



Andreyev Engineering, Inc.

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Reports

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▼ Groundwater ▼ Environmental ▼ Geotechnical ▼ Construction Materials Testing

June 9, 2008
Project No. CPGT-05-364

TO: **Kimley-Horn and Associates, Inc.**
3660 Maguire Blvd.
Orlando, Florida 32803
Attention: Mr. Chris Hanson

SUBJECT: **Geotechnical Investigation of Signal Poles,**
County Road 466A, Fruitland Park, Lake County, Florida

Dear Mr. Hanson:

Andreyev Engineering has conducted a geotechnical investigation of four proposed traffic signal poles to be located at the corners of the intersection of County Road 466A with Rose Ave. and with County Road 25A. in Fruitland Park, Lake County, Florida. We understand that the pole foundations will consist of drilled shafts having a depth below existing grade of approximately 25 feet.

The investigation consisted of first drilling exploratory SPT borings at the locations of the proposed signal poles. The borings were advanced to a depth of 25 feet below existing grade. The borings were used to assess the shallow subsurface soil stratigraphy. The locations of the borings are indicated on the attached **Figures 1 and 3**.

The results of the borings indicated the soils consist of brown fine sand followed by light brown silty fine sand at the Rose Ave. intersection (TB-1 and TB-2). At the C.R. 25A intersection (TB-3 and TB-4) the results of the borings indicated the soils consist of brown fine sand followed by orangish brown sandy clay, then light brown silty fine sand. The boring results are presented in the form of soil profiles on the attached **Figures 2 and 4**.

The soil density was found to range from very loose in the first few feet for the fine sands, to very dense for the deeper sands and hard for the sandy clays.

The groundwater table was not encountered to the maximum boring depth of 25 feet.

Based on the results of this investigation the encountered soils are considered suitable for structural support of the proposed signal poles using drilled shaft and/or driven piles. For purposes of estimating lateral earth pressures against the proposed poles we recommend the following average soil parameters:

Geotechnical Investigation of Signal Poles,
County Road 466A,
Lake County, Florida

Boring: TB-1

Location: Northwest of 466A and Rose Ave. Intersection

0 to 10 feet - Loose to medium dense fine sand (stratum 1)

Friction Angle.....	28
Soil Cohesion.....	0
At Rest Earth Pressure Coeff.....	0.53
Passive Earth Pressure Coeff.....	2.8
Active Earth Pressure Coeff.....	0.36
Moist Unit Weight.....	105
Saturated Unit Weight.....	120

10 to 25 feet - Dense to very dense silty fine sand (stratum 3)

Friction Angle.....	35
Soil Cohesion.....	0
At Rest Earth Pressure Coeff.....	0.42
Rankine Passive Earth Pressure Coeff.....	3.7
Rankine Active Earth Pressure Coeff.....	0.27
Moist Unit Weight.....	110
Saturated Unit Weight.....	130

Boring: TB-2

Location: Southeast of 466A and Rose Ave. Intersection

0 to 13.5 feet - Loose to medium dense fine sand (stratum 1)

Friction Angle.....	28
Soil Cohesion.....	0
At Rest Earth Pressure Coeff.....	0.53
Passive Earth Pressure Coeff.....	2.8
Active Earth Pressure Coeff.....	0.36
Moist Unit Weight.....	105
Saturated Unit Weight.....	120

13.5 to 25 feet - Dense to very dense silty fine sand (stratum 3)

Friction Angle.....	35
Soil Cohesion.....	0
At Rest Earth Pressure Coeff.....	0.42
Rankine Passive Earth Pressure Coeff.....	0.27
Rankine Active Earth Pressure Coeff.....	0.31
Moist Unit Weight.....	110
Saturated Unit Weight.....	125

Geotechnical Investigation of Signal Poles,
 County Road 466A,
 Lake County, Florida

Boring: TB-3

Location: Northeast of 466A and 25A Intersection

0 to 2 feet - Medium dense fine sand (stratum 1)

