Bound Reports
1720

Drainage Computations and Permit Application

NORTH HANCOCK ROAD (PHASE 1B)

LAKE COUNTY, FLORIDA

Prepared For:

Lake County Public Works Department

123 N. Sinclair Avenue

Tavares, Florida 32778

Prepared By:

VANASSE HANGEN BRUSTLIN, INC.

135 W. Central Boulevard, Suite 1150

Orlando, Florida 32801

April 12, 1999

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EXECUTIVE SUMMARY

North Hancock Road is a new urban roadway being constructed from State Road (SR) 50 to County Road (CR) 50. The overall length of the project is approximately 2.0 miles, and it will be constructed in two phases. Phase 1A, which extends from station 100+00 to 117+00, is currently under review at the St. Johns River Water Management District (Application Number 42-069-1391ANG-ERP); at this time Phase 1B is proposed which extends from station 117+00 to station 140+64. The roadway will consist of a four lane urban typical section with provisions to accommodate a section of the South Lake Rails to Trails Project. As a result of the proposed roadway construction, no wetlands will be impacted and no portion of the roadway will encroach into the 100-year floodplain.

The new roadway will provide a closed storm sewer drainage system with dry retention ponds for the entire length of this phase of the project. The stormwater runoff from station 117+00 to 120+98 will be collected and conveyed to a modified existing Florida Department of Transportation (FDOT) pond that will be expanded with the Phase 1A portion of the project. In addition, the stormwater runoff from station 120+98 to 140+64 will be collected and conveyed to an existing depression along the west side of North Hancock Road. The depression will be a shared stormwater facility with Park Square Homes.

Since the project will be permitted through the SJRWMD under 40C-42, treatment volume requirements will be met.

This project meets the requirements set forth by the SJRWMD, Lake County, and the Army Corps of Engineers.

INTRODUCTION

This report provides calculations and documentation to support the drainage design and a Environmental Resource Application (ERP) of Phase 1B of the North Hancock Road project. The proposed roadway is all new construction which will include the following: four 12 foot lanes, a 22 foot raised median, two 4 foot bike lanes, and curb and gutter with a closed storm sewer system. The improvements for Phase 1B of the project will extend from station 117+00, to station 140+64 with an overall length of this phase of approximately 0.4 miles. It should be noted that Phase 2, which extends from 140+64 to CR 50, will be constructed in the future for an additional length of 1.2 miles. The design of Phase 2 will be completed at a later date.

This project meets the requirements set forth by the SJRWMD, Lake County, and the Army Corps of Engineers. The ERP application is included in Appendix A.

PROJECT LOCATION

The project is located within Sections 21, 22, 27, and 28 Range 26 East, Township 22 South in Lake County, Florida. Figure 1 is a location map that shows the limits of the project. The project area, for Phase 1, within right-of-way, is approximately 5.0 acres. The total project area of Phases 1A, 1B and 2, within right-of-way, is approximately 29.2 acres.

SOILS INFORMATION

The soils within the project limits are identified in the "Soil Survey of Lake County Area, Florida" as Astatula sands. These soils are nearly level to strongly sloping, excessively drained soils. Figure 2 is a copy of a portion of the soil survey which shows the limits of the project. A summary of the soils information was included in the previous permit submittal.

A subsurface exploration was performed by Nodarse & Associates for the project. The exploration included a series of 18 auger borings along the centerline of the proposed roadway alignment, ranging in depth from 5 to 25 feet; 9 machine auger

borings; and two falling head permeability tests. A copy of the report was included in the previous permit submittal.

FLOODPLAIN INFORMATION

Figure 3 is a copy of a portion of Panel 120421 325B and 375B of the Flood Insurance Rate Map for Lake County, Florida, dated April 1, 1982. As shown in Figure 3, the proposed roadway does not encroach into any areas designated as 100-year floodplain. Therefore, there will be no impacts to the 100-year floodplain.

EXISTING DRAINAGE PATTERNS

From station 117+00 to 120+98 stormwater runoff drains from west to east towards an existing lake, north of SR 50. In general, from station 120+98 to station 140+64 stormwater runoff drains from east to west towards an existing depression, along the west side of North Hancock Road. The existing area which drains to the depression is approximately 38 acres.

PROPOSED DRAINAGE PATTERNS AND DESIGN

Phase 1B is comprised of two basins. Runoff from these basins is collected via curb and gutter and conveyed to either Pond A, which is an existing FDOT pond, or Pond B, which is an existing depression. Since the project will be permitted through the SJRWMD under 40C-42, the treatment volume requirements will be met. The treatment volume will be handled in the dry retention ponds with a 72 hour recovery period.

Basin A runs from SR 50 or station 100+00 to the entrance of the college or station 120+98; the portion of the road from 117+00 to 120+98 will be constructed at this time. Pond A has been expanded to accommodate all of the stormwater runoff from Basin A. The analysis was included with the previous submittal to the SJRWMD (Application Number 42-069-1391 ANG-ERP).

Basin B extends from station 120+98 to station 140+74. The project drainage area of Basin B is approximately 5.0 acres, and the total area that drains to Pond B (existing depression) is approximately 40.2 acres. The required treatment volume for the entire basin is approximately 3.6 acre-ft. The stormwater runoff from Basin B is treated and attenuated in an existing depression just west of North Hancock Road, between stations 130+00 and 135+00. It should be noted that approximately 2.2 acres

of additional area will drain to the depression, however the 100-year flood elevation will still be confined to the depression. Park Square Homes will share the facility with Lake County.

DESIGN CRITERIA

Regulations which govern the stormwater management design for the North Hancock Road project include: CH. 40C-42 F.A.C., administered by the SJRWMD; NPDES, an EPA regulation administered jointly by EPA and FDEP; National Flood Insurance Program, administered by FEMA, and Lake County.

A summary of the design criteria for the project is included with the previous permit application.

ANALYSIS

Hydrologic Analysis

The Rational Method was used to compute peak discharges. Times of concentration and runoff volumes were computed utilizing the methodology described in TR-55. Drainage areas were computed from the roadway plans. Runoff coefficients were determined utilizing Table 5-5 from the FDOT Drainage Manual, Volume 2A. Rainfall intensities were estimated from Figure 5-8 of the FDOT Drainage Manual, Volume 1. Copies of these tables and figures are included in Appendix C. Advanced Interconnected Pond Routing was used to develop hydrographs and compute peak stages of the ponds. Hydrologic computations are included in Appendix D.

Hydraulic Analysis

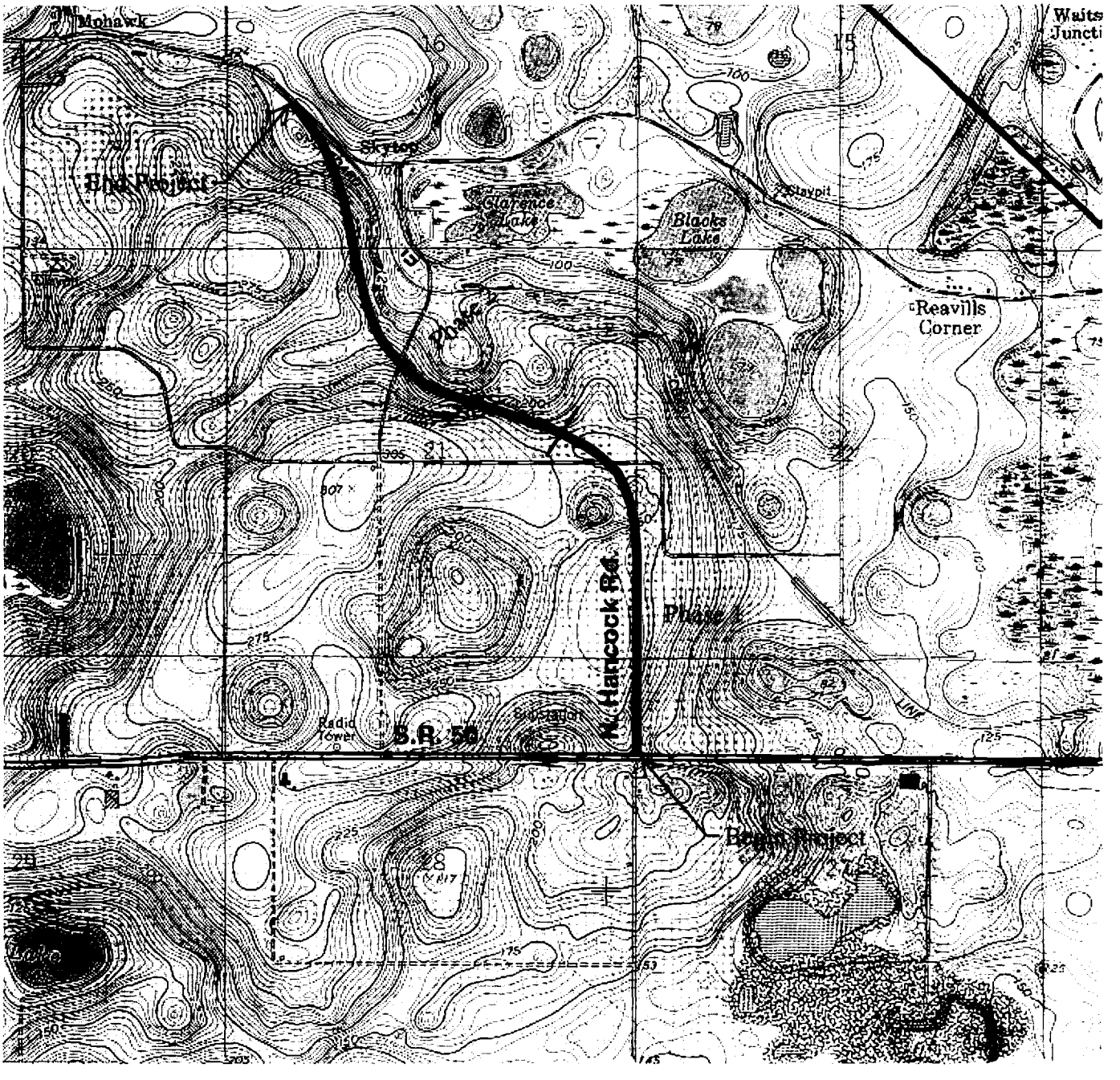
The hydraulic analysis of the storm sewer systems was performed utilizing the hydraulic program, Automated Storm Sewer Analysis and Design (ASAD). The hydraulic analyses are included in Appendix D.

Pond Recovery Analysis

The recovery analysis of Pond B (depression) was performed utilizing the program, PONDS. The analysis was performed by Nodarse & Associates, Inc. and is included in Appendix B.

SUMMARY AND RESULTS

The storm sewer systems were designed so that the hydraulic grade line from the 10-year design storm is at least 1.0 foot below the gutter elevations of North Hancock Road. In addition, inlets were spaced so that the spread along the roadway is a maximum of one-half of the outside lane width. Pond B was analyzed for the 25-year and 100-year 96-hour storm events. As shown in Table 1 the peak stages of the pond remain within the existing top of bank. In addition, the treatment volume will recover within 24 hours and the 100-year 10-day runoff volume will recover within 3.5 days.



