Bound Reports
1720

Appears off-site runoff from east & south coming into pond. However, holding 25yr/96 hr pre/post difference

7-ELEVEN HANCOCK ROAD
CLERMONT, FLORIDA
DRAINAGE CALCULATIONS
January 5, 2000 (SJRWMD Submittal)

67971-1 2001

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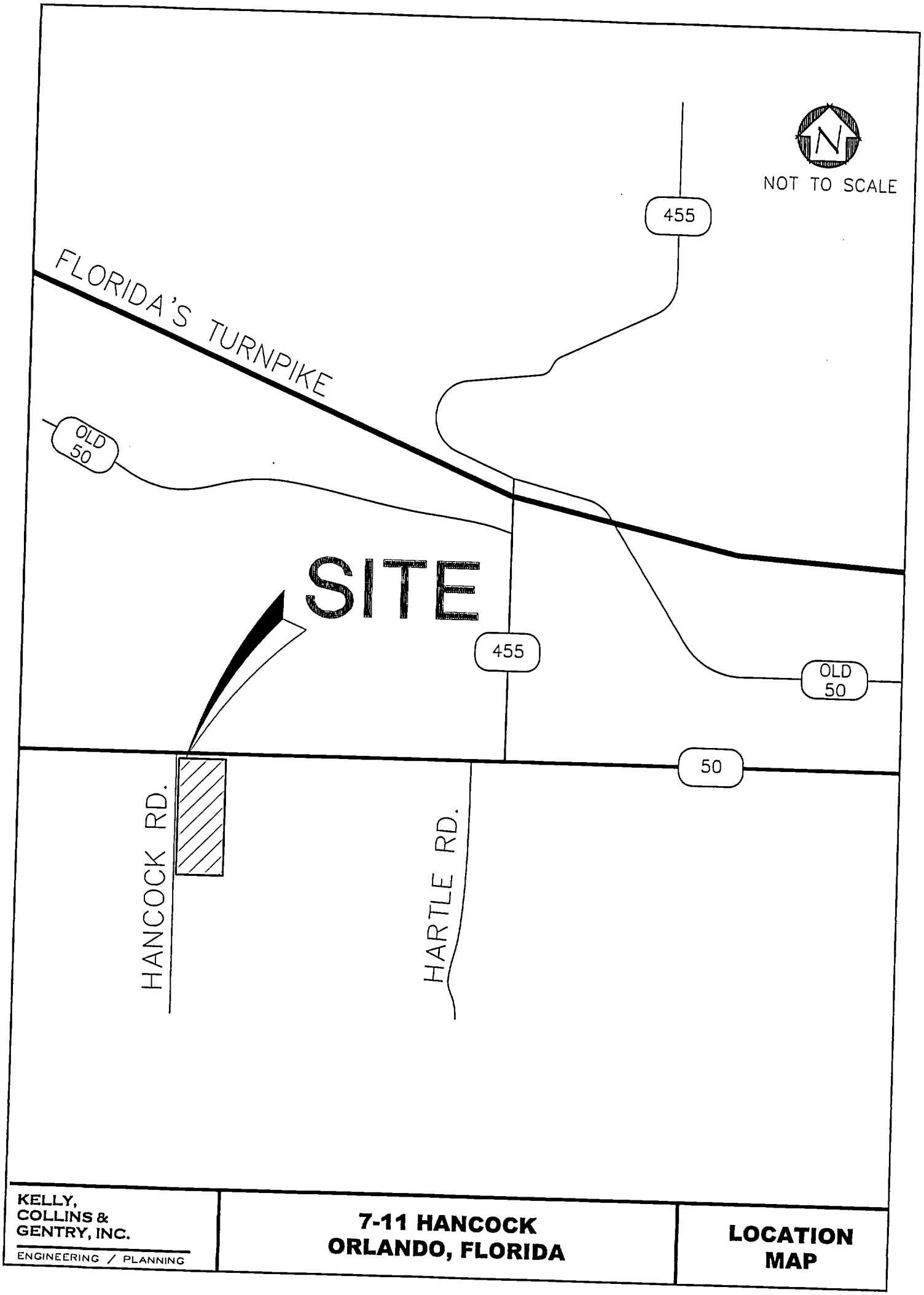
Exhibits

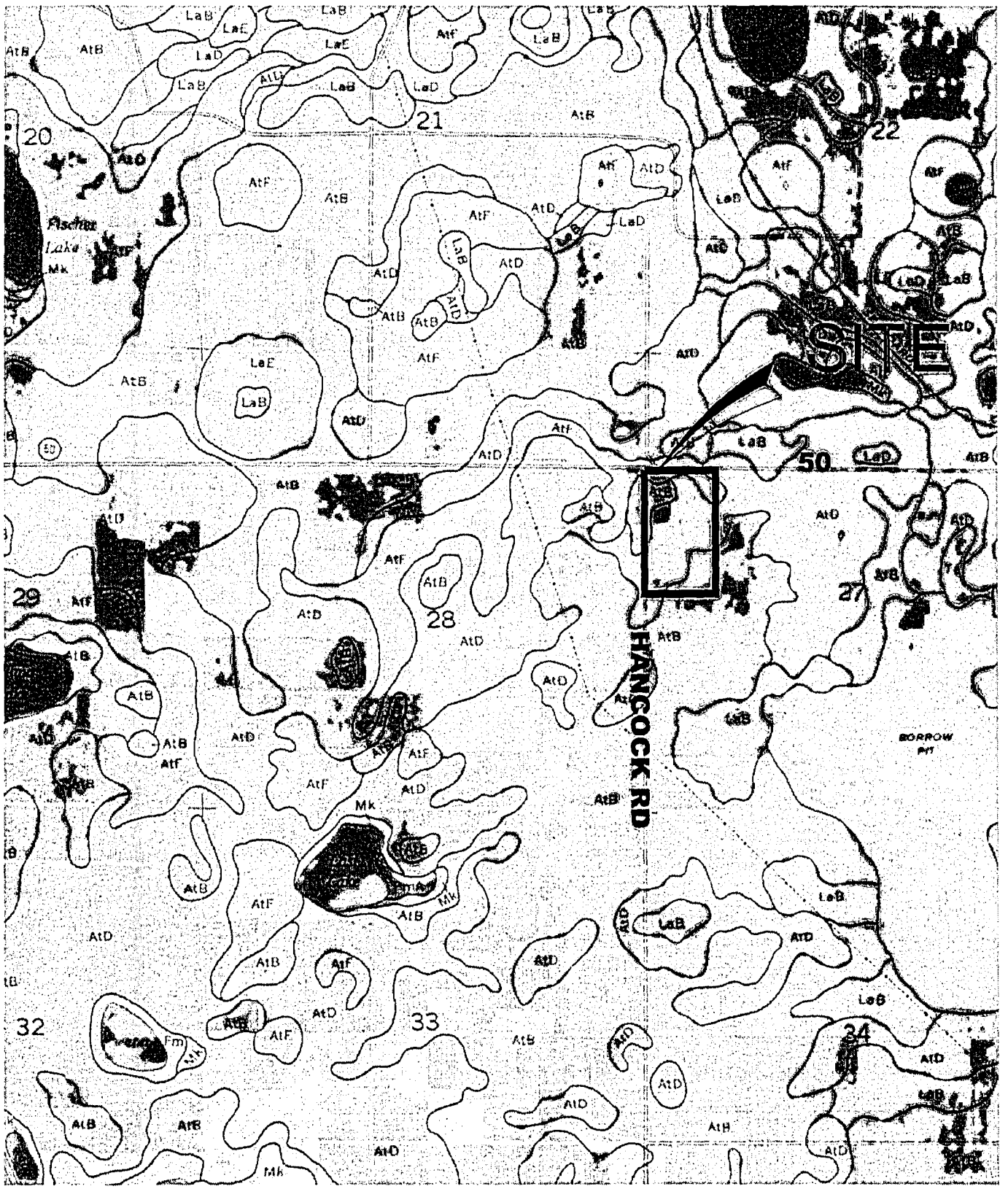


KELLY, COLLINS & GENTRY, INC.
ENGINEERING / PLANNING

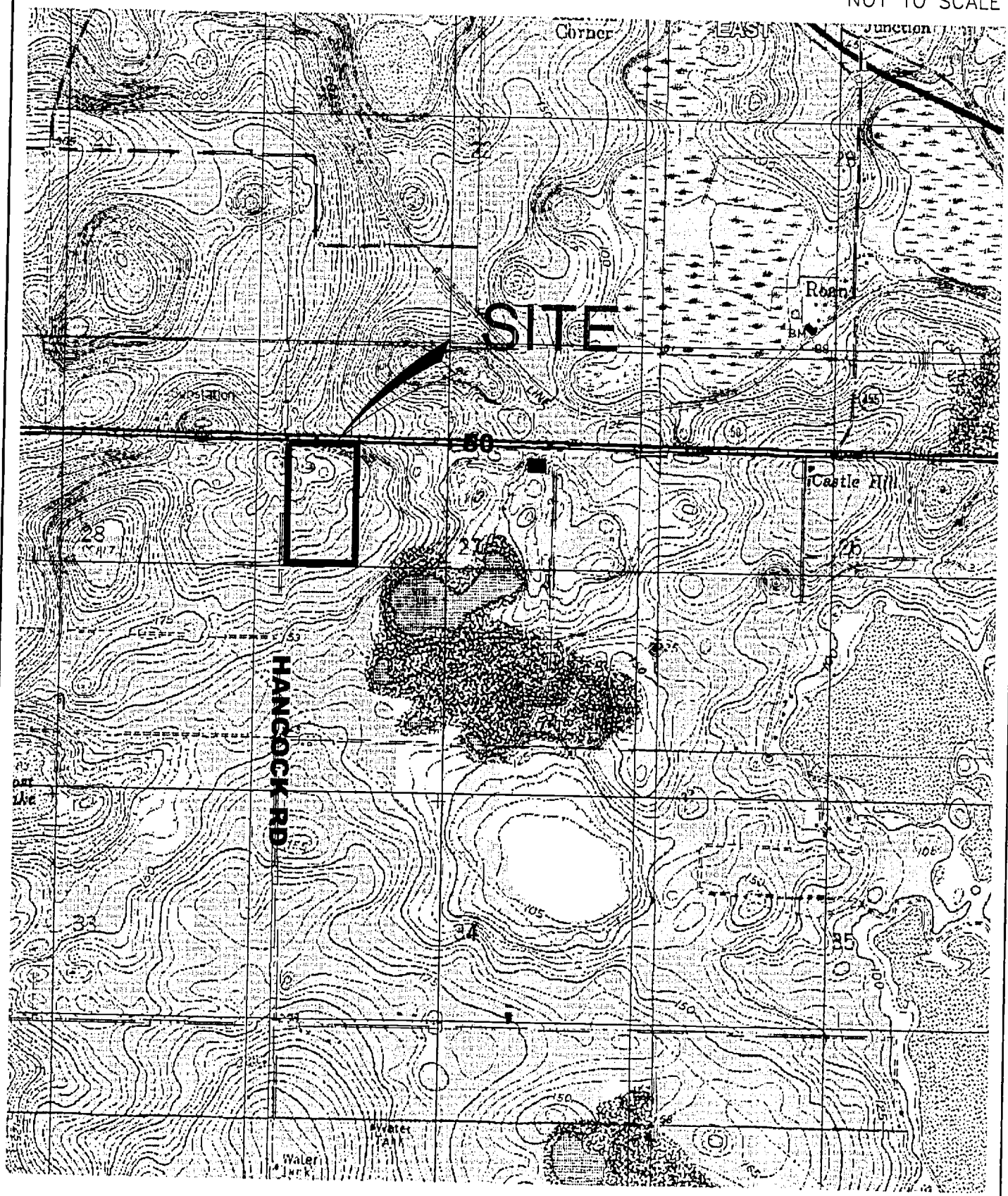
7-11 HANCOCK
ORLANDO, FLORIDA

LOCATION MAP

NOT TO SCALE



KELLY, COLLINS & GENTRY, INC. ENGINEERING / PLANNING	7-11 HANCOCK ORLANDO, FLORIDA	SCS SOILS MAP



KELLY, COLLINS & GENTRY, INC.

ENGINEERING / PLANNING

7-11 HANCOCK
ORLANDO, FLORIDA

USGS MAP

Drainage Narrative

Owner:	7-Eleven, Inc.
Project Name:	7-Eleven Convenience Store / Gas Station
Location:	S.R. 50 & Hancock Road, Lake County
Legal Description:	See Boundary & Topographic Survey (Sheet 2 of construction plans)
Existing Use:	Vacant
Proposed Use:	Service Station/Convenience Store

Project Description

The proposed project includes the development of a 4.09 ± acre site. The project is located within Lake County limits, Section 27, Township 22 South, Range 26 East. The site is located at the southeast corner of S.R. 50 and Hancock Road. The 7-Eleven site (1.73 ac) is located on the northern portion of the tract and the remainder is to be left for future development.

