BOARD OF COUNTY COMMISSIONERS
LAKE COUNTY, FLORIDA
OFFICE OF THE COUNTY MANAGER
AGENDA ITEM COVER SHEET

DATE: 09/25/2023
MEETING DATE: 10/24/2023
TO: Jennifer Barker, County Manager
ITEM TYPE: Consent Item
THRU:
ITEM ID: 27589
Fred Schneider, Assistant County Manager
BY: Deborah Marchese, Construction Program Supervisor
SUBJECT: Citrus Grove Road Phase 5

RECOMMENDATION/REQUIRED ACTION: Approve

Recommend approval:
1. To award the Citrus Grove Road Phase 5 construction project (Contract 23-562) to Southern Development & Construction Inc. (Oviedo, FL) for $6,944,777; and
2. Of a Purchase Agreement with SP-V Green Properties, LLC, 160 East Olentangy Street, Powell, Ohio 43065 for right of way associated with the paving of Citrus Grove Road Phase 5 for $100,000; and
3. To authorize Chairman to execute any necessary contracts and/or closing documents.

The estimated fiscal impact is $7,044,777 (expenditure - South Transportation Road Impact Fees) and is within, and will not exceed, the Fiscal Year 2024 Budget. Commission District 2.

BACKGROUND SUMMARY: The Citrus Grove Road Phase 5 roadway improvement project is to pave Citrus Grove Road / Fosgate Road from just west of Florida's Turnpike to just east of Blackstill Lake Road, near Clermont and Montverde. Additional right of way is needed from SP-V Green Properties, an adjacent property owner. SP-V Green Properties has agreed to sell the County 0.16 acres of right of way, 0.20 acres of grading easements and 0.07 acres of temporary construction easements to facilitate the paving of Citrus Grove Road. When constructed, the new 2-lane roadway will consist of 12-ft lanes, 4-ft bike lanes, curb and gutters, 12-ft trail and 5-ft sidewalks.

Furthermore, the Office of Procurement Services, in coordination with the Public Works Department, issued Invitation to Bid 23-562 for this project. Three responsive and responsible submittals were received. An evaluation completed by County staff confirmed that Southern Development & Construction Inc., was responsive to the terms and conditions of the Invitation to Bid with the lowest bid of $6,944,777 and staff recommends award to this contractor.

Fiscal Impact: $7,044,777 (expenditure)

Account No.:

Fund Name	Fund Number	Org Code	Object Code	Project Number	Amount
South Transportation Road Impact Fees	1157	5056670	860674		$7,044,777

Advertised Date: Paper:

Attachments:

1.	Vicinity Map
2.	Location Map
3.	Bid Comparison
4.	Other Bidders
5.	Purchase Agreement - Montverde School_Partially Executed

STAFF APPROVALS AND DATES:

Deborah Marchese	Created/Initiated - 9/25/2023
Miranda Lanoue	Approved - 9/25/2023
Jeffrey Earhart	Approved - 9/25/2023
Sandy Beckett	Approved - 9/25/2023
Fred Schneider	Approved - 9/25/2023
Ron Falanga	Approved - 9/27/2023
Allison Teslia	Approved - 9/28/2023
Melanie Marsh	Approved - 10/5/2023
Jennifer Barker	Approved - 10/5/2023
Misty Spahn	Final Approval - 10/11/2023

ACTION TAKEN BY BOARD:

Action: New Continued/Deferred Until:

Other:

BID NO. 23-562

BIDDING DOCUMENT

LAKE COUNTY
FLORIDA

INSTRUCTIONS TO BIDDERS, GENERAL CONDITIONS,
SPECIAL PROVISIONS AND TECHNICAL SPECIFICATIONS,
BID FORM, CONTRACT FORM, CONTRACT BOND FORM

FOR

CITRUS GROVE ROAD PHASE 5
PROJECT NO. 2023-08, BID NO. 23-562

ROADWAY CONSTRUCTION

Plans Prepared by: John R. Burkett, P.E., DRMP, Inc.

Design Division Contact: Osvaldo Nunez, Lake County Public Works

NOTE: Attach Your Bid Bond or Letter of Credit to This Document. All Extensions Must Be Carried Out. Any Changes Made in Unit Bid Prices Must Be Initialed by Bidder.

This Notice to be issued if a Pre Bid Conference is to be held.

NON-MANDATORY PRE-BID CONFERENCE NOTICE

BID NO. 23-562

CITRUS GROVE ROAD PHASE 5
PROJECT NO. 2023-08

In Lake County, Florida

Non-Mandatory Pre-Bid Conference

THE ATTENTION OF PROSPECTIVE BIDDERS IS DIRECTED TO THE NON-MANDATORY PRE-BID CONFERENCE TO BE CONDUCTED AT THE DATE, TIME AND PLACE INDICATED BELOW:

DATE: August 3, 2023
TIME: 9:00 a.m.

INTERESTED PARTIES CAN ATTEND VIA A TELECONFERENCE MEETING BY DIALING (321) 332-7400 AND ENTERING CONFERENCE NO. 706 860 307#

The County will point out specific job conditions which are difficult to describe or show on the Drawings. Questions that require additional clarification will be covered by an addendum which will be issued following the Non-Mandatory Pre-bid conference.

CONTRACT DOCUMENTS

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DIVISION A **INSTRUCTIONS TO BIDDERS**

DIVISION B **GENERAL CONDITIONS**

DIVISION A

INSTRUCTIONS TO BIDDERS

LAKE COUNTY TRANSPORTATION CONSTRUCTION PROGRAM

1. DEFINITIONS

Whenever the following terms, or pronouns used in place of them, are used in these Contract Documents, they shall have the meanings given below:

Addendum – A modification, revision or clarification of the Plans or other Contract Documents, issued by the Engineer and distributed to prospective bidders before the opening of bids.

Board of County Commissioners – Governing body of Lake County, hereinafter referred to as the Board.

Calendar Day – Every day shown on the calendar, ending and beginning at Midnight.

Change Order – A written order issued by the Engineer in accordance with Board policy, and accepted by the Contractor directing certain changes, additions or reductions in the work or in the materials used.

Consultant – The Professional Engineer or Engineering Firm registered in the State of Florida who performs Professional Engineering Services for the County, other than County personnel. The Consultant may be the Engineer of Record or may provide services through and be subcontracted to the Engineer of Record.

Contingency – A pay item included for usage as directed by the Engineer and for usage under conditions or circumstances unforeseen at the time of contract.

Contractor – The General Contractor, the Individual, Partnership or Corporation bidding or agreeing to do the work for the Owner as Prime Contractor.

Contract Documents – All documents referred to in Division X in addition to all duly executed and issued addenda, legal advertisements and change orders.

County/Owner – Lake, County, Florida, a political subdivision of the State of Florida.

Engineer – The County Senior Director of Public Works or his duly authorized representative, acting on behalf of the County.

Engineer of Record – The Professional Engineer or Engineering Firm contracted with by the County and registered in the State of Florida who develops criteria and concept for the project, performs the analysis and is responsible for the preparation of the Contract Plans and Specifications. The Engineer of Record may be County in-house staff or a Consultant retained by the County.

FDOT – The Florida Department of Transportation.

ID – Inside diameter, or dimension.

Inspector – An authorized representative of the Engineer, assigned to make any or all necessary inspections of the work performed and materials furnished by the Contractor.

LCPWD – The Lake County Public Works Department.

Plans – The approved drawings or reproductions thereof, that show the location, character, dimension and details of the work to be done as issued by the Engineer.

Regular Work Day – Any calendar day except a Saturday, Sunday or recognized Holiday.

Scope of Work – The general intent of the work to be accomplished as defined by the project plans and specifications.

Schedule of Values – The individual values as set forth by the Contractor as payment for the bid quantity units identified on the bid sheets. The total of the extended units in the schedule of values determines the contract limit. This contract limit amount may only be modified by change order approved in accordance with Board policy.

Special Provisions – Specific clauses adding to or revising the Standard Specifications, setting forth conditions varying from or additional to the Standard Specifications, for a specific project.

Specifications – The directions, provisions and requirements contained herein, together with all stipulations contained in the plans or in the Contract Documents, setting out or relating to the method and manner of performing the work, or to the quantities and qualities of materials and labor to be furnished under the contract.

Standard Specifications – FDOT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION," FY 2023/2024, or 2023 FDOT DESIGN MANUAL (FDM) (or latest edition), and all supplemental specifications thereto, or otherwise depicted on the construction plans.

Technical Special Provisions – Specifications prepared, signed and sealed by an Engineer registered in the State of Florida other than the State Specifications Engineer, or his designee, which are made part of the Contract as an attachment to the Specifications Package.

Work – All labor, materials and incidentals required for the construction of the improvement for which the contract is made, including superintendence, use of equipment and tools, and all services and responsibilities prescribed or implied, which are necessary for the complete performance by the Contractor of his obligations under the contact. Unless otherwise specified herein or in the Contract, all costs of liability and of performing the work shall be at the Contractor's expense.

2. BIDS

A. Sealed bids will be received by the Office of Procurement Services, on behalf of the Lake County Board of County Commissioners, until 3:00 p.m. on August 31, 2023, for the furnishing of all services, labor, materials and equipment for the construction of the following project:

BID NO. 23-562

CITRUS GROVE ROAD PHASE 5
PROJECT NO. 2023-08

B. This project is located between Minneola and Montverde in south Lake County and shall consists of constructing a new two-lane roadway approximately 4,074 feet in length connecting on either side to a newly constructed bridge over the Turnpike. Other work associated with this project will include constructing a 12' multiuse trail, curb and gutter, MSE wall, storm pipe and structures, stabilized radio tower access, sodding, striping, and other incidental miscellaneous construction. The Engineers estimate for this project is $6,711,891.33.

C. Plans, specifications and bid forms may be obtained from the County's website: http://www.lakecountyfl.gov/departments/fiscal_and_administrative_services/procurement_services/view_all_bids.aspx..

D. Hand delivery of submittals will not be accepted.

RESPONSES MUST BE SUBMITTED THROUGH THE SOLICITATION RESPONSE PORTAL TO BE CONSIDERED – https://procurement.lakecountyfl.gov/login

A response will not be accepted if completed and submitted after the official due date and time.

Interested parties may listen to the 3:01 P.M. solicitation opening by calling 1-321-332-7400, Conference ID 971 920 36# or clicking on the MICROSOFT TEAMS MEETING link in the solicitation.

E. All bids shall be received not later than the date and time specified above, at which time they will be publicly opened and read aloud in the Office of Procurement Services, Fourth Floor, Administration Building, Room 441, 315 West Main Street, Tavares, Florida. A bid will not be considered for award if received in the Procurement Services Office after the official opening date and time regardless of when or how it was received by the Lake County Clerk of the Circuit Court Mail Receiving Center. Allow sufficient time for transportation and inspection.

F. Bids may be withdrawn prior to the date of opening, but no bids may be withdrawn for a period of sixty (60) days after the date of opening of bids.

G. The Board of County Commissioners reserves the right to reject any or all bids, to waive formalities, and to award the contract in the best interest of Lake County, Florida.

H. Bids which are incomplete, unbalanced, conditional, obscure, or which contain additions not allowed for, alterations or irregularities of any kind, or which do not comply with the Contract Documents may be rejected at the option of the County.

I. Each Bid by an individual or firm shall state the name and address of each person who owns an interest therein, and, if a corporation, the name and addresses of its officers. Bids shall be signed by the person or member of the firm making the same, and if a corporation, by an authorized officer or agent subscribing the name of the corporation, together with his own name and the corporate seal.

3. BID GUARANTEE

A. All bids must be accompanied by a Bid Guarantee acceptable to the County Attorney, which shall be one of the following; bid bond or letter of credit, in the sum of five percent (5%) of the base bid and made payable to Lake County. Said bid bond or letter of credit shall be a guarantee that should the bid be accepted, the bidder will, within ten (10) days after written notice of the award of the contract, enter into a contract with Lake County for the services proposed to be performed and will at that time furnish an acceptable contract surety. Cash, company, certified or personal checks will not be accepted.

B. Said instruments and the monies payable thereon, will, at the option of the County, be forfeited if the bidder fails to execute the written contract and furnish the required surety bond within ten (10) consecutive calendar days following written notice of the award of the contract.

C. Attorneys-in-fact who sign bonds must file with such bond one (1) certified copy of their power of attorney to sign said bond.

D. All instruments shall have been issued within thirty (30) days of the date for receiving bids.

4. PRE-QUALIFICATION OF CONTRACTOR

This is not a pre-qualification project.

5. CONTRACT SECURITY

A. The Contractor shall provide a Performance Bond and a Payment Bond, in the form prescribed in Division Y, each in the amount of 100% of the Contract amount, the costs of which are to be paid by the Contractor. The Bonds will be acceptable to the County only if the following conditions are met:

1. For contracts that do not exceed $500,000.00, the Surety Company:

a. is licensed to do business in the State of Florida;

b. holds a certificate of authority authorizing it to write surety bonds in this state;

c. has twice the minimum surplus and capital required by the Florida Insurance Code at the time the invitation to bid is issued;

d. is otherwise in compliance with the provisions of the Florida Insurance Code; and

e. holds a currently valid certificate of authority issued by the United States Department of Treasury under 31 U.S.C. ss 9304-9308.

2. For contracts over $500,000.00, all of the requirements of paragraph A.1 above apply. In addition, the Surety Company must have a current rating of at least Excellent (A or A-) all as reported in the most current Best Key Rating Guide, published by A.M. Best Company, Inc., of 75 Fulton Street, New York, New York 10038, with an underwriting limitation of at least two times the dollar amount of the contract.

B. If the Surety for any Bond furnished by the Contractor is declared bankrupt, becomes insolvent, its right to do business is terminated in the State of Florida, or it ceases to meet the requirements imposed by the Contract Documents, the Contractor shall, within five (5) calendar days thereafter, substitute another Bond and Surety, both of which shall be subject to the County's approval.

C. By execution of these bonds, the Surety acknowledges that it has read the Surety qualifications and Surety obligations imposed by the construction documents and hereby satisfies those conditions.

6. INTERPRETATIONS PRIOR TO BID OPENING

No oral interpretations will be made to any bidder as to the meaning of the Specifications, or any other Contract Documents. Every request for such an interpretation must be in writing, and shall be received by the Office of Procurement Services not less than ten (10) calendar days prior to the date set for opening of bids. Every interpretation made to a bidder will be made by an addendum to the Contract Documents, which, when issued, will be sent as promptly as is practicable to all persons to whom the Specifications have been issued by the County. All such addenda shall become part of the Contract Documents. No substitution of any kind or riders of any nature to the bids will be considered except by the above-described method. For purposes of this Contract the term "Interpretations" shall include the approval of product substitution.

7. LICENSES, PERMITS, FEES AND TAXES

A. Acquisition of Permits and Licenses

1. The County has obtained all known Federal and State environmental permits required for the construction of the project.

2. The Contractor shall secure and maintain all other permits required for the construction of the Project, including building permits, National Pollution Discharge Elimination System (NPDES) Construction Permits, and permits required for tree removal or relocation.

3. The Contractor shall secure and maintain all contractor licenses required for the prosecution of the work.

B. Payment of Fees and Taxes

1. All fees associated with those permits and licenses that the Contractor is required to obtain shall be paid by the Contractor.

2. All sales, consumer, use and other similar taxes associated with the work, or portions thereof, and which are applicable during the performance of the work, shall be paid by the Contractor.

3. All fees required in connection with the Contractor's recording of bonds or other documents in the public records shall be paid by the Contractor.

4. All County permit fees shall be waived or paid by the County.

C. Reimbursements to the Contractor

1. The County will reimburse the Contractor for those fees paid for applicable permits. Reimbursement will be for the actual amount paid, as evidenced by official receipts from the offices collecting the fees. Reimbursement will not include, nor will any separate payment be made for, Contractor mark-up, "interest" or other charges claimed by the Contractor in connection with the payment of permit fees.

2. No reimbursement will be made for Contractor license fees.

3. No reimbursement will be made for fees or other charges (such as the cost of documentary stamps) required in connection with the recording of bonds or other documents in the public records.

D. Compliance with Permit and Licenses Requirements

The Contractor shall comply with all permit conditions and license requirements, applicable building and construction code requirements, and such other rules and regulations as may apply to the prosecution of the work.

8. COMPLIANCE WITH LAWS

The Contractor agrees to comply, at its own expense, with all Federal, State and Local laws, codes, statutes, ordinances, rules, regulations and requirements applicable to the project, including but not limited to those dealing with taxation, Workers' Compensation, equal employment, safety (including, but not limited to, the Trench Safety Act, Chapter 553.60, Florida Statutes), labor, work hours, labor conditions, environment, and related matters. If the Contractor observes that the Contract Documents are at variance therewith, it shall promptly notify the Engineer in writing.

9. INSURANCE

The contractor shall purchase and maintain, at its expense, from a company or companies authorized to do business in the State of Florida, and which are acceptable to the County, insurance policies containing the following selected types of coverage and minimum limits of liability protecting from claims which may arise out of or result from the performance or non-performance of services under this Contract by the contractor or by anyone directly or indirectly employed by it, or by anyone for whose acts it may be liable:

At time of contract, the Contractor will be required to provide a copy of all policy endorsement(s), reflecting the required coverage, with Lake County listed as an additional insured along with all required provisions to include waiver of subrogation. Contracts cannot be completed without this required insurance documentation. (Note: A simple COI WILL NOT be accepted in lieu of).

Contractor shall not commence work under the Contract until County has received an acceptable certificate or certificates of insurance evidencing the required insurance and all policy endorsement(s), reflecting the required coverage, with Lake County listed as an additional insured, along with all required provisions to include waiver of subrogation, which is as follows:

General Liability insurance on forms no more restrictive than the latest edition of the Occurrence Form Commercial General Liability policy (CG 00 01) of the Insurance Services Office or equivalent without restrictive endorsements, with the following minimum limits and coverage:

Each Occurrence/General Aggregate	$1,000,000/2,000,000
Products-Completed Operations	$2,000,000
Personal & Adv. Injury	$1,000,000
Fire Damage	$50,000
Medical Expense	$5,000
Contractual Liability	Included

Automobile liability insurance, including owned, non-owned, and hired autos with the following minimum limits and coverage:

Combined Single Limit	$1,000,000

Workers' compensation insurance based on proper reporting of classification codes and payroll amounts in accordance with Chapter 440, Florida Statutes, and/or any other

applicable law requiring workers' compensation (Federal, maritime, etc). If not required by law to maintain workers compensation insurance, the Contractor must provide a notarized statement that if he or she is injured, he or she will not hold the County responsible for any payment or compensation.

Employers Liability with the following minimum limits and coverage:

Each Accident	$1,000,000
Disease-Each Employer	$1,000,000
Disease-Policy Limit	$1,000,000

Railroad Protective Liability with bodily injury protection of Two Million dollars ($2,000,000) and property damage of Two Million dollars ($2,000,000) for any project or portion of the project which is located on Railroad property. The Railroad shall be endorsed to this policy as an additional insured.

Lake County, a Political Subdivision of the State of Florida, and the Board of County Commissioners, shall be named as additional insured as their interest may appear on all applicable policies.

Certificate(s) of insurance shall provide for a minimum of sixty (60) days prior written notice to the County of any change, cancellation, or nonrenewal of the required insurance.

Certificate(s) of insurance shall identify the contract number in the Description of Operations section of the Certificate.

Certificate of insurance shall evidence a waiver of subrogation in favor of the County, that coverage shall be primary and noncontributory, and that each evidenced policy includes a Cross Liability or Severability of Interests provision, with no requirement of premium payment by the County.

Certificate holder shall be:

LAKE COUNTY, A POLITICAL SUBDIVISION OF THE STATE OF FLORIDA,
AND THE BOARD OF COUNTY COMMISSIONERS.
P.O. BOX 7800
TAVARES, FL 32778-7800

The County shall be exempt from, and in no way liable for, any sums of money, which may represent a deductible or self-insured retention in any insurance policy. The payment of such deductible or self-insured retention shall be the sole responsibility of the Contractor and/or subcontractor providing such insurance.

The Contractor shall be responsible for subcontractors and their insurance. Subcontractors are to provide Certificates of Insurance to the County evidencing coverage and terms in accordance with the Contractor's requirements.

Failure to obtain and maintain such insurance as set out above will be considered a breach of contract and may result in termination of the contract for default.

Neither approval by the County of any insurance supplied by the Contractor, nor a failure to disapprove that insurance, shall relieve the Contractor of full responsibility of liability, damages, and accidents as set forth herein.

The Contractor shall submit to Lake County Public Works a copy of all accident reports arising out of any injuries to its employees or those of its subcontractors, or any personal injuries or property damage arising or alleged to have arisen on account of any work under the Contract.

If it is not possible for the Contractor to certify compliance, on the certificate of insurance, with all of the above requirements, then the Contractor is required to provide a copy of the actual policy endorsements(s) providing the required coverage and notification provisions.

10. QUANTITIES

A. Quantities, if shown on the Bid, are estimated for bidding purposes only and shall be verified by the Contractor.

B. Payment for work performed under this contract shall be based on a lump sum bid. Bidder shall determine quantities.

C. Regardless of uncertainties of material supply and production at the time of bidding, Contractors shall base their bids in strict accordance with items, materials and methods as set forth in the Contract Documents.

D. Pay items may be added, or deleted, to the list of pay items by the Engineer or Contractor, that are required to complete the scope of the work as defined by the project plans and specifications.

11. QUANTITIES REFLECTED IN PERMITTING DOCUMENTS

Any construction items or quantities reflected in the permitting documents, if any, required for this project are provided only for the purpose of enabling permitting authorities to assess the probable impact of the project, and are in no way intended to reflect or represent actual construction items or quantities for pay purposes.

12. ARITHMETIC DISCREPANCIES IN BIDS

A. For the purpose of evaluation of bids, the following criteria will be utilized in resolving discrepancies in arithmetic found on the face of the bidding schedule of values as submitted by the bidders:

1. In case of discrepancy between unit values and extended values the unit value shall take precedence.

2. Errors in extension of unit values will be corrected by the County.

3. Errors in addition of lump sum and extended values to determine the total bid amount will be corrected by the County.

B. For the purposes of bid evaluation, the County will proceed on the assumption that the bidder intends his bid to be evaluated on the basis of a lump sum bid with the numerical unit values, extensions and totals arrived at by resolution of arithmetic discrepancies as provided above.

13. AWARD OF CONTRACT

The Contract will be awarded for the entire work on the Base Bid plus any accepted options to the lowest responsive and responsible bidder, provided that the bid is reasonable, and that it is in the best interest of the County to accept. Lake County reserves the right to award any and all options as part of this contract. County will provide written notice of award to the Contractor.

14. NOTICE TO PROCEED TO CONTRACTOR

After all contract documents are signed and approved, a Notice to Proceed will be issued which shall include the commencement date. The Contractor shall be required to set up a pre-construction conference before any work shall begin.

15. INDEMNIFICATION

The Contractor will agree to indemnify the County as described in Division X of the Contract documents.

16. CONTRACT DOCUMENTS

The Contractor will be furnished with one (1) original of the Contract Documents for the project. Additional copies may be purchased from the LCPWD at the price per set listed in Division A. Copies of the "Standard Specifications" may be purchased from the FDOT. The Contractor shall have available on the job, at all times, one (1) copy of the Contract Documents.

DIVISION B

GENERAL CONDITIONS

1. INTENT OF THE CONTRACT DOCUMENTS

A. It is the intent of the Contract Documents to describe a functionally complete project (or portion thereof) to be constructed in accordance with the Contract Documents which combine to define the Scope of Work. Any work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result shall be supplied whether or not specifically called for. When words that have a well-known technical or trade meaning are used to describe work, materials or equipment, such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association or to the laws or regulations of any governmental authority having jurisdiction over the Project, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, law or regulation in effect at the time the work is performed, except as may be otherwise specifically stated herein.

B. The Contract Documents and all referenced standards cited therein are essential parts of the Contract requirements. A requirement occurring in one is as binding as though occurring in all. They are intended to be complimentary and to describe and provide for a complete project.

C. Drawings are intended to show general arrangements, design and extent of work. Specifications are separated into divisions for convenience of reference only and shall not be interpreted as establishing divisions for the work, trades, subcontracts, or extent of any part of the work. In the event of a discrepancy between or among the drawings, specifications or other Contract Document provisions, the Contractor shall be required to comply with the provision, which is the more restrictive or stringent requirement upon the Contractor, as determined by the Engineer. Unless otherwise specifically mentioned, all anchors, bolts, screws, fittings, fillers, hardware, accessories, trim and other parts required in connection with any portion of the work to make a complete, serviceable, finished and first quality installation shall be furnished and installed as part of the work, whether or not called for by the Contract Documents.

2. STORAGE OF MATERIALS

Materials shall be so placed so as to permit easy access for proper inspection and identification of each shipment. Any material which has deteriorated, become damaged, or is otherwise unfit for use, as determined by the Engineer, shall not be used in the work, and shall be removed from the site by the Contractor at his expense.

3. SANITATION

The Contractor shall provide and maintain adequate sanitary conveniences for the use of persons employed on the work. These conveniences shall be maintained at all times

without nuisance, and their use shall be strictly enforced. The location of these conveniences shall be subject to the Engineer's approval.

4. MAINTENANCE OF CONSTRUCTION SITE

A. **Mowing**: Contractor shall be responsible to mow and maintain all rights of way owned by the County within the limits of the construction project. Any retention areas that are built in conjunction with the road project shall also be mowed and maintained. Contractor shall be responsible to pick up trash prior to mowing. Mowing shall be completed every four (4) weeks (equivalent to 28 calendar days) unless authorized by the Project Manager. The height of the mowed vegetation shall be between four (4) and six (6) inches. At no time shall the Contractor mow wildflowers that may be growing whether or not they are in designated wildflower area. Sign posts, trees, retention pond inlet/outfall structures, fences, shrubs, plants, light poles, utility flags, mailboxes or other such obstacles to mowing shall be hand mowed or trimmed around as necessary to present a groomed appearance. Areas determined to be unsatisfactory by the Project Manager shall be re-mowed at no additional cost to the County.

B. **Trash Removal**: Contractor shall be responsible to remove trash and debris from the rights of way owned by the County within the limits of the construction project. The Contractor shall be responsible for the pickup, removal, and disposal of items such as, but not limited to: bottles, cans, tires, bags of trash, newspapers, cigarette packages, magazines, boxes, cups, food containers, sheets of paper, etc. The Contractor is responsible to remove trash from drainage ditches, headwalls, and along fence/tree lines. Trash removal shall not precede the mowing by more than twenty-four (24) hours.

C. **Maintenance Liquidated Damages**: In the event Contractor fails to comply with sections 4(A) and 4(B) above, the County may assess against the Contractor liquidated damages in the amount of $200 (two hundred dollars) per day if the Contractor does not correct any deficient area within two (2) calendar days after written notification from the County, unless otherwise authorized by the Project Manager. Written notification may be delivered to the Contractor or its agent by email, fax, mail or hand delivery. These liquidated damages will start the third (3rd) calendar day after notification and will continue for each calendar day thereafter until reported deficiencies are corrected to the satisfaction of the Project Manager.

5. ERRORS AND OMISSIONS

The Contractor shall not take advantage of any apparent error or omission in the Contract Documents. If any errors and/or omissions appear in the Contract Documents, or construction stakeout, the Contractor shall immediately notify the Engineer, in writing, of such errors and/or omissions. In the event the Contractor knows or should have known of any errors and/or omissions and fails to provide such notification, he shall be deemed to have waived any claim for increased time or compensation he may have had and he shall be held responsible for the results and the costs of rectifying any such errors and/or omissions.