Source
USGS Quadrangle Map
Clermont East, Florida
Sections 16,21,22,27,28, Township 22 South, Range 26 East
Scale: 1" = 2000'
1980

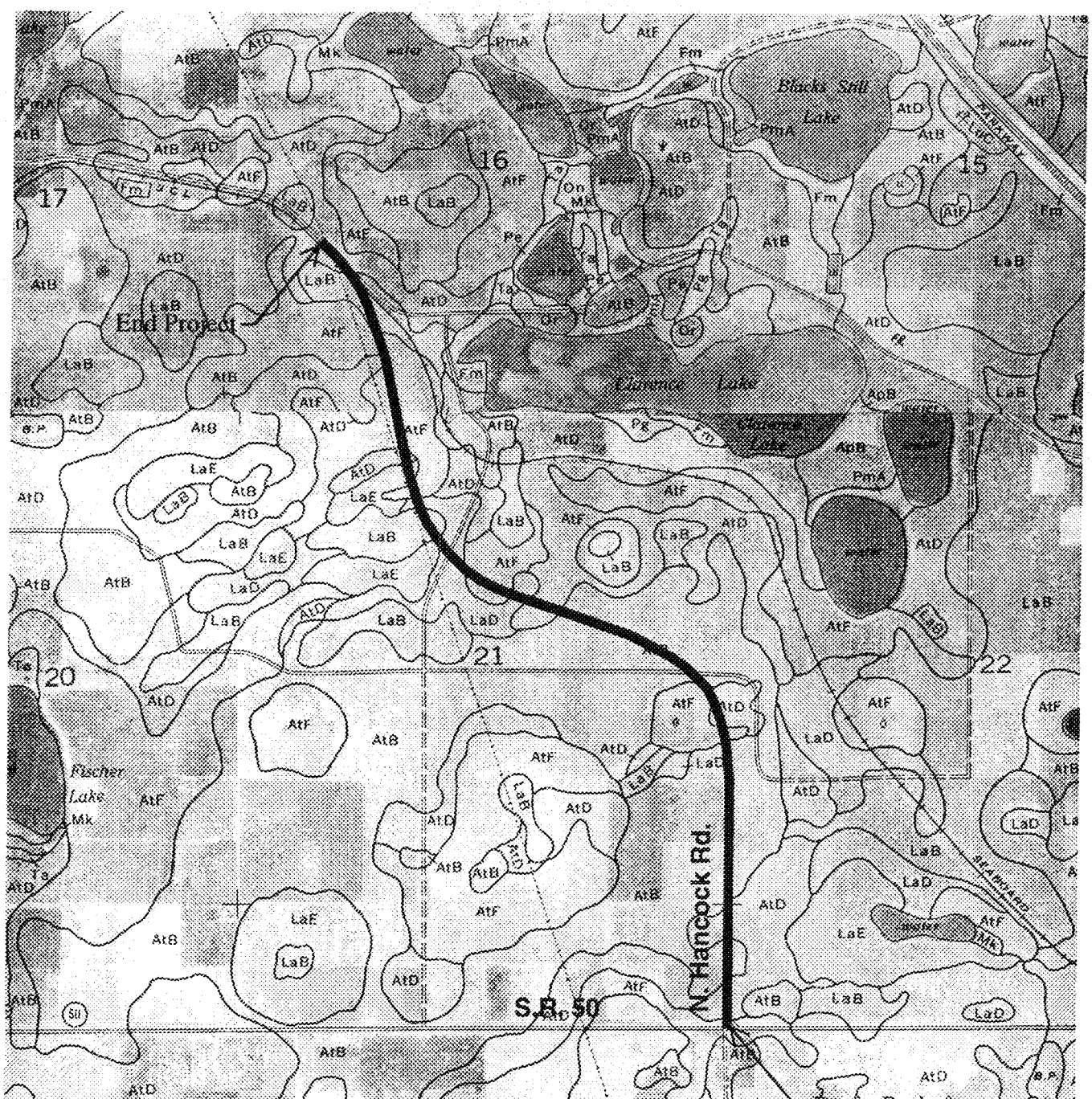
N

Vanasse Hangen Brustlin, Inc.

Drainage Area / Location Map

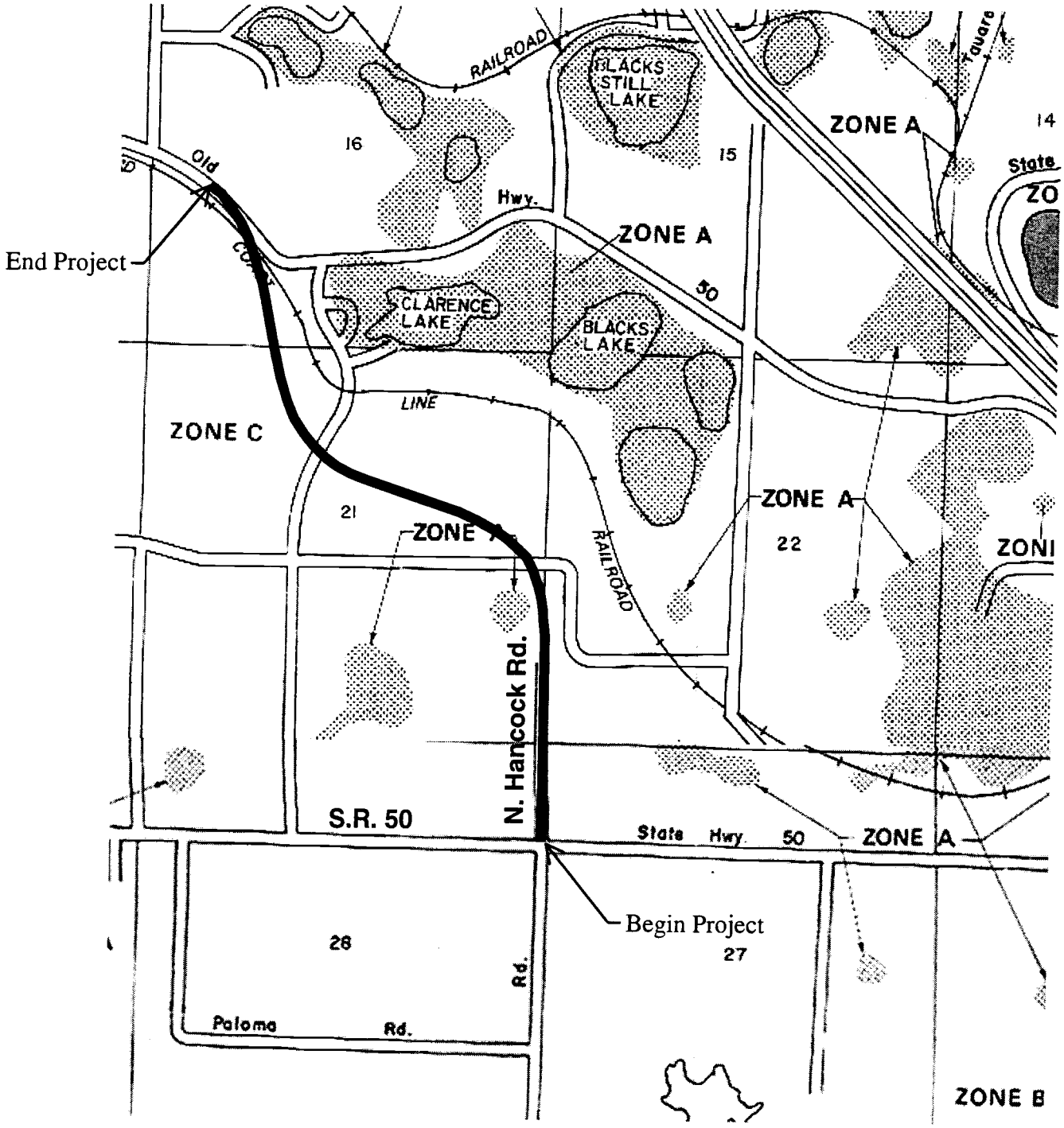
Figure 1

North Hancock Road



Source
Soils Survey of Lake County, FL
Sections 16,17,21,22,27,28, Township 22 South,
Range 26 East
Scale: 1:20000
1990

Soils Map Figure 2



Source
Lake County, FL FIRM Panel #120421 0325B
Lake County, FL FIRM Panel #120421 0375B
Dated 4/1/82
Scale: 1"=2000'

N

Flood Plain Map

Figure 3

Table 1

Summary of Results
Basin B (Pond B)

Storm Event	Peak Stage (feet)	
	Existing	Proposed
25-Year 96 Hour	203.61	203.98
100-Year 96 Hour	207.39	207.84

Storm Event	Peak Inflow (ft^3/s)	
	Existing	Proposed
25-Year 96 Hour	58.41	61.55
100-Year 96 Hour	99.05	104.38

Section H

A. General site conditions
   1. Recent aerial photo of project site. *Figure H.1 is an aerial photograph of the project site.*
   2. Map(s) or applicable construction plan(s) showing:
      a. General location of project shown on USGS quad map(s), including points of discharge. *Figure 1 of the report is a general location map.*
      b. Project area boundary. *Figure 1 of the report shows the limits of the project.*
      c. Pre-development (existing) topography. *The existing profile of North Hancock Road is included in the attached plans.*
      d. Pre-development drainage patterns including points of discharge for existing site drainage and drainage basin boundaries. *A copy of the pre-development and offsite drainage map is included in Appendix D.*
      e. Off-site drainage area and flow patterns across project site. *A copy of the pre-development and offsite drainage map is included in Appendix D.*
      f. Location of existing drainage right-of-way easements on-site. *The rights of way for North Hancock Road are shown on the attached plans.*
      g. Location of private and public water supply wells on-site. *There are no private and public water supply wells on-site.*
      h. All wetlands on the site. *There are no wetlands within or adjacent to the project limits.*
   3. SCS soils map and report and/or soil boring date for treatment facility locations. *Figure 2 of the report is a copy of the SCS soils map for the project area. Soils information is included in Appendix B.*
   4. Water table data
      a. Date, location, and water table level of actual measurements (if collected) with estimated depth of antecedent rainfall during the previous one month period. *Water table elevations were collected and are included in the Soils Report in the previous permit application. No groundwater was encountered in any of the soil borings.*
      b. Estimated normal dry and wet season water table elevation. *No groundwater was encountered in any of the soil borings. However, estimated wet season water table elevations are estimated to be deeper than 6 feet beneath the existing ground surface.*

B. Post-development Project Site Conditions
   1. Describe or document the legal outfall for point discharges of treated stormwater to adjacent property. *Roadway stormwater runoff will be collected in a closed storm sewer system and conveyed to Pond B (existing depression along North Hancock Road). Since the pond has no outfall, in general stormwater will infiltrate into the ground.*
   2. Identify and describe all on-site and off-site stormwater management systems which discharge into or receive discharge from the proposed project. *Stormwater is conveyed to an existing depression area.*

3. Provide the design tailwater elevation at all points of discharge. *Not applicable (discharge is through infiltration).*
4. Include the following on construction drawings for the project site:
   a. Project land use and land cover.
   b. Proposed construction, including erosion and sediment control plan for each phase. *Please see the attached construction plans. Please note this is a phased construction project.*
   c. Vegetative cover plan for all on-site and off-site earth surfaces disturbed by construction. *All disturbed surfaces will either be sodded or seeded and mulched. Please see the attached construction plans.*
   d. Legal reservations for access to the treatment system for maintenance and operation by future maintenance entities for subdivided projects. *Stormwater treatment will be provided in modified existing depression area. The right-of-way of the pond is owned by Park Square. Lake County is entering an agreement with Park Square Homes for operation and maintenance.*
   e. Provide locations for the following on construction plans:
      (1) Drainage divide and area served by each hydraulically separate stormwater treatment system. *A drainage map for the project is included in the attached report.*
      (2) Septic tank or other proposed on-site wastewater treatment facility. *Not applicable.*
      (3) Wells and surface water withdrawals. *Not applicable.*
   f. Provide plans, elevations and/or profiles, and details for the following:
      (1) Roadway and parking pavements. *Please see the attached construction plans.*
      (2) Floor slabs, walkways and other paved surfaces. *All proposed sidewalks are shown on the attached construction plans.*
      (3) Earthwork grades for pervious landscaped areas. *Please see the attached construction plans.*
      (4) All stormwater treatment and drainage facilities. *Please see the attached construction plans.*
      (5) Show the following details for stormwater treatment systems construction plans.
         a) All treatment systems:
            (1) Show the elevations of normal wet season water table, design normal water elevation, and elevations for storage of the treatment volume. *Stormwater treatment will be provided in Pond B (existing depression area). According to the geotechnical report, included in Appendix A, the seasonal high water table is at least 6 feet below the existing ground surface. No groundwater was encountered in the soil borings.*
            (2) Details of oil and grease control mechanism, if required. *Not applicable.*
            (3) Details of the outlet and overflow control structure. *Not applicable. In general discharge is through groundwater infiltration.*

(4) Details of treatment drawdown outlets. Show the design tailwater elevations on the outlet details. *Not applicable.*

(5) The minimum erosion and sediment control measures to be implemented during construction and all permanent control measures in post-development conditions. *Please see the attached construction plans.*

b) Retention/detention facilities:

(1) Plan contours and/or cross section details showing bottom contours and elevations, all design dimensions, side slopes, and top of bank elevations. *Please see the attached construction plans.*