Drainage Methodology

The proposed retention pond is to function as a joint use pond, handling runoff from both the developed site and a portion of the proposed Hancock Road widening. The subject 7-11 site will only contain 58.2% of impervious area.

The proposed retention pond will provide the required storage and treatment of the water quality volume generated from the developed site and roadway improvements. Stormwater runoff is conveyed to the pond via onsite stormsewer system. Additionally, due to the site being located in a land-locked basin, the pond is designed to retain the pre-post volume for the 25-year / 96-hour storm event.

providing for storm event > than mean annual

Drainage Calculations

Runoff Curve Numbers

Project: 7-11 Station - S.R. 50 By: GDH Date: 09/06/2000

Location: Pre Basin 1 (Site) Checked: SMG Date:

Circle one: Present Developed

Soil Name and Hydrologic Group	Area Description	CN			Area acres	Product of CN x Area
		TABLE 2-2	Fig 2-3	Fig 2-4		
Candler A	Grass	39			4.07 4.09	159.51
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
				Total =	4.09	159.51

Use CN = 39.0

Runoff Curve Numbers

Project: 7-11 Station - S.R. 50 By: GDH Date: 09/06/2000

Location: Pre Basin 2 (Hancock Rd) Checked: SMG Date:

Circle one: **Present** Developed

Soil Name and Hydrologic Group	Area Description	CN			Area acres	Product of CN x Area
		TABLE 2-2	Fig 2-3	Fig 2-4		
Candler A	Grass	39			0.99	38.61
	Asphalt	98			0.55	54.292
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
				Total =	1.54	92.902

Use CN = 60.2

Runoff Curve Numbers

Project: 7-11 Station - S.R. 50 By: GDH Date: 09/06/2000

Location: 7-11 Basin Checked: SMG Date:

Circle one: Present **Developed**

Soil Name and Hydrologic Group	Area Description	CN			Area acres	Product of CN x Area
		TABLE 2-2	Fig 2-3	Fig. 2-4		
Candler A	Grass	39			0.72	28.08
	Impervious area	98			1.01	98.98
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
				Total =	1.73	127.06

Use CN = 73.4

58.38 % impervious surface

Runoff Curve Numbers

Project: 7-11 Station - S.R.. 50 By: GDH Date: 09/06/2000

Location: Site Basin 1 Checked: SMG Date:

Circle one: Present **Developed**

Soil Name and Hydrologic Group	Area Description	CN			Area acres	Product of CN x Area
		TABLE 2-2	Fig 2-3	Fig 2-4		
Candler A	Developed open space	39			0.59	23.01
	Impervious area	98			1.77	173.46
						0
						0
						0
						0
						0
						0
						0
						0
						0
				Total =	2.36	196.47

Use CN = 83.3

Site Basin 1

Runoff Curve Numbers

Project: 7-11 Station - S.R. 50 By: GDH Date: 09/06/2000

Location: Hancock Rd Basin Checked: SMG Date:

Circle one: Present Developed

Soil Name and Hydrologic Group	Area Description	CN			Area acres	Product of CN x Area
		TABLE 2-2	Fig 2-3	Fig. 2-4		
Candler A	Grass	39			0.36	13.962
	Pavement	98			1.18	115.64
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
				Total =	1.54	129.602

Use CN = 84.3

Master Stormwater Pond
Stage / Storage Relationship

Stage [ft]	Area [sf]	Area [ac]	Incremental Storage [cf]	Cumulative Storage [cf]
200	2,905	0.067		0
			3,840	
201	4,775	0.110		3,840
			5,667	
202	6,559	0.151		9,507
			7,664	
203	8,768	0.201		17,170
			9,921	
204	11,074	0.254		27,091
			12,289	
205	13,504	0.310		39,380
			14,778	
206	16,052	0.369		54,158
			17,382	
207	18,712	0.430		71,540
			20,094	
208	21,475	0.493		91,634
			22,906	
209	24,336	0.559		114,539

Primary Water Quality Treatment Requirements

Area of total project= 5.63 ac (incl. 1.54 ac of Hancock Rd improvements)
Area of impervious = 3.96 ac ✓

Hancock Rd Basin Imp = 1.18 Ac
Site Basin 1 Impervious = 1.77 Ac
7-11 Basin Impervious = 1.01 Ac
3.96 Ac

PRIMARY TREATMENT:
Greater of the following:

1/2" of runoff over site:
5.63 ac (0.5 inches)/(12 in/ft) = 0.23 ac-ft

1.25 " over impervious area:
3.96 ac (1.25 inches)/(12 in/ft) = **0.41** **ac-ft**

Since on-line treatment,

Total treatment volume required = **0.65** **ac-ft**

SJRWMD Pre-Post Runoff Volume Calculation

Since this site is located in a landlocked basin, the pond is designed to retain the difference in post development runoff volume versus the pre-development runoff volume for the 25-year / 96-hour storm event.

Pre-development Runoff Volume (25-year / 96-hour storm) = 71, 245 cf
Post development Runoff Volume (25-year / 96-hour storm) = 174, 546 cf

Pre-Post Runoff Volume Retained in Pond = 174, 546 cf - 71, 245 cf = **103, 301 cf**

SJRWMD
Design Storm Analysis

AdICPR - Input

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.20) [1]

7-11 Clermont - Post Development Model (SJRWMD)

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

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

Name: POND Base Flow(cfs): 0 Init Stage(ft): 200
Group: BASE Warn Stage(ft): 209
Comment:

Stage(ft)	Area(ac)
200	0.067
201	0.11
202	0.151
203	0.201
204	0.254
205	0.31
206	0.369
207	0.43
208	0.493
209	0.559

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

Name: TW Base Flow(cfs): 0 Init Stage(ft): 180
Group: BASE Warn Stage(ft): 198
Comment:

Time(hrs)	Stage(ft)
0	180
12	180
30	180

--------Class: Basin----------

Basin: 7_11 Node: POND Status: On Site Type: SCS Unit Hydr
Group: BASE
Unit Hydrograph: UH256 Peak Factor: 256
Rainfall File: FLMOD Storm Duration(hrs): 24
Rainfall Amount(in): 10.5
Area(ac): 1.73 Concentration Time(min): 10
Curve #: 73.4 Time Shift(hrs): 0
DCIA(%): 0

--------Class: Basin----------

Basin: PRE1 Node: PRE Status: On Site Type: SCS Unit Hydr
Group: BASE
Unit Hydrograph: UH256 Peak Factor: 256
Rainfall File: FLMOD Storm Duration(hrs): 24
Rainfall Amount(in): 10.5
Area(ac): 4.09 Concentration Time(min): 30
Curve #: 39 Time Shift(hrs): 0
DCIA(%): 0

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.20) [2]
Copyright 1995, Streamline Technologies, Inc.

7-11 Clermont - Post Development Model (SJRWMD)

********** Input Report **
--------Class: Basin--
Basin: PRE2 Node: PRE Status: On Site Type: SCS Unit Hydr
Group: BASE
Unit Hydrograph: UH256 Peak Factor: 256
Rainfall File: FLMOD Storm Duration(hrs): 24
Rainfall Amount(in): 10.5
Area(ac): 1.54 Concentration Time(min): 15
Curve #: 60.2 Time Shift(hrs): 0
DCIA(%): 0

--------Class: Basin--
Basin: ROADWAY Node: POND Status: On Site Type: SCS Unit Hydr
Group: BASE
Unit Hydrograph: UH256 Peak Factor: 256
Rainfall File: FLMOD Storm Duration(hrs): 24
Rainfall Amount(in): 10.5
Area(ac): 1.54 Concentration Time(min): 15
Curve #: 84.3 Time Shift(hrs): 0
DCIA(%): 0

--------Class: Basin--
Basin: SITE Node: POND Status: On Site Type: SCS Unit Hydr
Group: BASE
Unit Hydrograph: UH256 Peak Factor: 256
Rainfall File: FLMOD Storm Duration(hrs): 24
Rainfall Amount(in): 10.5
Area(ac): 2.36 Concentration Time(min): 20
Curve #: 83.3 Time Shift(hrs): 0
DCIA(%): 0

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.20) [3]

7-11 Clermont - Post Development Model (SJRWMD)

********** Input Report **
--------Class: Weir---
Name: RCH1 From Node: POND
Group: BASE To Node: TW
Count: 1

Type: Mavis Flow: Both Geometry: Rectangular

Span(in): 200
Rise(in): 999
Invert(ft): 209
Control Elev(ft): 209
TABLE
Bottom Clip(in): 0
Top Clip(in): 0
Weir Discharge Coef: 3.2
Orifice Discharge Coef: 0.6

AdICPR - Output

7-11 Station - SR 50 & S. Hancock Rd.

SJRWMD Storm Analysis

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

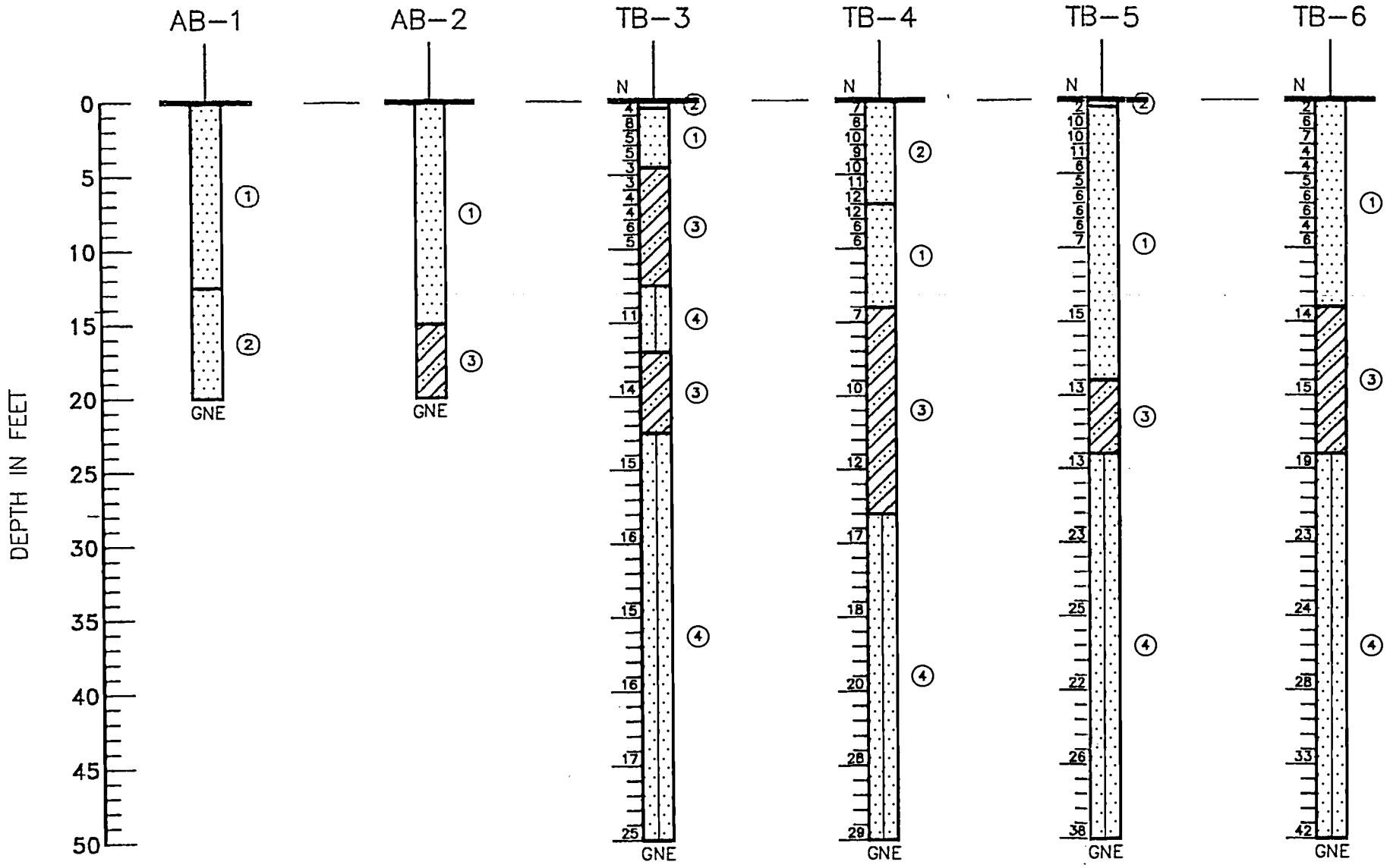
***		
Basin Name:	PRE1	PRE2
Group Name:	BASE	BASE
Node Name:	PRE	PRE
Hydrograph Type:	UH	UH
Unit Hydrograph:	UH256	UH256
Peaking Factor:	256.00	256.00
Spec Time Inc (min):	4.00	2.00
Comp Time Inc (min):	4.00	2.00
Rainfall File:	FLMOD	FLMOD
Rainfall Amount (in):	11.00	11.00
Storm Duration (hr):	96.00	96.00
Status:	ONSITE	ONSITE
Time of Conc. (min):	30.00	15.00
Lag Time (hr):	0.00	0.00
Area (acres):	4.09	1.54
Vol of Unit Hyd (in):	1.00	1.00
Curve Number:	39.00	60.20
DCIA (%):	0.00	0.00
Time Max (hrs):	48.20	48.03
Flow Max (cfs):	1.85	2.03
Runoff Volume (in):	2.63	5.75
Runoff Volume (cf):	39113	32132

7-11 Station - S.R. 50 & S. Hancock Rd.