6. CONTRACTOR'S OBLIGATIONS.

A. Qualification

1. The Contractor shall assure that all personnel are competent, careful and reliable. All personnel must have sufficient skill and experience to properly perform the work assigned them. All personnel shall have had sufficient experience to perform their assigned task properly and satisfactorily and to operate any equipment involved, and shall make due and proper effort to execute the work in the manner prescribed in the Contract Documents, or the Engineer may take action as prescribed below.

2. Whenever the Engineer shall determine that any person is incompetent, unfaithful, intemperate, disorderly or insubordinate, the Engineer shall notify the Contractor that such person is to be discharged from the work. The Contractor shall immediately discharge said person from the work and shall not again employ said person on this work except with the written consent of the Engineer. Should the Contractor fail to remove such person or persons the Engineer may withhold all payments.

3. Contractor acknowledges and agrees that, in accordance with Section 255.099, Florida Statutes, if this Project is being supported in whole or in part by State funding the Contractor shall give preference to the employment of state residents in the performance of the work on the Project if state residents have substantially equal qualifications to those of non-residents. If the Contractor is required to employ state residents, the Contractor shall contact the Department of Economic Opportunity to post the employment needs in the State's job bank system. However, in work involving the expenditure of federal aid funds, this section may not be enforced in such a manner as to conflict with or be contrary to federal law prescribing a labor preference to honorably discharged soldiers, sailors, or marines, or prohibiting as unlawful any other preference or discrimination among the citizens of the United States.

4. The Contractor shall utilize the U.S. Department of Homeland Security's E-Verify system to verify employment eligibility of all new employees hired by the Contractor during the term of the Contract and shall expressly require any subcontractors performing work or providing services pursuant to the Contract to likewise utilize the U.S. Department of Homeland Security's E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor during the Contract term.

B. Identification

1. Within ten (10) days after the award of any subcontract, either by himself or a subcontractor, the Contractor shall deliver to the Engineer a statement setting forth the name and address of the subcontractor and a summary description of the work subcontracted.

2. The Contractor shall be as fully responsible to the Owner for acts and omissions of his subcontractor and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

C. Contractor's Supervision

1. Prosecution of Work:

   The Contractor shall give the work the constant attention necessary to assure the scheduled progress and he shall cooperate fully with the Engineer and with other Contractors at work in the vicinity.

2. Contractor's Superintendent:

   a. The Contractor shall at all times have on the work as his agent, a competent superintendent capable of thoroughly interpreting the plans and specifications and thoroughly experienced in the type of work being performed, who shall receive the instructions from the Engineer or his authorized representatives. The superintendent shall have full authority to execute the orders or directions of the Engineer and to supply promptly any materials, tools, equipment, labor and incidentals, which may be required. Such superintendence shall be furnished regardless of the amount of work sublet.

   b. The Contractor's superintendent shall speak and understand English, and at least one responsible person who speaks and understands English shall be on the project during all working hours.

3. Supervision for Emergencies:

   The Contractor shall have a responsible person available at or reasonably near the work site on a twenty-four (24) hour basis, seven (7) days a week, in order that he may be contacted in emergencies and in cases where immediate action must be taken to maintain traffic or to handle any other problem that might arise. The Contractor's responsible person for supervision for emergencies shall speak and understand English. The Contractor shall submit to the Engineer, by certified mail, phone numbers and names of personnel designated to be contacted in cases of emergencies along with a description of the project location to the Florida Highway Patrol and all other local law enforcement agencies.

4. Worksite Traffic Supervisor:

   a. The Contractor shall have a Worksite Traffic Supervisor who will be responsible for initiating, installing and maintaining all traffic control devices as described in Section 102 of the FDOT Standard Specifications for Road and Bridge Construction, and in the plans. The Worksite Traffic Supervisor shall have at least one year of experience directly related to worksite traffic control in a supervisory or responsible capacity and shall be certified by the American Traffic Safety Services Association Worksite Traffic Supervisor Certification Program or an equal approved by the FDOT. Approved alternate Worksite Traffic Supervisors may be used when necessary.

   b. The Worksite Traffic Supervisor shall be available on a twenty-four (24) hour per day basis and shall review the project on a day to day basis as well as

being involved in all changes to traffic control. The Worksite Traffic Supervisor shall have access to all equipment and materials needed to maintain traffic control and handle traffic related situations. The Worksite Traffic Supervisor shall ensure that routine deficiencies are corrected within a 24-hour period.

c. The Worksite Traffic Supervisor shall be available on the site within forty-five (45) minutes after notification of an emergency situation, prepared to positively respond to repair the work zone traffic control or to provide alternate traffic arrangements.

d. Failure of the Worksite Traffic Supervisor to comply with the provisions of the Section 102 of the FDOT Standard Specifications for Road and Bridge Construction may be grounds for decertification or removal from the project or both. Failure to maintain a designated Worksite Traffic Supervisor or failure to comply with these provisions will result in temporary suspension of all activities except traffic and erosion control and such other activities deemed to be necessary for project maintenance.

D. General Inspection Requirements

1. Cooperation by the Contractor:

No work shall be done nor materials used, without suitable supervision or inspection by the Engineer or his representative, and the Contractor shall furnish the Engineer with every reasonable facility for ascertaining whether the work performed and materials used are in accordance with the requirements and intent of the plans and specifications. If the Engineer so requests, the Contractor shall, at any time before final acceptance of the work, remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore the uncovered portions of the work to the standard required by the specifications. Should the work so exposed or examined prove unacceptable, the uncover or removal, and the replacing of the covering or making good of the parts removed, shall be at the Contractor's expense. However, should the work thus exposed or examined prove acceptable, the uncovering or removing, and the replacing of the covering or making good of the parts removed, shall be paid for as Unforeseeable Work.

2. Failure to Remove and Renew Defective Materials and Work:

a. Should the Contractor fail or refuse to remove and renew any defective materials used or work performed, or to make any necessary corrections in an acceptable manner and in accordance with the requirements of the specifications, within the time indicated in writing, the Engineer shall have the authority to cause the unacceptable or defective materials or work to be repaired, removed and renewed, as may be necessary; all at the Contractor's expense.

b. Any expense incurred by the County in making these repairs, removals, or renewals, which the Contractor has failed or refused to make, shall be paid

for out of any moneys due or which may become due the Contractor, or may be charged against the contract bond. Continued failure or refusal on the part of the Contractor to make any or all necessary repairs promptly, fully and in an acceptable manner shall be sufficient cause for the County, at its option, to perform the work with its own organization, or to contract with any other individual, firm or corporation to perform the work. All costs and expenses incurred thereby shall be charged against the defaulting Contractor and the amount thereof deducted from any moneys due or which may become due him, or shall be charged against the contract bond. Any work performed subsequent to forfeiture of the contract, as described in this Paragraph, shall not relieve the Contractor in any way of his responsibility for the work performed by him.

3. Inspection by the Federal Government or State of Florida:

When the United States Government, or State of Florida, is to pay a portion of the cost of construction, the construction work will be subject to such inspection by its representatives as they may deem necessary, but such inspection will in no case make the Federal Government, or State of Florida, a party to this contract.

7. AUTHORITY OF THE ENGINEER AND ENGINEER'S ASSISTANTS

A. All work shall be done in accordance with the Contract Documents.

B. It is agreed by the parties hereto that the Engineer shall decide all questions, difficulties and disputes, of whatever nature, which may arise relative to the interpretation of the plans, construction, prosecution and fulfillment of the contract, and as to the character, quality, amount and value of any work done, and materials furnished, under or by reason of the contract.

C. The County retains the right to inspect all work to verify compliance with the Contract Documents. The Engineer may appoint such assistants and representatives as desired. They shall be authorized to inspect all work done and all materials furnished. This right of inspection in no way means or implies County control or other supervision over the work done or the work site. This right is solely for the County's benefit and imposes no duties or responsibilities on the County and confers no rights on any other parties. Such inspection may extend to all or any part of the work and to the manufacture, preparation or fabrication of the materials to be used. Such assistants shall not be authorized to revoke, alter or waive any requirement of the Contract Documents.

D. The assistants and representatives shall be authorized to call to the attention of the Contractor any failure of the work or materials to conform to the Contract Documents, and shall have the authority to reject materials or suspend the work until any questions at issue can be referred to and decided by the Engineer. The Contractor shall be immediately notified in writing of any such suspension of the work and such notice shall state in detail the reasons for the suspension. The presence of the Inspector or other assistant shall in no way lessen the responsibility of the Contractor.

E. Failure of the Engineer to Reject Work During Construction:

If, during or prior to construction operations, the Engineer should fail to reject defective work or materials, whether from lack of discovery of such defect or for any other reason, such initial failure to reject shall in no way prevent his later rejection when such defect is discovered, or obligate the County to final acceptance, and the Contractor shall make no claim for losses suffered due to any necessary removals or repairs of such defects.

F. Authority to Suspend Contractor's Operations:

The Engineer has the authority to suspend the Contractor's operations, wholly or in part. The Engineer will order such suspension in writing, giving in detail the reasons for the suspension. Contract Time will be charged during all suspensions of Contractor's operations. The County may grant an extension of Contract Time in accordance with 8-7.3.2 when determined appropriate in the County's sole judgment.

No additional compensation or time extension will be paid or granted to the Contractor when the operations are suspended for the following reasons:
1. The Contractor fails to comply with the Contract Documents.
2. The Contractor fails to carry out orders given by the Engineer.
3. The Contractor causes conditions considered unfavorable for continuing the Work.

The Contractor shall immediately comply with any suspension order and should not resume operations until authorized to do so by the Engineer in writing. Any operations performed by the Contractor, and otherwise constructed in conformance with the provisions of this contract, after the issuance of the suspension order and prior to the Engineer's authorization to resume operations will be at no cost to the County. Further, failure to immediately comply with any suspension order will also constitute an act of default by the Contractor and is deemed sufficient basis in and of itself exception that the Contractor will not have ten (10) calendar days to correct the conditions for which the suspension was ordered.

G. State of Emergency:

The Engineer has the authority to suspend the Contractor's operations, wholly or in part, pursuant to a Governor's Declaration of a State of Emergency. The Engineer will order such suspension in writing, giving in detail the reasons for the suspension. Contract Time will be charged during all suspensions of Contractor's operations. The County, at its sole discretion, may grant an extension of Contract Time and reimburse the Contractor for specific costs associated with such suspension. Further, in such instances, the County's determination as to entitlement to either time or compensability will be final, unless the Contractor can prove by clear and convincing evidence to a Disputes Review Board that the County's determination was without any reasonable factual basis

H. Prolonged Suspensions:

If the Engineer suspends the Contractor's operations for an indefinite period, the Contractor shall store all materials in such manner that they will not obstruct or impede the traveling public unnecessarily or become damaged in any way and shall

take every reasonable precaution to prevent damage to or deterioration of the work performed. The Contractor shall provide suitable drainage of the roadway by opening ditches, shoulder drains, etc., and provide any temporary structures necessary for public travel through the project.

I. Permission to Suspend Contractor's Operations:

The Contractor shall not suspend operations or remove equipment or materials necessary for completing the work without obtaining the Engineer's written permission. The Contractor shall submit all requests for suspension of operations in writing to the Engineer, and identify specific dates to begin and end the suspension. The Contractor is not entitled to any additional compensation for suspension of operations during such periods.

8. CONTRACT TIME AND TIME EXTENSIONS

A. Unless otherwise provided, contract time shall mean the number of consecutive calendar days from the commencement date noted in the Notice to Proceed to the date on which all work is to be completed. The Contractor shall diligently pursue the completion of the work and coordinate the work being done on the project by its subcontractors and material suppliers, as well as coordinate his work with the work of other contractors so that his work or the work of others shall not be delayed or impaired by any act or omission of any act by a Contractor. The Contractor shall be solely responsible for all construction means, methods, techniques, sequences and procedures, as well as coordination of all portions of the work under the Contract Documents.

B. Should the Contractor be obstructed or delayed in the prosecution of or completion of the work as a result of unforeseeable causes beyond the control of the Contractor, and not due to his fault or neglect, including but not restricted to acts of God or the public enemy, acts of government, fires, floods, discovery of pre-existing hazardous materials, utility conflicts, epidemics, quarantine regulations, strikes or lockouts, the Contractor shall notify the Engineer in writing within two (2) regular work days after the commencement of such delay, stating the cause or causes thereof, or be deemed to have waived any right which the Contractor may have had to request a time extension.

C. **NO CLAIM FOR DAMAGES OR ANY CLAIM OTHER THAN FOR AN EXTENSION OF TIME SHALL BE MADE OR ASSERTED AGAINST THE COUNTY BY REASON OF ANY DELAYS.** No interruption, interference, inefficiency, suspension or delay in the commencement or progress of the work shall relieve the Contractor of his duty to perform or give rise to any right to damages or additional compensation from the County. The Contractor expressly acknowledges and agrees that the Contractor shall receive no damages for delay. However, this provision shall not preclude recovery or damages by the Contractor for hindrances or delays due solely to fraud, bad faith or active interference on the part of the County. Otherwise, Contractor shall be entitled to extensions of the Contract Time as the sole and exclusive remedy for such resulting delay, in accordance with and to the extent specifically provided above. This provision applies to claims for early completion as well as late completion. Such extensions of time will not be granted for delays caused by unfavorable weather, ground conditions related to the weather,

inadequate construction force or for the failure of the Contractor to timely order equipment or materials.

D. If the Contractor complies with the two (2) regular work days' notice requirement, the Engineer shall ascertain the facts and the extent of the delay being claimed. The Engineer's findings of fact justify such an extension, and the Engineer's finding of fact shall be final and conclusive on the parties. The Contractor shall cooperate with the Engineer's investigation of the delays by providing any schedules, correspondence or other data that may be required to complete the findings of fact. Extensions to the contract time may be granted for only those delays that impact the Contractor's Construction Schedule. Extensions of contract time must be authorized by Change Order approved in accordance with Board policy.

9. PROSECUTION OF WORK ON SATURDAYS, SUNDAYS AND RECOGNIZED HOLIDAYS

A. Unless the Contractor submits a written request to work during one or more days of a Holiday or Special Event at least ten (10) calendar days in advance of the beginning date of the Holiday or Special Event and receives written approval from the Engineer, the Contractor shall not work on the following days: Martin Luther King, Jr. Day; Memorial Day; the Saturday and Sunday immediately preceding Memorial Day; Independence Day (Observed); Labor Day; the Friday, Saturday, and Sunday immediately preceding Labor Day; Veterans Day; Veterans Day (Observed); the Wednesday immediately preceding Thanksgiving Day; the Friday, Saturday and Sunday immediately following Thanksgiving Day; December 24 through January 2, inclusive; and Special Events noted in the Plans. Contract Time will be charged during these Holiday and Special Event periods. The Contractor is not entitled to any additional compensation beyond any allowed Contract Time adjustment for suspension of operations during such Holiday and Special Event Periods.

B. No work will be permitted on:

New Years Day
Independence Day
Thanksgiving Day
Christmas Day

C. If Christmas or New Year's Day shall fall on Tuesday or Thursday, the preceding Monday or the following Friday shall be recognized as a holiday also. If any recognized holiday shall fall on a Saturday, the preceding Friday shall be observed as a holiday. If any recognized holiday shall fall on a Sunday, the following Monday shall be observed as a holiday.

D. The Contractor shall pay to the County, as reimbursement of costs incurred by the County, the sum of TWO HUNDRED FIFTY and 00/100 DOLLARS ($250.00) per man per day for each Sunday or recognized Holiday on which the Contractor works. Payment to the County of such sums as may become payable under the provisions of this Article shall be made by identifying the said sums as a credit item on the Contractor's pay estimate for the period during which the liability for the sums occurred. The credit item shall show the total number of days applicable under (D) times the corresponding per day or per hour cost.

E. During such suspensions, remove all equipment and materials from the clear zone, except those required for the safety of the traveling public and retain sufficient personnel at the job site to properly meet the requirements of Sections 102 and 104 of the Standard Specifications.

10. LIQUIDATED DAMAGES

A. The County and the Contractor recognize that, since time is of the essence for this Contract, the County will suffer financial loss if the work is not completed within the time specified.

B. The County shall be entitled to assess, as liquidated damages, but not as a penalty, for each calendar day after the scheduled completion date. The project shall be deemed to be completed on the date the work is deemed complete to the satisfaction of the Engineer. The Contractor hereby expressly waives and relinquishes any right which it may have to seek to characterize the above-noted liquidated damages as a penalty. The parties agree that the liquidated damages sum represents a fair and reasonable estimate of the County's actual damages at the time of contracting if the Contractor fails to complete the work in a timely manner. The liquidated damages shall be as follows:

Original Contract Amount	Daily Charge Per Calendar Day
$299,999 and under	$980
$300,000 but less than $2,000,000	$1,699
$2,000,000 but less than $5,000,000	$2,650
$5,000,000 but less than $10,000,000	$3,819
$10,000,000 but less than $20,000,000	$4,687
$20,000,000 but less than $40,000,000	$7,625
$40,000,000 and over	$10,467 plus 0.00005 of any amount over $40 million (Round to nearest whole dollar)

C. Any Contractor that is in default for not completing the work within the time specified will be removed from the bidder's list, at the option of the County, and not permitted to bid work for Lake County until the project is complete and the liquidated damages sum is satisfied.

11. CHANGES IN THE WORK

A. Without invalidating the contract, the Engineer may at any time, by written order, direct extra work within the general scope or alter the work by addition or deduction of items that do not alter the scope of the work. Such changes may be effected by Change Order or by other written order. Such changes shall be binding on the Contractor. No officer, employee, or agent of the County is authorized to direct any extra or change work orally. All changes orders shall be executed in the manner set forth in the Lake County Purchasing Procedures. A copy of such procedures shall be available upon request.

B. If changes to the scope of the work are required or if the contract time or the total contract price is increased or decreased, a Change Order in accordance with Board policy will be required.

C. The value of such extra work or change shall be determined by contract unit values if applicable unit values are set forth in the contract. The amount of the change shall be computed from such values and added to or deducted from the contract price. If the applicable unit values are not in the contract, the value of such extra work or change shall be determined by negotiation.

D. Should a Change Order be required, and the County and the Contractor are unable to agree on the requested change, the Contractor shall, nevertheless, promptly perform the change as directed in writing by the Engineer. If the Contractor disagrees with the Engineer's adjustment determination, the Contractor must make a claim pursuant to the Claims and Dispute Section herein, or else be deemed to have waived any claim on this matter it might otherwise have had.

E. For new work not covered by contract unit values, the amount of an increase shall be limited to the Contractor's reasonable direct labor and material costs and reasonable actual equipment costs as a result of the change (including allowance for labor burden costs) plus a maximum ten percent (10%) markup for all overhead and profit. In the event such change work is performed by a subcontractor, a maximum ten percent (10%) markup for all overhead and profit for all subcontractors' direct labor and material costs and actual equipment costs shall be permitted, with a maximum five percent (5%) markup thereon by the Contractor for all of its overhead and profit, for a <u>total</u> overall maximum markup of fifteen percent (15%) of the amount of change work. All compensation due the Contractor and any Subcontractor or sub-subcontractor for field and home office overhead is included in the markups noted above.

F. In an emergency endangering life or property, or as expressly set forth herein, the Engineer has the authority to order the necessary work in writing. The County shall not be liable to the Contractor for any increased compensation without such written order. The payment authorized by a written order shall represent full and complete compensation to the Contractor for labor, materials, incidental expenses, overhead, profit, impact costs, and time associated with the work authorized by such written order.

G. Execution by the Contractor of a properly authorized Change Order (see appendix) shall be considered a waiver of all claims or requests for additional time or compensation for any activities prior to the time of execution related to items included in the Change Order.

12. CLAIMS AND DISPUTES

A. Claims by the Contractor shall be made in writing to the Engineer within two (2) business days after the commencement of the event giving rise to such claim or else the Contractor shall be deemed to have waived the claim. Written supporting data shall be submitted to the Engineer within ten (10) calendar days after the occurrence of the event, unless the County grants additional time in writing, or else the Contractor shall be deemed to have waived the claim. All claims shall be priced in

accordance with the provisions of the section in this document entitled "Changes in Work".

B. The Contractor shall proceed diligently with its performance as directed by the County, regardless of any pending claim, action, suit, or administrative proceeding, unless otherwise agreed to by the County in writing. The County shall continue to make payments on the undisputed portion of the contract in accordance with the contract documents during the pendency of any claim.

C. Claims by the Contractor shall be resolved in the following manner:

1. Upon receiving the claim and supporting data, the County shall within fifteen (15) business days respond to the claim in writing stating that the claim is either approved or denied. If denied, the County shall specify the grounds for denial. The Contractor shall then have fifteen (15) calendar days in which to provide additional supporting documentation, or to notify the County that the original claim stands as is.

2. If the claim is not resolved, the County may, at its option, choose to submit the matter to mediation. A mediator shall be mutually selected by the parties and each party shall pay one-half (1/2) the expense of mediation. If the County declines to mediate the dispute, the Contractor may bring an action in the County or Circuit Court sitting in Lake County, Florida.

D. Claims by the County against the Contractor shall be made in writing to the Contractor as soon as the event leading to the claim is discovered by the County. Written supporting data shall be submitted to the Engineer. All claims shall be priced in accordance with the provisions of the section in this document entitled "Changes in Work". The Engineer shall make a determination on the claim within fifteen (15) business days of receipt of the claim and shall communicate said determination to the County and the Contractor in writing. The Contractor may appeal the determination as set forth in subsection C(2) above.

E. Arbitration shall not be considered as a means of dispute resolution.

13. MEASUREMENT AND PAYMENT

A. All work completed under the terms of this contract shall be measured according to United States Standard Measures.

B. All measurements shall be taken horizontally or vertically, unless specifically provided otherwise.

C. In the measurement of items to be paid for on the basis of area of finished work, when the pay quantity is designated to be determined by calculation, the lengths and/or widths to be used in the calculations shall be the station-to-station dimensions shown on the plans, the station-to-station dimensions actually constructed within the limits designated by the Engineer, or the final dimensions measured of the completed work within the lines shown on the plans or designated by the Engineer. The method, or combination of methods, shall be those which

reflect with reasonable accuracy the actual area of finished work as determined and authorized by the Engineer.

D. No payment will be made for either construction over a greater area than authorized, or for material moved from outside of stakes and data shown on the plans, except when such work is performed upon instructions of the Engineer.

E. The Contractor shall accept compensation provided under the terms of this contract as full payment for furnishing all materials and for performing all work contemplated and embraced under this contract. Such compensation shall also be for any and all loss or damage arising out of the nature of the work or from the action of the elements, or from any unforeseen difficulties or obstructions encountered during the contract period until final acceptance by the County.

F. Whenever any change, or combination of changes in the plans, results in an increase or decrease in the original contract quantities, and the work added or decreased/eliminated is of the same general character as that called for in the plans, the Contractor shall accept payment in full at the original contract unit prices for the actual quantity of work performed, with no allowance for any loss of anticipated profits.

G. Where the pay quantity for an item is designated to be Lump Sum, and the plans or specifications indicate an estimated quantity, compensation for that item will be adjusted proportionately if a plan change results in a significant change in the quantity from such estimated plan quantity.

H. Failure to construct any item to plan or authorized dimensions within the specification tolerances shall result in reconstruction by the Contractor to acceptable tolerances at no additional cost to the County, acceptance at no pay, or acceptance at reduced final pay as determined by the Engineer. Adjustments to final pay for those items designated to be paid on the basis of Lump Sum quantity under these provisions shall not be made unless such adjustments results in an aggregate change per item of more than $1,000.00 for earthwork items, or more than $100.00 for any other item.

I. Materials purchased by the Contractor for drainage structures, drainage pipe, and road base delivered to job site for this contract are eligible as determined by the Engineer for payment up to one half the bid unit price. If payment is made the materials shall become the property of Lake County. The Contractor shall be responsible for loss or theft and shall replace, at the Contractor's expense, any such materials lost for any reason. The remainder of payment shall not be made until such materials are properly constructed and in place per plans and specifications.

14. PAYMENTS TO CONTRACTOR

Monthly progress payments will be made to the Contractor. In accordance with the items listed within the Bid Form - Tabulation of Estimated Quantities (Division W), a list of items rendered complete, satisfactory, and acceptable will be prepared by the Contractor and submitted with each payment request. The payment request shall be based on extension of the unit values for said quantities. The Contractor's project representative will be required to review the payment requests with the Inspector and

sign the request in agreement. The payment request will then be checked by the Inspector's supervisor, who will reconfirm with the Inspector and Contractor any required corrections, before further processing for payment. If a good-faith dispute exists as to whether one or more items have been completed pursuant to the Contract, the County may continue to withhold an amount not to exceed 150 percent of the total costs to complete the remaining items.

All payments made to the Contractor and all payment of subcontractors, sub-contractors, materialmen, and suppliers shall be in accordance with Part VII, Chapter 218, Florida Statutes.

Federal or State Funding: If any project given to the Contractor under this Agreement is one in which federal or state funds shall be used, the Contractor is hereby informed that payment shall be contingent upon receipt of said federal or state funds or approval. Additionally, payment shall be contingent upon the Contractor completing all required forms and documentation as is necessary in order to obtain such federal or state funding or approval.

15. ACCEPTANCE AND FINAL PAYMENT

A. Final Inspection and Punchlist. Pursuant to Section 218.735, Florida Statutes, a single list of items and each item's estimated completion cost will be prepared upon substantial completion of the project, or at least 30 days prior to contract completion date.

1. Whenever all materials have been furnished, all work has been performed, and the construction contemplated by the contract has been satisfactorily completed, the Contractor shall promptly request a final inspection by the County.
2. The County, or the County's Representative shall make the final inspection within five (5) business days of receipt of notification from the Contractor that the work is complete.
3. The County shall, prepare and deliver to the Contractor a single list of items and the estimated cost to complete the items required to render the Contract complete, satisfactory, and acceptable. Contractor shall fully cooperate with the County in development of the list.
4. The single list will be delivered by the County to the Contractor within five (5) business days after the list of items has been developed and reviewed. This date should not exceed thirty days from the date the County was notified by the Contractor that the work is complete.
5. The estimated cost to complete each item on the list will be based on the unit cost for said item as bid by the Contractor and the percentage of what remains to be paid for said item on the last payment application.
6. The failure by the County to include any corrective work or pending items on the list does not alter Contractor's responsibility for completing the Contract Work pursuant to this Agreement.
7. All items that require correction under the contract and that are identified after the preparation and delivery of the list remain the obligation of Contractor as defined by this Agreement.

B. Maintenance of Work. The Contractor shall maintain all work in first-class condition until final inspection is completed and accepted by the Engineer. All Bonds and

Insurance shall be maintained until final acceptance by the Board of County Commissioners.

C. Final Acceptance. Final completion must be within thirty (30) days after delivery of the list of items in Paragraph A of this section. If the County fails to provide the list as provided for in Paragraph A of this section, the time for completion will be extended by the number of days the County exceeded the delivery date. County will re-inspect to verify completion of the list of items provided to Contractor for final acceptance. The County may exclude the Contractor from those portions of work designated as complete after the inspection; provided, however, that the Contractor will have reasonable access for the time allotted by the County to complete or correct items on the punch list.

