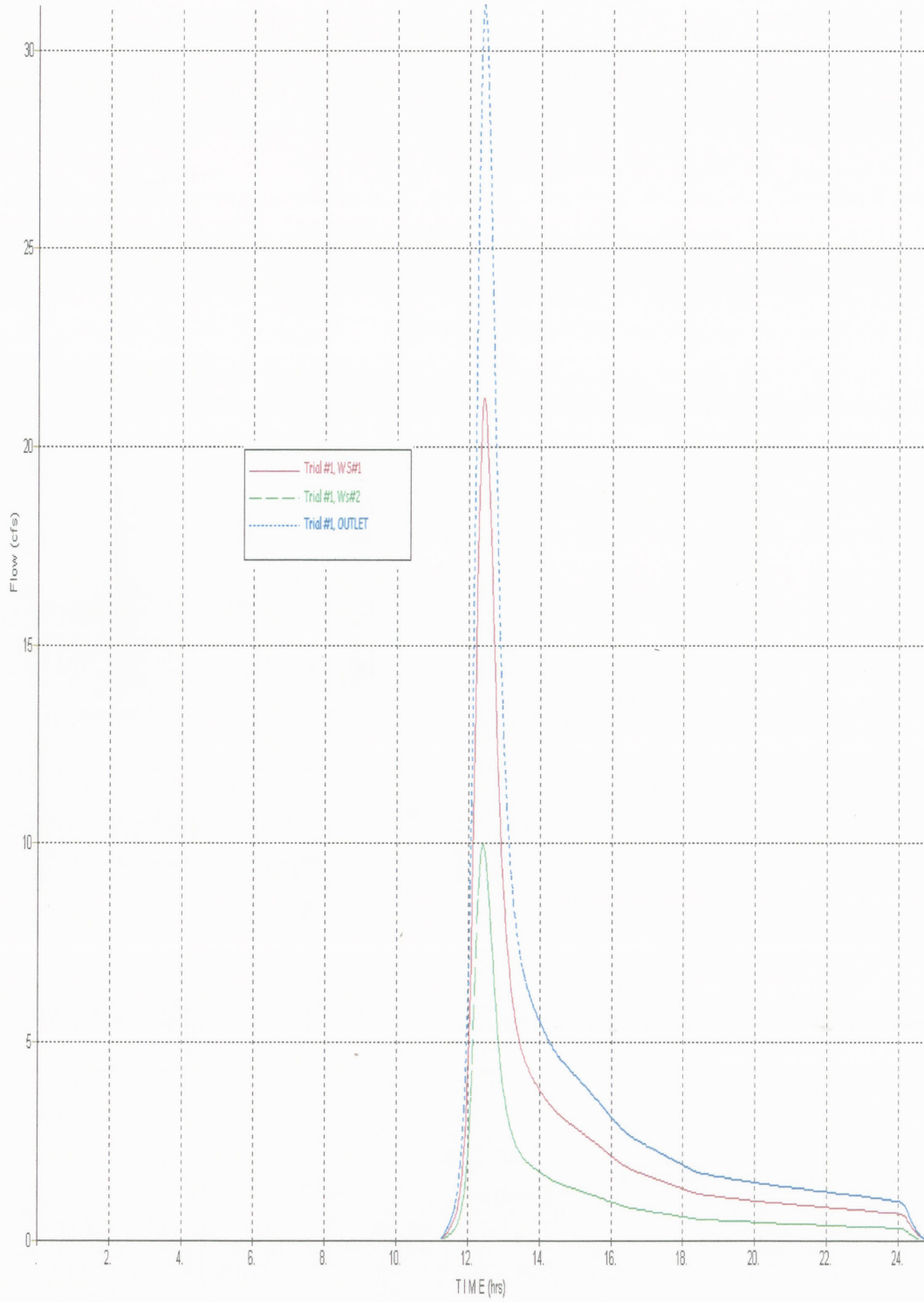
RA Assoc.

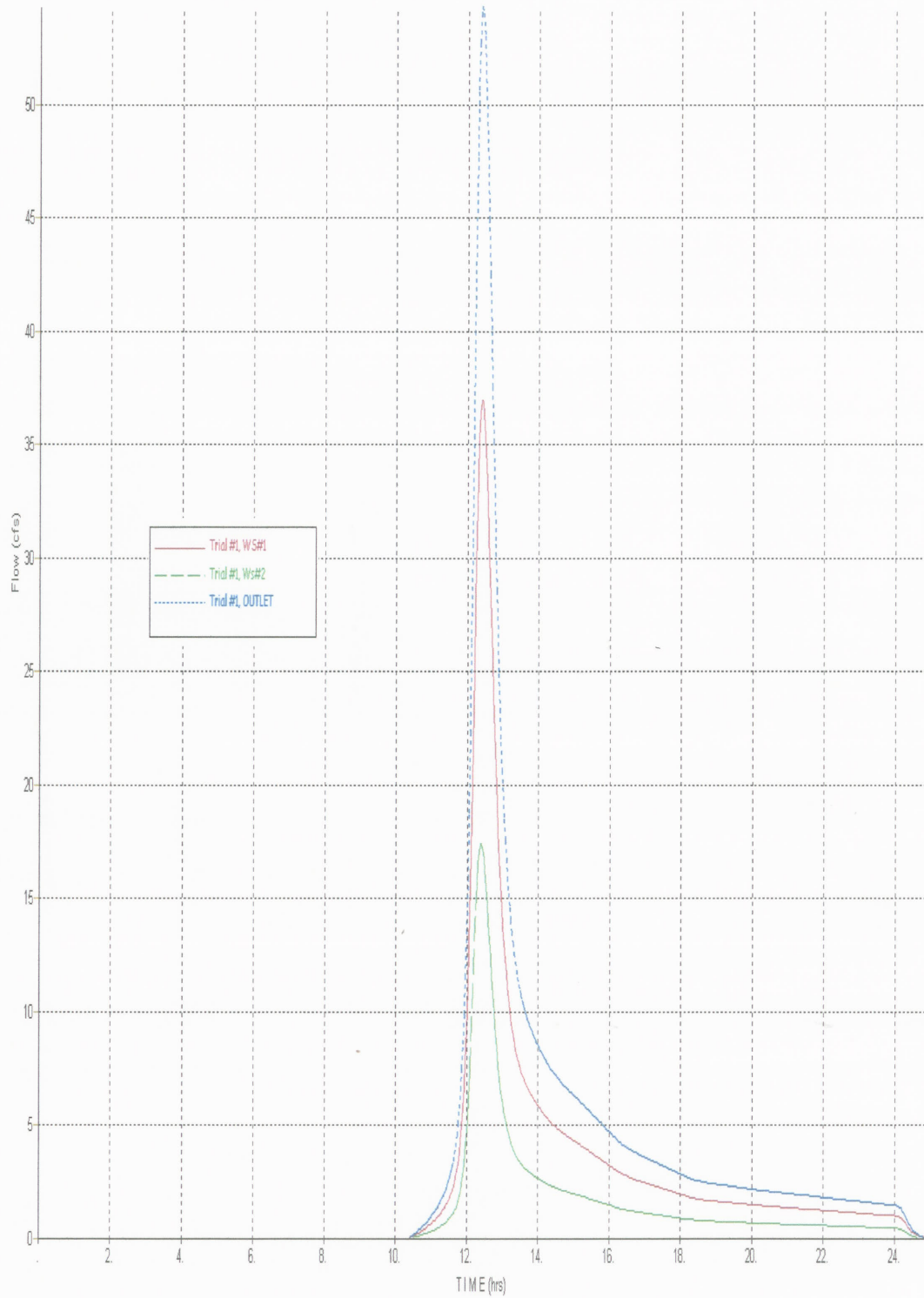
Miniceongo Park (1560)  
Existing Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
Rockland County, New York

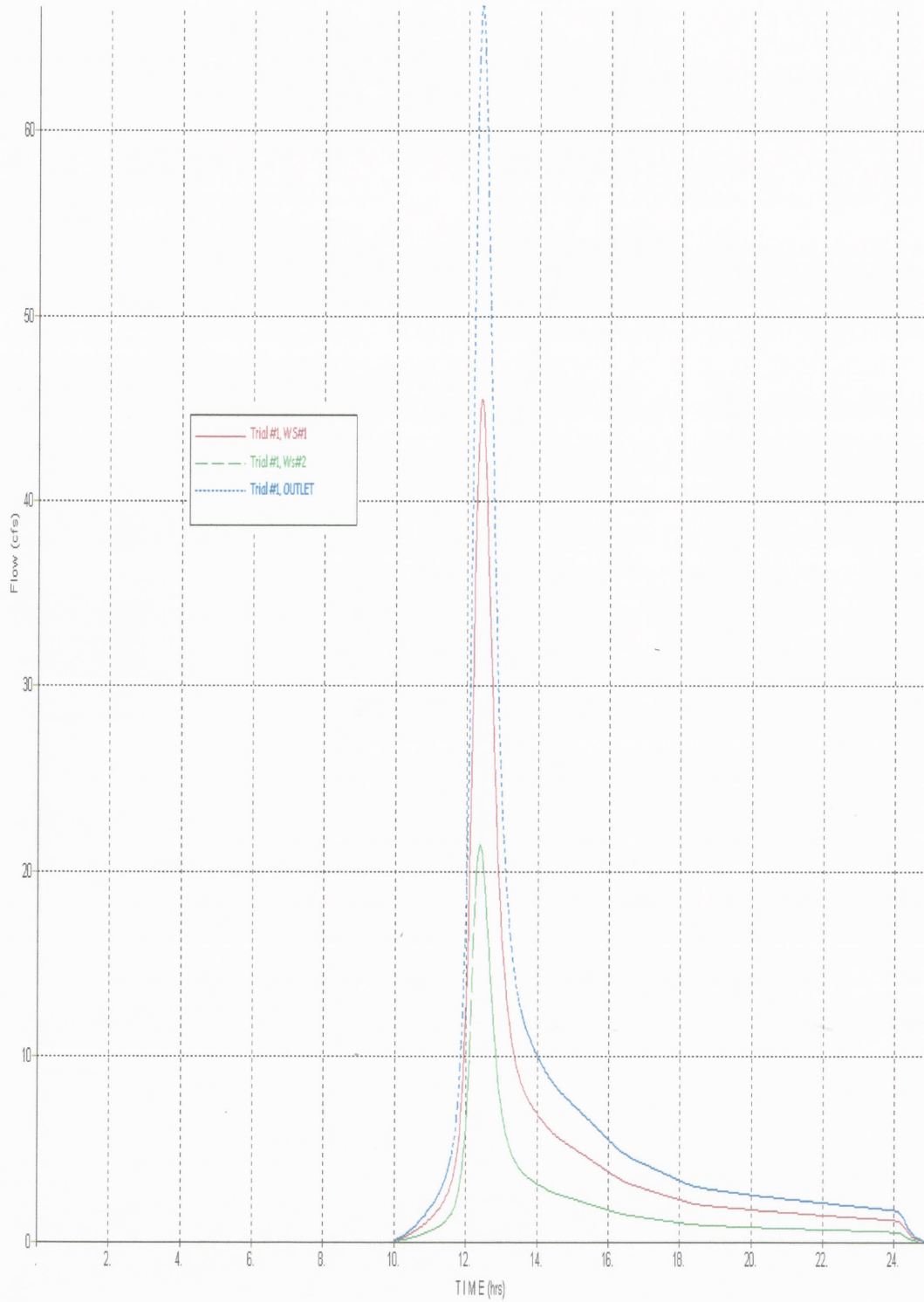
Sub-Area Land Use and Curve Number Details

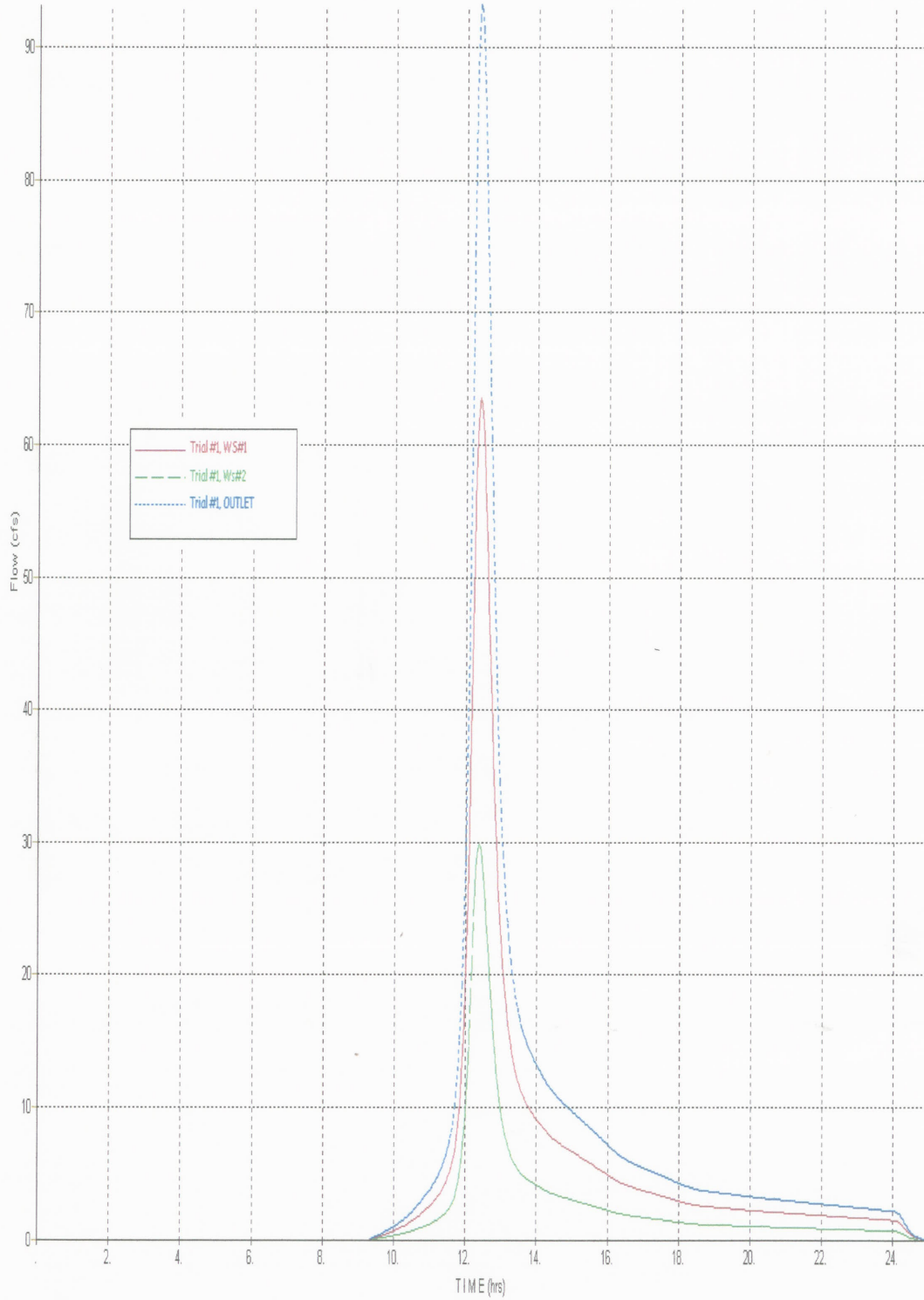
Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
WS#1	Gravel (w/ right-of-way)	C	.24	89
	Brush - brush, weed, grass mix	(fair) C	34.61	70
	Total Area / Weighted Curve Number			34.85
			=====	==
Ws#2	Brush - brush, weed, grass mix	(fair) C	16.02	70
	Total Area / Weighted Curve Number		16.02	70
			=====	==

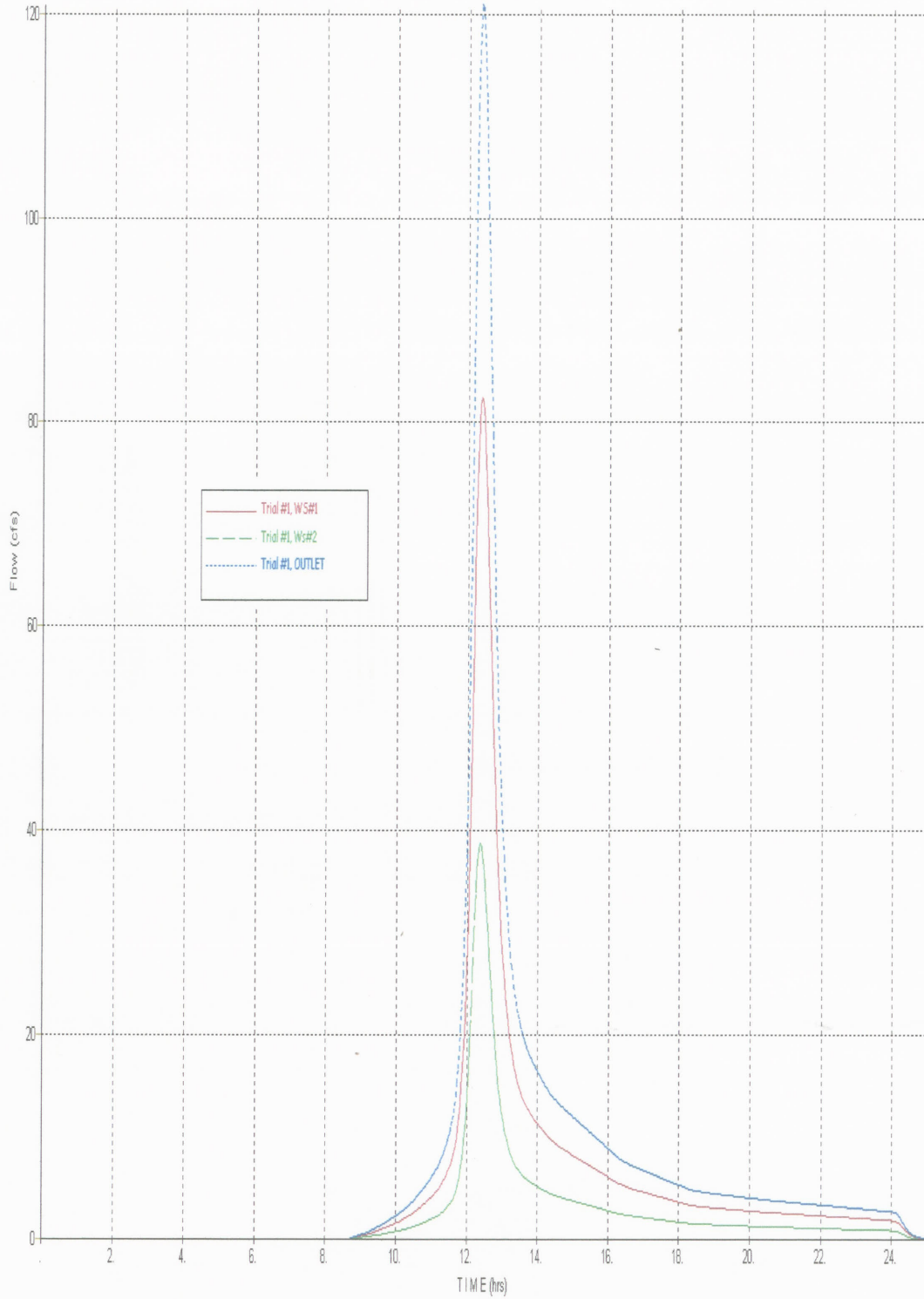


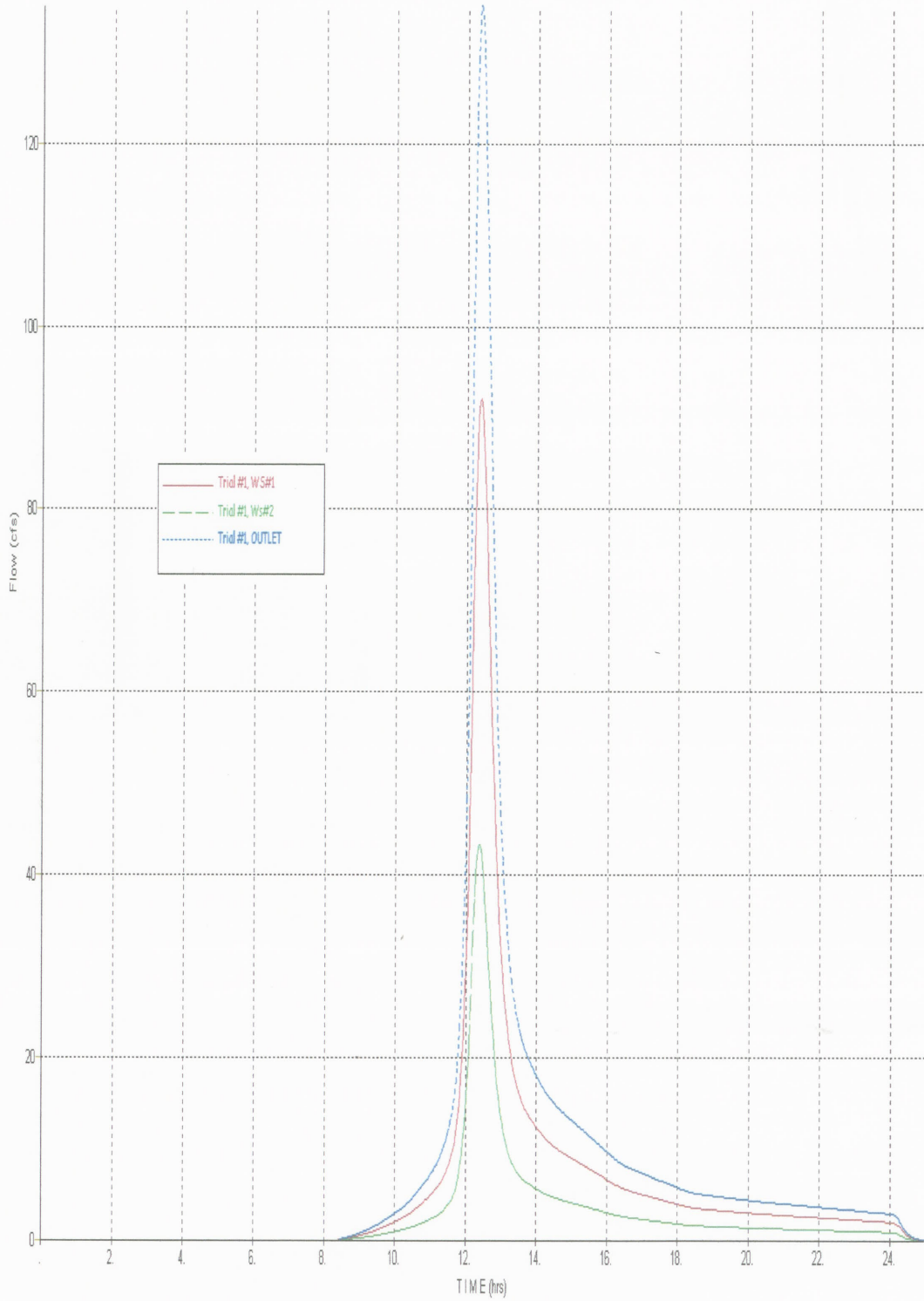












**MINISCEONGO PARK**

**N.Y.S. ROUTE 202  
TOWN OF HAVERSTRAW  
ROCKLAND COUNTY  
NEW YORK**

**TR-55 OUTPUT DATA  
AND  
HYDROGRAPHS  
FOR  
SITE DEVELOPED WITH STORAGE  
(1, 2, 5, 10, 25, 50 & 100-YEAR STORMS)**

**BY**

**RA ASSOCIATE CONSULTING ENGINEERS  
227 SOUTH MOUNTAIN ROAD  
NEW CITY, NEW YORK  
TEL / FAX (845)634-1351**

**DATE OF REPORT  
JULY 05, 2005**

**REVISED  
JULY 07, 2005**

## REACH FLOW PATH

Outlet

Reach#2 {Length=600 ft}

Reach#1 {Length=265 ft}

Pond#1 {Structure=Pond#1}

WS#1 {Area = 19.13 ac, CN = 87, Tc = 0.184}

Reach#3 {Length=925 ft}

Pond#2 {Structure=Pond#2}

WS#2 {Area = 6.65 ac, CN = 86, Tc = 0.214}

Reach#5 {Length=1400 ft}

Reach#4 {Length=1180 ft}

Pond#3 {Structure=Pond#3}

WS#3 {Area = 8.05 ac, CN = 85, Tc = 0.238}

Reach#6 {Length=925 ft}

WS#4 {Area = 0.95 ac, CN = 70, Tc = 0.101}

Reach#7 {Length=600 ft}

WS#6 {Area = 6.14 ac, CN = 72, Tc = 0.281}

WS#5 {Area = 9.98 ac, CN = 71, Tc = .486}

RA Assoc.

Miniceongo Park (1560)  
 Developed Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
 Rockland County, New York

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
WS#1	Open space; grass cover > 75%	(good)	C	9	74
	Paved parking lots, roofs, driveways		C	10.13	98
	Total Area / Weighted Curve Number				19.13
				=====	==
Ws#2	Open space; grass cover > 75%	(good)	C	3.23	74
	Paved parking lots, roofs, driveways		C	3.42	98
	Total Area / Weighted Curve Number				6.65
				=====	==
WS#3	Open space; grass cover > 75%	(good)	C	3.64	74
	Paved parking lots, roofs, driveways		C	3.72	98
	Brush - brush, weed, grass mix	(fair)	C	.69	70
	Total Area / Weighted Curve Number				8.05
				=====	==
WS#4	Brush - brush, weed, grass mix	(fair)	C	.95	70
	Total Area / Weighted Curve Number				.95
				=====	==
WS#5	Open space; grass cover > 75%	(good)	C	.36	74
	Paved parking lots, roofs, driveways		C	.35	98
	Brush - brush, weed, grass mix	(fair)	C	9.27	70
	Total Area / Weighted Curve Number				9.98
				=====	==
WS#6	Open space; grass cover > 75%	(good)	C	.68	74
	Paved parking lots, roofs, driveways		C	.26	98
	Brush - brush, weed, grass mix	(fair)	C	5.2	70
	Total Area / Weighted Curve Number				6.14
				=====	==

RA Assoc.

Miniceongo Park (1560)  
 Developed Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
 Rockland County, New York

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
-----							
WS#1							
SHEET	100	0.0270	0.150				0.138
SHALLOW	75	0.0186	0.050				0.009
CHANNEL	1025	0.0155	0.015	3.14	6.28	7.695	0.037
							Time of Concentration
							0.184
							=====
WS#2							
SHEET	100	0.0100	0.150				0.206
SHALLOW	125	0.0680	0.050				0.008
							Time of Concentration
							0.214
							=====
WS#3							
SHEET	100	0.0100	0.150				0.206
SHALLOW	80	0.0150	0.050				0.011
CHANNEL	480	0.0156	0.015	1.77	4.71	6.349	0.021
							Time of Concentration
							0.238
							=====
WS#4							
SHEET	85	0.3765	0.150				0.042
CHANNEL	740	0.0081	0.035	7.50	8.70	3.484	0.059
							Time of Concentration
							0.101
							=====
WS#5							
SHEET	100	0.0050	0.150				0.272
SHALLOW	650	0.0030	0.050				0.204
SHALLOW	75	0.1060	0.050				0.004
CHANNEL	75	0.0010	0.035	200.00	52.40	3.472	0.006
							Time of Concentration
							.486
							=====
WS#6							
SHEET	100	0.0300	0.150				0.133
SHALLOW	85	0.0941	0.050				0.005
CHANNEL	925	0.0043	0.025	6.00	7.71	3.294	0.078
CHANNEL	775	0.0010	0.035	200.00	52.40	3.312	0.065
							Time of Concentration
							0.281
							=====

WinTR-55 Current Data Description

--- Identification Data ---

User: RA Assoc. Date: 10/13/2005  
 Project: Miniceongo Park (1560) Units: English  
 SubTitle: Developed Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms Areal Units: Acres  
 State: New York  
 County: Rockland  
 Filename: P:\hydrology TR-55\1560\Sto-10-10-05 (Check\_ss).w55

--- Sub-Area Data ---

Name	Description	Reach	Area (ac)	RCN	Tc
WS#1	Fully Developed TownhousePond#1		19.13	87	0.184
WS#2	North Section of TownhousePond#2		6.65	86	0.214
WS#3	South sec. of Townhouses Pond#3		8.05	85	0.238
WS#4	Barr Lab embankment	Reach#6	0.95	70	0.101
WS#5	North Wetland Area	Outlet	9.98	71	.486
WS#6	South-West Wetland	Reach#7	6.14	72	0.281

Total area: 50.90 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.5	4.5	5.0	6.0	7.0	7.5	2.7

Storm Data Source: Rockland County, NY (NRCS)  
 Rainfall Distribution Type: Type III  
 Dimensionless Unit Hydrograph: <standard>

RA Assoc.

Miniceongo Park (1560)  
Developed Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
Rockland County, New York

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
WS#1	19.13	0.184	87	Pond#1	Fully Developed Townhouse
WS#2	6.65	0.214	86	Pond#2	North Section of Townhouse
WS#3	8.05	0.238	85	Pond#3	South sec. of Townhouses
WS#4	.95	0.101	70	Reach#6	Barr Lab embankment
WS#5	9.98	0.486	71	Outlet	North Wetland Area
WS#6	6.14	0.281	72	Reach#7	South-West Wetland

Total Area: 50.90 (ac)

RA Assoc.

Miniceongo Park (1560)  
Developed Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
Rockland County, New York

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.5	4.5	5.0	6.0	7.0	7.5	2.7

Storm Data Source: Rockland County, NY (NRCS)  
Rainfall Distribution Type: Type III  
Dimensionless Unit Hydrograph: <standard>

RA Assoc.

Miniceongo Park (1560)  
 Developed Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
 Rockland County, New York

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period						
	2-Yr (cfs)	5-Yr (cfs)	10-Yr (cfs)	25-Yr (cfs)	50-Yr (cfs)	100-Yr (cfs)	1-Yr (cfs)
-----							
SUBAREAS							
WS#1	39.06	54.88	62.85	78.70	94.47	102.35	26.68
WS#2	12.64	17.95	20.62	25.95	31.28	33.97	8.50
WS#3	14.31	20.51	23.64	29.97	36.28	39.42	9.50
WS#4	0.95	1.63	1.99	2.75	3.54	3.94	0.48
WS#5	6.76	11.58	14.18	19.63	25.30	28.23	3.44
WS#6	5.45	9.19	11.18	15.36	19.71	21.93	2.84
REACHES							
Pond#1	39.06	54.88	62.85	78.70	94.47	102.35	26.68
Down	10.79	16.33	19.10	24.58	30.45	33.38	6.36
Reach#1	10.79	16.33	19.10	24.58	30.45	33.38	6.36
Down	10.79	16.33	19.10	24.58	30.45	33.37	6.36
Reach#2	10.79	16.33	19.10	24.58	30.45	33.37	6.36
Down	10.67	16.14	18.88	24.32	30.10	32.99	6.33
Pond#2	12.64	17.95	20.62	25.95	31.28	33.97	8.50
Down	4.19	5.83	6.66	8.34	10.03	10.88	2.78
Reach#3	4.19	5.83	6.66	8.34	10.03	10.88	2.78
Down	4.19	5.83	6.66	8.34	10.03	10.87	2.78
Pond#3	14.31	20.51	23.64	29.97	36.28	39.42	9.50
Down	3.32	4.82	5.55	7.03	8.52	9.27	2.09
Reach#4	3.32	4.82	5.55	7.03	8.52	9.27	2.09
Down	3.32	4.82	5.55	7.03	8.52	9.27	2.09
Reach#5	3.32	4.82	5.55	7.03	8.52	9.27	2.09
Down	3.30	4.79	5.52	6.98	8.44	9.17	2.09
Reach#6	0.95	1.63	1.99	2.75	3.54	3.94	0.48
Down	0.95	1.62	1.99	2.74	3.54	3.94	0.48
Reach#7	5.45	9.19	11.18	15.36	19.71	21.93	2.84
Down	5.16	8.44	10.15	13.86	17.92	19.97	2.77
OUTLET	26.56	42.07	50.19	66.76	83.90	92.60	15.32

RA Assoc.

