



**Roadway Soil Survey Report
Chuluota Road Roadway Conceptual
Analysis - From East Colonial Road
(SR 50) to Lake Pickett Road
Orange County, Florida
Contract No. Y20-830-CH
NADIC Project No.: R20027**

Prepared for:

**JMT
615 Crescent Executive Court, Suite 106
Lake Mary, FL 32746**

Prepared by:

**Nadic Engineering Services, Inc.
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Consultants in: Civil · Environmental · Geotechnical Engineering
Offices in: Orlando · Miami

April 8, 2022

Johnson, Mirmiran & Thompson, Inc. (JMT)

615 Crescent Executive Court, Suite 106
Lake Mary, FL 32746

Attention: Mr. Greg T. Smith, P.E.

Re: Preliminary Roadway Soil Survey
Chuluota Road Roadway Conceptual Analysis (RCA)
(From East Colonial Drive (SR 50) to Lake Pickett Road)
Orange County, Florida
Orange County Project No.: Y20-830-CH
NADIC Project No. PR.GEO-RD20027

Dear Mr. Smith:

Nadic Engineering Services, Inc. (NADIC) is pleased to submit this Preliminary Roadway Soil Survey for the above referenced project. The purpose of this exploration was to evaluate soil and groundwater conditions along Chuluota Road for Chuluota Road Roadway Conceptual Analysis (RCA). This Soil Survey was authorized through a subconsultant agreement between JMT and **NADIC**. This report presents the results of our limited field and laboratory investigations and includes our recommendations regarding the geotechnical engineering aspects of the project.

NADIC appreciates the opportunity to be of service to JMT and Orange County Public Works Department on this project. We look forward to a continued association. Please contact us if you have any questions, or if we may be of further assistance to you as this project proceeds.

Sincerely,
NADIC ENGINEERING SERVICES, INC.
Engineering Business No. 8214



Maria Bridges, M.Sc., EI
Staff Engineer



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1.0 PROJECT LOCATION AND DESCRIPTION

Chuluota Road is an existing two-lane Minor Arterial roadway extending through a suburban area in Orange County to a sparsely developed area in Seminole County. Orange County is proposing to widen Chuluota Road from East Colonial Drive (SR 50) to Lake Pickett Road. The Chuluota Road Roadway Conceptual Analysis (RCA) is to identify the potential improvements needed to address the current and future traffic demands of Chuluota Road corridor. The approximate length of the study is about 1.9 miles.

The Roadway Conceptual Analysis (RCA) is to identify the potential improvements needed to address the current and future traffic demands of Chuluota Road corridor. The approximate length of ...

The project elements include the following: (1) Plan for completion of pedestrian and bike facilities on both sides of the road, and to accommodate the East Orange Trail. (2) Preliminary engineering and environmental analysis of approximately 10,032 feet of an existing two-lane urban Minor Arterial roadway from SR 50 to Lake Pickett Road and (3) Evaluate ten (10) retention pond locations with five (5) as preferred and the other five (5) alternative pond sites.

The project site is generally located within Sections 9, 16, 20 and 21, Township 22 South, Range 32 East, in Oviedo SW and Bithlo, Florida. A vicinity map showing the proposed roadway improvements is presented on the attached **Figure 1** in the **Appendix A**.

This report presents the findings of our subsurface exploration program and an evaluation of the soil and groundwater conditions encountered along the roadway corridor and proposed pond areas.

2.0 REVIEW OF AVAILABLE PUBLISHED DATA

2.1 General

To obtain general information on soil and groundwater conditions along the project alignment, NADIC reviewed available data including aerial maps, United States Geological Survey (USGS) Quadrangle Topographic Maps and the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey for Orange County, and other published sources. A summary of this information is presented below in the following report sections.

2.2 USGS Topographic Map

The “Oviedo, SW” and “Bithlo, FL” USGS topographic maps issued in 2021, in the vicinity of the Chuluota Road were reviewed. The project corridor is shown on an excerpt of the USGS topographic map and presented on **Figure 2** in **Appendix A**. The map shows the ground surface elevation in the project vicinity to range from approximately +65 to +75 feet, North American Vertical Datum of 1988 (NAVD-88).

2.3 USDA, NRCS Soil Survey

The Orange County Soil Survey published by the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) is a comprehensive publishes source of information regarding near-surface soil and surficial groundwater depth. The NRCS Orange County Soil Survey was reviewed for information regarding near-surface soil conditions within the study corridor.

The Orange County soil survey identified the following six (6) primary mapping soil units within the limits of the project corridor.

Table 1: USDA/NRCS Soil Survey Summary

Map Unit Symbol	USDA Soil Name	AASHTO* Group	Seasonal High Groundwater Depth in Natural Conditions (feet)	Hydrologic Soil Group
2	Archbold	A-3	3.5 – 6.0	A
3	Basinger fine sand, depressiona, 0 to 1 percent slopes	A-3, A-2-4	Ponded	A/D
34	Pomello fine sand, 0 to 5 percent slope	A-3, A-2-4	2.0-3.5	A
37	St. Johns fine sand	A-3, A-2-4	0-1.0	B/D
44	Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes	A-3, A-2-4	0-1.0	A/D
54	Zolfo fine sand, 0 to 2 percent slopes	A-3, A-2-4	2.0-3.5	A

*AASHTO: American Association of State Highway and Transportation Officials.

Refer to **Figures 3A** and **3B** in **Appendix A** for a reproduction of the USDA NRCS Orange County Soil Survey map for the project area. The NRCS Soil Survey generally identifies these soil types with poorly to moderately well drained soil, with permeability ranging from poorly to very high. The NRCS Soil Survey predicts the groundwater levels for these soil types to range from the natural ground surface to 72 inches below the natural ground surface.

Information from the NRCS Soil Survey is very general and may be outdated due to recent developments in the project site vicinity. Therefore, it may not reflect the actual soil and groundwater conditions, particularly where development has modified the natural soil conditions or surface and near surface drainage.

3.0 FIELD EXPLORATION PROGRAM AND METHODS

3.1 Field Exploration Program

The subsurface exploration for this preliminary evaluation consisted of 34 auger borings to a depth of five (5) feet each and 17 Standard Penetration Test (SPT) borings to a depth of 20 feet, at 200-foot interval as requested by Orange County. The borings were established in the unpaved areas along the northbound and southbound shoulder of Chuluota Road. A total of nine (9) SPT borings were completed for the stormwater ponds to a depth of 15 feet each below existing grade; one boring for each proposed pond locations. Due to lack of access and wetland conditions, borings were not drilled in Pond Sites 3, 4, 5 and 11.

The location of the borings was determined by NADIC based on information provided by JMT. All borings were staked in the field by a representative of NADIC with the aid of a Global Positioning System (GPS) device.

Upon completion and after groundwater measurements, all borings were backfilled for safety. Boring approximate locations are shown on **Figures 4A** through **4C** in the **Appendix A**.

The results of the exploration program in the form of soil profiles are shown on **Sheet 2** through **5** in **Appendix B**.

3.2 Field Exploration Methods

3.2.1 Hand Auger Borings

Hand auger borings were performed to a general depth of five (5) feet below the existing grade by manually twisting and advancing a bucket auger, three-inch diameter, six-inch long into the ground in four (4) to six (6) inch increments. These borings were performed in general accordance with the American Society of Testing and Materials (ASTM) Test Designation D-1452. As each soil type was revealed, representative samples were placed in air-tight bags and returned to our laboratory for further visual examination and classification by a geotechnical engineer.

Groundwater levels were measured in the borings upon completion and 24 hours later; each borehole was sealed with native soils.

3.2.2 Standard Penetration Test Borings

The SPT borings performed were conducted in general conformance with the American Standard Testing Method (ASTM) test designation D-1586. The borings were advanced by the rotary wash method with bentonite based mud as the circulating fluid to stabilize the borehole. The SPT borings were generally performed continuously from the ground surface to 10.5 feet and at 5-foot depth intervals thereafter. After seating the sampler six inches, the number of successive blows required to drive the sampler 12 inches into the soil constitutes the test result commonly referred to as the “N” value. Adjacent to the SPT boring profiles are the “N” values. The “N” value has been empirically correlated with various soil properties and is considered indicative of the relative density of cohesionless soils and the consistency of cohesive soils. All recovered samples were

visually classified in the field with representative portions of the samples placed in airtight jars and transported to our office for review by a Geotechnical Engineer for confirmation of the field classification and laboratory testing.

Groundwater levels were measured in the borings and upon completion, each borehole was sealed with native soils.

4.0 GENERAL SUBSURFACE CONDITIONS

4.1 General Subsoil Conditions

The soils encountered along the project alignment are shown on **Sheet 2** through **5** in the **Appendix B**. The soil survey encountered three (3) generalized soil strata within the project limits to the maximum depth explored in the boring. The soils encountered in the borings are classified using the AASHTO Soil Classification System (i.e. A-3, A-2-4, etc.). Soil classification and stratification are based on visual examination, interpretation of the boring logs by a geotechnical engineer and laboratory results of selected soil samples. The soil profiles indicate subsurface conditions encountered only at the specific boring locations at the time of the field exploration.

4.2 Roadway Boring Results

The soil borings along the roadway alignment encountered three (3) generalized soil strata within the project limits to the maximum depth explored in the borings. The soil strata encountered as well as soil descriptions, AASHTO classifications and FDOT 505 Embankment Soil Utilization designations are summarized below:

Stratum	Soil Description	AASHTO Soil Classification	FDOT Index 120-001 Classification
1	Brown to gray fine SAND, with silt/clay, occasionally with roots, limerock and shell fragments	A-3	Select (S)
2	Brown to gray silty SAND, occasionally with roots and organics	A-2-4	Select (S)
3	Dark brown to dark gray organic silty SAND to organic sandy SILT, occasionally with roots	A-8	Muck (M)

The above subsurface condition is only general descriptions. For further details at individual boring locations, refer to the Report of Roadway Borings on **Sheet 2** through **4** in **Appendix B**.

4.3 Pond Boring Results

The Pond Sites investigated are designated as Pond 1, 2, 6, 7, 8, 9, 10, 12 and 13. Based on limited soil borings completed in the proposed pond locations, two (2) generalized soil strata encountered

to the maximum depth explored in the borings. The soil strata encountered as well as soil descriptions, AASHTO classifications and FDOT 505 Embankment Soil Utilization designations are summarized below:

Stratum	Soil Description	AASHTO Soil Classification	FDOT Index 120-001 Classification
1	Brown to gray fine SAND, with silt/clay, occasionally with roots, limerock and shell fragments	A-3	Select (S)
2	Brown to gray silty SAND, occasionally with roots and organics	A-2-4	Select (S)

The above subsurface conditions are only general descriptions. For details refer to the boring profiles on **Sheet 5** in **Appendix B**.

4.4 Groundwater

Groundwater levels measured in the open borings during our roadway exploration indicate that the groundwater table ranged from about one (1) foot to six (6) feet below existing grade at the time of our exploration September 2021 and March 2022. Both encountered and estimated seasonal groundwater levels are shown adjacent to the boring profiles, where applicable (see **Sheet 2** through **5** in the **Appendix B**). Groundwater conditions will vary with environmental variations and seasonal conditions, such as the frequency and magnitude of rainfall patterns, as well as man-made influences, such as swales, drainage ponds, underdrains, and areas of covered soil (roadways, sidewalks, etc.).

For the purposes of this report, estimated seasonal high groundwater levels are defined as groundwater levels that are anticipated at the end of the wet season of a “normal rainfall year” under current site conditions. “Normal rainfall year” is defined as a year in which rainfall quantity and distribution were at or near historical rainfall averages. The estimated seasonal high groundwater levels presented next to the boring profiles (**Sheet 2** through **5** in the **Appendix B**) are based on the soil stratigraphy, measured groundwater levels, USDA/NRCS information, review of roadway plans, and past experience with similar soil conditions. In general, the estimated seasonal high groundwater level is not intended to define a limit or ensure future seasonal fluctuations in groundwater levels will not exceed the estimated levels. Post-development groundwater levels could exceed the seasonal high groundwater level estimates as a result of a series of rainfall events, changed conditions at the site which alter surface water drainage characteristics, or variations in the duration, intensity, or total volume of rainfall.

5.0 LABORATORY TESTING

Representative soil samples were retrieved from the borings and returned to NADIC's laboratory for further visual classification, stratification and selective soil testing. The roadway boring samples

were classified and stratified in general accordance with the American Association of State Highway and Transportation officials (AASHTO) Soil Classification System. Results of all roadway laboratory tests are summarized on the Roadway Soil Survey Sheet (**Sheet 1**) in **Appendix B** and on **Table 2** in the **Appendix A**.

6.0 PRELIMINARY EVALUATION AND RECOMMENDATIONS

6.1 General

The evaluation and recommendations contained in this preliminary roadway soil survey report are based in part on the data obtained from a limited number of soil samples and groundwater measurements obtained from widely spaced borings. One boring was completed in each of the nine (9) pond sites. The exploration methods used indicate subsurface conditions at specific boring locations, only at the time they were performed and to the depths penetrated. Borings cannot be relied upon to accurately reflect the variations that usually exist between boring locations and these variations may not become evident until construction. If variations from the conditions described in this report become evident during the course of construction, or project characteristics described in this report change, **NADIC** should be retained to re-evaluate the conclusions and recommendations contained in this report in light of such changes.

7.0 REPORT LIMITATIONS

Our professional services have been performed; our findings and recommendations obtained and prepared in accordance with generally accepted geotechnical engineering principles and practices. **NADIC** is not responsible for the conclusions, opinions or recommendations made by others based on these data.

The scope of the investigation was intended to evaluate soil conditions within the influence of the proposed roadway improvements. The analyses and recommendations submitted in this report are based upon the anticipated location and data obtained from the soil borings performed at the locations indicated and does not reflect any variations which may occur among these borings. If any variations become evident during the course of construction, a re-evaluation of the recommendations contained in this report will be necessary after **NADIC** has had an opportunity to observe the characteristics of the conditions encountered.

The scope of services, included herein, did not include any environmental assessment for the presence or absence of hazardous or toxic materials in the soil, surface water, groundwater, and air, on the site, below and around the site. Any statements in this report or on the boring logs regarding odors, colors, unusual or suspicious items and conditions are strictly for the information of the client.

APPENDIX A

Figure 1

Vicinity Map

Figure 2

USGS Topographic Map

Figures 3A & 3B

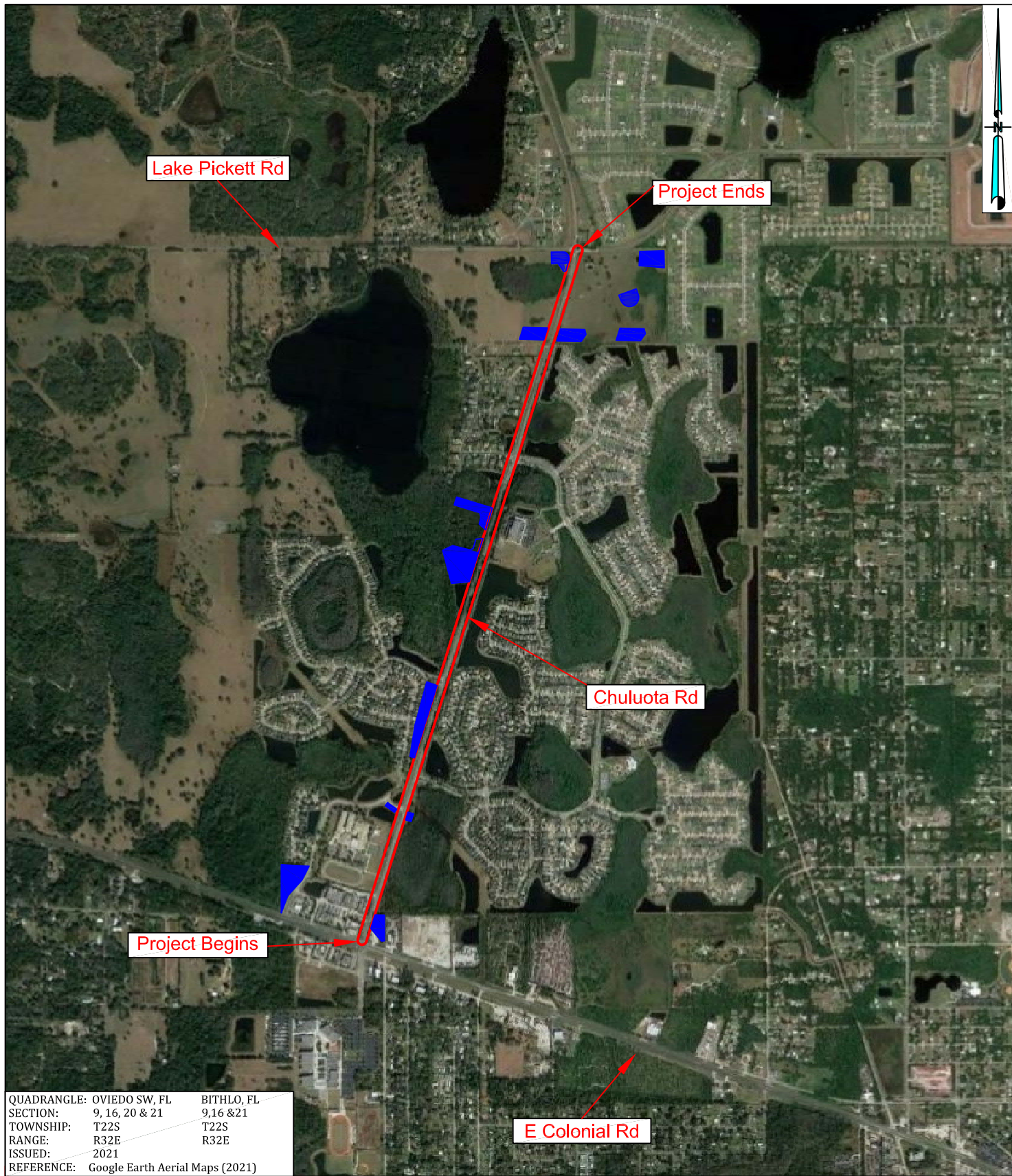
USDA/NRCS Soils Map

Figures 4A through 4C

Boring Location Map

Table 2

**Summary of Laboratory
Test Results**




QUADRANGLE: OVIEDO SW, FL BITHLO, FL
 SECTION: 9, 16, 20 & 21 9,16 &21
 TOWNSHIP: T22S T22S
 RANGE: R32E R32E
 ISSUED: 2021
 REFERENCE: Google Earth Aerial Maps (2021)