D. Release of Retained Funds. Funds retained will be released to the Contractor in accordance with Section 218.735, Florida Statutes, as follows:
   1. Within twenty (20) business days after the single list is provided to the Contractor by the County under paragraph A of this section and upon receipt of a proper invoice from the Contractor, the County shall pay the Contractor the remaining contract balance that includes all retainage previously withheld less an amount equal to 150% of the estimated cost to complete the items on the single list provided for under paragraph A.
   2. Upon completion and acceptance of the County of all items on the list of items provided for in paragraph A of this section, Contractor may submit a payment request for the remaining amount withheld. Contractor shall submit Contractor's Final Payment Affidavit (Division Z of the Contract) with the request for payment.
   3. If the County fails to develop the list as provided for in paragraph A of this section, the Contractor may submit a payment request to the County for the remaining balance of the contract, including all remaining retainage and the County must pay Contractor within twenty (20) business days of receiving a proper payment request or invoice. If the delay was due to the Contractor's failure to cooperate in the development of the list, and the County provides the Contractor written notice specifying this failure, the County shall only be required to pay the Contractor the remaining balance of the contract, less an amount equal to 150% of the estimated cost to complete the items that the County intended to include on the list.
   4. If a good faith dispute exists as to whether one or more of the items identified in the list have been completed pursuant to the contract, County may continue to withhold up to 150% of the total costs to complete such items. Further the County may continue to withhold payment of any amounts that are subject to a good faith dispute, made in writing, under this Agreement or which are the subject of a claim brought under Section 255.05, Florida Statutes.

E. Waiver of Claims

   1. The Contractor's acceptance of final payment shall constitute a full waiver of any and all claims by the Contractor against the County arising out of this Contract or otherwise related to the project, except those previously made in writing and identified by the Contractor as unsettled at the time the final estimate is prepared.

2. Neither the acceptance of the work nor payment by the County shall be deemed to be a waiver of the County's rights to enforce any continuing obligations of the Contractor hereunder or to the recovery of damages for defective work not discovered by the County at the time of final inspection.

F. Termination of Contractor's Responsibility

The contract will be considered complete when all work has been completed and has been accepted by the Engineer. The Contractor will then be released from further obligation except as set forth in his bonds and in this Division.

F. Recovery Rights, Subsequent to Final Payment

The County reserves the right, should an error be discovered in the partial or final estimates, or should proof of defective work or materials used by or on the part of the Contractor be discovered after the final payment has been made, to claim and recover from the Contractor or his surety, or both, by process of law, such sums as may be sufficient to correct the error or make good the defects in the work and materials.

16. COVENANT AGAINST CONTINGENT FEES

The Contractor warrants that no person or selling agency has been employed or retained to solicit or secure this Contract upon an agreement or understanding for a commission, percentage, brokerage or contingent fee, except bona fide employees of bona fide established commercial or selling agencies maintained by the Contractor for the purpose of securing business. For breach or violation of this warranty the County shall have the right to annul this Contract without liability or, in its discretion, to deduct from the Contract price or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage or contingent fee.

17. LANDS FOR WORK AND ACCESS THERETO

A. The County will furnish and define the limits of land for access to the construction site and for the site proper. All information shown in the Contract Documents constitutes the extent of land provided by the County. Any and all other lands required by the Contractor shall be procured by the Contractor at the Contractor's expense.

B. As the work progresses, the Contractor shall keep the site reasonably clear of rubbish, trash, waste and other disposable materials on a daily basis.

1. If the Contractor allows the site to become littered and unsightly, any payments otherwise due may be withheld until the Contractor cleans up the site to the satisfaction of the Engineer. If the Contractor fails to clean-up the site, the County may choose to clean-up the site at the Contractor's expense.

C. Temporary buildings (storage sheds, shops, offices, etc.) may be erected by the Contractor only with the approval of the Engineer after obtaining necessary permits, and shall be built with labor and materials furnished by the Contractor without expense to the County. Such temporary buildings and/or utilities shall remain the

property of the Contractor and will be removed by him at his expense upon the completion of the work. With the written consent of the Engineer, such buildings and/or utilities may be abandoned and need not be removed.

D. The Contractor shall confine all construction equipment, the storage of materials and equipment and the operations of workers to the project site and land and areas identified in and permitted by the Contract Documents, and shall not unreasonably encumber the project site with construction equipment or other material or equipment. The Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or any land or areas contiguous thereto, resulting from the performance of the work.

E. The Contractor is responsible for ensuring and complying with any permit requirements from Federal, State, County, or local agencies in the storage of material on properties not under the control of Lake County. The Contractor shall provide best management practices at storage sites to prevent erosion, hazardous materials contamination, or other contaminations from occurring.

18. EXCAVATED MATERIAL AND FILL MATERIAL

A. Any and all excavated material shall be hauled to legally permitted and environmentally appropriate locations only. Legally permitted locations shall be able to receive such material complying with all federal, state, and local laws.

B. Any fill material used for a County project shall be exclusively sourced from legally permitted and properly zoned sources. Legally permitted sources shall mean those sources complying with all federal, state, and local laws. Properly zoned shall refer to county and municipal local laws or regulations that govern how real property can and cannot be used in certain geographic areas.

C. Any contractor found not to be in compliance with Sections A and B above shall be held responsible and liable to repair and bring back into compliance any location in accordance with federal, state, or local requirements.

19. SITE INVESTIGATION

A. Each Contractor shall visit the site of the proposed work and fully acquaint himself with conditions relating to construction and labor so that he may fully understand the facilities, difficulties and restrictions attending the execution of work under the contract. The Contractor shall thoroughly examine and be familiar with the Contract Documents. Failure or omission of the Contractor to receive or examine any form, instrument, addendum or other documents, or to visit the site and acquaint himself with conditions existing thereon, shall in no way relieve the Contractor from any obligation with respect to the Contract.

The Geotechnical Report dated April 8, 2022, as prepared by Ardaman & Associates, Inc. are included in Appendix B-1 for review.

Lake County does not warrant the accuracy or completeness of these reports, soil samples, or any other site condition information or data made available including, but not limited to, underground utility location. The submission of a bid shall be taken as prima-facie evidence of compliance with this section.

B. The Contractor acknowledges that he has satisfied himself as to the nature and location of the work; the general and local conditions, including but not restricted to, those bearing upon transportation, disposal, handling and storage of materials; availability of labor, water, electric power, roads; and uncertainties of weather, river stages, tides or similar physical conditions at the site; the conformation and conditions of the ground; the character of equipment and facilities needed preliminary to and during prosecution of the work.

C. The Contractor further acknowledges that he has satisfied himself as to the character, quality and quantity of surface and subsurface materials, obstacles, or conditions to be encountered.

2. Any failure by the Contractor to acquaint himself with any aspect of the work or with any of the applicable conditions shall not relieve the Contractor from responsibility for adequately evaluating the difficulty or cost of successfully performing the work under the Contract Documents, nor shall it be considered the basis for any claim for additional time or compensation.

3. The County assumes no responsibility for any conclusions or interpretations made by the Contractor on the basis of the information made available by the County. The County also assumes no responsibility for any understanding or representations made by its officers or agents during or prior to the execution of this Contract, unless such understanding or interpretations are made in writing.

20. PROTECTION OF EXISTING STRUCTURES, UTILITIES, WORK AND VEGETATION

A. Location of existing structures and utilities provided in the Contract Documents are approximate only. Any damage to existing structures or work of any kind, or the interruption of a utility service resulting from failure to comply with the requirements of the Contract Documents, shall be repaired or restored promptly by, and at the expense of the Contractor.

B. The Contractor will preserve and protect all existing vegetation such as trees, shrubs and grass on or adjacent to the site which do not unreasonably interfere with the construction as may be determined by the Engineer. The Contractor will be responsible for all unauthorized cutting or damaging of trees and shrubs, including damage due to careless operation of equipment, stockpiling of materials or tracking of grass areas by equipment.

C. Care will be taken by the Contractor in felling trees authorized for removal to avoid unnecessary damage to vegetation that is to remain in place. Any limbs or branches of trees broken during such operations shall be trimmed without cutting into the trunk and left with a clean cut and a small stub. The Contractor will be liable for, or may be required to replace or restore at his own expense, all vegetation that may be destroyed or damaged due to the Contractor's failure to protect and preserve same as required herein.

D. Where the Contractor hauls material or equipment to the project over roads and bridges on the State road system, County road system or City street system, and such use causes damage, he shall immediately, at his expense, repair such road or

bridge to as good a condition as before the hauling began. Such hauling shall be conducted in accordance with all applicable environmental and safety regulations.

E. The Contractor shall fully protect the work from loss or damage and shall bear the cost of any such loss or damage until final payment has been made. If the Contractor or any one for whom the Contractor is legally liable for is responsible for any loss or damage to the work, or other work or materials of the County or County's separate contractors, the Contractor shall be charged with the same, and any monies necessary to replace such loss or damage shall be deducted from any amounts due the contractor.

F. All existing monuments shown on these plans are to be preserved, if possible. Any monuments damaged or destroyed without the express written permission of Lake County, including but not limited to horizontal and vertical control points and property corners, are to be restored at the expense of the Contractor by a professional surveyor and mapper, licensed to do business in the State of Florida.

21. OTHER WORK

A. The Contractor will cooperate with County forces or others who may be engaged in authorized work prior to final completion of the project.

B. The Contractor shall cooperate with the owners of any underground or overhead utility lines in their removal and rearrangement operations in order that these operations may progress in a reasonable manner and that service rendered by these parties will not be interrupted.

C. The County may perform other work related to the project at the site by the County's own forces, have other work performed by utility owners or let other direct contracts. If the fact that such other work is to be performed is not noted in the Contract Documents, notice thereof will be given to the Contractor. If the Contractor believes that such performance will involve additional expense to the Contractor or require additional time, the Contractor shall send written notice of that fact to the County and the Engineer within forty-eight (48) hours of being notified of the other work. If the Contractor fails to send the above required forty-eight (48) hour notice, the Contractor will be deemed to have waived any rights it otherwise may have had to seek an extension to the contract time or adjustment to the contract amount. The Contractor shall afford each utility owner and other contractors (or the County, if the County is performing the additional work with the County's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work and shall properly connect and coordinate its work with theirs. The Contractor shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of the Engineer and the others whose work will be affected.

D. If any part of the Contractor's work depends, for proper execution or results, upon the work of any other contractor other than a subcontractor or utility owner, the Contractor shall inspect and promptly report to the Engineer, in writing, any delays, defects or other problems in such other work that render it impossible for the Contractor to obtain proper execution or results. The Contractor's failure to report

will constitute an acceptance of the other work as fit and proper for integration with the Contractor's work.

22. TERMINATION

A. Termination for Default

1. The Contractor shall be considered in material default of the Contract and such default shall be considered cause for the County to terminate the Contract, in whole or in part, as further set forth in this Section, for any of the following reasons:

   a. Failing to begin the work under the Contract Documents within the time specified herein;

   b. Failing to properly and timely perform the work as directed by the Engineer or as provided for in the approved Construction Schedule;

   c. Performing the work unsuitably or neglecting or refusing to remove materials or to correct or replace such work as may be rejected as unacceptable, unsuitable or otherwise defective;

   d. Discontinuing the prosecution of the work;

   e. Failing to resume work that has been suspended within a reasonable time after being notified to do so;

   f. Becoming insolvent or declared bankrupt, or committing any act of bankruptcy;

   g. Allowing any final judgment to stand unsatisfied for more than ten (10) days;

   h. Making an assignment for the benefit of creditors;

   i. Failing to obey laws, ordinances, regulations or other codes of any governmental authority with jurisdiction on the project;

   j. Failing to perform or abide by the terms or spirit of the Contract Documents.

   k. Failing to maintain contract security as required by the Contract Documents.

2. The County shall notify the Contractor in writing of the Contractor's default. If the County determines that the Contractor has not taken substantial steps toward effecting a remedy or cure of the default or defaults in his performance within seven (7) calendar days following receipt by the Contractor of written notice of default or defaults, then the County, at its option, without releasing or waiving its rights and remedies against the Contractor's sureties, and without prejudice to any other right it may be entitled to hereunder or by law, may terminate the Contractor's right to proceed under this Contract, in whole or in part, and may take possession of the work and any materials, tools, equipment, and appliances of the Contractor, take assignments of any of the Contractor's

subcontracts and purchase orders and complete the Contractor's work by whatever means, method or agency which the County, in its sole discretion, may choose.

3. If the County deems any of the foregoing remedies necessary, the Contractor agrees it shall not be entitled to receive any further payment until after the work is completed. All money expended and all of the costs, losses, damages and extra expenses, including all management, administrative and other overhead and other direct and indirect expenses, (including engineering, architectural and attorney's fees) or damages incurred by the County incident to such completion, shall be deducted from the contract price, and if such expenditures exceed the unpaid balance of the contract price, the Contractor agrees to pay promptly to the County on demand, the full amount of such excess, including costs of collection, attorneys' fees (including appeal) and interest thereon at the maximum legal rate of interest until paid.

4. The liability of the Contractor hereunder shall extend to and include the full amount of any and all sums paid, expenses and losses incurred, damages sustained and obligations assumed by the County in good faith under the belief that such payments or assumptions were necessary or required, in completing the work and providing labor, materials, equipment, supplies, and other items therefore or relating to the work, and in settlement, discharge, or compromise of any claims, demands, suits or judgments pertaining to or arising out of the work hereunder.

5. If after notice of termination of the Contractor's right to proceed pursuant to this subparagraph A it is determined for any reason that the Contractor was not in default or that his default was excusable, or that the County is not entitled to the remedies against the Contractor provided herein, then the Contractor's remedies against the County shall be the same as and limited to those afforded the Contractor pursuant to the Termination for Convenience subparagraph B below.

B. Termination for Convenience and Right of Suspension

1. The County shall have the right to terminate or suspend this Contract, in whole or in part, without cause upon seven (7) calendar days written notice to the Contractor.

2. In the event of such termination or suspension for convenience, the Contractor's sole recovery against the County shall be limited to that portion of the contract price earned through the date of termination or suspension, together with any retainage withheld and reasonable termination or suspension expenses incurred, but the Contractor shall not be entitled to any other or further recovery against the County, including, but not limited to, damages and any anticipated profit or work not performed.

23. SUBMITTALS

A. Schedule

1. At or before the Pre-construction Conference, the Contractor shall submit a preliminary Construction Progress Schedule to the Engineer. The County will review the schedule and provide the Contractor with comments. Within ten (10) days after receipt of the County's comments, the Contractor shall deliver to the Engineer a Construction Progress Schedule in a form satisfactory to the Engineer and showing the proposed dates of commencement and completion of each of the various subdivisions of work. A bar graph format is acceptable for the Construction Progress Schedule. If required by the Engineer, at or before the Pre-construction Conference, the Contractor shall provide to the County a breakdown of estimated monthly payments for the entire duration of the contract period.

2. For lump sum contracts the Contractor shall also furnish the Engineer with a detailed estimate giving a complete breakdown of the value of items of work to be paid for the purpose of making partial payments thereon. The values employed in making up this estimate and the schedule will be used for determining the basis of partial payment and as a basis for determining work quantity pricing for additions to or deductions from the contract price.

3. The Construction Progress Schedule shall be updated by the Contractor. All updates to the progress schedule shall be submitted for the Engineer's file.

4. The work shall be planned and carried out so as to minimize the interruption of existing services, and/or traffic, or as directed by the Engineer.

5. The Contractor is to furnish the Engineer for approval a Traffic Control Plan (TCP) that complies with the Manual on Uniform Traffic Control Devices (MUTCD).

6. If a National Pollution Discharge Elimination System (NPDES) Construction Permit is required for the Project, prior to construction the Contractor is to furnish the Engineer a copy of the Stormwater Pollution Prevention Plan (SWPPP).

B. Shop Drawings/Working Drawings

8. Four (4) complete sets of detailed shop or working drawings shall be furnished by the prime Contractor to the County for review and processing. The submittal shall include all details, computations, materials, loads, stresses, member sizes, deflections, and temporary connections for precasting.

9. All shop, working and erection drawings prepared by the Contractor or his subcontractor, fabricator or supplier shall be REVIEWED, DATED, STAMPED, APPROVED, SEALED (if required), and SIGNED BY THE CONTRACTOR prior to submission to the County for Public Works' approval. By approving and submitting shop or working drawings, the Contractor represents that he has verified work requirements, field measurements, construction criteria, sequence of assembly and erection, access and clearances, catalog numbers and other similar data. Each submission shall indicate the specification section or bid item number and page and/or sheet number to which the submission applies. Under no circumstances will submittals be accepted from subcontractors.

   The Contractor shall indicate on the working, shop and erection drawings all deviations from the Contract Documents and shall itemize all deviations in the letter of transmittal.

10. Submittals shall be made to the County for approval by the Department of Public Works. The Contractor shall identify each submittal by contract number and title on the form provided by the Engineer. All submittals are to be transmitted in an expeditious manner to ensure "next day delivery". The approval by the County of shop drawings does not relieve the Contractor of liability to order materials and construct per FDOT specifications and the approved construction plans.

4. All submittals by the Contractor shall be made sufficiently in advance of the scheduled start of the applicable construction operation to allow for shop drawings review and for Contractor action required in addressing review comments. The review period shall begin on the day the submittal is received by the Department of Public Works and shall be completed on the day the County transmits reviewed drawings to the Contractor.

5. The Contractor shall schedule the submission of shop drawing sheets (to be discussed at the pre-construction meeting) so that approximately twenty-one (21) days are allowed for review by the County for routine work. For more complex work, the number of copies and the scheduled time for review shall be increased proportionately to the complexity of the work. Contractor submittals that are to be considered as complex and requiring proportionately greater review time include, but are not limited to, the following:

   a. Contractor submittals of alternative design features or modifications to the original design.

   b. Contractor submittals of complex designs, unusual construction or equipment and methods requiring analysis of design calculations.

C. Material Safety Data Sheets Requirement

If any chemicals, or materials or products containing toxic substances are to be used at any time during this Contract, pursuant to completion of this Contract, the Contractor shall furnish a Material Safety Data Sheet to both the Lake County Department of Risk Management and the Engineer, prior to commencing such use.

D. Materials

1. Delivery Tickets: The Contractor shall submit a copy of all delivery tickets for materials used on the project, regardless of the basis of payment.

c. Job Mix Formula for Asphaltic Concrete: Attention is directed to the provisions of FDOT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" FY 2023/2024, and all supplemental specifications thereto which require the submission of job mix formulas for asphaltic concrete, of the type specified, at least fourteen (14) days before plant operations begin. The submitted formula shall be approved by the County. The Contractor shall prepare the mix formula to be submitted to the County.

d. Job Mix Formula for Portland Cement Concrete: Attention is directed to the requirement that job mix design formulas for all Portland Cement Concrete, of the type specified, be submitted at least fourteen (14) days prior to use on the project. The submitted formulas shall be approved by the County and/or its agents prior to its use. All concrete mix designs shall meet FDOT Concrete Class mix guidelines or the requirements included in the Technical Specifications included in these Contract Documents.

e. All Job mix formulas shall be submitted to the Engineer.

24. RIGHT TO AUDIT

The County reserves the right to require the Contractor to submit to an audit by any auditor of the County's choosing. The Contractor shall provide access to all of its records, which relate directly or indirectly to this Agreement at its place of business during regular business hours. The Contractor shall retain all records pertaining to this Agreement and upon request make them available to the County for ten (10) years following expiration of the Agreement; provided, however, that records related to unresolved audit findings, appeals or litigation shall be retained until the action is completed or the dispute is resolved. The Contractor agrees to provide such assistance as may be necessary to facilitate the review or audit by the County to ensure compliance with applicable accounting and financial standards. Additionally, the Contractor agrees to include the requirements of this provision in all contracts with subcontractors and material suppliers in connection with the work performed hereunder. If an audit inspection or examination pursuant to this section discloses overpricing or overcharges of any nature by the Contractor to the County in excess of one percent (1%) of the total contract billings, in addition to making adjustments for the overcharges, the reasonable actual costs of the County's audit shall be reimbursed to the County by the Contractor. Any adjustments and/or payments which must be made as a result of any such audit or inspection of the Contractor's invoices and/or records shall be made within a reasonable amount of time, but in no

event shall the time exceed ninety (90) days, from presentation of the County's audit findings to the Contractor.

25. INTEREST ON JUDGMENTS

In the event of any disputes between the parties to this contract, including without limited thereto, their assignees and/or assigns, arising out of or relating in any way to this contract, which results in litigation and a subsequent judgment, award or decree against either party, it is agreed that any entitlement to post judgment interest, to either party and/or their attorneys, shall be fixed by the proper court at the rate of five (5%) percent, per annum, simple interest. Under no circumstances shall either party be entitled to pre-judgment interest. The parties expressly acknowledge and, to the extent allowed by law, hereby opt out of any provision of federal or state statute not in agreement with this paragraph.

26. DRAINAGE AND EROSION CONTROL

The Contractor shall so conduct his operations and maintain the work in such condition that adequate drainage and erosion control will be in effect at all times.

27. STANDARD SPECIFICATIONS

Unless otherwise specified, the standard specifications to be used for this work shall be the FDOT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION," FY 2023/2024, or 2023 FDOT DESIGN MANUAL (FDM), (or latest edition), and all supplemental specifications thereto, or otherwise depicted on the construction plans.

28. PRIORITY

In any instance where there is an apparent conflict between Special Provisions and the corresponding terms of the "Standard Specifications," the Special Provisions shall be controlling.

29. SURVEY AND LAYOUT

A. The Contractor shall be responsible for providing all lines, grades, boundaries and required survey and/or layout necessary to construct and inspect the project. All centerline control points shall be established and maintained through the contract period by the Contractor.

B. The Contractor shall employ or retain the services of a Florida registered Professional Land Surveyor to perform and supervise the establishment and setting of the project centerline control at intervals not to exceed 500 feet. All primary control points such as section corners, points of intersection, points of curvature and points of tangency shall be installed, referenced by acceptable standards, and maintained through the contract period. All stakes and points shall be clearly marked and identified.

C. The Contractor shall employ or retain the services of a Florida registered Professional Land Surveyor to perform and supervise the establishment of all rights-of-way/boundary staking at all project sidelines. Such staking shall be established and maintained by the Contractor's registered Professional Land Surveyor along each sideline or perimeter at each station and all points of

intersection, points of curvature, and points of tangency. All stakes shall be clearly marked and identified.

D. The Contractor's registered Professional Land Surveyor and all employees engaged in survey efforts shall keep proper documentation of survey notes in hard bound books. The use of digital data storage capabilities may be used in lieu of hardbound books. Standard ASCII files/format shall be used with software compatibility to that of the LCPWD. The Contractor shall submit for approval the selected format and software application(s).

E. The Contractor may perform or select the option to employ a Florida registered Professional Engineer or registered Professional Land Surveyor to provide construction layout. All layout and measurements shall be performed from control and boundaries established and maintained by the Contractor's Florida registered Professional Land Surveyor.

F. The Contractor shall be responsible to perform all layout in acceptable standard methods. All items shall be clearly staked and marked. Roadway items shall be staked for horizontal alignment relative to the edge of pavement with appropriate offset stakes. All vertical grades should be referenced to the nearest even foot cut or fill where practical. Tabulated cut/fill sheets are acceptable for utility work items, copies of which shall be furnished to the Engineer prior to the work.

G. All calculations for intermediate grades and locations shall be performed by the Contractor. All calculations shall be transcribed in hardbound field books prior to layout and staking.

H. The Contractor shall submit, for information only, a Survey and Layout Plan comprised of the following:

1. Name, address and certificate number of the registered Professional Land Surveyor to be in responsible charge of performing all survey control and boundary work.

2. Name, address and certificate registration number, if applicable, of the person in responsible charge of performing all layout, measurements and calculations for the project, if opted by the Contractor. This person must be a Contractor, Professional Land Surveyor or Professional Engineer.

I. Stakes Set by County: The Engineer will provide all construction stakes establishing right-of-way limits.

J. Preservation of Stakes and Marks: The Contractor will be held responsible for the preservation of all the stakes and marks. If any of the stakes or marks are carelessly or willfully destroyed or disturbed by the Contractor, the cost of replacing them shall be deducted from the payment for the work.

30. LABORATORY TESTING

Cost of all required laboratory testing shall be borne by the County with the exception of the cost of failing tests and subsequent re-tests which shall be borne by the Contractor. Testing shall be in accordance with the Standard Specifications.

31. CONFORMITY OF WORK WITH PLANS

A. All work performed and all materials furnished shall be in reasonably close conformity with the lines, grades, cross sections, dimensions, and material requirements, including tolerances, shown on the plans or indicated in the specifications.

B. In the event the Engineer finds the materials or the finished product in which the materials are used not within reasonably close conformity with the plans and specifications, but that reasonably acceptable work has been produced, he shall then make a determination if the work shall be accepted and remain in place. In this event, the Engineer will document the basis of acceptance by contract modification which will provide for an appropriate adjustment in the contract price for such work or materials as he deems necessary to conform to his determination based on engineering judgment.

C. For base and surface courses, the finished grade may vary as much as 0.1 foot from the grade shown in the plans, provided that all template and straight edge requirements are met and that suitable transitions are in place.

32. GUARANTEE

All work shall be guaranteed for eighteen (18) months after completion and acceptance of the work unless otherwise specified. The guarantees are to be construed as being supplemental in nature and in addition to any and all other remedies available to the County under the laws of the State of Florida.

33. WARRANTY

The Contractor shall obtain and assign to the County all express warranties given to the Contractor or any subcontractors by any material suppliers, equipment or fixtures to be incorporated into the Project. The Contractor warrants to the County that any materials and equipment furnished under the Contract Documents shall be new unless otherwise specified, and that all work shall be of good quality, free from all defects and in conformance with the Contract Documents. The Contractor further warrants to the County that all materials and equipment furnished under the Contract Documents shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturers, fabricators, suppliers or processors except as otherwise provided for in the Contract Documents. Unless otherwise specified, if within eighteen (18) months after final completion and acceptance, any work is found to be defective or not in conformance with the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the County. The Contractor shall also be responsible for and pay for replacement or repair of adjacent materials or work which may be damaged as a result of such

replacement or repair. These warranties are in addition to those implied warranties to which the County is entitled as a matter of law.

34. PUBLIC RECORDS

Pursuant to Section 119.0701, Florida Statutes, the Contractor shall comply with the Florida Public Records' laws, and shall:

A. Keep and maintain public records required by the County to perform the services identified herein.

B. Upon request from Lake County, provide the County with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in this chapter or as otherwise provided by law.

C. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the contractor does not transfer the records to the County.

D. Upon completion of the contract, transfer, at no cost, to the County all public records in possession of the contractor or keep and maintain public records required by the County to perform the service. If the contractor transfers all public records to the County upon completion of the contract, the contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the contractor keeps and maintains public records upon completion of the contract, the contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the County, upon request from the County's custodian of public records, in a format that is compatible with the information technology systems of the County.

E. **IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT 352-253-6007, DMARCHESE@LAKECOUNTYFL.GOV, OR DEB MARCHESE, LAKE COUNTY PUBLIC WORKS, PO BOX 7800, TAVARES, FL 32778.**

Failure to comply with this section shall be deemed a breach of the contract and enforceable as set forth in Section 119.0701, Florida Statutes.