SFWMD Storm Analysis

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

***			
Basin Name:	7_11	SITE	ROADWAY
Group Name:	BASE	BASE	BASE
Node Name:	POND	POND	POND
Hydrograph Type:	UH	UH	UH
Unit Hydrograph:	UH256	UH256	UH256
Peaking Factor:	256.00	256.00	256.00
Spec Time Inc (min):	1.33	2.67	2.00
Comp Time Inc (min):	1.33	2.67	2.00
Rainfall File:	SJRWMD96	SJRWMD96	SJRWMD96
Rainfall Amount (in):	11.00	11.00	11.00
Storm Duration (hr):	96.00	96.00	96.00
Status:	ONSITE	ONSITE	ONSITE
Time of Conc. (min):	10.00	20.00	15.00
Lag Time (hr):	0.00	0.00	0.00
Area (acres):	1.73	2.36	1.54
Vol of Unit Hyd (in):	1.00	1.00	1.00
Curve Number:	73.40	83.30	84.30
DCIA (%):	0.00	0.00	0.00
Time Max (hrs):	60.02	60.09	60.07
Flow Max (cfs):	7.50	8.66	6.49
Runoff Volume (in):	7.59	8.91	9.04
Runoff Volume (cf):	47681	76331	50534



LEGEND

- (1) GRAYISH BROWN TO ORANGISH BROWN FINE SAND (SP)
- (2) GRAYISH BROWN FINE SAND WITH ORANGISH BROWN SLIGHTLY CLAYEY FINE SAND AND GRAVEL DEBRIS, FILL (SP)(SP-SC)
- (3) ORANGISH BROWN TO REDDISH BROWN SLIGHTLY CLAYEY FINE TO MEDIUM SAND (SP-SC)
- (4) LIGHT YELLOWISH BROWN TO WHITE SLIGHTLY SILTY FINE TO MEDIUM SAND (SP-SM)
- (SP) UNIFIED SOIL CLASSIFICATION GROUP SYMBOL
- GNE GROUNDWATER NOT ENCOUNTERD
- N STANDARD PENETRATION RESISTANCE, IN BLOWS PER FOOT

Andreyev Engineering, Inc.

GEOTECHNICAL INVESTIGATION
4 ACRE PROPERTY ON
HWY. 50 & HANCOCK RD.
LAKE COUNTY, FLORIDA

SOIL PROFILES

SCALE:	DATE: 2/16/99	ENGINEER: SC
1"=10'	PN: CPGT-99-008	DRAWN BY: MK

FIGURE 3

Preliminary Geotechnical Investigation, 4 Acre Property on S.R. 50 and Hancock Road Clermont, Florida

Andreyev Engineering, Inc.

CLERMONT OFFICE
721 West Avenue
Clermont, Florida 34711
352-241-0508
Fax: 352-241-0977
Email: ANDENGI@AOL.COM

▼ Groundwater ▼ Environmental ▼ Geotechnical ▼ Construction Materials Testing

February 17, 1999
Project No. CPGT-99-008

TO: Maury L. Carter & Associates, Inc.
Post Office Box 568821
Orlando, Florida 32856-8821
Attention: Mr. Jeff Douglas

SUBJECT: **Preliminary Geotechnical Investigation,**
Proposed 4 Acre Development on State Road 50 and Hancock Road,
Clermont, Lake County, Florida

Dear Mr. Gentry:

In accordance with your request, Andreyev Engineering, Inc. has completed a preliminary geotechnical investigation of the above referenced property. Our investigation consisted of drilling a series of soil borings at the site for the purpose of characterizing subsurface conditions and assessment of general site suitability for construction of a commercial development. The following preliminary report presents the results of our investigations.

SITE LOCATION AND DESCRIPTION

The subject site will consist of a 4 acre commercial development. The property is located immediately south of SR 50, and east of Hancock Road, in Clermont, Lake County.

The subject property currently consists of vacant, undeveloped land which was formerly occupied by orange grove. The subject site is located on the south side of State Road 50, and the east side of Hancock Road. Based on review of the USGS Quadrangle map for this property the site grades from a high of approximately +235 ft-NGVD in the central portion to +215 ft-NGVD in the north portion. The USGS Quadrangle map encompassing the subject site is presented on **Figure 1**. Site reconnaissance indicates that minor earth moving activity has occurred in the south portion of the property.

We understand that a commercial development is proposed and that site elevations will be cut as much as 20 feet across the site. The proposed cutting will be in order to match elevations of the adjacent State Road 50 and Hancock Road. A location plan showing the boundary of the subject property is presented on **Figure 2**.

SCOPE OF INVESTIGATION

The purpose of our investigation was to characterize the soil and groundwater conditions across the site for assessment of the general suitability of the property for the intended commercial development. For this purpose the following investigation was conducted:

1. Drilled 4 Standard Penetration Test (SPT) borings to 50 feet deep to assess the shallow soil conditions across the site.

2. Drilled 2 auger borings to 40 feet deep at the location of potential stormwater retention areas.

3. Classified the encountered soils per the Unified soil classification system and evaluated the results, identified soil types for the purpose of foundation, roadway pavement design and retention pond design.

4. Prepared this summary report with investigation results in the form of drafted soil profiles, conclusions and preliminary recommendations.

FIELD INVESTIGATION AND RESULTS

Exploratory Drilling

A total of two (2) auger borings (designated as AB-1 and AB-2) and four (4) SPT borings (designated as TB-3 through TB-6) were drilled at the site. The boring locations were chosen based on the boundary survey provided by you and were located in the field by an engineer. Representative soil samples were collected at each change of soil strata for visual classification. The approximate location of the borings are presented on **Figure 2**, attached.

The results of the SPT borings are presented in the form of soil profiles on **Figure 3**. Soil stratification is based on review of recovered soil samples and interpretation of the field boring logs by a geotechnical engineer. The soil classification was performed using the Unified Soil Classification System.

Based on the field exploration and visual classification, the soil conditions generally consisted of a surface layer of grayish brown to orangish brown fine sand (stratum 1) extending to depths ranging from 4.5 to 18 feet below existing grade. Borings drilled in the north and central portions of the property (TB-3 through TB-5) encountered a surface layer of fill material (stratum 2) extending to depths of between 1 and 7 feet below grade. Underlying the surficial soils, the borings encountered a layer of orangish brown to reddish brown slightly clayey sand (stratum 3) to depths of between 22 and 28 feet, followed by light yellowish brown to white slightly silty sand to the maximum boring termination depth of 50 feet.

Soil Density

The relative density of the sand is determined based on the standard penetration resistance value, or N value. Based on the SPT-N values, the surficial sands and fill are generally in a very loose to medium dense state. The underlying stratum 3 clayey sand is in a stiff state, followed by the stratum 4 slightly silty sand which is in a medium dense to dense state. The SPT-N values are presented adjacent to the soils profiles on **Figure 3**.

Groundwater Table

The groundwater table was not encountered in any of the borings to the maximum termination depth of 50 feet below existing grade. Based on review of adjacent surface water features such as lakes and an open water mine pit located to the southeast, water levels in these features occur at approximate elevation +85 to +100 ft-NGVD. This indicates that groundwater beneath the site probably occurs at depths in excess of 75 feet.

EVALUATIONS AND RECOMMENDATIONS

Mass Grading

We understand that the subject property will be cut significantly in order to match adjacent roadway grades of State Road 50 and Hancock Road. Cuts of between 15 and 20 feet are anticipated. Based on the results of the borings, the soils which will be exposed following site cutting will primarily consist of the stratum 1 fine sands and/or stratum 3 slightly clayey sand, depending on the depth of removal. These soils are generally considered acceptable for support of structures associated with the development, including beneath foundations, pavement areas and buried utility lines.

Building Areas

Based on the results of this investigation the subject property is generally considered suitable for the intended construction of commercial buildings and pavement areas. The encountered soils indicate that these areas are suitable for construction of buildings and pavement provided that proper site preparation is carried out prior to construction. Site preparation would likely consist of site grading, leveling and compaction. In areas where stratum 3 soils are exposed, we recommend undercutting a few feet below pavement areas and foundation footers to prevent excess moisture from contacting the bottom of the base and/or footers. Once the design has progressed we will be available to conduct the appropriate analyses for sizing of foundations and pavement, and provide more detailed construction recommendations.

Retention Area

Based on the results of the borings, it is our opinion that the site soil and groundwater conditions are suitable for construction and operation of dry retention areas. However, a separation of approximately 5 feet should be maintained between the bottom of the retention areas and the stratum 3 clayey sand layer. Depending on the degree of cutting in the pond

areas, stratum 3 may be exposed or may be close to the pond bottom. If adequate separation cannot be achieved, the clayey sand must be removed entirely beneath the pond area in order to access the underlying stratum 4 slightly silty sand. For preliminary design purposes, the coefficient of hydraulic conductivity of the surficial stratum 1 sands is expected to be on the order of 30 to 50 feet per day. The underlying stratum 4 is expected to have a coefficient of hydraulic conductivity on the order of 10 to 20 feet per day. Actual field testing of the hydraulic conductivity must be conducted prior to design and permitting. Once the pond locations and configurations have been established we will be available to conduct the additional field testing and appropriate analyses.

CLOSURE

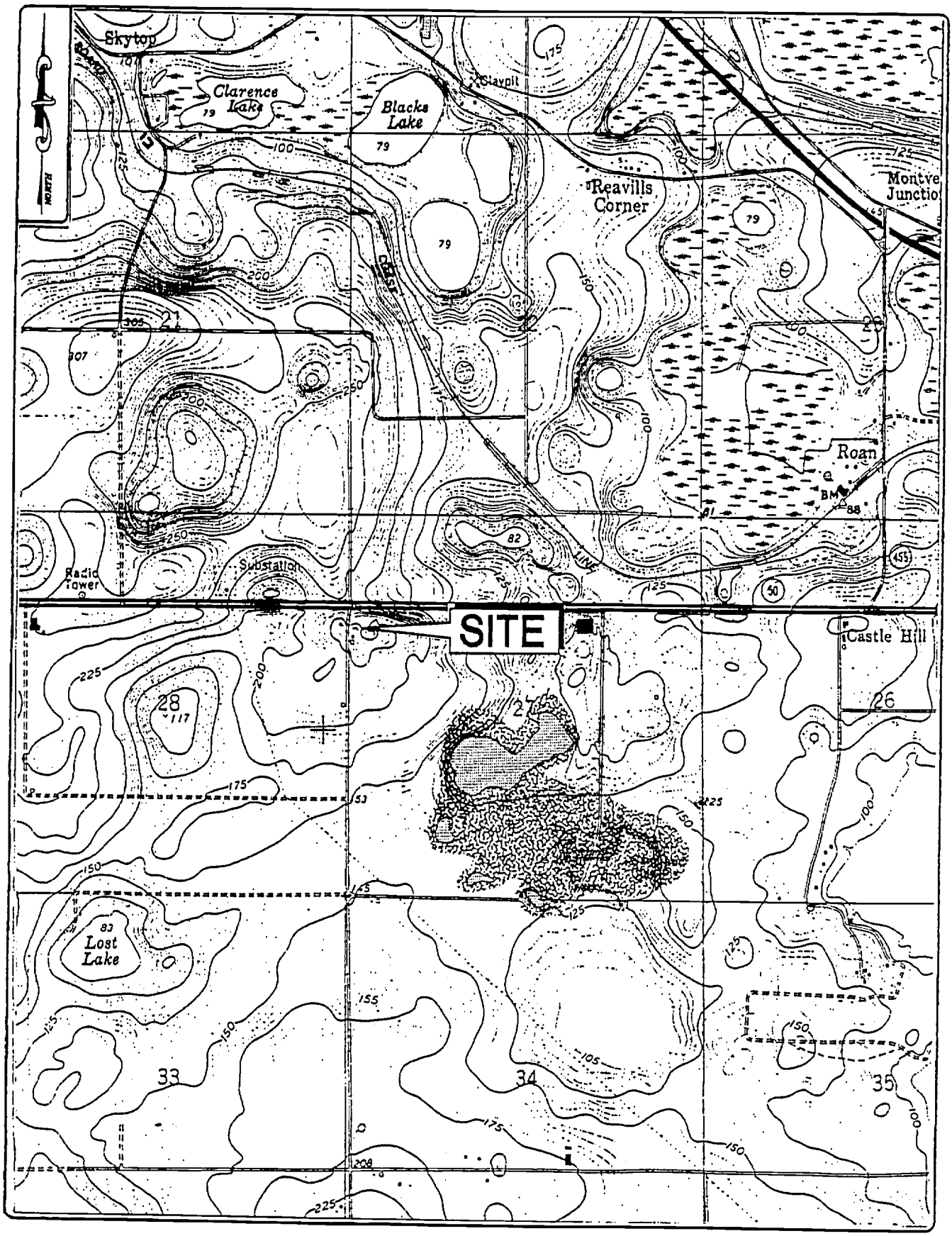
We appreciate the opportunity to provide our services on this project and trust that this report will be helpful for your preliminary design purposes. Should you have any questions concerning this report please do not hesitate to contact the undersigned.