NOT TO SCALE

▭ Approximate Project Location
 ▭ Proposed Pond Locations

REVISIONS			NAMES	DATES
DATES	BY	DESCRIPTION	DRAWN BY: MB	04-07-2022
			CHECKED BY: GNN	04-07-2022
			DESIGNED BY: N/A	N/A
			CHECKED BY: N/A	N/A
			APPROVED BY:	

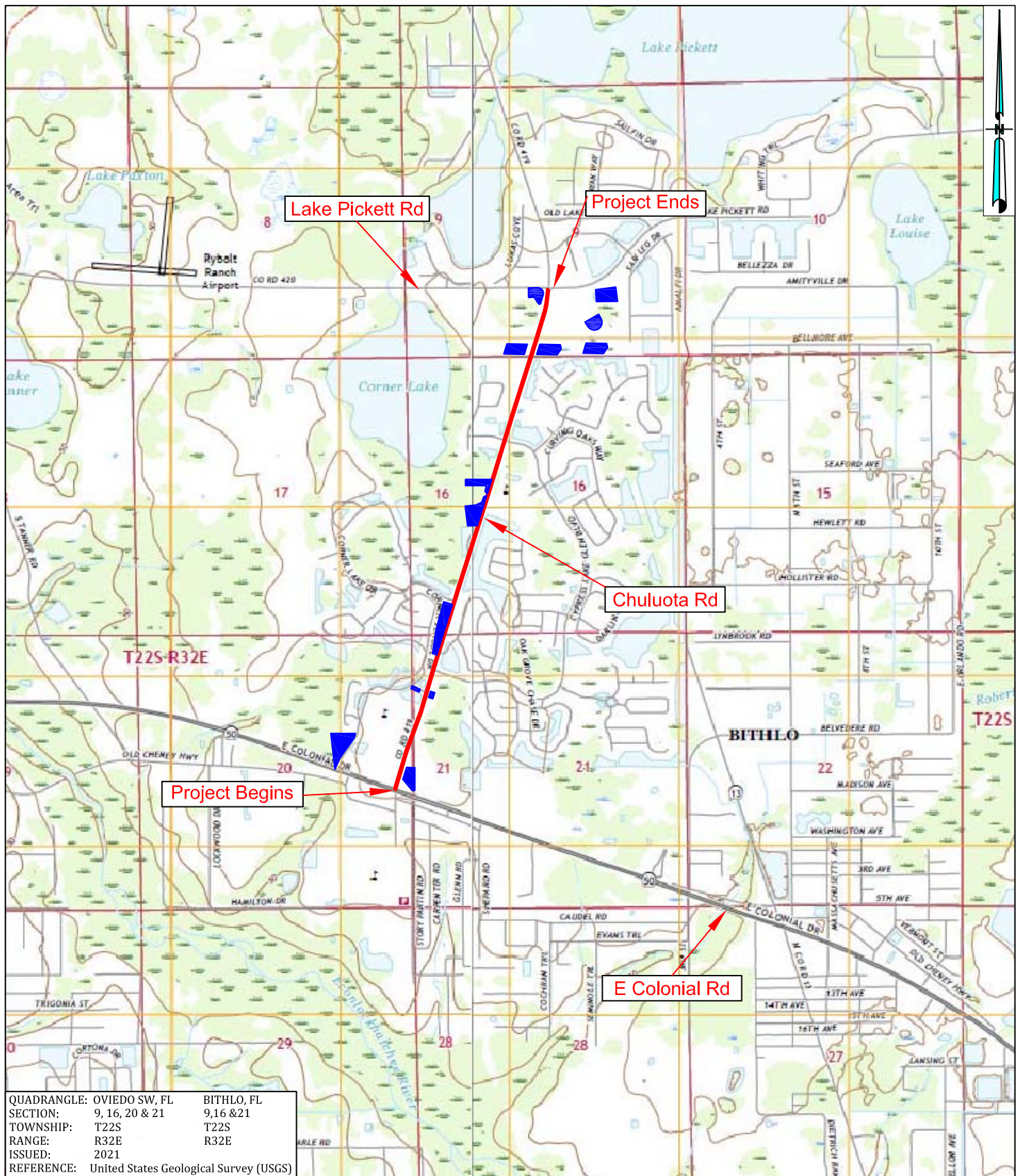


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 CERTIFICATE OF AUTHORIZATION NO. 8214



ORANGE COUNTY, FLORIDA	
COUNTY	CONTRACT No.
ORANGE	Y20-830-CH

FIGURE 1
VICINITY MAP
PROJECT NAME:
CHULOUTA ROAD ROADWAY CONCEPTUAL ANALYSIS (RCA)




QUADRANGLE: OVIEDO SW, FL BITHLO, FL
 SECTION: 9, 16, 20 & 21 9, 16 & 21
 TOWNSHIP: T22S T22S
 RANGE: R32E R32E
 ISSUED: 2021
 REFERENCE: United States Geological Survey (USGS)

NOT TO SCALE

▭ Approximate Project Location
 ▭ Proposed Pond Locations

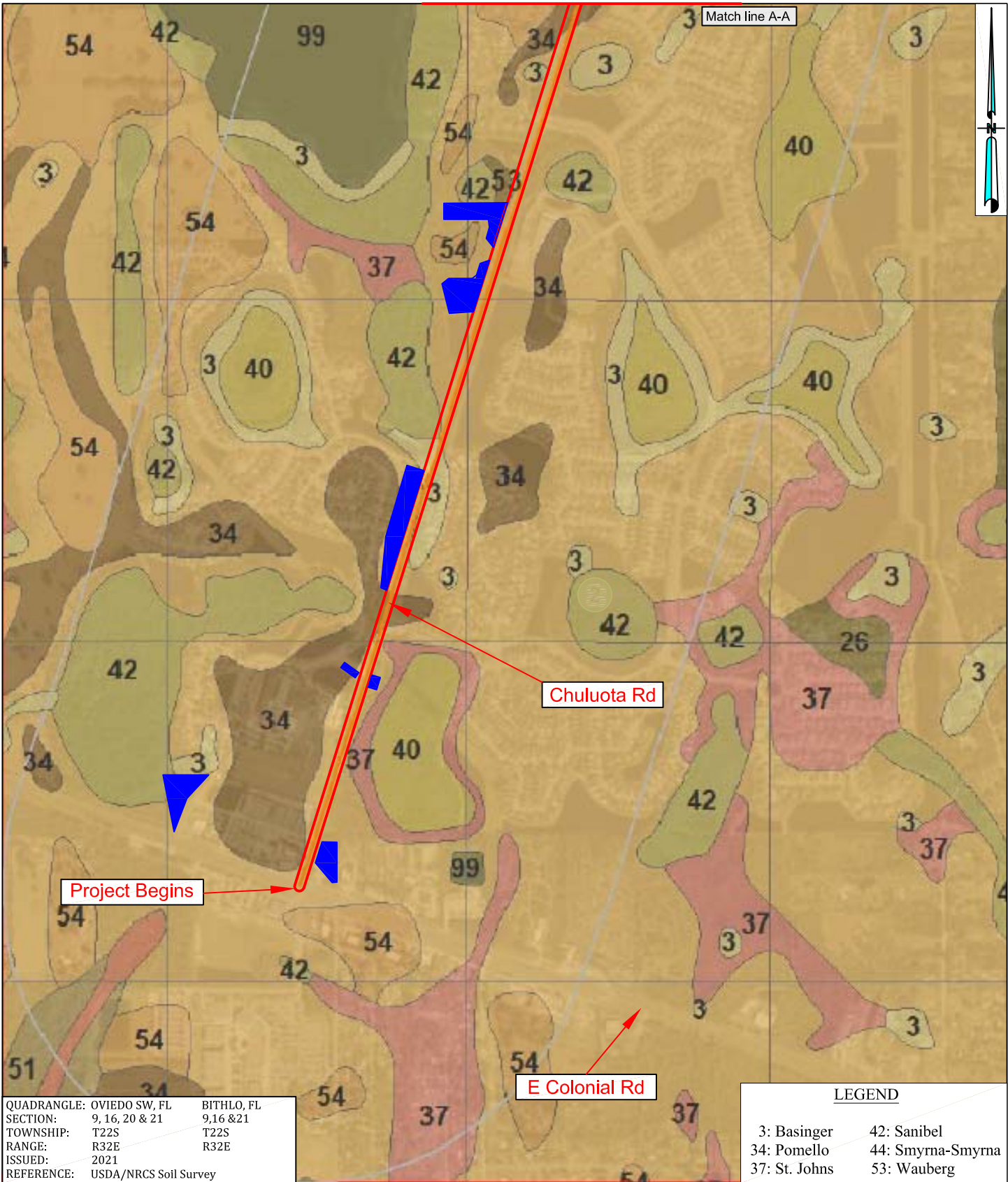
REVISIONS			NAMES	DATES
DATES	BY	DESCRIPTION	DRAWN BY: MB	04-07-2022
			CHECKED BY: GNN	04-07-2022
			DESIGNED BY: N/A	N/A
			CHECKED BY: N/A	N/A
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ORANGE COUNTY,
 FLORIDA
 COUNTY CONTRACT No.
 ORANGE Y20-830-CH

FIGURE 2
 USGS QUADRANGLE MAP
 PROJECT NAME:
 CHULOUTA ROAD
 ROADWAY CONCEPTUAL
 ANALYSIS (RCA)




QUADRANGLE: OVIEDO SW, FL BITHLO, FL
 SECTION: 9, 16, 20 & 21 9, 16 & 21
 TOWNSHIP: T22S T22S
 RANGE: R32E R32E
 ISSUED: 2021
 REFERENCE: USDA/NRCS Soil Survey

LEGEND	
3: Basinger	42: Sanibel
34: Pomello	44: Smyrna-Smyrna
37: St. Johns	53: Wauberg

NOT TO SCALE

□ Approximate Project Location
 □ Proposed Pond Locations

REVISIONS			NAMES	DATES
DATES	BY	DESCRIPTION	DRAWN BY: MB	04-07-2022
			CHECKED BY: GNN	04-07-2022
			DESIGNED BY: N/A	N/A
			CHECKED BY: N/A	N/A
			APPROVED BY:	

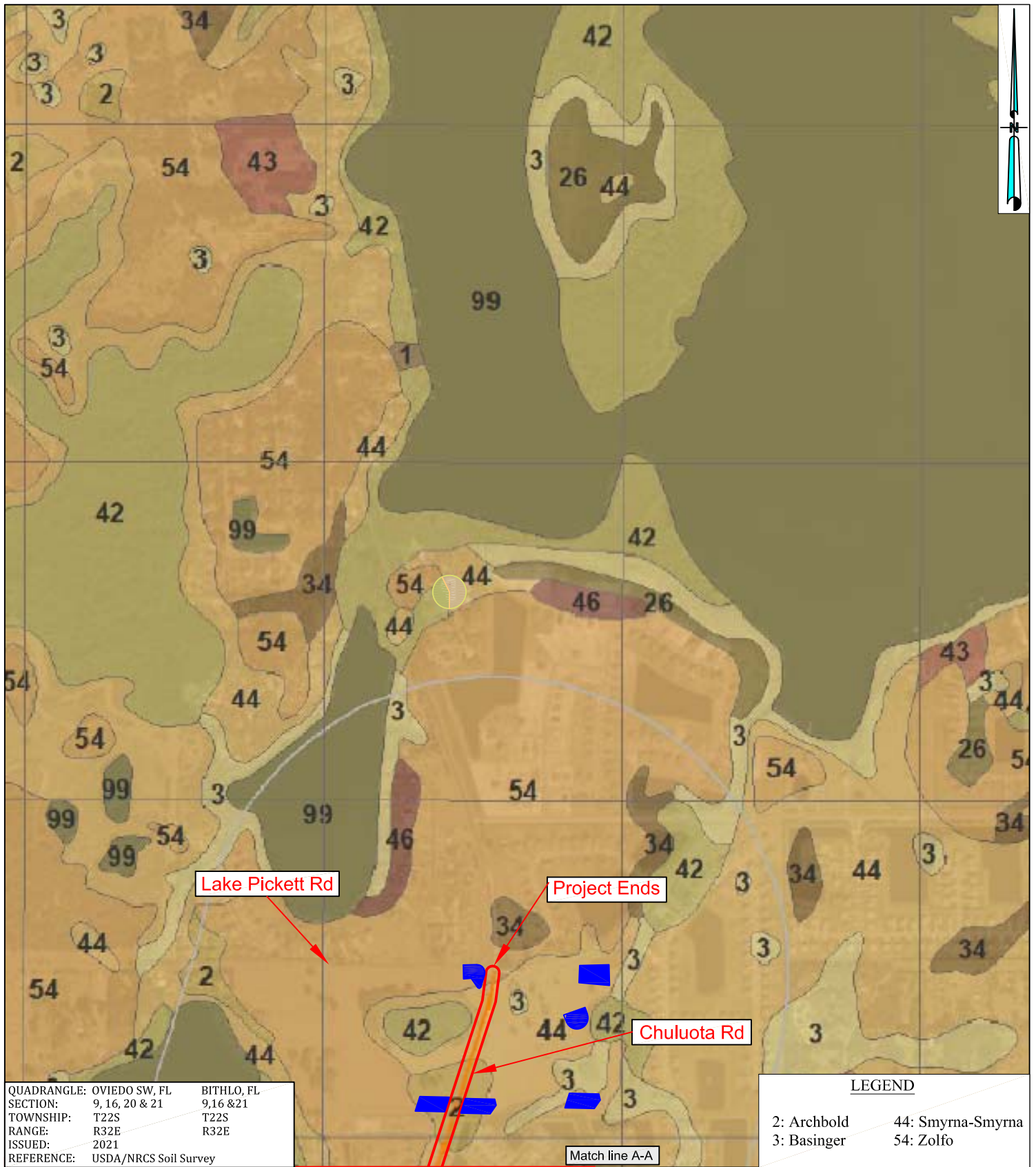


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ORANGE COUNTY, FLORIDA	
COUNTY	CONTRACT No.
ORANGE	Y20-830-CH

FIGURE 3A
 USDA/NRCS SOIL SURVEY MAP
 PROJECT NAME:
 CHULOUTA ROAD
 ROADWAY CONCEPTUAL
 ANALYSIS (RCA)



NOT TO SCALE

□ Approximate Project Location □ Proposed Pond Locations

REVISIONS			NAMES	DATES
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			CHECKED BY: GNN	04-07-2022
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			CHECKED BY: N/A	N/A
			APPROVED BY:	

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ORANGE	Y20-830-CH

FIGURE 3B
 USDA/NRCS SOIL SURVEY MAP
 PROJECT NAME:
 CHULOUTA ROAD ROADWAY CONCEPTUAL ANALYSIS (RCA)

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QUADRANGLE: OVIEDO SW, FL BITHLO, FL
 SECTION: 9, 16, 20 & 21 9, 16 & 21
 TOWNSHIP: T22S T22S
 RANGE: R32E R32E
 ISSUED: 2021
 REFERENCE: Google Earth Aerial Maps (2021)

NOT TO SCALE

LEGEND

- Approx. Roadway Boring Locations
- Approx. Pond Boring Locations
- Approx. Proposed Pond Area

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

NAMES	DATES
Drawn by: MB	04-07-2022
Checked by: GNN	04-07-2022
Designed by: N/A	N/A
Checked by: N/A	N/A
Approved by: GNN	