Miniceongo Park (1560)  
 Developed Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
 Rockland County, New York

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period						
	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)	1-Yr (cfs) (hr)
-----							
SUBAREAS							
WS#1	39.06 12.14	54.88 12.14	62.85 12.14	78.70 12.14	94.47 12.15	102.35 12.14	26.68 12.15
WS#2	12.64 12.16	17.95 12.16	20.62 12.16	25.95 12.15	31.28 12.16	33.97 12.15	8.50 12.16
WS#3	14.31 12.17	20.51 12.17	23.64 12.18	29.97 12.18	36.28 12.17	39.42 12.17	9.50 12.18
WS#4	0.95 12.12	1.63 12.12	1.99 12.12	2.75 12.12	3.54 12.11	3.94 12.11	0.48 12.13
WS#5	6.76 12.39	11.58 12.36	14.18 12.36	19.63 12.35	25.30 12.34	28.23 12.34	3.44 12.42
WS#6	5.45 12.22	9.19 12.21	11.18 12.22	15.36 12.21	19.71 12.20	21.93 12.20	2.84 12.23
REACHES							
Pond#1	39.06 12.14	54.88 12.14	62.85 12.14	78.70 12.14	94.47 12.15	102.35 12.14	26.68 12.15
Down	10.79 12.57	16.33 12.54	19.10 12.53	24.58 12.52	30.45 12.51	33.38 12.50	6.36 12.61
Reach#1	10.79 12.57	16.33 12.54	19.10 12.53	24.58 12.52	30.45 12.51	33.38 12.50	6.36 12.61
Down	10.79 12.57	16.33 12.55	19.10 12.54	24.58 12.53	30.45 12.52	33.37 12.50	6.36 12.62
Reach#2	10.79 12.57	16.33 12.55	19.10 12.54	24.58 12.53	30.45 12.52	33.37 12.50	6.36 12.62
Down	10.67 12.71	16.14 12.68	18.88 12.66	24.32 12.63	30.10 12.61	32.99 12.61	6.33 12.76
Pond#2	12.64 12.16	17.95 12.16	20.62 12.16	25.95 12.15	31.28 12.16	33.97 12.15	8.50 12.16
Down	4.19 12.55	5.83 12.55	6.66 12.55	8.34 12.54	10.03 12.55	10.88 12.55	2.78 12.57
Reach#3	4.19 12.55	5.83 12.55	6.66 12.55	8.34 12.54	10.03 12.55	10.88 12.55	2.78 12.57
Down	4.19 12.62	5.83 12.62	6.66 12.62	8.34 12.61	10.03 12.61	10.87 12.60	2.78 12.63
Pond#3	14.31 12.17	20.51 12.17	23.64 12.18	29.97 12.18	36.28 12.17	39.42 12.17	9.50 12.18
Down	3.32 12.70	4.82 12.68	5.55 12.68	7.03 12.67	8.52 12.67	9.27 12.66	2.09 12.73
Reach#4	3.32	4.82	5.55	7.03	8.52	9.27	2.09

RA Assoc.

Miniceongo Park (1560)  
 Developed Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
 Rockland County, New York

Hydrograph Peak/Peak Time Table (continued)

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period						
	2-Yr (cfs) (hr)	5-Yr (cfs) (hr)	10-Yr (cfs) (hr)	25-Yr (cfs) (hr)	50-Yr (cfs) (hr)	100-Yr (cfs) (hr)	1-Yr (cfs) (hr)
Down	12.70 3.32 12.74	12.68 4.82 12.72	12.68 5.55 12.72	12.67 7.03 12.72	12.67 8.52 12.72	12.66 9.27 12.71	12.73 2.09 12.78
Reach#5	3.32 12.74	4.82 12.72	5.55 12.72	7.03 12.72	8.52 12.72	9.27 12.71	2.09 12.78
Down	3.30 13.06	4.79 13.05	5.52 13.05	6.98 13.05	8.44 13.05	9.17 13.05	2.09 13.10
Reach#6	0.95 12.12	1.63 12.12	1.99 12.12	2.75 12.12	3.54 12.11	3.94 12.11	0.48 12.13
Down	0.95 12.18	1.62 12.18	1.99 12.18	2.74 12.17	3.54 12.18	3.94 12.17	0.48 12.06
Reach#7	5.45 12.22	9.19 12.21	11.18 12.22	15.36 12.21	19.71 12.20	21.93 12.20	2.84 12.23
Down	5.16 12.35	8.44 12.35	10.15 12.34	13.86 12.32	17.92 12.31	19.97 12.31	2.77 12.37
OUTLET	26.56	42.07	50.19	66.76	83.90	92.60	15.32



RA Assoc.

Miniceongo Park (1560)  
Developed Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
Rockland County, New York

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Pond#1	Reach#1		STRUCTURE (Pond#1)
Reach#1	Reach#2	265	CHANNEL
Reach#2	Outlet	600	CHANNEL
Pond#2	Reach#3		STRUCTURE (Pond#2)
Reach#3	Outlet	925	CHANNEL
Pond#3	Reach#4		STRUCTURE (Pond#3)
Reach#4	Reach#5	1180	CHANNEL
Reach#5	Outlet	1400	CHANNEL
Reach#6	Outlet	925	CHANNEL
Reach#7	Outlet	600	CHANNEL

RA Assoc.

Miniceongo Park (1560)  
 Developed Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
 Rockland County, New York

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Pond#1	(This reach is a structure: Pond#1)				
Reach#1	265	0.015	0.0226	1.5	2 :1
Reach#2	600	0.035	0.001	30	2 :1
Pond#2	(This reach is a structure: Pond#2)				
Reach#3	925	0.035	0.0145	30	10 :1
Pond#3	(This reach is a structure: Pond#3)				
Reach#4	1180	0.025	0.0131	30	2 :1
Reach#5	1400	0.035	0.001	30	2 :1
Reach#6	925	0.035	0.0145	30	10 :1
Reach#7	600	0.035	0.001	30	2 :1

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Pond#1	(This reach is a structure: Pond#1)				
Reach#1	0.0	0.000	0	1.5	0.0226
	0.5	8.972	1.3	3.5	
	1.0	36.504	3.5	5.5	
	2.0	169.584	11	9.5	
	5.0	1539.240	57.5	21.5	
	10.0	8922.449	215	41.5	
	20.0	53984.196	830	81.5	
Reach#2	0.0	0.000	0	30	0.001
	0.5	12.772	15.5	32	
	1.0	40.884	32	34	
	2.0	132.384	68	38	
	5.0	656.141	200	50	
	10.0	2383.806	500	70	
	20.0	9698.942	1400	110	
Pond#2	(This reach is a structure: Pond#2)				
Reach#3	0.0	0.000	0	30	0.0145
	0.5	51.519	17.5	40	
	1.0	175.999	40	50	
	2.0	647.260	100	70	
	5.0	4315.163	400	130	
	10.0	21028.203	1300	230	
	20.0	113827.008	4600	430	
Pond#3	(This reach is a structure: Pond#3)				
Reach#4	0.0	0.000	0	30	0.0131
	0.5	64.720	15.5	32	
	1.0	207.166	32	34	
	2.0	670.811	68	38	
	5.0	3324.765	200	50	
	10.0	12079.101	500	70	
	20.0	49145.986	1400	110	
Reach#5	0.0	0.000	0	30	0.001
	0.5	12.772	15.5	32	

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Miniceongo Park (1560)  
Developed Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
Rockland County, New York

Reach Channel Rating Details (continued)

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
	1.0	40.884	32	34	
	2.0	132.384	68	38	
	5.0	656.141	200	50	
	10.0	2383.806	500	70	
	20.0	9698.942	1400	110	
Reach#6	0.0	0.000	0	30	0.0145
	0.5	51.519	17.5	40	
	1.0	175.999	40	50	
	2.0	647.260	100	70	
	5.0	4315.163	400	130	
	10.0	21028.203	1300	230	
	20.0	113827.008	4600	430	
Reach#7	0.0	0.000	0	30	0.001
	0.5	12.772	15.5	32	
	1.0	40.884	32	34	
	2.0	132.384	68	38	
	5.0	656.141	200	50	
	10.0	2383.806	500	70	
	20.0	9698.942	1400	110	

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Miniceongo Park (1560)  
Developed Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
Rockland County, New York

Structure Description - User Entered

Reach Identifier	Surface Area @ Crest (ac)	Height Above Crest (ft)	Surface Area @ Ht Above (ac)	Pipe Diameter (in)	Head on Pipe (ft)	Weir Length (ft)
Pond#1	0.44	6	0.75			0.8
Pond#2	0.096	4	0.474			0.5
Pond#3	.189	4	.781			0.5

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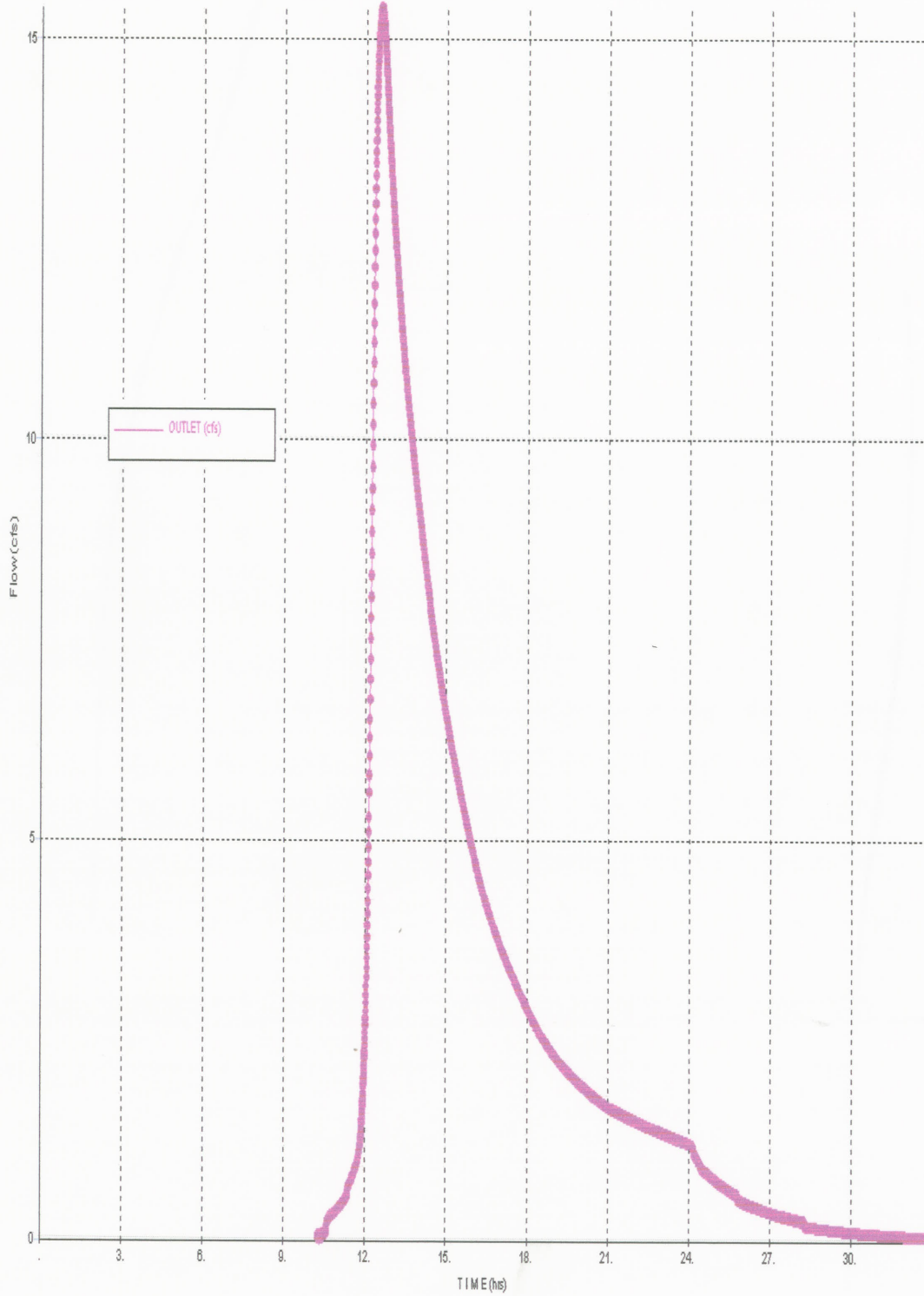
Miniceongo Park (1560)  
 Developed Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
 Rockland County, New York

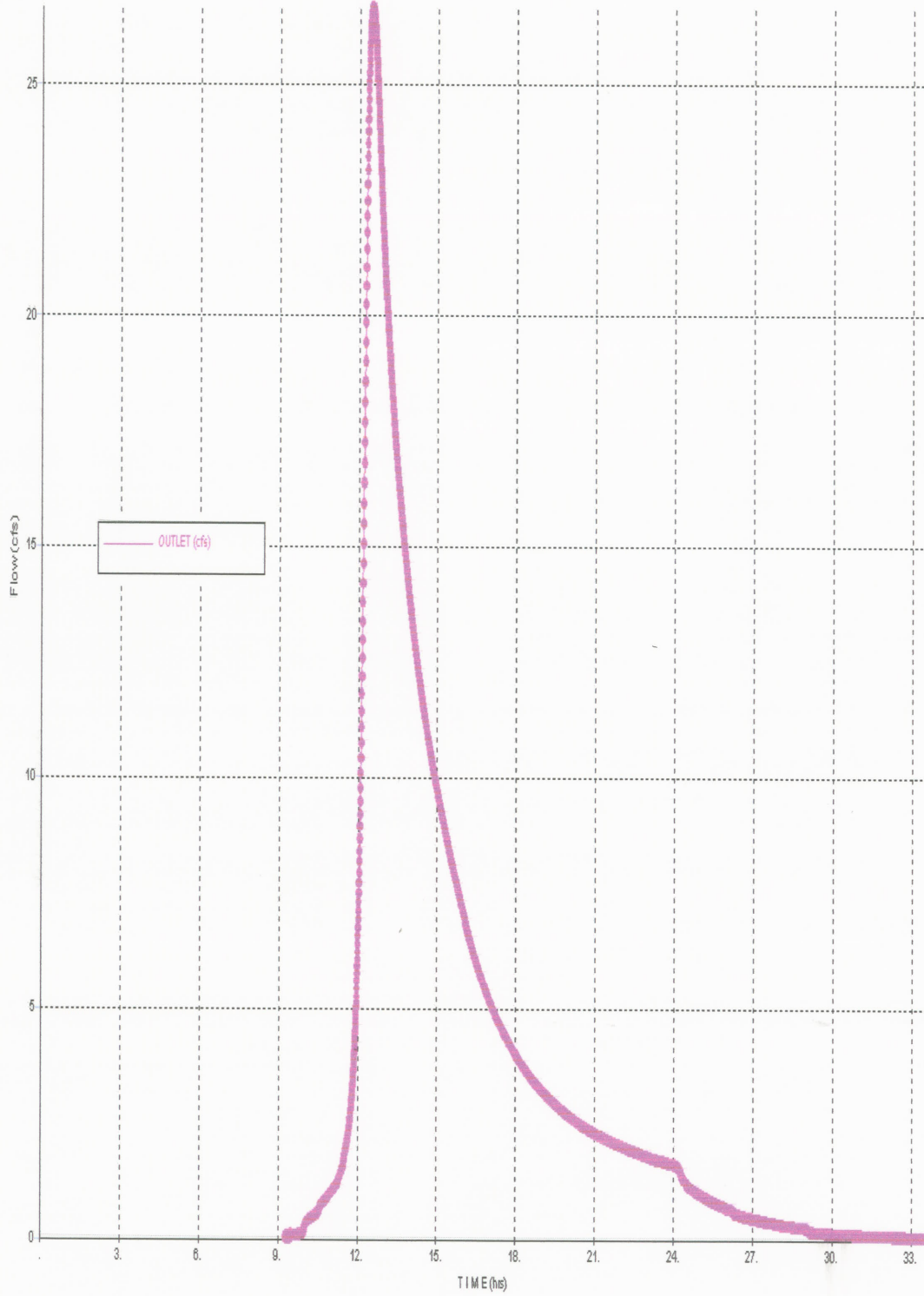
Structure Rating Details - Computed

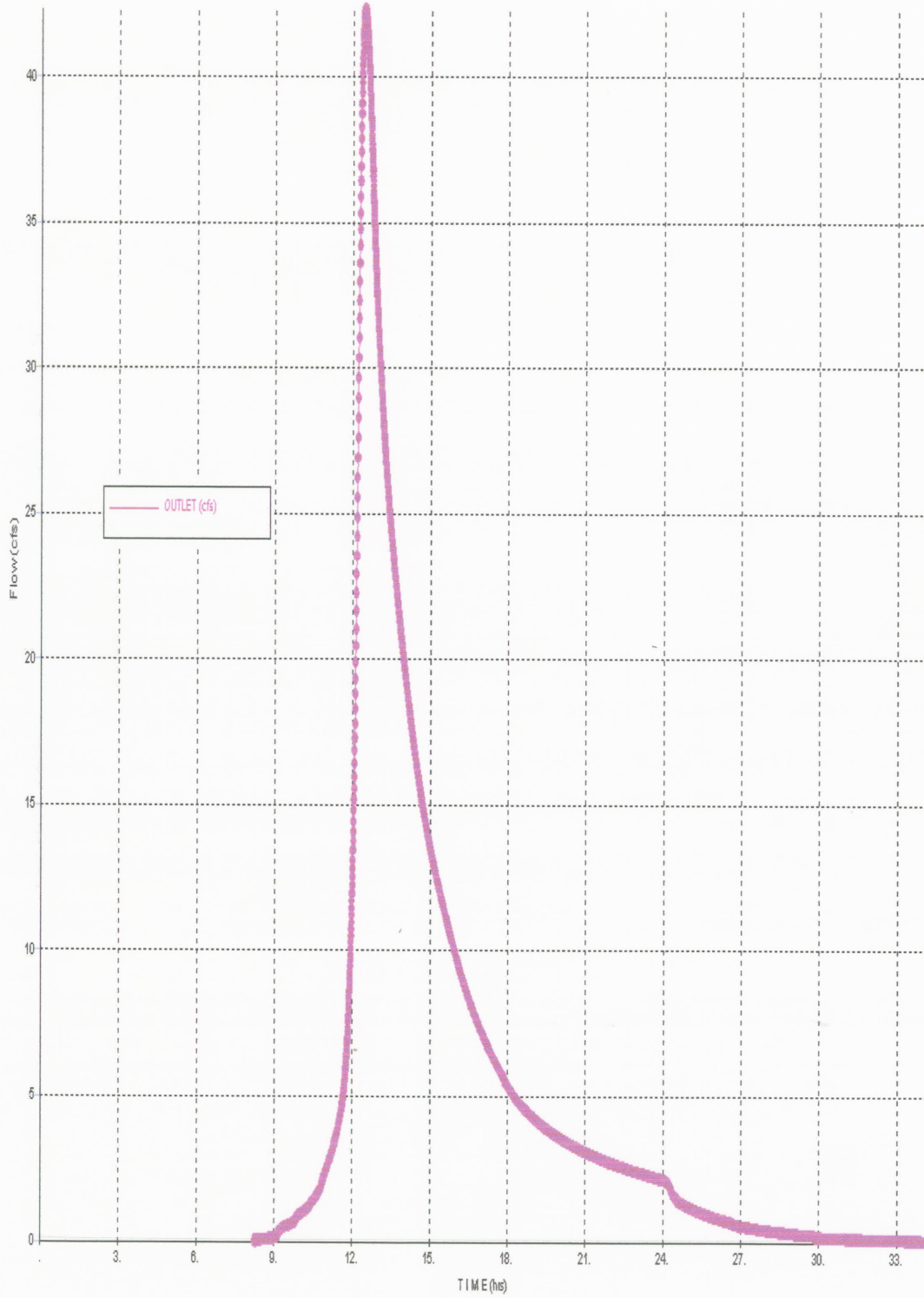
Reach Identifier	Stage (ft)	Pool Storage (ac ft)	Flows (cfs) @ Weir Length		
			Length #1 0.8ft	Length #2 ft	Length #3 ft
Pond#1	0	0.00	0.000		
	0.5	0.23	0.792		
	1	0.47	2.240		
	2	0.98	6.336		
	5	2.85	25.044		
	10	6.98	70.835		
	20	19.13	200.352		

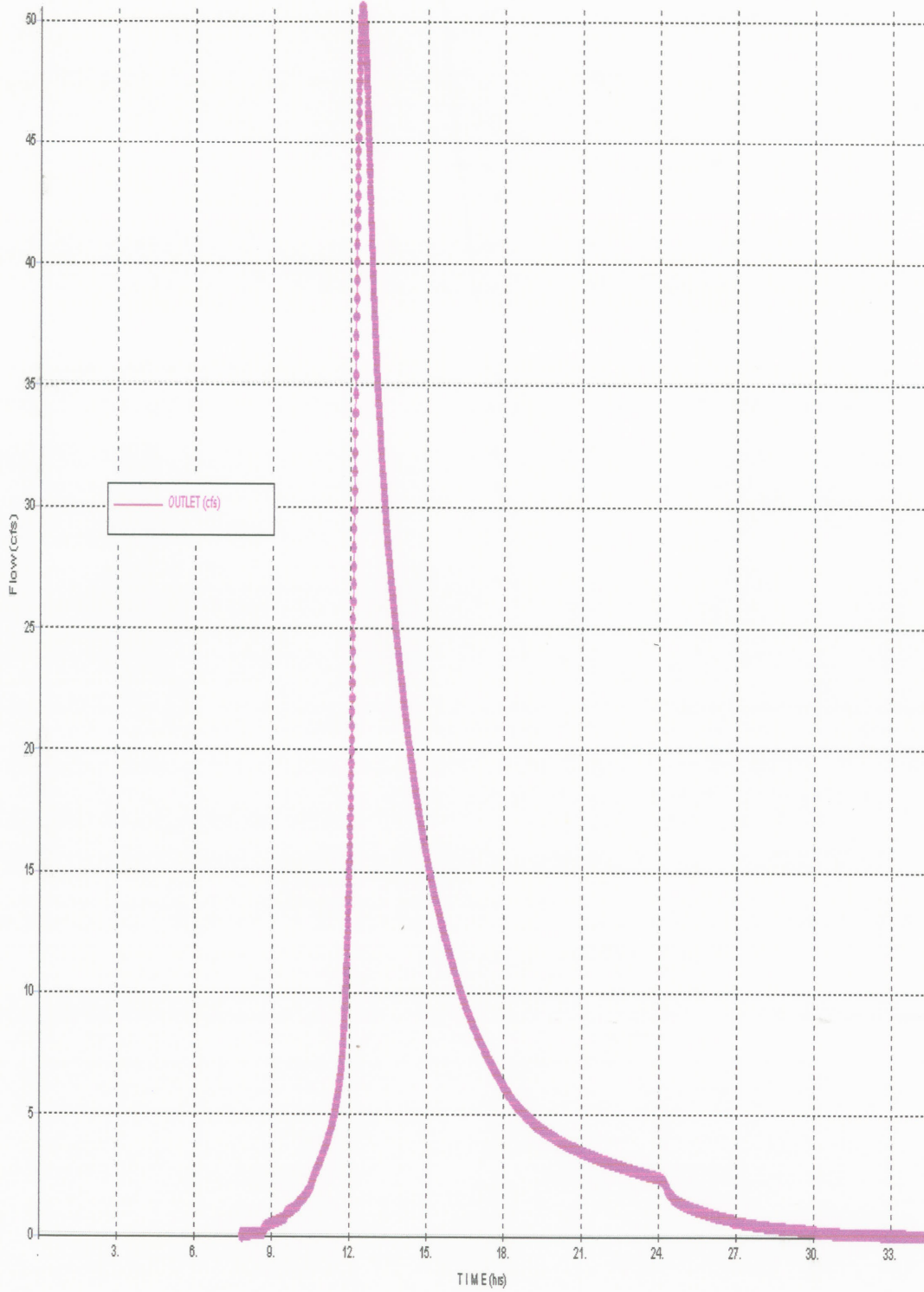
Reach Identifier	Stage (ft)	Pool Storage (ac ft)	Flows (cfs) @ Weir Length		
			Length #1 0.5ft	Length #2 ft	Length #3 ft
Pond#2	0	0.00	0.000		
	0.5	0.06	0.495		
	1	0.14	1.400		
	2	0.38	3.960		
	5	1.66	15.652		
	10	5.69	44.272		
	20	20.82	125.220		

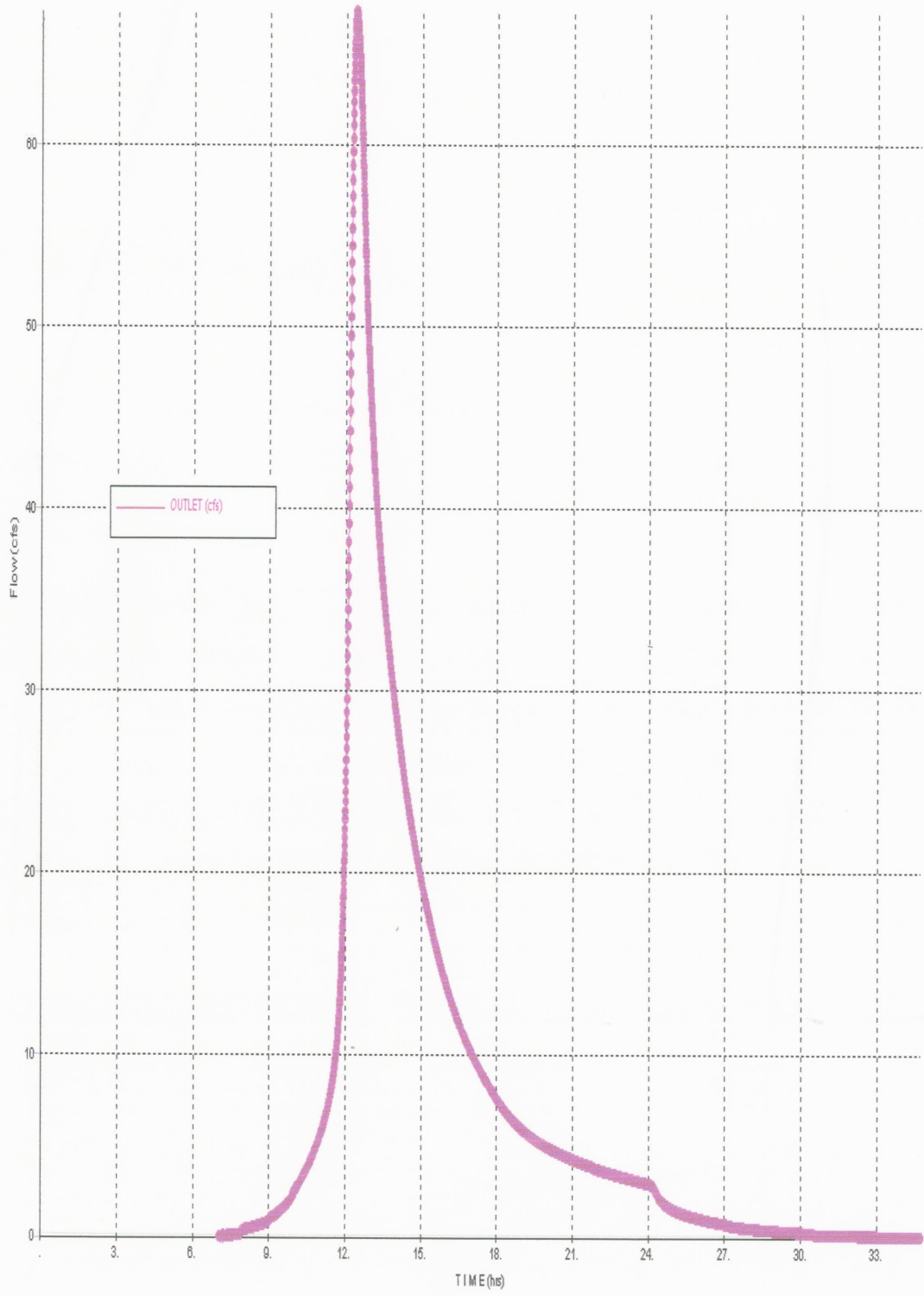
Reach Identifier	Stage (ft)	Pool Storage (ac ft)	Flows (cfs) @ Weir Length		
			Length #1 0.5ft	Length #2 ft	Length #3 ft
Pond#3	0	0.00	0.000		
	0.5	0.11	0.495		
	1	0.26	1.400		
	2	0.67	3.960		
	5	2.80	15.652		
	10	9.29	44.272		
	20	33.38	125.220		

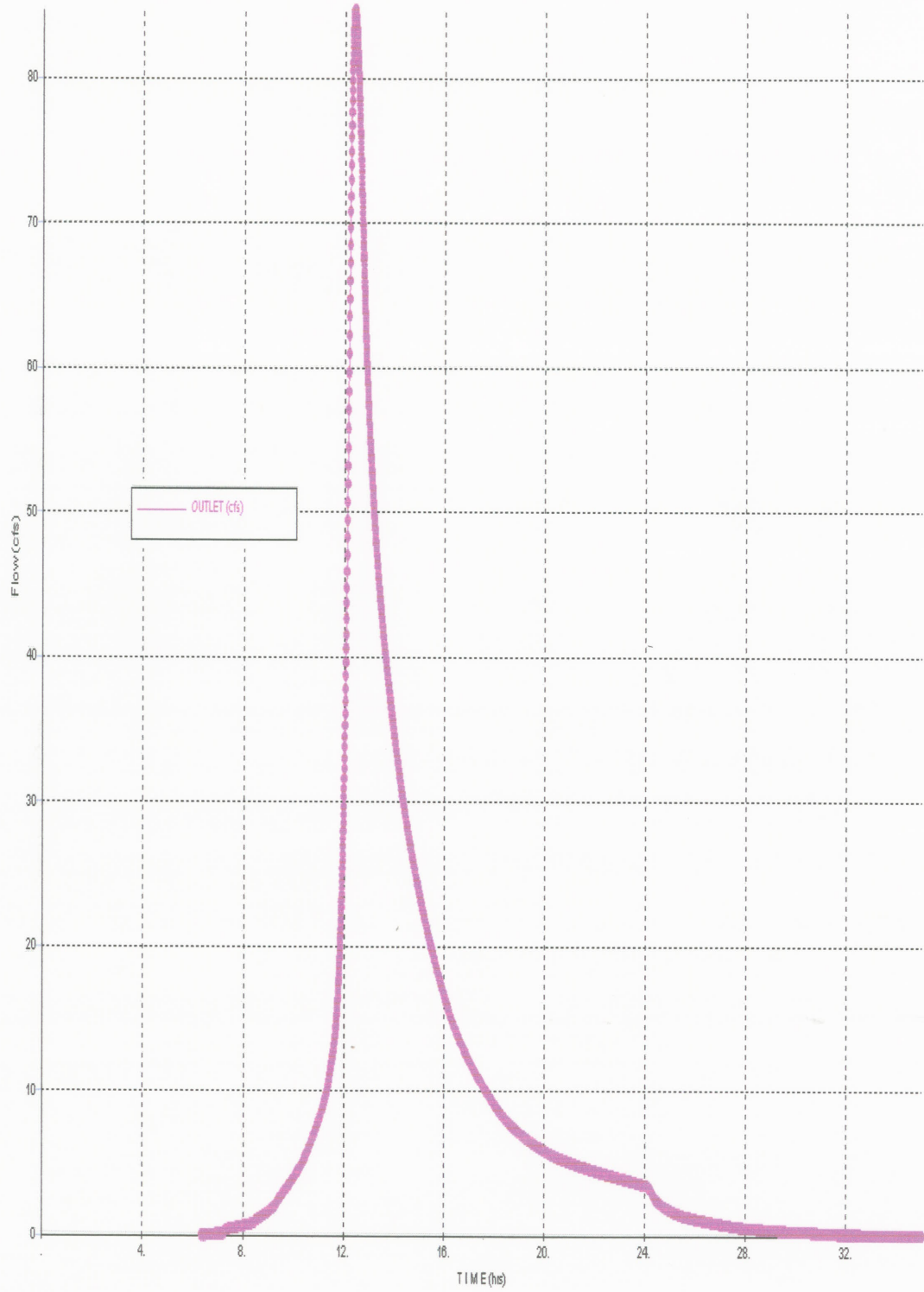


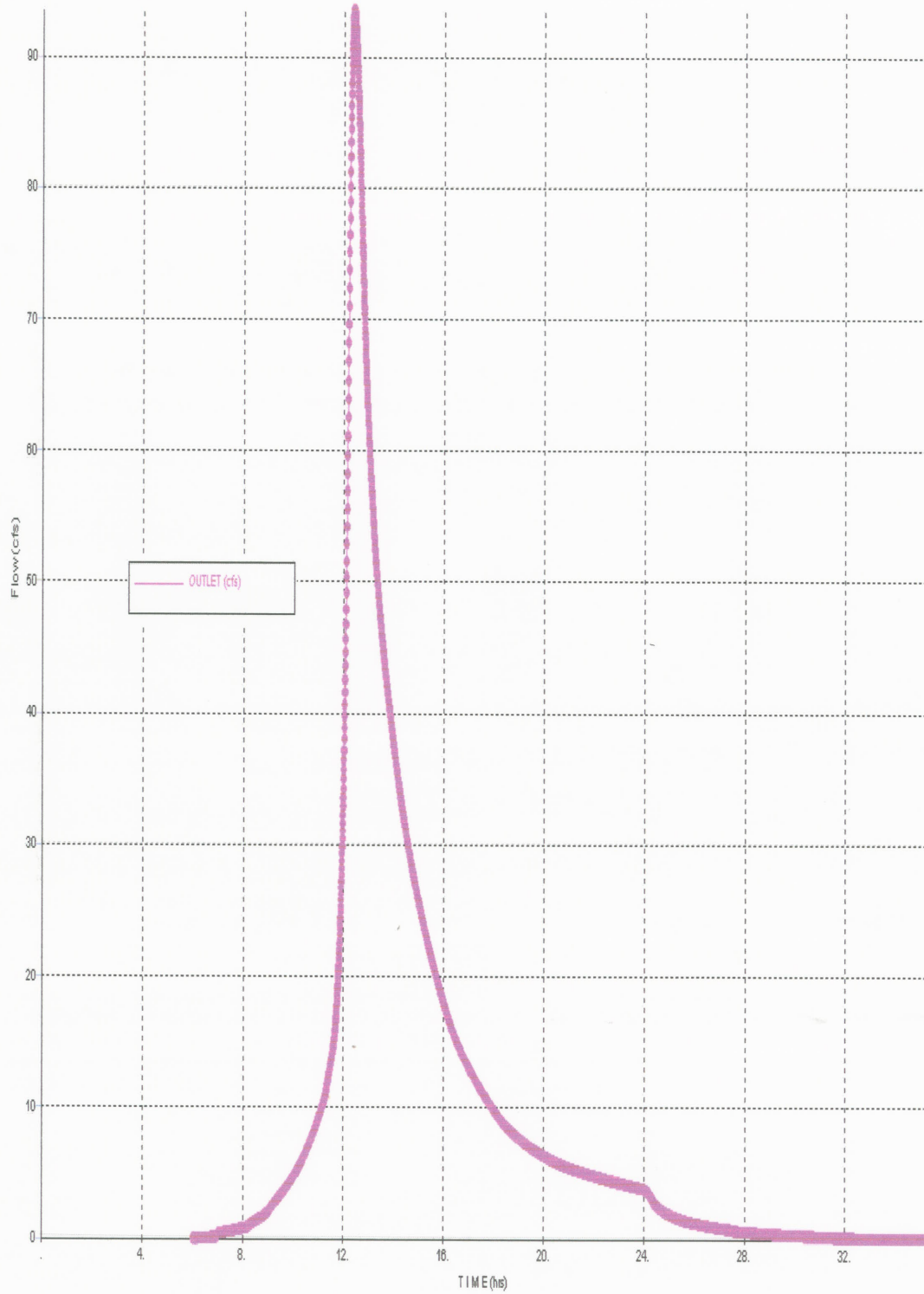












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Miniceongo Park (1560)  
Developed Condition, 1, 2, 5, 10, 25, 50 & 100-yr Storms  
Rockland County, New York

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Pond#1	Reach#1		STRUCTURE (Pond#1)
Reach#1	Reach#2	265	CHANNEL
Reach#2	Outlet	600	CHANNEL
Pond#2	Reach#3		STRUCTURE (Pond#2)
Reach#3	Outlet	925	CHANNEL
Pond#3	Reach#4		STRUCTURE (Pond#3)
Reach#4	Reach#5	1180	CHANNEL
Reach#5	Outlet	1400	CHANNEL
Reach#6	Outlet	925	CHANNEL
Reach#7	Outlet	600	CHANNEL

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINICEONGO PARK 1560

SHEET NO. ① OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 10/12/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

### WATER QUALITY

THE EXISTING GRADES WILL BE RAISED ACCORDING TO THE "F-1" PLAN. THREE SEDIMENT PONDS WILL BE CONSTRUCTED WHICH THEY RECEIVE BROWN WATER FROM THE DISTURBED AREA.