DIVISION J
LABORATORY TESTING AND SAMPLING SCHEDULE

OPERATION	MATERIAL SPECIFICATION	TESTS	PROJECT REQUIREMENTS	TESTING FREQUENCY
Prime and Tack Coats	FDOT Standard Specifications (Latest Edition)		Certification	Every Transport
Type Superpave Asphaltic Concrete	FDOT Standard Specifications (Latest Edition)	Job Mix Formula	Certification	Each mix design or change of aggregates
		RICE (Gmm)	Section 334	One per sublot
		Extraction Gradation Analysis	Section 334	One per sublot
		Field Density (Gmb)	Section 334	5 six inch cores per sublot (Random Locations)
		Asphalt Binder	Section 334	1 sample for the first 1000 tons and 1 per 4000 tons after
		Thickness	Section 330	Daily
Pavement Smoothness	FDOT Standard Specifications (Latest Edition)	Rolling Straight Edge	Section 330 (FM 5-509) Max 3/16 inch	Final SP structural layer and friction course layer
Concrete	FDOT Standard Specifications (Latest Edition)	Compression Strength	FDOT Section 346 and 347	Section 347 acceptance based on Certification; Section 346 One (1) set of cylinders for 10 CY or more per day. Additional set(s) for each 50 CY/day. One (1) set for each class of concrete placed each day.
		Each class of concrete used	Certification	Each mix design or change
Embankment	FDOT Standard Specifications (Latest Edition)	StandardProctor AASHTO T-99	Section 120	Per material type
		Field Density	Section 120 -100% AASHTO T-99180	Section 120-One test per 500 LF per 12" lift of embankment Section 125-One test per 300 LF of pipe trench (or between structures) per 6' lift until 1 ft above pipe; 12" lift of backfill 1 ft above pipe Section 125 (modified) One test per 12" lift of structure backfill alternating sides
Compacted Subgrade	FDOT Standard Specifications (Latest Edition)	Standard Proctor AASHTO T-99	Section 120	One per material type
		Field Density	100% AASHTO T-99	Section 120 (modified)-One per 300 LF of sidewalk One per driveway
Stabilized Subgrade	FDOT Standard Specifications (Latest Edition)	Limerock Bearing Ratio FM 5-515	Section 160	One per 1,000 LF per lane (One per 2 lots) One per 2,000 LF per shoulder (One per 4 lots)
		Field Density/Thickness	Section 160-98% AASHTO T-180	Density-One per 500 LF per lane (1 per lot) Thickness – 3 per lot Density/thickness (modified)-One per 500 LF per shoulder
Limerock Base Course	FDOT Standard Specifications (Latest Edition)	Modified Proctor AASHTO T-180	Section 200	One per 8 lots
		Field Density/Thickness	Section 200-98% AASHTO T-180	Density-One per 300 LF per lane Thickness- 3 per lot Density/Thickness-One per 500 LF per shoulder
Sodding	FDOT Standard Specifications (Latest Edition) Section 575, Sodding, and Section 981	Each type of sod used	Certification	All seed, sod and mulch shall be free of noxious weeds and exotic pest plants, plant parts or seed listed in the current Category I "List of Invasive Species" from the Florida Exotic Pest Plant Council

This page to be used if permits are required.

DIVISION P

PERMITS

BID NO. 23-562

PERMIT INDEX

AGENCY	PERMIT NO.	PAGE NO. (s)
St. Johns River Water Management District	148907-4	P-2 through P-13
Click here to enter text.		

St. Johns River
Water Management District
Ann B. Shortelle, Ph.D., Executive Director

4049 Reid Street • P.O. Box 1429 • Palatka, FL 32178-1429 • 386-329-4500 • www.sjrwmd.com

July 09, 2021

Fred Schneider
Lake County Public Works
PO Box 7800
Tavares, FL 32778-7800

SUBJECT: 148907-4
Citrus Grove Road Phase V

Dear Sir/Madam:

Enclosed is your individual permit issued by the St. Johns River Water Management District on July 09, 2021. This permit is a legal document and should be kept with your other important documents. Permit issuance does not relieve you from the responsibility of obtaining any necessary permits from any federal, state, or local agencies for your project.

Technical Staff Report:
If you wish to review a copy of the Technical Staff Report (TSR) that provides the District's staff analysis of your permit application, you may view the TSR by going to the Permitting section of the District's website at www.sjrwmd.com/permitting. Using the "search applications and permits" feature, you can use your permit number or project name to find information about the permit. When you see the results of your search, click on the permit number and then on the TSR folder.

Noticing Your Permit:
For noticing instructions, please refer to the noticing materials in this package regarding closing the point of entry for someone to challenge the issuance of your permit. Please note that if a timely petition for administrative hearing is filed, your permit will become non-final and any activities that you choose to undertake pursuant to your permit will be at your own risk. Please refer to the attached Notice of Rights to determine any legal rights you may have concerning the District's agency action.

Compliance with Permit Conditions:
To submit your required permit compliance information, go to the District's website at www.sjrwmd.com/permitting. Under the "Apply for a permit or submit compliance data" section, click to sign-in to your existing account or to create a new account. Select the "Compliance Submittal" tab, enter your permit number, and select "No Specific Date" for the Compliance Due Date Range. You will then be able to view all the compliance submittal requirements for your project. Select the compliance item that you are ready to submit and then attach the appropriate information or form. The forms to comply with your permit conditions are available at www.sjrwmd.com/permitting under the section "Handbooks, forms, fees, final orders". Click on

forms to view all permit compliance forms, then scroll to the ERP application forms section and select the applicable compliance forms. Alternatively, if you have difficulty finding forms or need copies of the appropriate forms, please contact the Bureau of Regulatory Support at (386) 329-4570.

Transferring Your Permit:
Your permit requires you to notify the District within 30 days of any change in ownership or control of the project or activity covered by the permit, or within 30 days of any change in ownership or control of the real property on which the permitted project or activity is located or occurs. You will need to provide the District with the information specified in rule 62-330.340, Florida Administrative Code (F.A.C.). Generally, this will require you to complete and submit Form 62-330.340(1), "Request to Transfer Permit," available at http://www.sjrwmd.com/permitting/permitforms.html.

Please note that a permittee is liable for compliance with the permit before the permit is transferred. The District, therefore, recommends that you request a permit transfer in advance in accordance with the applicable rules. You are encouraged to contact District staff for assistance with this process.

Thank you and please let us know if you have additional questions. For general questions contact e-permit@sjrwmd.com or (386) 329-4570.

Sincerely,

Michelle Reiber

Michelle Reiber, Bureau Chief
Division of Regulatory Services
St. Johns River Water Management District
525 Community College Parkway, S.E.
Palm Bay, FL 32909
(321) 409-2129

Enclosures: Permit
Notice of Rights
List of Newspapers for Publication

cc: District Permit File

George McLatchey
DRMP
941 Lake Baldwin Ln
Orlando, FL 32814-6438

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
Post Office Box 1429
Palatka, Florida 32178-1429

PERMIT NO: 148907-4 **DATE ISSUED:** July 09, 2021

PROJECT NAME: Citrus Grove Road Phase V

A PERMIT AUTHORIZING:
Construction and operation of a Stormwater Management System for a 10.09 acre project known as Citrus Grove Road Phase V as per plans received by the District on April 12, 2021.

LOCATION:
Section(s): 9, 10, 12, 11 Township(s): 22S Range(s): 26E
Lake County

Receiving Water Body:

Name	Class
Landlocked Basin	III Fresh

ISSUED TO:
Lake County Public Works
PO Box 7800
Tavares, FL 32778-7800

The permittee agrees to hold and save the St. Johns River Water Management District and its successors harmless from any and all damages, claims, or liabilities which may arise from permit issuance. Said application, including all plans and specifications attached thereto, is by reference made a part hereof.

This permit does not convey to the permittee any property rights nor any rights or privileges other than those specified herein, nor relieve the permittee from complying with any law, regulation or requirement affecting the rights of other bodies or agencies. All structures and works installed by permittee hereunder shall remain the property of the permittee.

This permit may be revoked, modified or transferred at any time pursuant to the appropriate provisions of Chapter 373, Florida Statutes.

PERMIT IS CONDITIONED UPON:
See conditions on attached "Exhibit A", dated July 09, 2021

AUTHORIZED BY: St. Johns River Water Management District
Division of Regulatory Services

By: _____

Sandra Joiner
Supervising Professional Engineer

"EXHIBIT A"
CONDITIONS FOR ISSUANCE OF PERMIT NUMBER 148907-4
Citrus Grove Road Phase V
DATED July 09, 2021

1. All activities shall be implemented following the plans, specifications and performance criteria approved by this permit. Any deviations must be authorized in a permit modification in accordance with Rule 62-330.315, F.A.C. Any deviations that are not so authorized may subject the permittee to enforcement action and revocation of the permit under Chapter 373, F.S.

2. A complete copy of this permit shall be kept at the work site of the permitted activity during the construction phase, and shall be available for review at the work site upon request by the District staff. The permittee shall require the contractor to review the complete permit prior to beginning construction.

3. Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be installed immediately prior to, and be maintained during and after construction as needed, to prevent adverse impacts to the water resources and adjacent lands. Such practices shall be in accordance with the State of Florida Erosion and Sediment Control Designer and Reviewer Manual (Florida Department of Environmental Protection and Florida Department of Transportation June 2007), and the Florida Stormwater Erosion and Sedimentation Control Inspector's Manual (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008), which are both incorporated by reference in subparagraph 62-330.050(9)(b)5, F.A.C., unless a project-specific erosion and sediment control plan is approved or other water quality control measures are required as part of the permit.

4. At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the District a fully executed Form 62-330.350(1), "Construction Commencement Notice," (October 1, 2013) (http://www.flrules.org/Gateway/reference.asp?No=Ref-02505), incorporated by reference herein, indicating the expected start and completion dates. A copy of this form may be obtained from the District, as described in subsection 62-330.010(5), F.A.C., and shall be submitted electronically or by mail to the Agency. However, for activities involving more than one acre of construction that also require a NPDES stormwater construction general permit, submittal of the Notice of Intent to Use Generic Permit for Stormwater Discharge from Large and Small Construction Activities, DEP Form 62-621.300(4)(b), shall also serve as notice of commencement of construction under this chapter and, in such a case, submittal of Form 62-330.350(1) is not required.

5. Unless the permit is transferred under Rule 62-330.340, F.A.C., or transferred to an operating entity under Rule 62-330.310, F.A.C., the permittee is liable to comply with the plans, terms and conditions of the permit for the life of the project or activity.

6. Within 30 days after completing construction of the entire project, or any independent portion of the project, the permittee shall provide the following to the Agency, as applicable:

   a. For an individual, private single-family residential dwelling unit, duplex, triplex, or quadruplex — "Construction Completion and Inspection Certification for Activities Associated with a Private Single-Family Dwelling Unit" [Form 62-330.310(3)]; or

b. For all other activities — "As-Built Certification and Request for Conversion to Operation Phase" [Form 62-330.310(1)].

c. If available, an Agency website that fulfills this certification requirement may be used in lieu of the form.

7. If the final operation and maintenance entity is a third party:

   a. Prior to sales of any lot or unit served by the activity and within one year of permit issuance, or within 30 days of as-built certification, whichever comes first, the permittee shall submit, as applicable, a copy of the operation and maintenance documents (see sections 12.3 thru 12.3.4 of Volume I) as filed with the Florida Department of State, Division of Corporations and a copy of any easement, plat, or deed restriction needed to operate or maintain the project, as recorded with the Clerk of the Court in the County in which the activity is located.

   b. Within 30 days of submittal of the as- built certification, the permittee shall submit "Request for Transfer of Environmental Resource Permit to the Perpetual Operation and Maintenance Entity" [Form 62-330.310(2)] to transfer the permit to the operation and maintenance entity, along with the documentation requested in the form. If available, an Agency website that fulfills this transfer requirement may be used in lieu of the form.

8. The permittee shall notify the District in writing of changes required by any other regulatory District that require changes to the permitted activity, and any required modification of this permit must be obtained prior to implementing the changes.

9. This permit does not:

   a. Convey to the permittee any property rights or privileges, or any other rights or privileges other than those specified herein or in Chapter 62-330, F.A.C.;

   b. Convey to the permittee or create in the permittee any interest in real property;

   c. Relieve the permittee from the need to obtain and comply with any other required federal, state, and local authorization, law, rule, or ordinance; or

   d. Authorize any entrance upon or work on property that is not owned, held in easement, or controlled by the permittee.

10. Prior to conducting any activities on state-owned submerged lands or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund, the permittee must receive all necessary approvals and authorizations under Chapters 253 and 258, F.S. Written authorization that requires formal execution by the Board of Trustees of the Internal Improvement Trust Fund shall not be considered received until it has been fully executed.

11. The permittee shall hold and save the District harmless from any and all damages, claims, or liabilities that may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any project authorized by the permit.

12. The permittee shall notify the District in writing:

    a. Immediately if any previously submitted information is discovered to be inaccurate; and

b. Within 30 days of any conveyance or division of ownership or control of the property or the system, other than conveyance via a long-term lease, and the new owner shall request transfer of the permit in accordance with Rule 62-330.340, F.A.C. This does not apply to the sale of lots or units in residential or commercial subdivisions or condominiums where the stormwater management system has been completed and converted to the operation phase.

13. Upon reasonable notice to the permittee, District staff with proper identification shall have permission to enter, inspect, sample and test the project or activities to ensure conformity with the plans and specifications authorized in the permit.

14. If prehistoric or historic artifacts, such as pottery or ceramics, projectile points, stone tools, dugout canoes, metal implements, historic building materials, or any other physical remains that could be associated with Native American, early European, or American settlement are encountered at any time within the project site area, the permitted project shall cease all activities involving subsurface disturbance in the vicinity of the discovery. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance Review Section (DHR), at (850) 245-6333, as well as the appropriate permitting agency office. Project activities shall not resume without verbal or written authorization from the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and the proper authorities notified in accordance with Section 872.05, F.S. For project activities subject to prior consultation with the DHR and as an alternative to the above requirements, the permittee may follow procedures for unanticipated discoveries as set forth within a cultural resources assessment survey determined complete and sufficient by DHR and included as a specific permit condition herein.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under Rule 62-330.201, F.A.C., provides otherwise.

16. The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, F.A.C., or cause violations of state water quality standards.

17. This permit is issued based on the applicant's submitted information that reasonably demonstrates that adverse water resource-related impacts will not be caused by the completed permit activity. If any adverse impacts result, the District will require the permittee to eliminate the cause, obtain any necessary permit modification, and take any necessary corrective actions to resolve the adverse impacts.

18. A Recorded Notice of Environmental Resource Permit may be recorded in the county public records in accordance with Rule 62-330.090(7), F.A.C. Such notice is not an encumbrance upon the property.

19. This permit for construction will expire five years from the date of issuance.

20. All wetland areas or water bodies that are outside the specific limits of construction authorized by this permit must be protected from erosion, siltation, scouring or excess turbidity, and dewatering.

21. The operation and maintenance entity shall inspect the stormwater or surface water management system once within two years after the completion of construction and every two years thereafter to determine if the system is functioning as designed and permitted.

The operation and maintenance entity must maintain a record of each required inspection, including the date of the inspection, the name and contact information of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by the District during normal business hours. If at any time the system is not functioning as designed and permitted, then within 30 days the entity shall submit a report electronically or in writing to the District using Form 62-330.311(1), "Operation and Maintenance Inspection Certification," describing the remedial actions taken to resolve the failure or deviation.

22. This permit does not authorize the permittee to cause any adverse impact to or "take" of state listed species and other regulated species of fish and wildlife. Compliance with state laws regulating the take of fish and wildlife is the responsibility of the owner or applicant associated with this project. Please refer to Chapter 68A-27 of the Florida Administrative Code for definitions of "take" and a list of fish and wildlife species. If listed species are observed onsite, FWC staff are available to provide decision support information or assist in obtaining the appropriate FWC permits. Most marine endangered and threatened species are statutorily protected and a "take" permit cannot be issued. Requests for further information or review can be sent to FWCConservationPlanningServices@MyFWC.com.

23. At a minimum, all retention and detention storage areas must be excavated to rough grade prior to building construction or placement of impervious surface within the area to be served by those facilities. To prevent reduction in storage volume and percolation rates, all accumulated sediment must be removed from the storage area prior to final grading and stabilization.

24. In accordance with the monitoring requirements of Section 13.7(b)(2) of the ERP Applicant's Handbook, SJRWMD Volume II (October 1, 2013), the permittee shall monitor water elevations in the stormwater management system for ten years following completion of construction of the entire system, including all associated residential, commercial, transportation, or agricultural improvements. If the results of the monitoring indicate that the system is not recovering storage in accordance with the permitted design or causes water to be discharged to Lake Apopka or its tributaries for events less than the 100-year 24-hour storm event, then the permittee shall either perform maintenance that brings the system into compliance or obtain a modification to the permit and implement measures to bring the system into compliance, and in either event the monitoring shall continue for three years after the date the system is brought into compliance.

25. The permittee shall install a staff gauge in each retention pond in a clearly visible location, upon completion of construction of the system or upon any part of the system being used for its intended purpose. During the monitoring period, water level elevations in each pond shall be monitored once a month in the months of March, and June through December. A permanent record of water level measurements showing the date and time of day of the measurement, the depth (water level) and weather conditions shall be maintained by the permittee. These records must be submitted to the District within 30 days of the end of each calendar year during the monitoring period.

26. This permit does not authorize any impacts to wetlands or other surface waters.

27. The proposed project must be constructed as per plans and calculations received by the District on April 12, 2021.

Notice Of Rights

1. A person whose substantial interests are or may be affected has the right to request an administrative hearing by filing a written petition with the St. Johns River Water Management District (District). Pursuant to Chapter 28-106 and Rule 40C-1.1007, Florida Administrative Code, the petition must be filed (received) either by delivery at the office of the District Clerk at District Headquarters, P. O. Box 1429, Palatka Florida 32178-1429 (4049 Reid St., Palatka, FL 32177) or by e-mail with the District Clerk at Clerk@sjrwmd.com, within twenty-six (26) days of the District depositing the notice of District decision in the mail (for those persons to whom the District mails actual notice), within twenty-one (21) days of the District emailing the notice of District decision (for those persons to whom the District emails actual notice), or within twenty-one (21) days of newspaper publication of the notice of District decision (for those persons to whom the District does not mail or email actual notice). A petition must comply with Sections 120.54(5)(b)4. and 120.569(2)(c), Florida Statutes, and Chapter 28-106, Florida Administrative Code. The District will not accept a petition sent by facsimile (fax), as explained in paragraph no. 4 below.

2. Please be advised that if you wish to dispute this District decision, mediation may be available and that choosing mediation does not affect your right to an administrative hearing. If you wish to request mediation, you must do so in a timely-filed petition. If all parties, including the District, agree to the details of the mediation procedure, in writing, within 10 days after the time period stated in the announcement for election of an administrative remedy under Sections 120.569 and 120.57, Florida Statutes, the time limitations imposed by Sections 120.569 and 120.57, Florida Statutes, shall be tolled to allow mediation of the disputed District decision. The mediation must be concluded within 60 days of the date of the parties' written agreement, or such other timeframe agreed to by the parties in writing. Any mediation agreement must include provisions for selecting a mediator, a statement that each party shall be responsible for paying its pro-rata share of the costs and fees associated with mediation, and the mediating parties' understanding regarding the confidentiality of discussions and documents introduced during mediation. If mediation results in settlement of the administrative dispute, the District will enter a final order consistent with the settlement agreement. If mediation terminates without settlement of the dispute, the District will notify all the parties in writing that the administrative hearing process under Sections 120.569 and 120.57, Florida Statutes, is resumed. Even if a party chooses not to engage in formal mediation, or if formal mediation does not result in a settlement agreement, the District will remain willing to engage in informal settlement discussions.

3. A person whose substantial interests are or may be affected has the right to an informal administrative hearing pursuant to Sections 120.569 and 120.57(2), Florida Statutes, where no material facts are in dispute. A petition for an informal hearing must also comply with the requirements set forth in Rule 28-106.301, Florida Administrative Code.

4. A petition for an administrative hearing is deemed filed upon receipt of the complete petition by the District Clerk at the District Headquarters in Palatka, Florida during the District's regular business hours. The District's regular business hours are 8:00 a.m. – 5:00 p.m., excluding weekends and District holidays. Petitions received by the District Clerk after the District's regular business hours shall be deemed filed as of 8:00 a.m. on the District's next regular business day. The District's acceptance of petitions filed by e-mail is subject to certain conditions set forth in the District's Statement of Agency Organization and Operation (issued pursuant to Rule 28-101.001, Florida Administrative Code), which is available for viewing at *sjrwmd.com*. These conditions include, but are not limited to, the petition being in the form of a PDF or TIFF file and being capable of being stored and printed by the District. Further, pursuant to the District's Statement of Agency Organization and Operation, attempting to file a petition by facsimile is prohibited and shall not constitute filing.

5. Failure to file a petition for an administrative hearing within the requisite timeframe shall constitute a waiver of the right to an administrative hearing. (Rule 28-106.111, Florida Administrative Code).

6. The right to an administrative hearing and the relevant procedures to be followed are governed by Chapter 120, Florida Statutes, Chapter 28-106, Florida Administrative Code, and Rule 40C-1.1007, Florida Administrative Code. Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means the District's final action may be different from the position taken by it in this notice. A person whose substantial interests are or may be affected by the District's final action has the right to become a party to the proceeding, in accordance with the requirements set forth above.

7. Pursuant to Section 120.68, Florida Statutes, a party to the proceeding before the District who is adversely affected by final District action may seek review of the action in the District Court of Appeal by filing a notice of appeal pursuant to Rules 9.110 and 9.190, Florida Rules of Appellate Procedure, within 30 days of the rendering of the final District action.

8. A District action is considered rendered, as referred to in paragraph no. 7 above, after it is signed on behalf of the District and filed by the District Clerk.

9. Failure to observe the relevant timeframes for filing a petition for judicial review as described in paragraph no. 7 above will result in waiver of that right to review.

NOR.Decision.DOC.001
Revised 12.7.11

NOTICING INFORMATION

Please be advised that the St. Johns River Water Management District will not publish a notice in the newspaper advising the public that it has issued a permit for this project.

Newspaper publication, using the District's notice form, notifies members of the public of their right to challenge the issuance of the permit. If proper notice is given by newspaper publication, then there is a 21-day time limit for someone to file a petition for an administrative hearing to challenge the issuance of the permit.

To close the point of entry for filing a petition, you may publish (at your own expense) a one-time notice of the District's decision in a newspaper of general circulation within the affected area as defined in Section 50.011 of the Florida Statutes. If you do not publish a newspaper notice to close the point of entry, the time to challenge the issuance of your permit will not expire and someone could file a petition even after your project is constructed.

A copy of the notice form and a partial list of newspapers of general circulation are attached for your convenience. However, you are not limited to those listed newspapers. If you choose to close the point of entry and the notice is published, the newspaper will return to you an affidavit of publication. In that event, it is important that you either submit a scanned copy of the affidavit by emailing it to *compliancesupport@sjrwmd.com* (preferred method) **or** send a copy of the original affidavit to:

Office of Business and Administrative Services
4049 Reid Street
Palatka, FL 32177

If you have any questions, please contact the Office of Business and Administrative Services at (386) 329-4570.

NOTICE OF AGENCY ACTION TAKEN BY THE
ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

Notice is given that the following permit was issued on _____:

(Name and address of applicant)_____
permit#_____. The project is located in _____County, Section _____, Township _____ South, Range _____ East. The permit authorizes a surface water management system on _____ acres for _____ known as _____. The receiving water body is _____.

A person whose substantial interests are or may be affected has the right to request an administrative hearing by filing a written petition with the St. Johns River Water Management District (District). Pursuant to Chapter 28-106 and Rule 40C-1.1007, Florida Administrative Code (F.A.C.), the petition must be filed (received) either by delivery at the office of the District Clerk at District Headquarters, P.O. Box 1429, Palatka FL 32178-1429 (4049 Reid St, Palatka, FL 32177) or by e-mail with the District Clerk at Clerk@sjrwmd.com, within twenty-one (21) days of newspaper publication of the notice of District decision (for those persons to whom the District does not mail or email actual notice). A petition must comply with Sections 120.54(5)(b)4. and 120.569(2)(c), Florida Statutes (F.S.), and Chapter 28-106, F.A.C. The District will not accept a petition sent by facsimile (fax). Mediation pursuant to Section 120.573, F.S., may be available and choosing mediation does not affect your right to an administrative hearing.

A petition for an administrative hearing is deemed filed upon receipt of the complete petition by the District Clerk at the District Headquarters in Palatka, Florida during the District's regular business hours. The District's regular business hours are 8 a.m. – 5 p.m., excluding weekends and District holidays. Petitions received by the District Clerk after the District's regular business hours shall be deemed filed as of 8 a.m. on the District's next regular business day. The District's acceptance of petitions filed by e-mail is subject to certain conditions set forth in the District's Statement of Agency Organization and Operation (issued pursuant to Rule 28-101.001, Florida Administrative Code), which is available for viewing at www.sjrwmd.com. These conditions include, but are not limited to, the petition being in the form of a PDF or TIFF file and being capable of being stored and printed by the District. Further, pursuant to the District's Statement of Agency Organization and Operation, attempting to file a petition by facsimile (fax) is prohibited and shall not constitute filing.

The right to an administrative hearing and the relevant procedures to be followed are governed by Chapter 120, Florida Statutes, Chapter 28-106, Florida Administrative Code, and Rule 40C-1.1007, Florida Administrative Code. Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means the District's final action may be different from the position taken by it in this notice. **Failure to file a petition for an administrative hearing within the requisite time frame shall constitute a waiver of the right to an administrative hearing. (Rule 28-106.111, F.A.C.).**

If you wish to do so, please visit http://www.sjrwmd.com/nor_dec/ to read the complete Notice of Rights to determine any legal rights you may have concerning the District's decision(s) on the permit application(s) described above. You can also request the Notice of Rights by contacting the Director of Business and Administrative Services, 4049 Reid St., Palatka, FL 32177-2529, tele. no. (386)329-4570.

NEWSPAPER ADVERTISING

ALACHUA
The Alachua County Record, Legal Advertising
P. O. Box 806
Gainesville, FL 32602
352-377-2444/ fax 352-338-1986

BRAFORD
Bradford County Telegraph, Legal Advertising
P. O. Drawer A
Starke, FL 32901
904-964-6305/ fax 904-964-8628

CLAY
Clay Today, Legal Advertising
1560 Kinsley Ave., Suite 1
Orange Park, FL 32073
904-264-3200/ fax 904-264-3285

FLAGLER
Flagler Tribune, c/o News Journal
P. O. Box 2831
Daytona Beach, FL 32120-2831
386- 681-2322

LAKE
Daily Commercial, Legal Advertising
P. O. Drawer 490007
Leesburg, FL 34749
352-365-8235/fax 352-365-1951

NASSAU
News-Leader, Legal Advertising
P. O. Box 766
Fernandina Beach, FL 32035
904-261-3696/fax 904-261-3698

ORANGE
Sentinel Communications, Legal Advertising
633 N. Orange Avenue
Orlando, FL 32801
407-420-5160/ fax 407-420-5011

PUTNAM
Palatka Daily News, Legal Advertising
P. O. Box 777
Palatka, FL 32178
386-312-5200/ fax 386-312-5209

SEMINOLE
Sanford Herald, Legal Advertising
300 North French Avenue
Sanford, FL 32771
407-323-9408

BAKER
Baker County Press, Legal Advertising
P. O. Box 598
Maclenny, FL 32063
904-259-2400/ fax 904-259-6502

BREVARD
Florida Today, Legal Advertising
P. O. Box 419000
Melbourne, FL 32941-9000
321-242-3832/ fax 321-242-6618

DUVAL
Daily Record, Legal Advertising
P. O. Box 1769
Jacksonville, FL 32201
904-356-2466 / fax 904-353-2628

INDIAN RIVER
Treasure Coast News
760 NW Enterprise Dr.
Port St. Lucie, FL 34986
772-283-5252

MARION
Ocala Star Banner, Legal Advertising
2121 SW 19th Avenue Road
Ocala, FL 34474
352-867-4010/fax 352-867-4126

OKEECHOBEE
Okeechobee News, Legal Advertising
P. O. Box 639
Okeechobee, FL 34973-0639
863-763-3134/fax 863-763-5901

OSCEOLA
Little Sentinel, Legal Advertising
633 N. Orange Avenue
Orlando, FL 32801
407-420-5160/ fax 407-420-5011

ST. JOHNS
St. Augustine Record, Legal Advertising
P. O. Box 1630
St. Augustine, FL 32085
904-819-3439

VOLUSIA
News Journal Corporation, Legal Advertising
P. O. Box 2831
Daytona Beach, FL 32120-2831
(386) 681-2322

DIVISION W

BID FORM

Southern Development & Construction Inc
COMPANY NAME

NOTE: BIDDER SHALL SUBMIT BID IN DUPLICATE ON FORM PROVIDED HEREIN.