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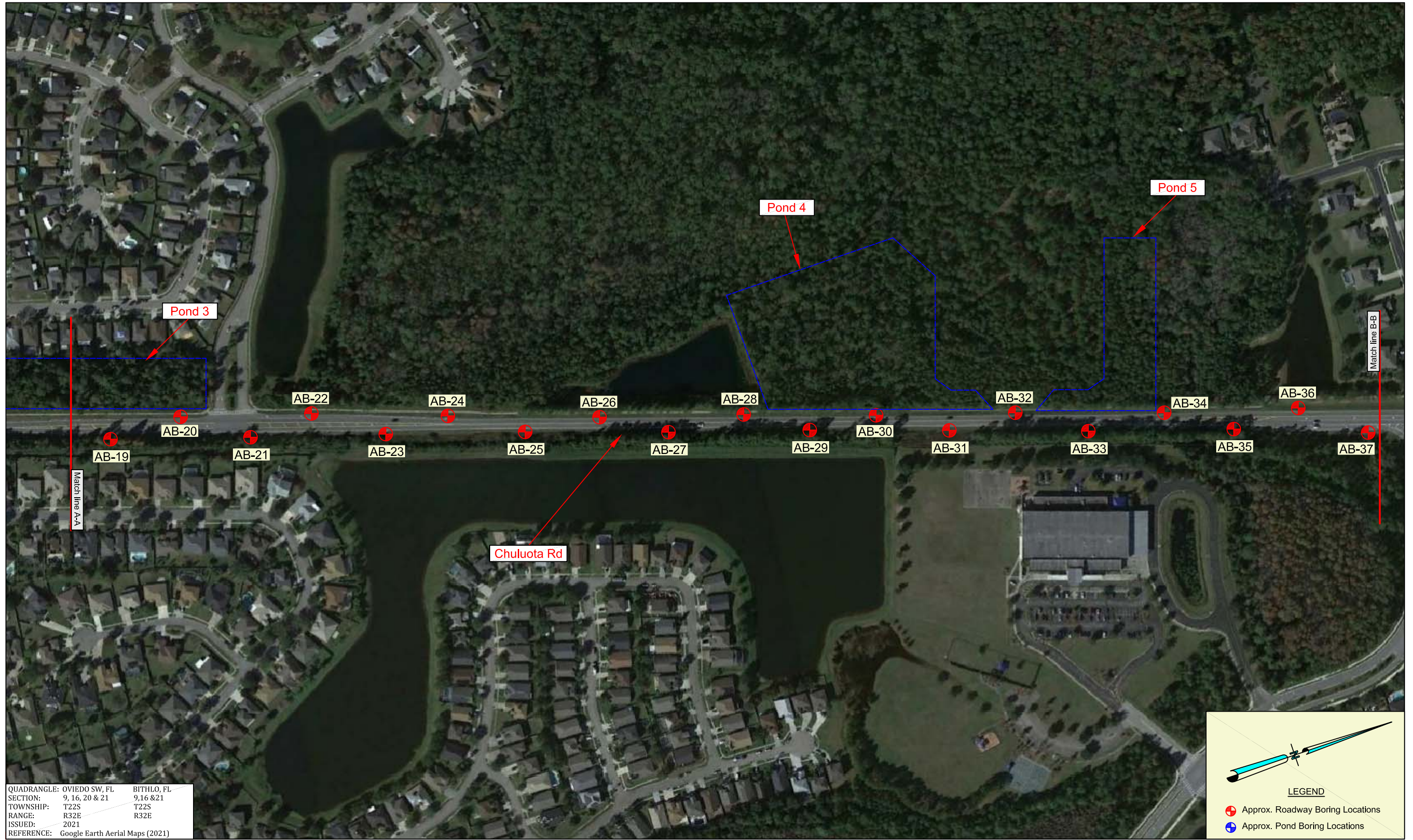


ORANGE COUNTY, FLORIDA		
ROAD NAME	COUNTY	PROJECT NO.
CHULUOTA RD	ORANGE	Y20-830-CH

TITLE: BORING LOCATION MAP
PROJECT NAME: CHULUOTA RD ROADWAY CONCEPTUAL ANALYSIS (RCA)

FIGURE NO. 4A

\\nadiserver\share\New Z Drive\Engineering\Geotechnical\Orlando\Roadway (RD)\2020\PR.GEO-RD20027 - Chuluota Road\Project Working Files\Autocad



QUADRANGLE: OVIEDO SW, FL BITHLO, FL
 SECTION: 9, 16, 20 & 21 9,16 &21
 TOWNSHIP: T22S T22S
 RANGE: R32E R32E
 ISSUED: 2021
 REFERENCE: Google Earth Aerial Maps (2021)

NOT TO SCALE

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ORANGE COUNTY, FLORIDA		
ROAD NAME	COUNTY	PROJECT NO.
CHULUOTA RD	ORANGE	Y20-830-CH

TITLE: BORING LOCATION MAP
PROJECT NAME: CHULUOTA RD ROADWAY CONCEPTUAL ANALYSIS (RCA)

FIGURE NO. 4B

\\nadservershare\New Z Drive\Engineering\Geotechnical\Orlando\Roadway (RD)\2020\PR.GEO-RD20027 - Chuluota Road\Project Working File\Autocad



NOT TO SCALE

REVISIONS					
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NAMES	DATES
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ORANGE COUNTY, FLORIDA		
ROAD NAME	COUNTY	PROJECT NO.
CHULUOTA RD	ORANGE	Y20-830-CH

TITLE: BORING LOCATION MAP
PROJECT NAME: CHULUOTA RD ROADWAY CONCEPTUAL ANALYSIS (RCA)

FIGURE NO. 4C

QUADRANGLE: OVIEDO SW, FL BITHLO, FL
 SECTION: 9, 16, 20 & 21 9, 16 & 21
 TOWNSHIP: T22S T22S
 RANGE: R32E R32E
 ISSUED: 2021
 REFERENCE: Google Earth Aerial Maps (2021)

TABLE 2 SUMMARY OF LABORATORY TEST RESULTS														
Boring No.	Approx. Latitude	Approx. Longitude	Sample Depth (ft.)	Stratum No.	Moisture Content (%)	Organic Content (%)	Sieve Analysis (Cumulative Percent Passing)							AASHTO* Classification
							#4	#10	#20	#40	#60	#100	#200	
ROADWAY														
AB-2	28°33'41.1"N	81° 7'46.3"W	3	1	19	-	100	100	100	98	92	36	6	A-3
AB-3	28°33'42.7"N	81° 7'44.9"W	4.5	1	25	-	100	100	100	98	92	35	7	A-3
AB-6	28°33'48.2"N	81° 7'43.6"W	3	1	27	-	100	100	100	98	91	35	9	A-3
AB-7	28°33'49.8"N	81° 7'42.2"W	3	1	20	-	100	100	100	98	91	38	9	A-3
AB-24	28°34'20.7"N	81° 7'31.9"W	3	1	14	-	100	100	100	98	89	33	8	A-3
AB-27	28°34'26.1"N	81° 7'29.4"W	1	1	19	-	98	98	98	95	85	31	7	A-3
AB-32	28°34'35.4"N	81° 7'26.7"W	3	1	14	-	100	100	100	98	89	30	8	A-3
AB-36	28°34'42.8"N	81° 7'24.1"W	3	1	30	-	100	100	100	98	89	34	9	A-3
AB-43	28°34'55.1"N	81° 7'19.1"W	1	1	17	-	100	100	100	98	88	29	4	A-3
AB-46	28°35'0.7"N	81° 7'17.7"W	3	1	22	-	100	100	100	98	89	27	4	A-3
AB-49	28°35'6.1"N	81° 7'15.2"W	3	1	22	-	100	100	100	98	88	30	6	A-3
AB-10	28°33'55.3"N	81° 7'41.0"W	5	2	28	-	100	100	100	98	91	41	19	A-2-4
AB-13	28°34'0.4"N	81° 7'38.3"W	3	2	29	1	100	100	100	99	92	37	11	A-2-4
AB-16	28°34'6.2"N	81° 7'37.1"W	3	2	22	-	100	100	100	99	89	37	11	A-2-4
AB-28	28°34'28.1"N	81° 7'29.3"W	3	2	17	-	100	100	99	97	87	36	12	A-2-4
AB-31	28°34'33.4"N	81° 7'26.8"W	5	2	25	-	100	100	100	98	91	46	26	A-2-4
AB-33	28°34'37.1"N	81° 7'25.5"W	4.5	2	25	-	100	100	100	99	92	44	24	A-2-4
AB-39	28°34'47.9"N	81° 7'21.5"W	3	2	22	-	100	100	100	98	90	34	13	A-2-4
AB-40	28°34'49.9"N	81° 7'21.7"W	3	2	23	-	100	100	100	98	89	32	11	A-2-4
AB-19	28°34'11.6"N	81° 7'34.6"W	5	3	127	12	100	100	100	98	93	61	47	A-8
AB-21	28°34'15.2"N	81° 7'33.2"W	3	3	86	11	100	100	100	98	89	40	18	A-8

*American Association of State Highway and Transportation Officials

JMT

Chuluota Road RCA Soil Survey
NADIC Project No. PR.GEO-RD20027

April 8, 2022

TABLE 2
SUMMARY OF LABORATORY TEST RESULTS CONTINUED

Boring No.	Approx. Latitude	Approx. Longitude	Sample Depth (ft.)	Stratum No.	Moisture Content (%)	Organic Content (%)	Sieve Analysis (Cumulative Percent Passing)						AASHTO* Classification	
							#4	#10	#20	#40	#60	#100		#200
PONDS														
P-6	28°35'2.8"N	81° 7'18.5"W	14	1	22	-	100	100	100	99	90	30	7	A-3
P-1	28°33'39.6"N	81° 7'44.0"W	9	2	29	-	100	100	100	98	93	45	16	A-2-4
P-2	28°33'56.2"N	81° 7'38.6"W	5	2	27	-	100	100	100	98	90	34	11	A-2-4
P-8	28°35'7.8"N	81° 7'3.4"W	1	2	38	3	100	100	100	98	89	42	24	A-2-4
P-10	28°35'13.2"N	81° 7'9.5"W	9	2	25	-	100	100	100	99	96	67	19	A-2-4
P-12	28°33'57.5"N	81° 7'41.8"W	3	2	17	-	100	100	100	99	91	37	12	A-2-4

*American Association of State Highway and Transportation Officials

APPENDIX B

Sheet 1

Roadway Soil Survey

Sheets 2 through 5

Report of Borings

NADIC ENGINEERING SERVICES, INC

ROADWAY CROSS SECTION OF SOIL SURVEY

REPORT OF TESTS

PROJECT No.: PR.GEO-RD20027
 PROJECT DESCRIPTION: CHULUOTA ROAD ROADWAY CONCEPTUAL ANALYSIS (RCA)
 SUBMITTED BY: NADIC

QUADRANGLE: OVIEDO SW, BITHLO, FLORIDA, FLORIDA
 SECTION: 9,16,20 & 21, 9,16 & 21
 TOWNSHIP: 22 SOUTH, 22 SOUTH
 RANGE: 32 EAST, 32 EAST
 SURVEY BEGINS: -
 SURVEY ENDS: -
 DATE REPORTED: MARCH, 2022

STRATUM NO.	ORGANIC CONTENT		MOISTURE CONTENT		SIEVE ANALYSIS RESULTS					ATTERBERG LIMITS (%)			AASHTO GROUP	DESCRIPTION	CORROSION TEST RESULTS					SUBSTRUCTURE ENVIRONMENTAL CLASSIFICATION			
	No. OF TESTS	% ORGANIC	No. OF TESTS	% MOISTURE CONTENT	% PASSING 10 MESH	% PASSING 40 MESH	% PASSING 60 MESH	% PASSING 100 MESH	% PASSING 200 MESH	No. OF TESTS	LIQUID LIMIT	PLASTICITY INDEX			No. OF TESTS	pH	RESISTIVITY OHM-CM	CHLORIDES PPM	SULFATE PPM	CONCRETE	STEEL		
1	-	-	12	14-30	12 (FULL)	98-100	95-99	85-92	27-38	4-9	-	-	-	A-3	BROWN TO GRAY FINE SAND TO FINE SAND WITH SILT/CLAY, OCCASIONALLY WITH ROOTS, LIMEROCK AND SHELL FRAGMENTS	-	-	-	-	-	-	-	-
2	2	1-3	13	17-38	13 (FULL)	100	97-99	87-96	32-67	11-26	-	-	-	A-2-4	BROWN TO GRAY SILTY SAND, OCASIONALLY WITH ROOTS AND ORGANICS	-	-	-	-	-	-	-	-
3	2	11-12	2	86-127	2 (FULL)	100	98	89-93	40-61	18-47	-	-	-	A-8	DARK BROWN TO DARK GRAY ORGANIC SILTY SAND TO ORGANIC SANDY SILT, OCCASIONALLY WITH ROOTS	-	-	-	-	-	-	-	-

NOTES:

- (1) STRATA BOUNDARIES ARE APPROXIMATE AND REPRESENT SOIL STRATA AT EACH TEST HOLE LOCATION ONLY. ANY STRATUM CONNECTING LINES SHOWN ARE FOR ESTIMATING EARTHWORK ONLY AND DO NOT INDICATE ACTUAL STRATUM LIMITS. SUBSURFACE VARIATIONS BETWEEN BORINGS SHOULD BE ANTICIPATED AS INDICATED IN FDOT SECTION 2-4. FOR FURTHER DETAILS SEE FDOT STANDARD SPECIFICATIONS SECTION 120-3.
- (2) SOIL PARAMETER NOT TESTED DENOTED AS "-" ABOVE.
- (3) ▼ INDICATES WATER TABLE WHERE ENCOUNTERED AT THE TIME OF SURVEY.
 GNE INDICATES GROUNDWATER LEVEL NOT ENCOUNTERED AT THE TIME OF SURVEY.
 ▽ INDICATES ESTIMATED SEASONAL HIGH WATER LEVEL.

- (4) REMOVAL OF PLASTIC AND HIGH PLASTIC MATERIAL OCCURING WITHIN THE ROADWAY SHALL BE ACCOMPLISHED IN ACCORDANCE WITH FDOT STANDARD INDEX No. 120-002 UNLESS OTHERWISE STATED IN THE PLANS. THE MATERIAL UTILIZED IN EMBANKMENT CONSTRUCTION SHALL BE IN ACCORDANCE WITH FDOT STANDARD INDEX No. 120-001.
- (5) STRATUM 1 AND 2 SHALL BE TREATED AS SELECT (S) MATERIALS PER FDOT STANDARD INDEX No. 120-001.
- (6) STRATUM 3 SHALL BE TREATED AS MUCK (M) MATERIAL PER FDOT INDEX No. 120-001.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

NAMES	DATES
Drawn by: MB	03-24-2022
Checked by: GNN	03-24-2022
Designed by: N/A	N/A
Checked by: N/A	N/A
Approved by: GNN	

ENGINEER OF RECORD:
 NADIC ENGINEERING SERVICES, INC.
 601 N. HART BOULEVARD
 ORLANDO FL, 32818
 GODWIN N. NNADI, P.E. NO. 50637

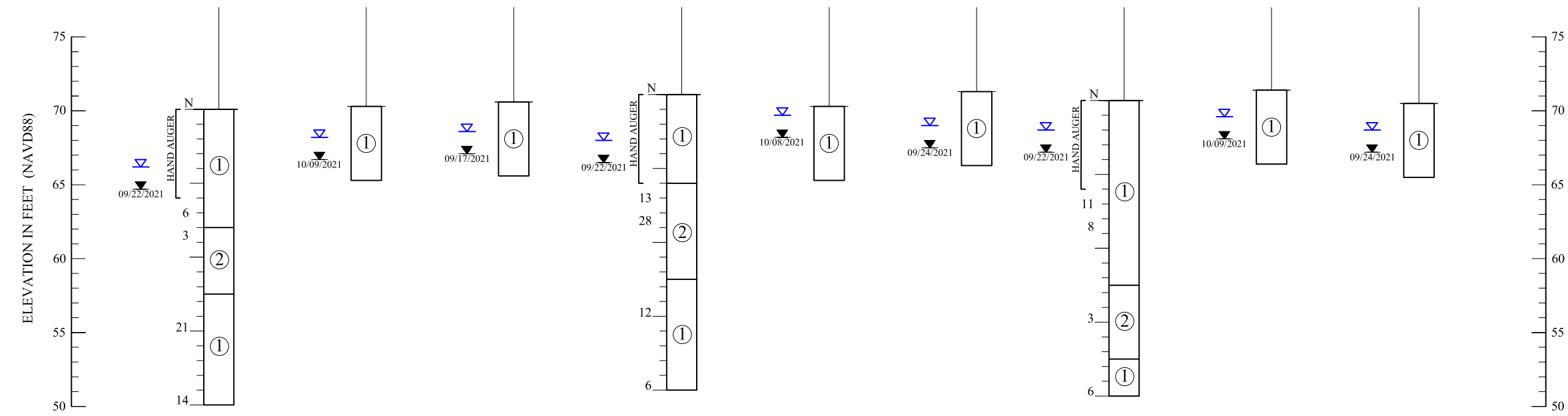


ORANGE COUNTY, FLORIDA		
ROAD NAME	COUNTY	CONTRACT NO.
CHULUOTA ROAD	ORANGE	Y20-830-CH

SHEET TITLE: REPORT OF ROADWAY SOIL SURVEY		SHEET NO.
PROJECT NAME: CHULUOTA ROAD ROADWAY CONCEPTUAL ANALYSIS (RCA)		

\\nadicserver\share\New Z Drive\Engineering\Geotechnical\Orlando\Roadway (RD)\2020\PR.GEO-RD20027 - Chuluota Road\Project Working File\Autocad

Boring No.:	AB-1	AB-2	AB-3	AB-4	AB-5	AB-6	AB-7	AB-8	AB-9
Approximate Latitude:	28°33'39.2"N	28°33'41.1"N	28°33'42.7"N	28°33'44.7"N	28°33'46.2"N	28°33'48.2"N	28°33'49.8"N	28°33'51.8"N	28°33'53.3"N
Approximate Longitude:	81°7'46.0"W	81°7'46.3"W	81°7'44.9"W	81°7'44.9"W	81°7'43.5"W	81°7'43.6"W	81°7'42.2"W	81°7'42.3"W	81°7'40.9"W
Approximate Elevation:	70.1'	70.3'	70.6'	71.1'	70.3'	71.3'	70.7'	71.4'	70.5'
Date Drilled:	09-22-2021	09-17-2021	09-17-2021	09-22-2021	09-17-2021	09-24-2021	09-22-2021	09-24-2021	09-24-2021



LEGEND

- ① Brown to gray fine SAND to fine SAND with silt/clay, occasionally with roots, limerock and shell fragments, (A-3)
- ② Brown to gray silty SAND, occasionally with roots and organics, (A-2-4)
- ▼ Groundwater level encountered on date shown
- ▽ Estimated seasonal high groundwater level
- (A-3) A.A.S.H.T.O.: Soil classification group symbol as determined by visual examination

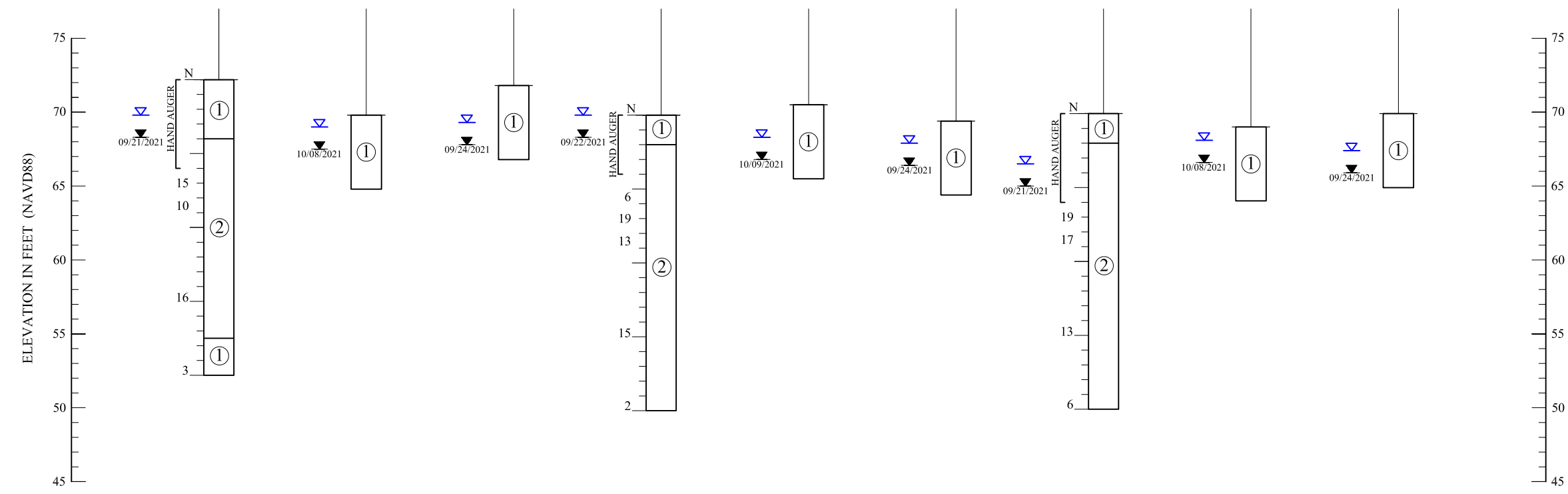
Standard Penetration Test Data

N Standard penetration resistance in blows per foot (18" spoon ASTM D-1586)
 Spoon Inside Diameter 1 3/8 in.
 Spoon Outside Diameter 2 in.
 ASTM Standard Automatic Hammer
 Hammer Weight 140 lbs.