AS STATED PREVIOUSLY, THE PONDS ARE OVER EXCAVATED TO MAKE ROOM FOR SEDIMENTS GENERATED FROM NEWLY PLACED FILL AT THE SITE.

277 TOWNHOUSES, TWO COMMERCIAL LOTS, BUILDINGS & AMINITIES ARE PROPOSED AT THE SITE. THE IMPERVIOUS AREAS COVER 17.88 ACS. TOTAL LAWN AREAS ARE 17.60 ACS. THE SEDIMENT PONDS WILL BE RE-GRADED TO MEET THE REQUIRED SIZE OF THE POND NEEDED FOR SITE DEVELOPED CONDITION. THE PEAK FLOW AT THE POINT OF INTEREST WILL BE INCREASED DUE TO INCREASE OF IMPERVIOUS AREAS. FOR "ZERO NET INCREASE OF PEAK FLOW" @ THE P.O.I. THE TOTAL VOLUME OF

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINICEONGO PARK 1560

SHEET NO. ② OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 10/12/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

STORAGE TO ACHIEVE ZERO NET INCREASE OF RUN OFF  
IS 6.38 AC-FT (POND #1 3.60 AC-FT + POND #2  
1.14 AC-FT + POND #3 1.64 AC-FT).

ADDITIONAL VOLUME IS NECESSARY FOR  
"WATER QUALITY". THE RUN OFF FROM DEVELOPED  
AREAS MUST FLOW INTO A WATER QUALITY POND  
BEFORE BEING RELEASED TO STREAM.

THE FOLLOWING STUDY IS PREPARED ACCORDING  
TO "STORMWATER MANAGEMENT DESIGN MANUAL"  
DATED AUGUST 2003. THE STEP BY STEP  
METHOD (CHAPTER 8) WILL BE USED IN THIS  
REPORT.

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINICEONGO PARK 1560

SHEET NO. ③ OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 10/12/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

SUMMARY OF HYDROLOGICAL DATA

AT THE POINT OF INTEREST (P.O.I.), TWO WATERSHEDS HAVE BEEN DELINEATED ON "EXISTING CONDITION" MAP. THE SAME AREA @ P.O.I., SIX WATERSHEDS HAVE BEEN DELINEATED ON THE "DEVELOPED CONDITION" MAP. TO ACHIEVE "ZERO NET INCREASE OF PEAK FLOW" @ P.O.I., THREE RETENTION PONDS BEEN PROPOSED. THEREFORE, THE VOLUME OF THREE WATERSHEDS HAVE TO BE REDUCED IN ORDER TO MEET THE ZERO NET INCREASE OF RUNOFF @ P.O.I.

100-YEAR STORM

Q CFS	WS#1	WS#2	WS#3	WS#4	WS#5	WS#6	REMARK
Qi	102.35	33.97	39.42	3.94	28.23	21.93	$\sum Q_i = 229.82$
Qo	61.72	10.88	9.27	3.94	28.23	21.93	EXIST. IS 135.97 CFS
Qo/Qi	0.60	0.32	0.24	1	1	1	
Vs/hr	0.241	0.362	0.42				
Qi (inches)	5.97	5.85	5.73	4.002			
Vr Ac-ft	9.51	3.24	3.85				
Vg	2.29	1.17	1.62				
ADD 15%	2.63	1.35	1.86				

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINICEONGO PARK 1560

SHEET NO. ④ OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE \_\_\_\_\_

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

WATERSHED #1  
VOLUMES

1) WATER QUALITY VOLUME, WQV

\* IMPERVIOUS COVER:

$$\text{IMPERVIOUS AREA} = 10.13 \text{ ACS}$$

$$\text{TOTAL AREA} = 19.13 \text{ ACS}$$

$$I = \frac{10.13}{19.13} = 53.04\%$$

\* RUNOFF COEFFICIENT  $R_v$

$$R_v = 0.05 + (I)(0.009)$$

$$R_v = 0.05 + 53.04(0.009) = 0.53$$

$$R_v = 0.53$$

\* WATER QUALITY VOLUME WQV

$$WQV = (0.9") (R_v) (A)$$

$$WQV = (0.9") (0.53) (19.13) \times \frac{1"}{12'} = 0.76 \text{ AC-FT}$$

$$WQV = 0.76 \text{ AC-FT}$$

2) STREAM CHANNEL PROTECTION VOLUME CPV

$$* \text{INITIAL ABSTRACTION } I_a = \frac{200}{CN} - 2$$

$$CN = 87 \quad \text{FROM TR-55}$$

$$P = 1.3" \quad 90\% \text{ RAINFALL (SEE CHART 4-1 DEC)}$$

$$I_a = \frac{200}{87} - 2 = 0.30$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
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JOB MINICEONGO PARK

1560

SHEET NO. (5)

OF

CALCULATED BY

DATE

10/13/05

CHECKED BY

DATE

SCALE

\*  $I_{a/p} = \frac{0.30}{1.3} = 0.231$

\*  $T_c = 0.184$  HR FROM TR-55

\*  $Q_{NU} = 1306.78$  FROM TR-55

2-TR STORM

	WS #1	WS #2	WS #3	WS #4	WS #5	WS #6	REMARK
$Q_i$	39.06	12.64	14.31	0.95	6.76	5.45	$\Sigma Q = 79.17$ CFS
$Q_o$	10.47	4.19	3.32	0.95	6.76	5.45	$\Sigma Q_{EXIST} = 31.14$
$Q_o/Q_i$	0.27 0.40	0.33 0.36	0.23 0.43	1	1	1	
$Q_i$	2.182"	2.095"	2.014"				
CFM	1306.78	1216.61	1137.61				
$V_r$ AC-FT	3.48	1.16	1.35				
$V_s$ AC-FT	1.39	0.42	0.58				
$Q_{NU}$	1306.78	1216.61	1137.61				

\*  $T = 24$  HRS

$Q_{NU} = 1307$  FIND  $\frac{Q_{NU}}{Q_i} \approx 0.005$  FROM CHART

$V_s/V_r = 0.683 - 1.43 \left(\frac{Q_{NU}}{Q_i}\right) + 1.64 \left(\frac{Q_{NU}}{Q_i}\right)^2 - 0.804 \left(\frac{Q_{NU}}{Q_i}\right)^3$

$V_s/V_r = 0.676$

$V_r = 1.479"$  FOR ONE-TR

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINI CEONGO PARK 1560

SHEET NO. 6 OF \_\_\_\_\_

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$$V_s = \frac{1.479''}{12} \times 19.13 \times 0.676 = 1.59 \text{ AC-FT}$$

$$C_{pv} = 1.59 \text{ AC-FT}$$

\* AVERAGE RELEASE RATE:

1.59 AC-FT TO BE RELEASED IN 24 HRS

$$\text{Rate} = \left( 1.59 \times 43560 \frac{\text{FT}^2}{\text{AC}} \right) \div (24 \times 60 \times 60) = 0.8$$

$$\text{Rate} = 0.8 \text{ CFS}$$

3) OVER BANK FLOOD VOLUME QPID

10-YR STORM

	WS#1	WS#2	WS#3	WS#4	WS#5	WS#6	
Q <sub>i</sub>	62.85	20.62	23.64	1.99	14.18	11.18	ΣQ = 134.46 CFS
Q <sub>o</sub>	27.20	6.66	5.55	1.99	14.18	11.18	Q <sub>EXIST</sub> = 66.76 CFS
$\frac{Q_o}{Q_i}$	0.43	0.32	0.23	1	1	1	
$\frac{V_s}{V_r}$	0.31	0.365	0.43				
Q <sub>i</sub>	3.567	3.463	3.366				
V <sub>r</sub> AC-FT	5.69	1.92	2.26				
V <sub>s</sub>	1.76	0.70	0.97				

11.4

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

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WATERSHED #2  
VOLUMES

1) WATER QUALITY VOLUME WQV

\* IMPERVIOUS COVER = 3.42 ACS

TOTAL AREA = 6.65 ACS

$$I = \frac{3.42}{6.65} = 51.43$$

\* RUNOFF COEFFICIENT RV

$$RV = 0.05 + (I \times 0.009)$$

$$RV = 0.05 + 51.43 \times 0.009 = 0.51$$

$$RV = 0.51$$

\* WATER QUALITY VOLUME WQV

$$WQV = (0.9") RV (A)$$

$$WQV = \frac{0.9 \times 0.51 \times 6.65}{12} = 0.26 \text{ AC-FT}$$

$$WQV = 0.26 \text{ AC-FT}$$

2) STREAM CHANNEL PROTECTION VOLUME CPV

\* INITIAL ABSTRACTION  $I_a = \frac{2.00}{CN} = 2$

CN = 86 FROM TR-55

P = 1.3" 70% RAINFALL (SEE CHART 4.1 DEC.)

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

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SCALE \_\_\_\_\_

$$I_a = \frac{200}{86} - 2 = 0.33$$

$$* I_a/P = \frac{0.33}{1.3} = 0.250$$

$$* T_c = 0.214 \text{ HRS} \quad \text{FROM TR-55}$$

$$* Q_{10} = 1,216.6' \quad \text{SEE PAGE ⑤}$$

$$\frac{Q_{10}}{Q_{11}} = 0.0092 \quad \text{FROM CHART B-1 DETENTION TIME}$$

$$V_s/V_r = 0.683 - 1.43 \left( \frac{Q_{10}}{Q_{11}} \right) + 1.64 \left( \frac{Q_{10}}{Q_{11}} \right)^2 - 0.804 \left( \frac{Q_{10}}{Q_{11}} \right)^3$$

$$V_s/V_r = 0.670$$

$$V_r = 1.406'' \quad \text{SEE TR-55}$$

$$* V_s = \frac{1.406''}{12} \times 6.65 \times 0.670 = 0.52 \text{ AC-FT}$$

$$C_{PV} = 0.52 \text{ AC-FT}$$

\* AVERAGE RATE OF RELEASE:

0.52 AC-FT TO BE RELEASED IN 24 HRS

$$\text{RATE} = \left( 0.52 \times 43560 \frac{\text{FT}^2}{\text{AC}} \right) \div (24 \times 3600) = 0.26 \text{ CFS}$$

$$\text{RATE} = 0.26 \text{ CFS}$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINICEONGO PARK

1560

SHEET NO. (9) OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 10/14/25

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

WS # 3 - VOLUMES

1) WATER QUALITY VOLUME, WQV

\* IMPERVIOUS AREA = 3.72 ACS

TOTAL AREA = 8.05 ACS

$$I = \frac{3.72}{8.05} = 46.21\%$$

\* RUNOFF COEFFICIENT  $R_v$

$$R_v = 0.05 + (I)(0.009)$$

$$R_v = 0.05 + 46.21(0.009) = \boxed{0.47}$$

\* WATER QUALITY VOLUME WQV

$$WQV = (0.9'')(R_v)(A)$$

$$WQV = (0.9'')(0.47)(8.05) \times \frac{1}{12} = 0.28 \text{ ACS-FT}$$

$$\boxed{WQV = 0.28 \text{ AC-FT}}$$

2) STREAM CHANNEL PROTECTION VOLUME  $C_pV$

\* INITIAL ABSTRACTION  $I_a = \frac{200}{CN} - 2$

$CN = 85$  FROM TR-55

$P = 1.3''$  90% RAINFALL (SEE CHART 4.1 DEC)

$$I_a = \frac{200}{85} - 2 = 0.35$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINICEANO PARK 1560

SHEET NO. (10) OF \_\_\_\_\_

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SCALE \_\_\_\_\_

$$I_a/p = \frac{0.35}{1.3} = 0.269$$

$$T_c = 0.238 \quad \text{FROM TR-55}$$

$$Q_{v0} = 1,137.61 \quad \text{" "}$$

$$\frac{Q_{v0}}{Q_{vi}} = 0.0131$$

$$V_s/V_r = 0.683 - 1.43 \left( \frac{Q_{v0}}{Q_{vi}} \right) + 1.64 \left( \frac{Q_{v0}}{Q_{vi}} \right)^2 - 0.804 \left( \frac{Q_{v0}}{Q_{vi}} \right)^3$$

$$V_s/V_r = 0.6643$$

$$V_r = 1.338'' \quad \text{FOR ONE-YR STORM}$$

$$V_s = \frac{1.338}{12} \times 8.05 \times 0.6643 = 0.60 \text{ AC-FT}$$

$$C_{pv} = 0.60 \text{ AC-FT}$$

x

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINICEONGO PARK

1560

SHEET NO. 11

OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_

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DATE \_\_\_\_\_

SCALE \_\_\_\_\_

POND DESIGN

WATERSHED #1 POND #1

STEP 1. PRELIMINARY RUNOFF CONTROL VOLUMES

SYMBOL	CATEGORY	VOLUME REQ'D AC-FT	NOTES
WQV	WATER QUALITY	0.76	
CPV	STREAM PROTECTION	1.39	AVERAGE ED = 0.8 CFS FOR 24 HRS
QP	PEAK CONTROL	1.76	10-YR STORM
QF	FLOOD CONTROL	2.29	100-YR STORM

STEP 2: DRY POND

STEP 2A: DAM SAFETY

STEP 3: N/A

STEP 4: SIZE OF WET FOREBAY

$10\% \times WQV$  OR  $0.1 \times 0.76 = 0.076$  AC-FT  $\approx 1$

STEP 5: PERMANENT POOL TO CONTAIN 50% OF WQV:

$0.5 \times (0.76) = 0.38$  AC-FT INCLUDES 0.1 AC-FT PERMANENT POOL

SIZE: ED VOLUME TO CONTAIN 50% OF WQV

$0.5 \times 0.76 = 0.38$  AC-FT

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINICEONGO PARK 1560

SHEET NO. (12) OF \_\_\_\_\_

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STEP 6 : POND GEOMETRY

POND # 1

ELEV MSL	AREA ft <sup>2</sup>	AVERAGE ft <sup>2</sup>	DEPTH ft	VOLUME ft <sup>3</sup>	CUMULATIVE		STORAGE ABOVE PERMANENT POOL
					ΣV + 3 FOREBAYS	AC-FT	
395.5	0				0	0	
		7,265	0.5				
396.0	14,530			3,633	3,876	0.089	0.874
		16,917	2				
398.0	19,304			33,834	40,807	0.937	0.860
		22,437	2				
400.0	25,570			44,874	91,812	2.108	1.89
		28,825	2				
402.0	32,079			57,650	160,204	3.678	3.21

PERMANENT POOL is 50% WQV:

$$0.5 \times (0.76) = 0.38 \text{ AC-FT (INCLUDES FORE BAYS VOLUME 0.1 AC-FT)}$$

ELEV.	FOREBAY #1 ft <sup>2</sup>	FOREBAY #2 ft <sup>2</sup>	FOREBAY #3	ΣA ft <sup>2</sup>	DEPTH	ΔV ft <sup>3</sup>	ΣV ft <sup>3</sup>	ΣV AC-FT
395.5	0	0	0	0		0	0	
					0.5			
396.0	801	0	172	973		243	243	0.0056
					2			
398.0	1,516	157	451	2,124		3,097	3,340	0.0767
					2			
400.0	2,485	524	998	4,007		6,131	9,471	0.2174
					2			
402.0	3,776	1,022	1,937	6,735		10,742	20,213	0.464

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

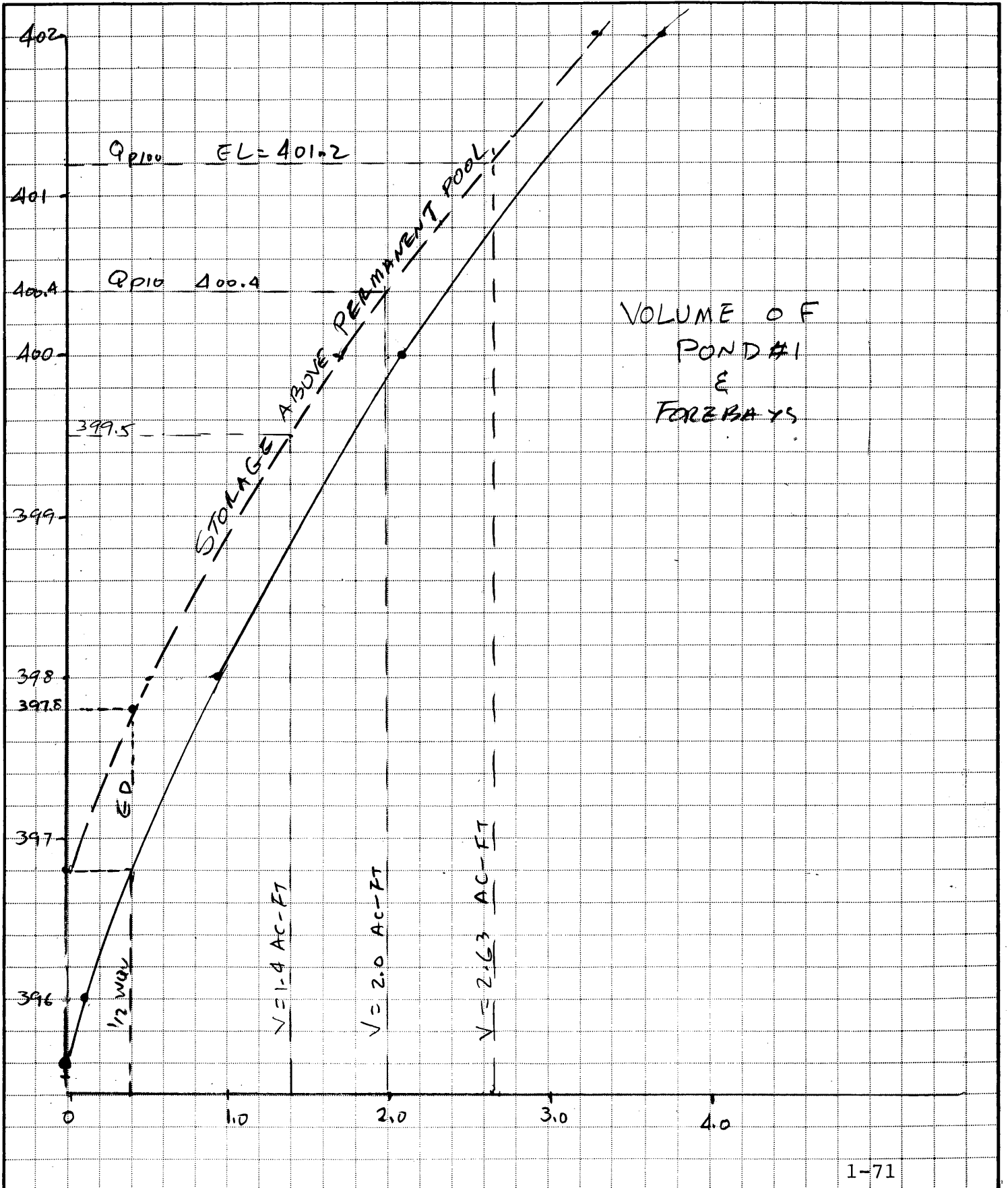
JOB \_\_\_\_\_

SHEET NO. 13 OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 10/17/05

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Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
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JOB \_\_\_\_\_

SHEET NO. (14) \_\_\_\_\_ OF \_\_\_\_\_

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SET BASIC ELEVATIONS FOR POND STRUCTURES:

\* THE POND BOTTOM SET AT 396.0 FT.

\* SET RISER INVERT @ EL = 395.5 FT FOR GRAVITY DRAIN

\* SET BARREL OUTLET @ EL = 395.0

SET WATER SURFACE & OTHER ELEVATIONS:

\* REQUIRED PERMANENT POOL VOLUME @ 50% OF WQV

$$\text{OR } \frac{1}{2} \times 0.76 = 0.38 \text{ AC-FT}$$

SET PERMANENT POOL @ EL = 396.8 FT

$$V = 0.4 \text{ AC-FT. OK}$$

PERMANENT POOL  
EL = 396.8 FT

\* FOREBAY VOLUME REQUIRED IS 0.1 AC-FT

\* REQUIRED EXTENDED DETENTION VOLUME IS

$$(WQV - ED) = 0.38 \text{ AC-FT}$$

THE VOLUME ABOVE PERMANENT POOL FOR  $V = 0.38$

AC-FT IS 397.8

EXTENDED DETENTION  
EL = 397.8

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

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SHEET NO. 15

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DATE 10/17/25

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DATE \_\_\_\_\_

SCALE \_\_\_\_\_

COMPUTE THE REQUIRED WQV-ED ORIFICE DIA.

\* AVERAGE ED RELEASE IS  $0.38 \text{ AC-FIT} \times 43,560 / 3600 \times 24$

RATE =  $0.19 \text{ CFS}$   
ED

\* ORIFICE INVERT @  $396.8$

\* AVERAGE HEAD =  $(397.8 - 396.8)^{1/2} = 0.5 \text{ FT}$

\*  $Q = CA(2gh)^{0.5}$

SOLVE FOR DIA

$C = 0.6$

$0.19 = 0.6 A (2 \times 32.2 \times 0.5)^{0.5} = 3.40 A$

$A = 0.06 \text{ S.F. OR } A = 8.04 \text{ in}^2 \text{ OR } D = 3.2''$

SAY  $D = 3.0''$

USE 4" PIPE & GATE  
DOWN TO 3.0"  
EQ.

$Q = CA(2gh)^{0.5} = 0.6 \times 0.0491 (2 \times 32.2)^{0.5} \times h^{0.5} = 0.19$

OR  $h = 0.65 \text{ FT}$

INSEL =  $396.8 + \frac{3''}{2} \times \frac{1}{2} + 0.65 = 397.58$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. 16 OF \_\_\_\_\_

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SCALE \_\_\_\_\_

STEP 7: COMPUTE ED ORIFICE SIZE  
RELEASE RATE FOR CPV-ED  
ESTABLISH CPV ELEVATION

SET THE CPV POOL ELEVATION

\* REQUIRED CPV STORAGE IS 1.39 AC-FT

\* FROM ELEV. VS STORAGE READ EL = 399.5 V = 1.4

CPV WSEL = 399.5 FT

SIZE CPV ORIFICE

\* RELEASE RATE =  $1.39 \times 43560 \div (24 \times 3600) = 0.70$  CFS

\* SET INVERT OF ORIFICE @ WSEL = 397.8

\* DISCHARGE FROM 3" ORIFICE IS

$$H = \frac{1}{2} (399.5 - 397.93) = 0.79 \text{ FT}$$

$$A = \frac{1.5 \times 1.5 \times \pi}{144} = 0.0491 \text{ S.F.}$$

$$Q = CA(2gh)^{0.5} = 0.6 \times 0.491 (2 \times 32.2 \times 0.79)^{0.5}$$

$$Q = 0.21 \text{ CFS}$$

3" orifice

$$Q = 0.7 - 0.21 = 0.49 \text{ CFS}$$

$$0.49 = 0.6 \times A (2 \times 32.2 \times 0.85)^{0.5}$$

$H_2 = \frac{399.5 - 397.8}{2} = 0.85$

$$A = 0.11 \text{ S.F.} \quad D = 0.37 \text{ FT} \quad \text{OR} \quad D = 4.5''$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

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SHEET NO. (17) \_\_\_\_\_ OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 10/18/05

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SCALE \_\_\_\_\_

\* USE 6" DIA PIPE & GATE IT DOWN TO  
0.5" EG.

\* NEW R =  $399.5 - (397.8 + 0.19) = 0.76$  FT

CALC. NEW Q

$$Q = 0.6 \times 0.611 (2 \times 32.2 \times 0.76)^{0.5} = 0.46 \text{ CFS}$$

$$\text{TOTAL } Q = 0.21 + 0.46 = 0.67 \approx 0.7 \text{ OK}$$

STEP 8:

$Q_{PI0}$  (10-TR STORM)

RELEASE RATE & WATER SURFACE ELE.

\*  $Q_{PI0}$ <sub>in</sub> = 62.85 CFS DEVELOPED

\*  $Q_{PI0}$ <sub>out</sub> = 27.2 CFS AFTER ROUTED THROUGH  
THE POND #1

\* ESTIMATE OF STORAGE IS  $V = 1.76$  AC-FT ADD

15% FOR ED.  $V = 1.15 \times 1.76 = \underline{\underline{2.02}}$  AC-FT

\* FROM STORAGE VS ELE.  $V = 2.0$  EL = 400.4

\* Q FROM 3" ORIFICE IS:

$$h = \frac{1}{2} (400.4 - 396.93) = 1.74 \text{ FT}$$

$$Q = 0.6 \times 0.491 (2 \times 32.2 \times 1.74)^{0.5} = 0.31 \text{ CFS}$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. 18 OF \_\_\_\_\_

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\*  $Q$  FROM 4.5" ORIFICE IS:

$$h = 1/2 (400.0 - 397.99) = 1.21 \text{ FT}$$

$$Q = 0.6 + 0.11 (2 \times 32.2 \times 1.21)^{0.5} = 0.58 \text{ CFS}$$

\*  $Q$  FOR SLOT DRAIN IS

$$Q = 27.2 - (0.31 + 0.58) = 26.41 \text{ SAY } \underline{26.4}$$

SET INV. @ -399.5

$$h = 400.0 - 399.5 = 0.90 \text{ FT}$$

$$Q = CLH^{3/2} = 3.1 \times L \times (0.9)^{3/2}$$

$$L = 9.97 \text{ FT}$$

USE  $L = 8.5 \text{ FT}$  & CALC.  $h$

$$h = 0.96 \text{ FT}$$

OK ORIFICE EQ.

SEE PRINT OUT ON PAGE 18A

## Straight Drop Structure

Participant: Miniceongo Park

Location: Route 202

County: County,

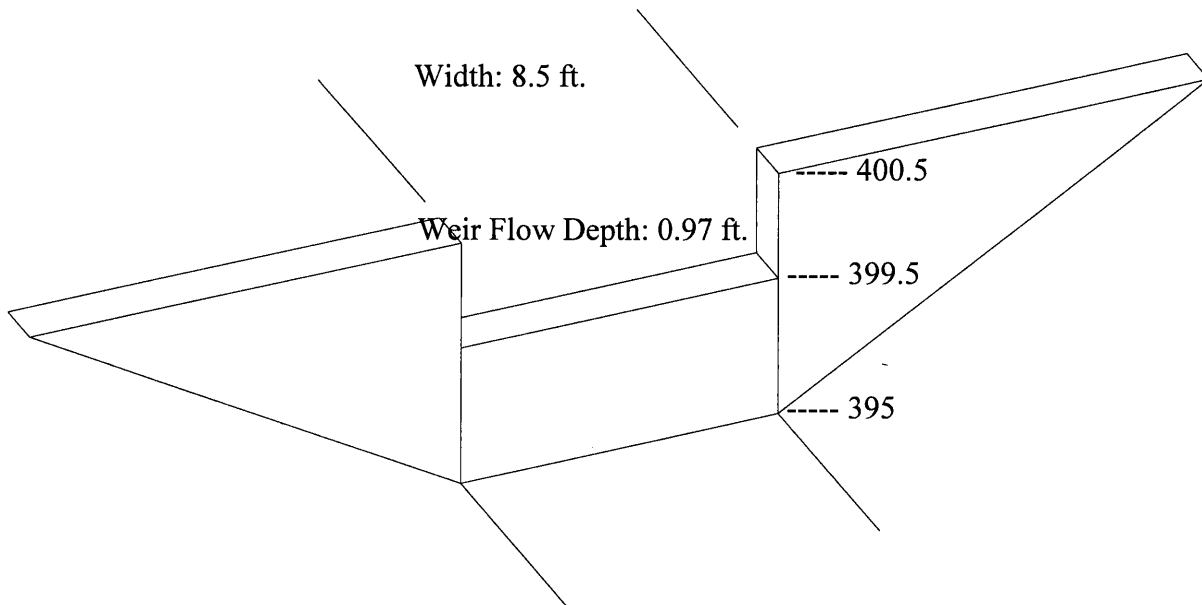
Designer: RA

Date: 10/18/2005

Checker: RA

Date: 10/18/05

Hydraulics Formula, Version 2.2.1



Width of inlet: 8.5 ft.

Depth of flow over weir: 0.97 ft.

Capacity: 26.4 cfs

Overfall: 4.5 ft.

Elevation of weir: 399.5  
Elevation of floor: 395  
Elevation of wingwall: 400.5

PAGE  
(18)A

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. 19 OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 10/18/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

STEP 9

SPILLWAY DESIGN

FLOOD RELEASE & WATER SURFACE EL.

\*  $Q_{P_{100}} = 102.35 \text{ CFS}$   
in

\*  $Q_{P_{100}} = 61.72 \text{ CFS}$   
out

\* STORAGE REQUIRED IS  $V = 2.29 \text{ AC-FT}$

ADD 15% TO ACCOUNT FOR EO

\*  $V = 1.15 \times 2.29 = 2.63 \text{ AC-FT}$

\* FROM STORAGE VS EL.  $EL = 401.2 \text{ FT}$

\* Q FROM 3" ORIFICE IS

$$H = \frac{1}{2} (401.2 - 396.93) = 2.14 \text{ FT}$$

$$Q = 0.6 \times 0.0491 \times (2 \times 32.2 \times 2.14)^{0.5} = 0.35 \text{ CFS}$$

\* Q FROM 4.5" ORIFICE IS :

$$H = \frac{1}{2} (401.2 - 397.99) = 1.61 \text{ FT}$$

$$Q = 0.6 \times 0.11 (2 \times 32.2 \times 1.61)^{0.5} = 0.67 \text{ CFS}$$

Q FROM 10 FT SLOT IS

$$H = 401.2 - 399.5 = 1.7 \text{ FT}$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
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JOB \_\_\_\_\_

SHEET NO. (20) \_\_\_\_\_ OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 10/18/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

$$Q = CLH^{3/2} = 3.1 \times 8.5 \times (1.7)^{3/2} = 58.41$$

$$TOTAL = 0.35 + 0.67 + 58.41 = 59.43 \quad \leftarrow \quad 61.72 \text{ CFS}$$

REVISE THE H FOR  $Q = 60.70$

act pot  
1.11

$$H = 1.71 \text{ FT} \quad Q = 60.70 \quad \text{OK}$$

$$EL = 401.21 \quad \text{OK}$$

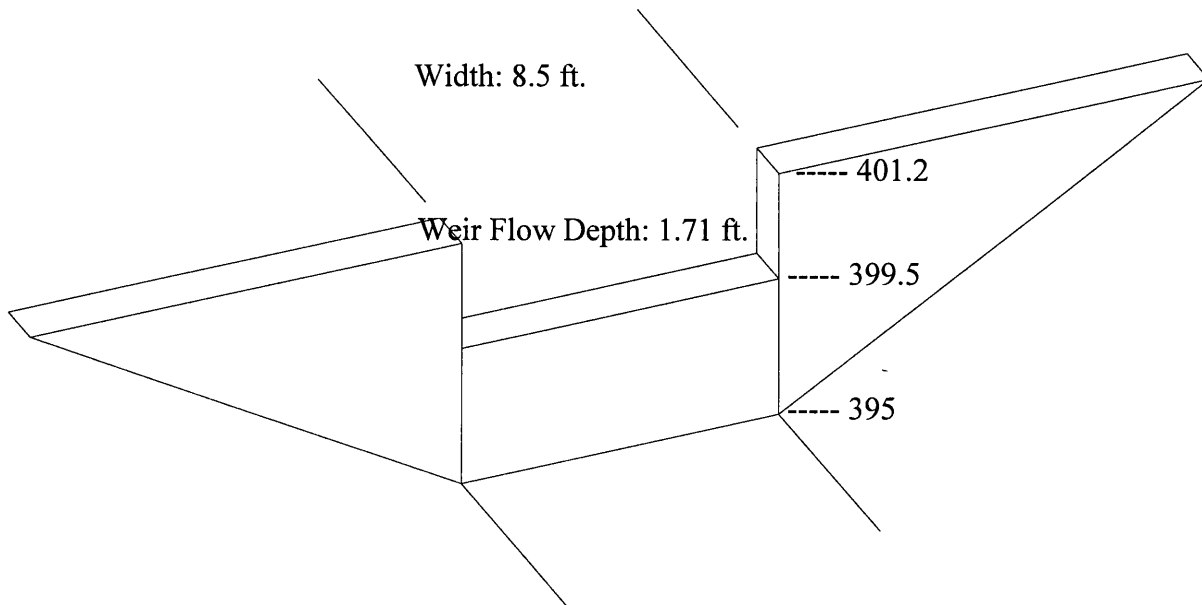
SEE PRINT OUT PAGE 21

# Straight Drop Structure

Participant: Miniceongo Park  
Location: Route 202  
County: County,  
Designer: RA  
Date: 10/18/2005

Checker: RA  
Date: 10/18/05

Hydraulics Formula, Version 2.2.1



Width of inlet: 8.5 ft.  
Depth of flow over weir: 1.71 ft.