BID

OF

Southern Development & Construction Inc
(Name)

2544 Connection Point Oviedo, FL 32765
(Address)

(321)-251-0535
(Phone No.) SHANE@SDCFL.COM

FOR

BID NO. 23-562

CITRUS GROVE ROAD PHASE 5
PROJECT NO. 2023-08

Lake County, Florida

Submitted Sept 14 2023

TO THE COUNTY OF LAKE, FLORIDA:

We, the undersigned, hereby declare that no person or persons, firm or corporation, other than the undersigned, are interested in this proposal, as principals, and that this Bid is made without collusion with any person, firm or corporation, and we have carefully and to our full satisfaction examined the Special Provisions and form of Contract and Bond, together with the approved Plans and Specifications for the above described project, and that we have made a full examination of the location of the proposed work and the source of supply of materials, and we hereby agree to furnish all necessary labor, equipment, and materials, fully understanding that the quantities shown herewith are approximate only, and that we will fully complete all necessary work in accordance with the Plans and Specifications, and the requirements under them of the Engineer, within the time limit specified in this Bid for the following unit values, to-wit:

BID FORM – TABULATION OF ESTIMATED QUANTITIES
CITRUS GROVE ROAD PHASE 5
PROJECT NO. 2023-08, BID NO. 23-562
ROADWAY CONSTRUCTION

Item No.	Description	Unit	Unit Price	Quantity	Amount
0101 1	Mobilization	LS	$ 680,000.00	1	$ 680,000.00
0101 1A	Survey/Layout/As Builts	LS	$ 167,200.00	1	$ 167,200.00
0101 1B	Portable Toilet	LS	$ 1,000.00	1	$ 1,000.00
0101 1C	Litter Removal	LS	$ 4,500.00	1	$ 4,500.00
0101 1D	Mowing	LS	$ 9,500.00	1	$ 9,500.00
0101 1E	NPDES Permit	LS	$ 1,000.00	1	$ 1,000.00
0101 1F	Payment/Performance Bond	LS	$ 45,000.00	1	$ 45,000.00
0102 1	Maintenance of Traffic	LS	$ 149,127.00	1	$ 149,127.00
0110 1 1	Clearing and Grubbing	AC	$ 8,000.00	13	$ 104,000.00
0120 1	Regular Excavation	CY	$ 8.00	7,700	$ 61,600.00
0120 6	Embankment	CY	$ 17.00	27,000	$ 459,000.00
0160 4	Type B Stabilization	SY	$ 5.50	21,155	$ 116,352.50
0285704	Optional Base, Base Group 04	SY	$ 14.00	3,575	$ 50,050.00
0285709	Optional Base, Base Group 09	SY	$ 24.00	10,050	$ 241,200.00
0327 70 1	Milling Exist Asphalt Pavement, 1" Average Depth	SY	$ 14.00	1,480	$ 20,720.00
0334 1 11	Superpave Asphaltic Concrete, Traffic A	TN	$ 195.00	250	$ 48,750.00
0334 1 13	Superpave Asphaltic Concrete, Traffic C	TN	$ 185.00	2325	$ 430,125.00
0337 7 82	Asphalt Concrete Friction Course, Traffic C, FC-9.5, Pg 76-22	TN	$ 235.00	955	$ 242,425.00
0400 0 11	Concrete Class NS, Gravity Wall	CY	$ 1,100.00	200	$ 220,000.00
0400143	Cleaning and Coating Concrete Surface, Class 5	SF	$ 2.00	22,200	$ 44,400.00
Continued on next page					

BID FORM – TABULATION OF ESTIMATED QUANTITIES
CITRUS GROVE ROAD PHASE 5
PROJECT NO. 2023-08, BID NO. 23-562
ROADWAY CONSTRUCTION

Item No.	Description	Unit	Unit Price	Quantity	Amount
0425 1351	Inlets, Curb, Type P-5, <10′	EA	$ 8,800.00	21	$ 184,800.00
0425 1352	Inlets, Curb, Type P-5, >10′	EA	$ 11,000.00	2	$ 22,000.00
0425 1361	Inlets, Curb, Type P-6, <10′	EA	$ 9,500.00	3	$ 28,500.00
0425 1521	Inlets, DT Bot, Type C, <10′	EA	$ 7,000.00	1	$ 7,000.00
0425 1541	Inlets, DT Bot, Type D, <10′	EA	$ 7,500.00	1	$ 7,500.00
0425 1881	Inlets, Barrier Wall, Rigid, Curb & Gutter, <=10′	EA	$ 12,000.00	5	$ 60,000.00
0425 2 61	Manholes, P-8, <10′	EA	$ 6,600.00	4	$ 26,400.00
0430175118	Pipe Culvert, Optional Material, Round, 18″ S/CD	LF	$ 100.00	2410	$ 241,000.00
0430175124	Pipe Culvert, Optional Material, 24″ S/CD	LF	$ 130.00	1285	$ 167,050.00
0430611125	U-Endwall with Baffles, Index 261/430-011, 1:4 Slope, 18″ Pipe	EA	$ 4,000.00	1	$ 4,000.00
0430511129	U-Endwall with Baffles, Index 261/430-011;1:4 Slope, 24″ Pipe	EA	$ 5,000.00	1	$ 5,000.00
0430982125	Mitered End Section, Optional Round, 18″ CD	EA	$ 2,800.00	3	$ 8,400.00
0515 1 1	Pipe Handrail - Guiderail, Steel	LF	$ 100.00	540	$ 54,000.00
0515 2221	Pedestrian/Bicycle Railing, Steel Only, 54′ Type 1	LF	0	0	0
0515 4 2	Bullet Rail, Double Rail	LF	$ 140.00	965	$ 135,100.00
0520 1 10	Concrete Curb & Gutter, Type F	LF	$ 35.00	6,590	$ 230,650.00
0520 2 4	Concrete Curb, Type D	LF	$ 22.00	365	$ 8,030.00
0521 6 11	Concrete Parapet, Pedestrian/Bicycle, 27″ height	LF	$ 400.00	954	$ 381,600.00
0521 72 40	Shoulder Concrete Barrier, 38″ or 44″ height	LF	$ 450.00	390	$ 175,500.00
Continued on next page					

BID FORM – TABULATION OF ESTIMATED QUANTITIES
CITRUS GROVE ROAD PHASE 5
PROJECT NO. 2023-08, BID NO. 23-562
ROADWAY CONSTRUCTION

Item No.	Description	Unit	Unit Price	Quantity	Amount
0521 72 43	Shoulder Concrete Barrier, Curb and Gutter Barrier	LF	$ 400.00	555	$ 222,000.00
0522 1	Concrete Sidewalk and Driveways, 4" thick	SY	$ 85.00	2,005	$ 170,425.00
0522 2	Concrete Sidewalk and Driveways, 6" Thick	SY	$ 130.00	2,100	$ 273,000.00
0523 2	Patterned pavement, Non-Vehicular Areas	SY	0	0	0
0524 1 2	Concrete Ditch Pavement, Non Reinforced, 4"	SY	0	0	0
0527 2	Detectable Warnings	SF	$ 40.00	245	$ 9,800.00
0530 3 4	Rip Rap, Ruble, FYI, Ditch lining	TN	$ 350.00	6.3	$ 2,205.00
0548 12	Retaining Wall System, Permanent, Excluding Barrier	SF	$ 60.00	18,200	$ 1,092,000.00
0570 1 1	Performance Turf	SY	$ 1.15	3,000.00	$ 3,450.00
0570 1 2	Performance Turf, Sod	SY	$ 5.00	26,000	$ 130,000.00
0630 2 16	Conduit, Furnish & Install, Embedded Concrete Barriers	LF	$ 40.00	954	$ 38,160.00
0635 3 13	Junction Box, Furnish & Install, Embedded	EA	$ 2,500.00	9	$ 22,500.00
0700 1 11	Single Post Sign, F&I Ground Mount, Up to 12 SF	AS	$ 400.00	24	$ 9,600.00
0700 1 12	Single Post Sign, F&I Ground Mount, 12-20 SF	AS	$ 1,000.00	1	$ 1,000.00
0700 1 60	Single Post Sign, Remove	AS	$ 200.00	6	$ 1,200.00
0705 10 4	Object Marker, Type 4	EA	$ 300.00	8	$ 2,400.00
0706 3	Retro-Reflective/Raised Pavement Markets	EA	$ 6.00	350	$ 2,100.00
0710 90	Painted Pavement Markings, Final Surface	LS	$ 20,000.00	1	$ 20,000.00
0711 11123	Thermoplastic, Standard, White, Solid, 24" for Stop Line and Crosswalk	LF	$ 4.00	460	$ 1,840.00
Continued on next page					

BID FORM – TABULATION OF ESTIMATED QUANTITIES
CITRUS GROVE ROAD PHASE 5
PROJECT NO. 2023-08, BID NO. 23-562
ROADWAY CONSTRUCTION

Item No.	Description	Unit	Unit Price	Quantity	Amount
0711 11125	Thermoplastic, Standard, White, Solid, 24" for Stop Line and Crosswalk	LF	$ 8.00	110	$ 880.00
0711 11141	Thermoplastic, Standard, White, 2-4 Dotted Guideline/6-10 Gap Extension, 6"	GM	$ 2,500.00	.12	$ 300.00
0711 11170	Thermoplastic, Standard, White, Arrow	EA	$ 100.00	10	$ 1,000.00
0711 11224	Thermoplastic, Standard, Yellow, Solid, 18" for Diagonal or Chevron	LF	$ 6.00	250	$ 1,500.00
0711 11241	Thermoplastic, Standard, Yellow, 2-4 Dotted Guideline/6-10 Dotted Extension Line, 6"	GM	0	0	0
0711 16101	Thermoplastic, Standard – Other Surfaces, White, Solid, 6"	GM	$ 5,800.00	1.66	$ 9,628.00
0711 16201	Thermoplastic, Standard – Other Surfaces, Yellow, Solid, 6"	GM	$ 5,800.00	1.90	$ 11,020.00
0713103101	Permanent Type, White, Solid, 6" for Concrete Bridges	GM	$ 45,000.00	.14	$ 6,300.00
0713103201	Permanent Type, Tellow, Solid, 6" for Concrete Bridges	GM	$ 45,000.00	.14	$ 6,300.00
Subtotal Bid – Roadway Construction In Words			Six million, eight hundred sixty-three thousand, eighty seven dollars & 50/100		
Subtotal Bid – Roadway Construction in Figures			$ 6,863,087.50		
Subtotal Number of Calendar Days to Complete Roadway Construction			Four hundered seventeen days (417 cd)		
Continued on next page					

BID FORM – TABULATION OF ESTIMATED QUANTITIES
CITRUS GROVE ROAD PHASE 5
PROJECT NO. 2023-08, BID NO. 23-562

LANDSCAPE IMPROVEMENTS

Specification	Description	Unit	Unit Price	Quantity	Amount
12'-14' OA, 5' Spread	Southern Red Cedar	EA	$ 550.00	8	$ 4,400.00
3" Cal, 14'-16' OA, 6' spread, full	Southern Live Oak	EA	$ 1,000.00	5	$ 5,000.00
10' – 12' Height, Full	Slash Pine	EA	$ 500.00	26	$ 13,000.00
3" Cal., 14'-16' OA, 6' Spread, Full	Southern Live Oak	EA	$ 1200.00	5	$ 6,000.00
Varied Heights, 12'-20' Overall, Slick, H.C.	Sabal Palm	EA	$ 600.00	14	$ 8,400.00
3 Gallon, 24" Overall, Full	Dwarf Firebush	EA	$ 9.50	182	$ 1,729.00
3 Gallon, 24" Overall, Full	Yellow Anise	EA	$ 10.50	85	$ 892.50
1 Gallon, 16" O.A. Ht., Full	Pink Muhly Grass	EA	$ 8.00	109	$ 872.00
1 Gallon, 20" O.A. Ht, Full	Fakahatchee Grass	EA	$ 8.00	137	$ 1,096.00
Weed Free	Bahia Sod	SF	$ 1.00	1,000	$ 1,000.00
3" Minimum Depth	Pine Straw Mulch	SF	$ .60	5,500	$ 3,300.00
	PVC Fence Relocation	LS	$ 25,000	1	$ 25,000.00
	Irrigation Relocation	LS	$ 11,000	1	$ 11,000.00
Subtotal Bid – Landscape Improvements In Words			Eighty one thousand, six hundred eighty-nine thousand dollars & 50/100		
Subtotal Bid – Landscape Improvements in Figures			$ 81,689.50		
Subtotal Number of Calendar Days to Complete			Sixty Days (60)		

BID FORM – TABULATION OF ESTIMATED QUANTITIES
CITRUS GROVE ROAD PHASE 5
PROJECT NO. 2023-08, BID NO. 23-562

SUMMARY

Item No.	Description	Unit	Unit Price	Quantity	Amount
Subtotal Bid – Roadway Construction In Words			Six million, eight hundred sixty-three thousand, eighty seven dollars & 50/100		
Subtotal Bid – Roadway Construction in Figures			$ 6,863,087.50		
Subtotal Number of Calendar Days to Complete Roadway Construction			Four hundered seventeen days (417 cd)		
Subtotal Bid – Landscape Improvements In Words			Eighty one thousand, six hundred eighty-nine thousand dollars & 50/100		
Subtotal Bid – Landscape Improvements in Figures			$ 81,689.50		
Subtotal Number of Calendar Days to Complete Landscape Improvements			60 (Concurrent to roadway)		
Total Bid – Roadway Construction and Landscape Improvements In Words			Six million, nine hundred fourty-four thousand, seven hundred seventy-seven dollars & xx/100		
Total Bid – Roadway Construction and Landscape Improvements in Figures			$ 6,944,777.00		
Total Number of Calendar Days to Complete Roadway Construction and Landscape Improvements			Four hundered seventeen days (417 cd)		

The undersigned further agrees to execute the Contract within ten (10) calendar days after receipt of notice of award, and within the time frame of Division X.

The undersigned further agrees to bear the full cost of maintaining all work until the final acceptance.

The undersigned further declares that his Bid is based on specifications as modified by the following Addenda:

Addendum No. 1 Dated 8-9-2023 Addendum No. 4 Dated 9-7-2023
Addendum No. 2 Dated 8-22-2023 Addendum No. 5 Dated 9-7-2023
Addendum No. 3 Dated 8-31-2023 Addendum No. _____ Dated _____

The undersigned Contractor's address and principal place of business is 2544 Connection Point Oviedo, FL 32765.

If Contractor is a corporation list the names, titles, and business addresses of its President, Secretary and Treasurer:

1. PRESIDENT Thomas J McNamara (Name) Address 2544 Connection Point Oviedo, FL 32765

2. SECRETARY Thomas J McNamara (Name) Address 2544 Connection Point Oviedo, FL 32765

3. TREASURER Thomas J McNamara (Name) Address 2544 Connection Point Oviedo, FL 32765

Reciprocal Vendor Preference
(Not applicable on Federal/State Projects)

Vendors are advised the County has established, under Lake County Code, Chapter 2, Article VII, Sections 2-221 and 2-222 (see below); a process under which a local vendor preference program applied by another county may be applied in a reciprocal manner within Lake County. The following information is needed to support application of the Code:

1. Primary business location of the responding vendor (city/state): Oviedo, Fl

2. Does the responding vendor maintain a significant physical location in Lake County at which employees are located and business is regularly transacted: ☒ Yes ☐ No If "yes" is checked, provide supporting detail:

Our over 400 employees are located throughout Central Florida including Lake County

Said corporation is qualified to do business in the State of Florida.

Southern Development & Construction Inc
Corporate Name

By: _____
Shane R. Cox, President
(Print Name)

CORPORATE SEAL

_____
or Qualifying Agent

CBC060345, FDOT - Attached, CUC 12224501
Contractor's Registration or Certification No.

If Contractor is not a corporation, list the name(s) and business address(es) of its owner(s), joint venturers or partners:

1. N/A (Name) Address _____

2. _____ (Name) Address _____

3. _____ (Name) Address _____

The said company or business entity is a sole proprietorship, partnership, or joint venture and is trading and doing business as N/A (Company Name).

By: _____

N/A
Name of Firm or Qualifying Agent

_____
Contractor's Registration or Certification No.

DIVISION X

AGREEMENT

THIS AGREEMENT, made and entered into by and between the Board of County Commissioners of Lake County, a political subdivision of the State of Florida, hereinafter designated the COUNTY, and Southern Development & Construction Inc. authorized to do business in the State of Florida, with principal place of business located at 2544 Connection Point, Oviedo, FL 32765 hereinafter designated the CONTRACTOR,

WITNESSETH:

That for and in consideration of the sum of Six Million Nine Hundred Forty Four Thousand Seven Hundred Seventy Seven and 00/100 Dollars ($6,944,777.00) to be paid by the COUNTY to the CONTRACTOR as herein provided, and in further consideration of the mutual covenants and promises to be kept and performed by and between the parties hereto, it is agreed as follows:

A. THE CONTRACTOR AGREES:

1. To furnish all services, labor, materials and equipment necessary for the complete performance, in a thorough and workmanlike manner, of the work contemplated under Citrus Grove Road Phase 5, Project No. 2023-08, Bid No. 23-562 in Lake County, Florida, to comply with the applicable standards, and to perform all work in strict accordance with the terms of the Contract Documents, defined in Section D of this Agreement.

2. To commence work under this contract with an adequate force and equipment within thirty (--30--) consecutive calendar days after receipt of written notice from the COUNTY to proceed hereunder, and to fully complete all necessary work under the same within not more than Four Hundred Seventeen (417) consecutive calendar days. It is understood and agreed that the date on which the consecutive calendar days will begin to be charged to the project shall be the thirtieth (30th) calendar day from the date of receipt

of the Notice to Proceed. Time of performance and completion of the work of this contract is of the essence.

3. That upon failure to complete all work within the time provided for above, the Contractor shall pay to the County such sums as shall be determined in accordance with the Liquidated Damages provision of this contract, and the payment of such sum shall be secured as provided for therein.

4. That the CONTRACTOR and each subcontractor shall furnish to the COUNTY, upon demand, a certified copy of the payroll covering work under this contract, together with such other information as may be required by the COUNTY to ensure compliance with the law and the provisions of this contract.

5. To procure and maintain all insurance as required by the Instructions to Bidders.

6. To procure and maintain all permits and licenses which may be required by law in connection with the prosecution of the work contemplated hereunder, except for those permits obtained by the County as expressly set forth in Division P of the Contract Documents.

7. To permit any representative(s) of the COUNTY, at all reasonable times, to inspect the work in progress or any of the materials used or to be used in connection therewith, whether such work is located on or off the project site, and to furnish promptly, without additional charge, all reasonable facilities, labor and materials deemed necessary by the County's Engineer, for the conducting of such inspections and tests as he may require.

8. Unless otherwise provided in the special provisions, conditions and specifications, to assume liability for all damage to work under construction or completed, whether from fire, water, winds, vandalism, or other causes, until final completion and acceptance by the County and notwithstanding the fact that partial payments may have been made during construction.

9. No subcontract or transfer of contract shall in any case release either the Contractor or his surety of any liability under the contract and bonds. The County reserves the right to reject any subcontractors or equipment.

10. The Contractor shall indemnify, pay the cost of defense, including attorneys' fees, and hold harmless the County from all suits, actions or claims of any character brought on account of any injuries or damages received or sustained by any person, persons or property by or from the said Contractor; or by, or in consequence of any neglect in safeguarding the work; or through the use of unacceptable materials in the construction of improvements; or by, or on account of any act or omission, neglect or misconduct of the said Contractor; or by, or on account of, any claim or amounts recovered for any infringement of patent, trademark or copyright; or from any claims or amounts arising or recovered under the "Workers' Compensation Law" or of any other laws, by-laws, ordinance, order or decree, including any joint negligence of the County, except only such injury or damage as shall negligence of the County, except only such injury or damage as shall have been occasioned by the sole negligence of the County; and so much of the money due the said Contractor under and by virtue of his Contract as shall be considered necessary, may be retained by the County or, in case no money is due, his surety shall be held until such suits, actions or claims for injuries or damages shall have been settled and suitable evidence to that effect furnished to the County. The County and the Contractor agree the first $100.00 of the Contract amount paid by the County to the Contractor shall be given as separate consideration for this indemnification, and any other indemnification of the County by the Contractor provided for within the Contract Documents, the sufficiency of such separate consideration being acknowledged by the Contractor by the Contractor's execution of the Agreement.

The Contractor shall guarantee the payment of all just claims for materials, supplies, tools, labor or other just claims against him or any subcontractor in connection with this

Contract; and his bonds will not be released by final acceptance and payment by the County unless all such claims are paid or released.

B. THE COUNTY AGREES:

To pay to the Contractor the contract price hereinabove specified, as follows:

If progress satisfactory to the County is being made by the Contractor, the Contractor will receive partial payments, not more frequently than once a month, on this contract as the work progresses, based upon estimates of the amount of work done less payments previously made. The County shall withhold 5% of each progress payment. Payment of retainage shall be as set forth in Section 218.735, Florida Statutes. Neither progress payment nor partial or entire use or occupancy of the project by the County shall constitute an acceptance of work not in accordance with the Contract Documents.

The County, prior to making of any payment, may require the Contractor to furnish a certificate or other evidence showing the amount of work done or completed at that time.

C. IT IS MUTUALLY AGREED:

1. That no change, alteration, amendment, payment for extra work or agreement to pay for same, shall be binding upon the County until its Engineer has approved the same, and until the same shall be properly approved in accordance with Board policy.

2. That the Engineer shall represent the County insofar as prosecution of the work, and interpretation of the plans and specifications are concerned, and that no payments shall be made by the County under this contract except upon the certificate of the Engineer.

3. This Contract shall be interpreted under and its performance governed by the laws of the State of Florida.

4. The failure of the County to enforce at any time or for any period of time any one or more of the provisions of the Contract Documents shall not be construed to

be and shall not be a waiver of any such provision or provisions or of its rights thereafter to enforce each and every such provision.

5. Each of the parties hereto agrees and represents that this Contract comprises the full and entire agreement between the parties affecting the work contemplated, and that no other agreement or understanding of any nature concerning the same has been entered into or will be recognized, and that all negotiations, acts, work performed, or payments made prior to execution hereof shall be deemed merged into, integrated and superseded by this Contract.

6. Should any provision of this Contract be determined by a court to be unenforceable, such determination shall not affect the validity or enforceability of any section or part thereof.

D. The following named Documents, which shall be referred to as the "Contract Documents," are by reference hereby incorporated into this contract:

DIVISION	A	Instructions to Bidders
DIVISION	B	General Conditions
DIVISION	J	Laboratory Testing and Sampling Schedule
DIVISION	P	Permits
DIVISION	W	Proposal and Bid
DIVISION	Y	Performance Bond Payment Bond
DIVISION	Z	Affidavit by General Contractor
APPENDIX	A1	"Sample Change Order"

ADDENDUM #1 through #5

Construction Plans prepared by the Engineer of record for this project.

E. Notices.

1. All notices, demands, or other writings required to be given or made or sent in this Contract, or which may be given or made or sent, by either party to the other, shall be deemed to have been fully given or made or sent when in writing and addressed as follows:

County
County Manager
P. O. Box 7800
315 West Main Street
Tavares, Florida 32778-7800

Contractor
Thomas J. McNamara
Southern Development & Construction Inc
2544 Connection Point
Oviedo, FL 32765

CC: Public Works Director
PO Box 7800
Tavares, FL 32778

2. All notices required, or which may be given hereunder, shall be considered properly given if (a) personally delivered, (b) sent by certified United States mail, return receipt requested, or (c) sent by Federal Express or other equivalent overnight letter delivery company.

3. The effective date of such notices shall be the date personally delivered, or if sent by mail, the date of the postmark, or if sent by overnight letter delivery company, the date the notice was picked up by the overnight letter delivery company.

4. Parties may designate other parties or addresses to which notice shall be sent by notifying, in writing, the other party in a manner designed for the filing of notice hereunder.

F. This contract shall be binding upon, and shall insure to the benefit of the executors, administrators, heirs, successors and assigns of the Contractor.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed on the day and year as written.

LAKE COUNTY acting by and through its Board of County Commissioners

Kirby Smith, Chairman

This 7th day of Dec, 2023.

ATTEST:

Gary J. Cooney, Clerk of the Board of County Commissioners of Lake County, Florida

BOARD OF COUNTY COMMISSIONERS LAKE COUNTY, FLORIDA

Approved as to form and legality by
County Attorney for Lake County, Florida
Lake County Administration Building
315 West Main Street
Tavares, Florida 32778
(352) 343-9787

Melanie Marsh
County Attorney

Southern Development & Construction, Inc.

Thomas J. McNamara, President

This 7th day of NOVEMBER, 2023.

ATTEST: _____

Print Name: THOMAS MCNAMARA
Title: PRESIDENT
CORPORATE SEAL

OR

WITNESSES:

Carolyn Mercurio

Print Name: CAROLYN MERCURIO

Lori Aulin

Print Name: Lori Aulin

Business Address: 2544 CONNECTION PT.
OVIEDO, FL 32765

Contractor's Reg. or Cert. No.
CUC 1224501
CBC 060345
FDOT FS93249904

DIVISION Y

BONDS

INSTRUMENT #2023151145
OR BK 6256 PG 889 - 896 (8 PGS)
DATE: 12/13/2023 9:39:59 AM
GARY J. COONEY, CLERK OF THE CIRCUIT COURT AND COMPTROLLER, LAKE COUNTY, FLORIDA
RECORDING FEES $69.50

BOND NO. 54-257150
Executed in 3 Counterparts

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that We,

Contractor Southern Development & Construction, Inc.
Contractor Address 2544 Connection Point
Contractor Address 2 Oviedo, FL 32765
Contractor Phone 407-977-9898

(hereinafter called the "Principal"), whose principal business address and telephone number is as stated above; and

Surety United Fire & Casualty Company
Surety Address PO Box 73909
Surety Address 2 Cedar Rapids, IA 52407-3909
Surety Phone 319-399-5700

(hereinafter called the "Surety"), whose principal address and telephone number is as stated above, a surety insurer chartered and existing under the laws of the State of IA and authorized to do business in the State of Florida;

are held and firmly bound unto Lake County Board of County Commissioners, Lake County, Florida, a political subdivision of the State of Florida, whose principal address is P.O. Box 7800, Tavares, Florida 32778, and whose principal telephone number is (352) 253-6000 (hereinafter called the "Obligee"), in the sum of Six Million Nine Hundred Forty Four Thousand Seven Hundred Seventy Seven and 00/100 Dollars ($ 6,944,777.00),

for payment of which we bind ourselves, our heirs, our legal representatives, our successors and our assignees, jointly and severally.