NOTES

1. Standard Penetration Test borings were performed in accordance with ASTM D-1586. Standard Penetration Resistance are shown on the borings at the test depths in blows per foot unless otherwise noticed
2. Subsurface conditions shown on the boring do not represent conditions between boring locations. Actual conditions between the borings may vary from those shown.
3. Unified Soil Classifications shown on the boring are based on visual examination and limited laboratory testing

Boring No.:	AB-10	AB-11	AB-12	AB-13	AB-14	AB-15	AB-16	AB-17	AB-18
Approximate Latitude:	28°33'55.3"N	28°33'56.9"N	28°33'58.9"N	28°34'0.4"N	28°34'2.4"N	28°34'4.0"N	28°34'6.2"N	28°34'8.0"N	28°34'9.9"N
Approximate Longitude:	81°7'41.0"W	81°7'39.6"W	81°7'39.8"W	81°7'38.3"W	81°7'38.5"W	81°7'37.2"W	81°7'37.1"W	81°7'35.9"W	81°7'35.8"W
Approximate Elevation:	72.2'	69.8'	71.8'	69.8'	70.5'	69.4'	69.9'	69.0'	69.9'
Date Drilled:	09-21-2021	09-24-2021	09-24-2021	09-22-2021	09-24-2021	09-24-2021	09-21-2021	09-24-2021	09-24-2021



GRANULAR MATERIALS

RELATIVE DENSITY	SPT (BLOWS/FT.)
Very loose	Less than 3
Loose	3-7
Medium Dense	7-21
Dense	21-35
Very Dense	Greater than 35

SILTS AND CLAYS

CONSISTENCY	SPT (BLOWS/FT.)
Very soft	Less than 1
Soft	1-3
Firm	3-6
Stiff	6-11
Very Stiff	11-21
Hard	Greater than 21

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

NAMES	DATES
Drawn by: MB	03-24-2022
Checked by: GNN	03-24-2022
Designed by: N/A	N/A
Checked by: N/A	N/A
Approved by: GNN	

ENGINEER OF RECORD:
NADIC ENGINEERING SERVICES, INC.
 601 N. HART BOULEVARD
 ORLANDO FL, 32818
 GODWIN N. NNADI, P.E. NO. 50637



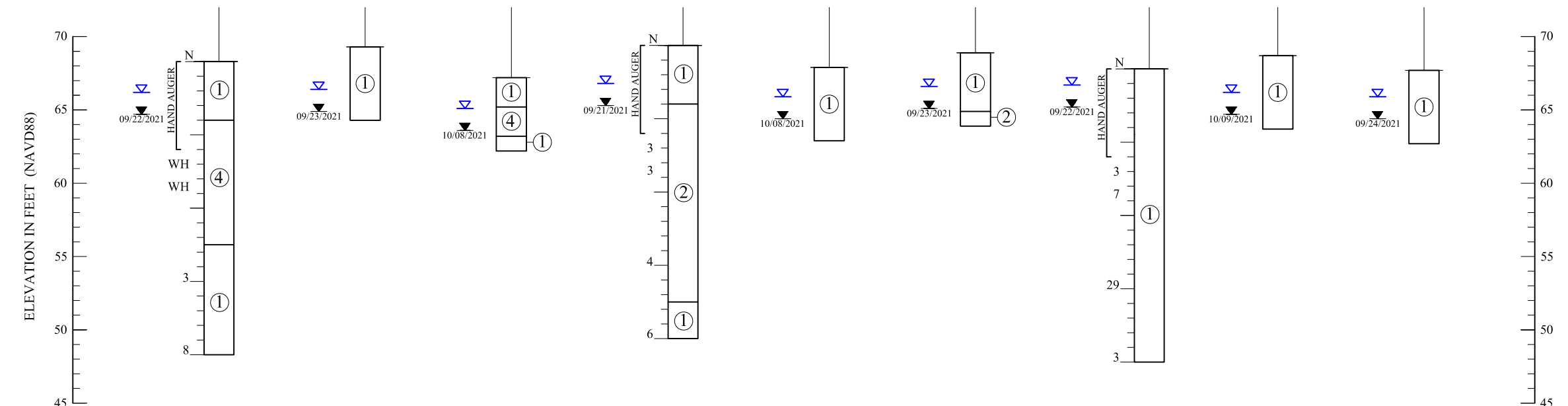
ORANGE COUNTY, FLORIDA		
ROAD NAME	COUNTY	CONTRACT NO.
CHULUOTA ROAD	ORANGE	Y20-830-CH

SHEET TITLE:	
REPORT OF ROADWAY BORINGS	
PROJECT NAME:	SHEET NO.
CHULUOTA ROAD ROADWAY CONCEPTUAL ANALYSIS (RCA)	

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

\\nadicserver\share\New Z Drive\Engineering\Geotechnical\Orlando\Roadway (RD)\2020\PR.GEO-RD20027 - Chuluota Road\Project Working File\Autocad

Boring No.:	AB-19	AB-20	AB-21	AB-22	AB-23	AB-24	AB-25	AB-26	AB-27
Approximate Latitude:	28°34'11.6"N	28°34'13.6"N	28°34'15.2"N	28°34'17.1"N	28°34'18.7"N	28°34'20.7"N	28°34'22.4"N	28°34'24.4"N	28°34'26.1"N
Approximate Longitude:	81°7'34.6"W	81°7'34.5"W	81°7'33.2"W	81°7'33.3"W	81°7'32.0"W	81°7'31.9"W	81°7'30.8"W	81°7'30.6"W	81°7'29.4"W
Approximate Elevation:	68.3'	69.3'	67.2'	69.4'	67.9'	68.9'	67.8'	68.7'	67.7'
Date Drilled:	09-22-2021	09-23-2021	09-24-2021	09-21-2021	09-24-2021	09-23-2021	09-22-2021	09-23-2021	09-24-2021



LEGEND

① Brown to gray fine SAND to fine SAND with silt/clay, occasionally with roots, limerock and shell fragments, (A-3)

② Brown to gray silty SAND, occasionally with roots and organics, (A-2-4)

③ Dark brown to dark gray organic silty SAND to organic sandy SILT, occasionally with roots, (A-8)

▼ Groundwater level encountered on date shown

▽ Estimated seasonal high groundwater level

(A-3) A.A.S.H.T.O.: Soil classification group symbol as determined by visual examination

WH Weight of hammer

Standard Penetration Test Data

N Standard penetration resistance in blows per foot (18" spoon ASTM D-1586)

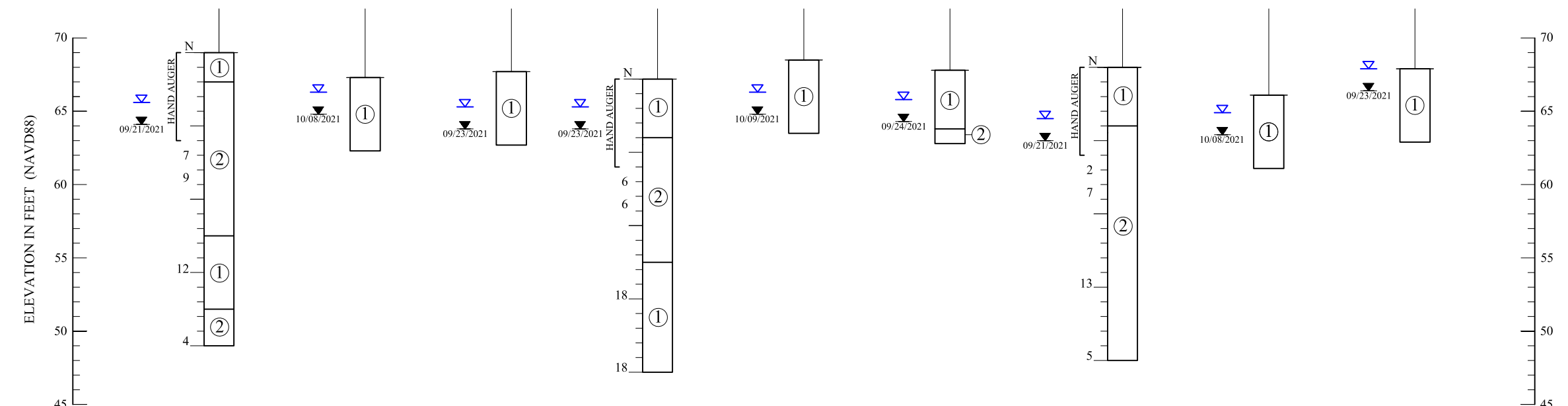
Spoon Inside Diameter 1 3/8 in.

Spoon Outside Diameter 2 in.

ASTM Standard Automatic Hammer

Hammer Weight 140 lbs.

Boring No.:	AB-28	AB-29	AB-30	AB-31	AB-32	AB-33	AB-34	AB-35	AB-36
Approximate Latitude:	28°34'28.1"N	28°34'29.8"N	28°34'31.7"N	28°34'33.4"N	28°34'35.4"N	28°34'37.1"N	28°34'39.1"N	28°34'40.8"N	28°34'42.8"N
Approximate Longitude:	81°7'29.3"W	81°7'28.1"W	81°7'28.0"W	81°7'26.8"W	81°7'26.7"W	81°7'25.5"W	81°7'25.4"W	81°7'24.2"W	81°7'24.1"W
Approximate Elevation:	69.0'	67.3'	68.7'	67.2'	68.5'	67.8'	68.0'	66.1'	67.9'
Date Drilled:	09-21-2021	09-24-2021	09-23-2021	09-23-2021	09-23-2021	09-24-2021	09-21-2021	09-24-2021	09-23-2021



- NOTES**
- Standard Penetration Test borings were performed in accordance with ASTM D-1586. Standard Penetration Resistance are shown on the borings at the test depths in blows per foot unless otherwise noticed
 - Subsurface conditions shown on the boring do not represent conditions between boring locations. Actual conditions between the borings may vary from those shown.
 - Unified Soil Classifications shown on the boring are based on visual examination and limited laboratory testing

GRANULAR MATERIALS	
RELATIVE DENSITY	SPT (BLOWS/FT.)
Very loose	Less than 3
Loose	3-7
Medium Dense	7-21
Dense	21-35
Very Dense	Greater than 35

SILTS AND CLAYS	
CONSISTENCY	SPT (BLOWS/FT.)
Very soft	Less than 1
Soft	1-3
Firm	3-6
Stiff	6-11
Very Stiff	11-21
Hard	Greater than 21

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

NAMES	DATES
Drawn by: MB	03-24-2022
Checked by: GNN	03-24-2022
Designed by: N/A	N/A
Checked by: N/A	N/A
Approved by: GNN	

ENGINEER OF RECORD:
NADIC ENGINEERING SERVICES, INC.
 601 N. HART BOULEVARD
 ORLANDO FL, 32818
 GODWIN N. NNADI, P.E. NO. 50637

ORANGE COUNTY, FLORIDA

ROAD NAME	COUNTY	CONTRACT NO.
CHULUOTA ROAD	ORANGE	Y20-830-CH

SHEET TITLE:
REPORT OF ROADWAY BORINGS

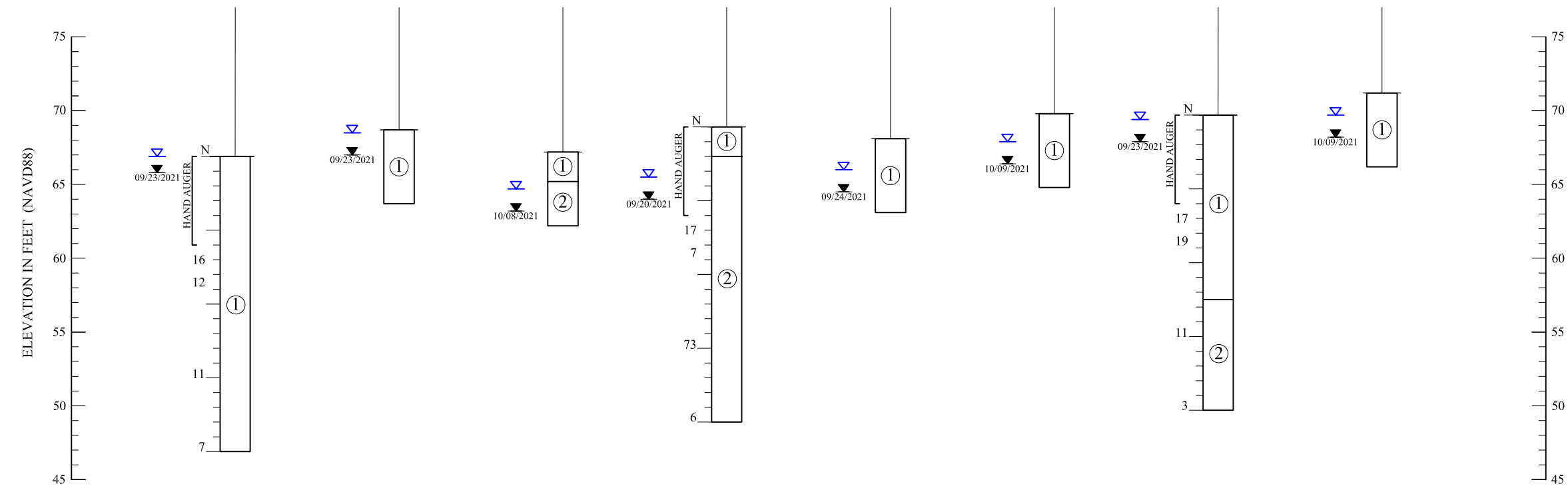
PROJECT NAME:
CHULUOTA ROAD ROADWAY CONCEPTUAL ANALYSIS (RCA)

SHEET NO.:

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

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Boring No.:	AB-37	AB-38	AB-39	AB-40	AB-41	AB-42	AB-43	AB-44
Approximate Latitude:	28°34'44.3"N	28°34'46.4"N	28°34'47.9"N	28°34'49.9"N	28°34'51.5"N	28°34'53.5"N	28°34'55.1"N	28°34'57.1"N
Approximate Longitude:	81°7'22.7"W	81°7'22.9"W	81°7'21.5"W	81°7'21.7"W	81°7'20.3"W	81°7'20.3"W	81°7'19.0"W	81°7'19.0"W
Approximate Elevation:	66.9'	68.7'	67.2'	68.9'	68.1'	69.8'	69.7'	71.2'
Date Drilled:	09-23-2021	09-23-2021	09-24-2021	09-20-2021	09-24-2021	09-23-2021	09-23-2021	09-17-2021



- LEGEND**
- ① Brown to gray fine SAND to fine SAND with silt/clay, occasionally with roots, limerock and shell fragments, (A-3)
 - ② Brown to gray silty SAND, occasionally with roots and organics, (A-2-4)
 - ▼ Groundwater level encountered on date shown
 - ▽ Estimated seasonal high groundwater level
 - (A-3) A.A.S.H.T.O.: Soil classification group symbol as determined by visual examination

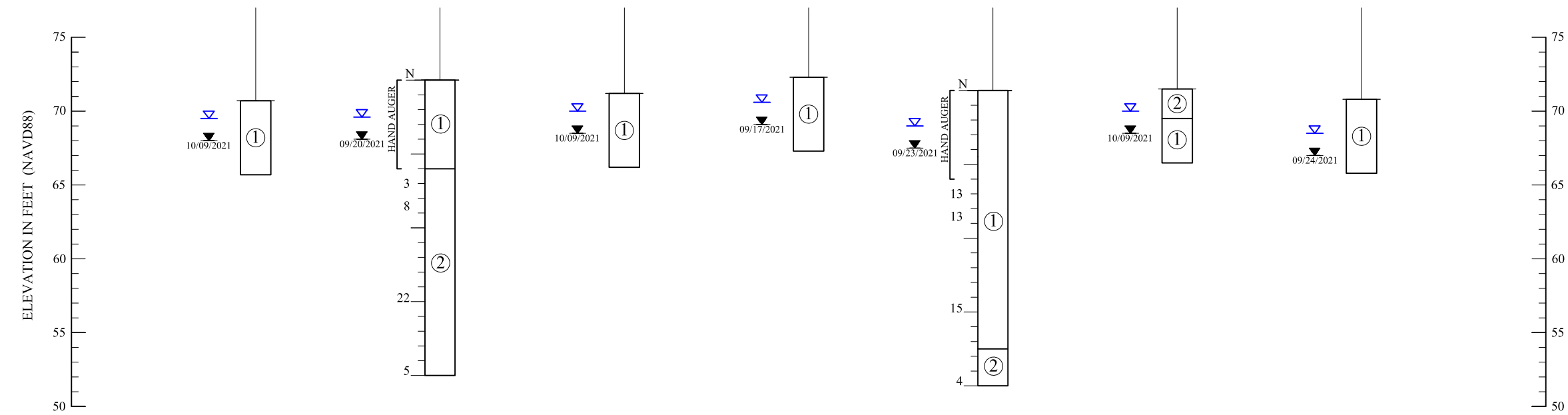
Standard Penetration Test Data

N Standard penetration resistance in blows per foot (18" spoon ASTM D-1586)

Spoon Inside Diameter 1 3/8 in.
 Spoon Outside Diameter 2 in.
 ASTM Standard Automatic Hammer
 Hammer Weight 140 lbs.