(2) Grassing or planting of all treatment system earth surfaces. *Please see the attached construction plans.*

c) Exfiltration trench. *Not applicable.*

d) Underdrain and filter systems. *Not applicable.*

e) Wet detention systems. *Not applicable.*

f) Wetland stormwater management systems. *Not applicable.*

g) Karst Sensitive Areas. *Not applicable.*

6. **Design analysis/calculations**

a. Provide the rational method runoff coefficient, drainage area, and impervious area for each treatment system. *The runoff coefficient, drainage area, and impervious area calculations are included in Appendix D.*

b. Calculate treatment volume required for each separate system. *Treatment volume calculations are included in Appendix D.*

c. Provide stage-storage tabulations... *Included in Appendix D.*

d. Demonstrate 72-hour drawdown... *Included in Appendix D.*

e. Demonstrate that the function of the proposed treatment systems does not aversely affect the treatment performance of all other stormwater management systems which serve or are served by the proposed project. *Not applicable.*

f. Demonstrate no more than half the treatment volume is discharge within 48 to 60 hours... *Not applicable.*

g. Design analysis for sizing wet detention permanent pool volume. *Not applicable.*

h. Describe any additional management practices such as pretreatment, which will be used to enhance the water quality of the stormwater discharge. *Not applicable.*

i. Peak discharge and conveyance calculations for pre-development and post-development conditions as follows:

(1) Runoff characteristics, including area, runoff curve number or runoff coefficient, SCS hydrologic soil group, and time of concentration for each drainage hydrologic unit. *Runoff coefficients and times of concentrations are included in Appendix D.*

(2) Design storms used including duration, frequency, and time distribution. *Included in Appendix D.*

(3) Runoff hydrographs for each drainage basin. *Included in Appendix D.*
(4) Stage-storage computations. *Included in Appendix D.*
(5) Stage-discharge computations. *Not applicable.*
(6) Flood routings through on-site conveyance and storage areas. *Included in Appendix D.*
(7) Water surface profiles and elevations in the primary surface water management system for the required design storm events. *Included in Appendix D.*
(8) Runoff peak rates and volumes discharges from the system for the design storm event. *Included in Appendix D.*

7. **Operation and maintenance** *North Hancock Road will be owned and operated by Lake County. The existing depression is owned and operated by Park Square Homes. Lake County will enter into an agreement with Park Square Homes for the operation and maintenance of the depression area.*
8. **Alternative stormwater treatment** *Not applicable*
9. **Wekiva River Basin** *Not applicable*

NODARSE & ASSOCIATES, INC.

Geotechnical, Environmental Geotechnics & Materials Engineering

March 23, 1999
Project No. W98-G-032

Mr. J. Dwayne Darbonne, P.E.
Vanasse Hangen Brustlin, Inc.
135 West Central Boulevard, Suite 1150
Orlando, Florida 32801

RE: Stormwater Recovery Analysis
Florida Department of Transportation Pond
North Hancock Road Improvements
Lake County, Florida

Dear Mr. Darbonne:

At the request of Mr. Paul Yeargain of your firm, Nodarse & Associates, Inc. (N&A) has performed a stormwater recovery analysis on the existing depression designated as Pond 2 for the North Hancock Road Project. We understand the requirements for the pond are as follows:

- Water quality volume of 3.35 acre feet in 72 hours.
- Stormwater runoff volume of 10.35 acre feet in thirty (30) days. Half of this volume must recover in seven (7) days.

Borings in the stormwater pond generally found Stratum 1 soils (A-3) to their boring termination depth of 25 feet below the existing ground surface. The boring locations and profiles are attached. Groundwater was not observed to the termination depth of 25 feet. A laboratory falling head vertical permeability test was performed on a sample obtained from Boring AB-4 at a depth of 5 feet below the existing pond bottom. Laboratory test results found the vertical permeability rate to be approximately 61 feet per day. The effective permeability rate of the soils was reduced to approximately 10 feet per day to account for possible siltation of the pond bottom and long-term densification for infiltrating water. Stormwater recovery analysis was modeled using the computer program PONDS, Version 2.26 using the simplified method. Analyses show the water quality volume being recovered in less than 12 hours with the total runoff volume recovered in less than four (4) days. The calculations are attached.

NODARSE & ASSOCIATES, INC.

Should you have any questions, or if we can be of any further service to you, please do not hesitate to contact us.

Sincerely,

3-23-99

Michael J. Horst, P.E.
Project Engineer
FL Registration No. 52668

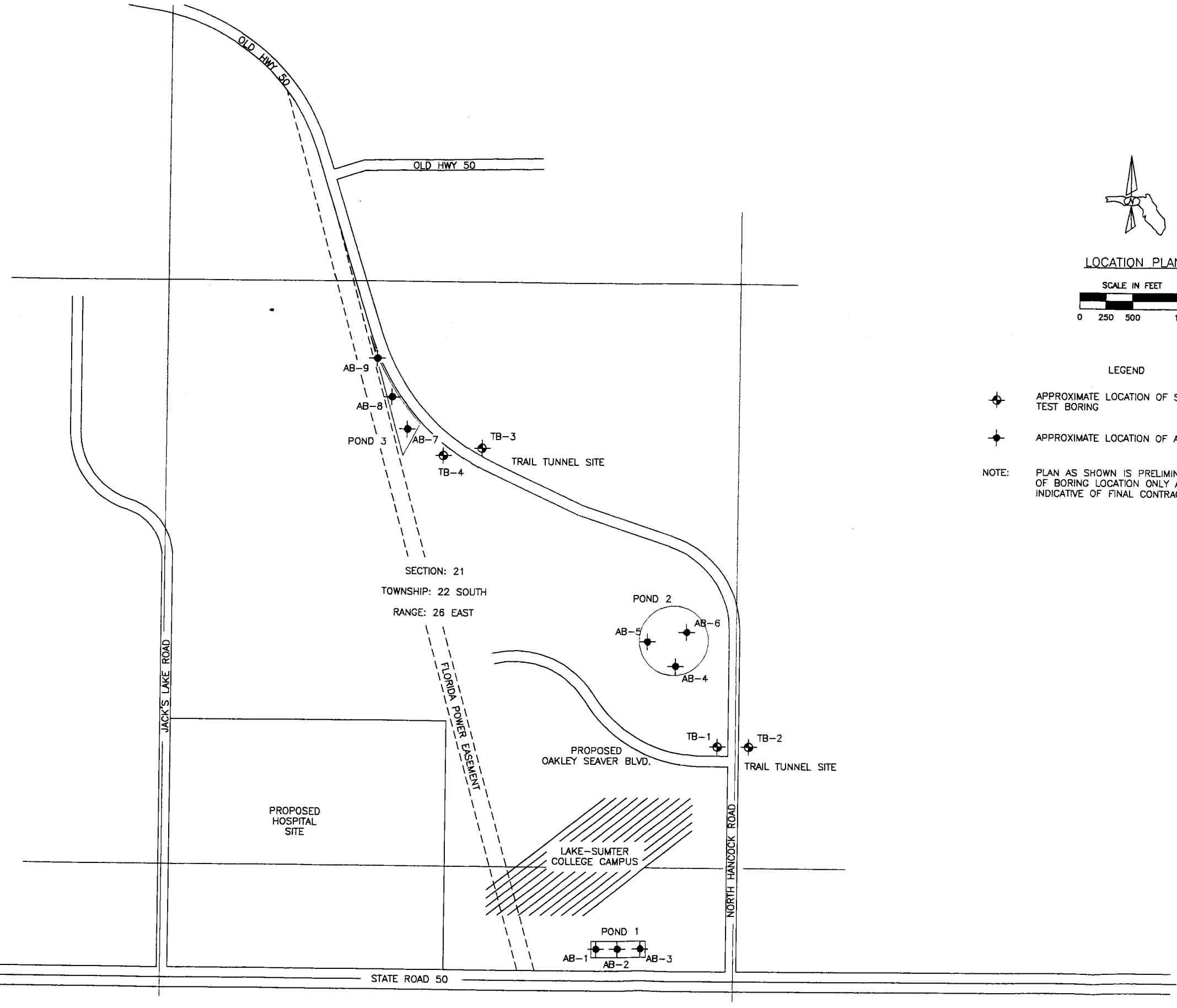
3/23/99

Jay W. Casper, P.E.
Manager, Geotechnical Services
FL Registration No. 36330

W98-032.LET:MJH3-99/sc

Attachments: Figures 2 and 5
Calculations

FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
	FLA.			



LOCATION PLAN

SCALE IN FEET

0 250 500 1000

LEGEND

- APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING
- APPROXIMATE LOCATION OF AUGER BORING

NOTE: PLAN AS SHOWN IS PRELIMINARY FOR REPRESENTATION OF BORING LOCATION ONLY AND MAY NOT BE INDICATIVE OF FINAL CONTRACT PLANS.

APPROVED BY: _____

JAY W. CASPER

P.E. NO.: 36330 DATE:

POND AND TUNNEL BORING LOCATION PLAN

REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	N/A	N/A	DRAWN BY	SW	1-30-99
CHECKED BY	N/A	N/A	CHECKED BY	MJH	1-30-99

SUPERVISED BY: JAY W. CASPER, P.E.

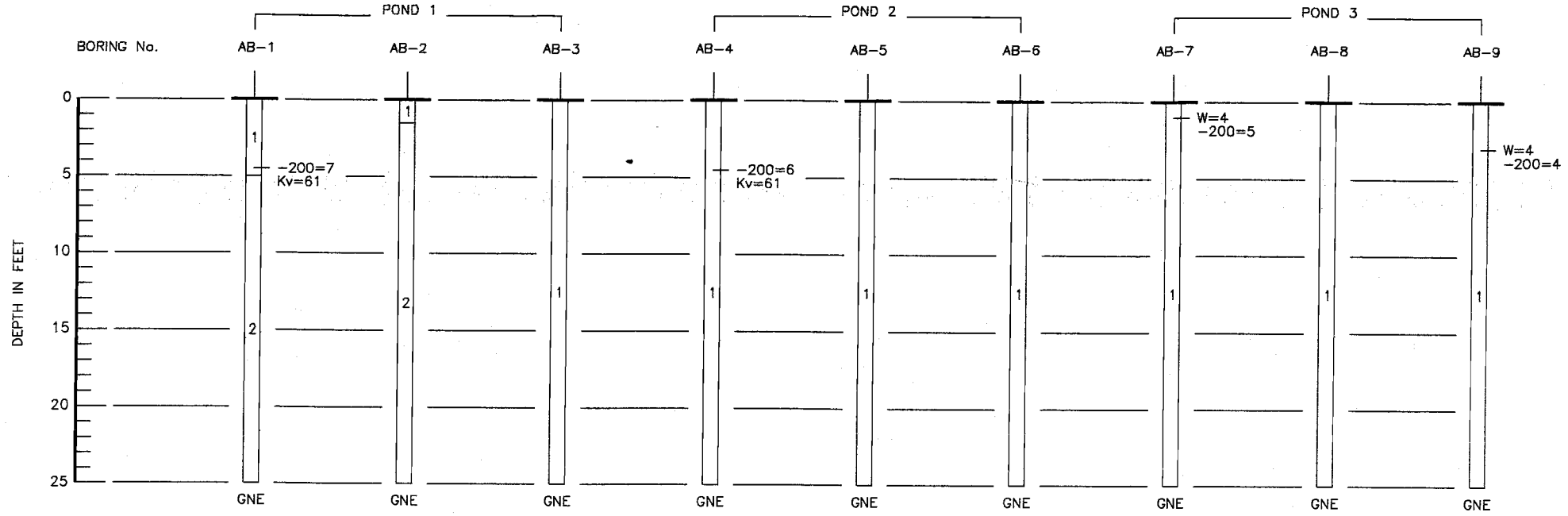
Nodarse & Associates, Inc. Geotechnical, Environmental & Materials Engineers

APPROVED BY: _____ DATE:

GEOTECHNICAL ENGINEERING EVALUATION
NORTH HANCOCK ROAD
LAKE COUNTY, FLORIDA

NODARSE and ASSOC. No. W98C-032 FIGURE: 2

FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
	FLA.			



LEGEND

1	ORANGE-BROWN TO BROWN FINE SAND TO SLIGHTLY SILTY FINE SAND (A-3)
2	ORANGE-BROWN TO ORANGE SLIGHTLY SILTY TO SILTY FINE SAND (A-2-4)
3	RED-ORANGE SILTY FINE SAND, TRACE CLAY (A-2-4)
(A-3)	A.A.S.H.T.O. SOIL CLASSIFICATION GROUP SYMBOL AS DETERMINED BY VISUAL EXAMINATION
GNE	GROUNDWATER NOT ENCOUNTERED TO DEPTH OF BORING
W	NATURAL MOISTURE CONTENT (%)
-200	FINES PASSING No. 200 SIEVE (%)
Kv	COEFFICIENT OF VERTICAL PERMEABILITY (ft./day)

APPROVED BY: _____

JAY W. CASPER

P.E. NO.: 36330 DATE:

POND BORINGS

REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
-								

	NAME	DATE		NAME	DATE
DESIGNED BY	N/A	N/A	DRAWN BY	SW	1-25-99
CHECKED BY	N/A	N/A	CHECKED BY	MJH	1-25-99

SUPERVISED BY: JAY W. CASPER, P.E.