Friction Angle.....	28
Soil Cohesion.....	0
At Rest Earth Pressure Coeff.....	0.53
Passive Earth Pressure Coeff.....	2.8
Active Earth Pressure Coeff.....	0.36
Moist Unit Weight.....	105
Saturated Unit Weight.....	120

2 to 8 feet - Hard clayey fine sand to sandy clay (stratum 2)

Friction Angle.....	32
Soil Cohesion.....	0.2
At Rest Earth Pressure Coeff.....	0.47
Rankine Passive Earth Pressure Coeff.....	3.3
Rankine Active Earth Pressure Coeff.....	0.31
Moist Unit Weight.....	110
Saturated Unit Weight.....	130

8 to 13.5 feet - Dense to very dense silty fine sand (stratum 3)

Friction Angle.....	35
Soil Cohesion.....	0
At Rest Earth Pressure Coeff.....	0.42
Rankine Passive Earth Pressure Coeff.....	3.7
Rankine Active Earth Pressure Coeff.....	0.27
Moist Unit Weight.....	110
Saturated Unit Weight.....	125

13.5 to 25 feet - Dense slightly silty fine sand (stratum 4)

Friction Angle.....	32
Soil Cohesion.....	0
At Rest Earth Pressure Coeff.....	0.47
Passive Earth Pressure Coeff.....	3.3
Active Earth Pressure Coeff.....	0.31
Moist Unit Weight.....	105
Saturated Unit Weight.....	125

Geotechnical Investigation of Signal Poles,
 County Road 466A,
 Lake County, Florida

Boring: TB-4

Location: Southwest of 466A and 25A Intersection

0 to 2 feet - Medium dense fine sand (stratum 1)

Friction Angle.....	28
Soil Cohesion.....	0
At Rest Earth Pressure Coeff.....	0.53
Passive Earth Pressure Coeff.....	2.8
Active Earth Pressure Coeff.....	0.36
Moist Unit Weight.....	105
Saturated Unit Weight.....	120

2 to 10 feet - Hard clayey fine sand to sandy clay (stratum 2)

Friction Angle.....	32
Soil Cohesion.....	0.2
At Rest Earth Pressure Coeff.....	0.47
Rankine Passive Earth Pressure Coeff.....	3.3
Rankine Active Earth Pressure Coeff.....	0.31
Moist Unit Weight.....	110
Saturated Unit Weight.....	130

10 to 25 feet - Dense slightly silty fine sand (stratum 4)

Friction Angle.....	32
Soil Cohesion.....	0
At Rest Earth Pressure Coeff.....	0.47
Passive Earth Pressure Coeff.....	3.3
Active Earth Pressure Coeff.....	0.31
Moist Unit Weight.....	110
Saturated Unit Weight.....	125


These earth pressure coefficients are recommended assuming the fine sands and clays surrounding the drilled shafts are not free to move or yield. The groundwater table is deep at this site, therefore the saturated unit weight is not required. The equivalent pressure is calculated by multiplying the earth pressure coefficient by the vertical effective soil pressure (unit weight multiplied by depth). This earth pressure criterion does not include a factor of safety or effects of surcharge loadings at the surface.

*Geotechnical Investigation of Signal Poles,
County Road 466A,
Lake County, Florida*

We appreciate the opportunity to participate in this project and we trust that the information presented herein is sufficient for your needs. Should you have any questions or comments concerning this report, please do not hesitate to contact the undersigned.