- NOTES**
- Standard Penetration Test borings were performed in accordance with ASTM D-1586. Standard Penetration Resistance are shown on the borings at the test depths in blows per foot unless otherwise noticed
 - Subsurface conditions shown on the boring do not represent conditions between boring locations. Actual conditions between the borings may vary from those shown.
 - Unified Soil Classifications shown on the boring are based on visual examination and limited laboratory testing

Boring No.:	AB-45	AB-46	AB-47	AB-48	AB-49	AB-50	AB-51
Approximate Latitude:	28°34'58.7"N	28°35'0.7"N	28°35'2.4"N	28°35'4.4"N	28°35'6.1"N	28°35'8.1"N	28°35'9.7"N
Approximate Longitude:	81°7'17.7"W	81°7'17.7"W	81°7'16.5"W	81°7'16.4"W	81°7'15.2"W	81°7'15.1"W	81°7'13.8"W
Approximate Elevation:	70.7'	72.1'	71.2'	72.3'	71.4'	71.5'	70.8'
Date Drilled:	09-24-2021	09-20-2021	09-24-2021	09-17-2021	09-23-2021	09-17-2021	09-24-2021



GRANULAR MATERIALS	
RELATIVE DENSITY	SPT (BLOWS/FT.)
Very loose	Less than 3
Loose	3-7
Medium Dense	7-21
Dense	21-35
Very Dense	Greater than 35

SILTS AND CLAYS	
CONSISTENCY	SPT (BLOWS/FT.)
Very soft	Less than 1
Soft	1-3
Firm	3-6
Stiff	6-11
Very Stiff	11-21
Hard	Greater than 21

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

NAMES	DATES
Drawn by: MB	03-24-2022
Checked by: GNN	03-24-2022
Designed by: N/A	N/A
Checked by: N/A	N/A
Approved by: GNN	

ENGINEER OF RECORD:
NADIC ENGINEERING SERVICES, INC.
 601 N. HART BOULEVARD
 ORLANDO FL, 32818
 GODWIN N. NNADI, P.E. NO. 50637



ORANGE COUNTY, FLORIDA		
ROAD NAME	COUNTY	CONTRACT NO.
CHULUOTA ROAD	ORANGE	Y20-830-CH

SHEET TITLE: REPORT OF ROADWAY BORINGS	
PROJECT NAME: CHULUOTA ROAD ROADWAY CONCEPTUAL ANALYSIS (RCA)	
SHEET NO.	

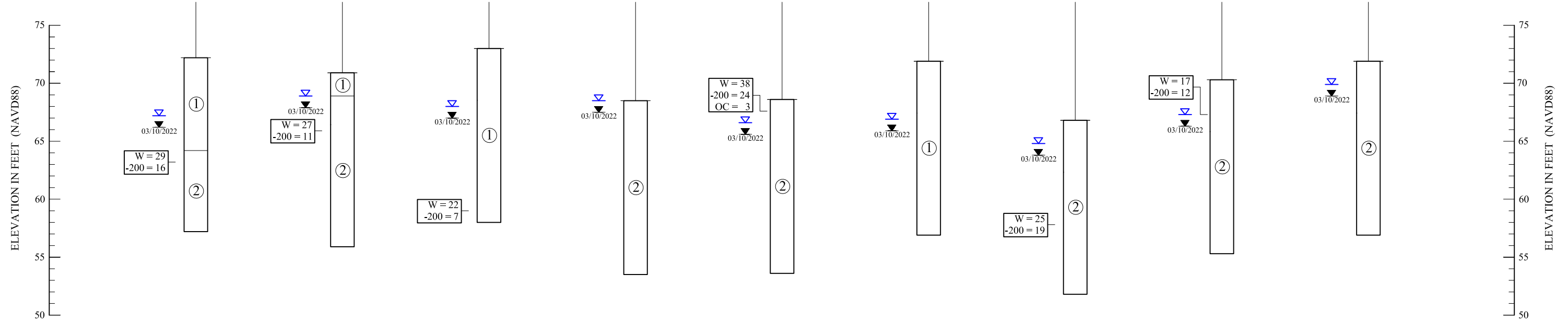
THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

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- LEGEND**
- ① Brown to gray fine SAND to fine SAND with silt/clay, occasionally with roots, limerock and shell fragments, (A-3)
 - ② Brown to gray silty SAND, occasionally with roots and organics, (A-2-4)
- | | |
|--------|---|
| W = | Natural Moisture Content (%) (FM 1-T265) |
| -200 = | Percent Passing No. 200 US Standard Sieve (%) (FM-T088) |
| OC = | Liquid Limit (%) (FM 1-T089) |
- ▼_{03/10/2022} Groundwater level encountered on date shown
 - ▽ Estimated seasonal high groundwater level
 - (A-3) A.A.S.H.T.O.: Soil classification group symbol as determined by visual examination

Boring No.:	P-1	P-2	P-6	P-7	P-8	P-9	P-10	P-12	P-13
Approximate Latitude:	28°33'39.6"N	28°33'56.2"N	28°35'2.8"N	28°35'2.8"N	28°35'7.8"N	28°35'13.6"N	28°35'13.2"N	28°33'57.5"N	28°33'57.2"N
Approximate Longitude:	81°7'44.0"W	81°7'38.6"W	81°7'18.5"W	81°7'13.1"W	81°7'3.4"W	81°7'14.9"W	81°7'9.5"W	81°7'41.8"W	81°7'41.9"W
Elevation:	72.2'	70.9'	73.0'	68.5'	68.6'	71.9'	66.8'	70.3'	71.9'
Date Drilled:	03-10-2022	03-10-2022	03-10-2022	03-10-2022	03-10-2022	03-10-2022	03-10-2022	03-10-2022	03-10-2022



REVISIONS						NAMES		DATES		ORANGE COUNTY, FLORIDA			SHEET TITLE:		
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	Drawn by:	Checked by:	Designed by:	Checked by:	Approved by:	ROAD NAME	COUNTY	CONTRACT NO.	PROJECT NAME:	SHEET NO.
						MB	GNN	N/A	N/A	GNN	CHULUOTA ROAD	ORANGE	Y20-830-CH	CHULUOTA ROAD ROADWAY CONCEPTUAL ANALYSIS (RCA)	

ENGINEER OF RECORD:
NADIC ENGINEERING SERVICES, INC.
 601 N. HART BOULEVARD
 ORLANDO FL, 32818
 GODWIN N. NNADI, P.E. NO. 50637



ORANGE COUNTY, FLORIDA
 ROAD NAME: CHULUOTA ROAD
 COUNTY: ORANGE
 CONTRACT NO.: Y20-830-CH

SHEET TITLE:
 REPORT OF POND BORINGS
PROJECT NAME:
 CHULUOTA ROAD ROADWAY CONCEPTUAL ANALYSIS (RCA)
SHEET NO.:

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

APPENDIX C

Selected Laboratory Test Graphs

SIEVE ANALYSIS REPORT

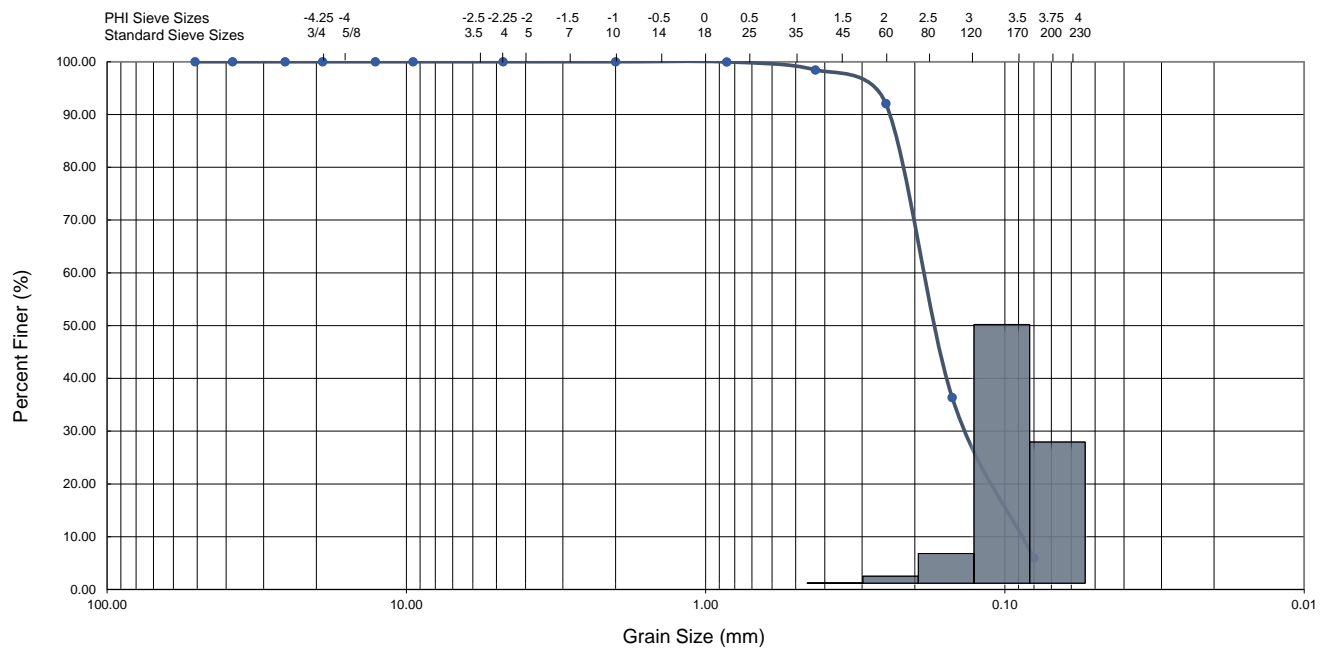
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: AB-2 (2-4')
 Test Date: 9/29/2021

Analyzed By: NADIC
 Engineer: MB
 Date: 10/6/2021

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.00	0.00	0.00	0.00	100.00
10	-1.00	2.00	0.00	0.00	0.00	0.00	100.00
20	0.23	0.85	0.12	0.04	0.12	0.04	99.96
40	1.22	0.43	5.16	1.51	5.28	1.55	98.45
60	2.00	0.25	21.85	6.40	27.13	7.94	92.06
100	2.74	0.15	190.27	55.70	217.40	63.64	36.36
200	3.64	0.08	103.87	30.41	321.27	94.05	5.95
PAN			0.25		321.52	YES	0.00

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
405.86	341.61	321.52	0.25	0.000	5.95	19	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
2.67 (Phi)	2.55 (Phi)	0.29	1.02	0.29 (Phi)	D ₁₀ = 0.087 D ₅₀ = 0.17	C _u = D ₆₀ /D ₁₀ C _u = 2.07	AASHTO: A-3
0.16 (mm)	0.17 (mm)			0.82 (mm)	D ₃₀ = 0.14 D ₆₀ = 0.18	C _c = (D ₃₀) ² / (D ₁₀ * D ₆₀) C _c = 1.25	

SIEVE ANALYSIS REPORT

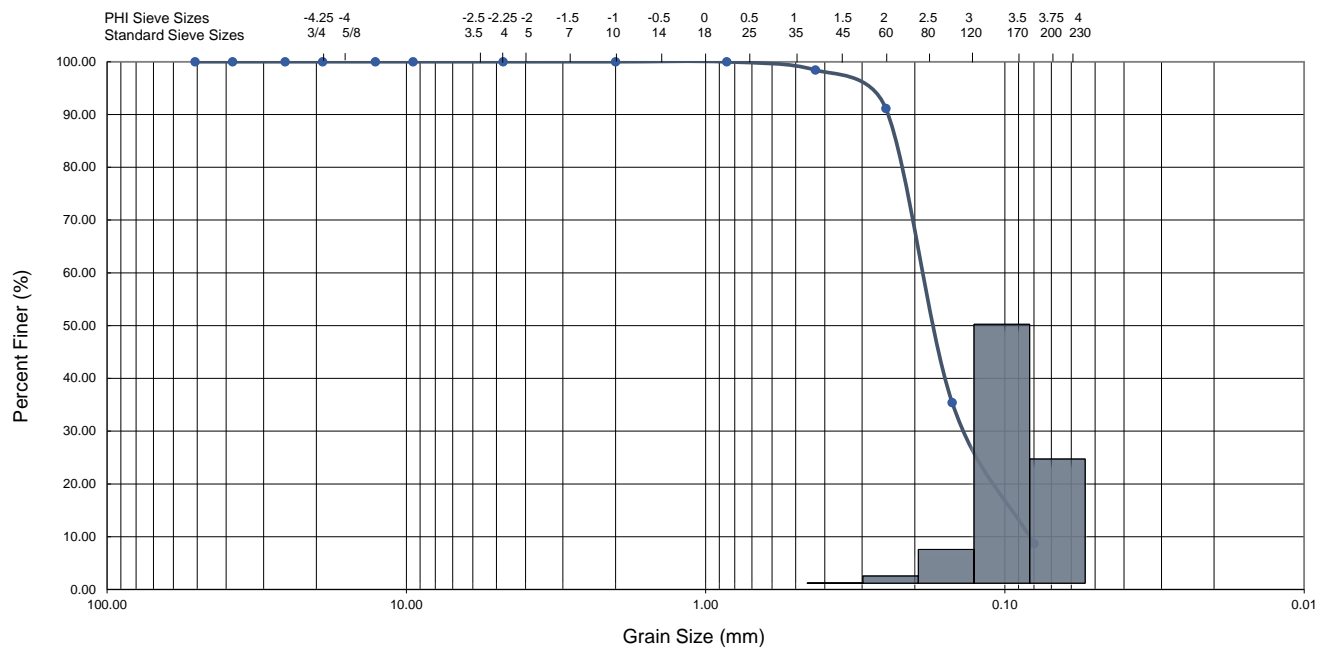
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: AB-6 (2-4')
 Test Date: 9/29/2021

Analyzed By: NADIC
 Engineer: MB
 Date: 10/6/2021

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.00	0.00	0.00	0.00	100.00
10	-1.00	2.00	0.00	0.00	0.00	0.00	100.00
20	0.23	0.85	0.05	0.03	0.05	0.03	99.97
40	1.22	0.43	2.90	1.55	2.95	1.58	98.42
60	2.00	0.25	13.64	7.28	16.59	8.86	91.14
100	2.74	0.15	104.39	55.74	120.98	64.60	35.40
200	3.64	0.08	50.04	26.72	171.02	91.32	8.68
PAN			0.30		171.32	YES	0.00

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
237.96	187.27	171.32	0.30	0.000	8.68	27	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
2.68 (Phi)	2.52 (Phi)	0.34	1.07	0.31 (Phi)	D ₁₀ = 0.082 D ₅₀ = 0.16	C _u = D ₆₀ /D ₁₀ C _u = 2.20	AASHTO: A-3
0.16 (mm)	0.17 (mm)			0.81 (mm)	D ₃₀ = 0.14 D ₆₀ = 0.18	C _c = (D ₃₀) ² / (D ₁₀ * D ₆₀) C _c = 1.33	