Capacity: 60.7 cfs  
Overfall: 4.5 ft.

Elevation of weir: 399.5  
Elevation of floor: 395  
Elevation of wingwall: 401.2

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. 22 OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 10/18/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

POND #1

$Q_{P100}$   $V = 2.63$   $EL = 401.21$

OVER FLOW  
 $EL = 401.21$

$Q_{P10}$   $V = 2.06$  AC-FT  $EL = 400.5$

$Q_{P5}$   $EL = 399.5$   
 $V = 1.39$  AC-FT

WEIR  $L = 8.5$  FT  
 $INV = 399.5$

$WQ_{10}$   $EL = 397.8$   
 $V = 0.76$  AC-FT

6" PIPE GATE DOWN TO  
4.5"  
 $EL = 397.99$

PERMANENT POOL  $EL = 396.8$   
 $V = 0.38$  AC-FT

4" PIPE GATE TO 3"  
 $EL = 396.93$

$INV = 395.5$

RISER  $INV. = 395$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. (23) \_\_\_\_\_ OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 10/18/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

POND # 2

STEP #1 PRELIMINARY RUNOFF CONTROL VOLUMES

SYMBOLS	CATEGORY	VOLUMES AC-FT	NOTES
WQV	WATER QUALITY	0.26	
CPV	STREAM PROTECTION	0.42	
Q <sub>P</sub>	PEAK CONTROL	0.70	10-YR STORM
Q <sub>F</sub>	FLOOD CONTROL	1.17	100-YR STORM

STEPS #2, 2A & 3 N/A

STEP #4 SIZE OF WET FOREBAY

$$10\% \times WQV \text{ OR } 0.1 \times 0.26 = 0.026 \approx 0.05 \text{ AC-FT}$$

STEP #5: PERMANENT POOL TO CONTAIN 50% OF WQV:

$$0.5 (0.26) = 0.13 \text{ AC-FT INCLUDES } 0.05 \text{ AC-FT}$$

SIZE OF ED (EXTENDED DETENTION) VOLUME

TO CONTAIN 50% OF WQV

$$0.5 \times 0.26 = 0.13 \text{ AC-FT}$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. 24 OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE \_\_\_\_\_

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

STEP #6: POND GEOMETRY

POND #2

ELEVATION Ft	AREA Ft <sup>2</sup>	AVERAGE Ft <sup>2</sup>	DEPTH Ft	VOLUME Ft <sup>3</sup>	ΣV+2 FOREBAYS	Σ AC-FT
401.0	0			0	0	
		3,238	1			
402.0	6,476			3,238	3264	0.0749
		9,067	2			
404.0	11,658			18,134	21,765	0.500
		16,199	2			
406.0	20,740			32,398	55,449	1.273

FOREBAY YES

ELEVATION	FOREBAY #1	FOREBAY #2	ΣA Ft <sup>2</sup>	DEPTH	ΣV
401	0	0		1	
402	0	55	55	2	26
404	120	312	432	2	367
406	430	974	1,404	2	1286

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

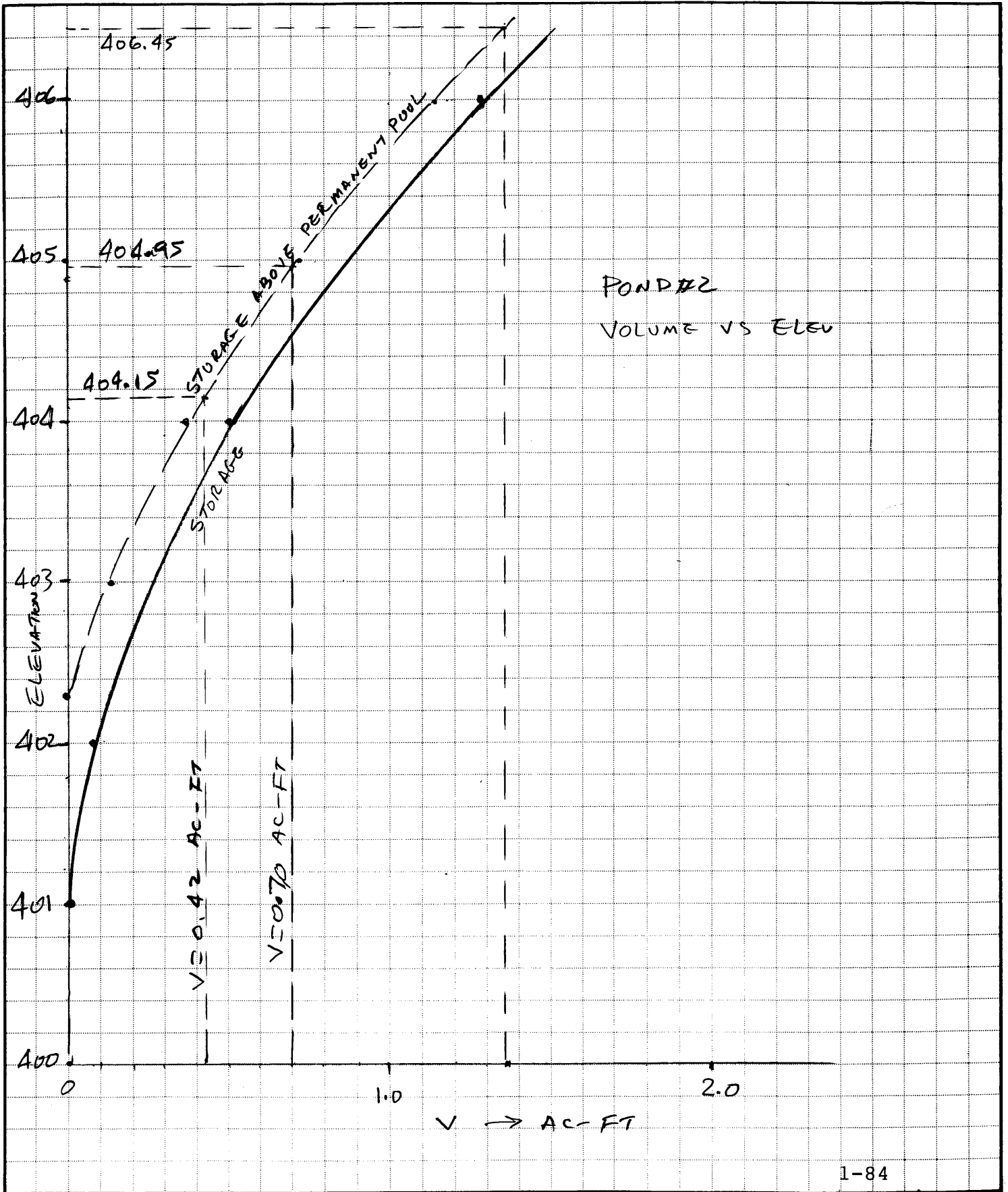
JOB \_\_\_\_\_

SHEET NO. 25 OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 10/18/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_



Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. 26 OF \_\_\_\_\_

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CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

SET BASIC ELEVATION FOR POND STRUCTURES:

\* POND BOTTOM SET @ 401.0 FT

\* SET RISER INVERT @ EL = 401.0

\* SET LEVEL SPREADER @ 401.0

SET WATER SURFACE & OTHER ELEVATIONS:

\* REQUIRED PERMANENT POOL VOLUME @ 50% OF WQV

OR  $1/2 \times 0.26 = 0.13$  AC-FT

SET PERMANENT POOL ELEVATION @ 402.15

PERMANENT POOL  
EL = 402.15

\* FOREBAY VOLUME IS 0.05 AC-FT

\* REQUIRED EXTENDED DETENTION VOLUME IS

$(WQV - ED) = 0.13$  AC-FT

THE VOLUME ABOVE PERMANENT POOL FOR  $V = 0.13$

AC-FT IS 403.0

EXTENDED DETENTION  
EL = 403.0

COMPUTE THE REQUIRED WQV - ED' ORIFICE DIA.

\* AVERAGE ED RELEASE IS :

$$R = 0.13 \times 43560 \div (24 \times 3600) = 0.066 \text{ CFS}$$

\* ORIFICE INVERT @ 402.15

\* AVERAGE HEAD =  $\frac{1}{2}(403 - 402.15) = 0.425 \text{ FT}$

\*  $Q = CA(2gh)^{0.5}$

$$D = 2'' \quad Q = 0.07 \text{ CFS} \quad \text{OK}$$

USE 4" PIPE, THEN GATE IT DOWN TO 2" EQ.

\*  $WSEL = 402.15 + \frac{2'}{12} \times \frac{1}{2} + 0.85 = 403.08 \quad \text{OK}$

STEP 7:

COMPUTE ED ORIFICE SIZE

RELEASE FOR CPV - ED

ESTABLISH CPV ELEVATION

SET THE CPV POOL ELEVATION

\* REQUIRED CPV STORAGE IS  $V = 0.42 \text{ AC-FT}$

\* FROM ELEV. VS STORAGE  $\rightarrow$  READ EL = 404.15

SIZE CPV ORIFICE

\* RELEASE RATE =  $0.42 \times 43560 \div (24 \times 3600) = 0.21 \text{ CFS}$

\* SET INVERT OF ORIFICE @ EL = 403.0

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. (28) \_\_\_\_\_ OF \_\_\_\_\_

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SCALE \_\_\_\_\_

\* DISCHARGE FROM 2" ORIFICE IS

$$h = \frac{1}{2}(404.15 - 402.23) = 0.96 \text{ FT}$$

$$Q = 0.10 \text{ CFS}$$

$$Q = 0.21 - 0.10 = 0.11 \text{ CFS}$$

$$h = \frac{1}{2}(404.15 - 403.10) = 0.58 \text{ FT}$$

USE 4" PIPE & GATE IT DOWN TO 2.3" EQ.

$$Q = 0.11 \text{ CFS FOR } D = 2.3" \text{ & } h = 0.58 \text{ AVERAGE}$$

$$* \text{ WSEL} = 403.0 + \frac{2.3}{12} \times \frac{1}{2} + 0.58 = \boxed{404.26 \text{ OK}}$$

$$\boxed{\bar{EL} = 404.26}$$

STEP 8:

$$Q_{P10} \text{ (10-YR STORM)}$$

RELEASE RATE & WATER SURFACE EL.

$$* Q_{P10} = 20.62 \text{ CFS IN FLOW}$$

$$Q_{P10} = 6.66 \text{ CFS OUT FLOW}$$

\* ESTIMATE OF STORAGE IS  $V = 0.70 \text{ AC-FT}$

\* FROM STORAGE VS VOLUME;  $EL = 404.95$

\*  $Q$  FROM 2" ORIFICE

$$h = \frac{1}{2}(404.95 - 402.23) = 1.36 \text{ FT}$$

$$Q = 0.12 \text{ CFS}$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

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SHEET NO. (29) \_\_\_\_\_ OF \_\_\_\_\_

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SCALE \_\_\_\_\_

Q From 2.3" ORIFICE

$$h = 1/2 (404.95 - 403.10) = 0.93$$

$$Q = 0.13 \text{ CFS}$$

$$Q = 6.66 - (0.12 + 0.13) = 6.41 \text{ CFS}$$

\*

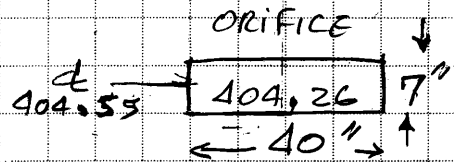
DESIGN RECTANGULAR ORIFICE

$$2h = 404.95 - 404.26 = 0.69$$

$$A = 280 \text{ SQ. INCHES}$$

$$h = 404.95 - 404.55 = 0.40$$

$$Q = 5.92 \text{ CFS} < 6.41$$



$$\text{USE } h = 0.47 \text{ FT } \quad Q = 6.41 \text{ CFS OK}$$

$$\text{WS EL} = 404.55 + 0.47 = 405.02$$

$$\text{CPVZ EL} = 405.02$$

STEP 9:

SPILLWAY DESIGN

FLOOD RELEASE & WATER SURFACE EL.

$$* \quad Q_{P100} = 33.97 \text{ CFS IN FLOW}$$

$$Q_{P100} = 9.27 \text{ CFS OUT FLOW}$$

$$* \quad \text{REQUIRED STORAGE} = 1.17$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. (30) OF \_\_\_\_\_

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SCALE \_\_\_\_\_

\* ADD 15% FOR ED  $V = 1.15 \times 1.17 = 1.35$  AC-FT

\* FROM STORAGE VS ELEVATION  $\rightarrow EL = 406.45$

\* Q FROM 2" ORIFICE IS:

$$h = \frac{1}{2}(406.45 - 402.15) = 2.15$$

$$Q_{2"} = 0.15 \text{ CFS}$$

Q FROM 2.3" ORIFICE IS:

$$h = \frac{1}{2}(406.45 - 403.10) = 1.68 \text{ FT}$$

$$Q_{2.3"} = 0.18 \text{ CFS}$$

Q FROM RECT. ORIFICE  $A = 280$  SQ. INCHES

$$h = \frac{1}{2}(406.45 - 404.55) = 0.95$$

$$Q = 9.21 \text{ CFS}$$

$$\Sigma Q = 0.15 + 0.18 + 9.21 = 9.54 \text{ CFS}$$

$$\text{USE } h = 0.91$$

$$Q = 8.93 \text{ CFS}$$

$$\Sigma Q = 0.15 + 0.18 + 8.93 = 9.26 \text{ CFS OK}$$

$$\text{WSEL} = 404.55 + 2 \times 0.91 = 406.37$$

$$Q_{P_{100}} \text{ EL} = 406.37$$

OK

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

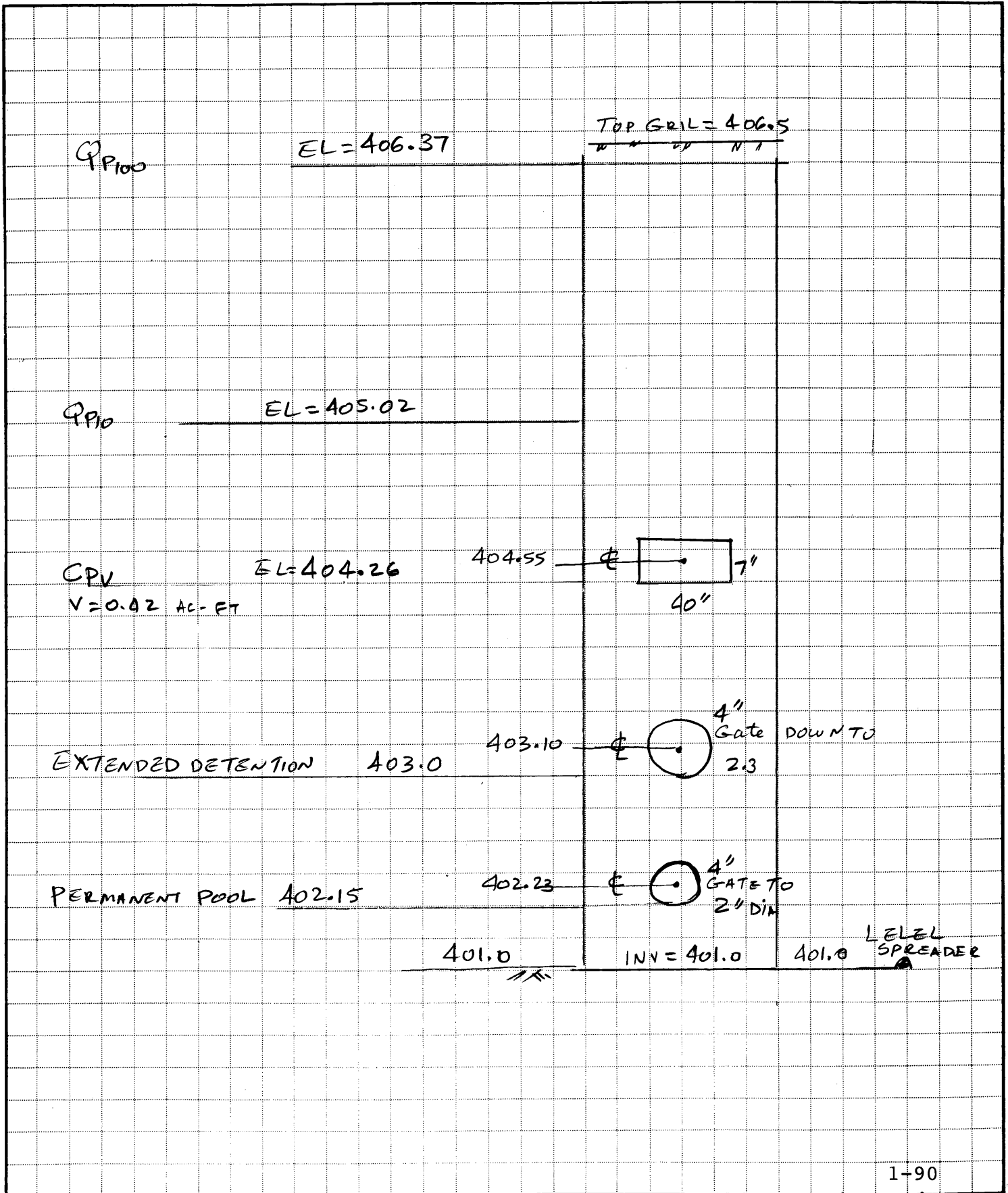
JOB \_\_\_\_\_

SHEET NO. (31) OF \_\_\_\_\_

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Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. (32) OF \_\_\_\_\_

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SCALE \_\_\_\_\_

POND #3

STEP #1 PRELIMINARY RUNOFF CONTROL VOLUMES

SYMBOLS	CATEGORY	VOLUMES AC-FT	NOTES
WQV	WATER QUALITY	0.28	
CPV	STREAM PROTECTION	0.60	
QP	PEAK CONTROL	0.97	10-YR STORM
QF	FLOOD CONTROL	1.62	100-YR STORM

STEPS # 2, 2A, & 3 N/A

STEP # 4: SIZE OF WET FOREBAY

$$10\% \times WQV \quad \text{OR} \quad 0.1 \times 0.28 = 0.028 \approx 0.05$$

STEP # 5: PERMANENT POOL TO CONTAIN 50% OF WQV.

$$0.5(0.28) = 0.13 \text{ AC-FT (INCLUDES } 0.05 \text{ AC-FT)}$$

SIZE OF ED (EXTENDED DETENTION) VOLUME

$$0.5 \times 0.28 = 0.14 \text{ AC-FT}$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. (33) OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 10/19/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

STEP #6 POND GEOMETRY:

ELEV FT	AREA FT <sup>2</sup>	AVERAGE AREA	DEPTH	VOLUME FT <sup>3</sup>	Σ V + Z FORBAYS	TOTAL V	V AC-F1
405	0					0	
		4136	1	4136	4,427	4,427	0.102
406	8,272						
		10,822	2	21644	22,963	27,390	0.629
408	13,371						
		23,092	2	46184	49,490	76,880	1.765
410	32,812						
		37,484	1	37,484	43,374	120,254	2.76
411	42,156						

FORBAY

EL FT	FORBAY FT <sup>2</sup>	FORBAY FT <sup>2</sup>	Σ A	AVERAGE FT <sup>2</sup>	DEPTH	VOLUME FT <sup>3</sup>
405	0	0	0			0
				146	1	291
406	34	257	291			
				660	2	1,319
408	279	749	1,028			
				1,653	2	3,306
410	676	1,602	2,278			
				2664	1	5970
411	1250	1800	3050			

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

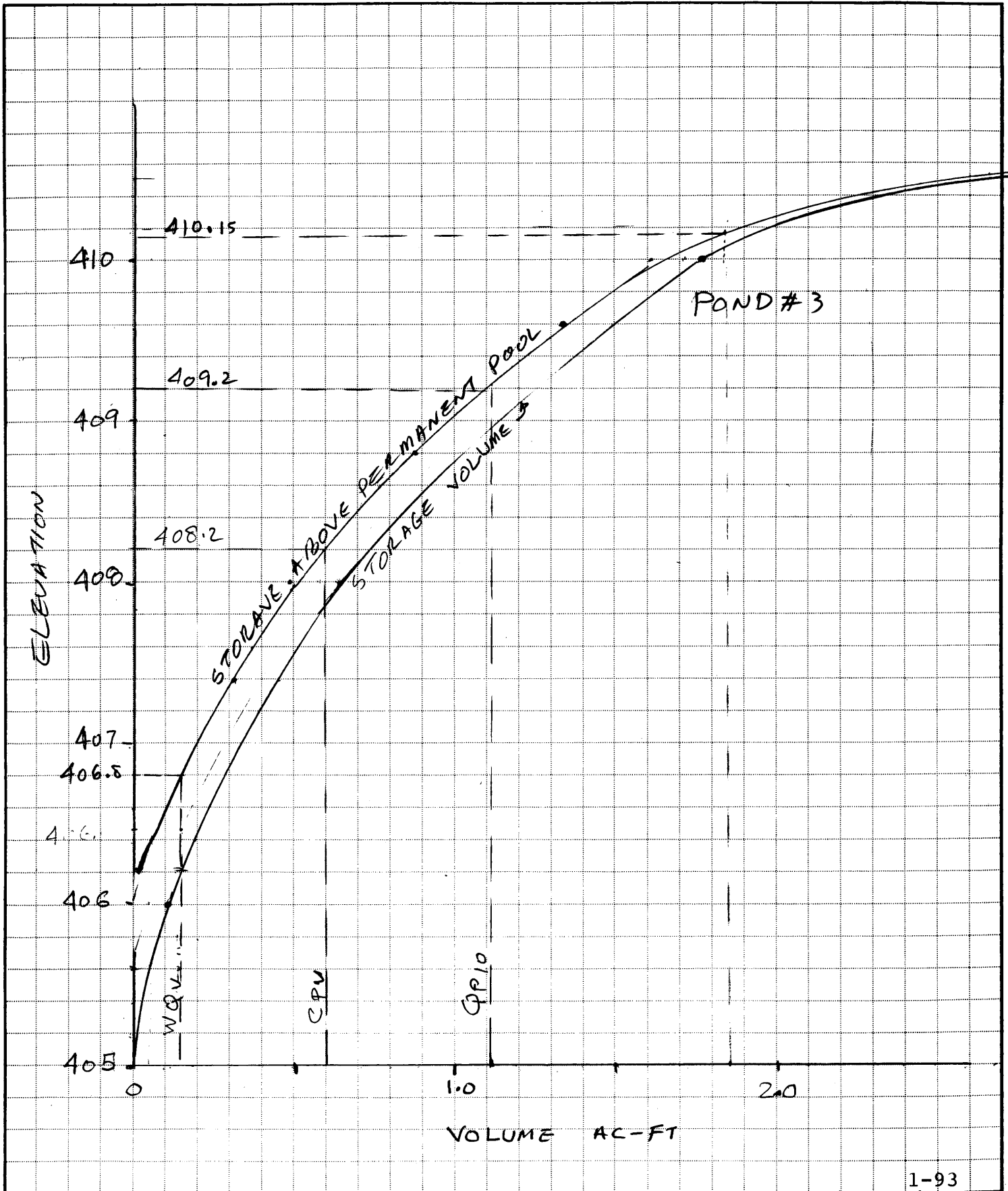
JOB \_\_\_\_\_

SHEET NO. (34) OF \_\_\_\_\_

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Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
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JOB \_\_\_\_\_

SHEET NO. (35)

OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_

DATE 10/19/05

CHECKED BY \_\_\_\_\_

DATE \_\_\_\_\_

SCALE \_\_\_\_\_

SET BASIL ELEVATION FOR POND STRUCTURES:

\* POND BOTTOM SET @ EL = 405.6

\* SET RIVER INVERT @ EL = 405.1

\* SET BARREL OUTLET @ EL = 405.0

SET WATER SURFACE & OTHER ELEVATIONS.

\* REQUIRED PERMANENT POOL VOLUME @ 50% OF WQV

OR  $\frac{1}{2} \times 0.28 = 0.14$  AC-FT

SET PERMANENT POOL @ EL = 406.20 FT

PERMANENT POOL  
EL = 406.20 FT

\* FORBAY VOLUME REQUIRED IS 0.1 AC-FT

\* REQUIRED EXTENDED DETENTION VOLUME IS:

$(WQV - ED) = 0.14$  AC-FT

THE VOLUME ABOVE PERMANENT POOL FOR  $V = 0.14$  AC-FT

FROM EL. VS STORAGE EL = 406.8 FT

EXTENDED DETENTION  
EL = 406.8

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. 36

OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_

DATE 10/19/05

CHECKED BY \_\_\_\_\_

DATE \_\_\_\_\_

SCALE \_\_\_\_\_

COMPUTE THE REQUIRED WQV - ED ORIFICE DIA.

\* AVERAGE ED RELEASE IS :

$$0.14 \times 43560 \div (24 \times 3600) = 0.07 \text{ CFS}$$

\* ORIFICE INVERT SET @ EL = 406.2

$$h = 1/2 (406.8 - 406.2) = 0.3 \text{ FT}$$

$$Q = CA (2gh)^{0.5}$$

$$C = 0.6, h = 0.3 \text{ FT}, \text{ DIA} = 2.2''$$

$$Q = \frac{0.07 \text{ CFS}}{2.2''}$$

USE 4" DIA, GATE DOWN TO 2.2"

USE 4" PIPE & GATE  
DOWN TO 2.2" EQ

$$h = 1/2 (406.8 - 406.29) = 0.26$$

$$Q = 0.06 \text{ REVISED } h \text{ TO } 0.3$$

$$\text{WSEL} = 406.29 + 2 \times 0.3 = 406.89 \text{ FT}$$

$$\text{ED EL} = 406.89$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
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JOB \_\_\_\_\_

SHEET NO. (37) OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE \_\_\_\_\_

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

STEP 7: COMPUTE ED ORIFICE SIZE  
RELEASE RATE FOR CPV - ED  
ESTABLISH CPV ELEVATION

SET THE CPV POOL ELEVATION

\* REQUIRED CPV STORAGE IS  $V = 0.6$  AC-FT

\* FROM EL. VS STORAGE  $\rightarrow$  EL = 408.2

CPV WSEL = 408.2

SIZE ORIFICE FOR CPV

\* RELEASE RATE =  $0.6 \times 43560 \div (24 \times 3600) = 0.30$   
CFS

\* SET INV. OF THE ORIFICE @ EL = 406.89

\* DISCHARGE FROM 2.2" DIA ORIFICE

$$h = 1/2 (408.2 - 406.29) = 0.96 \text{ FT}$$

$$Q = 0.12 \text{ CFS}$$

2.2"

$$Q = 0.30 - 0.12 = 0.18 \text{ CFS}$$

$$h = 1/2 (408.2 - 406.89) = 0.66 \text{ FT}$$

$$\text{DIA} = 3" \text{ DIA}$$

$$Q = 0.19 \text{ CFS}$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. 38 OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE \_\_\_\_\_

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

RE-CALC.

$$\text{EL OF ORIFICE IS } 406.89 + \frac{3}{12} \times \frac{1}{12} = \boxed{407.02}$$

$$R = \frac{1}{2} (408.2 - 407.02) = 0.59$$

$$Q = 0.18 \text{ CFS} \quad \text{OK}$$

USE 4" PIPE  
GATE DOWN TO  
3" EQ.

STEP 88

$Q_{P10}$  (10-YR STORM)

RELEASE RATE @ WATER SURFACE

\*  $Q_{P10} = 23.69 \text{ CFS}$  IN FLOW

\*  $Q_{P10} = 5.55 \text{ CFS}$  OUT FLOW

\* ESTIMATED OF STORAGE IS  $V = 0.97 \text{ AC-FT}$

ADD 15% FOR ED

$$V = 1.15 \times 0.97 = 1.12 \text{ AC-FT}$$

\* FROM EL. VS STORAGE READ  $\text{EL} = 409.2$

\*  $Q$  FROM 2.2"

$$R = \frac{1}{2} (409.2 - 406.29) = 1.46 \text{ FT} \quad Q = 0.15$$

$Q$  FROM 3" ORIFICE

$$R = \frac{1}{2} (409.2 - 407.02) = 1.09 \text{ FT} \quad Q = 0.25$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. 39 OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 10/19/05

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SCALE \_\_\_\_\_

$$Q = 0.25 \text{ CFS}$$

3"

$$Q = 5.55 - (0.15 + 0.15) = \underline{5.15} \text{ CFS}$$

USE RECT. ORIFICE 40" x 6" HIGH

$$R = \frac{1}{2} (409.2 - 408.2) = 0.5 \text{ FT}$$

$$Q = 5.67 \text{ CFS}$$

RE-CAL

$$\Phi \text{ OF ORIFICE IS } 408.2 + 0.25 = 408.45 \text{ FT}$$

$$R = \frac{1}{2} (409.2 - 408.45) = 0.38$$

$$Q = 4.94$$

USE 42" x 6" ORIFICE  $\rightarrow Q = 5.16 \text{ CFS}$   
OK

$$\text{WSEL} = 408.2 + \frac{3}{12} + 0.38 \times 2 = 409.2$$

$$\boxed{\text{WSEL} = 409.2}$$

STEP 9:

SPILLWAY DESIGN

FLOOD RELEASE & WATER SURFACE EL.