Sincerely,

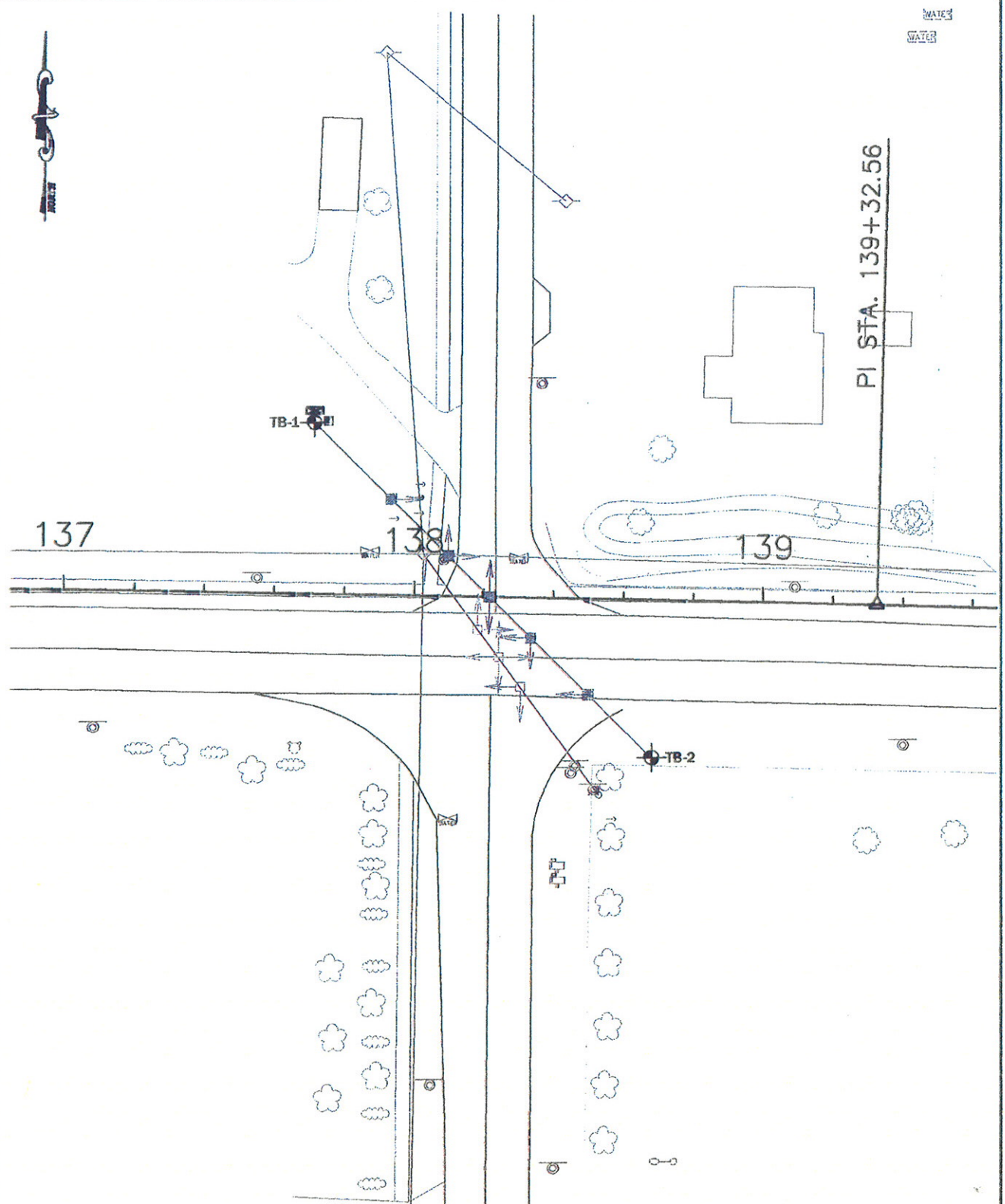
ANDREYEV ENGINEERING, INC.


A handwritten signature in black ink, appearing to read "T. Scott Cavin". The signature is fluid and cursive, with the first name "T. Scott" and the last name "Cavin" clearly distinguishable.