SIEVE ANALYSIS REPORT

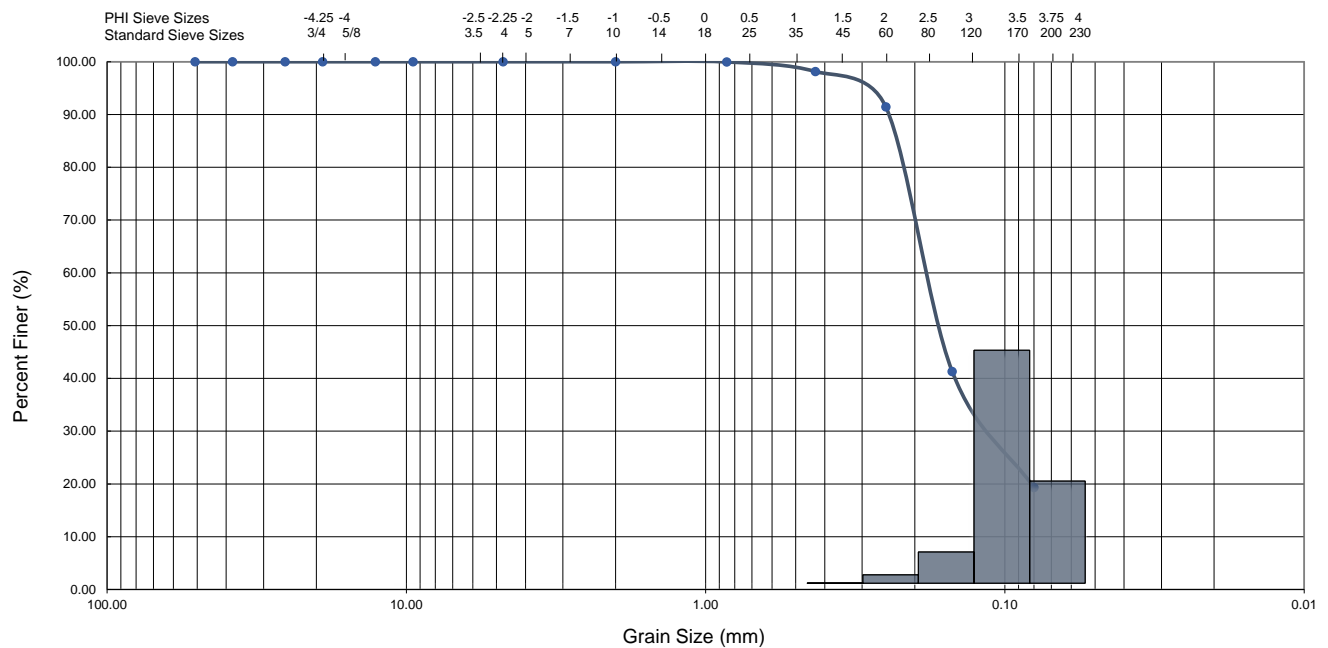
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: AB-10 (4-6')
 Test Date: 9/29/2021

Analyzed By: NADIC
 Engineer: MB
 Date: 10/6/2021

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.00	0.00	0.00	0.00	100.00
10	-1.00	2.00	0.00	0.00	0.00	0.00	100.00
20	0.23	0.85	0.05	0.04	0.05	0.04	99.96
40	1.22	0.43	2.43	1.82	2.48	1.85	98.15
60	2.00	0.25	8.98	6.71	11.46	8.56	91.44
100	2.74	0.15	67.10	50.13	78.56	58.70	41.30
200	3.64	0.08	29.43	21.99	107.99	80.69	19.31
PAN			0.19		108.18	YES	0.00

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
171.45	133.84	108.18	0.19	0.000	19.31	28	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
2.85 (Phi)	2.59 (Phi)	0.42	0.91	0.41 (Phi)	D ₁₀ = D ₃₀ = 0.12	D ₅₀ = 0.16 D ₆₀ = 0.18 C _u = C _c =	AASHTO: A-2-4

SIEVE ANALYSIS REPORT

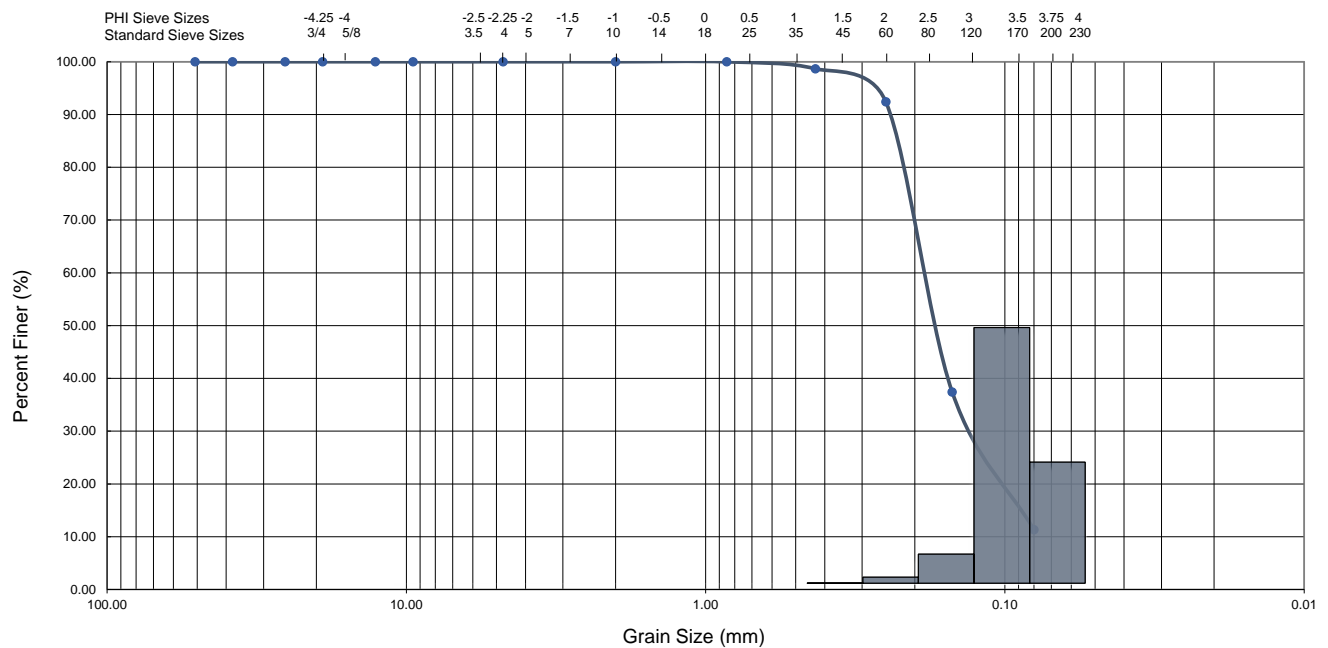
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: AB-13 (2-4')
 Test Date: 9/29/2021

Analyzed By: NADIC
 Engineer: MB
 Date: 10/6/2021

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.00	0.00	0.00	0.00	100.00
10	-1.00	2.00	0.00	0.00	0.00	0.00	100.00
20	0.23	0.85	0.05	0.02	0.05	0.02	99.98
40	1.22	0.43	3.32	1.31	3.37	1.33	98.67
60	2.00	0.25	15.87	6.26	19.24	7.59	92.41
100	2.74	0.15	139.38	55.00	158.62	62.60	37.40
200	3.64	0.08	66.04	26.06	224.66	88.66	11.34
PAN			0.32		224.98	YES	0.00

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
326.72	253.40	224.98	0.32	0.000	11.34	29	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
2.73 (Phi)	2.56 (Phi)	0.36	0.98	0.34 (Phi)	D ₁₀ = D ₃₀ = 0.13	C _u = D ₆₀ /D ₁₀ C _c = (D ₃₀) ² /(D ₁₀ *D ₆₀)	AASHTO: A-2-4
0.15 (mm)	0.17 (mm)			0.79 (mm)	D ₅₀ = 0.17 D ₆₀ = 0.18	Cu = Cc =	

SIEVE ANALYSIS REPORT

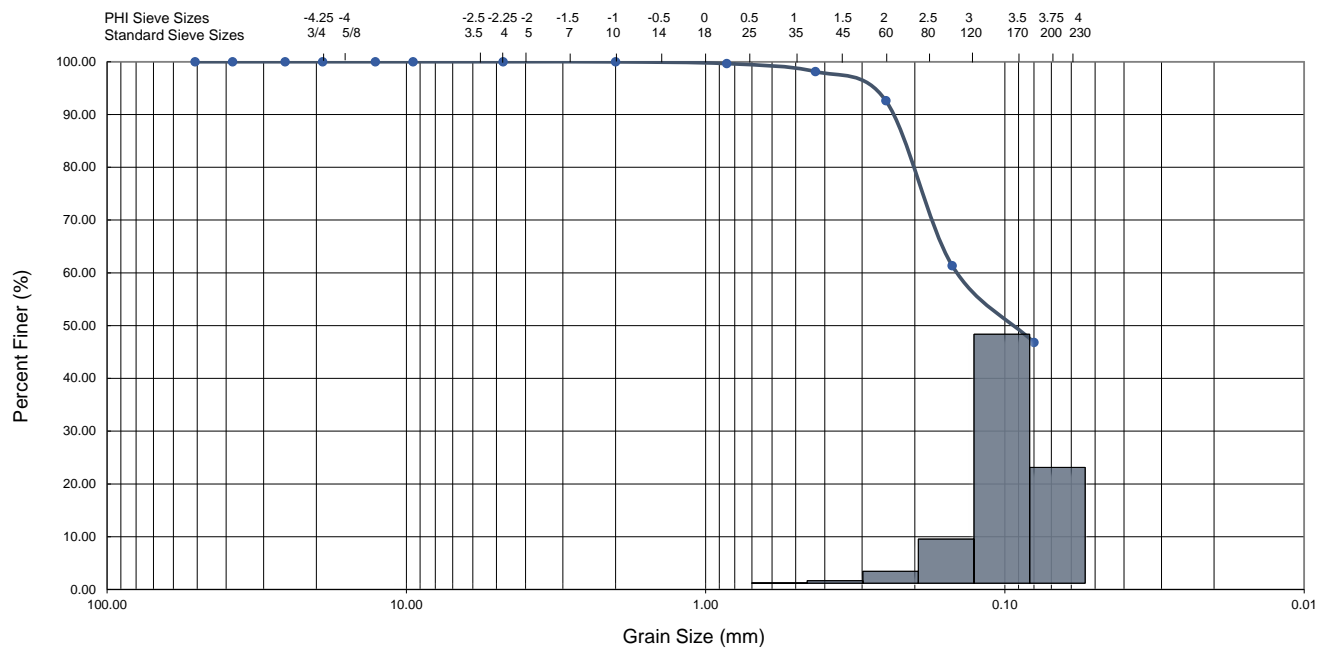
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: AB-19 (4-6')
 Test Date: 9/29/2021

Analyzed By: NADIC
 Engineer: MB
 Date: 10/6/2021

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.00	0.00	0.00	0.00	100.00
10	-1.00	2.00	0.02	0.02	0.02	0.02	99.98
20	0.23	0.85	0.27	0.33	0.29	0.35	99.65
40	1.22	0.43	1.23	1.50	1.52	1.86	98.14
60	2.00	0.25	4.52	5.53	6.04	7.39	92.61
100	2.74	0.15	25.55	31.25	31.59	38.64	61.36
200	3.64	0.08	11.89	14.54	43.48	53.19	46.81
PAN			0.10		43.58	YES	0.00

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
185.74	81.75	43.58	0.10	0.000	46.81	127	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
1.88 (Phi)	3.42 (Phi)	2.37	0.32	-0.56 (Phi)	D ₁₀ = D ₃₀ =	C _u = D ₆₀ /D ₁₀ C _c = (D ₃₀) ² /(D ₁₀ *D ₆₀)	AASHTO: A-8
0.27 (mm)	0.09 (mm)			1.47 (mm)	D ₅₀ = 0.09 D ₆₀ = 0.14	Cu = Cc =	

SIEVE ANALYSIS REPORT

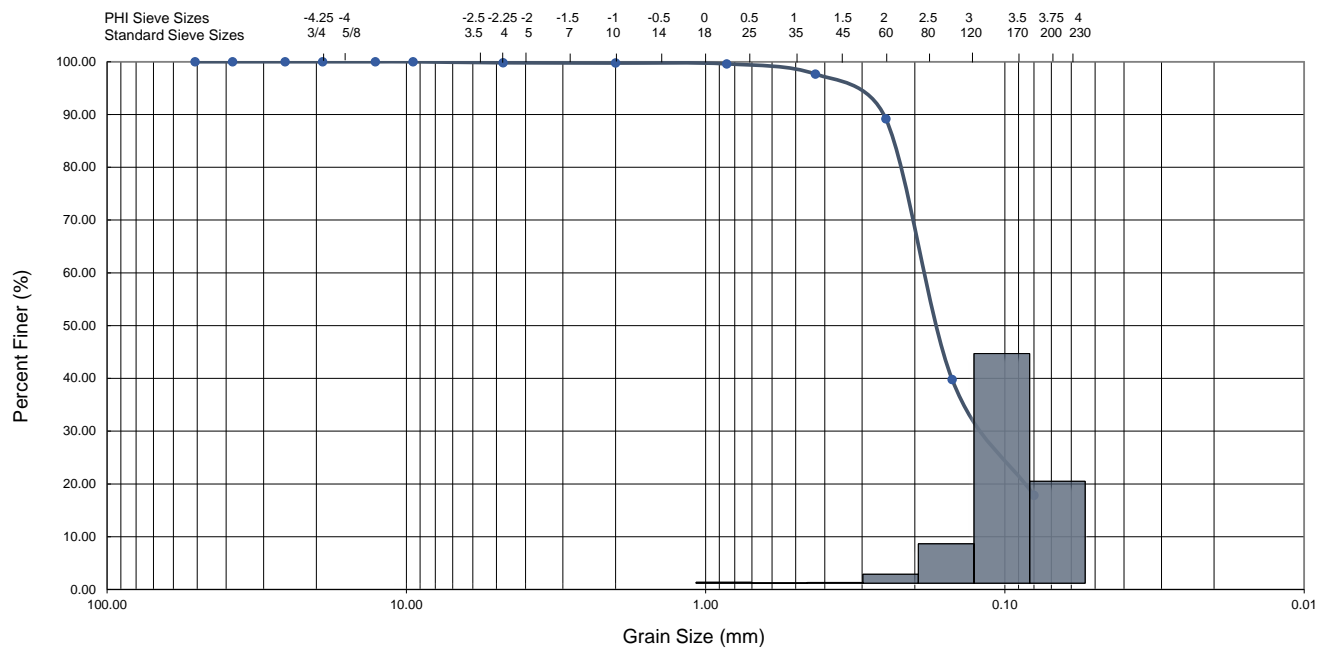
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: AB-21 (2-4')
 Test Date: 9/29/2021

Analyzed By: NADIC
 Engineer: MB
 Date: 10/6/2021

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.25	0.19	0.25	0.19	99.81
10	-1.00	2.00	0.07	0.05	0.32	0.25	99.75
20	0.23	0.85	0.20	0.15	0.52	0.40	99.60
40	1.22	0.43	2.51	1.94	3.03	2.34	97.66
60	2.00	0.25	11.00	8.48	14.03	10.82	89.18
100	2.74	0.15	64.08	49.41	78.11	60.23	39.77
200	3.64	0.08	28.46	21.95	106.57	82.18	17.82
PAN			0.11		106.68	YES	0.00

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
174.52	129.68	106.68	0.11	0.000	17.82	35	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
2.80 (Phi)	2.56 (Phi)	0.38	1.01	0.41 (Phi)	D ₁₀ = D ₃₀ = 0.12	C _u = D ₆₀ /D ₁₀ C _c = (D ₃₀) ² /(D ₁₀ *D ₆₀)	AASHTO: A-8
0.14 (mm)	0.17 (mm)			0.76 (mm)	D ₅₀ = 0.17 D ₆₀ = 0.18	Cu = Cc =	

SIEVE ANALYSIS REPORT

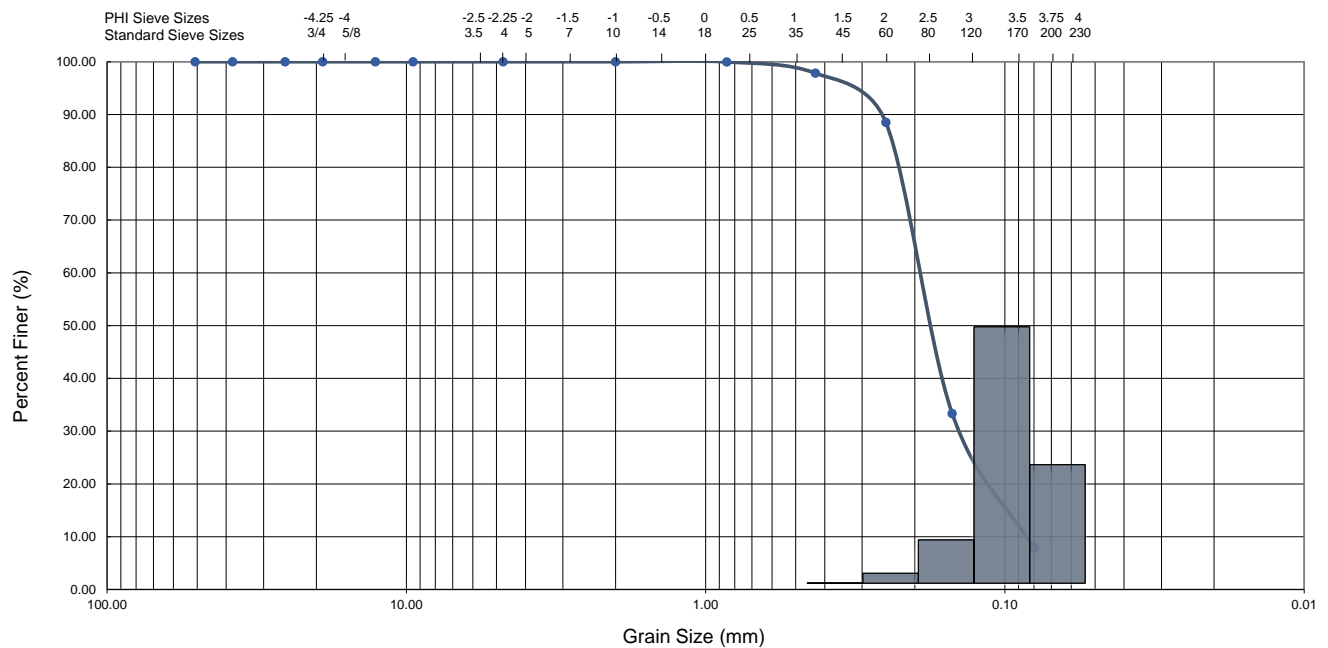
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: AB-24 (2-4')
 Test Date: 9/29/2021