Nodarse & Associates, Inc.
Geotechnical, Environmental & Materials Engineers

APPROVED BY:

DATE:

GEOTECHNICAL ENGINEERING EVALUATION
NORTH HANCOCK ROAD
LAKE COUNTY, FLORIDA

NODARSE and ASSOC. No. W98G-032 FIGURE: 5

PONDS - Version 2.26

Written By Devo Seereeram, Ph.D., P.E.
And Robert D. Casper

Retention Pond Recovery Analysis

I. Job Information

Job Name: North Hancock Road-Water Quality Volume
Engineer: MJH/JWC
Date: 3-19-99

II. Input Data

Equivalent Pond Length, [L] (ft):	261.00
Equivalent Pond Width, [W] (ft):	261.00
Pond Bottom Elevation, [PB] (ft above datum):	188.00
Porosity Of Material Within Pond, [p] (%):	100.00
Base Of Aquifer Elevation, [B] (ft above datum):	163.00
Water Table Elevation, [WT] (ft above datum):	164.00
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day)	10.00
Fillable Porosity of Aquifer, [n] (%):	25.00
Runoff Volume, [V] (cubic feet)	145926.00
Percent Recovery Of Runoff Volume, [PV] (%)	100.00

III. Results

UNSATURATED FLOW

Not Considered.

SATURATED FLOW

Recovery Time From Saturated Flow, [T2] (days):	0.4714
Recovered Volume From Saturated Flow, [V2] (ft^3):	145926.00
Maximum Radius Of Influence, [R] (ft):	42.90
Maximum Driving Head, [Hmax] (ft):	26.142
Minimum Driving Head, [Hmin] (ft):	24.000

TOTAL

Total Recovery Time, [T] (days):	0.4714
Total Recovered Volume, [V] (ft^3):	145926.00

PONDS - Version 2.26

Written By Devo Seereeram, Ph.D., P.E.
And Robert D. Casper

Retention Pond Recovery Analysis

I. Job Information

Job Name: North Hancock Road-Runoff Volume
Engineer: MJH/JWC
Date: 3-19-99

II. Input Data

Equivalent Pond Length, [L] (ft):	261.00
Equivalent Pond Width, [W] (ft):	261.00
Pond Bottom Elevation, [PB] (ft above datum):	188.00
Porosity Of Material Within Pond, [p] (%):	100.00
Base Of Aquifer Elevation, [B] (ft above datum):	163.00
Water Table Elevation, [WT] (ft above datum):	164.00
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day)	10.00
Fillable Porosity of Aquifer, [n] (%):	25.00
Runoff Volume, [V] (cubic feet)	450846.00
Percent Recovery Of Runoff Volume, [PV] (%)	100.00

III. Results

UNSATURATED FLOW

Not Considered.

SATURATED FLOW

Recovery Time From Saturated Flow, [T2] (days):	3.5090
Recovered Volume From Saturated Flow, [V2] (ft^3):	450846.00
Maximum Radius Of Influence, [R] (ft):	116.65
Maximum Driving Head, [Hmax] (ft):	30.618
Minimum Driving Head, [Hmin] (ft):	24.000

TOTAL

Total Recovery Time, [T] (days):	3.5090
Total Recovered Volume, [V] (ft^3):	450846.00

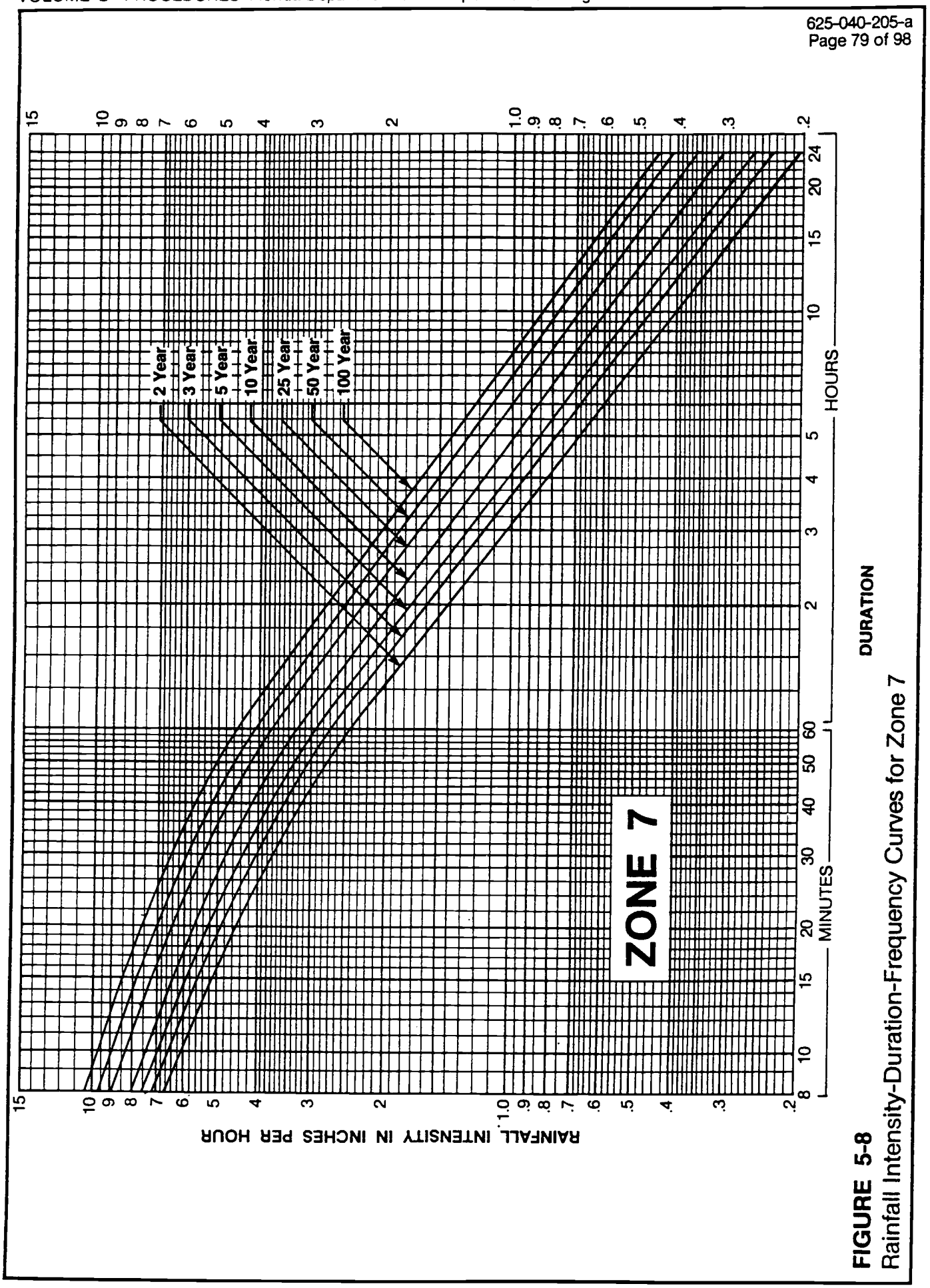


FIGURE 5-8
Rainfall Intensity-Duration-Frequency Curves for Zone 7

Table 5-5
RUNOFF COEFFICIENTS[a] FOR A DESIGN STORM RETURN PERIOD OF 10 YEARS OR LESS

Slope	Land Use	Sandy Soils Min.	Sandy Soils Max.	Clay Soils Min.	Clay Soils Max.
Flat (0-2%)	Woodlands	0.10	0.15	0.15	0.20
	Pasture, grass, and farmland[b]	0.15	0.20	0.20	0.25
	Rooftops and pavement	0.95	0.95	0.95	0.95
	Pervious pavements[c]	0.75	0.95	0.90	0.95
	SFR: ½-acre lots and larger	0.30	0.35	0.35	0.45
	Smaller lots	0.35	0.45	0.40	0.50
	Duplexes	0.35	0.45	0.40	0.50
	MFR: Apartments, townhouses, and condominiums	0.45	0.60	0.50	0.70
	Commercial and Industrial	0.50	0.95	0.50	0.95
Rolling (2-7%)	Woodlands	0.15	0.20	0.20	0.25
	Pasture, grass, and farmland[b]	0.20	0.25	0.25	0.30
	Rooftops and pavement	0.95	0.95	0.95	0.95
	Pervious pavements[c]	0.80	0.95	0.90	0.95
	SFR: ½-acre lots and larger	0.35	0.50	0.40	0.55
	Smaller lots	0.40	0.55	0.45	0.60
	Duplexes	0.40	0.55	0.45	0.60
	MFR: Apartments, townhouses, and condominiums	0.50	0.70	0.60	0.80
	Commercial and Industrial	0.50	0.95	0.60	0.95
Steep (7%+)	Woodlands	0.20	0.25	0.25	0.30
	Pasture, grass, and farmland[b]	0.25	0.35	0.30	0.40
	Rooftops and pavement	0.95	0.95	0.95	0.95
	Pervious pavements[c]	0.85	0.95	0.90	0.95
	SFR: ½-acre lots and larger	0.40	0.55	0.50	0.65
	Smaller lots	0.45	0.60	0.55	0.70
	Duplexes	0.45	0.60	0.55	0.70
	MFR: Apartments, townhouses, and condominiums	0.60	0.75	0.65	0.85
	Commercial and Industrial	0.60	0.95	0.65	0.95

[a] Weighted coefficient based on percentage of impervious surfaces and green areas must be selected for each site.

[b] Coefficients assume good ground cover and conservation treatment.

[c] Depends on depth and degree of permeability of underlying strata.

Note: SFR = Single Family Residential
MFR = Multi-Family Residential

Table 5-8
SCS RUNOFF CURVE NUMBERS FOR SELECTED AGRICULTURAL, SUBURBAN, AND URBAN LAND USE

Land Use Description		Hydrologic Soil Group A	B	C	D
Cultivated Land[a]:					
Without conservation treatment		72	81	88	91
With conservation treatment		62	71	78	81
Pasture or range land:					
Poor condition		68	79	86	89
Good condition		39	61	74	80
Meadow: good condition		30	58	71	78
Wood or Forest Land:					
Thin stand, poor cover, no mulch		45	66	77	83
Good cover[b]		25	55	70	77
Open Spaces, Lawns, Parks, Golf Courses, Cemeteries:					
Good condition: grass cover on 75% or more of the area		39	61	74	80
Fair condition: grass cover on 50% to 75% of the area		49	69	79	84
Poor condition: grass cover on 50% or less of the area		68	79	86	89
Commercial and Business Areas (85% impervious)		89	92	94	95
Industrial Districts (72% impervious)		81	88	91	93
Residential[c]:					
Average lot size	Average % Impervious[d]				
1/8 acre or less	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
Paved Parking Lots, Roofs, Driveways[e]:		98	98	98	98
Streets and Roads:					
Paved with curbs and storm sewers[e]		98	98	98	98
Gravel		76	85	89	91
Dirt		72	82	87	89
Paved with open ditches		83	89	92	93
Newly graded area (no vegetation established)[f]		77	86	91	94

[a]For a more detailed description of agricultural land use curve numbers, refer to Table 5-9.

[b]Good cover is protected from grazing and litter and brush cover soil.

[c]Curve numbers are computed assuming the runoff from the house and driveway is directed toward the street with a minimum of roof water directed to lawns where additional infiltration could occur.

[d]The remaining pervious areas (lawn) are considered to be in good pasture condition for these curve numbers.

[e]In some warmer climates of the country, a curve number of 96 may be used.

[f]Use for temporary conditions during grading and construction.

Note: These values are for Antecedent Moisture Condition II, and $I_a = 0.2S$.