WHEREAS, Principal has entered into a contract with Obligee as the owner for Citrus Grove Road Phase 5, Project No. 2023-08, Bid No. 23-562 (hereinafter called the "Contract"), which conditions and provisions as are further described in the aforementioned Contract, which Contract is incorporated herein by reference and made a part hereof for the purpose of perfecting this bond.

NOW THEREFORE, THE CONDITION OF THIS BOND, are such that if Principal:

1. Fully, promptly, and faithfully performs the Contract at the times and in the manner prescribed in the Contract, including all obligations imposed by the Contract documents, specifications, and changes orders; and

2. Pays Obligee any and all losses, damages, costs and attorneys' fees, including appellate proceedings, that Obligee sustains because of any default by Principal under the Contract, including, but not limited to, all delay damages, whether liquidated or actual, incurred by Obligee; and

3. Performs the guarantee of all work and materials furnished under the Contract for the time specified in the Contract; and

4. Promptly make all payments to all persons defined in Section 713.01, Florida Statutes, as amended, whose claims derive directly or indirectly from the prosecution of the work provided for in the Contract;

then this bond shall be void; otherwise it remains in full force and effect.

The Surety, for value received, hereby stipulates and agrees that no changes, extensions of time, alterations or additions to the terms of the Contract or other work to be performed hereunder, or the specifications referred to therein shall in any way affect Surety's obligation under this bond, and it does hereby waive notice of any such changes, extensions of time, alterations or additions to the terms of the Contract or to work or to the specifications.

This instrument shall be construed in all respects as a statutory bond. It is expressly understood the time provisions and statute of limitations under Section 255.05, Florida Statutes, as amended, shall apply to this bond.

By execution of this bond, the Surety acknowledges that it has read the Surety qualifications and obligations imposed by the Contract and hereby satisfies those conditions.

The parties agree that this public performance bond and any claims instituted under this bond shall be governed by the laws, rules and regulations of the State of Florida and venue shall be in a court of competent jurisdiction in and for Lake County, Florida.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument on the day and year below mentioned, the name of each party being affixed and these presents duly signed by its/their undersigned representative(s), pursuant to authority of its governing body.

Signed, sealed and delivered
in the presence of:

Contractor, as PRINCIPAL:

Company: Southern Development & Construction, Inc.

By: _____
(Authorized Signature)

Printed Name: THOMAS MCNAMARA

Title: PRESIDENT

Date: 11/7/23

_____
#1 Witness as to Principal

_____
#2 Witness as to Principal

STATE OF FLORIDA
COUNTY OF SEMINOLE

The foregoing instrument was acknowledged before me by means of ☑ physical presence or ☐ online notarization, this 7th day of NOVEMBER, 2023, by THOMAS MCNAMARA as PRESIDENT for SOUTHERN DEVELOPMENT & CONSTRUCTION, INC.

Personally Known OR Produced Identification
Type of Identification Produced _____

_____
(Notary Signature)

(SEAL)

Notary Public State of Florida
Carolyn Mercurio
My Commission HH 295447
Expires 8/31/2026

BOND NO. 54-257150

SURETY:

Company: United Fire & Casualty Company

~~#1 Witness as to Surety~~

By: _____
(Authorized Signature)

~~#2 Witness as to Surety~~

Printed Name: _____

Title: _____

Date: _____

OR BY ATTORNEY IN FACT (POWER OF ATTORNEY *MUST* BE ATTACHED)

Debbie Beaumont
#1 Witness as Attorney In Fact

Steve Eyechut
#2 Witness as Attorney In Fact

By: Lisa A. Roseland
(As Attorney In Fact) & FL Licensed Resident Agent

Printed Name: Lisa A. Roseland, Inquiries: 407-786-7770

Date: December 7, 2023

Address: PO Box 73909
Cedar Rapids, IA 52407-3909
118 Second Ave. SE, Cedar Rapids, IA 52401

Phone: 319-399-5700

STATE OF FLORIDA
COUNTY OF ORANGE

The foregoing instrument was acknowledged before me by means of [X] physical presence or [ ] online notarization, this 2nd day of November, 2023, by Lisa A. Roseland as Attorney-In-Fact for United Fire & Casualty Company.

Personally Known OR Produced Identification
Type of Identification Produced N/A

(Notary Signature) Elizabeth Luu Karoly

(SEAL)

Notary Public State of Florida
Elizabeth Luu Karoly
My Commission HH 283384
Expires 7/9/2026

BOND NO. 54-257150

Executed in 3 Counterparts

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that We,

Contractor Southern Development & Construction, Inc.
Contractor Address 2544 Connection Point
Contractor Address 2 Oviedo, FL 32765
Contractor Phone 407-977-9898

(hereinafter called the "Principal"), whose principal business address and telephone number is as stated above; and

Surety United Fire & Casualty Company
Surety Address PO Box 73909
Surety Address 2 Cedar Rapids, IA 52407-3909
Surety Phone 319-399-5700

(hereinafter called the "Surety"), whose principal address and telephone number is as stated above, a surety insurer chartered and existing under the laws of the State of IA and authorized to do business in the State of Florida;

are held and firmly bound unto Lake County Board of County Commissioners, Lake County, Florida, a political subdivision of the State of Florida, whose principal address is P.O. Box 7800, Tavares, Florida 32778, and whose principal telephone number is (352) 253-6000 (hereinafter called the "Obligee"), in the sum of Six Million Nine Hundred Forty Four Thousand Seven Hundred Seventy Seven and 00/100 Dollars ($ 6,944,777.00----------)

for payment of which we bind ourselves, our heirs, our legal representatives, our successors and our assignees, jointly and severally.

WHEREAS, Principal and Obligee as Owner have reached a mutual agreement for Citrus Grove Road Phase 5, Project No. 2023-08, Bid No. 23-562 (hereinafter referred to as the "Contract") which conditions and provisions as are further described in the aforementioned Contract, which said Contract being made a part of this Bond by this reference for the purpose of perfecting this Bond.

NOW THEREFORE, THE CONDITIONS OF THIS BOND are such that if Principal:

1. Shall promptly make payments to all claimants as defined in Section 255.05(1), Florida Statutes, as amended, supplying the Principal with labor, materials or supplies, as used directly or indirectly by the Principal in the prosecution of the work provided for in the Contract; and

2. Shall pay the Obligee for all losses, damages, expenses, costs and attorneys' fees, including those resulting from appellate proceedings, that the Obligee sustains because of a default by the Principal in contravention to the Contract in regard to payment for such labor, materials, or supplies furnished to the Principal;

then this bond shall be void; otherwise this Bond remains in full force and effect.

BOND NO. 54-257150

BE IT FURTHER KNOWN AND AGREED TO BY THE PARTIES THAT:

1. Any changes in or under the Contract and compliance or noncompliance with any formalities connected with the said Contract or alterations which may be made in the terms of the said Contract, or in the work to be done under it, or the giving by the Obligee of any extension of time for the performance of the said Contract, or any other forbearance on the part of the Obligee or Principal to the other, shall not in any way release the Principal and the Surety, or either of them, their heirs, personal representatives, successors or assigns from liability hereunder, notice to the Surety of any such changes, alterations, extensions or forbearance being hereby waived.

2. Certain claimants seeking the protection of this Bond must timely comply with the strict requirements set forth in Section 255.05, Florida Statutes, as amended, and as otherwise provided by law.

3. The Provisions of this bond are subject to the limitations of Section 255.05(2), Florida Statutes, as amended.

By execution of this bond, the Surety acknowledges that it has read the Surety qualifications and obligations imposed by the Contract and hereby satisfies those conditions.

The parties agree that this public bond and any claims instituted under this bond shall be governed by the laws, rules and regulations of the State of Florida and venue shall be in a court of competent jurisdiction in and for Lake County, Florida.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument on the day and year below mentioned, the name of each party being affixed and these presents duly signed by its/their undersigned representative(s), pursuant to authority of its governing body.

Signed, sealed and delivered
in the presence of:

Contractor, as PRINCIPAL:

Company: Southern Development & Construction, Inc.

By: _____
(Authorized Signature)

Printed Name: THOMAS MCNAMARA

Title: PRESIDENT

Date: 11/7/23

_____
#1 Witness as to Principal

_____
#2 Witness as to Principal

STATE OF FLORIDA
COUNTY OF SEMINOLE

The foregoing instrument was acknowledged before me by means of ☑ physical presence or ☐ online notarization, this 7th day of November 2023, by THOMAS MCNAMARA as PRESIDENT for SOUTHERN DEVELOPMENT & CONSTRUCTION, INC.

Personally Known OR Produced Identification
Type of Identification Produced _____

_____
(Notary Signature)

(SEAL)

Notary Public State of Florida
Carolyn Mercurio
My Commission HH 295447
Expires 8/31/2026

BOND NO. 54-257150

SURETY:

Company: United Fire & Casualty Company

~~#1 Witness as to Surety~~

By: _____
(Authorized Signature)

~~#2 Witness as to Surety~~

Printed Name: _____

Title: _____

Date: _____

OR BY ATTORNEY IN FACT (POWER OF ATTORNEY *MUST* BE ATTACHED)

Debbie Redemann
#1 Witness as Attorney In Fact

Steve Eyestone
#1 Witness as Attorney In Fact

By: Lisa A Roseland
(As Attorney In Fact) - FL Licensed Resident Agent

Printed Name: Lisa A Roseland, Inquiries 407-786-7770

Date: December 7, 2023

Address: PO Box 73909
Cedar Rapids, IA 52407-3909
118 Second Ave. SE, Cedar Rapids, IA 52401

Phone: 319-399-5700

STATE OF FLORIDA
COUNTY OF ORANGE

The foregoing instrument was acknowledged before me by means of [X] physical presence or [ ] online notarization, this 2nd day of November, 2023, by Lisa A. Roseland as Attorney-In-Fact for United Fire & Casualty Company.

Personally Known OR Produced Identification
Type of Identification Produced N/A

(Notary Signature) Elizabeth Luu Karoly

(SEAL)

Notary Public State of Florida
Elizabeth Luu Karoly
My Commission HH 283384
Expires 7/9/2026

UNITED FIRE & CASUALTY COMPANY, CEDAR RAPIDS, IA
UNITED FIRE & INDEMNITY COMPANY, WEBSTER, TX
FINANCIAL PACIFIC INSURANCE COMPANY, LOS ANGELES, CA
CERTIFIED COPY OF POWER OF ATTORNEY
(original on file at Home Office of Company – See Certification)

Inquiries: Surety Department
118 Second Ave SE
Cedar Rapids, IA 52401

KNOW ALL PERSONS BY THESE PRESENTS, That United Fire & Casualty Company, a corporation duly organized and existing under the laws of the State of Iowa; United Fire & Indemnity Company, a corporation duly organized and existing under the laws of the State of Texas; and Financial Pacific Insurance Company, a corporation duly organized and existing under the laws of the State of California (herein collectively called the Companies), and having their corporate headquarters in Cedar Rapids, State of Iowa, does make, constitute and appoint

KIM E. NIV, JEFFREY W. REICH, SUSAN L. REICH, TERESA L. DURHAM, LISA A. ROSELAND, SONJA AMANDA FLOREE HARRIS, CHERYL A. FOLEY, ROBERT P. O'LINN, SARAH K. O'LINN, EMILY J. GOLECKI, NATHAN K. REICH, EACH INDIVIDUALLY

their true and lawful Attorney(s)-in-Fact with power and authority hereby conferred to sign, seal and execute in its behalf all lawful bonds, undertakings and other obligatory instruments of similar nature provided that no single obligation shall exceed $100,000,000.00 and to bind the Companies thereby as fully and to the same extent as if such instruments were signed by the duly authorized officers of the Companies and all of the acts of said Attorney, pursuant to the authority hereby given and hereby ratified and confirmed.

The Authority hereby granted is continuous and shall remain in full force and effect until revoked by United Fire & Casualty Company, United Fire & Indemnity Company, and Financial Pacific Insurance Company.

This Power of Attorney is made and executed pursuant to and by authority of the following bylaw duly adopted by the Boards of Directors of United Fire & Casualty Company, United Fire & Indemnity Company, and Financial Pacific Insurance Company.

"Article VI – Surety Bonds and Undertakings"

Section 2. Appointment of Attorney-in-Fact. "The President or any Vice President, or any other officer of the Companies may, from time to time, appoint by written certificates attorneys-in-fact to act in behalf of the Companies in the execution of policies of insurance, bonds, undertakings and other obligatory instruments of like nature. The signature of any officer authorized hereby, and the Corporate seal, may be affixed by facsimile to any power of attorney or special power of attorney or certification of either authorized hereby; such signature and seal, when so used, being adopted by the Companies as the original signature of such officer and the original seal of the Companies, to be valid and binding upon the Companies with the same force and effect as though manually affixed. Such attorneys-in-fact, subject to the limitations set of forth in their respective certificates of authority shall have full power to bind the Companies by their signature and execution of any such instruments and to attach the seal the Companies thereto. The President or any Vice President, the Board of Directors or any other officer of the Companies may at any time revoke all power and authority previously given to any attorney-in-fact.

IN WITNESS WHEREOF, the COMPANIES have each caused these presents to be signed by its vice president and its corporate seal to be hereto affixed this 24th day of January, 2023

UNITED FIRE & CASUALTY COMPANY
UNITED FIRE & INDEMNITY COMPANY
FINANCIAL PACIFIC INSURANCE COMPANY

By: Dennis J. Richmann
Vice President

State of Iowa, County of Linn, ss:

On 24th day of January, 2023, before me personally came Dennis J. Richmann to me known, who being by me duly sworn, did depose and say; that he resides in Cedar Rapids, State of Iowa; that he is a Vice President of United Fire & Casualty Company, a Vice President of United Fire & Indemnity Company, and a Vice President of Financial Pacific Insurance Company the corporations described in and which executed the above instrument; that he knows the seal of said corporations; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporations and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporations.

Judith A. Jones
Iowa Notarial Seal
Commission number 173041
My Commission Expires 4/23/2024

Judith A. Jones
Notary Public
My commission expires: 4/23/2024

I, Mary A. Bertsch, Assistant Secretary of United Fire & Casualty Company and Assistant Secretary of United Fire & Indemnity Company, and Assistant Secretary of Financial Pacific Insurance Company, do hereby certify that I have compared the foregoing copy of the Power of Attorney and affidavit, and the copy of the Section of the bylaws and resolutions of said Corporations as set forth in said Power of Attorney, with the ORIGINALS ON FILE IN THE HOME OFFICE OF SAID CORPORATIONS, and that the same are correct transcripts thereof, and of the whole of the said originals, and that the said Power of Attorney has not been revoked and is now in full force and effect.

In testimony whereof I have hereunto subscribed my name and affixed the corporate seal of the said Corporations this 7th day of December, 2023

By: Mary A. Bertsch
Assistant Secretary,
UF&C & UF&I & FPIC

BPOA0049.1217

This paper has a colored background and void pantograph.

UNITED FIRE AND CASUALTY COMPANY

P.O Box 73909, Cedar Rapids, IA. 52407

Statement of Financial Condition
As Of December 31, 2022

ASSETS

Bonds	$728,330,998
Stocks	489,443,543
Real Estate and Equipment	43,046,869
Cash in Banks and Offices and Short Term Investments	200,229,538
Premiums in Course of Collection (less than 90 days old)	306,595,891
Reinsurance and Other Accounts Receivable	47,474,988
Deposits and Other Non Invested Assets	123,757,079
Total Admitted Assets	**$1,938,878,906**

LIABILITIES, SURPLUS AND OTHER FUNDS

Reserve for Unearned Premiums		$282,103,082
Reserve for Claims and Claim Expense		895,733,447
Reserve for Taxes and Expense		43,333,834
Total Liabilities		**$1,221,170,363**
Capital Stock and Paid In Capital	$213,100,301	
Surplus Notes	50,000,000	
Surplus	454,608,242	
Surplus as regards Stockholders		717,708,543
Total		**$1,938,878,906**

Securities carried at $85,908,216 in the above statement are deposited as required by law.

Securities carried on the basis prescribed by the National Association of Insurance Commissioners. On the basis of December 31, 2022 market quotations for all bonds and stocks owned, the Company's total admitted assets would be $1,938,878,906 and surplus as regards shareholders $717,708,543.

I, Janice A. Martin, Treasurer of United Fire and Casualty Company, do hereby certify that the foregoing statement is a correct exhibit of the assets and liabilities of the said Company on the 31st day of December, 2022

Treasurer

State of Iowa
City of Cedar Rapids } SS:

Subscribed and sworn to, before me, a Notary Public of the State of Iowa in the City of Cedar Rapids, this 23rd day of March, 2023

SHERI FENTON
Commission Number 222621
My Commission Expires
3-21-25

Notary Public

DIVISION Z

AFFIDAVIT OF RELEASE AND GUARANTEE

Before me, the undersigned authority, personally appeared _____after being duly sworn, deposes and says:

All charges for labor, materials, supplies, lands, licenses and other expenses arising from the Contract, Citrus Grove Road Phase 5, Project No. 2023-08, Bid No. 23-562, for which Lake County, Florida, hereinafter "County" might be sued or for which a lien or a demand against any payment bond might be filed, have been fully satisfied and paid or will be fully satisfied and paid promptly upon receipt of payment by the Contractor. The Contractor will fully indemnify, defend and save harmless the County from all demands, suits, actions, claims of lien or other charges filed or asserted against the County in connection with matters certified to herein.

On behalf of itself and its subcontractors, suppliers, materialmen, successors and assigns, the Contractor releases and waives all claims, demands, damages, costs and expenses, against the Board of County Commissioners of Lake County, relating in any way to the performance or payment of the above-numbered Contract, for the period from the date of execution of the Contract through and including the date of acceptance of Final Payment.

The Contractor is aware of contractual provisions for warranties and guarantees contained in the General Conditions of the above numbered contract, and acknowledges that those provisions shall have the same force and effect as if this Affidavit had not been executed, and understands that the County's remedies are not limited by same but are in addition to any other remedies provided by law.

This Affidavit is given in connection with the Contractors application for Final Payment.

FURTHER AFFIANT SAYETH NAUGHT.

_____
(Affiant)

STATE OF FLORIDA
COUNTY OF _____

The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☐ online notarization, this _____ day of _____, 20___, by _____ as _____ for _____.

Personally Known OR Produced Identification
Type of Identification Produced _____

_____
(*Notary Signature*)

(SEAL)

APPENDIX A1
SAMPLE CHANGE ORDER

Contract Change Order

Lake County
Department of Public Works
323 North Sinclair Avenue
Tavares, FL 32778

Date:
Project No.:
Location:
Contract No:
Change Order No.:

To:

YOU ARE HEREBY REQUESTED TO COMPLY WITH THE FOLLOWING CHANGES FOR THE AGREEMENT, PLANS AND SPECIFICATIONS

ITEM NO.	DESCRIPTION IN CHANGES - QUANTITIES, UNITS, UNIT PRICES, CHANGE IN COMPLETION SCHEDULE, ETC.	DECREASE IN CONTRACT PRICE	INCREASE IN CONTRACT PRICE
1		$ -	$ -
2			
3			
	Per attached Exhibit "A"		
	Change In contract price due to change order:		
	Total Decrease	$ -	
	Total Increase		$ -
	Difference		$ -
	Net ~~Increase~~/~~Decrease~~ Contract Price		$ -

The sum of $ 0 is hereby **added to/~~subtracted from~~** the total agreement price, and the total adjusted agreement price to date thereby is $_____This document shall become an amendment to the agreement and all other provisions of the agreement shall apply hereto.

Recommended by: _____ Date: _____
(type name)

Accepted by: _____ Date: _____
(type name)

Approved by: _____ Date: _____
(type name)

To be funded from Account #

EXHIBIT B-1

LAKE COUNTY, FL
REAL FLORIDA • REAL CLOSE

March 30, 2022

Onda Mexicana Radio Group Inc.
Attn: Oscar Pineda
9401 W. Colonial Drive
Suite 700
Ocoee, FL 34761-6811

Re: Citrus Grove Road Ph. 5

Mr. Pineda:

We appreciate your willingness to support the above-mentioned road project. As discussed, the following items have been agreed upon:

1. The County agrees to the following in conjunction with the above-described roadway project:
   a. The County agrees to construct a new driveway apron and a 12' compacted and stabilized driveway for ingress and egress within the existing 30' platted right of way at the location shown on Exhibit "A".
   b. The driveway apron construction shall take place at the same time as the Citrus Grove Road Ph. 5 improvements and County staff will coordinate with Vista Grande Properties, LLC. to construct the 12' compacted and stabilized driveway.

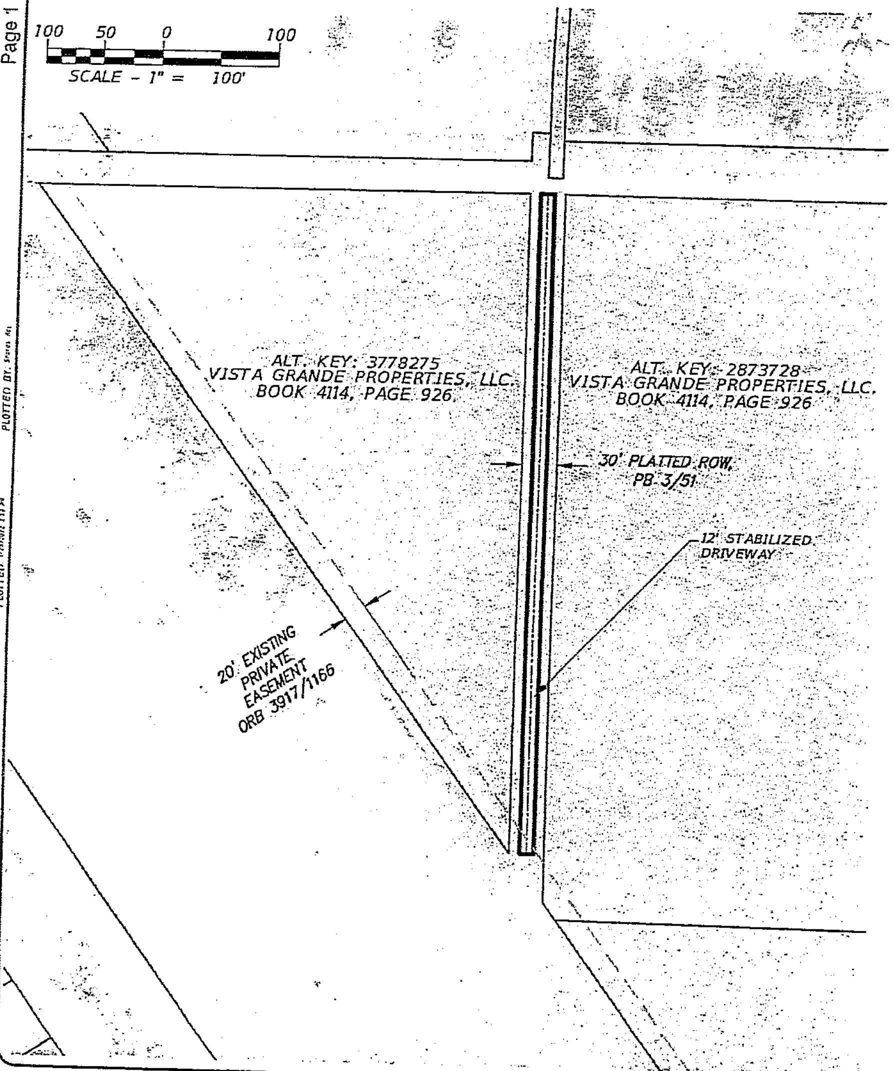
Please be advised that the County requires 100% of the right of way, prior to beginning of the construction process. Roadway construction projects are subject to available funding.

We agree with the items listed above, on behalf of Lake County Public Works Department.

Jeff Earhart, P.E.
Engineering Manager

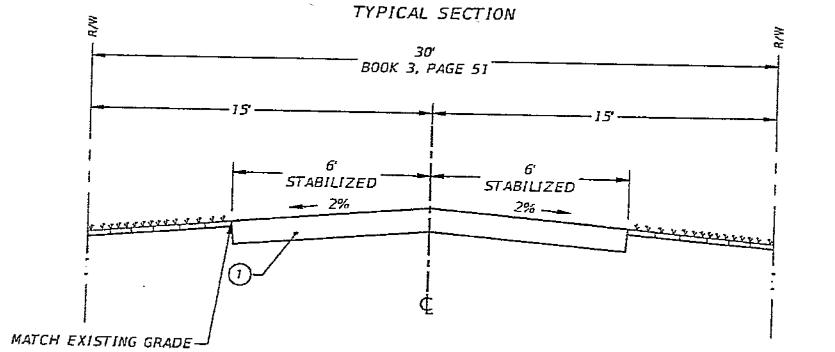
Fred J. Schneider, P.E.
Assistant County Manager

R:\Public Works\Right of Way\Projects\Citrus Grove Rd. Phase 5 Conditions\Radio Tower Cond ltr.docx



STABILIZED DRIVEWAY

TYPICAL SECTION



KEY	THICKNESS	SPECIFICATIONS
1	12"	TYPE B STABILIZED SUBGRADE LBR MIN. 40, 98% COMPACTION, A.A.S.H.T.O. T-180.

SCALE: NTS

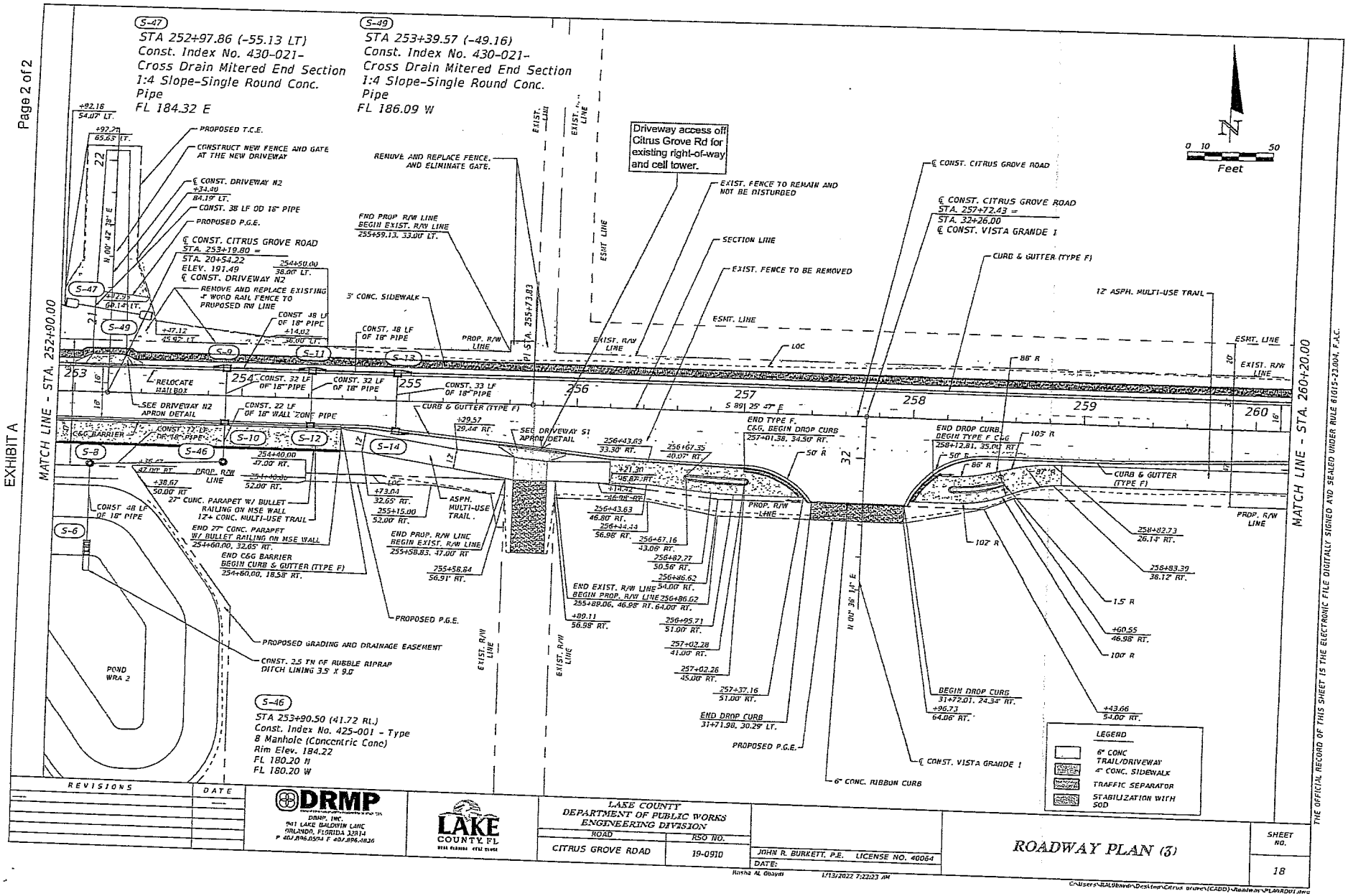
Note to Contractor:
Due to sandy soil, mix the stabilized driveway in the same manner when constructing roadway subgrade, which means adding clay to existing material. Contractor is required to submit to Lake County a certified test report showing that they achieved 40 LBR, 98% compaction requirement.