Sincerely,

ANDREYEV ENGINEERING, INC.

T. Scott Cavin, P. E.
Vice President, Clermont Branch Manager
Florida Registration No. 48125

FIGURES



REFERENCE:
U.S.G.S. CLERMONT EAST, FLA.
QUADRANGLE MAP
DATED 1962
PHOTOREVISED 1980
SECTION 27
TOWNSHIP 22 SOUTH
RANGE 26 EAST

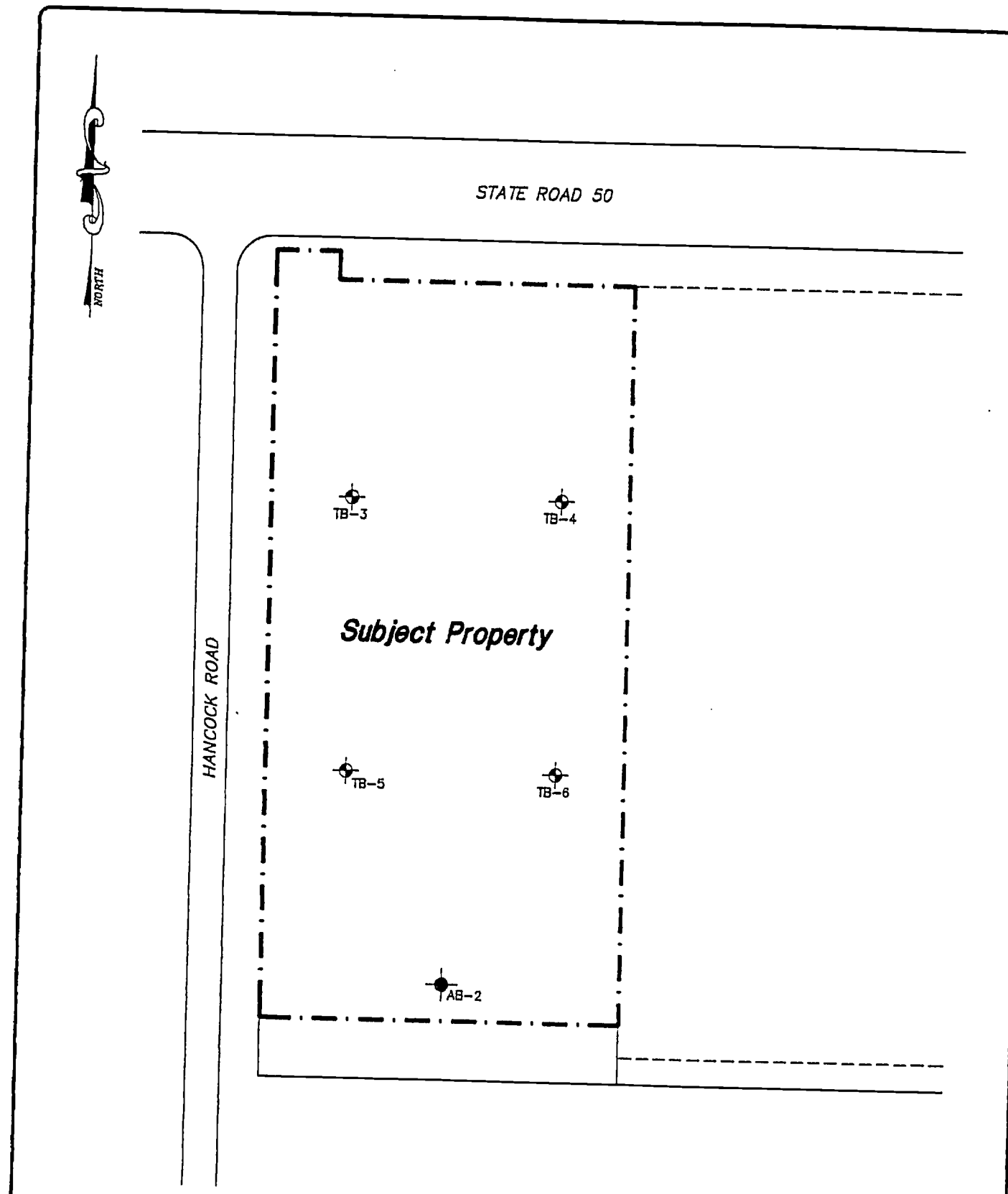
Andreyev Engineering, Inc.

GEOTECHNICAL INVESTIGATION
4 ACRE PROPERTY ON HWY. 50 & HANCOCK RD.
LAKE COUNTY, FLORIDA

SCALE:	DATE: 2/16/99	ENGINEER: SC
1"=2000'	PN: CPGT-99-008	DRAWN BY: MK

VICINITY MAP

FIGURE 1



LEGEND

- AUGER BORING LOCATION
- SPT BORING LOCATION

Andreyev Engineering, Inc.

GEOTECHNICAL INVESTIGATION
4 ACRE PROPERTY ON HWY. 50 & HANCOCK RD.
LAKE COUNTY, FLORIDA

SCALE:	DATE: 2/16/99	ENGINEER: SC
1"=100'	PN: CPGT-99-008	DRAWN BY: MK

LOCATION PLAN

FIGURE 2

Andreyev Engineering, Inc.

CLERMONT OFFICE
1170 W. Minneola Avenue
Clermont, Florida 34711
352-241-0508
Fax: 352-241-0977
Email: AEICLERMNT@AOL.COM

▼ Groundwater ▼ Environmental ▼ Geotechnical ▼ Construction Materials Testing

December 4, 2000

TO: **KCG Engineering, Inc.**
1600 E. Robinson Street
Suite 400,
Orlando, Florida 32803

Attention: Mr. Greg Hudak

SUBJECT: **Retention Pond Infiltration Analysis,**
Proposed 7-11 Store on Hancock Road, Clermont, Florida

Dear Mr. Hudak:

Andreyev Engineering, Inc. has completed an infiltration and recovery analysis for the proposed stormwater retention area for the above referenced development. This evaluation was conducted in accordance with St. John's River Water Management District permit criteria regarding recovery of the pollution abatement volume within 3 days following a storm. This analysis is conducted in response to a request by the District in their letter dated October 10, 2000.

Evaluation of recovery of the design runoff volume was conducted using the MODRET pond infiltration and recovery program. Model input parameters were chosen based on the results of our field and laboratory investigation presented in AEI's geotechnical report dated February 17 1999, and pond design assumptions provided by you. The horizontal hydraulic conductivity was conservatively estimated based on soil texture due to lack of actual test data.

Pond Bottom Area (sq. ft.)	2905
Pond Bottom Elevation (ft-NGVD)	+200
Pollution Abatement Volume (cu.ft.)	28,314
Top of Confining Soil Layer (ft-NGVD)	+179
Seasonal High Groundwater Level (ft-NGVD)	+180
Vertical Unsaturated Hydraulic Conductivity (ft/day)	5
Average Horizontal Saturated Hydraulic Conductivity (ft/day)	5
Soil Storage Coefficient	0.20

The results of the simulation including results of predicted water levels following application of the design runoff volume are presented on the attached computer printouts. Based on the model results the retained storm volume will recover in 40.2 hours following cessation of the storm, and therefore meets the permit criteria.

For purposes of routing of larger storms and estimation of discharge rates and volumes, the model was also utilized to estimate a rating curve (i.e. stage vs. infiltration rate). The rating curve was developed by applying sufficient volume of runoff to the pond to reach maximum stage, then evaluating instantaneous infiltration as the pond recovers. Initial recharge to the pond was applied over a period of 6 hours. The results of the rating curve are summarized below:

Stage (ft-NGVD)	Infiltration Rate (cfs)
201	0.097
202	0.115
203	0.144
204	0.175
205	0.204
206	0.247
207	0.310
208	0.375
209	0.351

Please note that a layer of clayey fine sand must be overexcavated in the pond area and backfilled with clean, fine sand. This layer was encountered at a depth of approximately 14 feet below existing grade and extends to approximately 28 feet below existing grade. The depth of the clay over the pond area may vary somewhat. We recommend that the clay layer be removed over the entire pond bottom area plus a perimeter margin of 10 feet. Backfill should consist of fine to medium grained sand which is light in color and free of debris. The backfill should have a percent fines content not exceeding 5 percent passing the No. 200 sieve. The stratum 1 and 2 soils (see geotechnical report) are sufficient for use as backfill. Care should be taken to avoid over compaction of the backfilled soil. These recommendations should be incorporated into the project construction plans.

We appreciate the opportunity to provide our continued services on this project. Should you have any questions or comments concerning the contents of this attached report, please do not hesitate to contact the undersigned.

Sincerely,

ANDREYEV ENGINEERING, INC.

T. Scott Cavin, P.E.
Vice Presiden
FL Registration No. 48125

Attachment

MODRET

SUMMARY OF UNSATURATED & SATURATED INPUT PARAMETERS

PROJECT NAME : 7-11 on Hancock Road
MANUAL RUNOFF DATA USED
UNSATURATED ANALYSIS EXCLUDED

Pond Bottom Area	2,905.00 ft^2
Pond Volume between Bottom & DHWL	27,091.00 ft^3
Pond Length to Width Ratio (L/W)	3.00
Elevation of Effective Aquifer Base	179.00 ft
Elevation of Seasonal High Groundwater Table	180.00 ft
Elevation of Starting Water Level	200.00 ft
Elevation of Pond Bottom	200.00 ft
Design High Water Level Elevation	204.00 ft
Avg. Effective Storage Coefficient of Soil for Unsaturated Analysis	0.20
Unsaturated Vertical Hydraulic Conductivity	5.00 ft/d
Factor of Safety	2.00
Saturated Horizontal Hydraulic Conductivity	5.00 ft/d
Avg. Effective Storage Coefficient of Soil for Saturated Analysis	0.20
Avg. Effective Storage Coefficient of Pond/Exfiltration Trench	1.00

Hydraulic Control Features:

	Top	Bottom	Left	Right
Groundwater Control Features - Y/N	N	N	N	N
Distance to Edge of Pond	0.00	0.00	0.00	0.00
Elevation of Water Level	0.00	0.00	0.00	0.00
Impervious Barrier - Y/N	N	N	N	N
Elevation of Barrier Bottom	0.00	0.00	0.00	0.00

MODRET

TIME - RUNOFF INPUT DATA

PROJECT NAME: 7-11 ON HANCOCK ROAD

STRESS PERIOD NUMBER	INCREMENT OF TIME (hrs)	VOLUME OF RUNOFF (ft^3)
Unsat	0.00	0.00
1	1.00	28,314.00
2	12.00	0.00
3	12.00	0.00
4	12.00	0.00
5	12.00	0.00
6	12.00	0.00
7	11.00	0.00

MODRET

SUMMARY OF RESULTS

PROJECT NAME : 7-11 on Hancock Road

CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
00.00 - 0.00	180.000	0.000 *		
			0.00000	
0.00	180.000	0.04944		
			0.06506	
1.00	204.146	0.08068		0.00
			0.26811	
13.00	202.436	0.23247		0.00
			0.19682	
25.00	201.180	0.17418		0.00
			0.15153	
37.00	200.214	0.13818		0.00
			0.12483	
40.22	200.000	0.11511		0.00
			0.10540	
61.00	198.745	0.09815		0.00
			0.09150	
72.00	198.210			0.00