\*

$$Q_{P_{100}} = 39.42 \text{ CFS INFLOW}$$

$$Q_{P_{100}} = 9.27 \text{ CFS OUTFLOW}$$

$$V = 1.62 \text{ AC-FT REQUIRES}$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB \_\_\_\_\_

SHEET NO. (40)

OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_

DATE 10/20/05

CHECKED BY \_\_\_\_\_

DATE \_\_\_\_\_

SCALE \_\_\_\_\_

\* ADD 15% FOR ED

$$V = 1.15 \times 1.62 = 1.86 \text{ AC-FT}$$

\* FROM STORAGE VS EL. READ EL = 410.15

\* Q FROM 2.2" ORIFICE

$$h = 1/2 (410.15 - 406.29) = 1.93$$

$$Q = 0.18 \text{ CFS}$$

Q FROM 3" ORIFICE IS:

$$h = 1/2 (410.15 - 407.02) = 1.57 \text{ FT}$$

$$Q = 0.30 \text{ CFS}$$

Q FROM 42" x 6" ORIFICE

$$h = 1/2 (410.15 - 408.45) = 0.85$$

$$Q = 7.76$$

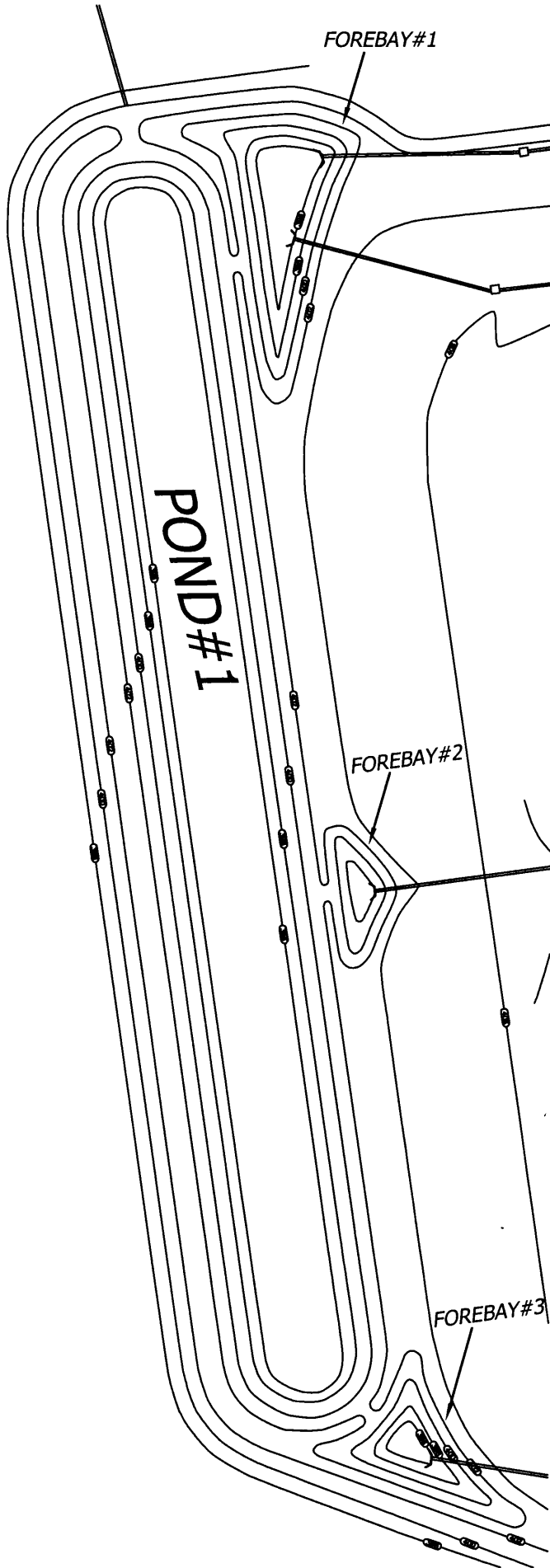
\* 
$$Q = 9.27 - (0.18 + 0.30 + 7.76) = 1.03$$

SET ORIFICE @ EL = 409.2

$$D = 8.5"$$

$$h = 1/2 \left( 410.15 - \left( 409.2 + \frac{8.5'}{12} \times 1/2 \right) \right) = 0.30$$

$$Q = 1.04 \text{ CFS OK}$$

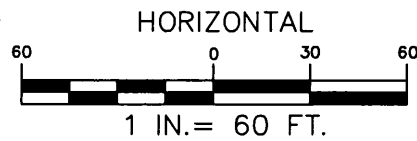


# POND#1

ELEVATION (FT.)	AREA (SQ. FT.)
396	14,530
398	19,304
400	25,570
402	32,079

# FOREBAY

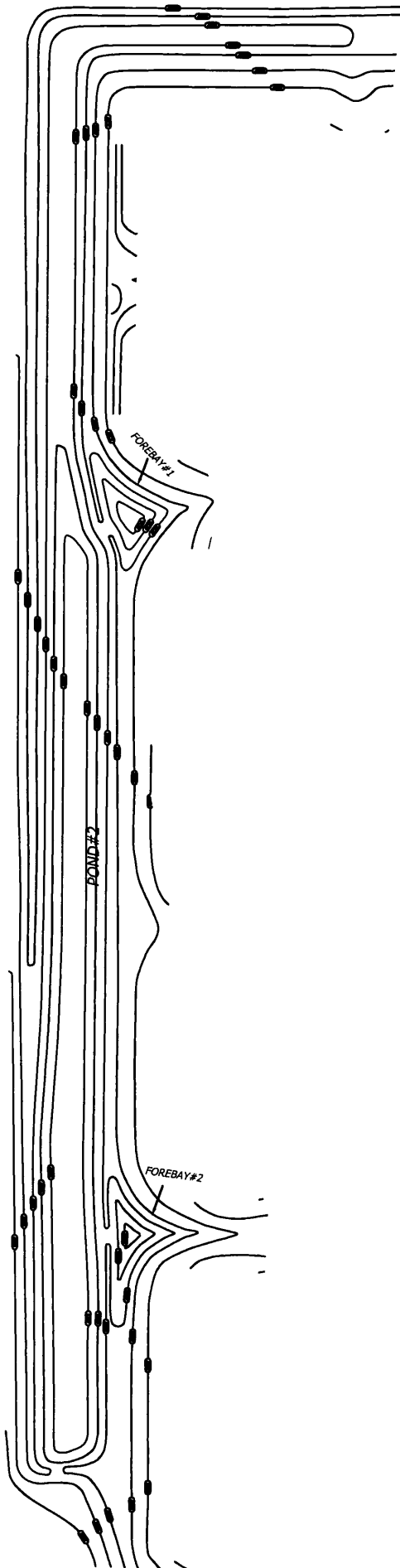
ELEVATION (FT.)	FOREBAY#1	FOREBAY#2	FOREBAY#3
	AREA (SQ. FT.)	AREA (SQ. FT.)	AREA (SQ. FT.)
396	801	0	172
398	1,516	157	451
400	2,485	524	998
402	3,776	1,022	1,937



REVISIONS	



MINISCEONGO PARK	1560
ROUTE 202 TOWN OF HAINESBORO ROCKLAND COUNTY, NEW YORK	OCTOBER 14, 2005
POND#1 R A ASSOCIATES CONSULTING ENGINEER	1"=60'
	1/3



## POND#2

ELEVATION (FT.)	AREA (SQ. FT.)
402	6,476
404	11,658
406	20,740

## FOREBAY

ELEVATION (FT.)	FOREBAY#1	FOREBAY#2
	AREA (SQ. FT.)	AREA (SQ. FT.)
402	0	55
404	120	312
406	430	974
408	972	N/A

REVISIONS



R A ASSOCIATES  
CONSULTING ENGINEERS  
INC. 200 WEST 200  
ST. LOUIS, MO 63108

MINISCEONGO PARK

ROUTE 202  
TOWN OF HANSTEAD  
TOWN OF RAMAPO  
ROCLAND COUNTY, NEW YORK

POND#2  
R A ASSOCIATES  
CONSULTING ENGINEERS

INC. 200 WEST 200  
ST. LOUIS, MO 63108

1560

OCTOBER  
14, 2005

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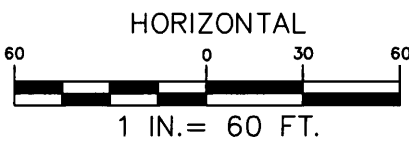
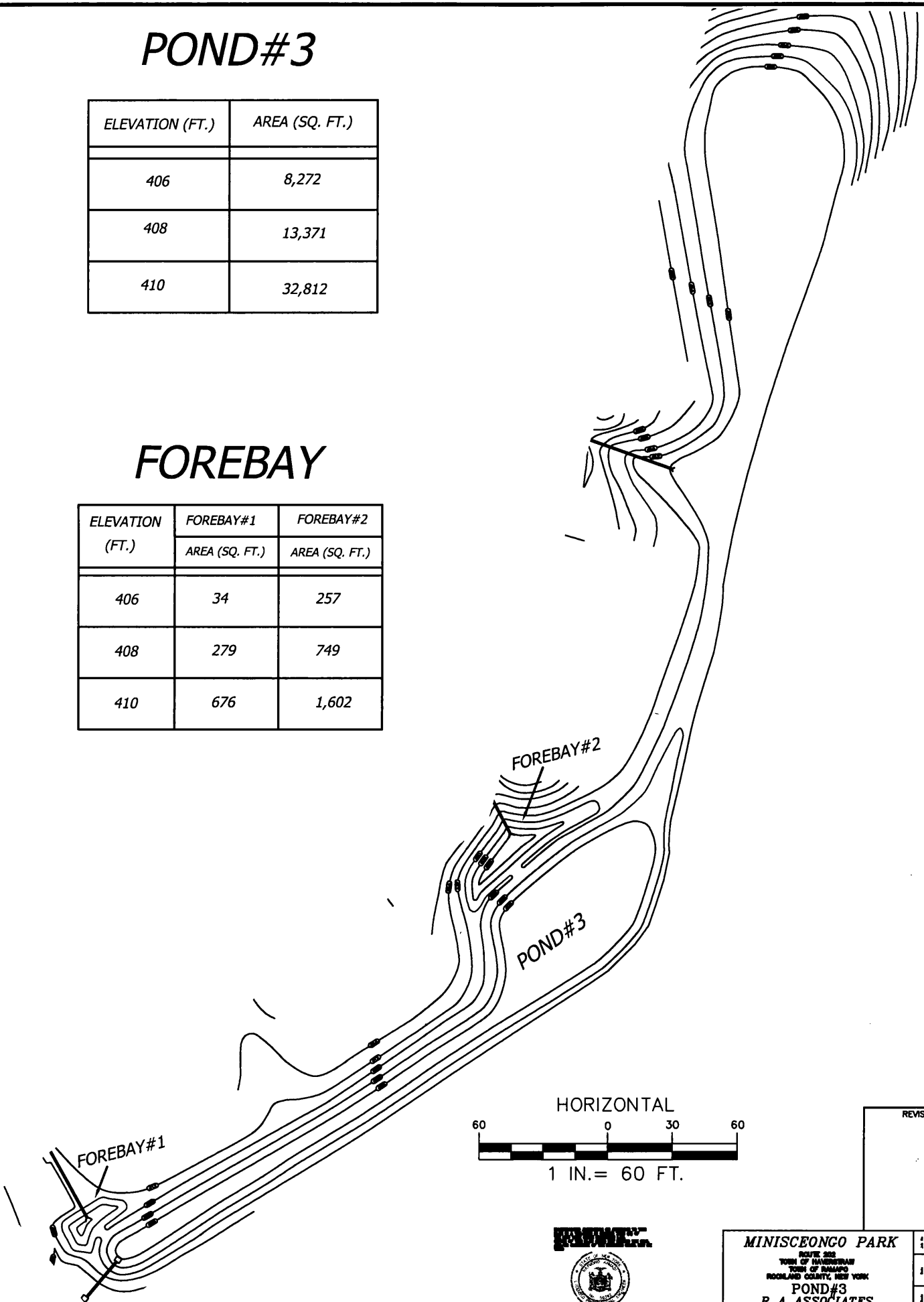
2/3

# POND#3

ELEVATION (FT.)	AREA (SQ. FT.)
406	8,272
408	13,371
410	32,812

# FOREBAY

ELEVATION (FT.)	FOREBAY#1	FOREBAY#2
	AREA (SQ. FT.)	AREA (SQ. FT.)
406	34	257
408	279	749
410	676	1,602



REVISIONS	



MINISCEONGO PARK	1560
ROUTE 202 TOWN OF HAINESBRAW ROCKLAND COUNTY, NEW YORK	OCTOBER 14, 2005
POND#3 R A ASSOCIATES CONSULTING ENGINEER	1"=60'
	3/3

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

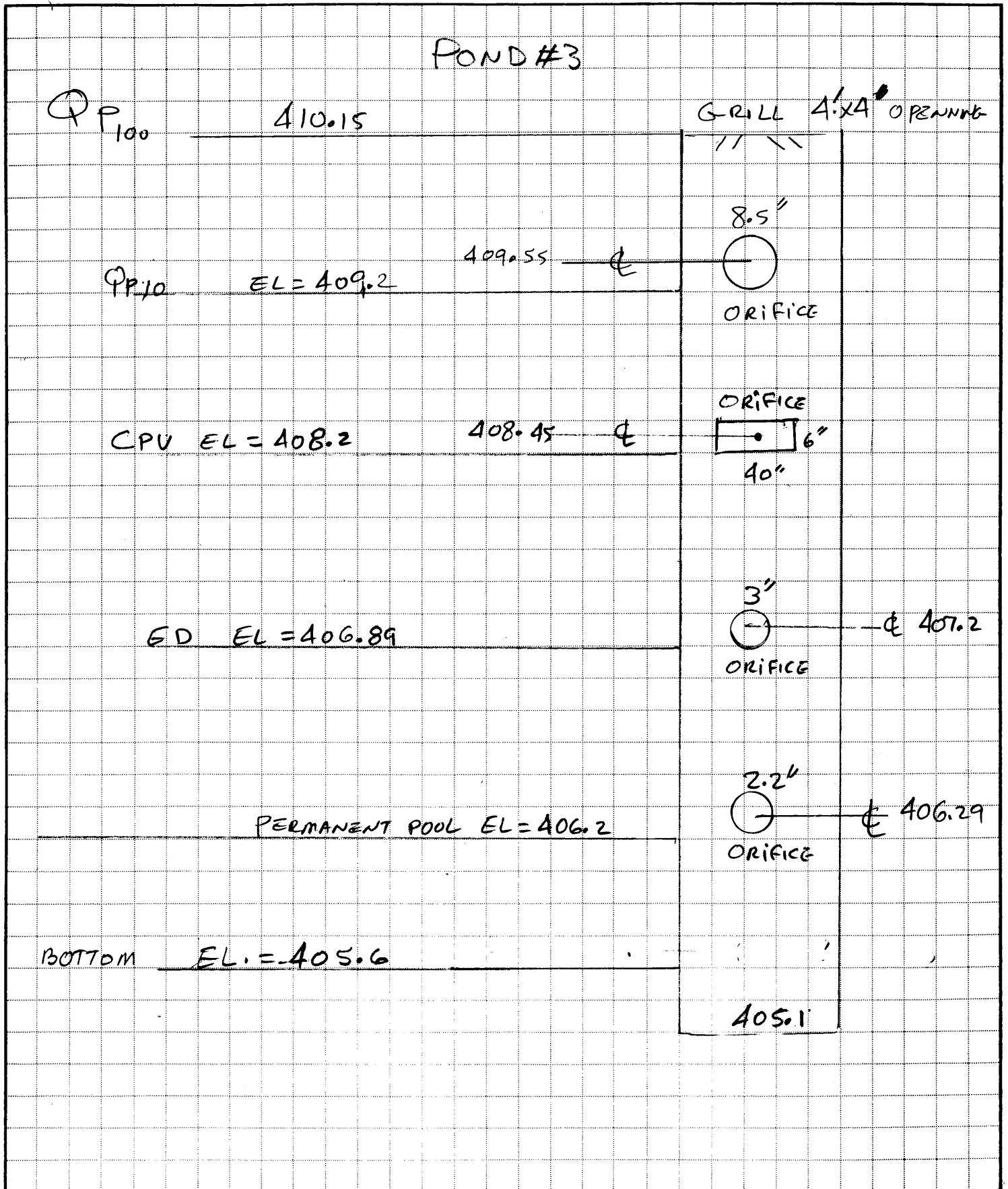
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SHEET NO. (41) OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE \_\_\_\_\_

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_



# **MINISCEONGO PARK**

**N. Y. S. ROUTE 202  
TOWN OF HAVERSTRAW  
TOWN OF RAMAPO  
ROCKLAND COUNTY  
NEW YORK**

## **SOIL EROSION & SEDIMENT CONTROL DURING CONTROL FILL**

**BY**

**RA ASSOCIATE CONSULTING ENGINEERS  
227 SOUTH MOUNTAIN ROAD  
NEW CITY, NEW YORK  
TEL / FAX (845)634-1351**

**DATE OF REPORT  
SEPTEMBER 13, 2005**



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# RA Associates

CONSULTING ENGINEERS / PLANNER

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**Ray Ahmadi, Ph.D., P.E.**  
227 South Mountain Road  
New City, New York 10956  
Tel.: (845) 634-1351  
Fax/Ans. 634-1351  
E-Mail: [RAAssoc@optonline.net](mailto:RAAssoc@optonline.net)  
RA-Engineers.com

September 13, 2005

Town of Haverstraw  
Town Hall  
One Rosman Rd.  
Haverstraw, NY 10920

Att.: Mr. Joseph Caruso, P.E.  
Village Engineer  
Maser Consulting Engineering

Re: Minisceongo Park  
Town of Haverstraw  
Town of Ramapo  
Rockland County, New York

Sub: Soil Erosion & Sediment control  
During Control Fill

## INTRODUCTION:

The Minisceongo Park Town Houses are proposed to be built at a location that it used to be sand and gravel pits in the past. The site is fairly flat. The proposed grading plan shows a minimum grade from north to south of the site. The north end of the

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MINICEONGO PARK  
ROUTE 202, TOWN OF HAVERSTRAW-TOWN OF RAMAPO, NY



property is approximately forty feet lower than Quaker Road. At the south side of the property, the land is frequently flooded by the South Branch Miniceongo Creek.

The limit of the wetlands along the South Branch Miniceongo Creek has been delineated by Robert Torgensenon, L.S. AIA on November 9, 2001. The Soil Erosion / Water Quality Plan depicts the following features:

- A) existing grades. The land slopes down from east (Quaker Road) to west (South Branch Miniceongo Creek). The drop is eleven feet in approximately 1,800 feet, which is less than 1% slope across the site (along Route 202).
- B) limit of wetland as located on November 9, 2001.
- C) limit of one hundred feet buffer zones with respect to the limit of wetland.
- D) limit of one hundred-year flood elevation.
- E) proposed contour lines during initial fill placement.
- F) proposed limits of surcharged fill area.
- G) silt fences around the disturbed areas.
- H) the disturbed area is divided into three subareas. Each subarea will drain into a proposed silt pond.
- I) the silt ponds are over excavated to store the silts eroded from the disturbed area during the fill placement and rough grading. After the fill placement, the ponds will be re-graded in order to be used as permanent storm water management and water quality control during and after the construction.

New York Guidelines for Urban Erosion & Sediment Control, Fourth Edition- April 1997 has been in preparation of this report.

#### **SITE LOCATION:**

The site is a former sand and gravel pits located northwest corner of Haverstraw Road (Route 202) and Quaker Road in the Town of Haverstraw & Ramapo, New York.

The site is forty feet (40') lower than Quaker Road and approximately two feet above the 100-year flood elevation at the South Branch Miniceongo Creek. The site is fairly flat, less than 1% slope from Quaker Road to South Branch Miniceongo Creek.

## **FILL PLACEMENT:**

The site must be fill in from zero to twelve feet from the west to east in order to be able to drain impervious areas to the ponds. The existing ground cover will be stripped and clean fill materials will be brought to the site. The sequence of fill replacement activities are shown on the attached map entitled "Miniceongo Park, Soil Erosion / Water Quality Plan" (F-1).

## **DISTURBED AREAS:**

The clean fill materials will be brought to the site to lift up the existing grades to the proposed basements elevations. A portion of the site is reserved for stock pilling the material for future use. See attached Soil Erosion / Water Quality Plan (F-1) for details.

The total disturbed area will be 33.65 acres. There are three proposed sediment ponds which they are designed to receive the annual sediment yields from the disturbed areas. These temporary sediment ponds will be regarded after the construction of the development and install the proposed control devices according to the attached "Stormwater Management Design Report".

The disturbed areas are divided into three subareas. The Dist.#1 has an area of 21.4 acres. The northwest area of this area will be surcharged as shown on F-1 plan. Down grade of the construction soils' (fill material) stock pile will be a temporary trench connecting pond #2 to pond #1. Disturbed area No.2 (Dist.#2) located south of Bar Lab and it has an area of 6.40 acres. The runoff and sediment laden will flow into the proposed temporary pond #2 and then any over flow from the check dam flows into the temporary trench connected to pond #1. Disturbed area No. 3 (Dist.#3) is located west of PIP access Road with an area of 5.85 acres. The runoff and sediment laden will flow toward the proposed temporary sediment pond #3. Any over flow from the check dam flows through the down stream swale which it is connected to the pond #1.

Over flows from ponds Nos. 2 & 3 will flow slowly toward pond # 1 with velocity of less than one foot per second (FS). The pond are grossly over excavated (up 200% of required volumes). The water surface at the ponds must be risen to the elevation of the check dam's weir in order to be released. There is no pipe except over flow weir at four to six feet above the bottom of the sediment basin. During the detention of the brown water in the ponds, the particles (sediment) in the brown water will be settled. As stated previously, the site is a former sand and gravel pits. Therefore, the storm water will be infiltrated to the ground through the pond's side walls. It is assumed that the bottom of the pond will be silted soon after the first storm and there will be no infiltration through the bed of the ponds.

The particles in the water flowing with a velocity of less than 2 FPS are in settling stage. The pond #1 has approximately 6 ac-ft capacity which is more than double the capacity needed for the entire project. The temporary sediment ponds are two ft lower

than the permanent ponds in order to have storage capacity for the sediment laden deposit from the disturbed areas.

**SEDIMENT YIELDS:**

Appendix "B" of New York Guidelines for Estimating Sediment Yields for Urban Construction Areas, dated April 1997 will be utilized to calculate sediment yields for the disturbed area.

The sediment yields for each disturbed areas have been calculated base on the above-mentioned guidelines. If the upstream pond Nos. 2 & 3 are breached, the sediment from the entire disturbed area (33.65 acres) will reach pond #1 which is six feet below the existing ground. The water surface must be raised at least 5.5 feet above the bed of pond #1 before any overflow releases from the proposed weir. The capacity of this basin more than double of the required brown runoff from the entire disturbed area. The design safety factor is more than two.

**SUMMARY OF SEDIMENT YIELD  
DURING  
CONSTRUCTION & FILLING THE SITE**

Disturbed Area ID	Area (Acre)	Sediment Yield (Acre-ft)	Provided Storage (± Acre-ft)	Remark
Dist.# 1	21.40	2.56	6.00	*
Dist.# 2	6.40	1.86	2.38	*
Dist.# 3	5.85	1.77	5.59	*
Total	33.65	2.91	6.00	*

\* Temporary Sediment Pond is over excavated area by two feet.

**HYDRAULIC / HYDROLOGY  
OF  
SEDIMENT YIELD  
DURING  
CONSTRUCTION & FILLING THE SITE**

During the rough grading the site, the disturbed areas, the flush flooding will occur due to the loose bare soils imported filling the site. The ground cover of the disturbed areas have an important role in the hydrology the site.

The disturbed areas are divided into three sub areas. Each sub area drains into a temporary sediment pond. These ponds have a dual functions; a) to collect sediment, b) to attenuate the runoffs before reaching Miniceongo Creek.

**HYDROLOGICAL SOIL GROUP:**

The imported soils are assumed to have a CN number of 91 (CN=91). The higher the CN number, the higher the rate of runoff. The CN number of impervious areas such as roofs, driveway, etc. is 98 (maximum value of CN).

**DRAINAGE STUDY:**

We have prepared the attached Hydrological – Hydraulics analysis for the existing condition and disturbed areas. The existing site is located on two watersheds (WS#1 & WS#2). The total area of both watersheds is 50.87 acres. With the exception of the edge of property lines, the entire area is flat. The area used to be a sand pits, which the materials were excavated and used elsewhere.

The disturbed areas are located on three disturbed areas (Dist.#1, Dist.#2 and Dist.#3). The runoffs from each disturbed area will flow into a proposed temporary sediment pond. The purpose of the pond is to attenuate the flow and settle the sediment (water quality) before released to Minisceongo.

As the result of these activities, the runoff from the disturbed areas with a total area of equal to 33.65 acres will be increased due to the bare soil (no cover and the surface is smooth). For the comparison purposes, the runoff from the existing area must be proportioned to the same areas that they will be disturbed. . A detention pond is required to attenuate the peak runoffs during construction to existing condition.

The runoff for the existing condition is calculated in the attached section of this report. The peak flows must be multiplied by 0.66 ( $50.87 \text{ ac}/33.65 \text{ ac}=0.66$ ) in order to obtain the peak runoff from portion of the site which it will be disturbed for filling the site.

A summary table of peak flows are attached for your reference

The volume of the proposed detention ponds are crossly over designed to protect Miniceongo Creek from receiving brown water from the site.

Preliminary calculations are attached for your reference.

Very truly yours,

Ray Ahmadi, Ph.D., P.E.

C:\Hydrology TR-55\1560\Modified Report\Soil Erosion Report.wpd

**SUMMARY OF PEAK FLOW OF  
DIFFERENT STORM FREQUENCIES  
DURING CONSTRUCTION AND FILLING THE SITE**

<b>Storm Frequency (Year)</b>	<b>Existing Condition (CFS) (1)</b>	<b>Developed Condition with Ponds (CFS) (2)</b>	<b>Change in Flow (CFS)</b>	<b>Remarks</b>
1	10.18	12.32	+2.14	*
2	20.55	19.29	-1.26	*
10	44.06	33.67	-10.39	*
100	89.19	57.97	-31.22	*

- (1) Flows are reduced for portion of disturbed areas
- (2) Provided three ponds to attenuate the flows
- \* Required storage

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MINICEONGO PARK  
ROUTE 202, TOWN OF HAVERSTRAW-TOWN OF RAMAPO, NY

# **MINISCEONGO PARK**

**N. Y. S. ROUTE 202  
TOWN OF HAVERSTRAW  
TOWN OF RAMAPO  
ROCKLAND COUNTY  
NEW YORK**

**TR-55 INPUT DATA  
FOR  
SOIL EROSION/ WATER QUALITY  
AND  
SEDIMENT YIELD  
DURING FILL PLACEMENT**

**BY**

**RA ASSOCIATE CONSULTING ENGINEERS  
227 SOUTH MOUNTAIN ROAD  
NEW CITY, NEW YORK  
TEL / FAX (845)634-1351**

**DATE OF REPORT  
SEPTEMBER 13, 2005**



Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
914 634-1351  
634-4106

JOB MINICEONGO PARK (1560)

SHEET NO. ① OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 9/6/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE SOIL EROSION/WATER QUALITY

INTRODUCTION:

THE SITE IS A FORMER SAND PIT LOCATED AT NORTH-WEST CORNER OF HAYESTRAW RD (RT202) & QUAKER RD IN THE TOWN OF HAYESTRAW & RAMPO, NY.

THE SITE IS  $40 \pm$  LOWER THAN QUAKER, AND  $2 \pm$  ABOVE THE 100-YR FLOOD ELEVATION AT MINICEONGO CREEK. THE DISTANCE FROM QUAKER ROAD TO MINICEONGO CREEK IS 1800  $\pm$  & GRADE DROPS APPROXIMATELY  $11 \pm$  FT (FROM  $411 \pm$  @ THE EAST OF THE SITE TO  $400 \pm$  @ THE BANK OF THE CREEK).

IN ORDER TO ACHIEVE THE PROSED GRADE PER GRADING PLAN AND BE ABLE TO DRAIN THE DEVELOPED AREA INTO THE PROPOSED PONDS, THE SITE MUST BE FILLED IN FROM "0" FT TO 12 FT.

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
914 634-1351  
634-4106

JOB MINICEONGO PARK (1560)

SHEET NO. (2) OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 9/6/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE SOIL EROSION/WATER QUALITY

## DISTURBED AREA

THE FILL MATERIALS WILL BE BROUGHT FROM OUTSIDE TO BRING UP THE EXISTING GRADE UP TO THE PROPOSED BASEMENT ELEVATION. SEE ATTACHE SOIL EROSION/WATER QUALITY MAP (F-1).

THE TOTAL DISTURBED AREA WILL BE  $33.65 \pm$  ACS. THERE ARE THREE PROPOSED SEDIMENT PONDS WHICH THEY WILL BE RE-GRADED AFTER THE CONSTRUCTION OF THE SITE TO PERMENANT 'FLOOD CONTROL/WATER QUALITY PONDS. CALCULATIONS ARE COVERED IN THE "MINICEON PARK, STORMWATER MANAGEMENT REPORT"

THE SEDIMENT PONDS WILL BE TWO FT LOWER THAN THE PERMENANT POND TO HAVE ROOM FOR SEDIMENT LANDEN DEPOSIT.

THE DISTURBED AREAS WILL BE DIVIDED INTO THREE SUB-AREAS. THE DIST. #1 HAS AN AREA OF 21.40 ACS. THE NORTH-WEST OF THIS AREA WILL

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
914 634-1351  
634-4106

JOB MINICEONGO PARK (1560)

SHEET NO. 3 OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE \_\_\_\_\_

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE SOIL EROSION / WATER QUALITY

BE SURCHARGED AS SHOWN ON F-1 PLANS. DOWN  
GRADE OF THE SOIL STOCK PILE WILL BE A TEMPORARY  
SEDIMENT POND. THE BOTTOM OF THE POND'S  
ELEVATION IS @ 394. A DEAD STORAGE IS  
CREATED TO RECEIVE THE SEDIMENT LOADS FROM  
THIS DISTURBED AREA.

DIST. #2 LOCATED SOUTH OF BAR LAB E  
HAS AN AREA OF 6.40 ACS. THE RUN OFF &  
SEDIMENT LADEN WILL FLOW INTO THE PROPOSED  
TEMPORARY POND #2.

DIST. #3 IS LOCATED WEST OF PIP ACCESS  
ROAD WITH AN AREA OF 5.85 ACS. THE RUN OFF  
& SEDIMENT LADEN WILL FLOW TOWARD PROPOSED  
TEMPORARY POND #3.

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
914 634-1351  
634-4106

JOB MINICEONGO PARK (1560)

SHEET NO. (4) OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 9/6/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE SOIL EROSION / WATER QUALITY

## SEDIMENT YIELDS

NY GUIDELINES FOR URBAN EROSION & SEDIMENT CONTROL,  
FOURTH PRINTING - APRIL 1997 WILL BE FOLLOWED IN THIS  
REPORT.

APPENDIX "B" GUIDELINES FOR ESTIMATING SEDIMENT  
YIELDS FOR URBAN CONSTRUCTION AREAS WILL BE UTILIZED  
TO CALCULATE SEDIMENT YIELDS FOR THE DISTURBED  
AREAS.

PER FIGURE B-1 "AVERAGE ANNUAL ISO -  
ERODENT VALUES", THE SITE IS LOCATED IN ROCKLAND  
COUNTY WITH ISO - ERODENT VALUE OF "200".  
FROM TABLE B-1 CORRECTION FACTOR USED IN EQUATION  
IS "1.34"

SEDIMENT YIELD EQUATION (APPENDIX B)

$$V = \left( (C \times A / 1320) \times (222000/A)^{0.715} \right)$$

WHERE:

V = ACRE-FT, REQUIRED SEDIMENT STORAGE  
PER YEAR

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
914 634-1351  
634-4106

JOB MINICEONGO PARK (1560)

SHEET NO. (5) OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 9/6/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

A = UNCONTROLLED DRAINAGE AREA UNDER CONSTRUCTION  
EXPRESSED IN SQUARE MILES.

C = 150 - ERODENT CORRECTION FACTOR

DIST. #1

A = 21.40 ACS OR A = 0.03344 S.M.

C = 1.34

$$V = \left( \left( \frac{1.34 \times 0.03344}{1320} \right) \times \left( \frac{222,000}{0.03344} \right)^{0.715} \right)$$

**V = 2.56 AC-FT**

THE PROPOSED TEMPORARY SEDIMENT POND #1

AT 4 FT. DEEP (BASIN IS 6 FT DEEP, FROM

ELEV = 394 TO TOP EL = 400) HAS 6.16 AC-FT.

ELEV - VS - STORAGE

POND #1

EL.	A AC	V AC-FT	V AC-FT
393.8	0	0.046	
394	0.459	1.27	→ 0.046
396	0.811	2.04	→ 1.32
398	1.23	2.80	→ 3.36
400	1.57		→ 6.16

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956

914 634-1351  
634-4106

JOB MINICEONGO PARK (1560)

SHEET NO. (6)

OF \_\_\_\_\_

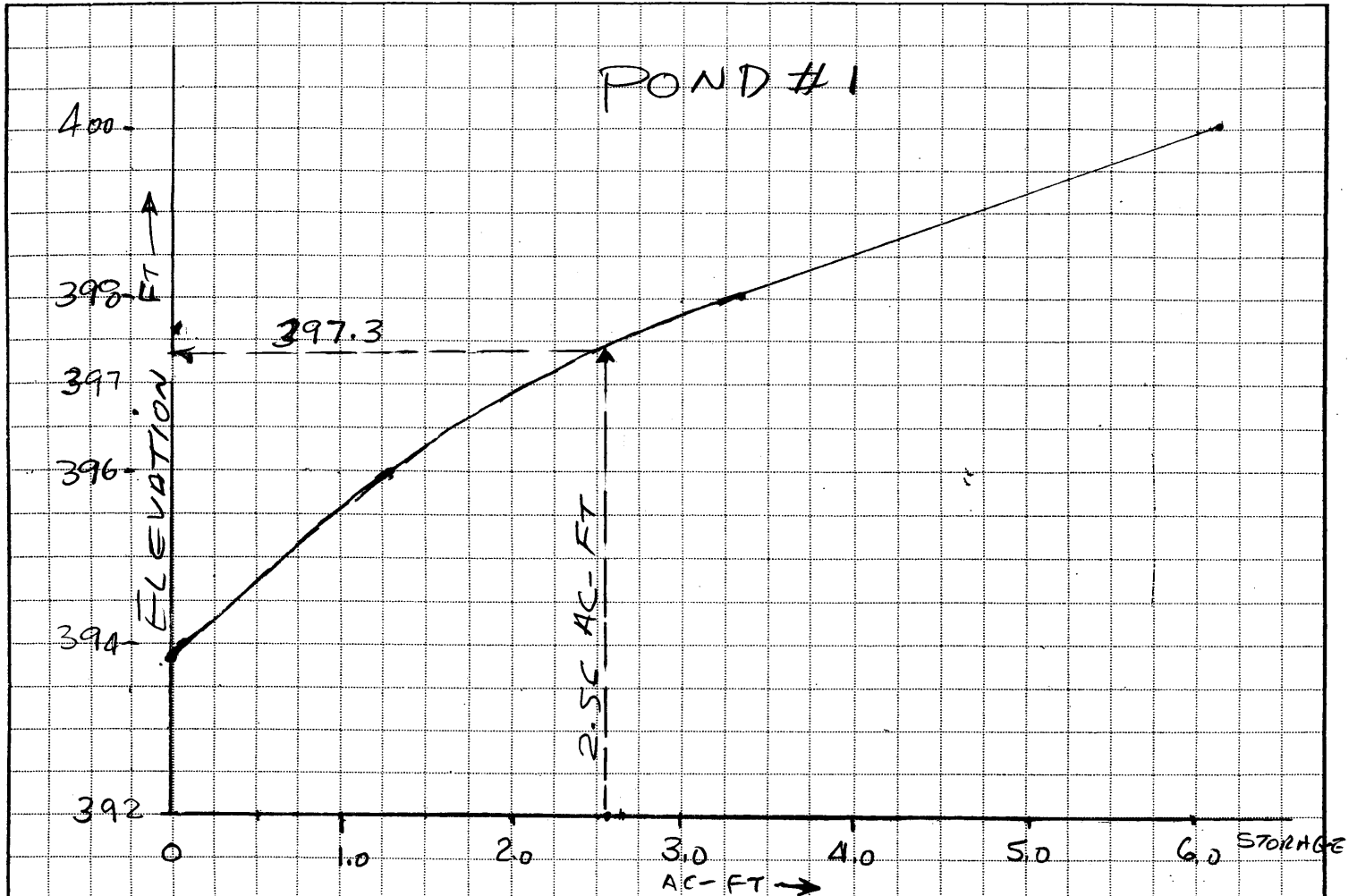
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DATE 9/6/05

CHECKED BY \_\_\_\_\_

DATE \_\_\_\_\_

SCALE \_\_\_\_\_



### ELEV. VS. STORAGE

ONE YEAR SEDIMENT DEPOSIT WILL FILL UP THE PROPOSED TEMPORARY POND #1 UP TO ELEV. 397.3.