Analyzed By: NADIC
 Engineer: MB
 Date: 10/6/2021

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.00	0.00	0.00	0.00	100.00
10	-1.00	2.00	0.00	0.00	0.00	0.00	100.00
20	0.23	0.85	0.06	0.03	0.06	0.03	99.97
40	1.22	0.43	3.82	2.13	3.88	2.16	97.84
60	2.00	0.25	16.73	9.33	20.61	11.49	88.51
100	2.74	0.15	98.99	55.18	119.60	66.66	33.34
200	3.64	0.08	45.75	25.50	165.35	92.16	7.84
PAN			0.20		165.55	YES	0.00

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
203.70	179.41	165.55	0.20	0.000	7.84	14	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
2.63 (Phi)	2.50 (Phi)	0.26	1.18	0.31 (Phi)	D ₁₀ = 0.084 D ₅₀ = 0.18	C _u = D ₆₀ /D ₁₀ C _u = 2.26	AASHTO: A-3
0.16 (mm)	0.18 (mm)			0.81 (mm)	D ₃₀ = 0.15 D ₆₀ = 0.19	C _c = (D ₃₀) ² / (D ₁₀ * D ₆₀) C _c = 1.41	

SIEVE ANALYSIS REPORT

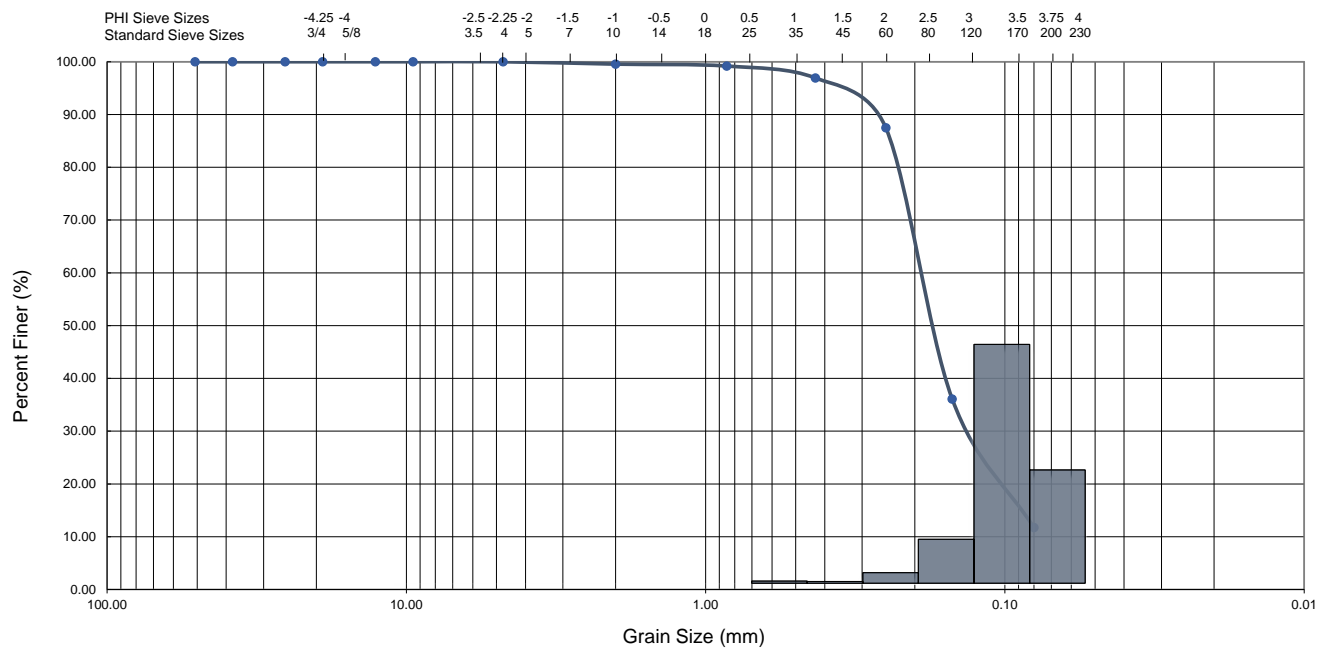
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: AB-28 (2-4')
 Test Date: 10/6/2021

Analyzed By: NADIC
 Engineer: MB
 Date: 10/6/2021

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.00	0.00	0.00	0.00	100.00
10	-1.00	2.00	0.69	0.45	0.69	0.45	99.55
20	0.23	0.85	0.55	0.36	1.24	0.81	99.19
40	1.22	0.43	3.45	2.26	4.69	3.08	96.92
60	2.00	0.25	14.40	9.44	19.09	12.52	87.48
100	2.74	0.15	78.36	51.39	97.45	63.91	36.09
200	3.64	0.08	37.16	24.37	134.61	88.28	11.72
PAN			0.09		134.70	YES	0.00

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
177.98	152.48	134.7	0.09	0.000	11.72	17	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
2.70 (Phi)	2.51 (Phi)	0.29	1.14	0.35 (Phi)	D ₁₀ = 0.17 D ₃₀ = 0.14	C _u = D ₆₀ /D ₁₀ C _c = (D ₃₀) ² /(D ₁₀ *D ₆₀)	AASHTO: A-2-4
0.15 (mm)	0.18 (mm)			0.78 (mm)	D ₆₀ = 0.19	Cu = Cc =	

SIEVE ANALYSIS REPORT

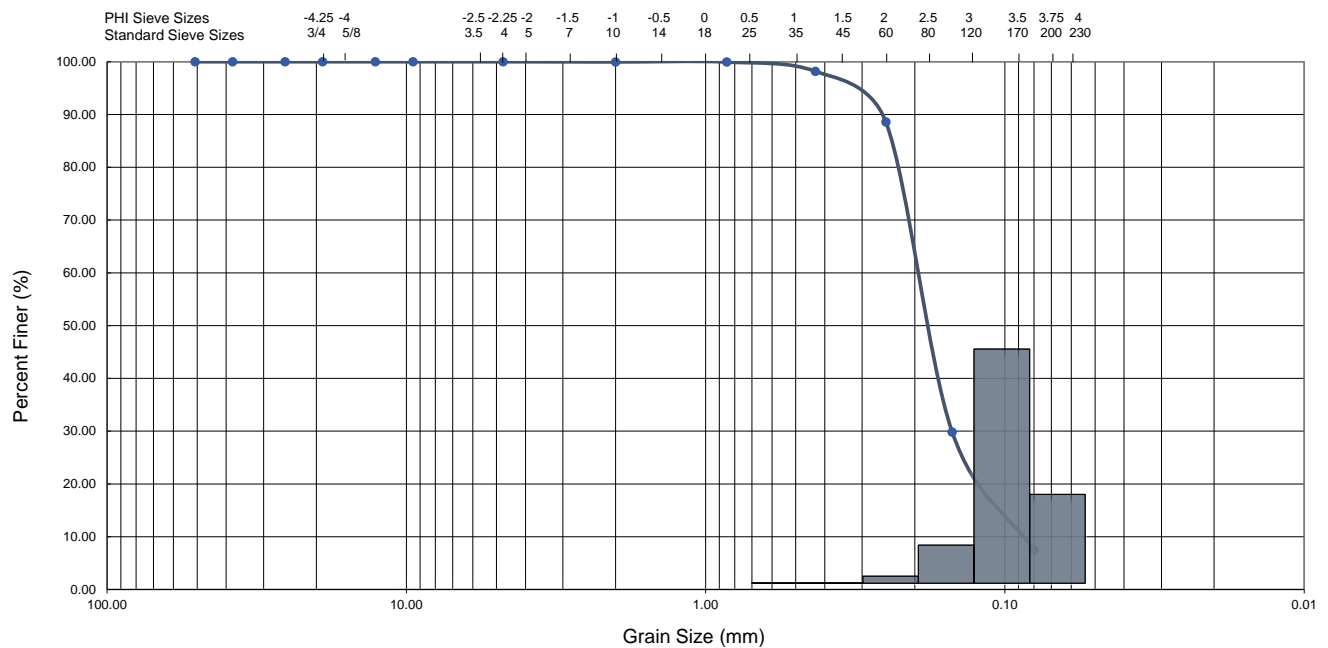
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: AB-32 (2-4')
 Test Date: 10/6/2021

Analyzed By: NADIC
 Engineer: MB
 Date: 10/6/2021

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.00	0.00	0.00	0.00	100.00
10	-1.00	2.00	0.09	0.03	0.09	0.03	99.97
20	0.23	0.85	0.06	0.02	0.15	0.06	99.94
40	1.22	0.43	4.59	1.76	4.74	1.82	98.18
60	2.00	0.25	25.00	9.58	29.74	11.40	88.60
100	2.74	0.15	153.43	58.79	183.17	70.19	29.81
200	3.64	0.08	58.21	22.31	241.38	92.50	7.50
PAN			0.26		241.64	YES	0.00

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
298.33	260.96	241.64	0.26	0.000	7.50	14	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
2.60 (Phi)	2.48 (Phi)	0.28	1.29	0.28 (Phi)	D ₁₀ = 0.086 D ₅₀ = 0.18	C _u = D ₆₀ /D ₁₀ C _u = 2.21	AASHTO: A-3
0.17 (mm)	0.18 (mm)			0.82 (mm)	D ₃₀ = 0.15 D ₆₀ = 0.19	C _c = (D ₃₀) ² /(D ₁₀ *D ₆₀) C _c = 1.38	



SIEVE ANALYSIS REPORT

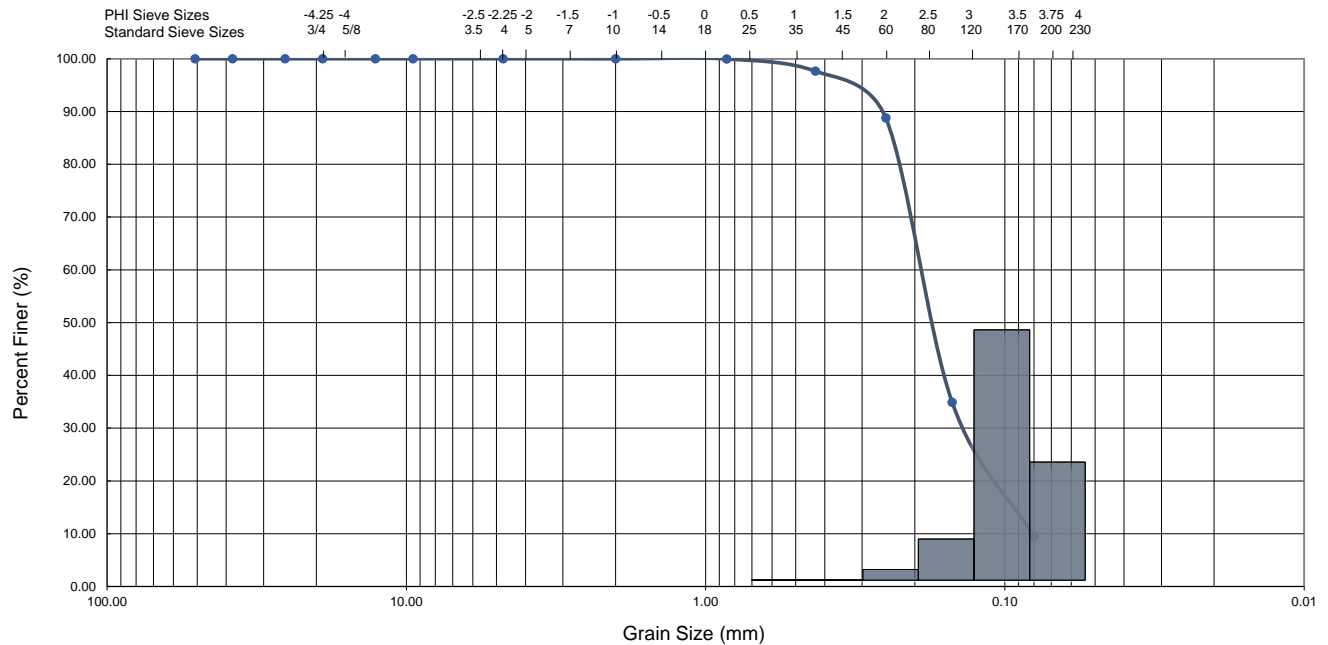
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: AB-36 (2-4')
 Test Date: 10/6/2021

Analyzed By: NADIC
 Engineer: MB
 Date: 10/6/2021

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.00	0.00	0.00	0.00	100.00
10	-1.00	2.00	0.03	0.01	0.03	0.01	99.99
20	0.23	0.85	0.07	0.03	0.10	0.04	99.96
40	1.22	0.43	5.17	2.31	5.27	2.36	97.64
60	2.00	0.25	19.83	8.87	25.10	11.23	88.77
100	2.74	0.15	120.47	53.89	145.57	65.12	34.88
200	3.64	0.08	56.82	25.42	202.39	90.54	9.46
PAN			0.13		202.52	YES	0.00

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
290.69	223.54	202.52	0.13	0.000	9.46	30	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
2.67 (Phi)	2.51 (Phi)	0.29	1.13	0.33 (Phi)	D ₁₀ = 0.08 D ₅₀ = 0.18	C _u = D ₆₀ /D ₁₀ C _u = 2.38	AASHTO: A-3
0.16 (mm)	0.18 (mm)			0.80 (mm)	D ₃₀ = 0.15 D ₆₀ = 0.19	C _c = (D ₃₀) ² /(D ₁₀ *D ₆₀) C _c = 1.48	

SIEVE ANALYSIS REPORT

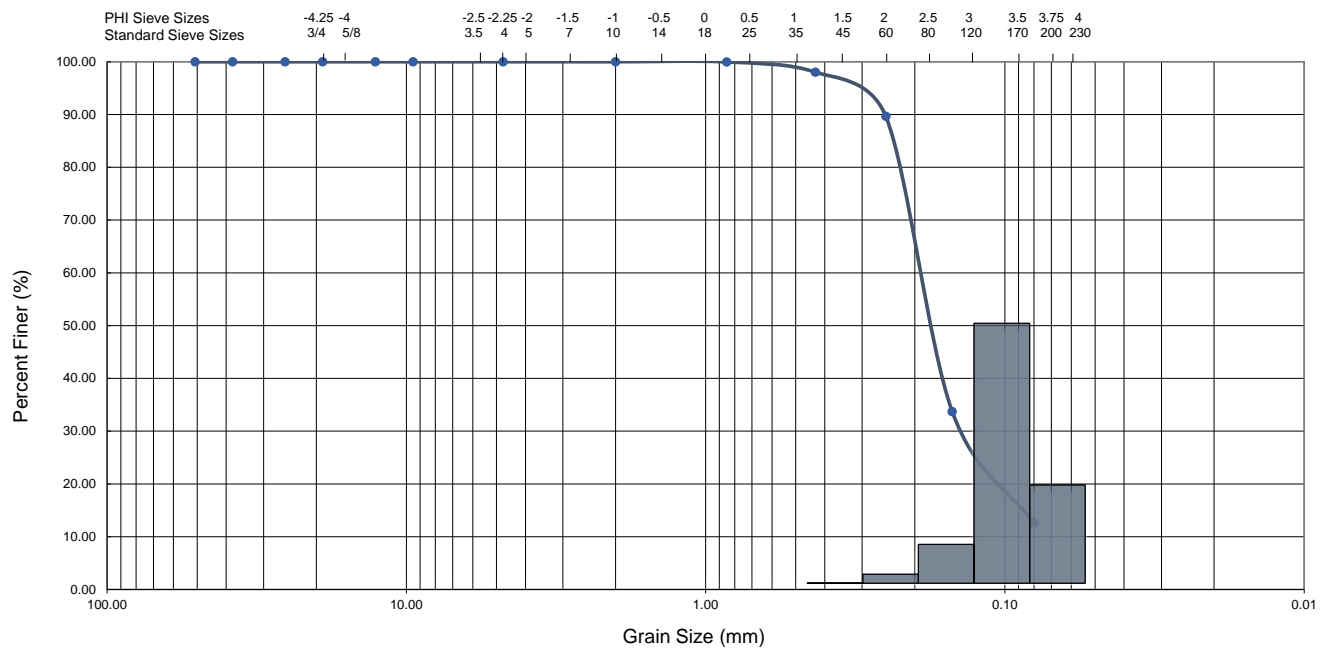
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: AB-39 (2-4')
 Test Date: 10/6/2021

Analyzed By: NADIC
 Engineer: MB
 Date: 10/6/2021

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.00	0.00	0.00	0.00	100.00
10	-1.00	2.00	0.00	0.00	0.00	0.00	100.00
20	0.23	0.85	0.10	0.04	0.10	0.04	99.96
40	1.22	0.43	5.14	1.94	5.24	1.98	98.02
60	2.00	0.25	22.13	8.37	27.37	10.35	89.65
100	2.74	0.15	147.89	55.92	175.26	66.27	33.73
200	3.64	0.08	55.95	21.16	231.21	87.43	12.57
PAN			0.22		231.43	YES	0.00

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
322.62	264.46	231.43	0.22	0.000	12.57	22	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
2.70 (Phi)	2.50 (Phi)	0.38	1.19	0.35 (Phi)	D ₁₀ = D ₃₀ = 0.14	C _u = D ₆₀ /D ₁₀ C _c = (D ₃₀) ² /(D ₁₀ *D ₆₀)	AASHTO: A-2-4
0.15 (mm)	0.18 (mm)			0.79 (mm)	D ₅₀ = 0.18 D ₆₀ = 0.19	Cu = Cc =	