CITRUS GROVE · TOWER ACCESS · CONCEPT PLAN

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
LAKE COUNTY, FL
350 N. SINCLAIR AVE., TAVARES, FLORIDA 32778

JOB NO.: CONCEPT
SHEET: A

EXHIBIT A



REVISIONS	DATE

DRMP, INC.
941 LAKE BALDWIN LANE
ORLANDO, FLORIDA 32814
P 407.896.0594 F 407.896.4826

LAKE COUNTY FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ROAD	RSO NO.
CITRUS GROVE ROAD	19-0910

JOHN R. BURKETT, P.E. LICENSE NO. 40064
DATE:
Raisha Al Obaym 1/13/2022 7:22:23 AM

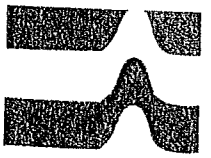
ROADWAY PLAN (3)

SHEET NO. 18

C:\Users\RALObaym\Desktop\Citrus grove\(CADD)-Roadway-PLANRD01.dwg

EXHIBIT C-1

Roadway Soil Survey
Relative to Final Submittal
Citrus Grove Road Phase 5
From SR 91 to Blackstill Lake Road
Lake County, Florida



Ardaman & Associates, Inc.

CORPORATE HEADQUARTERS

8008 S. Orange Avenue, Orlando, FL 32809 - Phone: (407) 855-3860 Fax: (407) 859-8121

Branch Office Locations

Florida: Bartow, Cocoa, Fort Myers, Miami, Orlando, Port St. Lucie, Sarasota, Tallahassee, Tampa, West Palm Beach
Louisiana: Baton Rouge, Monroe, New Orleans, Shreveport

Ardaman & Associates, Inc.

Geotechnical, Environmental and
Materials Consultants

April 8, 2022
File No. 19-6418

DRMP, Inc.
941 Lake Baldwin Lane
Orlando, Florida 32814

Attention: Mr. John Burkett, P.E.

Subject: Roadway Soil Survey
Relative to Final Submittal
Citrus Grove Road Phase 5
From SR 91 to Blackstill Lake Road
Lake County, Florida

Dear Mr. Burkett:

As requested and authorized, we have completed a roadway soil survey for the referenced section of the Citrus Grove Road project. The purposes of performing this exploration were to evaluate the general subsurface conditions at selected locations in the areas of proposed roadway construction and to evaluate the general subsurface conditions within the two proposed stormwater pond locations. In addition, we have provided geotechnical engineering information for use during design of the project. This report documents our findings and presents our engineering recommendations.

This report has been prepared in accordance with generally accepted geotechnical engineering practices for specific application to the project limits indicated in this report. No other warranty, expressed or implied, is made. The soils information and recommendations submitted herein are based on the data obtained from the soil borings presented on Figures 5 through 9. This report does not reflect any variations which may occur adjacent to or between the borings. The nature and extent of the variations adjacent to or between the borings may not become evident until during construction.

It is a pleasure assisting you with this project. If you have any questions, or when we may be of further assistance to you, please do not hesitate to contact us.

Very truly yours,
ARDAMAN & ASSOCIATES, INC.
Certificate of Authorization No. 5950

Eric C. Balog, P.E.
Project Engineer
Florida License No. 90833

Colin T. Jewsbury, P.E.
Orlando Branch Manager
Florida License No. 58074

Alexandra G. Aydelotte, P.E.
Project Engineer
Florida License No. 86461

ALEXANDRA GRACE AYDELOTTE
LICENSE
No 86461
STATE OF FLORIDA
PROFESSIONAL ENGINEER

THIS ITEM HAD BEEN DIGITALLY SIGNED AND SEALED BY:
Alexandra G Aydelotte 2022.04.08 09:49:48 -04'00'
ON THE DATE ADJACENT TO THE SEAL

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

ARDAMAN & ASSOCIATES, INC.
8008 S. ORANGE AVENUE
ORLANDO, FLORIDA 32809
(407)855-3860
CERTIFICATE OF AUTHORIZATION: 5950
ALEXANDRA G. AYDELOTTE, P.E. NO 86461

ECB/AGA/jj/ag
19-6418 RSS Final Submittal Citrus Grove s&s_aga.docx (2019 Geo. RSS)

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1.0 INTRODUCTION

1.1 Site Location

The proposed roadway project is located in Sections 9 and 10 of Township 22 South, Range 26 East, in Lake County, Florida. The project limits along the proposed Citrus Grove Road alignment extend from just west of SR 91 to east of Blackstill Lake Road. The proposed roadway will be between approximate Stations 242+64 to 287+28. As an exception Stations 247+53 to 251+08 are excluded from the project since they constitute the existing Florida Turnpike right-of-way.

The approximate limits of the project alignment are shown superimposed on the Clermont East, Florida, U.S.G.S. quadrangle map presented on Figure 1.

1.2 Project Considerations

It is our understanding that the proposed construction includes a new roadway with one travel lane in each direction with a concrete sidewalk on the north side of the road. A 12 to 15-foot wide multi-use trail will also be constructed on the south side of the road. Based on roadway cross sections provided by DRMP, up to 24 feet of fill and on the order of 3 feet of cut is proposed as part of the proposed roadway construction.

It is our understanding that stormwater ponds are to be constructed along the proposed alignment at the following general locations.

Pond Designation	Baseline	Approximate Station	Offset
Pond 2A	CL Citrus Grove Rd	252+00 to 254+90	Right
Pond 3A	CL Citrus Grove Rd	277+70 to 281+10	Right

1.3 Purpose and Scope of Project

The purposes of this exploration were to preliminary explore shallow subsurface conditions within the roadway improvement areas and stormwater ponds and to provide geotechnical engineering evaluation of the conditions encountered.

We accomplished these purposes by:

1. Obtaining and evaluating readily available geologic and soil survey data.

2. Conducting auger borings and measuring groundwater levels in the roadway and stormwater pond areas.

3. Conducting Standard Penetration Test (SPT) borings in high fill areas.

4. Observing recovered soil samples in our laboratory and performing tests on selected samples to aid in classification.

5. Obtaining pavement core samples along Fosgate Road to identify the existing asphalt and base components.

6. Analyzing and interpreting the field and laboratory data.

7. Performing geotechnical engineering analyses to develop recommendations for site preparation.

1.4 Review of Available Data

1.4.1 USGS Quadrangle Map

The approximate project alignment is shown superimposed on the Clermont East, Florida USGS quadrangle map presented on Figure 1. The approximate ground surface elevations along the project alignment and based on 1929 National Geodetic Vertical Datum (NGVD) are presented in the following table.

Mainline Location	Approximate Natural Ground Surface Elevation (Feet, NGVD)
Begin Project Approximate Station 242+64	+175
Begin Exception Approximate Station 247+53	+190
End Exception Approximate Station 251+08	+195
End Project Approximate Station 287+28	+135

1.4.2 Soil Survey Map

Based on the Web Soil Survey, as prepared by the U.S. Department of Agriculture Soil Conservation Service, various soil types exist along the proposed roadway alignment. The individual soil types and their characteristics are summarized and presented in Table 1. The type and location of the individual soils are also included on the Soil Survey map presented as Figure 2.

1.4.3 Potentiometric Map

Based on review of the "Potentiometric Surface of the Upper Floridan Aquifer in the St. Johns River Water Management District and Vicinity, Florida" Map (dated June, 2010) published by the United States Geological Survey, the potentiometric elevation within the general project alignment is approximately +75 feet NGVD. This potentiometric surface is below the existing ground surface elevations of approximately +125 to +195 feet NGVD, as determined by a review of the U.S.G.S. quadrangle maps. Therefore, the project corridor is not in an area mapped with artesian type conditions.

2.0 FIELD EXPLORATION PROGRAM

2.1 Auger Borings

The field exploration program relative to the roadway improvements generally consisted of performing one auger boring at approximate 200-foot intervals along the proposed Citrus Grove roadway alignment and at locations requested by you for the proposed stormwater pond areas. The auger borings were conducted using a 3-inch diameter manual bucket auger or a 4-inch diameter continuous flight auger and were advanced to depths ranging from 5 to 20 feet below the existing ground surface. A summary of the auger boring procedure is included in Appendix I.

An attempt was made to measure the water levels at each of the boring locations upon completion of drilling. The auger borings were backfilled with soil cuttings upon completion.

2.2 SPT Borings

The field exploration program included performing 9 Standard Penetration Test (SPT) borings within high fill areas proposed along the roadway alignment. The SPT borings were advanced to depths ranging from 15 to 55 feet below the ground surface using the methodology outlined in ASTM D-1586. A summary of this field procedure is included in Appendix I. Split-spoon soil samples recovered during performance of the borings were visually classified in the field and representative portions of the samples were transported to our laboratory in sealed sample jars.

An attempt was made to measure the groundwater level at each of the boring locations during drilling. Upon completion of drilling the borings were backfilled with soil cuttings.

We note that the data obtained from the SPT borings was converted to an equivalent auger boring format and incorporated onto the cross sections located in the roadway plans set.

2.3 Bulk Soil Sampling

Bulk soil samples were collected from five locations along the proposed roadway alignment and transferred to our laboratory for Limerock Bearing Ratio testing. The samples were obtained from depths of ½ to 1½ feet below the existing ground surface adjacent to their respective locations.

2.4 Field Permeability Tests

Field permeability tests were performed at selected boring locations within the proposed stormwater pond areas. The field permeability tests were performed by installing a solid-walled PVC casing snugly fit into a 3 or 4-inch diameter auger borehole. The bottom of the pipe was open and raised 1 foot above the bottom of the borehole. The bottom 1 foot of the borehole was gravel-packed. The pipe was then filled to the top with water. The tests were performed as "falling head" tests in which the rate of water drop within the pipe was measured. Results of the field permeability testing are summarized on Table 2 and discussed further in Section 4.5 of this report.

2.5 Pavement Coring

The field exploration program also included obtaining three cores of the existing Fosgate Road pavement. At each core location, the asphalt and underlying base course were measured in the field for thickness and the type of base was recorded. Upon completion, the core holes were filled with asphaltic "cold patch" material. The approximate locations and a summary of the measurements made of the core samples are included in Section 3.4 of this report.

2.6 Groundwater Level

An attempt was made to measure the groundwater level in the boreholes during and/or upon completion of drilling. The measured groundwater levels are shown adjacent to the soil boring profiles presented on Figures 5 through 9.

2.7 Test Locations

The locations of the borings were staked in the field by representatives of Ardaman and Associates using a hand-held GPS unit. The locations of pond borings were subsequently surveyed by DRMP. The pond boring locations including station, offset and existing ground surface elevation are shown on the boring profiles presented on Figure 9.

The boring locations should be considered as accurate as implied by the method of measurement used. The stations and offsets presented on the boring profiles reference the centerline of construction of proposed Citrus Grove Road as depicted on the roadway plans.

3.0 LABORATORY TESTING PROGRAM

3.1 Visual Examination and Classification Testing

Representative soil samples obtained during our field sampling operation were packaged and transferred to our laboratory for further visual examination and classification to obtain more accurate descriptions of the existing soil strata. The soil samples were visually classified in general accordance with the AASHTO Soil Classification System.

In addition, we conducted 3 natural moisture content tests (ASTM D2216), 10 grain size analyses (ASTM D421), 8 percent fines analysis (ASTM D1140) and 1 Atterberg limits test (ASTM D4318) on selected soil samples obtained from the borings. The resulting soil descriptions and the results of our tests are shown in Table 3 and are summarized on the Soil Survey sheet presented as Figure 4.

3.2 Corrosion Series Testing

A total of three soil samples were collected at selected boring locations and returned to our laboratory for corrosion series testing. The results of the tests are presented in the following table.

Location	Depth (Feet)	Stratum	pH	Resistivity (ohm-cm)	Sulfate (mg/L)	Chloride (mg/L)
AB-242L	0-5	1	5.9	34,868	3	BDL
AB-257L	0-4.5	1	6.3	23,315	BDL	BDL
AB-273L	0-3	1	7.7	35,702	6	BDL

BDL: Below Detectable Limit.

3.3 Limerock Bearing Ratio (LBR) Testing

Limerock Bearing Ratio (LBR) tests were performed on the five recovered bulk soil samples. LBR tests were conducted on Strata 1 and 2 soils. The LBR values with the corresponding maximum dry density and optimum moisture contents are shown in Table 4. Copies of the laboratory curves are included in Appendix II. It should be noted that actual LBR values of final subgrade soils for pavement sections placed on fill may vary with the fill source.

3.4 Results of Pavement Cores

Cores of the existing Fosgate Road pavement were obtained using a 6-inch diameter, diamond tipped core bit. After coring the asphalt pavement, an auger boring was used to advance a borehole through the pavement base. The thickness of the asphalt pavement and base were measured. The core samples of the asphalt pavement were returned to our laboratory for further examination and measurements. The results of the pavement coring is presented in the following table.

Location	Thickness of Asphalt (Inches)	Thickness of Base (inches)	Base Type
C-281	4	15	Limerock
C-283	2¾	--	--
C-285	2¾	--	--

We note that no base material was encountered in pavement cores C-283 and C-285. The existing asphalt at these two locations was underlain by orange-brown fine sand with clay (Stratum 2 soil).

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 General Soil Stratigraphy

The results of the field exploration and laboratory testing programs are graphically summarized on the Soil Survey sheet (Figure 4), Roadway Boring Profile sheets (Figures 5 through 8) and Pond Boring Profile sheet (Figure 9). The stratification of the boring profiles represents our interpretation of the field boring logs and the results of the laboratory examination of the recovered samples. The stratification lines represent the approximate boundary between soil types. The actual transitions may be more gradual than implied.

The results of our borings indicate the following general soil types:

Stratum No.	Description	Classification	
		AASHTO	Index 120-001
1	Light brown to dark brown, light orange-brown to orange-brown fine sand to fine sand with silt	A-3	S
2	Light brown to brown, light orange-brown to orange-brown fine sand with clay to clayey fine sand	A-3, A-2-4	S

The results of our exploration indicate that the soil conditions encountered in the borings presented on Figures 5 through 9 are appropriate for construction of the proposed roadway, in accordance with standard FDOT design and construction practices.

Soil Strata 1 and 2 (A-3, A-2-4) may be considered as select materials based on FDOT criteria (Standard Plan Index 120-001). The use of these soils relative to embankment construction should be in accordance with Standard Plan Index 120-001 and with proper moisture conditioning, should densify using conventional compaction equipment.

4.2 Groundwater Control

An attempt was made to measure the groundwater level in the boreholes during and/or upon completion of drilling. The absence of groundwater data at the boring locations indicates that groundwater was not encountered within the vertical reaches of the borings on the date drilled (referenced "GNE" on Figures 5 through 9). For borings referenced 'GNM' at the bottom of the boring profiles on Figures 5 through 9, groundwater was not encountered within the top 10 feet and could not be measured below a depth of 10 feet due to the mudded condition of the borehole. However, this does not necessarily mean that groundwater would not be encountered within the

vertical reach of the borings referenced 'GNE' or within the top 10 feet of the borings referenced 'GNM' at some other time.

Fluctuation in groundwater levels should be anticipated throughout the year primarily due to seasonal variations in rainfall and other factors that may vary from the time the borings were conducted. The groundwater levels, where encountered in the borings, are shown on Figures 5 through 9.

Some form of groundwater control (dewatering) may be required during construction in areas of high or perched groundwater conditions. Positive site drainage should be established early during construction in order to reduce ponding of surface water during heavy or prolonged rainfall. Means and methods of groundwater and surface water control should be the responsibility of the contractor.

4.3 Estimated Seasonal High Water Table

The estimated seasonal high water table each year is the level in the August-September period at the end of the rainy season during a year of normal (average) rainfall. The water table elevations associated with a flood level would be much higher than the seasonal high water table elevations. The estimated high water levels would more approximate the seasonal high water table elevations.

The estimated seasonal high water table is affected by a number of factors. The drainage characteristic of the soils, the land surface elevation, relief points such as lakes, rivers, swamp areas, etc., and distance to relief points are some of the more important factors influencing the seasonal high water table elevation.

Based on our interpretation of the site conditions using our boring log data, we have preliminarily estimated the seasonal high water table at the boring locations, assuming that the site drainage existing at the time the borings were conducted is maintained. If site drainage conditions are altered from those existing at the time of our borings, our estimates may not be valid. Our estimates of the normal seasonal high groundwater levels at the boring locations are presented adjacent to the boring profiles on Figures 5 through 9. We note that groundwater may perch atop the clayey soils (Stratum 2) during periods of heavy and/or prolonged rainfall.

4.4 Limerock Bearing Ratio (LBR) Results

The LBR values with the corresponding maximum dry density and optimum moisture content are shown in Table 4. The LBR curves are presented in Appendix II.

4.5 Results of Field Permeability Tests

The results of the permeability tests are presented in Table 2. Details of the test calculations are also included in Appendix III. For the type of soils encountered at the test locations, a

transformation ratio of 1 is considered appropriate. Therefore, the horizontal and vertical permeability's are estimated to be approximately equal. A soil porosity of 0.3 (i.e. 30%) may also be used in design of the ponds.

4.6 Construction Considerations

Roadway construction should be performed in accordance with the appropriate sections of the FDOT current edition of the Standard Specifications for Road and Bridge Construction. If needed, backfill should generally consist of select material (A-3, A-2-4) compacted in accordance with the FDOT Standard Specification for Road and Bridge Construction. In accordance with these specifications, the removal of organic materials and any plastic soils should be accomplished in accordance with FDOT Standard Plan Index 120-002 unless otherwise shown on the plans. In-place density tests should be performed on the fill soils to verify the specified degree of compaction. The minimum density test frequency should be in accordance with the FDOT Materials, Sampling, Testing, and Reporting Guide. Fill placement and side slopes for embankment construction are presented in the FDOT Standard Plan Index 120-001.

Some form of groundwater control (dewatering) may be required during construction. Positive site drainage should be established early during construction in order to reduce ponding of surface water during heavy or prolonged rainfall. Means and methods of groundwater and surface water control should be the responsibility of the contractor.

We recommend that the designer add notes to the plans relative to removal of unsuitable soils, difficult excavation, dewatering, maintaining positive site drainage, and wrapping pipe joints.

TABLE 1

Review of Soil Survey Maps
Citrus Grove Road Phase 5
From SR 91 to Blackstill Lake Road
Lake County, Florida

Soil Map Unit	Description	Permeability		Approximate Depth to Normal Seasonal High Groundwater Level
		Depth (inches)	inch/hour	
8; Candler sand, 0 to 5 percent slopes	Consists of nearly level to gently sloping and excessively drained sandy soil on the uplands.	0 – 80	6 – 20	More than 80 inches.
9; Candler sand, 5 to 12 percent slopes	Consists of sloping and strongly sloping and excessively drained sandy soil on the uplands.	0 – 80	6 – 20	More than 80 inches
21; Lake sand, 0 to 5 percent slopes	Consists of nearly level to gently sloping and excessively drained sandy soil on the uplands.	0 – 80	20 – 50	More than 80 inches
22; Lake sand, 5 to 12 percent slopes	Consists of sloping to strongly sloping and excessively drained sandy soil on the uplands.	0 – 80	20 – 50	More than 80 inches

TABLE 2

Summary of Field Permeability Test Results
Citrus Grove Road Phase 5
From SR 91 to Blackstill Lake Road
Lake County, Florida

Pond Designation	Test Location	Test Depth (feet)	Measured Permeability (feet/day)
Pond 2A	WRA-2-AB-1	4 – 5	>40
Pond 2A	WRA-2A-AB-2	4 – 5	>40
Pond 3A	WRA-3-AB-2	5.5 – 6.5	>40
Pond 3A	WRA-3B-AB-1	6 – 7	>40
Miscellaneous	WRA-2A-AB-1	5 – 6	>40
Miscellaneous	WRA-3-AB-1	5 – 6	>40

It is noted that a suitable factor of safety should be used with these values. In addition, for the type of soils tested, a transformation ratio of 1 horizontal to 1 vertical is appropriate (i.e.; the estimated ratio of horizontal to vertical permeability).

TABLE 3

Summary of Laboratory Test Results
Citrus Grove Road Phase 5
From SR 91 to Blackstill Lake Road
Lake County, Florida

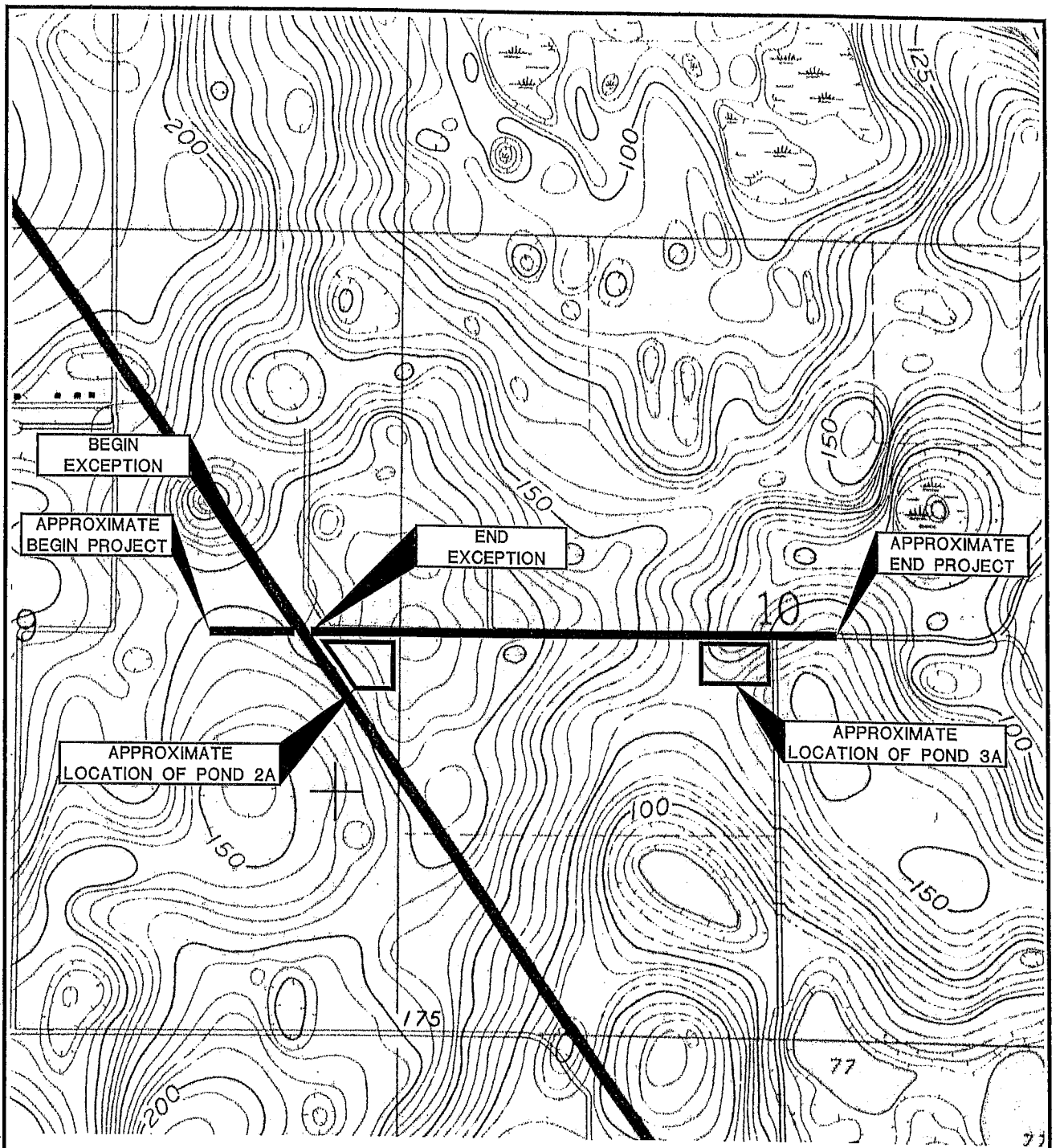
Boring I.D.	Station No.	Offset (ft)	Depth (ft)	Stratum No.	Grain Size Distribution - Percent Passing					OC (%)	NM (%)	Atterberg Limits (%)	
					#10 (%)	#40 (%)	#60 (%)	#100 (%)	#200 (%)			Liquid Limit	Plasticity Index
AB-255R	256+36	16R	0 - 1½	1	100	76	33	11	4	--	--	--	--
AB-261L	262+36	15L	1 - 4	1	100	76	28	5	3	--	--	--	--
AB-267R	268+36	15R	0 - 1½	1	100	74	32	9	5	--	--	--	--
AB-269L	270+36	15L	1½ - 4½	1	--	--	--	--	5	--	--	--	--
AB-271R	272+36	15R	1½ - 6	1	--	--	--	--	3	--	--	--	--
TH-241.5R	242+87	42R	20	1	--	--	--	--	4	--	--	--	--
TH-244.5R	245+80	7R	5 - 6	1	--	--	--	--	2	--	--	--	--
WRA-3B-AB-1	278+39	106R	0 - 7	1	100	80	35	8	3	--	--	--	--
AB-244L*	245+36	16L	½ - 1½	1	100	79	26	5	2	--	--	--	--
AB-263R*	264+36	35R	½ - 1½	1	100	73	32	7	4	--	--	--	--
AB-273L*	274+36	15L	½ - 1½	1	100	83	34	6	2	--	--	--	--
AB-285*	286+36	CL	½ - 1½	1	99	74	35	12	5	--	--	--	--
AB-281R	282+36	5R	1½ - 2½	2	98	80	46	20	13	--	--	--	--
TH-250R	251+74	35R	15	2	--	--	--	--	17	--	10	--	--
TH-277R	278+36	3R	3½ - 5	2	--	--	--	--	20	--	10	NP	NP
TH-279R	280+38	12R	0 - 2	2	--	--	--	--	13	--	9	--	--
WRA-2A-AB-1	254+83	176R	15 - 19½	2	--	--	--	--	6	--	--	--	--
WRA-3B-AB-2	279+28	206R	7 - 12	2	100	84	65	29	17	--	--	--	--
TH-277R*	278+36	3R	½ - 1½	2	99	66	28	9	6	--	--	--	--