THE STORAGE ABOVE THIS ELEVATION ( $V = 3 \pm$  AC-FT) WILL BE USED FOR FLOODING, WATER QUALITY PURPOSES.

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
914 634-1351  
634-4106

JOB MINICEONGO PARK (1560)

SHEET NO. ⑦ OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 9/6/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

DIST. #2

$A = 6.40 \text{ ACS OR } A = 0.01 \text{ S.M.}$

$C = 1.34$

$$V = \left( \frac{C \times A}{1320} \right) \times \left( \frac{222,000}{A} \right)^{0.715}$$

$$V = \left( \frac{1.34 \times 10^{-2}}{1320} \right) \left( \frac{222,000}{10^2} \right)^{0.715} = 1.82 \text{ AC-Ft}$$

$$V = 1.82 \text{ AC-Ft}$$

POND #2

ELEV VS. STORAGE

ELEV Ft	A ACS	$\Delta V$ AC-Ft	$\Sigma V$ AC-Ft
399.5	0		
		0.07	
400.0	0.26	→ 0.07	
		0.78	
402.0	0.52	→ 0.85	
		1.53	
404.0	1.01	→ 2.38	

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956

914 634-1351  
634-4106

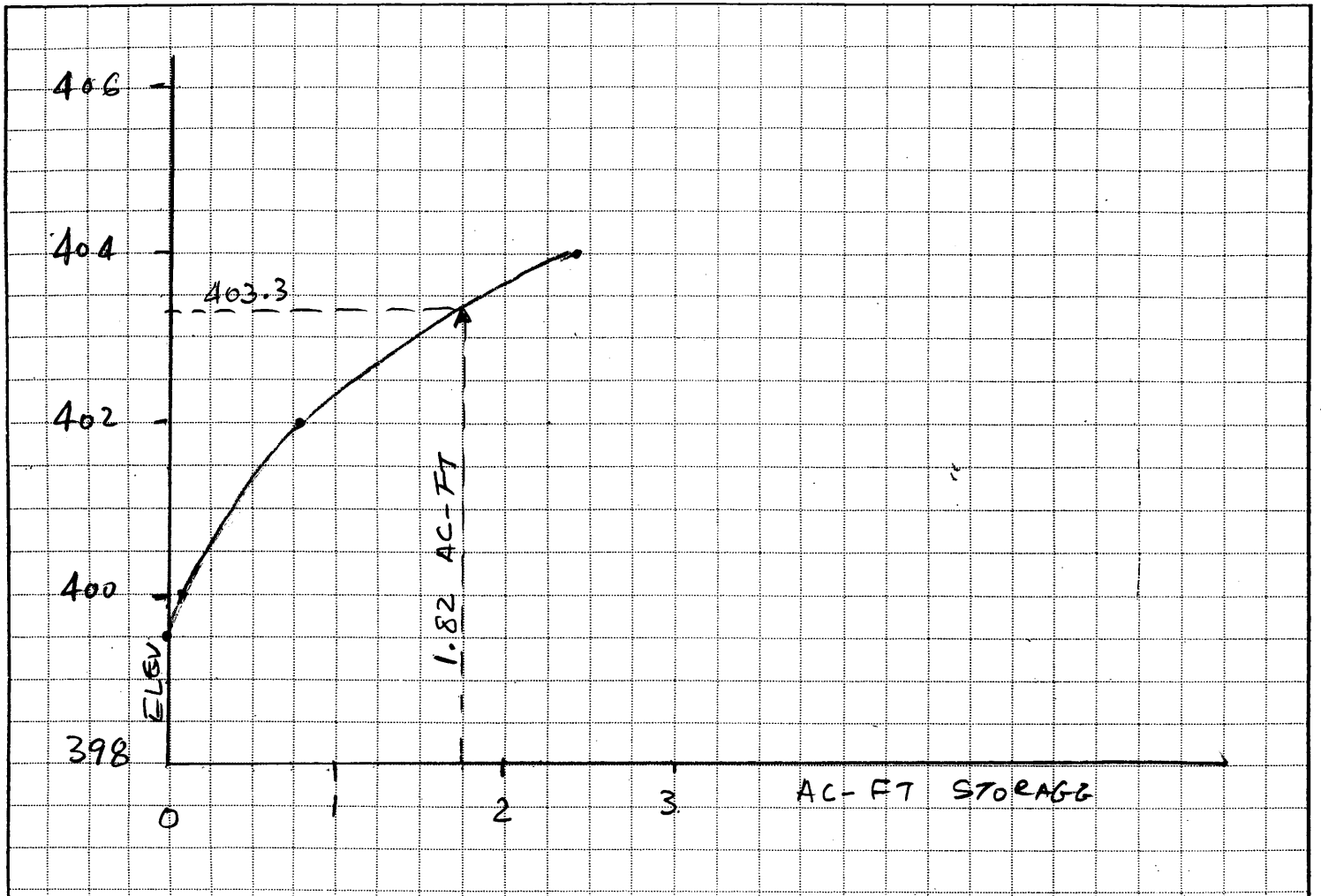
JOB MINICEONGO PARK (1560)

SHEET NO. (8) OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 9/6/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_



AFTER ONE YEAR OF SEDIMENT DEPOSIT FROM DISTURBED  
AREA #2, THE BOTTOM ELEVATION OF THE POND #2 WILL BE  
REACHED AT ELEVATION 403.3.

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
914 634-1351  
634-4106

JOB MINICEONGO PARK (1560)

SHEET NO. 9 OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 9/6/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

DIST. #3

$A = 5.85 \text{ ACS}$  OR  $A = 0.00914 \text{ S. AC.}$

$C = 1.34$

$$V = \left( \frac{1.34 \times 0.00914}{1320} \right) \left( \frac{222,000}{0.00914} \right)^{0.715} = 1.77 \text{ AC-Ft}$$

$$V = 1.77 \text{ AC-Ft}$$

POND #3

ELEVATION VS. STORAGE

ELEV. FT	AREA ACS	$\Delta V$ AC-Ft	$\Sigma V$ AC-Ft
403	0		0
404	0.53	0.27	0.27
406	0.96	1.49	1.76
408	1.87	2.83	4.59

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956

914 634-1351  
634-4106

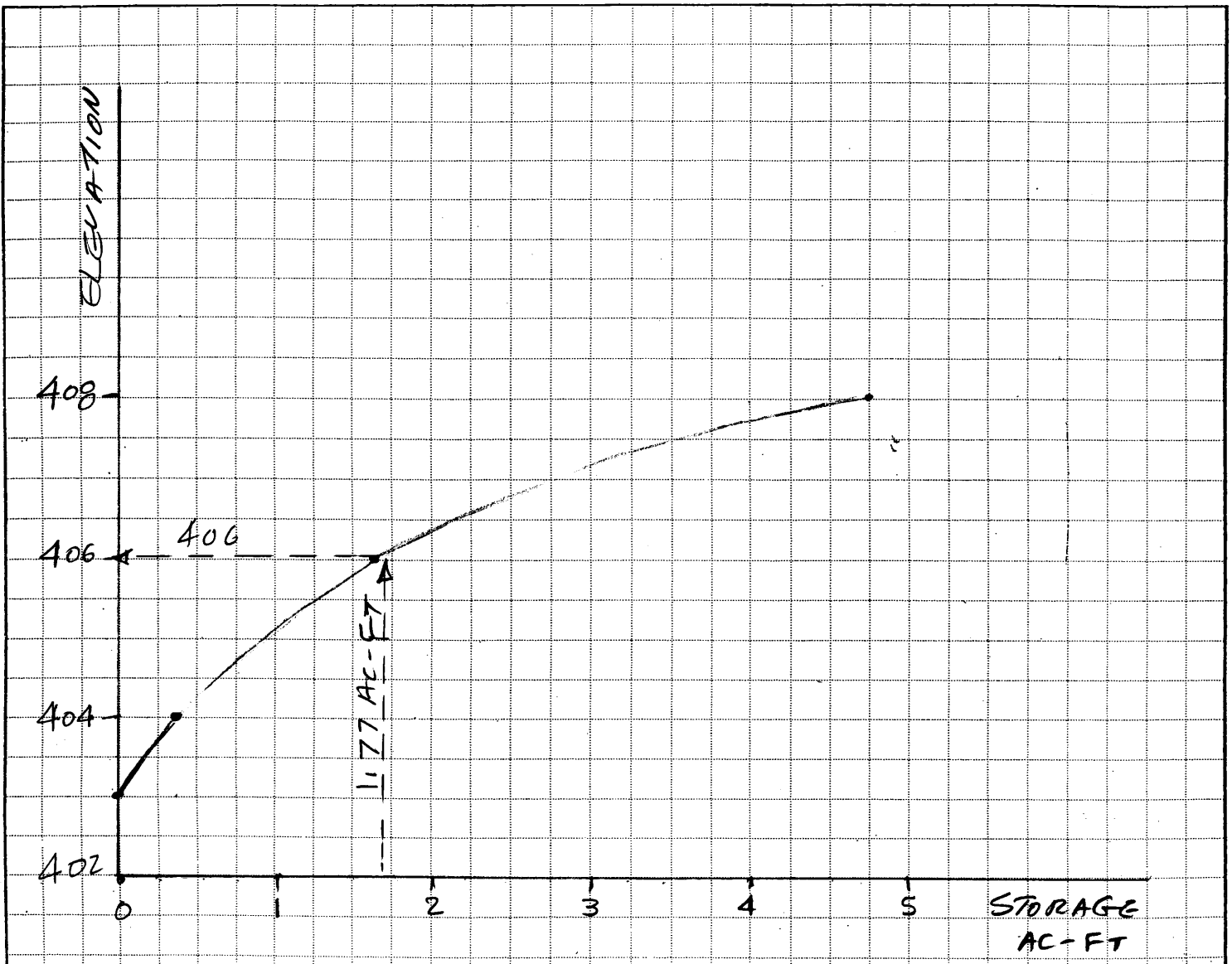
JOB MINI CEONGO PARK (1560)

SHEET NO. 10 OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 9/6/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_



ONE YEAR SEDIMENT FROM DIST. #3 WILL  
FILL UP THE PROPOSED TEMPORARILY POND #3  
UP TO ELEVATION 404.

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINICEONGO PARK (1560)

SHEET NO. 11 A OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 7/19/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

ASSUME PONDS NO. 2 & 3 ARE FAILED. THE  
SEDIMENT YIELDS FROM ENTIRE DISTURBED AREA  
IS CALCULATED AS FOLLOWS:

$$A = 33.65 \text{ ACS OR } 0.05258$$

$$C = 1.34$$

$$V = \left( \frac{C \times A}{1320} \right) \times \left( \frac{222,000}{A} \right)^{0.715} = \left( \frac{1.34 \times 0.05258}{1320} \right) \left( \frac{222,000}{0.05258} \right)^{0.715}$$

$$V = 2.91 \text{ AC-FT}$$

$$V = 2.91 \text{ AC-FT}$$

POND # 1 @ ELEV = 400 HAS 6 AC-FT  
CAPACITY.



**MINISCEONGO PARK**

**N. Y. S. ROUTE 202  
TOWN OF HAVERSTRAW  
TOWN OF RAMAPO  
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NEW YORK**

**TR-55 INPUT DATA  
FOR  
HYDRAULIC / HYDROLOGY  
OF DISTURBED AREAS  
DURING CONSTRUCTION & FILLING THE SITE**

**BY**

**RA ASSOCIATE CONSULTING ENGINEERS  
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**DATE OF REPORT  
SEPTEMBER 13, 2005**



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Consulting Engineer

227 South Mountain Road  
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JOB MINICEONGO PARK (1560)

SHEET NO. (11) OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 9/6/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

HYDRAULIC / HYDROLOGY  
OF  
DISTURBED AREAS  
DURING  
CONSTRUCTION & FILLING  
THE SITE

APPROXIMATELY 33.65 ACS OF THE SITE WILL BE  
DISTURBED DURING ROUGH GRADING THE SITE.  
SEE F-10 THE DISTURBED AREAS ARE SUB-  
DIVIDED INTO THREE SEGMENTS. RUN OFF  
FROM EACH DISTURBED AREAS WILL FLOW INTO  
A PROPOSED TEMPORARY SEDIMENT POND.,  
THE SEDIMENT PARTICLES: WILL HAVE  
SUFFICIENT TIME TO BE SETTLED BEFORE  
THE RELEASE OF THE RUN OFF TO MINICEONGO CRK.

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10958  
634-1351

JOB MINICEONGO PARK (1560)

SHEET NO. (12) OF

CALCULATED BY DATE 9/6/05

CHECKED BY DATE

SCALE

DIST. #1

$$A = 21.40 \text{ ACS}$$

CN = 91 PERVIOUS AREAS GRADED "C"

$$L_1 = 100 \text{ LF}$$

$$S = \frac{414 - 413}{100} = 0.01 \text{ DISTURBED AREA (FILL)}$$

L2 = 475 LF SHALLOW CONCENTRATED FILL

$$S_2 = \frac{413 - 404}{475} = 0.0189$$

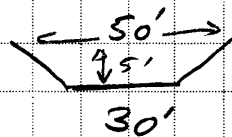
L3 = 575 LF SHALLOW CONC. FLOW

$$S_3 = \frac{404 - 402}{575} = 0.0035$$

L4 = 800 LF STREAM FLOW TO P.O.I

$$S_4 = 0.001$$

$$A = 200 \text{ FT}^2$$



$$WP = 52.4 \text{ FT}$$

$$n = 0.035 \text{ FT}$$

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINICEONGO PARK

SHEET NO. 13 OF

CALCULATED BY DATE 9/6/05

CHECKED BY DATE

SCALE

DISTURBED AREA #2

$$A = 6.40 \text{ ACS}$$

$CW = 91$  PERVIOUS AREA, GRADED "C"

$L_1 = 100$  LF OVER LAND

$$S_1 = \frac{414 - 413}{100} = 0.01$$

$L_2 = 200$  LF CONCENTRATED FLOW

$$S_2 = \frac{413 - 408}{200} = 0.0250$$

$L_3 = 70$  LF SHALLOW CONCENTRATED FLOW

$$S_3 = \frac{408 - 402}{70} = 0.0857$$

$L_4 = 1050$  LF CHNL NORTH-WEST OF THE SITE

$$S_4 = \frac{400 - 394}{1050} = 0.0057$$

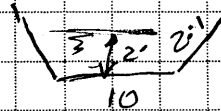
$$B = 10'$$

$$D = 2'$$

$$A = 140 \text{ S.F.}$$

$$P = 18.94 \text{ FT}$$

$$n = 0.035$$



Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956

634-1351

JOB MINICEONGO PARK

SHEET NO. (1A) OF \_\_\_\_\_

CALCULATED BY \_\_\_\_\_ DATE 9/6/05

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

SCALE \_\_\_\_\_

$L_5 = 800$  LF STREAM

$S_5 = 0.001$

$A = 200$  S.F.

$P = 52.4$  FT

$n = 0.035$

DIST. #3

$A = 5.85$  ACS

$CN = 91$  PVIOUS AREA NEWLY GRADED "C"

$L_1 = 100$  LF OVER LAND FLOW

$$S_1 = \frac{414 - 413}{100} = 0.01$$

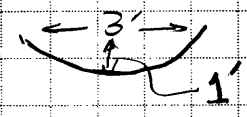
$L_2 = 550$  LF SHALLOW CONCENTRATED FLOW

$$S_2 = \frac{413 - 406}{550} = 0.0127$$

POND #3 AFTER TO POND #1

$L_3 = 900$  LF SWALE (TEMPORARY)

$$S_3 = \frac{406 - 400}{900} = 0.0067$$



$$A = \frac{2}{3} \times 3 \times 1 = 2 \text{ S.F.}$$

WP = 3 FT

Ray Ahmadi, Ph.D. P.E.

Consulting Engineer

227 South Mountain Road  
New City, New York 10956  
634-1351

JOB MINICEONGO PARK

SHEET NO. 13

OF

CALCULATED BY

DATE

9/6/05

CHECKED BY

DATE

SCALE

$$n = 0.035$$

$$LA = 800 \text{ LF} \quad \text{STREAM}$$

$$S_A = 0.001$$

$$A = 200 \text{ S.F.} \quad \text{STREAM SECT.}$$

$$WP = 52.4 \text{ FT}$$

$$n = 0.035$$



**MINISCEONGO PARK**

**N.Y.S. ROUTE 202  
TOWN OF HAVERSTRAW  
TOWN OF RAMAPO  
ROCKLAND COUNTY  
NEW YORK**

**TR-55 OUTPUT DATA  
AND  
HYDROGRAPHS  
FOR  
DISTURBED AREAS  
(1, 2, 10 & 100-YEAR STORMS)**

**BY**

**RA ASSOCIATE CONSULTING ENGINEERS  
227 SOUTH MOUNTAIN ROAD  
NEW CITY, NEW YORK  
TEL / FAX (845)634-1351**

**DATE OF REPORT  
SEPTEMBER 13, 2005**



WinTR-55 Current Data Description

--- Identification Data ---

User: RA Assoc. Date: 9/13/2005  
 Project: Miniceongo Park Units: English  
 SubTitle: Disturbed Areas (Fill), 1, 2, 5, 10 & 100-year Storms Areal Units: Acres  
 State: New York  
 County: Rockland  
 Filename: P:\hydrology TR-55\1560\Dist#1.w55

--- Sub-Area Data ---

Name	Description	Reach	Area (ac)	RCN	Tc
Dist. #1	Disturbed Area	Pond#1	21.4	91	.251
Dist.#2	Disturbed Area	Pond#2	6.4	91	0.1
Dist.#3	Disturbed Area	Pond#3	5.85	91	0.109

Total area: 33.65 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.5	4.5	5.0	6.0	7.0	7.5	2.7

Storm Data Source: Rockland County, NY (NRCS)  
 Rainfall Distribution Type: Type III  
 Dimensionless Unit Hydrograph: <standard>

RA Assoc.

Miniceongo Park  
Disturbed Areas (Fill), 1, 2, 5, 10 & 100-year Storms  
Rockland County, New York

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
3.5	4.5	5.0	6.0	7.0	7.5	2.7

Storm Data Source: Rockland County, NY (NRCS)  
Rainfall Distribution Type: Type III  
Dimensionless Unit Hydrograph: <standard>

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Miniceongo Park  
Disturbed Areas (Fill), 1, 2, 5, 10 & 100-year Storms  
Rockland County, New York

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period			
	2-Yr (cfs)	10-Yr (cfs)	100-Yr (cfs)	1-Yr (cfs)
-----				
SUBAREAS				
Dist. #1	46.29	70.97	111.61	33.08
Dist.#2	16.13	24.61	38.52	11.59
Dist.#3	14.66	22.37	35.04	10.53
REACHES				
Pond#1	55.36	86.64	138.94	38.69
Down	19.29	33.67	57.97	12.32
Pond#2	16.13	24.61	38.52	11.59
Down	5.56	9.22	15.51	3.63
Pond#3	14.66	22.37	35.04	10.53
Down	5.00	8.29	14.25	3.22
OUTLET	19.29	33.67	57.97	12.32

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Miniceongo Park  
Disturbed Areas (Fill), 1, 2, 5, 10 & 100-year Storms  
Rockland County, New York

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period			
	2-Yr (cfs) (hr)	10-Yr (cfs) (hr)	100-Yr (cfs) (hr)	1-Yr (cfs) (hr)
-----				
SUBAREAS				
Dist. #1	46.29 12.18	70.97 12.18	111.61 12.17	33.08 12.18
Dist. #2	16.13 12.11	24.61 12.11	38.52 12.11	11.59 12.11
Dist. #3	14.66 12.11	22.37 12.11	35.04 12.11	10.53 12.11
REACHES				
Pond#1	55.36 12.18	86.64 12.18	138.94 12.18	38.69 12.18
Down	19.29 12.71	33.67 12.65	57.97 12.61	12.32 12.78
Pond#2	16.13 12.11	24.61 12.11	38.52 12.11	11.59 12.11
Down	5.56 12.40	9.22 12.36	15.51 12.34	3.63 12.44
Pond#3	14.66 12.11	22.37 12.11	35.04 12.11	10.53 12.11
Down	5.00 12.42	8.29 12.38	14.25 12.35	3.22 12.45
OUTLET	19.29	33.67	57.97	12.32

RA Assoc.

Miniceongo Park  
Disturbed Areas (Fill), 1, 2, 5, 10 & 100-year Storms  
Rockland County, New York

Structure Output Table

Reach Identifier Peak Flow (PF), Storage Volume (SV), Stage (STG)  
Structure Identifier by Rainfall Return Period  
2-Yr 10-Yr 100-Yr 1-Yr

---

Reach: Pond#1  
Weir : Pond#1  
3(ft)  
PF (cfs) 19.29 33.67 57.97 12.32  
SV (ac ft) 2.37 3.57 5.47 1.70  
STG (ft) 1.71 2.42 3.46 1.26

Reach: Pond#2  
Weir : Pond#2  
3(ft)  
PF (cfs) 5.56 9.22 15.51 3.63  
SV (ac ft) .46 .69 1.05 .33  
STG (ft) .74 1.05 1.46 .56

Reach: Pond#3  
Weir : Pond#3  
3(ft)  
PF (cfs) 5.00 8.29 14.25 3.22  
SV (ac ft) .42 .63 .96 .31  
STG (ft) .69 .99 1.38 .52

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Miniceongo Park  
Disturbed Areas (Fill), 1, 2, 5, 10 & 100-year Storms  
Rockland County, New York

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Dist. #1	21.40	0.251	91	Pond#1	Disturbed Area
Dist.#2	6.40	0.100	91	Pond#2	Disturbed Area
Dist.#3	5.85	0.109	91	Pond#3	Disturbed Area
Total Area:	33.65 (ac)				

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Miniceongo Park  
Disturbed Areas (Fill), 1, 2, 5, 10 & 100-year Storms  
Rockland County, New York

Reach Summary Table

Reach Identifier	Receiving Reach Identifier	Reach Length (ft)	Routing Method
Pond#1	Outlet		STRUCTURE (Pond#1)
Pond#2	Pond#1		STRUCTURE (Pond#2)
Pond#3	Pond#1		STRUCTURE (Pond#3)

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Miniceongo Park  
Disturbed Areas (Fill), 1, 2, 5, 10 & 100-year Storms  
Rockland County, New York

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
-----							
Dist. #1							
SHEET	100	0.0100	0.011				0.025
SHALLOW	475	0.0189	0.050				0.059
SHALLOW	575	0.0035	0.050				0.167
					Time of Concentration		.251
							=====
Dist. #2							
SHEET	100	0.0100	0.011				0.025
SHALLOW	200	0.0250	0.050				0.022
SHALLOW	70	0.0857	0.050				0.004
					Time of Concentration		0.1
							=====
Dist. #3							
SHEET	100	0.0100	0.011				0.025
SHALLOW	550	0.0127	0.050				0.084
					Time of Concentration		0.109
							=====

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Miniceongo Park  
Disturbed Areas (Fill), 1, 2, 5, 10 & 100-year Storms  
Rockland County, New York

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Dist. #1	Newly graded area (pervious only)	C	21.4	91
	Total Area / Weighted Curve Number		21.4 ====	91 ==
Dist.#2	Newly graded area (pervious only)	C	6.4	91
	Total Area / Weighted Curve Number		6.4 ===	91 ==
Dist.#3	Newly graded area (pervious only)	C	5.85	91
	Total Area / Weighted Curve Number		5.85 ====	91 ==

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Miniceongo Park  
Disturbed Areas (Fill), 1, 2, 5, 10 &100-year Storms  
Rockland County, New York

Reach Channel Rating Details

Reach Identifier	Reach Length (ft)	Reach Manning's n	Friction Slope (ft/ft)	Bottom Width (ft)	Side Slope
Pond#1	(This reach is a structure: Pond#1)				
Pond#2	(This reach is a structure: Pond#2)				
Pond#3	(This reach is a structure: Pond#3)				

Reach Identifier	Stage (ft)	Flow (cfs)	End Area (sq ft)	Top Width (ft)	Friction Slope (ft/ft)
Pond#1	(This reach is a structure: Pond#1)				
Pond#2	(This reach is a structure: Pond#2)				
Pond#3	(This reach is a structure: Pond#3)				

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Miniceongo Park  
Disturbed Areas (Fill), 1, 2, 5, 10 & 100-year Storms  
Rockland County, New York

Structure Description - User Entered

Reach Identifier	Surface Area @ Crest (ac)	Height Above Crest (ft)	Surface Area @ Ht Above (ac)	Pipe Diameter (in)	Head on Pipe (ft)	Weir Length (ft)
Pond#1	1.23	2	1.57			3
Pond#2	0.52	2	1.01			3
Pond#3	0.53	2	0.96			3

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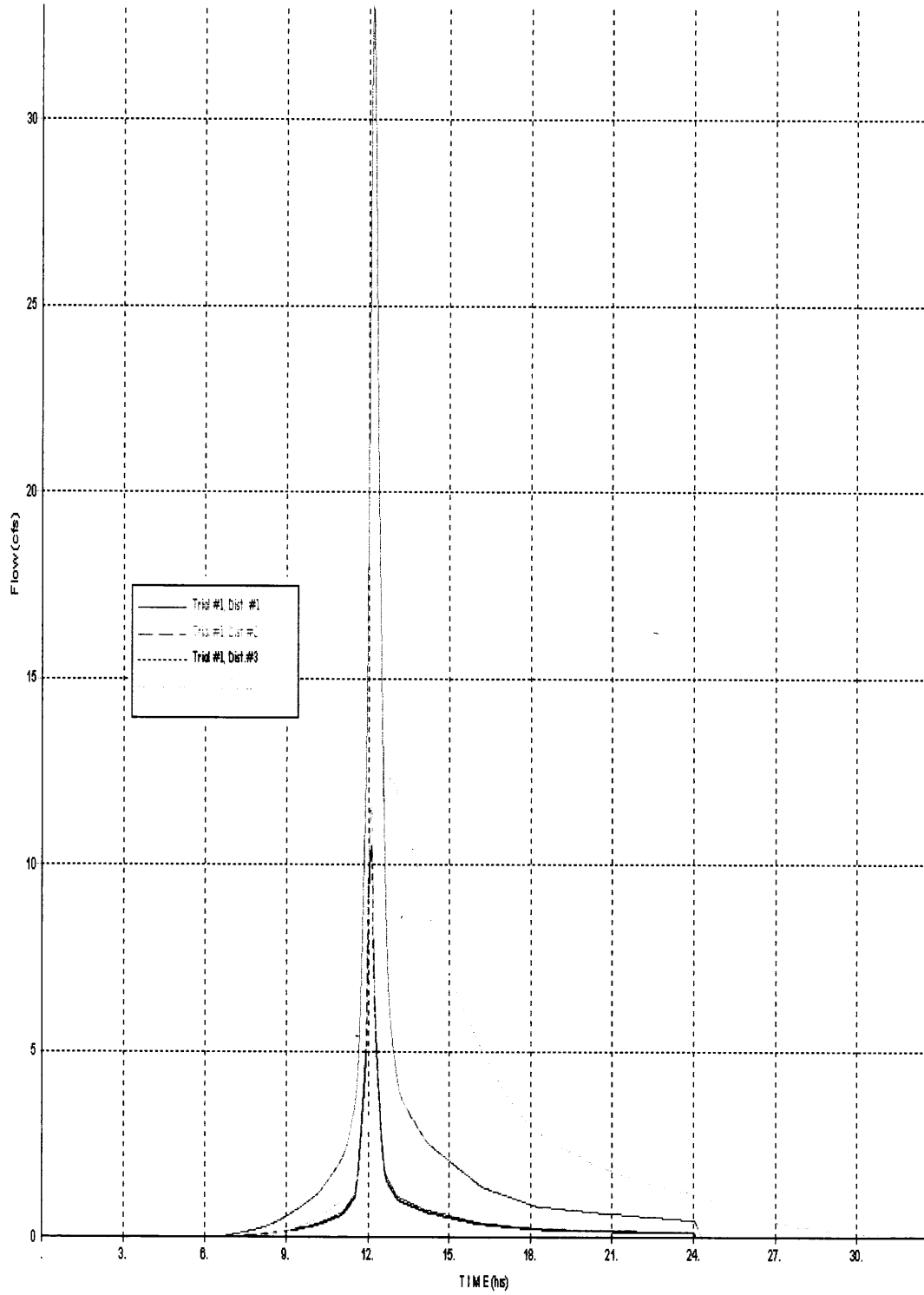
Miniceongo Park  
 Disturbed Areas (Fill), 1, 2, 5, 10 & 100-year Storms  
 Rockland County, New York