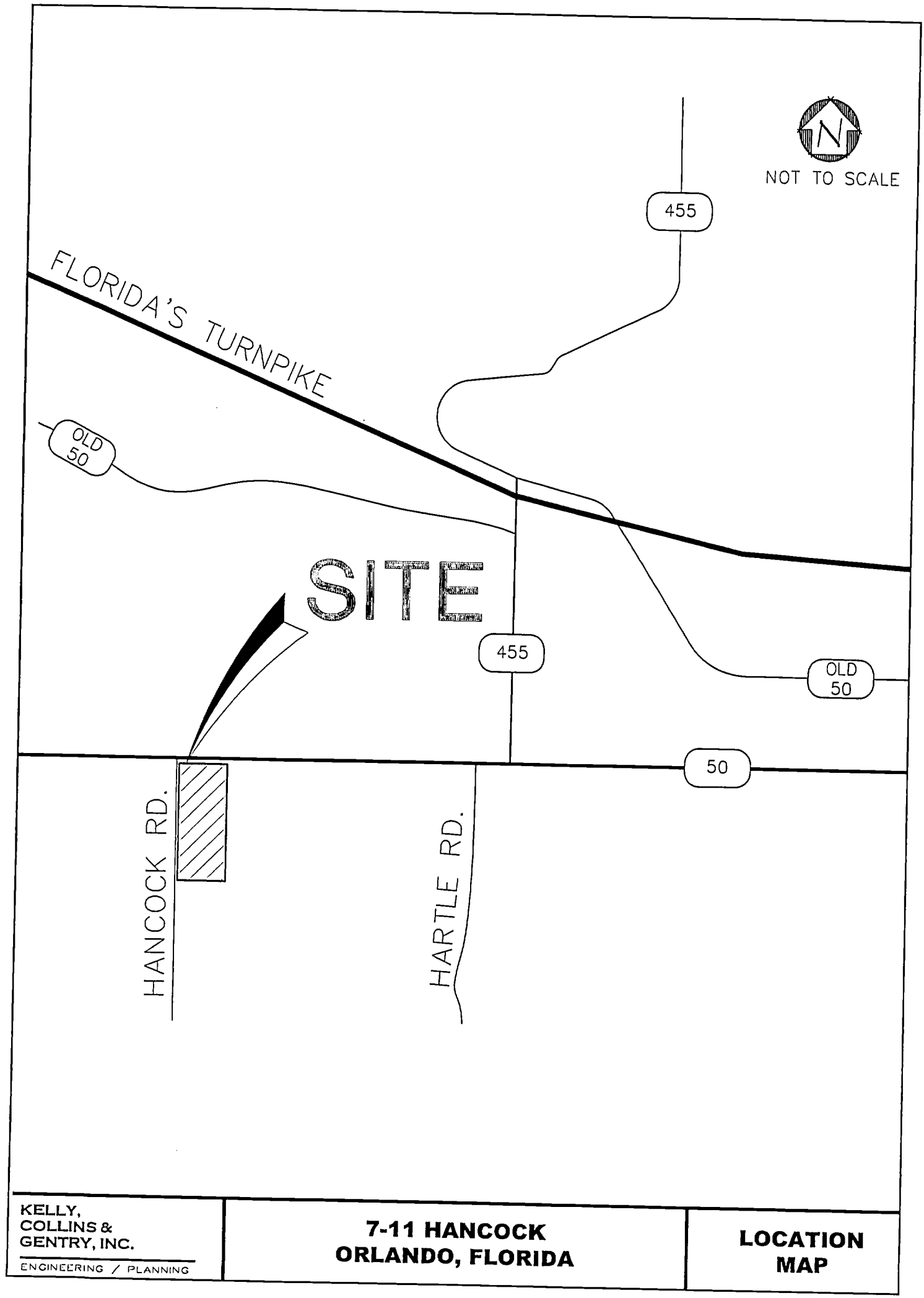
Maximum Water Elevation: 204.146 feet @ 1.00 hours Recovery @ 40.223 hours

* Time increment when there is no runoff

7-ELEVEN HANCOCK ROAD
CLERMONT, FLORIDA
DRAINAGE CALCULATIONS
September 13, 2000

Table of Contents

Exhibits

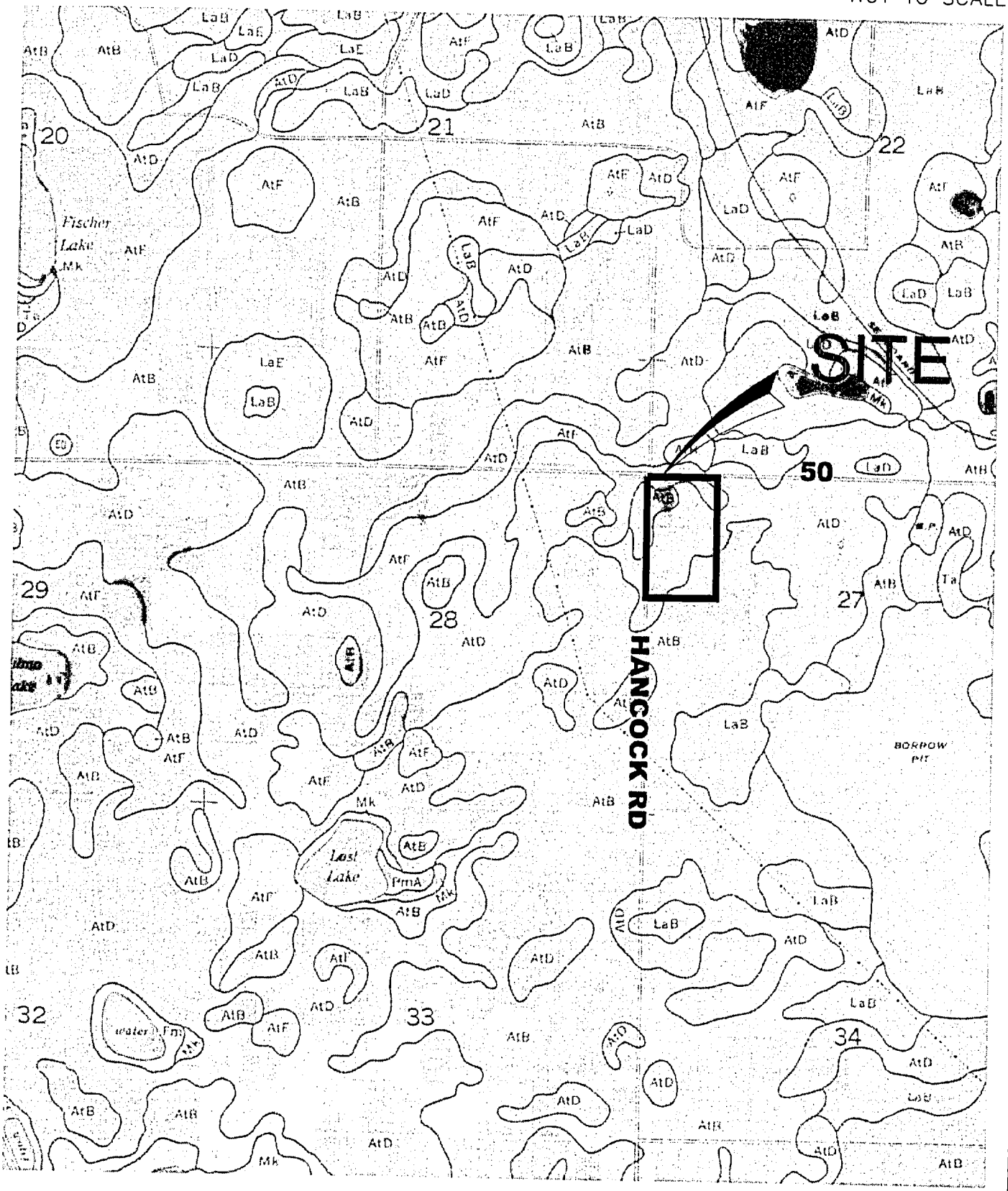


KELLY, COLLINS & GENTRY, INC.
ENGINEERING / PLANNING

7-11 HANCOCK
ORLANDO, FLORIDA

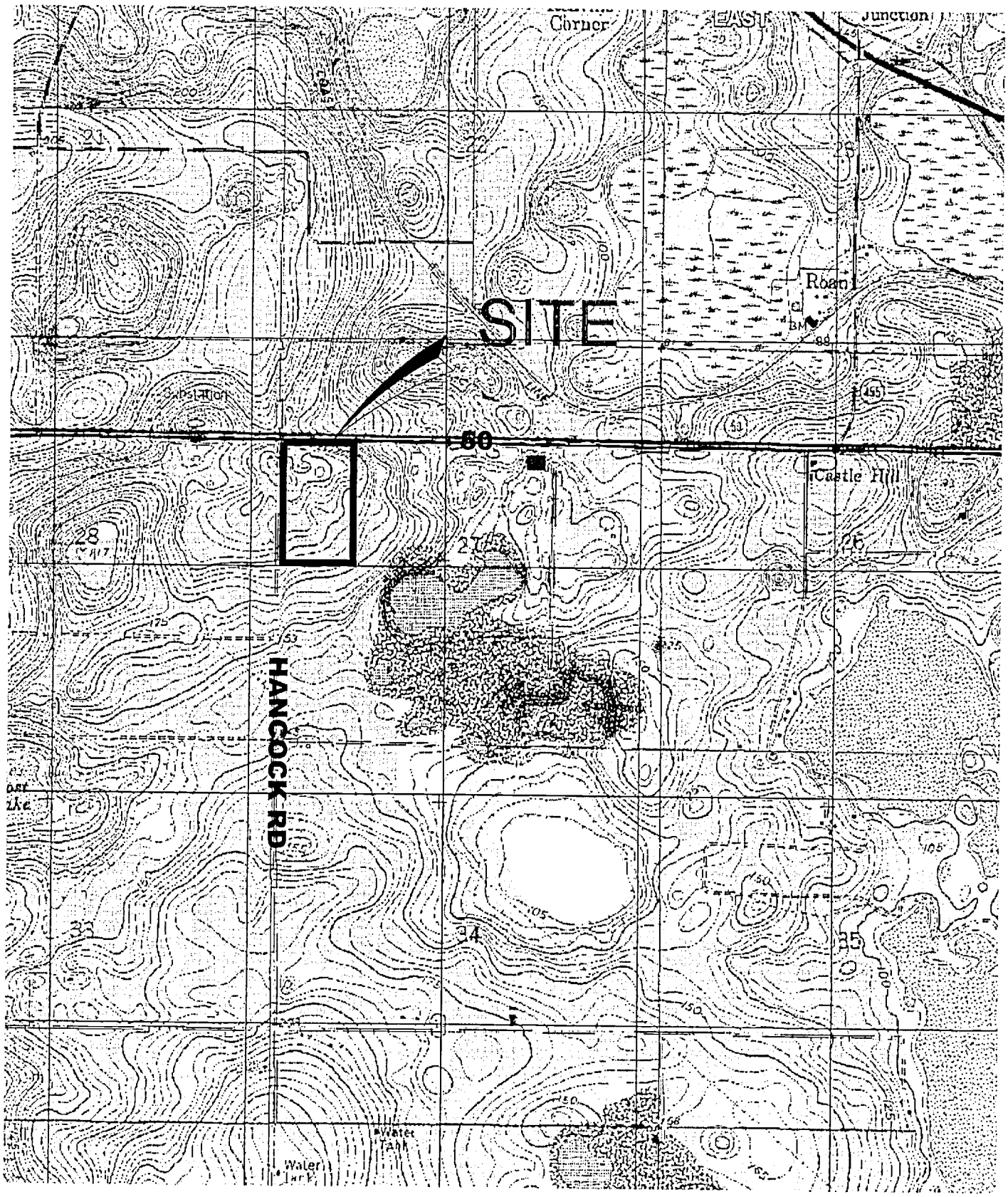
LOCATION MAP

NOT TO SCALE



KELLY, COLLINS & GENTRY, INC. ENGINEERING / PLANNING	7-11 HANCOCK ORLANDO, FLORIDA	SCS SOILS MAP

NOT TO SCALE



KELLY, COLLINS & GENTRY, INC.
ENGINEERING / PLANNING

7-11 HANCOCK
ORLANDO, FLORIDA

USGS MAP

Drainage Narrative

Owner:	7-Eleven, Inc.
Project Name:	7-Eleven Convenience Store / Gas Station
Location:	S.R. 50 & Hancock Road, Lake County
Legal Description:	See Boundary & Topographic Survey (Sheet 2 of construction plans)
Existing Use:	Vacant
Proposed Use:	Service Station/Convenience Store

Project Description

The proposed project includes the development of a 4.09 ± acre site. The project is located within Lake County limits, Section 27, Township 22 South, Range 26 East. The site is located at the southeast corner of S.R. 50 and Hancock Road. The 7-Eleven site (1.73 ac) is located on the northern portion of the tract and the remainder is to be left for future development.