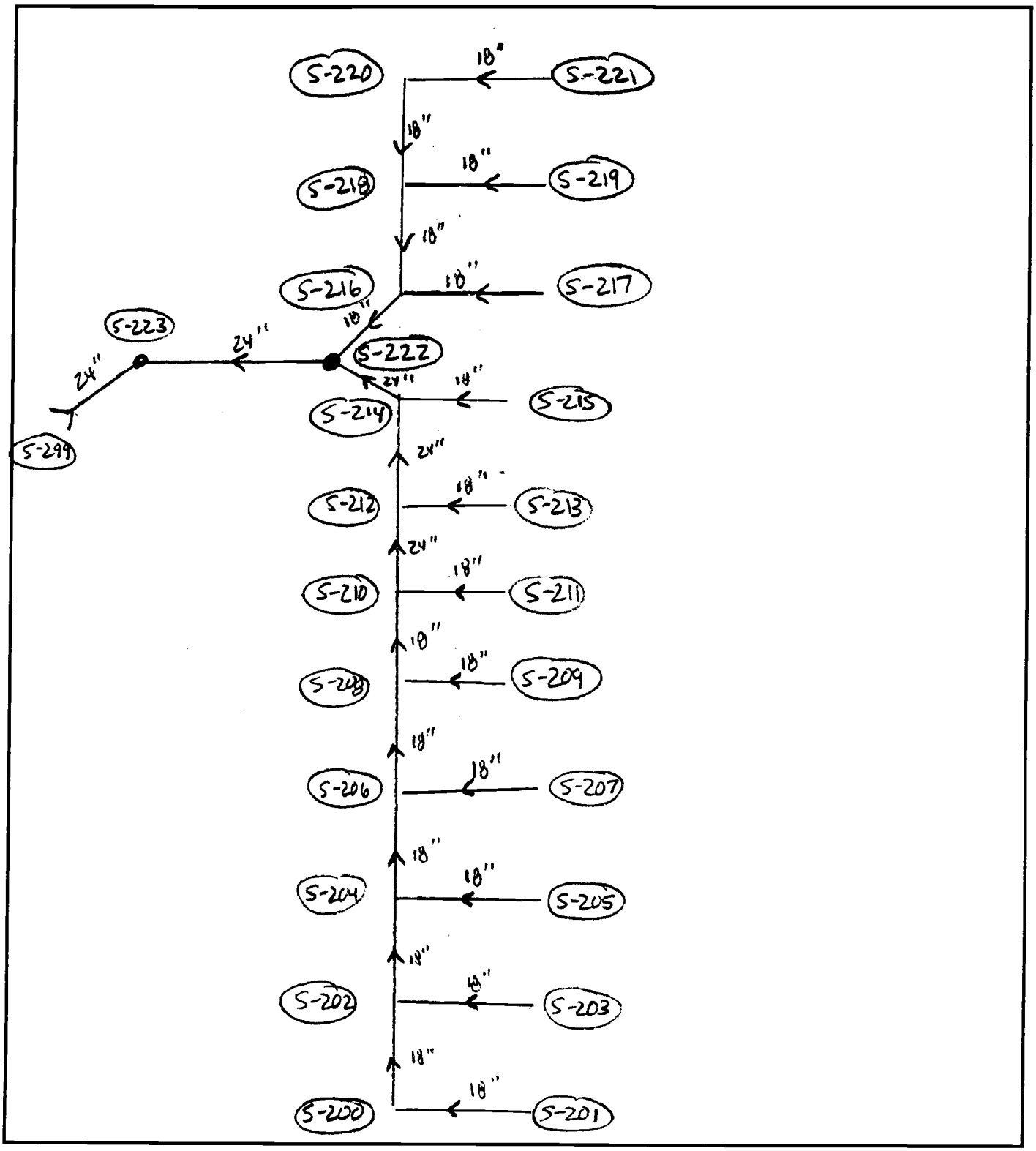
Reference: USDA, SCS, TR-55 (1984).

Storm Sewer Analysis

VHB

Computations

Project N. Hancock Rd. Project # 60633
Location Lake Co. Sheet 1 of 1
Calculated by PWY Date 4/9/99
Checked by _____ Date _____
Title Storm Sewer Nodal Diagram



STORM SEWER HYDRAULICS

System: **BASINB**

PROJECT

Number: 60633
Description: N. HANCOCK
County: LAKE COUNTY

Organization: Vanasse Hangen Brustlin, Inc.
Designed by: JOK
Checked by: PWY

Outfall Tailwater Elevation: 0.00
Exit Loss at Outfall: 0.00
Storm Sewer Control Elevatio 220.70

CONDITIONS

Storm Event		Runoff Coefficients		
Zone	Freq	Area 1	Area 2	Area 3
7	10	0.95	0.20	0.00

FROM Station / Type	TO Brls	Offset / Len	Drainage Areas Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs) (Qb)	Sum(Qb) / CIA / TOTAL	Inlet Elevations Inlet / Clear.	HGL / Jnc Loss	Pipe Elevations HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity (fps)	Capacity (cfs)	Mann'g 'N'
S-200		**S-202**	0.30	0.59	0.56					0.00	0.00	264.29	260.62	260.62	257.20	3.416	18	1.626	Partial			
123+80		-52.25	0.05	0.09	0.02	10.55	0.45	7.28	0.58		4.21			261.60	257.20				sub	7.84	16.47	0.0120
P-5	1	210.00	0.00	0.00	0.00						**4.21**	3.68	0.00	260.10	255.70	4.400	18	2.095				
S-201		**S-200**	0.29	0.29	0.27					0.00	0.00	264.53	260.95	260.95	260.75	0.200	18	0.216	Partial			
123+80		40.25	0.04	0.04	0.01	10.00	0.55	7.41	0.28		2.08			261.80	261.60				super	2.82	5.29	0.0120
P-5	1	92.50	0.00	0.00	0.00						**2.08**	3.58	0.00	260.30	260.10	0.200	18	0.216				
S-202		**S-204**	0.24	1.01	0.96					0.00	0.00	259.95	256.32	256.32	250.70	5.620	18	2.672	Partial			
125+90		-52.25	0.06	0.21	0.04	10.99	0.34	7.17	1.00		7.17			257.20	250.70				sub	10.40	20.00	0.0120
P-5	1	210.34	0.00	0.00	0.00						**7.17**	3.63	0.00	255.70	249.20	6.500	18	3.090				
S-203		**S-202**	0.18	0.18	0.17					0.00	0.00	260.19	257.21	257.21	257.20	0.013	18	0.014	Full			
125+90		40.25	0.06	0.06	0.01	10.00	0.77	7.41	0.18		1.36			257.50	257.20					0.77	6.48	0.0120
P-5	1	92.50	0.00	0.00	0.00						**1.36**	2.97	0.00	256.00	255.70	0.300	18	0.324				
S-204		**S-206**	0.21	1.41	1.34					0.00	0.00	253.54	249.93	249.93	243.80	6.125	18	3.063	Partial			
128+00		-40.25	0.06	0.34	0.07	11.33	0.28	7.10	1.41		10.01			250.70	243.80				sub	11.82	21.14	0.0120
P-5	1	200.00	0.00	0.00	0.00						**10.01**	3.62	0.00	249.20	242.30	6.900	18	3.450				
S-205		**S-204**	0.19	0.19	0.18					0.00	0.00	253.54	250.71	250.71	250.70	0.013	18	0.016	Full			
128+00		40.25	0.07	0.07	0.01	10.00	0.67	7.41	0.20		1.45			250.80	250.70					0.82	4.01	0.0120
P-5	1	80.50	0.00	0.00	0.00						**1.45**	2.83	0.00	249.30	249.20	0.100	18	0.124				
S-206		**S-208**	0.17	1.80	1.71					0.00	0.00	246.60	243.76	243.76	241.48	2.275	18	1.267	Full			
130+00		-40.25	0.06	0.53	0.11	11.61	0.41	7.04	1.82		12.81			243.80	240.40					7.25	15.66	0.0120
P-5	1	179.51	0.00	0.00	0.00						**12.81**	2.84	0.00	242.30	238.90	3.400	18	1.894				
S-207		**S-206**	0.22	0.22	0.21					0.00	0.00	246.88	243.82	243.82	243.80	0.019	18	0.024	Full			
130+00		40.25	0.13	0.13	0.03	10.00	0.67	7.41	0.24		1.75			243.90	243.80					0.99	4.01	0.0120
P-5	1	80.50	0.00	0.00	0.00						**1.75**	3.06	0.00	242.40	242.30	0.100	18	0.124				
S-208		**S-210**	0.16	2.11	2.01					0.00	0.00	243.11	241.48	241.48	240.59	0.896	18	1.689	Full			
131+82		-40.25	0.03	0.59	0.12	12.03	0.11	6.95	2.13		14.79			240.40	240.20					8.37	6.99	0.0120
P-5	1	53.04	0.00	0.00	0.00						**14.79**	1.63	0.00	238.90	238.70	0.200	18	0.377				
S-209		**S-208**	0.16	0.16	0.15					0.00	0.00	243.43	241.49	241.49	241.48	0.004	18	0.010	Full			
131+82		-2.25	0.03	0.03	0.01	10.00	0.32	7.41	0.15		1.14			240.70	240.40					0.64	10.11	0.0120
P-5	1	38.00	0.00	0.00	0.00						**1.14**	1.94	0.00	239.20	238.90	0.300	18	0.789				
S-210		**S-212**	0.09	2.30	2.19					0.00	0.00	242.91	240.59	240.59	240.36	0.224	24	0.427	Full			
132+37.27		-40.25	0.01	0.61	0.12	12.13	0.17	6.93	2.31		16.01			240.20	240.00					5.10	15.12	0.0120
P-6	1	52.52	0.00	0.00	0.00						**16.01**	2.33	0.00	238.20	238.00	0.200	24	0.381				
S-211		**S-210**	0.09	0.09	0.09					0.00	0.00	243.23	240.59	240.59	240.59	0.001	18	0.004	Full			
132+37.27		-2.25	0.01	0.01	0.00	10.00	0.32	7.41	0.09		0.68			240.50	240.20					0.38	10.11	0.0120
P-6	1	38.00	0.00	0.00	0.00						**0.68**	2.64	0.00	239.00	238.70	0.300	18	0.789				

Units: ENGLISH

STORM SEWER HYDRAULICS

System: **BASINB**

PROJECT

Number: 60633
Description: N. HANCOCK
County: LAKE COUNTY

Organization: Vanasse Hangen Brustlin, Inc.
Designed by: JOK
Checked by: PWY

Outfall Tailwater Elevation: 0.00
Exit Loss at Outfall: 0.00
Storm Sewer Control Elevatio 220.70

CONDITIONS

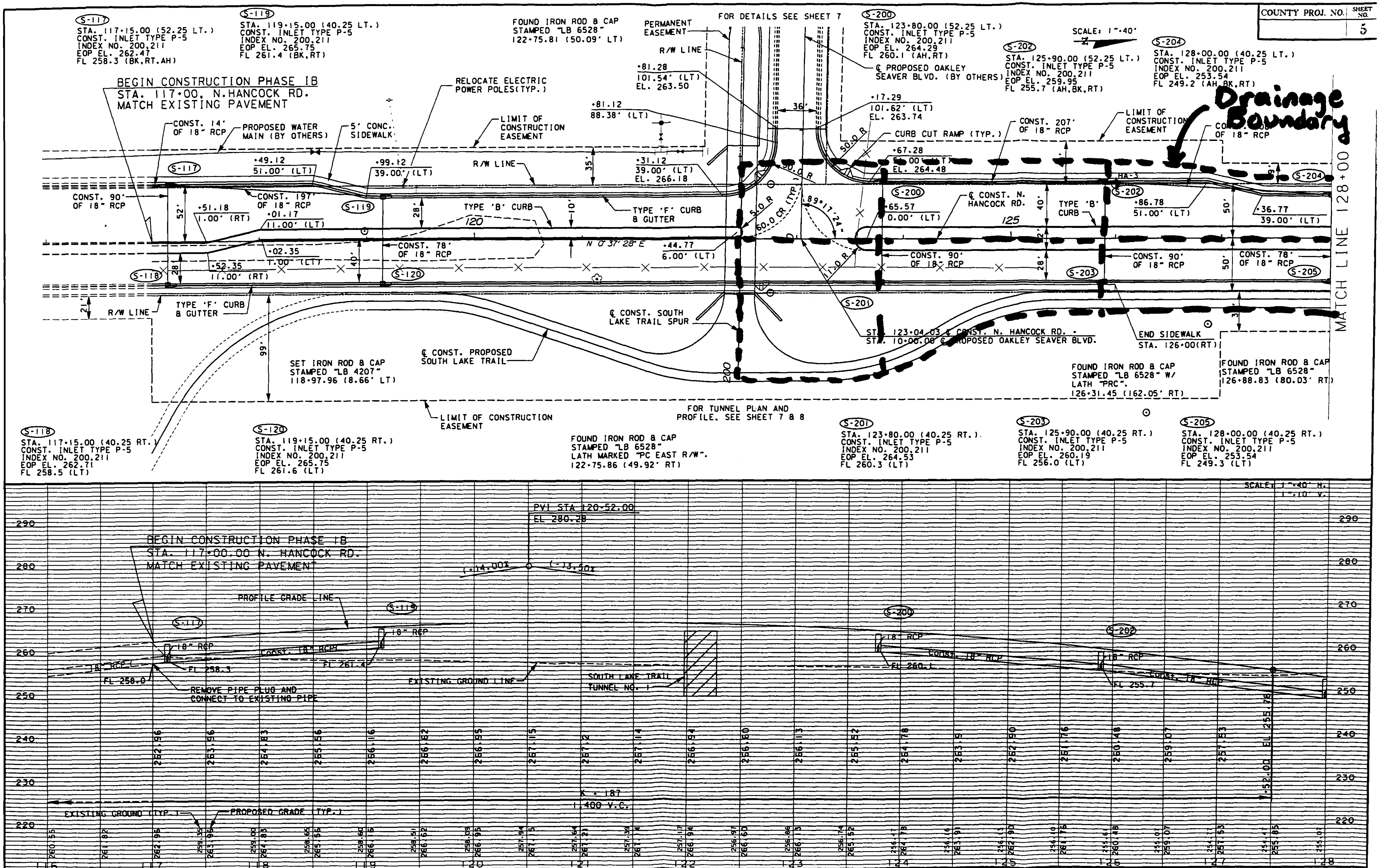
Storm Event		Runoff Coefficients		
Zone	Freq	Area 1	Area 2	Area 3
7	10	0.95	0.20	0.00