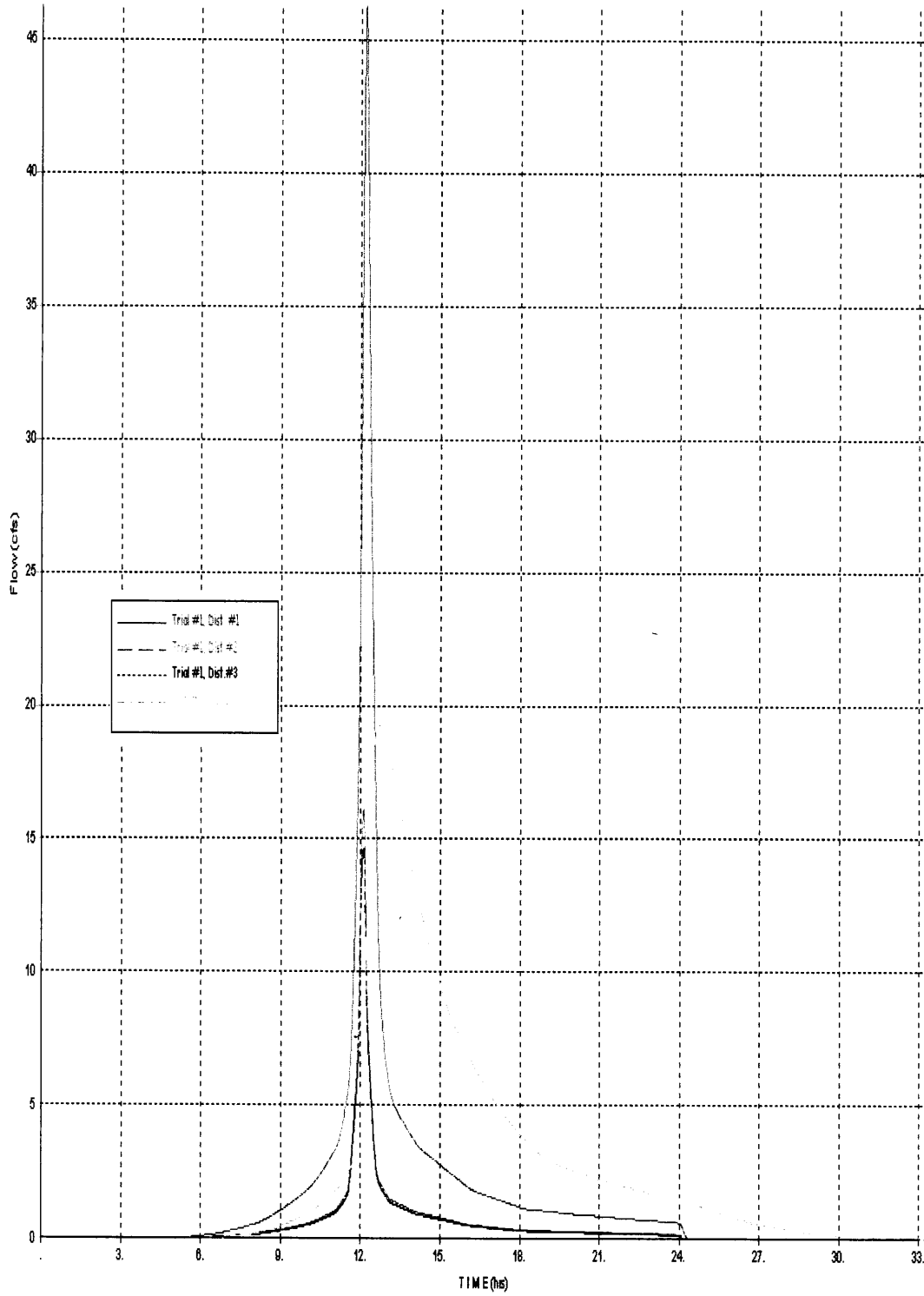
Structure Rating Details - Computed

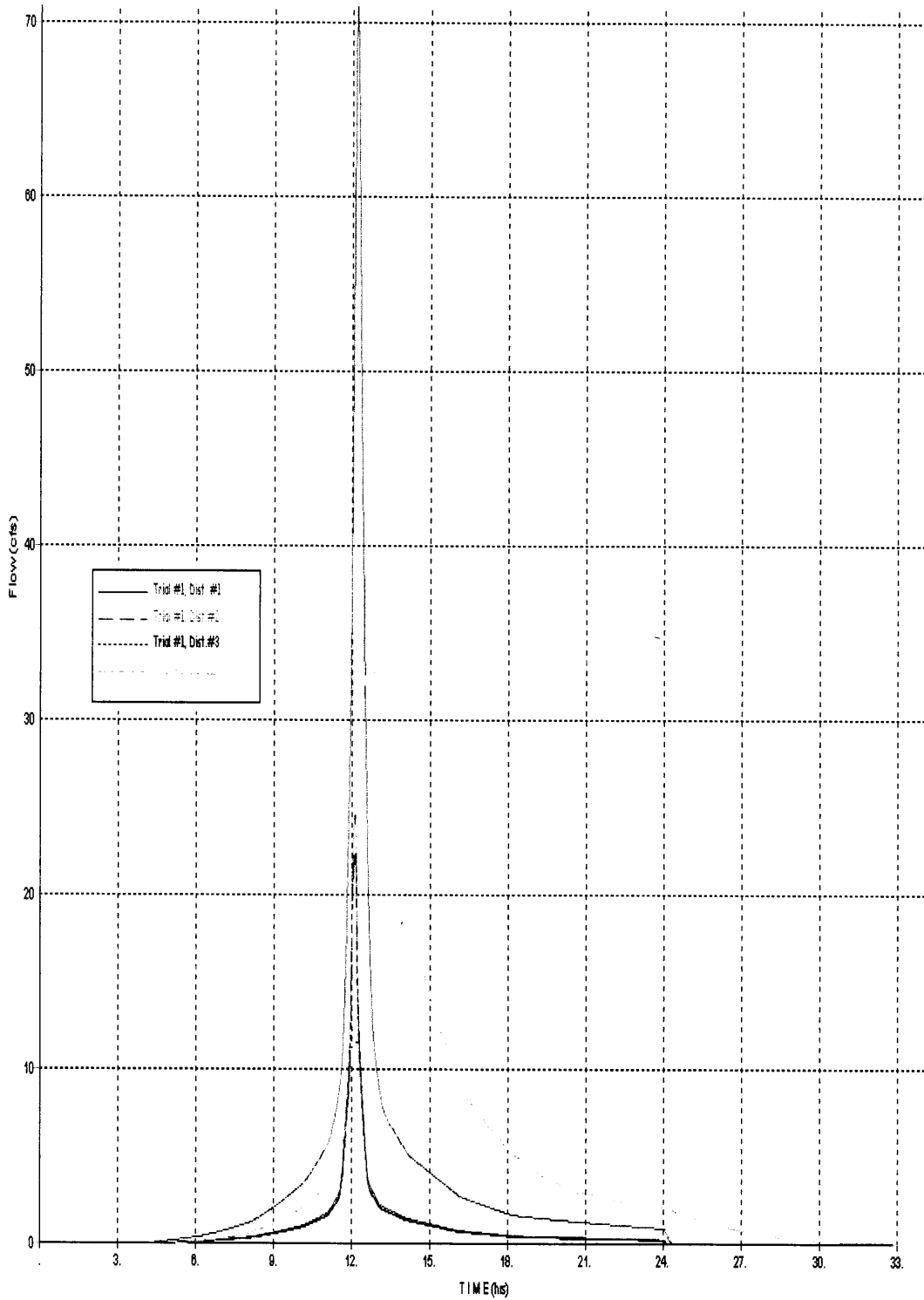
Reach Identifier	Stage (ft)	Pool Storage (ac ft)	Flows (cfs) @ Weir Length		
			Length #1 3ft	Length #2 ft	Length #3 ft
Pond#1	0	0.00	0.000		
	0.5	0.64	2.970		
	1	1.32	8.400		
	2	2.80	23.759		
	5	8.28	93.915		
	10	20.80	265.631		
	20	58.60	751.319		

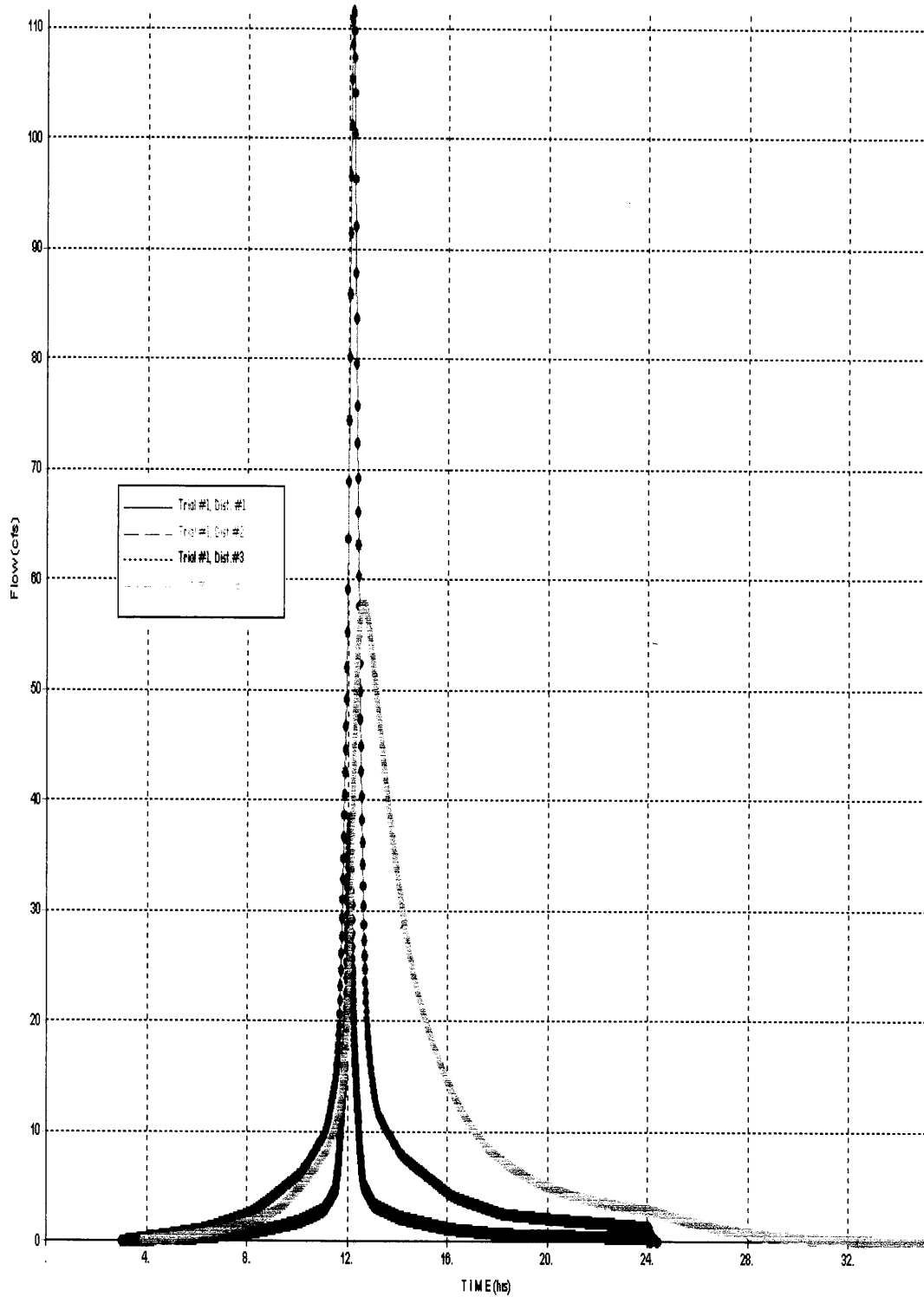
Reach Identifier	Stage (ft)	Pool Storage (ac ft)	Flows (cfs) @ Weir Length		
			Length #1 3ft	Length #2 ft	Length #3 ft
Pond#2	0	0.00	0.000		
	0.5	0.29	2.970		
	1	0.64	8.400		
	2	1.53	23.759		
	5	5.66	93.915		
	10	17.45	265.631		
	20	59.40	751.319		

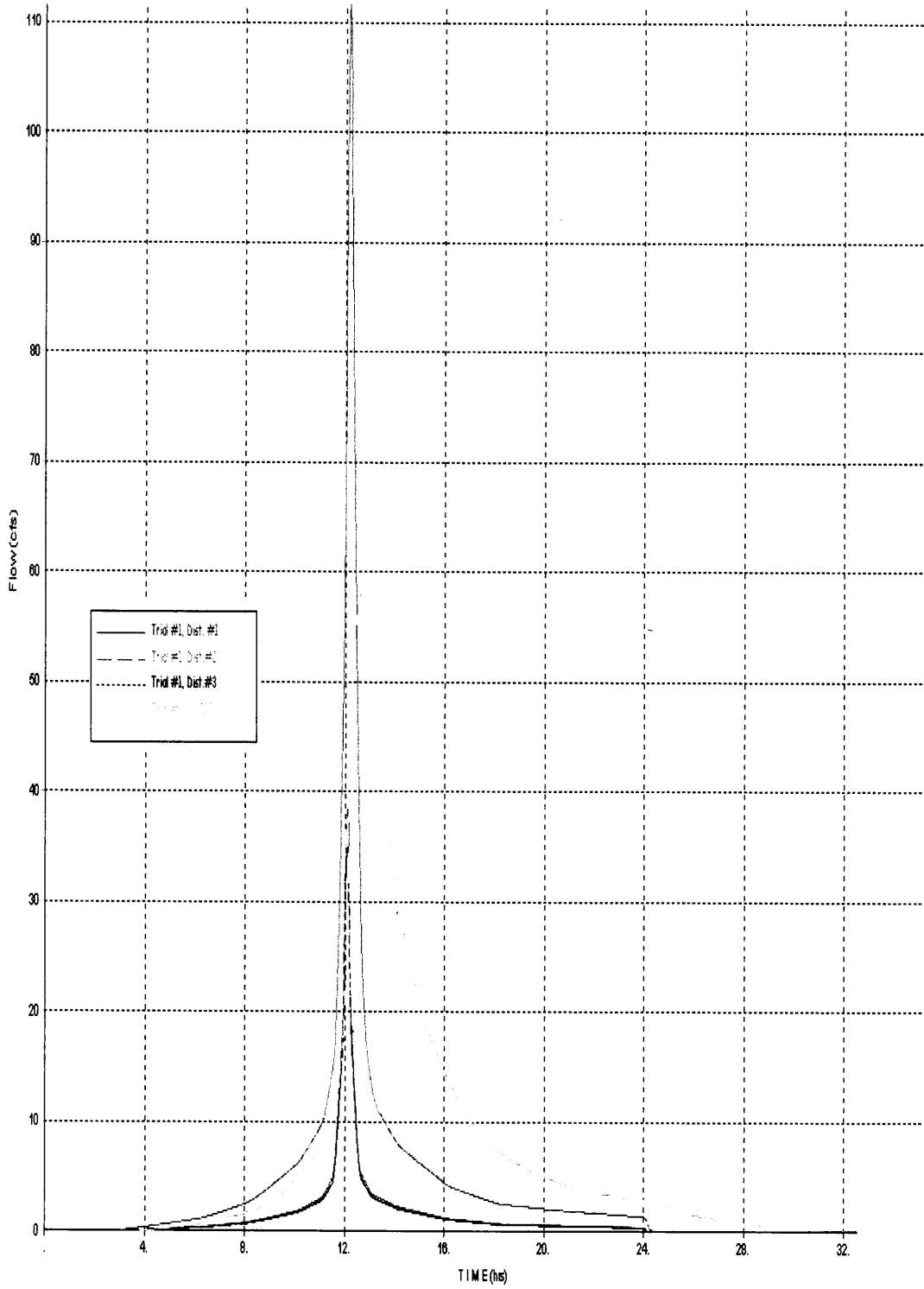
Reach Identifier	Stage (ft)	Pool Storage (ac ft)	Flows (cfs) @ Weir Length		
			Length #1 3ft	Length #2 ft	Length #3 ft
Pond#3	0	0.00	0.000		
	0.5	0.29	2.970		
	1	0.64	8.400		
	2	1.49	23.759		
	5	5.34	93.915		
	10	16.05	265.631		
	20	53.60	751.319		







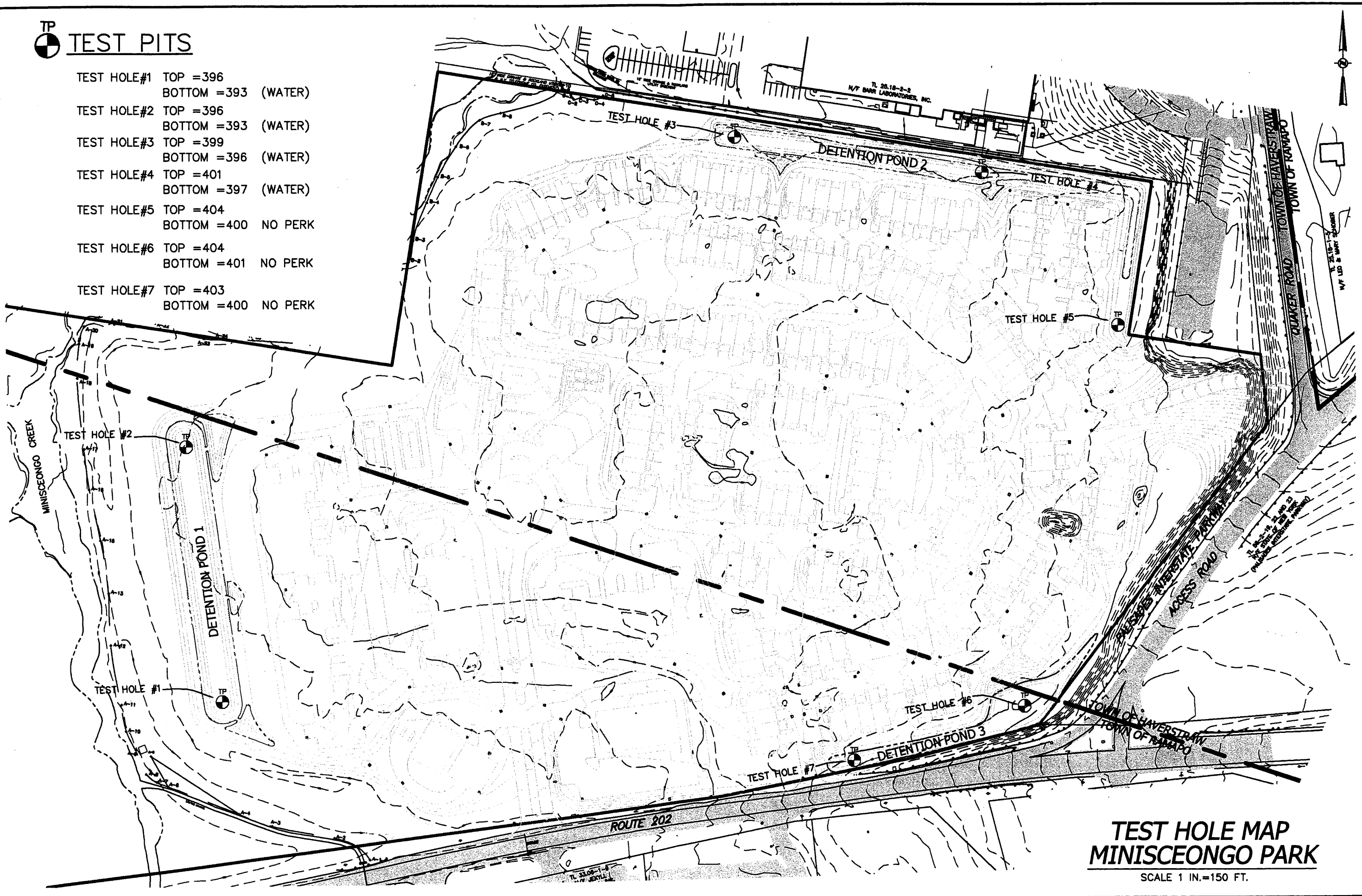






**TP** **TEST PITS**

- TEST HOLE #1 TOP =396  
BOTTOM =393 (WATER)
- TEST HOLE #2 TOP =396  
BOTTOM =393 (WATER)
- TEST HOLE #3 TOP =399  
BOTTOM =396 (WATER)
- TEST HOLE #4 TOP =401  
BOTTOM =397 (WATER)
- TEST HOLE #5 TOP =404  
BOTTOM =400 NO PERK
- TEST HOLE #6 TOP =404  
BOTTOM =401 NO PERK
- TEST HOLE #7 TOP =403  
BOTTOM =400 NO PERK



**TEST HOLE MAP  
MINISCEONGO PARK**  
SCALE 1 IN.=150 FT.



**NY STATE POLLUTANT DISCHARGE ELIMINATION  
SYSTEM FOR CONSTRUCTION ACTIVITIES**

**STORMWATER POLLUTION  
PREVENTION PLAN**

**For**

**MINISCENGO PARK**

**Route 202 and Palisades Interstate Parkway**

**Town of Haverstraw & Town of Ramapo  
Rockland County, New York**

**Ray Ahmadi, Ph.D., P.E.**

**RA ASSOCIATES Consulting Engineers**

227 South Mountain Road

New City, New York 10956

Phone/Fax: (845) 634-1351

e-mail: [RAAssoc@optonline.net](mailto:RAAssoc@optonline.net)

**March 31, 2006**



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  - 2.3 General Contractor\*:
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## Minisceongo Park – Stormwater Pollution Prevention Plan Report

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### Figures

Figure 1: Site Location Map (source: USGS Quad Pomona 1983)

### Appendices

Appendix A - SWPPP CONSTRUCTION SITE LOG BOOK

Appendix B – STORMWATER POND CONSTRUCTION INSPECTION CHECKLIST FORM

Appendix C - SPILL CONTROL & PREVENTION LOG

### Drawings

Drawing No. SWPPP – STORMWATER POLLUTION PREVENTION PLAN

Drawing No. 6 – EROSION CONTROL PLAN

Drawing No. 7 – EROSION CONTROL PLAN DETAILS

Drawing No. F-1 – SOIL EROSION/WATER QUALITY PLAN

## 1.0 INTRODUCTION

---

### 1.1 NOTICE OF INTENT

Section 402 of the Clean Water Act requires permits for stormwater discharge from construction activities, that disturb one or more acres of land to obtain a permit. To implement this law, the New York State Department of Environmental Conservation (NYSDEC) issued the General Permit GP-02-01 for Stormwater Discharges from Construction Activities. The Notice of Intent (NOI) is the means to obtain coverage under this permit.

### 1.2 SWPPP GOALS AND OBJECTIVES

The goal of the Stormwater Pollution Prevention Plan (SWPPP) is to control runoff of pollutants from the project site during and after construction activities by complying with the NY State Pollutant Discharge Elimination System (SPDES) Stormwater Permit for construction activities and local rules and regulations. The SWPPP will implement the following practices:

- Reduction or elimination of erosion and sediment loading to waterbodies during construction;
- Control of the impact of stormwater runoff on the water quality of the receiving waters;
- Control of the increased volume and peak rate of runoff during and after construction; and
- Maintenance of stormwater controls during and after completion of construction.

The SWPPP will incorporate the proper selection, sizing and siting of the Stormwater Management Practices (SMPs) to protect water resources from stormwater impacts. The design of the proposed SMPs were determined using current engineering methodologies to provide appropriate sizing criteria to avoid overburdening stormwater conveyance structures. Erosion and Sediment Control (ESC), Water Quantity Control, and Water Quality Controls are inter-related components of the SWPPP.

The SWPPP is intended to be a “living” document. The document should be revised and updated by a qualified professional whenever site conditions dictate. Any proposed revisions shall undergo review by the owner or his designated representative prior to incorporation in the SWPPP and implementation at the site. Any proposed modifications shall be in accordance with the New York State Department of Environmental Conservation’s technical standards.

## 2.0 SITE DESCRIPTION

---

### 2.1 Project Name & Location:

Minisceongo Park  
U.S. Route 202  
Town of Haverstraw & Ramapo  
Rockland County, New York

Town of Haverstraw: Section 25.18, Block 2, Lots 3 and 4  
Town of Ramapo: Section 33.06, Block 1, Lots 1 and 2

### 2.2 Owner/Operator Name & Address:

Davies Farm, LLC  
475 Route 304, New City, NY 10956  
Attention: Eric Bergstol  
(845) 638-6565

### 2.3 General Contractor\*:

\_\_\_\_\_  
(Company Name)

\_\_\_\_\_  
(Street Address)

\_\_\_\_\_  
(City, State, Zip Code)

\_\_\_\_\_  
(Phone Number)

\*note – General Contractor shall be identified 30 days prior to commencement of work.

### 2.4 Description:

The development project consists of the construction of a mixed-use residential and commercial development on an approximately 53.3 acre site. This would consist of 279 multifamily and one-family attached townhouse dwellings. Of the total dwelling units, 164 dwelling units would be located in Haverstraw and 115 dwelling units would be located in Ramapo. The applicant proposes to construct only townhomes in Haverstraw while a mix of 96-multifamily and 19 townhome dwellings will be constructed in Ramapo.

Soil disturbing activities will include clearing and grubbing; installing a stabilized construction entrance; grading (cuts & fills); excavation for drainage, sanitary sewer, other utilities, and building foundations; construction of public and private roads and parking areas; and preparation for final planting and seeding.

## Minisceongo Park – Stormwater Pollution Prevention Plan Report

### 2.5 Impervious Cover:

The existing project site consists of primarily vacant land with no impervious cover. The developed site includes approximately 33.5% impervious cover.

### 2.6 Site Area:

The existing project is approximately 53.3 acres, of which, approximately 35.6 acres will be disturbed by construction activities. The existing vegetative cover and habitat on the remaining 17.7 acres of the site would not be disturbed by the proposed project.

### 2.7 Location Map:



**Figure 1: Site Location Map (source: USGS Quad Pomona 1983)**

### 2.8 Sequence of Major Activities:

Phasing and schedule of construction is as follows (several phases will overlap):

Phase 1	Surcharge Fill	2 months for placement of surcharge material and 3 months for surcharge activity – (5 months total)
Phase 2	Fill and Compaction	6 months from completion of surcharge
Phase 3	Rough Grading	5 months

## Minisceongo Park – Stormwater Pollution Prevention Plan Report

Phase 4	Building Construction	22 months
Phase 5	Final Grading, Landscaping	4 months

The proposed project will be completed within approximately 42 months from the beginning of surcharge fill activities. There would be an overlap between Phases 3, 4, and 5. Grading could be occurring in one portion of the site, while vertical building construction could be occurring elsewhere on the site.

During the surcharge phase, approximately 100,000-125,000 cubic yards of fill will be brought to the site. While during the site work phase, an additional 320,000-345,000 cubic yards of fill will be brought to the site.

The general order of activities will be as follows:

1. Install the stabilized construction entrance and track-out pad.
2. Perform limited clearing and grubbing activities in stages where total disturbance is not more than 5 acres at any point in time.
3. Prior to fill being brought to the site for the surcharge and fill compaction phase, erosion and sediment control measures including temporary silt fences, haybale barriers, drainage diversion swales, sediment traps, check dams and berms will be installed.
4. Dust control and debris track-out control measures will be implemented.
5. Disturbed area will be divided into three distinct subareas; each with a temporary silt/sedimentation trap that will be constructed by over-excavation in the locations of the future proposed stormwater ponds.
6. Perform surcharge fill operations in stages as shown on the Soil Erosion/Water Quality Plan During Fill Placement Phase plan.
7. Temporary soil covering measures including mulching, seeding and erosion control matting will be applied to stabilize surcharge fill and stockpile areas.
8. Following the surcharge and fill compaction phase program, grading activities and site work will commence which will be preceded by a reinstallation, replacement and expansion of erosion and sediment control measures as per the erosion control plan for this project.
9. Immediately following installation of the sewer and drainage system, curb inlet protection measures including stone, haybales, fabric or excavated depressions will be established around inlets to filter sediments from runoff.
10. Construction of all roads and utilities shall proceed from downstream to upstream. Also, all major roads will be constructed prior to minor roads.
11. Perform grading for the buildings and driveways where an access road is already constructed. Construct driveways and buildings in stages.
12. As construction proceeds, all disturbed areas shall be paved, seeded, sodded, or planted as specified on the plans in a timely manner as noted in the "Timing of Controls/Measures" to prevent unnecessary erosion.
13. Remove any accumulated sediment and regrade permanent stormwater ponds to slopes and grades as per plan.
14. Once all disturbed areas have been properly stabilized, temporary control measures shall be removed.

## 3.0 CONTROLS

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### 3.1 EROSION AND SEDIMENT CONTROLS STABILIZATION PRACTICES

#### 3.1.1 Temporary Stabilization:

Topsoil, stockpiles, and soils that are exposed and left bare for a periods 14 days which are not being graded, not under active construction for 21 days or more, or not scheduled for permanent seeding within 21 days will be stabilized with temporary seed and mulch. All grass seed mixtures and application rates shall comply with Sediment and Erosion Control Plan.

Areas of the site which are to be paved, will be temporarily stabilized by applying stone sub-base until bituminous pavement can be applied.

#### 3.1.2 Permanent Stabilization:

Disturbed portions of the site where construction activities permanently cease shall be stabilized with permanent seed no later than 14 days after the last construction activity. All grass seed mixtures and application rates shall comply with the Landscaping Plan.

### 3.2 STRUCTURAL PRACTICES

Proposed measures include silt fences, haybale filters, gravel sediment filters, rip-rap, temporary sediment traps, inlet protection, stabilized construction entrance, check dams and anti-tracking pads. Refer to Eosion Control Plan and Details sheet for the location and construction requirements of the proposed structural practices.

### 3.3 STORMWATER MANAGEMENT WATER QUALITY

Hydrologic and hydraulic analyses were conducted to address four distinct sizing criteria for storm water management practices. The four criteria are:

- Meeting pollutant removal goals,
- Reducing channel erosion,
- Preventing overbank flooding, and
- Helping to control extreme flood events.

Stormwater runoff entering the site will be directed through a combination of grading and pipe flow toward three separate wet extended detention ponds.

In New York State, a unified approach has been established for addressing these criteria. All runoff from developed portions of the site is conveyed into the permanent water quality ponds. The water quality ponds are designed in accordance with the 90% rule as specified by the New York State Department of Environmental Conservation Phase II stormwater regulations. This design is intended to capture and treat 90% of the average annual stormwater runoff volume (water quality volume) entering the site. The water quality volume is directly related to the amount of impervious surface created at a site. This volume of water contains the majority of contaminants and sediment from

## Minisceongo Park – Stormwater Pollution Prevention Plan Report

contributing roads, driveways, rooftops, and other portions of the site. While in these ponds, these contaminants will settle out to the bottom of the ponds and later be cleaned out from the bottom at the appropriate time. This water is then slowly discharged from the ponds after the storm runoff has been treated.

Channel protection will be achieved through the 24-hour extended detention of the post-developed one-year, 24-hour storm – meaning the volume of water from the one-year, 24-hour storm should be discharged from the site over a 24-hour period.

Overbank flooding is minimized by controlling the peak discharge from the 10-year storm to pre-development flow rates during the same storm event. Extreme floods are minimized by controlling the peak discharge from the 100-year storm to the pre-development flow rates during the same storm event.

The Homeowners Association will provide long-term operation, maintenance and inspection of the wet extended detention ponds.

### 3.3.1 Name of Receiving Waters:

The site drains towards the west along the delineated wetland boundary and ultimately into the South Branch of the Minisceongo Creek.

## 3.4 PEAK FLOW ATTENUATION

For this site, three (3) stormwater quality/detention ponds are designed to attenuate potential increases in discharge and to provide adequate water quality and channel protection volumes as stipulated by the NYSDEC Stormwater Management Design Manual. The property has very gently sloping to nearly level topography, except along the easterly and northeasterly periphery of the site, which slopes up to Quaker Road and the Palisades Interstate Parkway ramp. As such, the site generally drains in one direction, from the east to the west. Flows eventually drain into Minisceongo Creek, which is located along the west end of the property.

## 3.5 RUNOFF CONVEYANCE SYSTEMS

Discharge outlet pipes for the site have been designed to convey the 100-year peak discharge.

## 3.6 OTHER CONTROLS

### 3.6.1 Waste Materials:

All waste materials will be collected and stored in securely lidded metal dumpsters rented from \_\_\_\_\_, a solid waste management company located in Rockland County (name of carting company to be identified 30 days prior to commencement of work). The dumpsters will meet Town of Haverstraw, Town of Ramapo, Rock County, and New York State solid waste management regulations. All trash and construction debris from the site will be deposited in the dumpsters. The dumpsters will be emptied as necessary, and the trash will be hauled off site to \_\_\_\_\_ (destination to be identified 30 days prior to

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commencement of work). No construction waste materials will be buried on site. All personnel will be instructed regarding the correct procedure for waste disposal. Notices stating these practices will be posted in the office trailer and \_\_\_\_\_, the Job Supervisor, individual who is responsible for managing the day to day site operations, will be responsible for seeing that these procedures are followed (Job Supervisor shall be identified 30 days prior to commencement of work).

### 3.6.2 Hazardous waste:

All hazardous waste materials will be disposed of in the manner specified by local or state regulation or by the manufacturer. Site personnel will be instructed in these practices and \_\_\_\_\_, Job Supervisor, individual who is responsible for managing the day to day site operations, will be responsible for seeing that these procedures are followed (Job Supervisor shall be identified 30 days prior to commencement of work).

### 3.6.3 Sanitary Waste:

A licensed sanitary waste management contractor (sanitary waste management contractor to be identified 30 days prior to commencement of work) will collect all sanitary waste from the portable units.

### 3.6.4 Offsite Vehicle Tracking:

A stabilized construction entrance and gravel pad will be provided to wash, vacuum, sweep or spray-clean trucks over before leaving the site in order to prevent track-out of dirt, mud, debris and dust. Also, trucks will be covered with a tarp and at least 6 inches of freeboard clearance will be maintained to keep excessive dust from escaping the truck during hauling operations. Macadam surfaces shall be swept or vacuumed periodically as needed and at the end of each day during construction.

## 3.7 TIMING OF CONTROL MEASURES

As indicated in the Sequence of Major Activities, the stabilized construction entrance and other sediment and erosion control activities will be constructed prior to earthwork activities on any part of the site. Any soil areas that are exposed and left bare for a period of 14 days which are not being graded, not under active construction for 21 days or more, or not scheduled for permanent seeding within 21 days will be treated with temporary seed and mulch. Once construction activity ceases permanently in an area, that area will be stabilized with permanent seed and mulch. After the entire site is stabilized, accumulated sediments will be removed from the sediment and erosion control structures and the controls will be removed.

## 3.8 CERTIFICATION OF COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS

The stormwater pollution prevention plan reflects New York State Department of Environmental Conservation requirements for storm water management and erosion and sediment control, as established in Article 17, Titles 7, 8 and Article 70 of the Environmental Conservation Law. To ensure compliance, this plan was prepared in

## **Minisceongo Park – Stormwater Pollution Prevention Plan Report**

accordance with guidelines issued with the SPDES General Permit for Storm Water Discharges from Construction Activities that are Classified as “Associated with Construction Activity”, published by the New York State Department of Environmental Conservation.

## 4.0 MAINTENANCE & INSPECTION PROCEDURES

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### 4.1 SEDIMENT & EROSION CONTROL INSPECTION AND MAINTENANCE PRACTICES

The following are inspection and maintenance practices that will be used in coordination with the SWPPP Construction Log Book prepared for this project to maintain sediment and erosion controls:

- The Operator shall have a qualified professional conduct an assessment of the site prior to the commencement of construction and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP, as required by the SPDES General Permit for Stormwater Discharges, have been adequately installed or implemented to ensure overall preparedness of the site for commencement of construction. Qualified professional means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a licensed professional engineer, Certified Professional in Erosion and Sediment Control (CPESC), soil scientist, or someone working under the direction and supervision of a licensed professional engineer, Certified Professional in Erosion and Sediment Control (CPESC), or soil scientist (person must have experience in the principles and practices of erosion and sediment control). The template for the initial inspection and assessment is included in Appendix A.
- All control measures will be inspected by a qualified professional at least once each week (7 days) and immediately following any storm event of 0.5 inches or greater.
- All measures will be maintained in good working order. If a repair is necessary, it will be initiated within 24 hours of discovery.
- Built-up sediment will be removed from silt fences when it has reached one-third the height of the fence.
- Silt fence will be inspected for depth of sediment, tears, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in the ground.
- Temporary and permanent seeding and planting will be inspected for bare spots, washouts, and healthy growth.
- A maintenance inspection report will be filled out after each inspection and will become part of the SWPPP.
- \_\_\_\_\_, Job Supervisor, will select individuals who will be responsible for coordinating efforts with the qualified professional for regular inspections, maintenance and repair activities, and filling out the inspection and maintenance report forms. Inspection reports will summarize:
  1. Name of Inspector
  2. Qualifications of Inspector
  3. Date of Inspection
  4. Weather Conditions
  5. Areas inspected, including measurements
  6. Areas that have undergone temporary and permanent stabilization
  7. Indicate all disturbed areas that have not undergone active site work during the previous 14-day period

## Minisceongo Park – Stormwater Pollution Prevention Plan Report

8. Observed condition of all erosion and sediment control practices
9. Inspect all sediment control practices and record approximate degree of sediment accumulation as a percentage of the sediment storage volume
10. Actions Taken to Correct Problems
11. Incorporate changes necessary to the SWPPP

The template for regular inspections is included in Appendix A.