Drainage Methodology

The proposed retention pond is to function as a joint use pond, handling runoff from both the developed site and a portion of the proposed Hancock Road widening. The subject 7-11 site will only contain 58.2% of impervious area.

The proposed retention pond will provide the required storage and treatment of the water quality volume generated from the developed site and roadway improvements. Stormwater runoff is conveyed to the pond via onsite stormsewer system. Additionally, due to the site being located in a land-locked basin, the pond is designed to retain the pre-post volume for the 25-year / 96-hour storm event.

Drainage Calculations

Runoff Curve Numbers

Project: 7-11 Station - S.R. 50 By: GDH Date: 09/06/2000

Location: Pre Basin 1 (Site) Checked: SMG Date:

Circle one: **Present** Developed

Soil Name and Hydrologic Group	Area Description	CN			Area acres	Product of CN x Area
		TABLE 2-2	Fig 2-3	Fig 2-4		
Candler A	Grass	39			4.09	159.51
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
Total =					4.09	159.51

Use CN = 39.0

Runoff Curve Numbers

Project: 7-11 Station - S.R. 50 By: GDH Date: 09/06/2000

Location: Pre Basin 2 (Hancock Rd) Checked: SMG Date:

Circle one: Present Developed

Soil Name and Hydrologic Group	Area Description	CN			Area acres	Product of CN x Area
		TABLE 2-2	Fig 2-3	Fig. 2-4		
Candler A	Grass	39			0.99	38.61
	Asphalt	98			0.55	54.292
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
				Total =	1.54	92.902

Use CN = 60.2

Runoff Curve Numbers

Project: 7-11 Station - S.R. 50 By: GDH Date: 09/06/2000

Location: 7-11 Basin Checked: SMG Date:

Circle one: Present **Developed**

Soil Name and Hydrologic Group	Area Description	CN			Area acres	Product of CN x Area
		TABLE 2-2	Fig. 2-3	Fig. 2-4		
Candler A	Grass	39			0.72	28.08
	Impervious area	98			1.01	98.98
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
				Total =	1.73	127.06

Use CN = **73.4**

Runoff Curve Numbers

Project: 7-11 Station - S.R.. 50 By: GDH Date: 09/06/2000

Location: Site Basin Checked: SMG Date:

Circle one: Present **Developed**

Soil Name and Hydrologic Group	Area Description	CN			Area acres	Product of CN x Area
		TABLE 2-2	Fig 2-3	Fig. 2-4		
Candler A	Developed open space	39			0.59	23.01
	Impervious area	98			1.77	173.46
						0
						0
						0
						0
						0
						0
						0
						0
						0
				Total =	2.36	196.47

Use CN = 83.3

Runoff Curve Numbers

Project: 7-11 Station - S.R. 50 By: GDH Date: 09/06/2000

Location: Hancock Rd Basin Checked: SMG Date:

Circle one: Present Developed

Soil Name and Hydrologic Group	Area Description	CN			Area	Product of CN x Area
		TABLE 2-2	Fig 2-3	Fig. 2-4	acres	
Candler A	Grass	39			0.36	13.962
	Pavement	98			1.18	115.64
						0
						0
						0
						0
						0
						0
						0
						0
						0
						0
				Total =	1.54	129.602

Use CN = 84.3

Master Stormwater Pond
Stage / Storage Relationship

Stage [ft]	Area [sf]	Area [ac]	Incremental Storage [cf]	Cumulative Storage [cf]
199	3,234	0.074		0
			8,708	
201	5,474	0.126		8,708
			14,911	
203	9,437	0.217		23,619
			22,499	
205	13,062	0.300		46,118
			30,045	
207	16,983	0.390		76,163
			38,121	
209	21,138	0.485		114,284

Primary Water Quality Treatment Requirements

Area of total project= 5.63 ac (incl. 1.54 ac of Hancock Rd improvements)
Area of impervious = 3.96 ac

PRIMARY TREATMENT:
Greater of the following:

1/2" of runoff over site:
5.63 ac (0.5 inches)/(12 in/ft) = 0.23 ac-ft

1.25 " over impervious area:
3.96 ac (1.25 inches)/(12 in/ft) = **0.41** **ac-ft**

Since on-line treatment,

Total treatment volume required = **0.65** **ac-ft**

SJRWMD Pre-Post Runoff Volume Calculation

Since this site is located in a landlocked basin, the pond is designed to retain the difference in post development runoff volume versus the pre-development runoff volume for the 25-year / 96-hour storm event.

Pre-development Runoff Volume (25-year / 96-hour storm) = 71, 245 cf
Post development Runoff Volume (25-year / 96-hour storm) = 174, 546 cf

Pre-Post Runoff Volume Retained in Pond = 174, 546 cf - 71, 245 cf = **103, 301 cf**

SJRWMD
Design Storm Analysis

AdICPR - Input

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.10) [1]

7-11 Clermont Post-Development

********** Input Report **********
--------Class: Node----------
Name: POND Base Flow(cfs): 0 Init Stage(ft): 199
Group: BASE Length(ft): 0 Warn Stage(ft): 209
Comment:

Stage(ft)	Area(ac)
199	0.075
200	0.1
201	0.125
202	0.178
203	0.217
204	0.258
205	0.3
206	0.344
207	0.39
208	0.437
209	0.485

--------Class: Node----------
Name: TW Base Flow(cfs): 0 Init Stage(ft): 198
Group: BASE Length(ft): 0 Warn Stage(ft): 198
Comment:

Time(hrs)	Stage(ft)
0	190
12	190
30	190

--------Class: Basin----------
Basin: 7_11 Node: POND Status: On Site Type: SCS Unit Hydr
Group: BASE
Unit Hydrograph: UH256 Peak Factor: 256
Rainfall File: FLMOD Storm Duration(hrs): 24
Rainfall Amount(in): 10.5
Area(ac): 1.73 Concentration Time(min): 10
Curve #: 73.4 Lag Time(hrs): 0
DCIA(%): 0

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.10) [2]

7-11 Clermont Post-Development

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

--------Class: Basin--------

Basin: ROADWAY Node: POND Status: On Site Type: SCS Unit Hydr
Group: BASE
Unit Hydrograph: UH256 Peak Factor: 256
Rainfall File: FLMOD Storm Duration(hrs): 24
Rainfall Amount(in): 10.5
Area(ac): 1.54 Concentration Time(min): 15
Curve #: 84.3 Lag Time(hrs): 0
DCIA(%): 0

--------Class: Basin--------

Basin: SITE Node: POND Status: On Site Type: SCS Unit Hydr
Group: BASE
Unit Hydrograph: UH256 Peak Factor: 256
Rainfall File: FLMOD Storm Duration(hrs): 24
Rainfall Amount(in): 10.5
Area(ac): 2.36 Concentration Time(min): 20
Curve #: 83.3 Lag Time(hrs): 0
DCIA(%): 0

--------Class: Weir--------

Name: RCH1 From Node: POND
Group: BASE To Node: TW
Count: 1

Type: Mavis Flow: Both Geometry: Rectangular

Span(in): 200
Rise(in): 999
Invert(ft): 209
Control Elev(ft): 209
TABLE
Bottom Clip(in): 0
Top Clip(in): 0
Weir Discharge Coef: 3.2
Orifice Discharge Coef: 0.6

AdICPR - Output

7-11 Station - SR 50 & S. Hancock Rd.

SJRWMD Storm Analysis

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

***		
Basin Name:	PRE1	PRE2
Group Name:	BASE	BASE
Node Name:	PRE	PRE
Hydrograph Type:	UH	UH
Unit Hydrograph:	UH256	UH256
Peaking Factor:	256.00	256.00
Spec Time Inc (min):	4.00	2.00
Comp Time Inc (min):	4.00	2.00
Rainfall File:	FLMOD	FLMOD
Rainfall Amount (in):	11.00	11.00
Storm Duration (hr):	96.00	96.00
Status:	ONSITE	ONSITE
Time of Conc. (min):	30.00	15.00
Lag Time (hr):	0.00	0.00
Area (acres):	4.09	1.54
Vol of Unit Hyd (in):	1.00	1.00
Curve Number:	39.00	60.20
DCIA (%):	0.00	0.00
Time Max (hrs):	48.20	48.03
Flow Max (cfs):	1.85	2.03
Runoff Volume (in):	2.63	5.75
Runoff Volume (cf):	39113	32132

7-11 Station - S.R. 50 & S. Hancock Rd.

SFWMD Storm Analysis

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

***			
Basin Name:	7_11	SITE	ROADWAY
Group Name:	BASE	BASE	BASE
Node Name:	POND	POND	POND
Hydrograph Type:	UH	UH	UH
Unit Hydrograph:	UH256	UH256	UH256
Peaking Factor:	256.00	256.00	256.00
Spec Time Inc (min):	1.33	2.67	2.00
Comp Time Inc (min):	1.33	2.67	2.00
Rainfall File:	SJRWMD96	SJRWMD96	SJRWMD96
Rainfall Amount (in):	11.00	11.00	11.00
Storm Duration (hr):	96.00	96.00	96.00
Status:	ONSITE	ONSITE	ONSITE
Time of Conc. (min):	10.00	20.00	15.00
Lag Time (hr):	0.00	0.00	0.00
Area (acres):	1.73	2.36	1.54
Vol of Unit Hyd (in):	1.00	1.00	1.00
Curve Number:	73.40	83.30	84.30
DCIA (%):	0.00	0.00	0.00
Time Max (hrs):	60.02	60.09	60.07
Flow Max (cfs):	7.50	8.66	6.49
Runoff Volume (in):	7.59	8.91	9.04
Runoff Volume (cf):	47681	76331	50534

FDOT
Critical Storm Analysis

FDOT CRITICAL STORM ANALYSIS
7-11 / HANCOCK ROAD
CLERMONT, FLORIDA

STORM		POST COND. stage ft
2 YEAR	1 HR	201.16
	2	202.28
	4	203.03
	8	203.19
	24	202.55
	72	202.23
	168	202.27
	240	203.02
5 YEAR	1 HR	201.60
	2	202.87
	4	203.60
	8	203.96
	24	204.16
	72	203.25
	168	203.22
	240	204.14
10 YEAR	1 HR	201.86
	2	203.29
	4	204.13
	8	204.56
	24	205.88
	72	206.43
	168	203.89
	240	204.97
25 YEAR	1 HR	202.37
	2	203.96
	4	204.77
	8	206.39
	24	206.17
	72	207.44
	168	204.74
	240	205.98
50 YEAR	1 HR	203.29
	2	205.18
	4	206.36
	8	207.15
	24	206.87
	72	205.46
	168	205.49
	240	206.48
100 YEAR	1 HR	203.72
	2	205.74
	4	206.97
	8	207.69
	24	207.68
	72	206.69
	168	206.18
	240	207.11

None of the 48 storms top the pond, therefore no drainage impact to FDOT right of way.