FROM / Station / Type	TO / Offset / Brls	Len	Drainage Areas: Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs): (Qb)	Sum(Qb) CIA TOTAL	Inlet Elevations: Inlet	HGL Clear.	HGL Jnc Loss	Pipe Elevations: HGL Crown Line	HGL Flow Line	Fall (ft)	Pipe Height (in)	Width (in)	HGL (%) FL (%)	Flow Type	Velocity (fps)	Capacity (cfs)	Mann'g 'N'
S-212	**S-214**		0.08	2.45	2.33																			
132+92		-40.25	0.01	0.63	0.13	12.30	0.26	6.90	2.46	0.00	0.00	243.11	240.36		240.36	239.96	0.403	24		0.478	Full			
P-5	1	84.43	0.00	0.00	0.00						16.94				240.00	239.80						5.39	11.93	0.0120
											16.94	2.75	0.00		238.00	237.80	0.200	24		0.237				
S-213	**S-212**		0.08	0.08	0.07																			
132+92		-2.25	0.01	0.01	0.00	10.00	0.32	7.41	0.07	0.00	0.00	243.43	240.40		240.40	240.40	0.001	18		0.002	Full			
P-5	1	38.00	0.00	0.00	0.00						0.54				240.70	240.40						0.31	10.11	0.0120
											0.54	3.03	0.00		239.20	238.90	0.300	18		0.789				
S-214	**S-222**		0.04	2.54	2.42																			
133+80		-40.25	0.00	0.64	0.13	12.56	0.21	6.84	2.54	0.00	0.00	244.25	239.96		239.96	239.60	0.359	24		0.504	Full			
P-5	1	71.26	0.00	0.00	0.00						17.40				239.80	239.60						5.54	12.98	0.0120
											17.40	4.29	0.00		237.80	237.60	0.200	24		0.281				
S-215	**S-214**		0.04	0.04	0.04																			
133+80		-2.25	0.00	0.00	0.00	10.00	0.22	7.41	0.04	0.00	0.00	244.60	240.57		240.57	240.17	0.400	18		1.053	Partial			
P-5	1	38.00	0.00	0.00	0.00						0.32				241.90	241.50					critical	2.90	11.68	0.0120
											0.32	4.03	0.00		240.40	240.00	0.400	18		1.053				
S-216	**S-222**		0.19	1.14	1.08																			
135+98		-52.25	0.02	0.26	0.05	11.17	0.24	7.13	1.13	0.00	0.00	248.36	244.79		244.79	240.69	4.100	18		2.725	Partial			
P-5	1	150.45	0.00	0.00	0.00						8.10				245.60	241.50					sub	10.26	18.79	0.0120
											8.10	3.57	0.00		244.10	240.00	4.100	18		2.725				
S-217	**S-216**		0.15	0.15	0.14																			
135+98		11.25	0.05	0.05	0.01	10.00	0.53	7.41	0.15	0.00	0.00	249.16	245.61		245.61	245.60	0.006	18		0.009	Full			
P-5	1	63.50	0.00	0.00	0.00						1.10				246.50	245.60						0.62	13.55	0.0120
											1.10	3.55	0.00		245.00	244.10	0.900	18		1.417				
S-218	**S-216**		0.21	0.81	0.77																			
137+30		-52.25	0.02	0.19	0.04	10.92	0.25	7.19	0.81	0.00	0.00	250.81	247.22		247.22	245.60	1.621	18		1.297	Partial			
P-5	1	125.01	0.00	0.00	0.00						5.80				248.10	245.60					sub	8.38	16.09	0.0120
											5.80	3.59	0.00		246.60	244.10	2.500	18		2.000				
S-219	**S-218**		0.17	0.17	0.16																			
137+30		11.25	0.06	0.06	0.01	10.00	0.53	7.41	0.17	0.00	0.00	251.61	248.11		248.11	248.10	0.008	18		0.012	Full			
P-5	1	63.50	0.00	0.00	0.00						1.25				248.90	248.10						0.71	12.77	0.0120
											1.25	3.50	0.00		247.40	246.60	0.800	18		1.260				
S-220	**S-218**		0.23	0.43	0.41																			
138+80		-52.25	0.03	0.11	0.02	10.53	0.40	7.28	0.43	0.00	0.00	252.64	248.91		248.91	248.10	0.807	18		0.568	Partial			
P-5	1	142.03	0.00	0.00	0.00						3.15				249.90	248.10					sub	5.99	12.81	0.0120
											3.15	3.74	0.00		248.40	246.60	1.800	18		1.267				
S-221	**S-220**		0.20	0.20	0.19																			
138+80		11.25	0.08	0.08	0.02	10.00	0.53	7.41	0.21	0.00	0.00	253.44	249.91		249.91	249.90	0.012	18		0.019	Full			
P-5	1	63.50	0.00	0.00	0.00						1.55				250.70	249.90						0.88	12.77	0.0120
											1.55	3.53	0.00		249.20	248.40	0.800	18		1.260				
S-222	**S-223**		0.00	3.68	3.50																			
134+40		-84.00	0.00	0.89	0.18	12.78	0.19	6.80	3.68	0.00	0.00	246.00	232.94		232.94	222.94	10.000	24		5.174	Partial			
MHP-7T	1	193.29	0.00	0.00	0.00						25.02				234.00	224.00					sub	17.30	55.74	0.0120
											25.02	13.06	0.00		232.00	222.00	10.000	24		5.174				
S-223	**S-299**		0.00	3.68	3.50																			
134+27		-277.00	0.00	0.89	0.18	12.96	0.00	6.77	3.68	0.00	0.00	226.00	221.24		221.24	220.70	0.541	24		1.031	Full			
MHP-7T	1	52.50	0.00	0.00	0.00						24.88				220.90	220.70						7.92	15.13	0.0120
											24.88	4.76	0.00		218.90	218.70	0.200	24		0.381				

Units: ENGLISH

$$$$$$SYTIME$$$$$$
$$$$$$$DGNSPECIFICATION$$$$$$$

COUNTY PROJ. NO.	SHEET NO.
	5



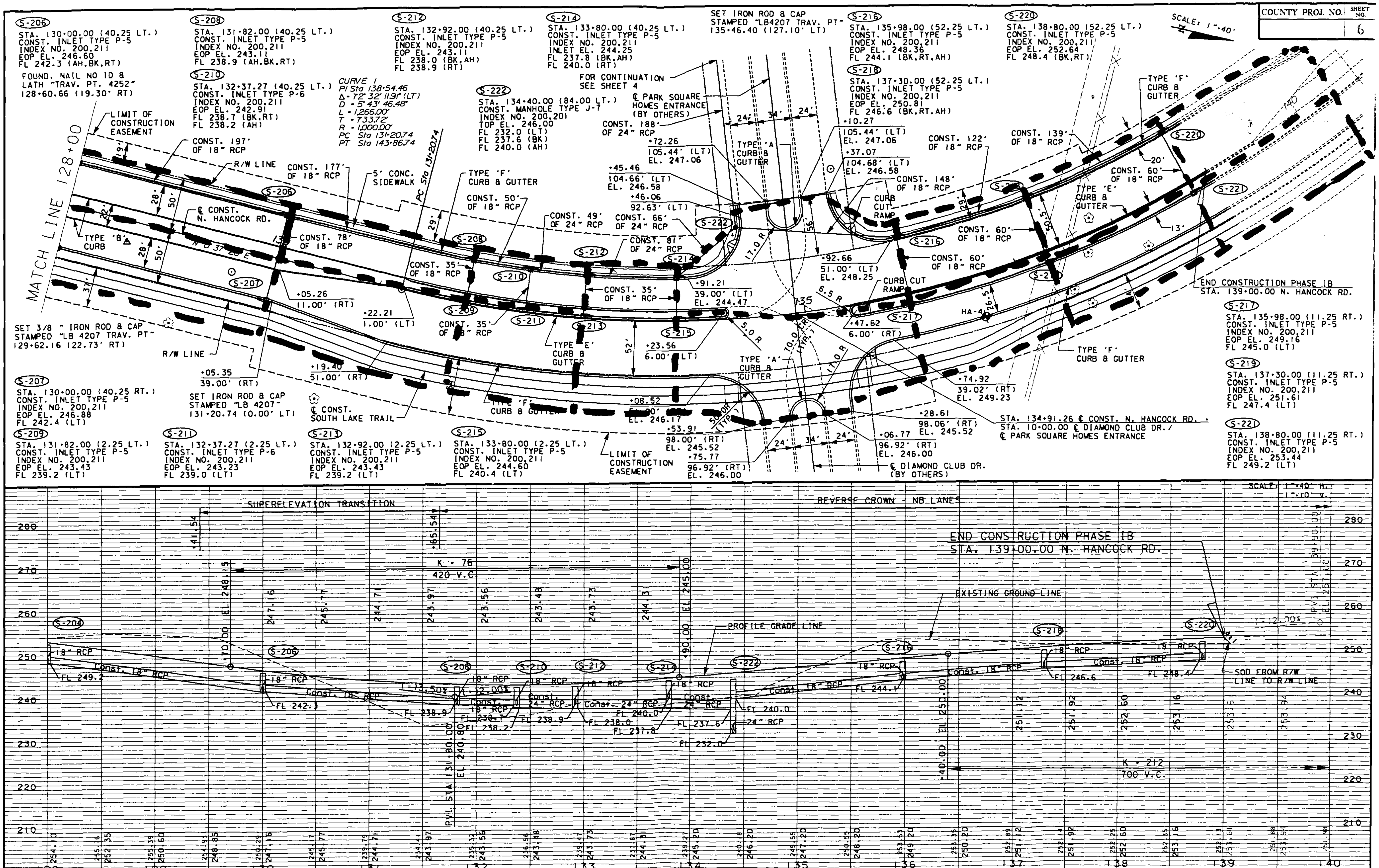
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

REVISIONS

VHB VANASSE HANGEN BRUSTLIN, INC.
TRANSPORTATION, LAND DEVELOPMENT, ENVIRONMENTAL SERVICES
135 W. CENTRAL BLVD., SUITE 1150
ORLANDO, FL 32801 (407)839-4006

LAKE COUNTY PUBLIC WORKS
ENGINEERING DIVISION
123 N. SINCLAIR AVE.
TAVARES, FLORIDA 32778

PLAN / PROFILE
N. HANCOCK ROAD
STA 117+00 TO STA 128+00



REVISIONS												
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	

VHB VANASSE HANGEN BRUSTLIN, INC.
TRANSPORTATION, LAND DEVELOPMENT, ENVIRONMENTAL SERVICES
135 W. CENTRAL BLVD., SUITE 1150
ORLANDO, FL 32801 (407)839-4006