- Personnel selected for inspection and maintenance responsibilities will receive training from the Job Supervisor and/or the qualified professional. They will be trained in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls used on site in good working order.
- The Operator shall ensure that a record of all inspection reports is maintained in the SWPPP Construction Log Book. The site log book shall be maintained on site and be made available to the permitting authorities upon request. Prior to the commencement of construction, the Operator shall certify in the site log book that the SWPPP was prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements. The Operator shall retain copies of SWPPPs and any reports submitted in conjunction with this permit, and records of all data used to complete the NOI to be covered by this permit, for a period of at least three years from the date that the site is finally stabilized. The Operator shall post at the site, in a publicly-accessible location, a summary of the site inspection activities on a monthly basis. The template for SWPPP Construction Log Book is included in Appendix A.
- Prior to filing of the Notice of Termination (NOT) or the end of permit term, the Operator shall have the qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. Final stabilization means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of 80% has been established, or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structure. The template for final inspections is included in Appendix A.
- When the site has been finally stabilized, the operator must submit a Notice of Termination form to terminate coverage under the SPDES General Permit GP-02-01. The permittee must identify all of the permanent stormwater management structures that have been constructed. In addition, an manual describing the operation and maintenance practices that will be necessary for the structures to function as designed after the site is stabilized must be finalized and in-place. The permittee must also certify that the permanent structure have been constructed as described in the SWPPP.

## 5.0 NON-STORM WATER DISCHARGES

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### 5.1 NON-STORMWATER DISCHARGES

It is expected that the following non-storm water discharges will occur from the site during the construction period:

- Water from water line flushing.
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).
- Uncontaminated groundwater (from natural springs)

## **6.0 INVENTORY FOR POLLUTION PREVENTION PLAN**

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### 6.1 MATERIAL SUBSTANCES

The materials or substances listed below are expected to be present on the site during construction:

- Concrete
- Detergents
- Paints (enamels and latex)
- Metal Studs
- Roofing Materials
- Tar and Paving Materials
- Fertilizers
- Petroleum Based Products
- Cleaning Solvents
- Wood
- Masonry Block

## **7.0 SPILL CONTROL & PREVENTION**

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### **7.1 MATERIAL MANAGEMENT PRACTICES**

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to storm water runoff:

#### **7.1.1 Good Housekeeping:**

The following good housekeeping practices will be followed on site during the construction project:

- An effort will be made to store only enough product required to do the job.
- All materials stored on site will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
- Product will be kept in their original containers with the original manufacturer's label.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used up before disposing of the container.
- Manufacturer's recommendations for proper use and disposal will be followed.
- The Job Supervisor will inspect daily to ensure proper use and disposal of materials on site.

#### **7.1.2 Hazardous Products:**

The following practices will be used to reduce the risks associated with hazardous materials:

- Products will be kept in original containers unless they are not resealable.
- Original labels and material safety data will be retained; they contain important product information.
- If surplus product must be disposed of, manufacturer's or local and State recommended methods for proper disposal will be followed.

### **7.2 PRODUCT SPECIFIC PRACTICES**

The following product specific practices will be followed on site:

#### **7.2.1 Petroleum Products:**

All onsite vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers, which are clearly labeled. Any asphalt substances used on site will be applied according to the manufacturer's recommendations.

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### 7.2.2 Fertilizers:

Fertilizers will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to stormwater. Storage will be in a covered shed. The content of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

### 7.2.3 Paints:

All containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm drainage system, but will be properly disposed of according to manufacturer's instructions or State and local regulations.

### 7.2.4 Concrete Trucks:

Concrete trucks will not be allowed to wash out or discharge surplus concrete or drum wash water on the site.

## 7.3 SPILL CONTROL PRACTICES

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanups:

- Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage areas on site. Equipment and materials will include, but not be limited to, brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated, and personnel will wear appropriate protective clothing to prevent injury from contact with hazardous substances.
- Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of the size of the spill. The Spill Control & Prevention Log form provided in Appendix C should be used for this purpose.
- The spill prevention plan will be adjusted to include measures to prevent a repetitive type of spill from re-occurring and how to clean up the spill if it does re-occur. A description of the spill, what caused it, and the cleanup measures will also be included.
- The Job Supervisor responsible for daily site operations, will be designated as the spill prevention and cleanup coordinator. He will designate at least three other site personnel who will receive spill prevention and cleanup

## **Minisceongo Park – Stormwater Pollution Prevention Plan Report**

training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of the responsible spill personnel will be posted in the material storage area and in the office trailer on site.

## 8.0 SUPPORTING PLANS & REPORTS

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1. Site Plan Drawings prepared by Atzl, Scatassa & Zigler P.C.
2. Erosion Control Plans prepared by R.A. Associates Consulting Engineers
3. Soil Erosion/Water Quality Plan by R.A. Associates Consulting Engineers
4. Stormwater Management Report prepared by R.A. Associates Consulting Engineers
5. Soil Erosion & Sediment Control During Control Fill Report prepared by R.A. Associates Consulting Engineers
6. Fugitive Dust Control & Management Plan Report prepared by R.A. Associates Consulting Engineers

## 9.0 POLLUTION PREVENTION PLAN CERTIFICATION

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### 9.1 OWNER/OPERATOR CERTIFICATION

"I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I also certify under penalty of law that this document and all corresponding attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person(s) who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgement that I will receive as a result of submitting this NOI. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction and agree to comply with all the terms and conditions of the general permit for which this NOI is being submitted."

Signed: \_\_\_\_\_  
(Owner/Operator)

Date: \_\_\_\_\_

\_\_\_\_\_  
(Printed Name & Title)

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
(Company Name, Address & Telephone Number)

## 10.0 CERTIFICATION BY CONTRACTORS

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Made pursuant to the State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-02-01) for:

MINISCENGO PARK DEVELOPMENT, Route 202 and Palisades Interstate Parkway,  
Town of Haverstraw & Town of Ramapo, Rockland County, New York

### 10.1 PRIME CONTRACTOR CERTIFICATION

"I certify under penalty of law that I understand and agree to comply with the terms and conditions of the stormwater pollution prevention plan for the construction site identified in this plan as a condition of authorization to discharge stormwater. I also understand that the operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards."

Prime Contractor:

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Company)

\_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Street Address)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(City, State, Zip Code)

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Phone Number)

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10.2 SUB-CONTRACTOR CERTIFICATION

“I certify under penalty of law that I understand and agree to comply with the terms and conditions of the stormwater pollution prevention plan for the construction site identified in this plan as a condition of authorization to discharge stormwater. I also understand that the operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards.”

Sub-Contractor:

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Company)

\_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Street Address)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(City, State, Zip Code)

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Phone Number)



**Appendix A**

**SWPPP CONSTRUCTION SITE LOG BOOK**



**NY STATE POLLUTANT DISCHARGE ELIMINATION  
SYSTEM FOR CONSTRUCTION ACTIVITIES**

**SWPPP CONSTRUCTION SITE LOG BOOK**

For

**MINISCENGO PARK**

**Route 202 and Palisades Interstate Parkway**

**Town of Haverstraw & Town of Ramapo  
Rockland County, New York**

**Table of Contents**

1. Pre-Construction Meeting Documents
2. Owner/Operator Certification
3. Pre-Construction Site Assessment Form
4. Construction Duration Inspections
  - Directions
  - Monthly Summary Report
  - Maintenance Schedules
  - Modification to the SWPPP
5. Three-Month Status Reports
6. Final Stabilization and Retention of Records
  - Qualified Professional's Certification of Final Stabilization
  - Retention of Records

**Properly completing forms such as these which are also contained in Appendix D of the New York Standards and Specifications for Erosion and Sediment Control meet the inspection requirement of NYSDEC SPDES GP for Construction Activities. Completed forms shall be kept on site at all times and made available to authorities upon request.**

**1. PRE-CONSTRUCTION MEETING DOCUMENTS**

**Project Name** MINISCENGO PARK

**GP-02-01 Permit No.** \_\_\_\_\_ **Date of Authorization** \_\_\_\_\_

**Name of Operator** \_\_\_\_\_

**General Contractor** \_\_\_\_\_

**The Following Information To Be Read By All Persons Involved in The Construction of Stormwater Related Activities:**

**Site Assessment and Inspections –**

- a. The Operator agrees to have a qualified professional<sup>1</sup> conduct an assessment of the site prior to the commencement of construction and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction. Following the commencement of construction, site inspections shall be conducted by the qualified professional at least every 7 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.
- b. The Operator shall maintain a record of all inspection reports in this site log book. The site log book shall be maintained on site and be made available to the permitting authorities upon request. Prior to the commencement of construction,<sup>2</sup> the Operator shall certify in the site log book that the SWPPP was prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements. The Operator shall post at the site, in a publicly-accessible location, a summary of the site inspection activities on a monthly basis.
- c. Prior to filing of the Notice of Termination or the end of permit term, the Operator shall have the qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization<sup>3</sup> using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed.

**1 "Qualified Professional means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a licensed professional engineer, Certified Professional in Erosion and Sediment Control (CPESC), soil scientist, or someone working under the direction and supervision of a licensed professional engineer, Certified Professional in Erosion and Sediment Control (CPESC), or soil scientist (person must have experience in the principles and practices of erosion and sediment control).**

**2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.**

**3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.**

**2. OWNER/OPERATOR CERTIFICATION**

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. Further, I hereby certify that the SWPPP meets all Federal State and local erosion and sediment control requirements. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law. "

**Signature:** \_\_\_\_\_

**Name (please print):** \_\_\_\_\_

**Title:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Phone:** \_\_\_\_\_

**Email:** \_\_\_\_\_

**3. PRE-CONSTRUCTION SITE ASSESSMENT FORM**

\_\_\_\_\_  
**Inspector (print name)**

\_\_\_\_\_  
**Date of Inspection**

\_\_\_\_\_  
**Qualified Professional (print name)**

\_\_\_\_\_  
**Qualified Professional Signature**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the following forms is accurate and complete.

**NOTE: Provide comments below as necessary**

**a. Notice of Intent, SWPPP, and Contractors' Certification:**

**Yes No NA**

Has a Notice of Intent been filed with the NYS Department of Conservation?

Is the SWPPP on-site? Where? \_\_\_\_\_

Is the Plan current? What is the latest revision date? \_\_\_\_\_

Have all contractors involved with implementing the erosion and sediment control portions of the SWPPP signed the contractor's certification?

**b. Resource Protection**

**Yes No NA**

Are construction limits clearly flagged or fenced?

Important trees and associated rooting zones, on-site septic systems absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, etc. have been flagged for protection.

Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

**c. Surface Water Protection**

**Yes No NA**

Clean stormwater runoff has been diverted from areas to be disturbed.

Bodies of water located either on site or in the vicinity of the site have been identified and protected.

Appropriate practices to protect on-site or downstream surface water are installed.

**d. Stabilized Construction Entrance**

**Yes No NA**

A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.

Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.

Sediment tracked onto public streets is removed or cleaned on a regular basis.

**e. Perimeter Sediment Controls**

**Yes No NA**

Silt fence material and installation comply with the standard drawing and specifications.

Silt fences are installed at appropriate spacing intervals

Sediment/detention basin was installed as first land disturbing activity.

Sediment traps and barriers are installed.

#### 4. CONSTRUCTION DURATION INSPECTIONS

These Inspection Forms will be filled out during the entire construction phase of the project.

\_\_\_\_\_  
Inspector (print name)

\_\_\_\_\_  
Date of Inspection

\_\_\_\_\_  
Qualified Professional (print name)

\_\_\_\_\_  
Qualified Professional Signature

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Check one of the following:

- Weekly Inspection or,**
- Rain Event Inspection** (greater than 0.5 inches in 24 hour period)  
**Date of Rain Event** \_\_\_\_\_ **Amount of Rain** \_\_\_\_\_ inches

**Stage of Construction** (% complete) \_\_\_\_\_ %

On a plan/sketch below that represents the project area, or on an attached site map:

1. Indicate the extent of all disturbed site areas and drainage pathways;
2. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;
3. Indicate all areas of the site that have undergone temporary or permanent stabilization;
4. Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

#### SITE PLAN/SKETCH

**General Housekeeping**

**Yes No NA**

- Is there an increase in turbidity that will cause a substantial visible contrast to natural conditions?
- Is there residue from oil and floating substances, visible oil film, or globules or grease?
- Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
- Is construction impacting the adjacent property?
- Is dust adequately controlled?

**Temporary Stream Crossing**

**Yes No NA**

- Maximum diameter pipes necessary to span creek without dredging are installed.
- Installed non-woven geotextile fabric beneath approaches.
- 20 feet minimum approach length, minimum 6 inch depth of rock, 18 inch maximum fill depth over pipes.
- Installed diversion dike/swale through both approaches 50 feet (max) from top of bank.
- Fill composed of clean shot rock or KTC Class III channel lining.
- Rock clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

**Excavation Dewatering**

**Yes No NA**

- Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
- Clean water from upstream pool is being pumped to the downstream pool.
- Sediment laden water from work area is being discharged to a silt-trapping device.
- Constructed upstream berm with one-foot minimum freeboard.

**Vegetative Filter Strips**

**Yes No NA**

- Vegetation is dense and there are no signs of erosion.
- Width of filter strip is per the approved plan.
- Ground slope of filter strip is between 1% and 5%.

**Level Spreader**

**Yes No NA**

- Installed per plan.
- Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
- Flow sheets out of level spreader without erosion on downstream edge.

**Interceptor Dikes and Swales**

**Yes No NA**

- Installed per plan with minimum side slopes 2H:1V or flatter.
- Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
- Sediment-laden runoff directed to sediment trapping structure

**Sediment Control**

**Yes No NA**

- Sediment control practices are located and installed correctly.
- BMPs are maintained per specifications
- Stockpiles are stabilized and contained.
- De-watering operations prevent direct discharges to sensitive features.
- Construction Schedule—Are clearing and grading operations divided into stages for large areas (i.e. greater than 2 acres), as opposed to mass grading?  
(NOTE: If staged, erosion control measures may also need to be staged.)

**Adverse Impacts or Off-Site Degradation**

**Yes No NA**

- Work is within the limits of the approved plans, including clearing and blasting.
- Adverse impacts – ponds, streams, wetlands and sinkholes are free of sediment from site.
- Off-site degradation - sediment is kept out of roadways, adjacent property, storm sewers, or air (dust).

**Stabilized Construction Entrance**

**Yes No NA**

- Stone is clean enough to effectively remove mud from vehicles.
- Installed per standards and specifications?
- Does all traffic use the stabilized entrance to enter and leave site?
- Is adequate drainage provided to prevent ponding at entrance?

**Reinforced Silt Fence**

**Yes No NA**

- Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
- Joints constructed by wrapping the two ends together for continuous support.
- Installed steel posts, downstream side of flow, maximum 6 foot intervals with 6 x 6 inch 14 gage wire.
- Fabric buried 6 inches minimum.
- Posts are stable, fabric is tight and without rips or frayed areas.
- Sediment accumulation is \_\_\_\_\_% of design capacity.

**Stone Check Dam**

**Yes No NA**

- Channel is without erosion (i.e., flow is not eroding soil underneath or around the structure).
- Check is in good condition (i.e., rocks have not been displaced and no permanent pools behind the structure).
- Sediment accumulation is \_\_\_\_\_% of design capacity.

**Block and Gravel Drop Inlet Protection**

**Yes No NA**

- Installed concrete blocks lengthwise so open ends face outward, not upward.
- Placed wire screen between No. 3 crushed stone and concrete blocks.
- Sediment accumulation \_\_\_\_\_% of design capacity.

**Filter Fabric (Drop) Inlet Protection**

**Yes No NA**

- Installed 2-inch x 4-inch wood frame and wood posts, with maximum 3-foot spacing.
- Filter fabric buried a minimum of 8 inches and secured to frame/posts with staples at max 8-inch spacing.
- Posts 3-foot maximum spacing between posts.
- Posts are stable, fabric is tight and without rips or frayed areas.
- Sediment accumulation is \_\_\_\_\_% of design capacity.

**Excavated Drop Inlet Protection**

**Yes No NA**

- Excavated depth is a minimum 1-foot, but no more that 2-feet maximum.
- Gravel supported by hardware cloth to allow drainage and restrict sediment movement.
- Excavated side slopes should be 2:1.

**Temporary Sediment Trap**

**Yes No NA**

- Outlet structure is constructed per the approved plan or drawing.
- Geotextile fabric has been placed beneath rock fill.
- Sediment accumulation is \_\_\_\_\_% of design capacity.

**Temporary Sediment Basin**

**Yes No NA**

- Basin and outlet structure constructed per the approved plan.
- Basin side slopes are stabilized with seed/mulch.
- Sediment accumulation is \_\_\_\_\_% of design capacity
- Drainage structure flushed and basin surface restored upon removal of sediment basin facility.





**6. FINAL STABILIZATION AND RETENTION OF RECORDS**

**A. Qualified Professional Certification** -The Operator shall have the qualified professional perform a final site inspection prior to filing the Notice of Termination of the end of the permit term.

- |                          |                          |                          |  |
|--------------------------|--------------------------|--------------------------|--|
| YES                      | NO                       | NA                       |  |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Final site drainage will prevent erosion, concentrated flows to adjacent properties, uncontrolled overflow, and ponding. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Conveyance systems are stabilized.   |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Channels and streambanks are seeded at the outlet points.  |

"I hereby certify that the site has undergone final stabilization. Final Stabilization means that all soil disturbing activities have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures. Further, all temporary erosion and sediment controls (such as silt fence) not specified for permanent erosion control have been removed.

Name of Qualified Professional: \_\_\_\_\_

Signature: \_\_\_\_\_

**B. Retention of Records** - The Operator shall retain copies of SWPPPs and any reports submitted in conjunction with this permit, and records of all data used to complete the NOI to be covered by this permit, for a period of at least three years from the date that the site is finally stabilized. The Department, in its sole discretion, at any time upon written notification may extend this period.

**C. Maintenance of SWPPP and any reports at the construction site** - The Operator shall retain a copy of the SWPPP required by this permit at the construction site from the date of initiation of construction activities to the date of final stabilization.

**D. Addresses** - Except for the submittal of NOIs and NOTs, all written correspondence under this permit directed to NYSDEC, including the submittal of individual permit applications, shall be sent to the address of the appropriate Department Office.

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**1. PRE-CONSTRUCTION MEETING DOCUMENTS**

**Project Name**

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**GP-02-01 Permit No.** \_\_\_\_\_ **Date of**  
**Authorization** \_\_\_\_\_  
**Name of Operator** \_\_\_\_\_

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**General Contractor**

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**The Following Information To Be Read By All Persons Involved in The  
Construction of Stormwater  
Related Activities:**

**Site Assessment and Inspections -**

a. The Operator agrees to have a qualified professional<sup>1</sup> conduct an assessment of the site prior to the commencement of construction and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Following the commencement of construction, site inspections shall be conducted by the qualified professional at least every 7 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

b. The Operator shall maintain a record of all inspection reports in this site log book. The site log book shall be maintained on site and be made available to the permitting authorities upon request. Prior to the commencement of construction, <sup>2</sup> the Operator shall certify in the site log book that the SWPPP, prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements. The Operator shall post at the site, in a publicly-accessible location, a summary of the site inspection activities on a monthly basis.

c. Prior to filing of the Notice of Termination or the end of permit term, the Operator shall have the qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization<sup>3</sup> using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed.

<sup>1</sup> "Qualified Professional means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a Certified Professional in Erosion and Sediment Control (CPESC), soil scientist, licensed engineer or someone working under the direction and supervision of a licensed engineer (person must have experience in the principles and practices of erosion and sediment control). Certified Professional in Erosion and Sediment Control (CPESC), or soil scientist.

<sup>2</sup> "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.

3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

## 2. OPERATOR.S CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. Further, I hereby certify that the SWPPP meets all Federal State and local erosion and sediment control requirements. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law. "

**Name (please print)**

**Title**

**Date:**

**Address:**

**Phone:**

**Email:**

New York Standards and Specifications Page D.4 March 2003  
For Erosion and Sediment Control

## 3. PRE-CONSTRUCTION SITE ASSESSMENT FORM

\_\_\_\_\_  
\_\_\_\_\_  
**Inspector (print name)**

**Date of Inspection**

\_\_\_\_\_  
\_\_\_\_\_  
**Qualified Professional (print name)**  
**Signature**

**Qualified Professional**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the following forms is accurate and complete.

**NOTE: Provide comments below as necessary**

### a. Notice of Intent, SWPPP, and Contractors. Certification:

**Yes No NA**

Has a Notice of Intent been filed with the NYS Department of Conservation?

Is the SWPPP on-site? Where? \_\_\_\_\_

Is the Plan current? What is the latest revision date? \_\_\_\_\_

Have all contractors involved with implementing the erosion and sediment control portions of the SWPPP signed the contractor's certification?

**b. Resource Protection**

**Yes No NA**

Are construction limits clearly flagged or fenced?

Important trees and associated rooting zones, on-site septic systems absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, etc. have been flagged for protection.

Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

**c. Surface Water Protection**

**Yes No NA**

Clean stormwater runoff has been diverted from areas to be disturbed.

Bodies of water located either on site or in the vicinity of the site have been identified and protected.

Appropriate practices to protect on-site or downstream surface water are installed.

**d. Stabilized Construction Entrance**

**Yes No NA**

A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.

Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.

Sediment tracked onto public streets is removed or cleaned on a regular basis.

**e. Perimeter Sediment Controls**

**Yes No NA**

Silt fence material and installation comply with the standard drawing and specifications.

Silt fences are installed at appropriate spacing intervals

Sediment/detention basin was installed as first land disturbing activity.

Sediment traps and barriers are installed.

**4. CONSTRUCTION DURATION INSPECTIONS**

**These Inspection Forms will be filled out during the entire construction phase of the project.**

\_\_\_\_\_

**Inspector (print name)**

**Date of Inspection**

\_\_\_\_\_

**Qualified Professional (print name)  
Signature**

**Qualified Professional**

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Check one of the following:

- Weekly Inspection or,**
- Rain Event Inspection** (greater than 0.5 inches in 24 hour period)

Date of Rain Event \_\_\_\_\_ Amount of Rain \_\_\_\_\_

inches

**Stage of Construction** (% complete) \_\_\_\_\_ %

On a plan/sketch below that represents the project area, or on an attached site map:

1. Indicate the extent of all disturbed site areas and drainage pathways;
2. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;
3. Indicate all areas of the site that have undergone temporary or permanent stabilization;
4. Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;

### **SITE PLAN/SKETCH**

#### **General Housekeeping**

**Yes No NA**

Is there an increase in turbidity that will cause a substantial visible contrast to natural conditions?

Is there residue from oil and floating substances, visible oil film, or globules or grease?

Are facilities and equipment necessary for implementation of erosion and sediment control in

working order and/or properly maintained?

Is construction impacting the adjacent property?

Is dust adequately controlled?

#### **Temporary Stream Crossing**

**Yes No NA**

Maximum diameter pipes necessary to span creek without dredging are installed.

Installed non-woven geotextile fabric beneath approaches.

20 feet minimum approach length, minimum 6 inch depth of rock, 18 inch maximum fill

depth over pipes.

Installed diversion dike/swale through both approaches 50 feet (max) from top of bank.

Fill composed of clean shot rock or KTC Class III channel lining.

Rock clean enough to remove mud from vehicles & prevent sediment from entering stream

during high flow.

#### **Excavation Dewatering**

**Yes No NA**

Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.

Clean water from upstream pool is being pumped to the downstream pool.

Sediment laden water from work area is being discharged to a silt-trapping device.

Constructed upstream berm with one-foot minimum freeboard.

#### **Vegetative Filter Strips**

**Yes No NA**

Vegetation is dense and there are no signs of erosion.

- Width of filter strip is per the approved plan.
- Ground slope of filter strip is between 1% and 5%.

**Level Spreader**

**Yes No NA**

- Installed per plan.
- Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
- Flow sheets out of level spreader without erosion on downstream edge.

**Interceptor Dikes and Swales**

**Yes No NA**

- Installed per plan with minimum side slopes 2H:1V or flatter.
  - Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
  - Sediment-laden runoff directed to sediment trapping structure
- New York Standards and Specifications Page D.6 December 2003  
For Erosion and Sediment Control

**Sediment Control**

**Yes No NA**

- Sediment control practices are located and installed correctly.
- BMPs are maintained per specifications
- Stockpiles are stabilized and contained.
- De-watering operations prevent direct discharges to sensitive features.
- Construction Schedule—Are clearing and grading operations divided into stages for large areas (i.e. greater than 2 acres), as opposed to mass grading? (NOTE: If staged, erosion control measures may also need to be staged.)

**Adverse Impacts or Off-Site Degradation**

**Yes No NA**

- Work is within the limits of the approved plans, including clearing and blasting.
- Adverse impacts – ponds, streams, wetlands and sinkholes are free of sediment from site.
- Off-site degradation - sediment is kept out of roadways, adjacent property, storm sewers, or air (dust).

**Stabilized Construction Entrance**

**Yes No NA**

- Stone is clean enough to effectively remove mud from vehicles.
- Installed per standards and specifications?
- Does all traffic use the stabilized entrance to enter and leave site?
- Is adequate drainage provided to prevent ponding at entrance?

**Reinforced Silt Fence**

**Yes No NA**

- Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
- Joints constructed by wrapping the two ends together for continuous support.
- Installed steel posts, downstream side of flow, maximum 6 foot intervals with 6 x 6 inch 14 gage wire.
- Fabric buried 6 inches minimum.

Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation is \_\_\_% of design capacity.

#### **Stone Check Dam**

**Yes No NA**

Channel is without erosion (i.e., flow is not eroding soil underneath or around the structure).

Check is in good condition (i.e., rocks have not been displaced and no permanent pools behind the structure).

Sediment accumulation is \_\_\_% of design capacity.

#### **Block and Gravel Drop Inlet Protection**

**Yes No NA**

Installed concrete blocks lengthwise so open ends face outward, not upward.

Placed wire screen between No. 3 crushed stone and concrete blocks.

Sediment accumulation \_\_\_% of design capacity.

#### **Filter Fabric (Drop) Inlet Protection**

**Yes No NA**

Installed 2-inch x 4-inch wood frame and wood posts, with maximum 3-foot spacing.

Filter fabric buried a minimum of 8 inches and secured to frame/posts with staples at max

8-inch spacing.

Posts 3-foot maximum spacing between posts.

Posts are stable, fabric is tight and without rips or frayed areas.

Sediment accumulation is \_\_\_% of design capacity.

#### **Excavated Drop Inlet Protection**

**Yes No NA**

Excavated depth is a minimum 1-foot, but no more that 2-feet maximum.

Gravel supported by hardware cloth to allow drainage and restrict sediment movement.

Excavated side slopes should be 2:1.

#### **Temporary Sediment Trap**

**Yes No NA**

Outlet structure is constructed per the approved plan or drawing.

Geotextile fabric has been placed beneath rock fill.

Sediment accumulation is \_\_\_% of design capacity.

#### **Temporary Sediment Basin**

**Yes No NA**

Basin and outlet structure constructed per the approved plan.

Basin side slopes are stabilized with seed/mulch.

Sediment accumulation is \_\_\_% of design capacity

Drainage structure flushed and basin surface restored upon removal of sediment basin facility.

### **MAINTENANCE SCHEDULES**







permit, for a period of at least three years from the date that the site is finally stabilized. This period may be extended by the Department, in its sole discretion, at any time upon written notification.

**C. Maintenance of SWPPP and any reports at the construction site** - The Operator shall retain a copy of the SWPPP required by this permit at the construction site from the date of initiation of construction activities to the date of final stabilization.

**D. Addresses** - Except for the submittal of NOIs and NOTs, all written correspondence under this permit directed to NYSDEC, including the submittal of individual permit applications, shall be sent to the address of the appropriate Department Office.

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**Appendix B**

**STORMWATER POND CONSTRUCTION INSPECTION  
CHECKLIST FORM**

**Minisceongo Park Stormwater Pond #1, #2, and #3  
Construction Inspection Checklist Form**

**MINISCEONGO PARK  
STORMWATER POND #1, #2, and #3  
CONSTRUCTION INSECTION CHECKLIST FORM**

Project: Minisceongo Park Development  
Location: Town of Haverstraw & Town of Ramapo, Rockland County, NY

Site Status: \_\_\_\_\_  
Date of Inspection: \_\_\_\_\_  
Time of Inspection: \_\_\_\_\_  
Weather Conditions  
(including recent rainfall): \_\_\_\_\_  
Inspector's Name: \_\_\_\_\_

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
<b>1. Pre-Construction/Materials and Equipment</b>		
Pre-construction meeting		
Pipe and appurtenances on-site prior to construction and dimensions checked		
1. Material (including protective coating, if specified)		
2. Diameter		
3. Dimensions of metal riser or pre-cast concrete outlet structure		
4. Required dimensions between water control structures (orifices, weirs, etc.) are in accordance with approved plans		
5. Barrel stub for prefabricated pipe structures at proper angle for design barrel slope		
6. Number and dimensions of prefabricated anti-seep collars		
7. Watertight connectors and gaskets		
8. Outlet drain valve		
Project benchmark near pond site		
Equipment for temporary de-watering		
<b>2. Subgrade Preparation</b>		
Area beneath embankment stripped of all Vegetation, topsoil, and organic matter		
<b>3. Pipe Spillway Installation</b>		
Method of installation detailed on plans		
<b>A. Bed preparation</b>		
Installation trench excavated with specified side slopes		

**Minisceongo Park Stormwater Pond #1, #2, and #3  
Construction Inspection Checklist Form**

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
Stable, uniform, dry subgrade of relatively impervious material (If subgrade is wet, contractor shall have defined steps before proceeding with installation)		
Invert at proper elevation and grade		
<b>B. Pipe placement</b>		
Metal / plastic pipe		
1. Watertight connectors and gaskets properly installed		
2. Anti-seep collars properly spaced and having watertight connections to pipe		
3. Backfill placed and tamped by hand under "haunches" of pipe		
4. Remaining backfill placed in max. 8 inch lifts using small power tamping equipment until 2 feet cover over pipe is reached		
<b>3. Pipe Spillway Installation</b>		
Concrete pipe		
1. Pipe set on blocks or concrete slab for pouring of low cradle		
2. Pipe installed with rubber gasket joints with no spalling in gasket interface area		
3. Excavation for lower half of anti-seep collar(s) with reinforcing steel set		
4. Entire area where anti-seep collar(s) will come in contact with pipe coated with mastic or other approved waterproof sealant		
5. Low cradle and bottom half of anti-seep collar installed as monolithic pour and of an approved mix		
6. Upper half of anti-seep collar(s) formed with reinforcing steel set		
7. Concrete for collar of an approved mix and vibrated into place (protected from freezing while curing, if necessary)		
8. Forms stripped and collar inspected for honeycomb prior to backfilling. Parge if necessary.		
<b>C. Backfilling</b>		
Fill placed in maximum 8 inch lifts		
Backfill taken minimum 2 feet above top of anti-seep collar elevation before traversing with heavy equipment		
<b>4. Riser / Outlet Structure Installation</b>		
Riser located within embankment		
<b>A. Metal riser</b>		
Riser base excavated or formed on stable subgrade to design dimensions		
Set on blocks to design elevations and plumbed		
Reinforcing bars placed at right angles and projecting into sides of riser		

**Minisceongo Park Stormwater Pond #1, #2, and #3  
Construction Inspection Checklist Form**

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
Concrete poured so as to fill inside of riser to invert of barrel		
<b>B. Pre-cast concrete structure</b>		
Dry and stable subgrade		
Riser base set to design elevation		
If more than one section, no spalling in gasket interface area; gasket or approved caulking material placed securely		
Watertight and structurally sound collar or Gasket joint where structure connects to pipe spillway		
<b>C. Poured concrete structure</b>		
Footing excavated or formed on stable Subgrade, to design dimensions with reinforcing steel set		
Structure formed to design dimensions, with reinforcing steel set as per plan		
Concrete of an approved mix and vibrated into place (protected from freezing while curing, if necessary)		
Forms stripped & inspected for "honeycomb" prior to backfilling; parge if necessary		
<b>5. Embankment Construction</b>		
Fill material		
Compaction		
<b>Embankment</b>		
1. Fill placed in specified lifts and compacted with appropriate equipment		
2. Constructed to design cross-section, side slopes and top width		
3. Constructed to design elevation plus allowance for settlement		
<b>6. Impounded Area Construction</b>		
Excavated / graded to design contours and side slopes		
Inlet pipes have adequate outfall protection		
Forebay(s)		
Pond benches		
<b>7. Earth Emergency Spillway Construction</b>		
Spillway located in cut or structurally stabilized with riprap, gabions, concrete, etc.		
Excavated to proper cross-section, side slopes and bottom width		
Entrance channel, crest, and exit channel Constructed to design grades and elevations		
<b>8. Outlet Protection</b>		
<b>A. End section</b>		
Securely in place and properly backfilled		
<b>B. Endwall</b>		
Footing excavated or formed on stable Subgrade, to design dimensions and reinforcing steel set, if specified		







## **Appendix C**

# **SPILL CONTROL & PREVENTION LOG**







Full-scale Plans for the SWPPP accompany the DEIS.