SIEVE ANALYSIS REPORT

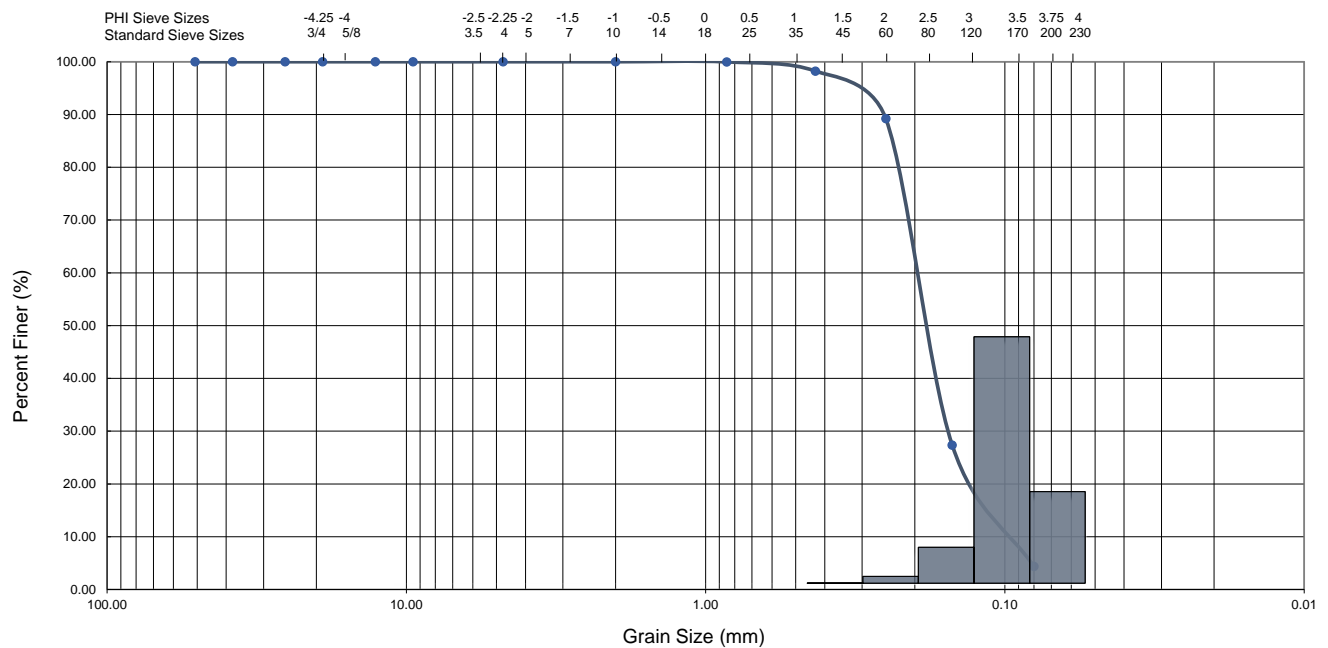
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: AB-46 (2-4')
 Test Date: 10/6/2021

Analyzed By: NADIC
 Engineer: MB
 Date: 10/6/2021

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.00	0.00	0.00	0.00	100.00
10	-1.00	2.00	0.00	0.00	0.00	0.00	100.00
20	0.23	0.85	0.07	0.03	0.07	0.03	99.97
40	1.22	0.43	4.13	1.74	4.20	1.77	98.23
60	2.00	0.25	21.41	9.02	25.61	10.79	89.21
100	2.74	0.15	146.88	61.86	172.49	72.65	27.35
200	3.64	0.08	54.60	23.00	227.09	95.64	4.36
PAN			0.12		227.21	YES	0.00

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
288.82	237.44	227.21	0.12	0.000	4.36	22	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
2.54 (Phi)	2.45 (Phi)	0.25	1.30	0.25 (Phi)	D ₁₀ = 0.1 D ₅₀ = 0.18	C _u = D ₆₀ /D ₁₀ C _u = 2	AASHTO: A-3
0.17 (mm)	0.18 (mm)			0.84 (mm)	D ₃₀ = 0.14 D ₆₀ = 0.2	C _c = (D ₃₀) ² / (D ₁₀ * D ₆₀) C _c = 0.98	

SIEVE ANALYSIS REPORT

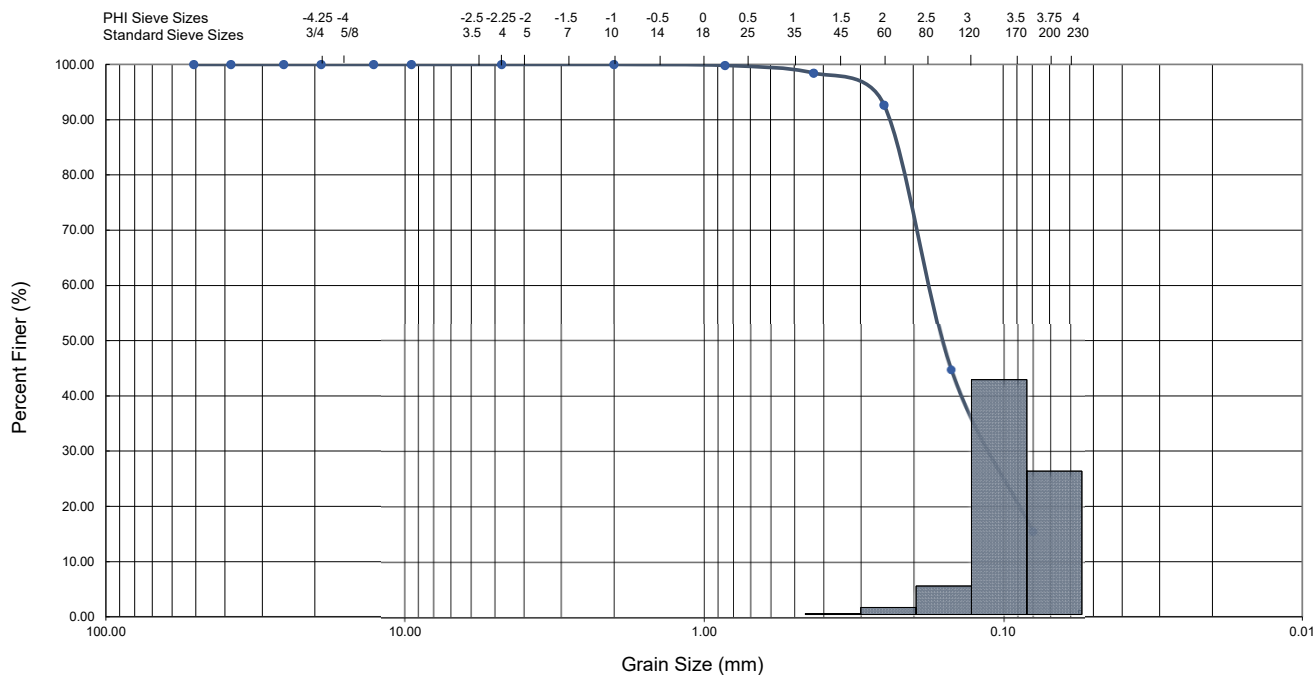
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: P-1 (8-10')
 Test Date: 3/11/2022

Analyzed By: NADIC
 Engineer: MB
 Date: 3/16/2022

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.00	0.00	0.00	0.00	100.00
10	-1.00	2.00	0.00	0.00	0.00	0.00	100.00
20	0.23	0.85	0.54	0.17	0.54	0.17	99.83
40	1.22	0.43	4.40	1.40	4.94	1.57	98.43
60	2.00	0.25	18.13	5.78	23.07	7.36	92.64
100	2.74	0.15	150.30	47.92	173.37	55.27	44.73
200	3.64	0.08	91.68	29.23	265.05	84.50	15.50
PAN			0.55		265.60	YES	0.000

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
404.54	313.66	265.6	0.55	0.000	15.50	29	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
2.81 (Phi)	2.63 (Phi)	0.34	0.86	0.37 (Phi)	D ₁₀ = N/A	C _u = D ₆₀ /D ₁₀	AASHTO: A-2-4
0.14 (mm)	0.16 (mm)			0.78 (mm)	D ₃₀ = 0.102	C _c = (D ₃₀) ² / (D ₁₀ * D ₆₀)	
					D ₆₀ = 0.17	C _u = N/A	
						C _c = N/A	

SIEVE ANALYSIS REPORT

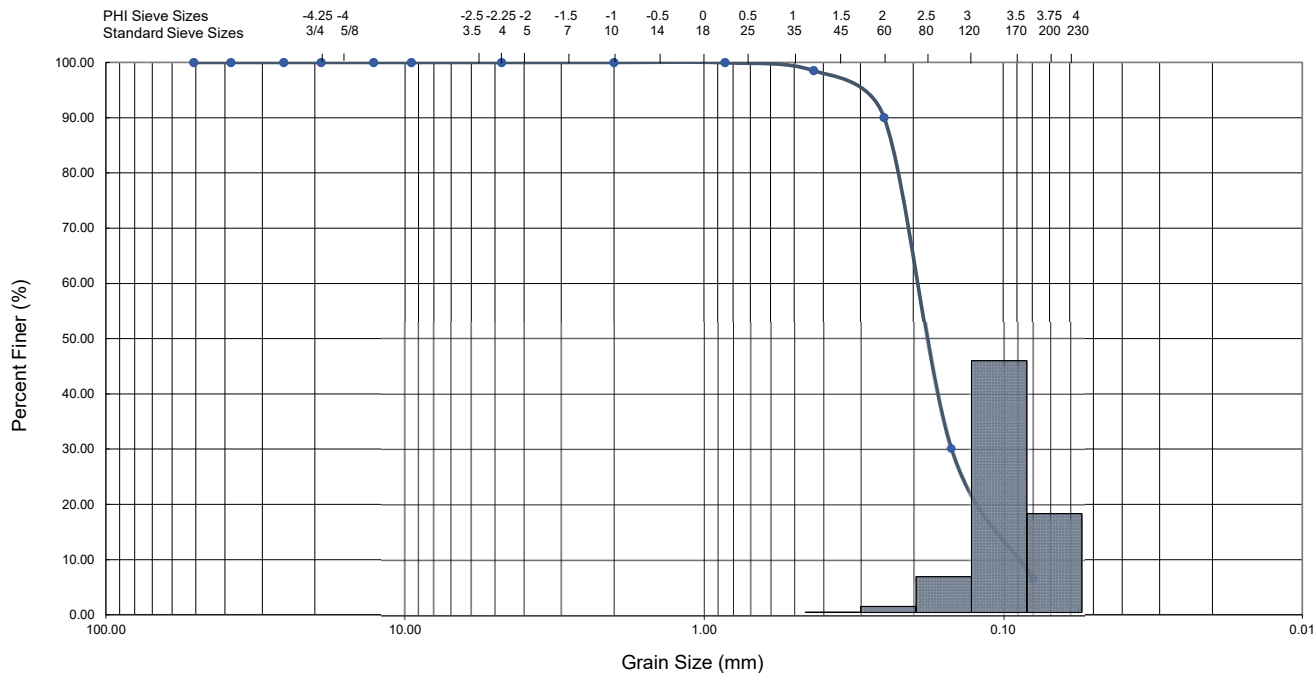
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: P-6 (13-15')
 Test Date: 3/11/2022

Analyzed By: NADIC
 Engineer: MB
 Date: 3/17/2022

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.00	0.00	0.00	0.00	100.00
10	-1.00	2.00	0.00	0.00	0.00	0.00	100.00
20	0.23	0.85	0.13	0.04	0.13	0.04	99.96
40	1.22	0.43	4.45	1.43	4.58	1.47	98.53
60	2.00	0.25	26.40	8.50	30.98	9.97	90.03
100	2.74	0.15	186.07	59.89	217.05	69.86	30.14
200	3.64	0.08	73.08	23.52	290.13	93.38	6.62
PAN			0.63		290.76	YES	0.000

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
378.23	310.70	290.76	0.63	0.000	6.62	22	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
2.60 (Phi)	2.48 (Phi)	0.30	1.25	0.28 (Phi)	D ₁₀ = 0.09	C _u = D ₆₀ /D ₁₀	AASHTO: A-3
0.16 (mm)	0.18 (mm)			0.83 (mm)	D ₃₀ = 0.15	D ₅₀ = 0.17	
					D ₆₀ = 0.19	C _u = 2.11	
						C _c = 1.32	

SIEVE ANALYSIS REPORT

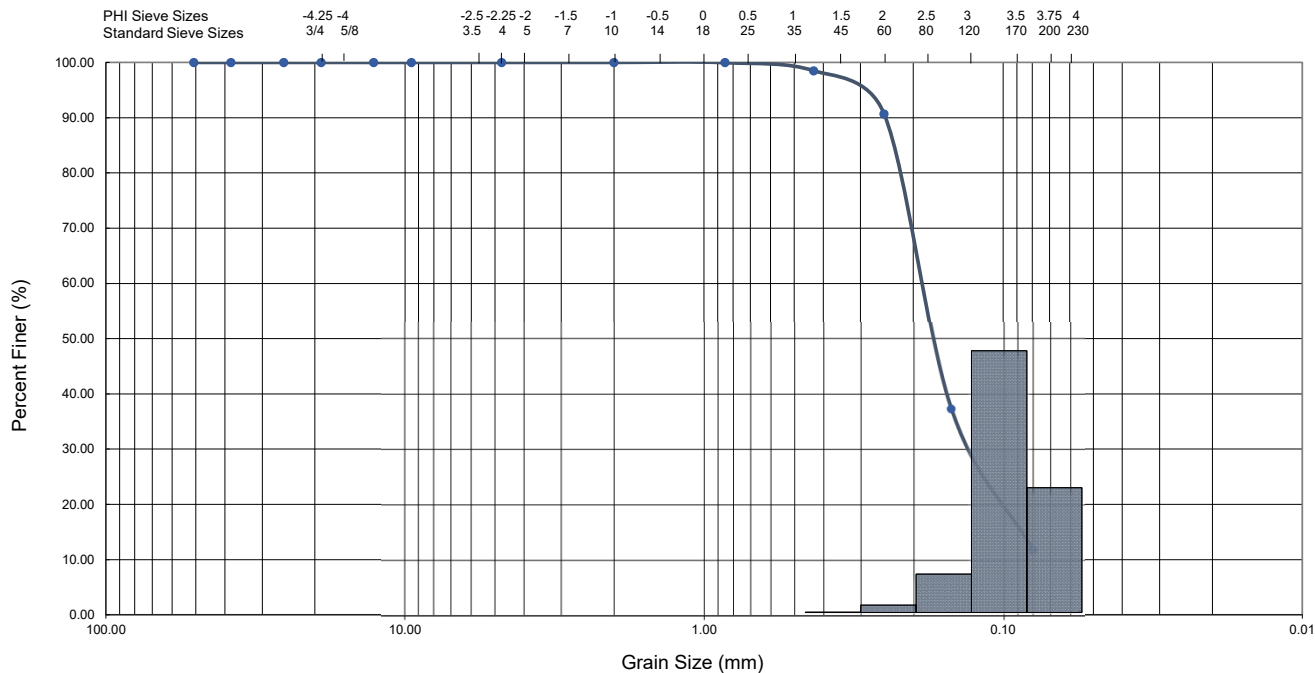
Project Name : Chuluota Rd
 Clients Contract No.: JMT
 Nadic Project No.: PR.GEO-RD20027

Sample ID: P-12 (2-4)
 Test Date: 3/11/2022

Analyzed By: NADIC
 Engineer: MB
 Date: 3/17/2022

Sieve Size	Sieve Size (Phi)	Sieve Size (mm)	Grams Retained	% Weight Retained	Cum. Grams Retained	Cumulative % Wt RET	Cum % Wt PASS
2	-5.67	50.80	0.00	0.00	0.00	0.00	100.00
1 1/2"	-5.25	38.10	0.00	0.00	0.00	0.00	100.00
1	-4.67	25.40	0.00	0.00	0.00	0.00	100.00
3/4"	-4.25	19.05	0.00	0.00	0.00	0.00	100.00
1/2"	-3.67	12.70	0.00	0.00	0.00	0.00	100.00
3/8"	-3.25	9.50	0.00	0.00	0.00	0.00	100.00
4	-2.25	4.75	0.00	0.00	0.00	0.00	100.00
10	-1.00	2.00	0.00	0.00	0.00	0.00	100.00
20	0.23	0.85	0.08	0.03	0.08	0.03	99.97
40	1.22	0.43	3.79	1.47	3.87	1.50	98.50
60	2.00	0.25	20.15	7.82	24.02	9.32	90.68
100	2.74	0.15	137.53	53.36	161.55	62.68	37.32
200	3.64	0.08	65.64	25.47	227.19	88.15	11.85
PAN			0.69		227.88	YES	0.000

Wet Wt:	Dry Wt:	Wash Wt:	Pan Ret:	Sieve Loss %:	Pass 200 %:	Moisture %	Munsell Color:
300.29	257.72	227.88	0.69	0.000	11.85	17	----



Gravel		Sand			Silt and Clay
Coarse	Fine	Coarse	Medium	Fine	

Mean	Median	Skew	Kurt	S.Deviation	Grain Size	Coefficients	Classification:
2.73 (Phi)	2.55 (Phi)	0.34	1.01	0.34 (Phi)	D ₁₀ = N/A	C _u = D ₆₀ /D ₁₀	AASHTO: A-2-4
0.15 (mm)	0.17 (mm)			0.79 (mm)	D ₃₀ = 0.13	D ₅₀ = 0.17	