LAKE COUNTY PUBLIC WORKS
ENGINEERING DIVISION
123 N. SINCLAIR AVE.
TAVARES, FLORIDA 32778

PLAN / PROFILE
HANCOCK ROAD
STA 128+00 TO STA 139+00

COUNTY PROJ. NO. | SHEET NO. 6

Hydrologic Computations

VHB **Computations**

Project N. Hancock Rd. Project # 60633
Location Lake Co. Sheet 1 of 2
Calculated by PWY Date 3/19/99
Checked by _____ Date _____
Title _____

1. Compute Treatment Volume

: Existing Area to depression = 38.1 Ac
· Additional Area to depression = 1.75 Ac (A to 204/205)
(North Hancock)
· Addition Area to depression = 0.30 Ac (North of 204/205)
(North Hancock)

Total Area 40.15 Ac

$TV_1 = (40.15 Ac)(1 in)(\frac{1 ft}{12 in}) = 3.35$ Ac-ft

$TV_2 = (4.13 Ac)(1.75 in)(\frac{1 ft}{12 in}) = 0.60$ Ac-ft

∴ Use TV = 3.35 Ac-ft

Recovery w/in 72-hours

2. Compute Runoff Volume 25-96 hour Storm Event

P = 11.8 in
A = 40.2 Ac
CN = 39

Project N. Hancock Rd Project # 60633
Location Lake Co. Sheet 2 of 2
Calculated by PWY Date 3/19/99
Checked by _____ Date _____
Title _____

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

$$S = \frac{1000}{CN} - 10 \Rightarrow S = \frac{1000}{39} - 10 \Rightarrow S = 15.64$$

$$Q = \frac{[11.8 - (0.2)(15.64)]^2}{(11.8 + (0.8)(15.64)} \Rightarrow Q = 3.09 \text{ in}$$

$$RV = (3.09 \text{ in})(40.15 \text{ ac})\left(\frac{1 \text{ ft}}{12 \text{ in}}\right)$$

$$\boxed{RV = 10.35 \text{ ac-ft}}$$

Runoff Curve Number

Project: North Hancock Rd
Location: Pond B (Depression)
Basin: B
Condition: Pre-development

Computed by: PWY
Date: 12/14/98
Checked:
Date:

Soil Name and Hydrologic Group	Cover Description	CN			Area (acres)	Product of CN x Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
Astatula (A)	Orange Grove (fair condition)	32			38.10	1219.2
						0.0
						0.0
				Totals =	38.10	1219.2

CN (Weighted) = (total product)/(total area) = 32.00 **Use CN =** **32**

Directly Connected Impervious Area (%)= **0.0**

CN (NDCIA) = 32.00 **Use CN =** **32**

Vanasse Hangen Brustlin, Inc.
Reference: SCS TR-55

Runoff Curve Number

Project: North Hancock Rd
Location: Pond B (Depression)
Basin: B
Condition: Post-development

Computed by: PWY
Date: 3/18/99
Checked:
Date:

Soil Name and Hydrologic Group	Cover Description	CN			Area (acres)	Product of CN x Area
		Table 2-2	Fig. 2-3	Fig. 2-4		
Astatula (A)	Open Space (good condition)	39			0.96	37.4
Astatula (A)	Orange Grove (fair condition)	32			34.81	1113.9
Impervious	Roadway Pavement	98			4.38	429.2
				Totals =	40.15	1580.6

CN (Weighted) = (total product)/(total area) = 39.37 **Use CN =** **39**

Directly Connected Impervious Area (%)= **10.9**

CN (NDCIA) = 32.19 **Use CN =** **32**

Vanasse Hangen Brustlin, Inc.
Reference: SCS TR-55

Stage-Storage-Area Computation

Project: N. Hancock Rd.
Basin: Segment 2 (Pre-development)
Pond: N/A
Computed by: PWY **Checked by:**
Date: 11/3/98 **Date:**

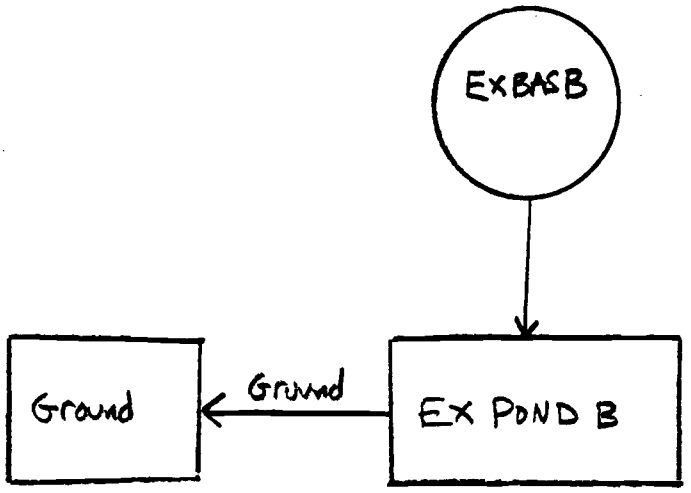
Elevation (ft)	Area (acres)	Ave Depth (ft)	Incremental Volume (acre-ft)
188.0	0.02	0.00	0.00
190.0	0.13	2.00	0.150
195.0	0.51	5.00	1.600
200.0	0.97	5.00	3.700
205.0	1.56	5.00	6.325
220.0	3.68	15.00	39.300
230.0	5.67	10.00	46.750
235.0	7.88	5.00	33.88
Total			**131.70**

Runoff Volume 15.40 (acre-ft)
Elevation (@ Runoff Volume)= **237.66** **(feet)**

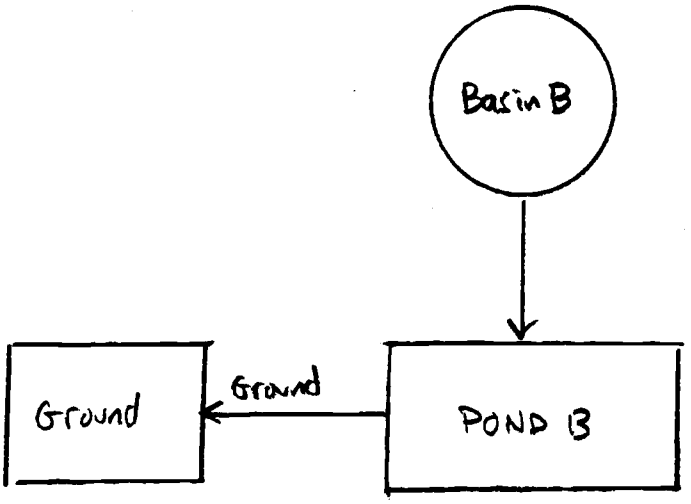
Vanasse, Hangen, Brustlin, Inc.

VHB **Computations**

Project N. Hancock Rd Project # 60633
Location Lake CO. Sheet 1 of 1
Calculated by PWY Date 4/9/99
Checked by _____ Date _____
Title Ad ICPR Nodal Diagram



Pre- Development



Post- development

North Hancock Road
25-year 96-hour
PWY 4-6-98

********** Basin Summary - 25YR96HR **********

***		
Basin Name:	EXBASB	BASINB
Group Name:	BASE	BASE
Node Name:	EXPONDB	PONDB
Hydrograph Type:	UH	UH
Unit Hydrograph:	UH484	UH484
Peaking Factor:	484.00	484.00
Spec Time Inc (min):	4.60	4.60
Comp Time Inc (min):	4.60	4.60
Rainfall File:	SJRWMD96	SJRWMD96
Rainfall Amount (in):	11.80	11.80
Storm Duration (hr):	96.00	96.00
Status:	ONSITE	ONSITE
Time of Conc. (min):	34.50	34.50
Lag Time (hr):	0.00	0.00
Area (acres):	38.10	40.15
Vol of Unit Hyd (in):	1.00	1.00
Curve Number:	39.00	39.00
DCIA (%):	0.00	0.00
Time Max (hrs):	60.18	60.18
Flow Max (cfs):	58.41	61.55
Runoff Volume (in):	3.09	3.09
Runoff Volume (cf):	427143	450126

North Hancock Road
100-year 96-hour
PWY 4-6-98

********** Basin Summary - 100Y96H **********

***		
Basin Name:	EXBASB	BASINB
Group Name:	BASE	BASE
Node Name:	EXPONDB	PONDB
Hydrograph Type:	UH	UH
Unit Hydrograph:	UH484	UH484
Peaking Factor:	484.00	484.00
Spec Time Inc (min):	4.60	4.60
Comp Time Inc (min):	4.60	4.60
Rainfall File:	SJRWMD96	SJRWMD96
Rainfall Amount (in):	14.90	14.90
Storm Duration (hr):	96.00	96.00
Status:	ONSITE	ONSITE
Time of Conc. (min):	34.50	34.50
Lag Time (hr):	0.00	0.00
Area (acres):	38.10	40.15
Vol of Unit Hyd (in):	1.00	1.00
Curve Number:	39.00	39.00
DCIA (%):	0.00	0.00
Time Max (hrs):	60.18	60.18
Flow Max (cfs):	99.05	104.38
Runoff Volume (in):	5.05	5.05
Runoff Volume (cf):	698120	735683

North Hancock Road
100-year 96-hour
PWY 4-6-98

********** Node Maximum Conditions - 100Y96H **********

^(Time units - hours)

Node Name	Group Name	Max Time Conditions	Max Stage (ft)	Warning Stage (ft)	Max Delta Stage (ft)	Max Surface Area (sf)	Max Time Inflow	Max Inflow (cfs)	Max Time Outflow	Max Outflow (cfs)
EXPONDB	BASE	96.01	207.39	235.00	0.0489	82694.25	60.00	77.41	0.00	0.00
GROUND	BASE	0.00	150.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00
PONDB	BASE	96.01	207.84	235.00	0.0499	85426.29	60.00	81.58	0.00	0.00

North Hancock Road
100-year 96-hour
PWY 4-6-98

********** Node Maximum Conditions - 25YR96HR **********

^(Time units - hours)

Node Name	Group Name	Max Time Conditions	Max Stage (ft)	Warning Stage (ft)	Max Delta Stage (ft)	Max Surface Area (sf)	Max Time Inflow	Max Inflow (cfs)	Max Time Outflow	Max Outflow (cfs)
EXPONDB	BASE	96.01	203.61	235.00	0.0486	60818.02	60.00	43.62	0.00	0.00
GROUND	BASE	0.00	150.00	0.00	0.0000	0.00	0.00	0.00	0.00	0.00
PONDB	BASE	96.01	203.98	235.00	0.0498	62714.48	60.00	45.96	0.00	0.00

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.11) [1]

North Hancock Road

********** Input Report **********

--------Class: Node--------

Name: EXPONDB Base Flow(cfs): 0 Init Stage(ft): 188
Group: BASE Length(ft): 0 Warn Stage(ft): 235
Comment: pre-development

Stage(ft)	Area(ac)
188	0.02
190	0.13
195	0.51
200	0.97
205	1.56
220	3.68
230	5.67
235	7.88

--------Class: Node--------

Name: GROUND Base Flow(cfs): 0 Init Stage(ft): 150
Group: BASE Length(ft): 0 Warn Stage(ft): 0
Comment:

Time(hrs)	Stage(ft)
0	150
100	150

--------Class: Node--------

Name: PONDB Base Flow(cfs): 0 Init Stage(ft): 188
Group: BASE Length(ft): 0 Warn Stage(ft): 235
Comment:

Stage(ft)	Area(ac)
188	0.02
190	0.13
195	0.51
200	0.97
205	1.56
220	3.68
230	5.67
235	7.88

--------Class: Operating Table--------

Name: GROUND Type: Rating Curve
Comment:

U/S Stage(ft)	Discharge(cfs)
188	0
200	0

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.11) [2]
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North Hancock Road

********** Input Report **********

--------Class: Rating Curve----------

Name: GRNDIN Count: 1 From Node: PONDB
Group: BASE Flow: Positive To Node: GROUND

	NAME	ELEV ON(ft)	ELEV OFF(ft)
#1:	GROUND	188	187.9
#2:		0	0
#3:		0	0
#4:		0	0

--------Class: Rating Curve----------

Name: GRNDINEX Count: 1 From Node: EXPONDB
Group: BASE Flow: Positive To Node: GROUND