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

FIGURES

WATER
WATER



LEGEND:
 LOCATION OF SPT BORING

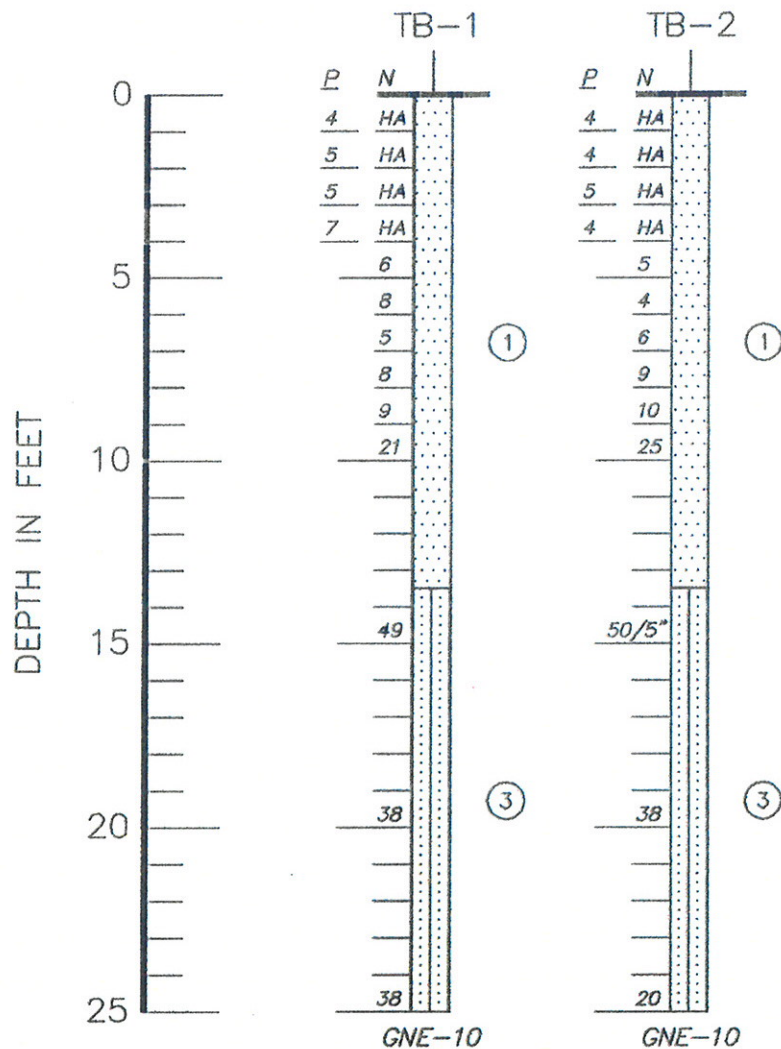


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GEOTECHNICAL INVESTIGATION
 CR 466A SIGNAL POLES
 FRUITLAND PARK, LAKE CO., FL.

APPROXIMATE SCALE: 1" = 40'
 DATE: 06/09/08 ENGINEER: SC
 PN: CPGT-05-364 DRAWN BY: DLS

LOCATION PLAN
 FIGURE 1



LEGEND:

- ① BROWN FINE SAND (SP)
- ② ORANGISH-BROWN TO BROWN SANDY CLAY (CL)
- ③ LIGHT BROWN SILTY FINE SAND (SM)
- ④ VERY LIGHT BROWN TO BROWN SLIGHTLY SILTY FINE SAND (SP-SM)

(SP) UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL

GNE-10 GROUNDWATER NOT ENCOUNTERED IN UPPER 10 FEET OF BORING

N STANDARD PENETRATION RESISTANCE, IN BLOWS PER FOOT

P HAND PENETROMETER READING

HA BORING ADVANCED USING HAND AUGER

50/5" 50 HAMMER BLOWS TO ADVANCE SAMPLING TOOL 5 INCHES



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GEOTECHNICAL INVESTIGATION
CR 466A SIGNAL POLES
FRUITLAND PARK, LAKE CO., FL.