AdICPR - Input

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.10) [1]

7-11 Clermont FDOT Critical Storm Analysis

********** Input Report **
--------Class: Node--
Name: POND Base Flow(cfs): 0 Init Stage(ft): 199
Group: BASE Length(ft): 0 Warn Stage(ft): 209
Comment:

Stage(ft)	Area(ac)
199	0.075
200	0.1
201	0.125
202	0.178
203	0.217
204	0.258
205	0.3
206	0.344
207	0.39
208	0.437
209	0.485

--------Class: Node--
Name: TW Base Flow(cfs): 0 Init Stage(ft): 190
Group: BASE Length(ft): 0 Warn Stage(ft): 198
Comment:

Time(hrs)	Stage(ft)
0	190
250	190

--------Class: Operating Table---
Name: INFIL Type: Rating Curve
Comment: K=7.5 ft/day (Factor of Safety = 2.0)

U/S Stage(ft)	Discharge(cfs)
199	0.28
201	0.48
203	0.82
205	1.13
207	1.47
209	1.84

--------Class: Basin---
Basin: 7_11 Node: POND Status: On Site Type: SCS Unit Hydr
Group: BASE
Unit Hydrograph: UH256 Peak Factor: 256
Rainfall File: FDOT-24 Storm Duration(hrs): 24
Rainfall Amount(in): 8.5
Area(ac): 1.73 Concentration Time(min): 10
Curve #: 73.4 Lag Time(hrs): 0
DCIA(%): 0

Post-Development Basin #1

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.10) [2]

7-11 Clermont FDOT Critical Storm Analysis

********** Input Report **
--------Class: Basin--
Basin: PRE1 Node: PRE Status: On Site Type: SCS Unit Hydr
Group: BASE
Unit Hydrograph: UH256 Peak Factor: 256
Rainfall File: FDOT-24 Storm Duration(hrs): 24
Rainfall Amount(in): 8.5
Area(ac): 4.09 Concentration Time(min): 30
Curve #: 39 Lag Time(hrs): 0
DCIA(%): 0

Pre-Development

--------Class: Basin--
Basin: PRE2 Node: PRE Status: On Site Type: SCS Unit Hydr
Group: BASE
Unit Hydrograph: UH256 Peak Factor: 256
Rainfall File: FDOT-24 Storm Duration(hrs): 24
Rainfall Amount(in): 8.5
Area(ac): 1.54 Concentration Time(min): 15
Curve #: 60.2 Lag Time(hrs): 0
DCIA(%): 0

Pre-Development

--------Class: Basin--
Basin: ROADWAY Node: POND Status: On Site Type: SCS Unit Hydr
Group: BASE
Unit Hydrograph: UH256 Peak Factor: 256
Rainfall File: FDOT-24 Storm Duration(hrs): 24
Rainfall Amount(in): 8.5
Area(ac): 1.54 Concentration Time(min): 15
Curve #: 84.3 Lag Time(hrs): 0
DCIA(%): 0

Post-Development Basin #3

--------Class: Basin--
Basin: SITE Node: POND Status: On Site Type: SCS Unit Hydr
Group: BASE
Unit Hydrograph: UH256 Peak Factor: 256
Rainfall File: FDOT-24 Storm Duration(hrs): 24
Rainfall Amount(in): 8.5
Area(ac): 2.36 Concentration Time(min): 20
Curve #: 83.3 Lag Time(hrs): 0
DCIA(%): 0

Post-Development Basin #2

Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.10) [3]

7-11 Clermont FDOT Critical Storm Analysis

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

--------Class: Weir----------

Name:	RCH1	From Node:	POND
Group:	BASE	To Node:	TW
Count:	1		

Type: Mavis Flow: Both Geometry: Rectangular

Span(in):	200
Rise(in):	999
Invert(ft):	209
Control Elev(ft):	209
	TABLE
Bottom Clip(in):	0
Top Clip(in):	0
Weir Discharge Coef:	3.2
Orifice Discharge Coef:	0.6

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

Name:	RCH2	Count:	1	From Node:	POND
Group:	BASE	Flow:	Both	To Node:	TW

	NAME	ELEV ON(ft)	ELEV OFF(ft)
#1:	INFIL	199	199
#2:		0	0
#3:		0	0
#4:		0	0

AdICPR - Output

FDOT Critical Storm Analysis

********** Node Maximum Conditions - 2YR8HR **********

(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)
POND	BASE	7.05	203.19	209.00	0.0494	9793.05	4.00	5.38	7.05	0.85
TW	BASE	0.00	190.00	198.00	0.0000	0.00	7.05	0.85	0.00	0.00

FDOT Critical Storm Analysis

********** Node Maximum Conditions - 5YR24HR **********

(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)
POND	BASE	19.70	204.16	209.00	0.0146	11523.79	12.00	2.65	19.70	1.00
TW	BASE	0.00	190.00	198.00	0.0000	0.00	19.70	1.00	0.00	0.00

FDOT Critical Storm Analysis

********** Node Maximum Conditions - 10YR72HR **********

(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)
POND	BASE	62.45	206.43	209.00	0.0495	15837.41	60.00	16.66	62.45	1.37
TW	BASE	0.00	190.00	198.00	0.0000	0.00	62.45	1.37	0.00	0.00

FDOT Critical Storm Analysis

********** Node Maximum Conditions - 25YR72HR **********

(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)
POND	BASE	62.58	207.44	209.00	0.0492	17889.63	60.00	20.20	62.58	1.55
TW	BASE	0.00	190.00	198.00	0.0000	0.00	62.58	1.55	0.00	0.00

FDOT Critical Storm Analysis

********** Node Maximum Conditions - 50YR8HR **********

(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)
POND	BASE	7.39	207.15	209.00	0.0499	17294.11	4.00	13.84	7.39	1.50
TW	BASE	0.00	190.00	198.00	0.0000	0.00	7.39	1.50	0.00	0.00

FDOT Critical Storm Analysis

********** Node Maximum Conditions - 100YR8HR **********

(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)
POND	BASE	7.43	207.69	209.00	0.0497	18397.20	4.00	15.25	7.43	1.60
TW	BASE	0.00	190.00	198.00	0.0000	0.00	7.43	1.60	0.00	0.00

FDOT Critical Storm Analysis

********** Node Maximum Conditions - 100YR24H **********

(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)
POND	BASE	21.12	207.68	209.00	0.0189	18375.09	11.99	5.17	21.12	1.60
TW	BASE	0.00	190.00	198.00	0.0000	0.00	21.12	1.60	0.00	0.00

Soils Report

Preliminary Geotechnical Investigation, 4 Acre Property on S.R. 50 and Hancock Road Clermont, Florida

Andreyev Engineering, Inc.

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▼ Groundwater ▼ Environmental ▼ Geotechnical ▼ Construction Materials Testing

February 17, 1999
Project No. CPGT-99-008

TO: Maury L. Carter & Associates, Inc.
Post Office Box 568821
Orlando, Florida 32856-8821
Attention: Mr. Jeff Douglas

SUBJECT: **Preliminary Geotechnical Investigation,**
Proposed 4 Acre Development on State Road 50 and Hancock Road,
Clermont, Lake County, Florida

Dear Mr. Gentry:

In accordance with your request, Andreyev Engineering, Inc. has completed a preliminary geotechnical investigation of the above referenced property. Our investigation consisted of drilling a series of soil borings at the site for the purpose of characterizing subsurface conditions and assessment of general site suitability for construction of a commercial development. The following preliminary report presents the results of our investigations.

SITE LOCATION AND DESCRIPTION

The subject site will consist of a 4 acre commercial development. The property is located immediately south of SR 50, and east of Hancock Road, in Clermont, Lake County.

The subject property currently consists of vacant, undeveloped land which was formerly occupied by orange grove. The subject site is located on the south side of State Road 50, and the east side of Hancock Road. Based on review of the USGS Quadrangle map for this property the site grades from a high of approximately +235 ft-NGVD in the central portion to +215 ft-NGVD in the north portion. The USGS Quadrangle map encompassing the subject site is presented on **Figure 1**. Site reconnaissance indicates that minor earth moving activity has occurred in the south portion of the property.

We understand that a commercial development is proposed and that site elevations will be cut as much as 20 feet across the site. The proposed cutting will be in order to match elevations of the adjacent State Road 50 and Hancock Road. A location plan showing the boundary of the subject property is presented on **Figure 2.**

SCOPE OF INVESTIGATION

The purpose of our investigation was to characterize the soil and groundwater conditions across the site for assessment of the general suitability of the property for the intended commercial development. For this purpose the following investigation was conducted:

1. Drilled 4 Standard Penetration Test (SPT) borings to 50 feet deep to assess the shallow soil conditions across the site.

2. Drilled 2 auger borings to 40 feet deep at the location of potential stormwater retention areas.

3. Classified the encountered soils per the Unified soil classification system and evaluated the results, identified soil types for the purpose of foundation, roadway pavement design and retention pond design.

4. Prepared this summary report with investigation results in the form of drafted soil profiles, conclusions and preliminary recommendations.

FIELD INVESTIGATION AND RESULTS

Exploratory Drilling

A total of two (2) auger borings (designated as AB-1 and AB-2) and four (4) SPT borings (designated as TB-3 through TB-6) were drilled at the site. The boring locations were chosen based on the boundary survey provided by you and were located in the field by an engineer. Representative soil samples were collected at each change of soil strata for visual classification. The approximate location of the borings are presented on **Figure 2**, attached.

The results of the SPT borings are presented in the form of soil profiles on **Figure 3**. Soil stratification is based on review of recovered soil samples and interpretation of the field boring logs by a geotechnical engineer. The soil classification was performed using the Unified Soil Classification System.

Based on the field exploration and visual classification, the soil conditions generally consisted of a surface layer of grayish brown to orangish brown fine sand (stratum 1) extending to depths ranging from 4.5 to 18 feet below existing grade. Borings drilled in the north and central portions of the property (TB-3 through TB-5) encountered a surface layer of fill material (stratum 2) extending to depths of between 1 and 7 feet below grade. Underlying the surficial soils, the borings encountered a layer of orangish brown to reddish brown slightly clayey sand (stratum 3) to depths of between 22 and 28 feet, followed by light yellowish brown to white slightly silty sand to the maximum boring termination depth of 50 feet.

Soil Density

The relative density of the sand is determined based on the standard penetration resistance value, or N value. Based on the SPT-N values, the surficial sands and fill are generally in a very loose to medium dense state. The underlying stratum 3 clayey sand is in a stiff state, followed by the stratum 4 slightly silty sand which is in a medium dense to dense state. The SPT-N values are presented adjacent to the soils profiles on **Figure 3**.

Groundwater Table

The groundwater table was not encountered in any of the borings to the maximum termination depth of 50 feet below existing grade. Based on review of adjacent surface water features such as lakes and an open water mine pit located to the southeast, water levels in these features occur at approximate elevation +85 to +100 ft-NGVD. This indicates that groundwater beneath the site probably occurs at depths in excess of 75 feet.

EVALUATIONS AND RECOMMENDATIONS

Mass Grading

We understand that the subject property will be cut significantly in order to match adjacent roadway grades of State Road 50 and Hancock Road. Cuts of between 15 and 20 feet are anticipated. Based on the results of the borings, the soils which will be exposed following site cutting will primarily consist of the stratum 1 fine sands and/or stratum 3 slightly clayey sand, depending on the depth of removal. These soils are generally considered acceptable for support of structures associated with the development, including beneath foundations, pavement areas and buried utility lines.

Building Areas

Based on the results of this investigation the subject property is generally considered suitable for the intended construction of commercial buildings and pavement areas. The encountered soils indicate that these areas are suitable for construction of buildings and pavement provided that proper site preparation is carried out prior to construction. Site preparation would likely consist of site grading, leveling and compaction. In areas where stratum 3 soils are exposed, we recommend undercutting a few feet below pavement areas and foundation footers to prevent excess moisture from contacting the bottom of the base and/or footers. Once the design has progressed we will be available to conduct the appropriate analyses for sizing of foundations and pavement, and provide more detailed construction recommendations.

Retention Area

Based on the results of the borings, it is our opinion that the site soil and groundwater conditions are suitable for construction and operation of dry retention areas. However, a separation of approximately 5 feet should be maintained between the bottom of the retention areas and the stratum 3 clayey sand layer. Depending on the degree of cutting in the pond

areas, stratum 3 may be exposed or may be close to the pond bottom. If adequate separation cannot be achieved, the clayey sand must be removed entirely beneath the pond area in order to access the underlying stratum 4 slightly silty sand. For preliminary design purposes, the coefficient of hydraulic conductivity of the surficial stratum 1 sands is expected to be on the order of 30 to 50 feet per day. The underlying stratum 4 is expected to have a coefficient of hydraulic conductivity on the order of 10 to 20 feet per day. Actual field testing of the hydraulic conductivity must be conducted prior to design and permitting. Once the pond locations and configurations have been established we will be available to conduct the additional field testing and appropriate analyses.