	NAME	ELEV ON(ft)	ELEV OFF(ft)
#1:	GROUND	188	187.9
#2:		0	0
#3:		0	0
#4:		0	0

--------Class: Simulation----------

P:\60633\TECH\ADICPR\SIM\BASINB\10YR24HR
Execution: Both
Header: North Hancock Road
10-year 24-hour
PWY 4-6-98

---------HYDRAULICS----------HYDROLOGY----------

Max Delta Z (ft): 1
Delta Z Factor: 0.05
Override Defaults: Yes
Time Step Optimizer: 10
Storm Dur(hrs): 24
Drop Structure Optimizer: 10
Rain Amount(in): 7.4
Sim Start Time(hrs): 0
Rainfall File: FLMOD
Sim End Time(hrs): 30
Min Calc Time(sec): 0.5
Max Calc Time(sec): 30

To Hour:	PInc(min):	To Hour:	PInc(min):
10	60	30	30
15	15		
30	60		

---------GROUP SELECTIONS----------

+ BASE [04/06/99]

```
    Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.11) [3]
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    North Hancock Road


    ********** Input Report ************************************************
    --------Class: Simulation-----------------------------------------------
 P:\60633\TECH\ADICPR\SIM\25YR24HR
 Execution: None
    Header: North Hancock Road
            25-year 24-hour
            PWY 4-6-98
---------HYDRAULICS-----------------------------HYDROLOGY-------------------
        Max Delta Z (ft): 1
          Delta Z Factor: 0.05          Override Defaults: Yes
     Time Step Optimizer: 10               Storm Dur(hrs): 24
Drop Structure Optimizer: 10              Rain Amount(in): 8.6
     Sim Start Time(hrs): 0                 Rainfall File: FLMOD
       Sim End Time(hrs): 30
      Min Calc Time(sec): 0.5
      Max Calc Time(sec): 30
        To Hour:   PInc(min):                 To Hour:   PInc(min):
        10         60                         30         30
        15         15
        30         60
---------GROUP SELECTIONS-----------------------------------------------------
+ BASE     [11/03/98]
    --------Class: Simulation-----------------------------------------------
 P:\60633\TECH\ADICPR\SIM\100YR24H
 Execution: None
    Header: North Hancock Road
            100-year 24-hour
            PWY 4-6-98
---------HYDRAULICS-----------------------------HYDROLOGY-------------------
        Max Delta Z (ft): 1
          Delta Z Factor: 0.05          Override Defaults: Yes
     Time Step Optimizer: 10               Storm Dur(hrs): 24
Drop Structure Optimizer: 10              Rain Amount(in): 10.6
     Sim Start Time(hrs): 0                 Rainfall File: FLMOD
       Sim End Time(hrs): 30
      Min Calc Time(sec): 0.5
      Max Calc Time(sec): 30
        To Hour:   PInc(min):                 To Hour:   PInc(min):
        10         60                         30         30
        15         15
        30         60
---------GROUP SELECTIONS-----------------------------------------------------
+ BASE     [11/03/98]
```

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.11) [4]
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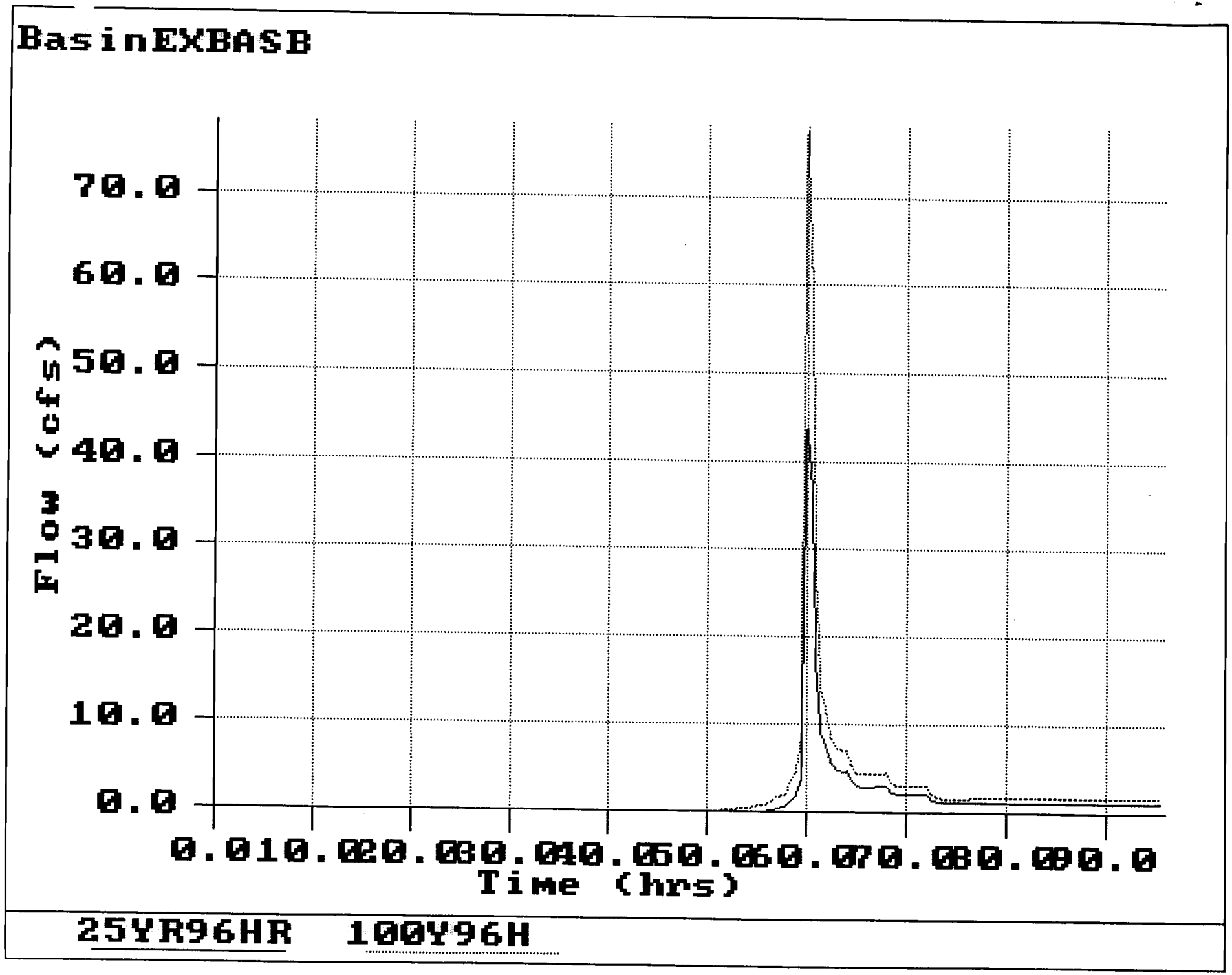
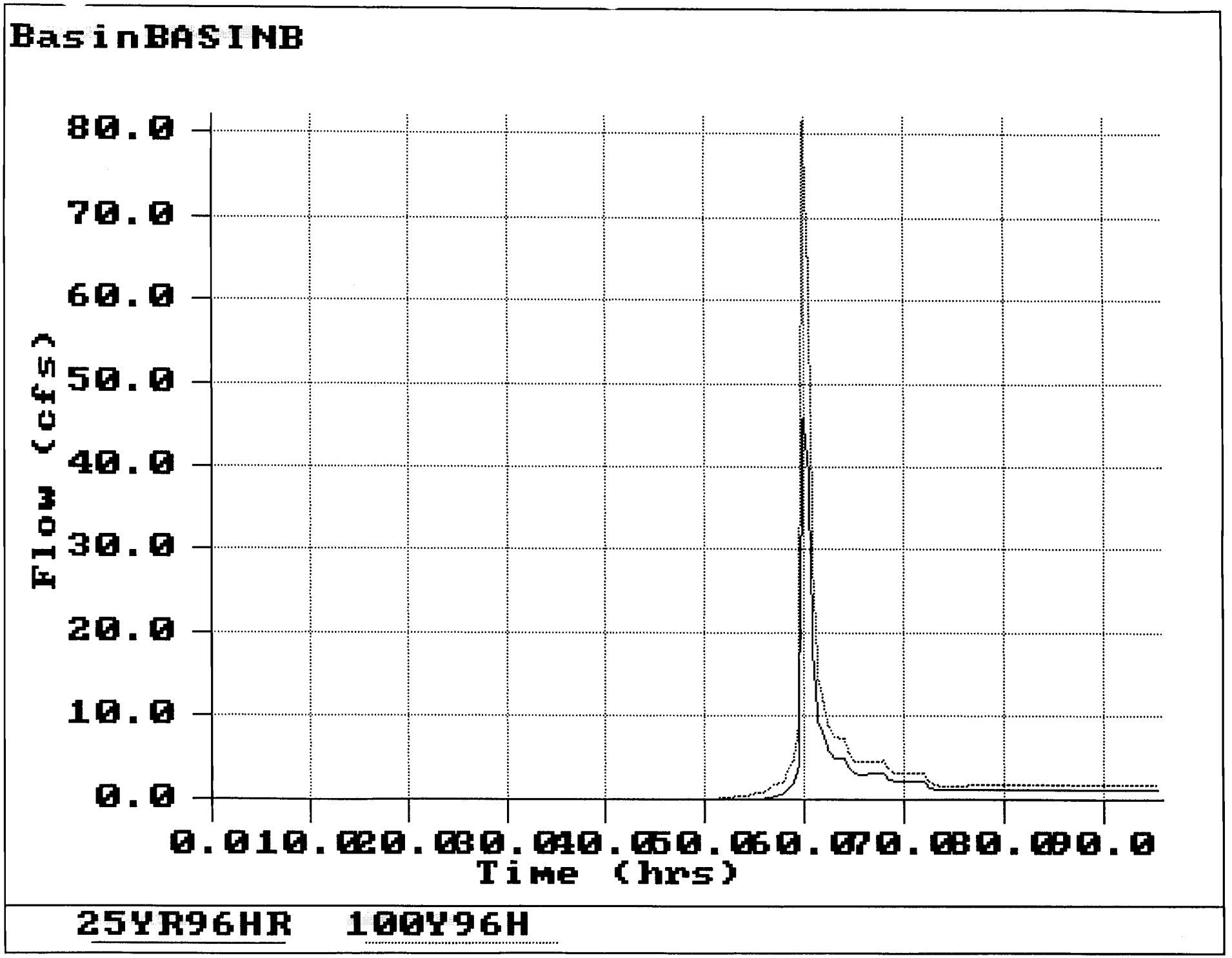
North Hancock Road

********** Input Report **
--------Class: Simulation---
P:\60633\TECH\ADICPR\SIM\BASINB\25YR96HR
Execution: Both
Header: North Hancock Road
25-year 96-hour
PWY 4-6-98
---------HYDRAULICS-----------------------------HYDROLOGY--------------------
Max Delta Z (ft): 1
Delta Z Factor: 0.05 Override Defaults: Yes
Time Step Optimizer: 10 Storm Dur(hrs): 96
Drop Structure Optimizer: 10 Rain Amount(in): 11.8
Sim Start Time(hrs): 0 Rainfall File: SJRWMD96
Sim End Time(hrs): 100
Min Calc Time(sec): 0.5
Max Calc Time(sec): 30
To Hour: PInc(min): To Hour: PInc(min):
100 15 96 30
---------GROUP SELECTIONS---
+ BASE [04/06/99]
--------Class: Simulation---
P:\60633\TECH\ADICPR\SIM\BASINB\100Y96H
Execution: Both
Header: North Hancock Road
100-year 96-hour
PWY 4-6-98
---------HYDRAULICS-----------------------------HYDROLOGY--------------------
Max Delta Z (ft): 1
Delta Z Factor: 0.05 Override Defaults: Yes
Time Step Optimizer: 10 Storm Dur(hrs): 96
Drop Structure Optimizer: 10 Rain Amount(in): 14.9
Sim Start Time(hrs): 0 Rainfall File: SJRWMD96
Sim End Time(hrs): 100
Min Calc Time(sec): 0.5
Max Calc Time(sec): 30
To Hour: PInc(min): To Hour: PInc(min):
100 30 96 30
---------GROUP SELECTIONS---
+ BASE [04/06/99]


BasinEXBASB
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Flow (cfs)
0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0
Time (hrs)
25YR96HR
100Y96H


BasinBASINB
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Flow (cfs)
0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0
Time (hrs)
25YR96HR
100Y96H