APPROXIMATE SCALE:

1"=5'

DATE: 08/09/08

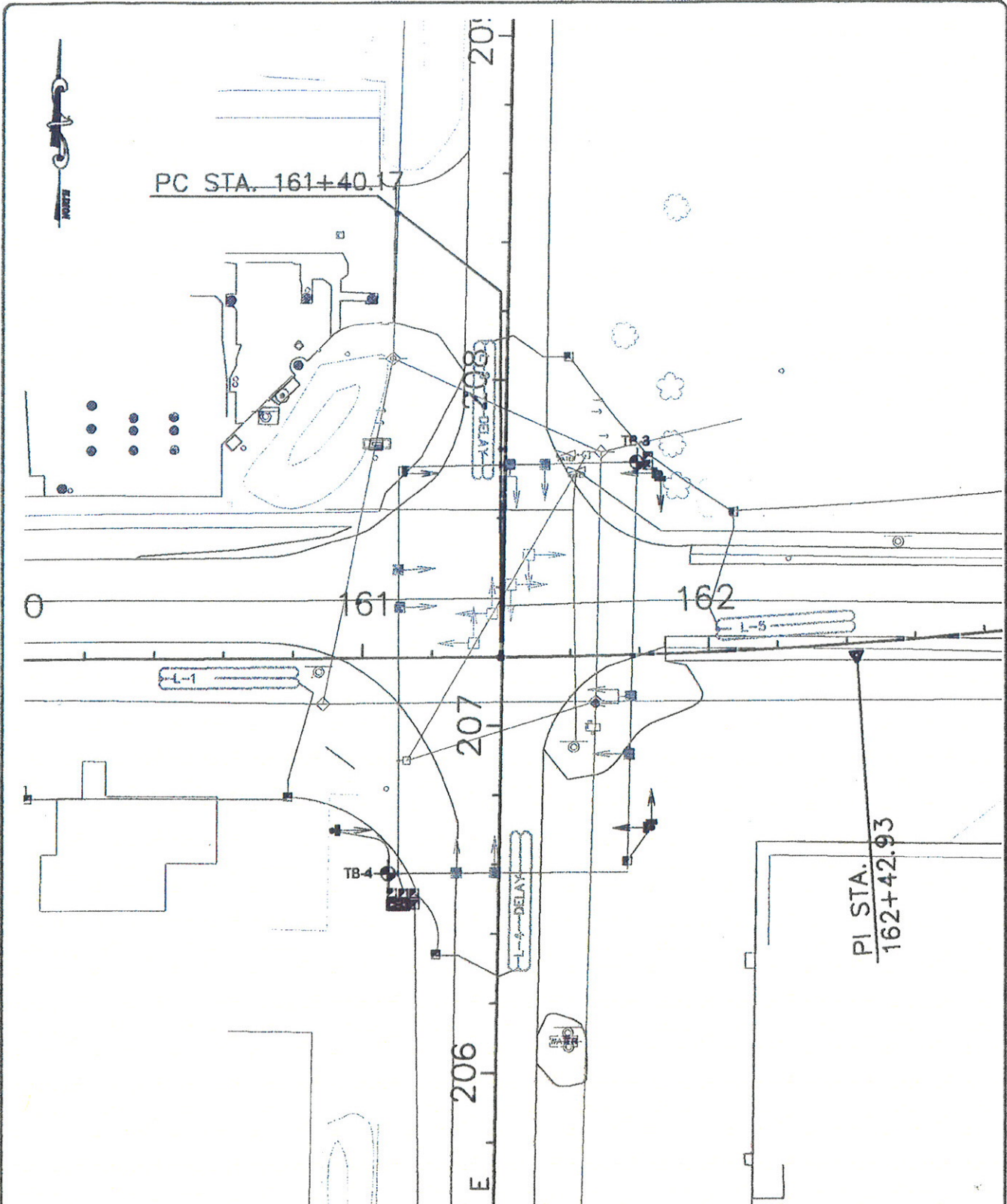
ENGINEER: SC

PN: CPGT-05-364

DRAWN BY: DLS

SOIL PROFILES

FIGURE 2



LEGEND:
 ⊕ LOCATION OF SPT BORING



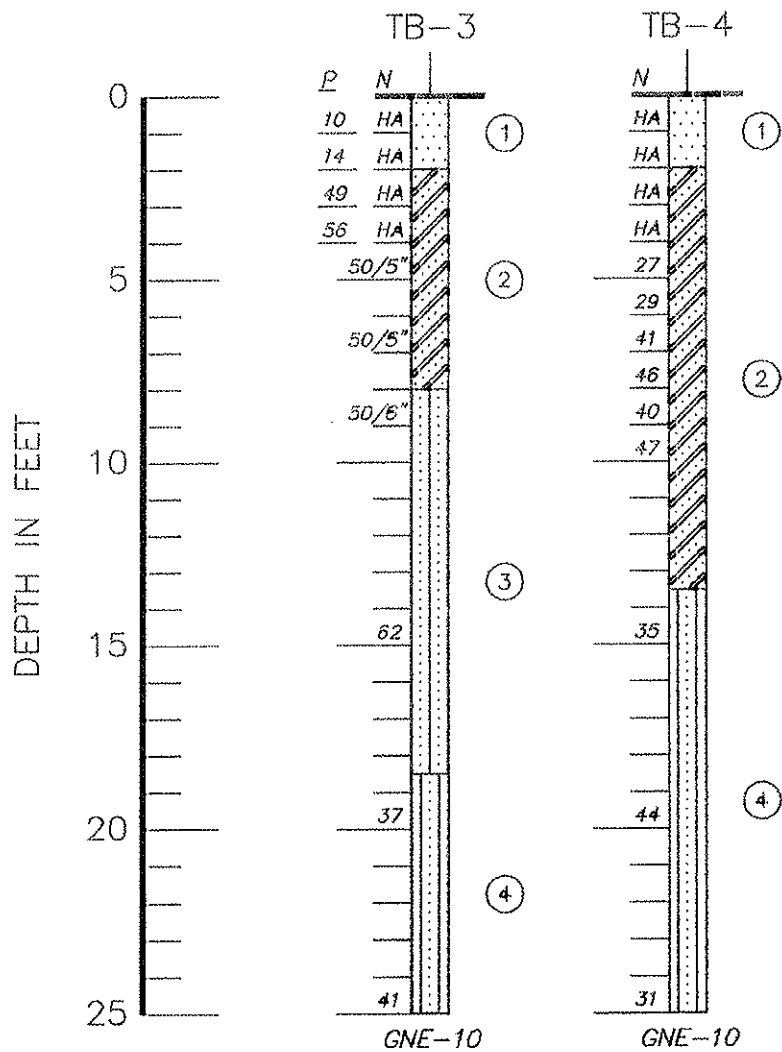
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GEOTECHNICAL INVESTIGATION
 CR 466A SIGNAL POLES
 FRUITLAND PARK, LAKE CO., FL.

APPROXIMATE SCALE:	DATE: 06/09/08	ENGINEER: SC
1" = 40'	PN: CPGT-05-384	DRAWN BY: DLS


LOCATION PLAN

FIGURE 3



LEGEND:

- ① BROWN FINE SAND (SP)
 - ② ORANGISH-BROWN TO BROWN SANDY CLAY (CL)
 - ③ LIGHT BROWN SILTY FINE SAND (SM)
 - ④ VERY LIGHT BROWN TO BROWN SLIGHTLY SILTY FINE SAND (SP-SM)
- (SP) UNIFIED SOIL CLASSIFICATION SYSTEM GROUP SYMBOL
- GNE-10 GROUNDWATER NOT ENCOUNTERED IN UPPER 10 FEET OF BORING
- N STANDARD PENETRATION RESISTANCE, IN BLOWS PER FOOT
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- HA BORING ADVANCED USING HAND AUGER
- 50/5" 50 HAMMER BLOWS TO ADVANCE SAMPLING TOOL 5 INCHES

 Andreyev Engineering, Inc.	GEOTECHNICAL INVESTIGATION CR 466A SIGNAL POLES FRUITLAND PARK, LAKE CO., FL.	
	SOIL PROFILES	
APPROXIMATE SCALE: 1" = 5'	DATE: 08/08/08 PN: CPGT-05-364	ENGINEER: SC DRAWN BY: DLS
		FIGURE 4