CLOSURE

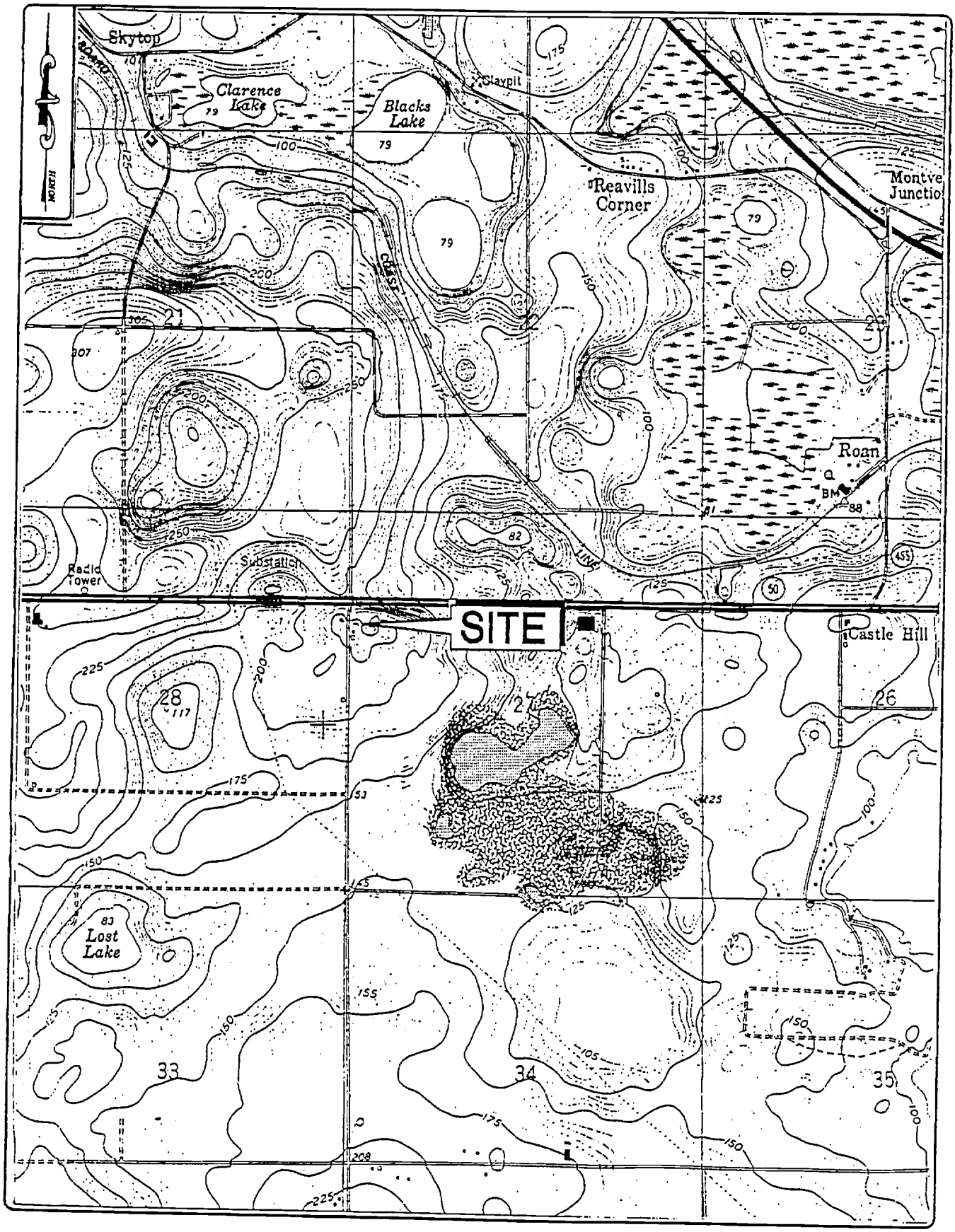
We appreciate the opportunity to provide our services on this project and trust that this report will be helpful for your preliminary design purposes. Should you have any questions concerning this report please do not hesitate to contact the undersigned.

Sincerely,

ANDREYEV ENGINEERING, INC.

T. Scott Cavin, P. E.
Vice President, Clermont Branch Manager
Florida Registration No. 48125

FIGURES



REFERENCE:
U.S.G.S. CLERMONT EAST, FLA.
QUADRANGLE MAP
DATED 1962
PHOTOREVISED 1980
SECTION 27
TOWNSHIP 22 SOUTH
RANGE 26 EAST

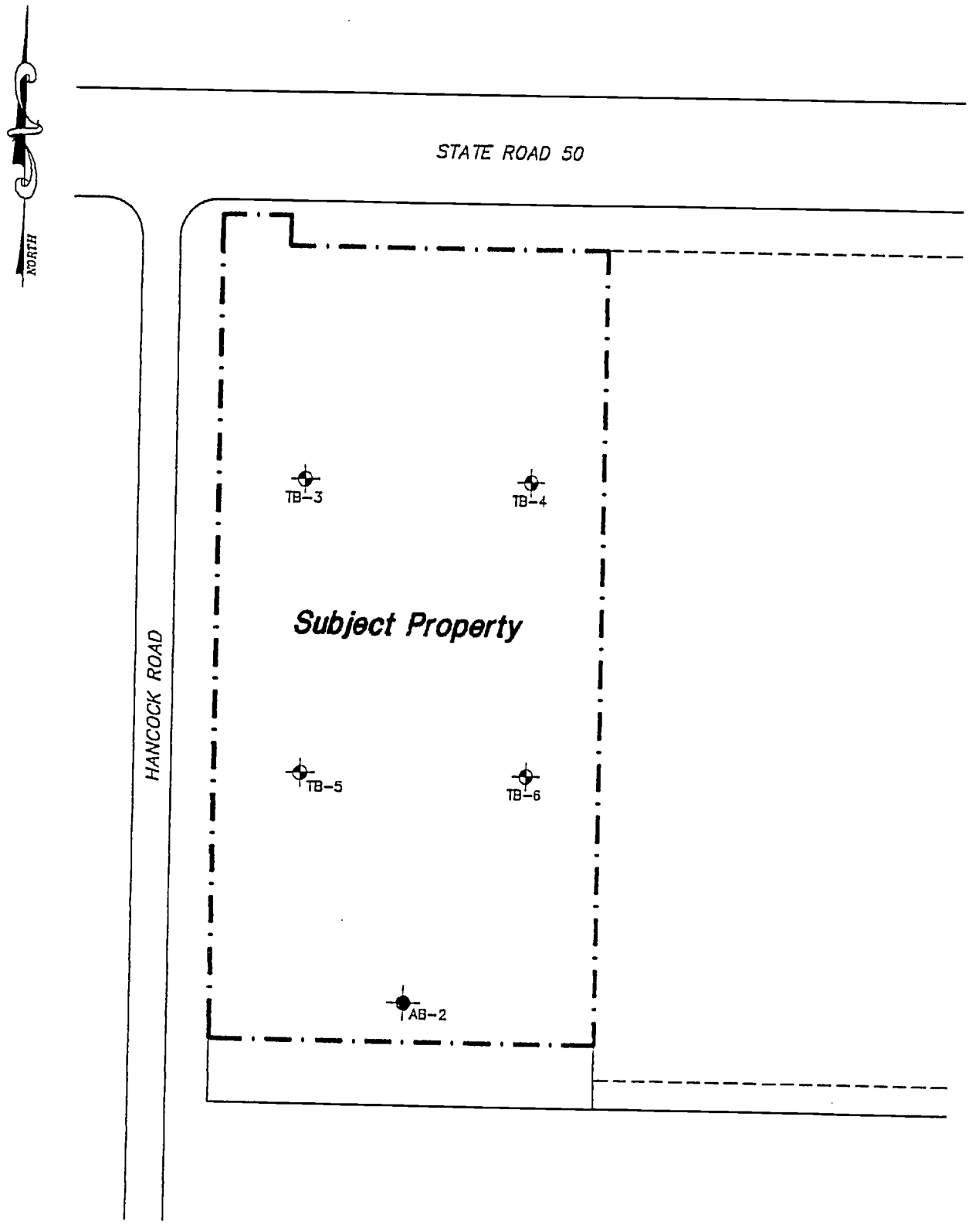
Andreyev Engineering, Inc.

SCALE:	DATE: 2/16/99	ENGINEER: SC
1"=2000'	PN: CPGT-99-008	DRAWN BY: MK

GEOTECHNICAL INVESTIGATION
4 ACRE PROPERTY ON HWY. 50 & HANCOCK RD.
LAKE COUNTY, FLORIDA

VICINITY MAP

FIGURE 1



LEGEND

- AUGER BORING LOCATION
- SPT BORING LOCATION

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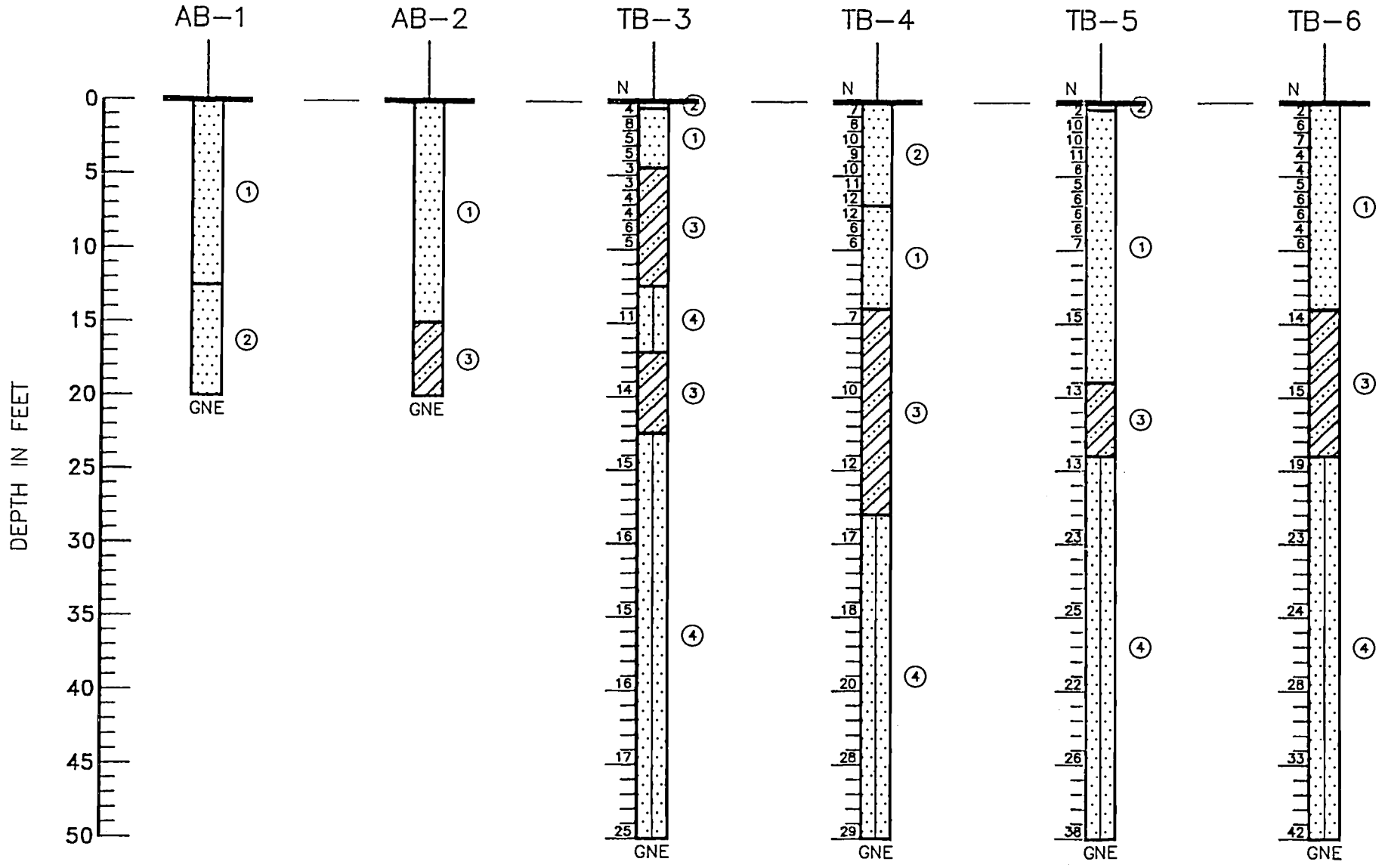
GEOTECHNICAL INVESTIGATION
4 ACRE PROPERTY ON HWY. 50 & HANCOCK RD.
LAKE COUNTY, FLORIDA

SCALE:	DATE: 2/16/99	ENGINEER: SC
1"=100'	PN: CPGT-99-008	DRAWN BY: MK

LOCATION PLAN

FIGURE 2



LEGEND

①	GRAYISH BROWN TO ORANGISH BROWN FINE SAND (SP)
②	GRAYISH BROWN FINE SAND WITH ORANGISH BROWN SLIGHTLY CLAYEY FINE SAND AND GRAVEL DEBRIS, FILL (SP)(SP–SC)
③	ORANGISH BROWN TO REDDISH BROWN SLIGHTLY CLAYEY FINE TO MEDIUM SAND (SP–SC)
④	LIGHT YELLOWISH BROWN TO WHITE SLIGHTLY SILTY FINE TO MEDIUM SAND (SP–SM)
(SP)	UNIFIED SOIL CLASSIFICATION GROUP SYMBOL
GNE	GROUNDWATER NOT ENCOUNTERD
N	STANDARD PENETRATION RESISTANCE, IN BLOWS PER FOOT

Andreyev Engineering, Inc.

GEOTECHNICAL INVESTIGATION
4 ACRE PROPERTY ON
HWY. 50 & HANCOCK RD.
LAKE COUNTY, FLORIDA

SOIL PROFILES

FIGURE 3

SCALE:	DATE: 2/16/99	ENGINEER: SC
1"=10'	PN: CPGT–99–008	DRAWN BY: MK