OC = Organic Content NM = Natural Moisture Content -- = Property Not Measured NP = Non Plastic * = LBR Location

TABLE 4

Summary of LBR Test Data
Citrus Grove Road Phase 5
From SR 91 to Blackstill Lake Road
Lake County, Florida

Boring No.	Stratum	Depth (ft)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Maximum LBR
AB-244L	1	0.5 – 1.5	105.1	14.2	36
AB-263L	1	0.5 – 1.5	110.4	11.5	39
AB-273L	1	0.5 – 1.5	108.1	12.3	47
AB-285	1	0.5 – 1.5	109.0	11.4	48
TH-277R	2	0.5 – 1.5	104.7	10.7	39
Average					42



SECTIONS 9 AND 10
TOWNSHIP 22 SOUTH
RANGE 26 EAST

OBTAINED FROM U.S.G.S. QUAD MAP: CLERMONT EAST, FLORIDA 1962
(PHOTOREVISED 1980)

N

0 500 1000
SCALE: (FEET)

QUADRANGLE LOCATION

SITE LOCATION MAP

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

SUBSURFACE SOIL EXPLORATION
CITRUS GROVE ROAD
PHASE V
MINNEOLA, LAKE COUNTY, FLORIDA

DRAWN BY: CD	CHECKED BY:	DATE: 03/18/20
FILE NO. 19-6418	APPROVED BY:	FIGURE: 1

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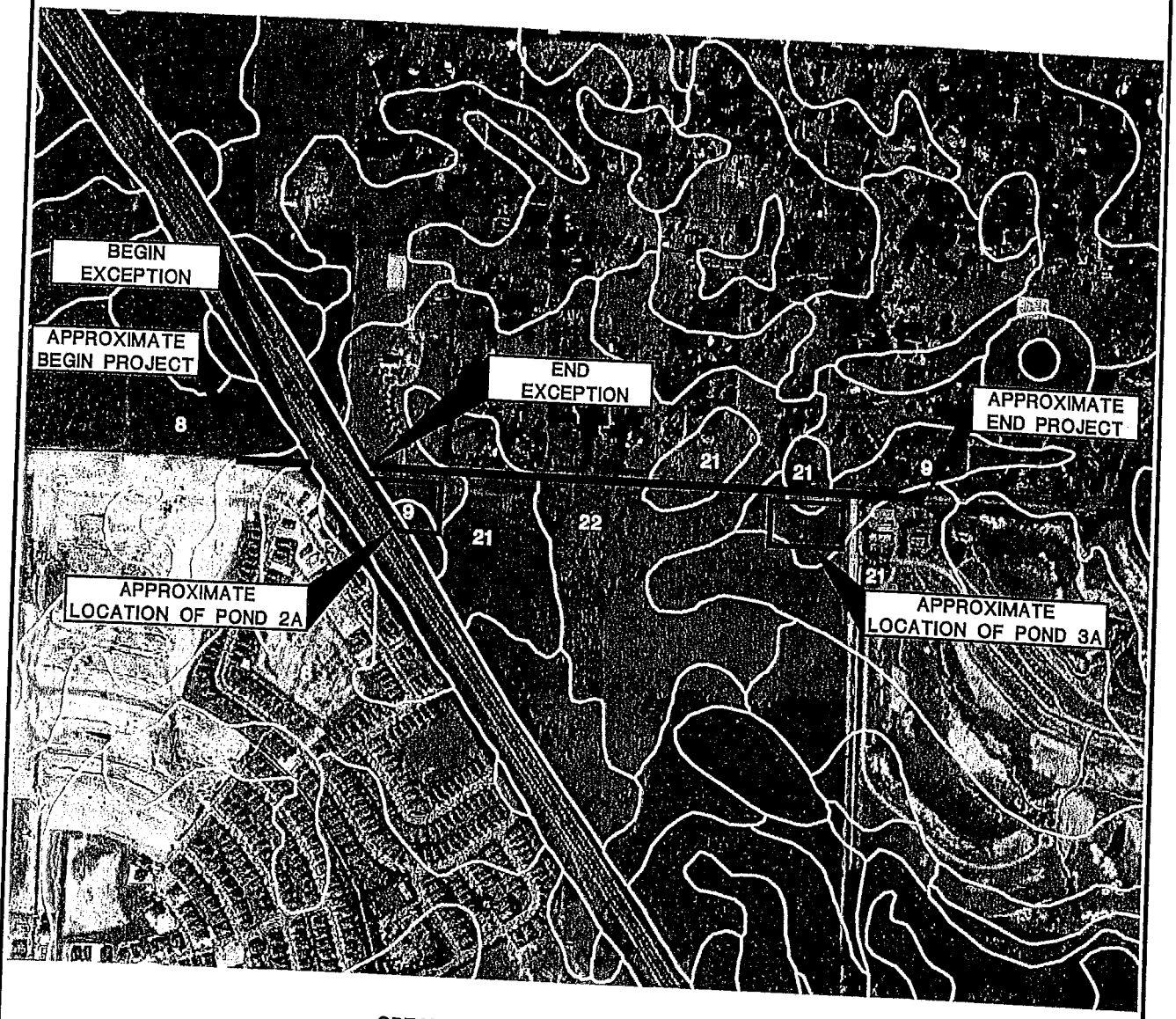

OBTAINED FROM: GOOGLE EARTH PRO
DATED: 03/17/2017

LEGEND

8 - CANDLER SAND, 0 TO 5 PERCENT SLOPES

9 - CANDLER SAND, 5 TO 12 PERCENT SLOPES

21 - LAKE SAND, 0 TO 5 PERCENT SLOPES

22 - LAKE SAND, 5 TO 12 PERCENT SLOPES

N

0 500 1000

SCALE: (FEET)

SOIL SURVEY MAP

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

SUBSURFACE SOIL EXPLORATION
CITRUS GROVE ROAD
PHASE V
MINNEOLA, LAKE COUNTY, FLORIDA

DRAWN BY: CD	CHECKED BY:	DATE: 03/16/20
FILE NO. 19-6418	APPROVED BY:	FIGURE: 2

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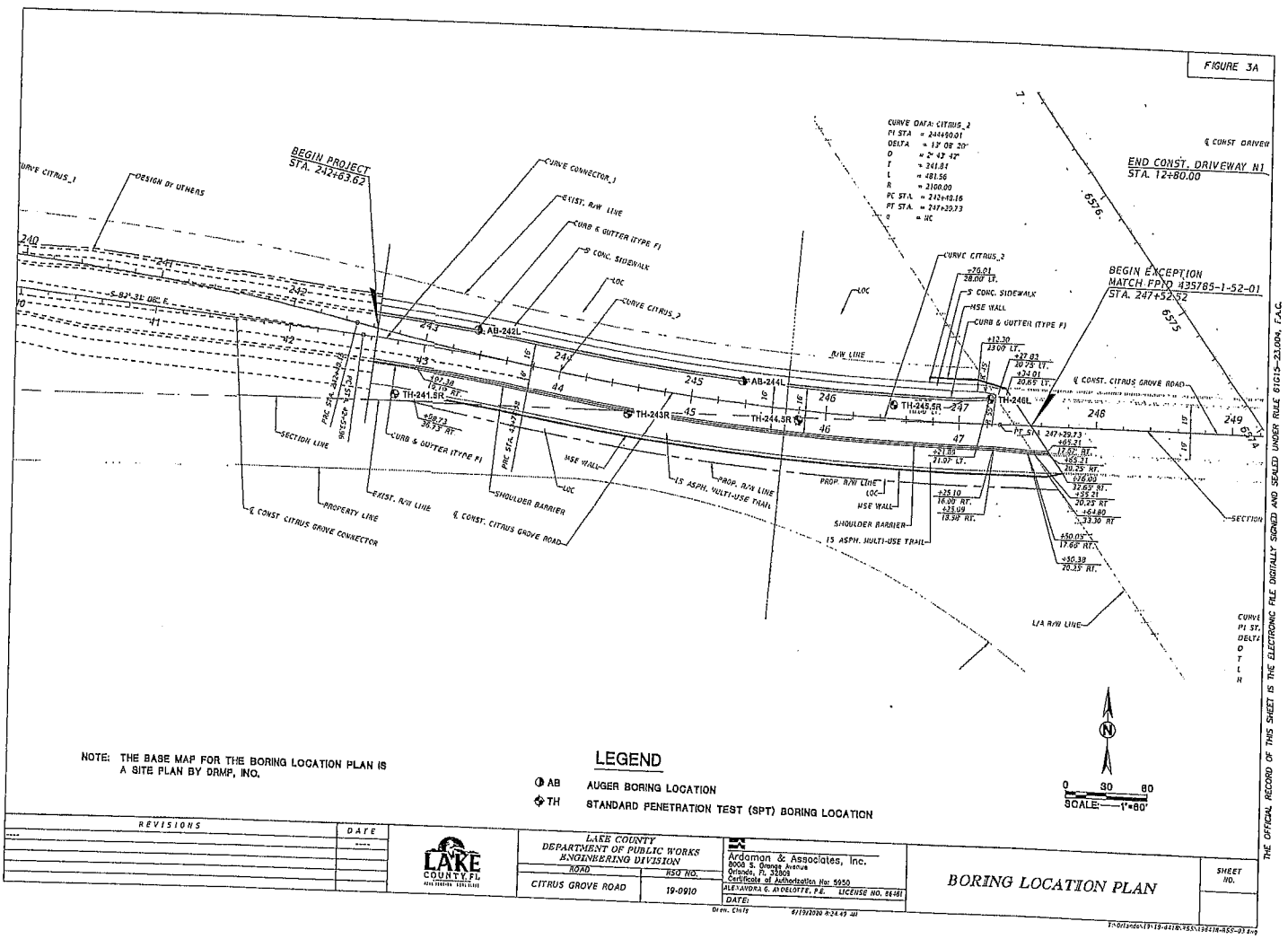
FIGURE 3A



NOTE: THE BASE MAP FOR THE BORING LOCATION PLAN IS A SITE PLAN BY DRMP, INC.

LEGEND

- AB — AUGER BORING LOCATION
- TH — STANDARD PENETRATION TEST (SPT) BORING LOCATION

N

0 30 60

SCALE: 1"=60'

REVISIONS	DATE
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LAKE COUNTY FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ROAD	RSQ NO.
CITRUS GROVE ROAD	19-0910

Ardaman & Associates, Inc.
8008 S. Orange Avenue
Orlando, FL 32809
Certificate of Authorization No. 6950
ALEJANDRA C. AYCOLOTTE, P.E. LICENSE NO. 86481
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BORING LOCATION PLAN

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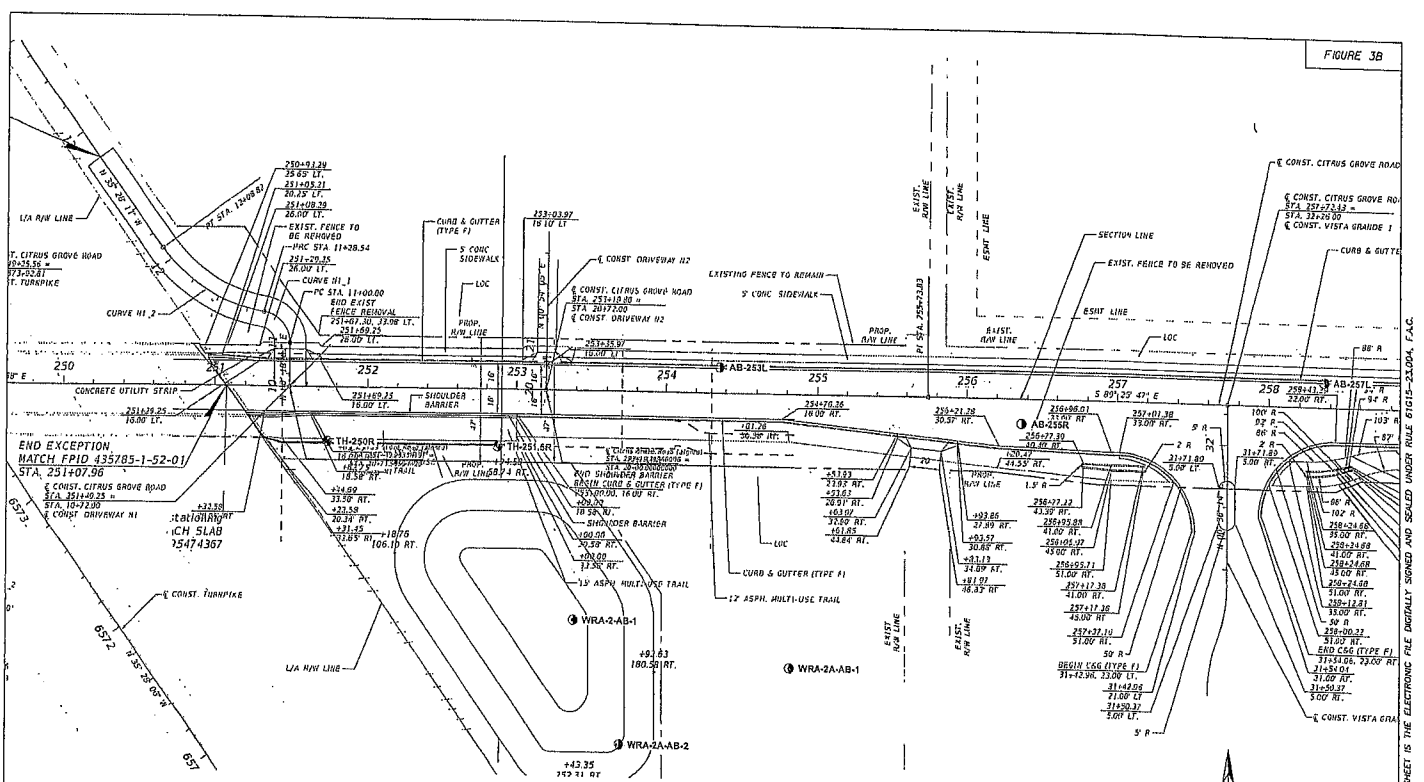
FIGURE 3B



NOTE: THE BASE MAP FOR THE BORING LOCATION PLAN IS A SITE PLAN BY DRMP, INC.

LEGEND

- AB — AUGER BORING LOCATION
- WRA — POND AUGER BORING LOCATION
- TH — STANDARD PENETRATION TEST (SPT) BORING LOCATION

0 30 60
SCALE: 1"=60'

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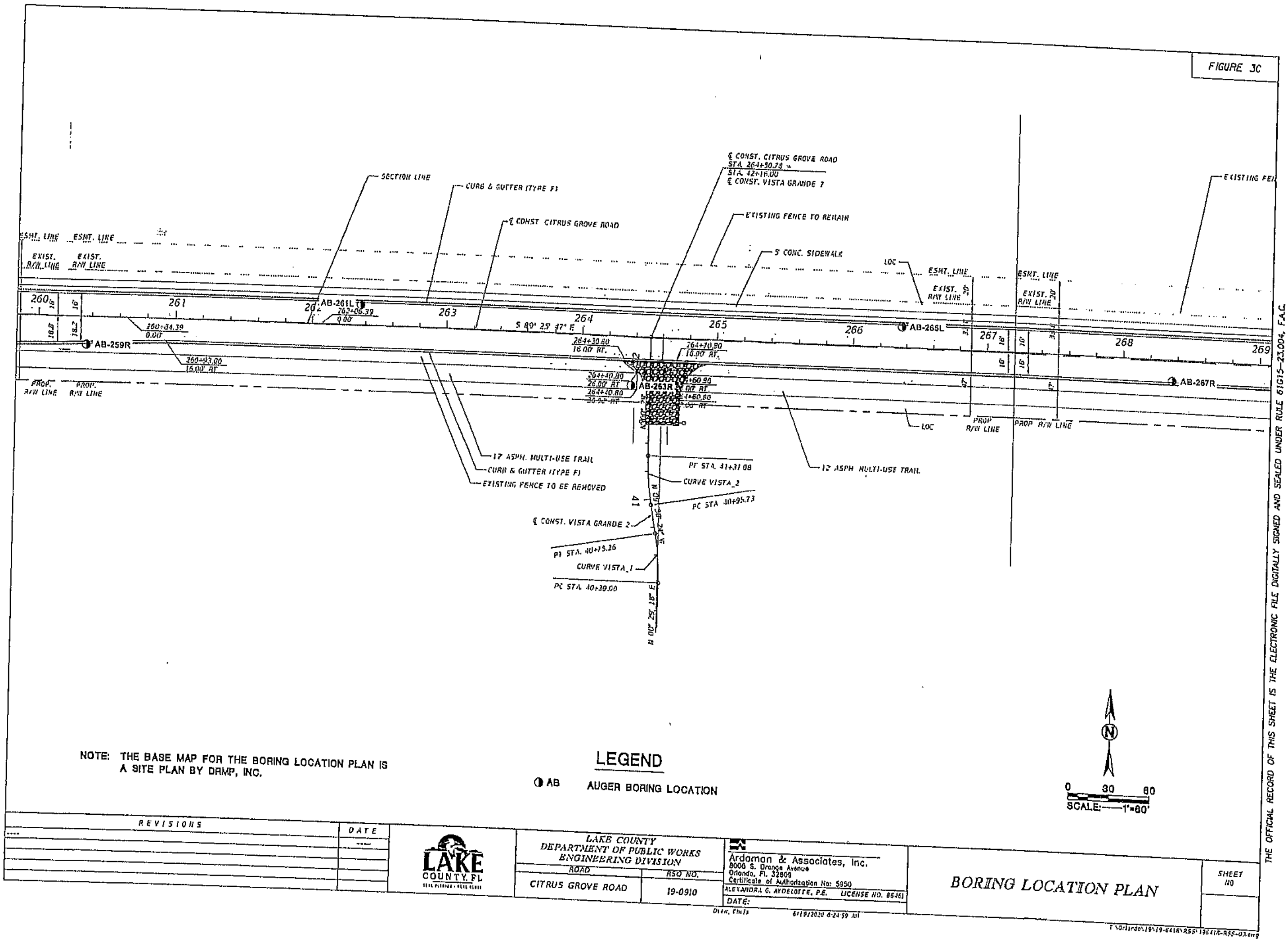
FIGURE 3C
SECTION LINE
CURB & GUTTER (TYPE F)
℄ CONST. CITRUS GROVE ROAD
℄ CONST. CITRUS GROVE ROAD STA. 264+30.78
STA. 42+16.00
℄ CONST. VISTA GRANDE 2
EXISTING FENCE TO REMAIN
5' CONC. SIDEWALK
EXISTING FENCE
ESMT. LINE
EXIST. R/W LINE
PROP. R/W LINE
LOC
AB-259R
AB-261L
AB-263R
AB-265L
AB-267R
S 89° 25' 47" E
12' ASPH. MULTI-USE TRAIL
CURB & GUTTER (TYPE F)
EXISTING FENCE TO BE REMOVED
PT STA. 41+31.08
CURVE VISTA_2
PC STA. 40+95.73
℄ CONST. VISTA GRANDE 2
PI STA. 40+75.26
CURVE VISTA_1
PC STA. 40+39.00
NOTE: THE BASE MAP FOR THE BORING LOCATION PLAN IS A SITE PLAN BY DRMP, INC.
LEGEND
AB AUGER BORING LOCATION
SCALE: 1"=60'
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DATE
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LAKE COUNTY
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CITRUS GROVE ROAD
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BORING LOCATION PLAN
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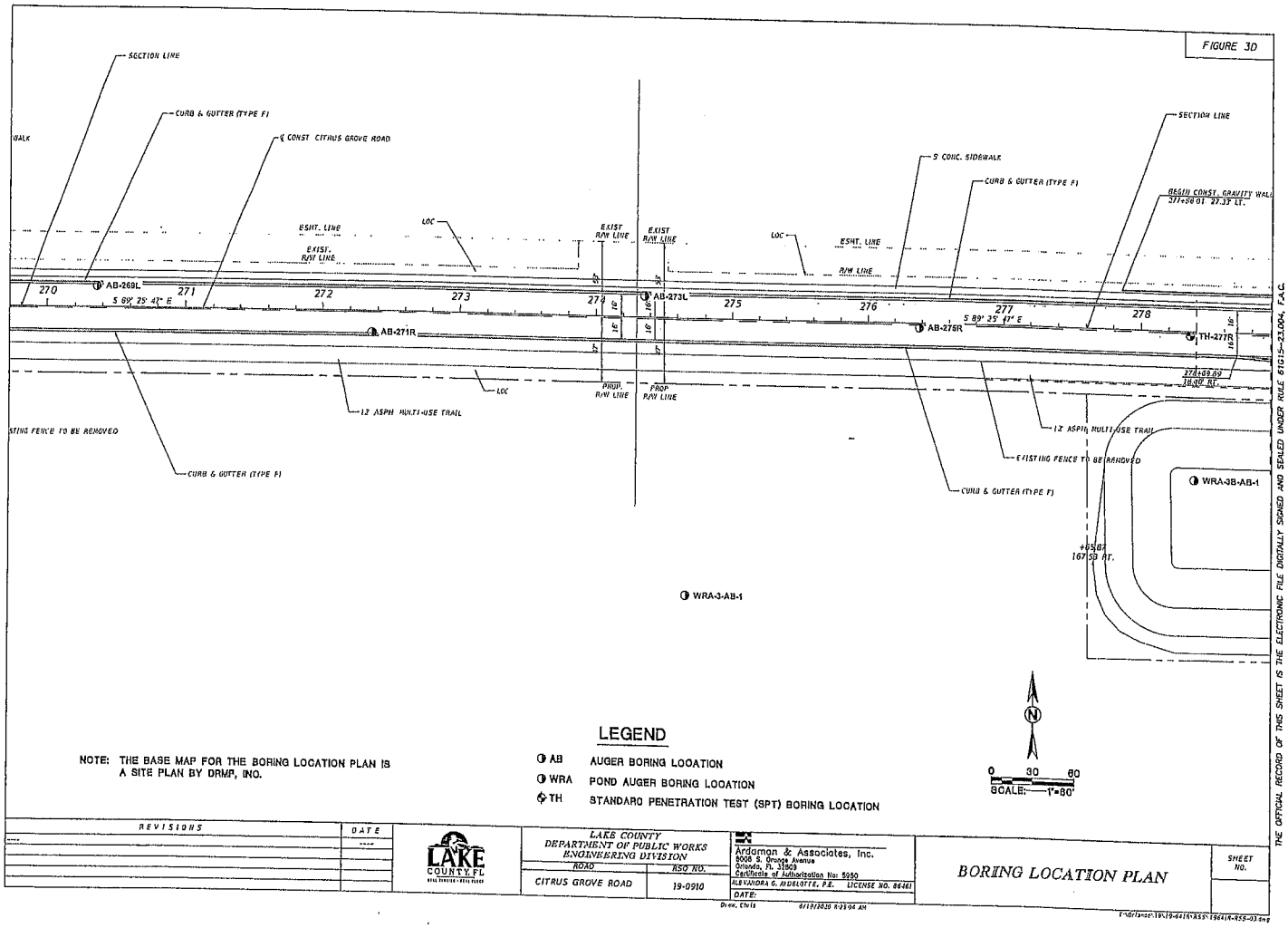
FIGURE 3D



NOTE: THE BASE MAP FOR THE BORING LOCATION PLAN IS A SITE PLAN BY DRMP, INC.

LEGEND

- AB — AUGER BORING LOCATION
- WRA — POND AUGER BORING LOCATION
- TH — STANDARD PENETRATION TEST (SPT) BORING LOCATION

N

0 30 60

SCALE: 1"=60'

REVISIONS	DATE
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DATE:

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BORING LOCATION PLAN

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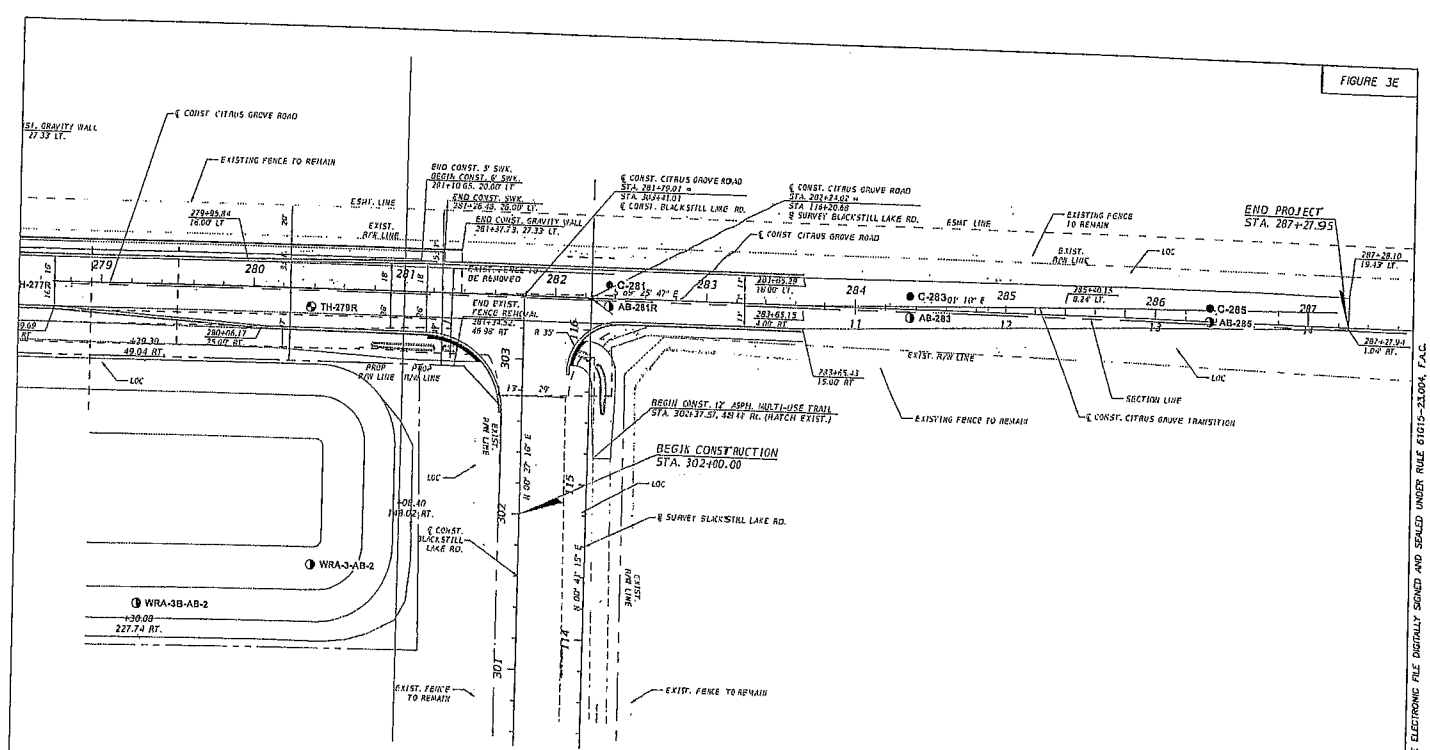
FIGURE 3E



NOTE: THE BASE MAP FOR THE BORING LOCATION PLAN IS A SITE PLAN BY DRMP, INC.

LEGEND

- AB — AUGER BORING LOCATION
- WRA — POND AUGER BORING LOCATION
- TH — STANDARD PENETRATION TEST (SPT) BORING LOCATION
- C — PAVEMENT CORE LOCATION

SCALE: 1"=60'

REVISIONS	DATE
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LAKE COUNTY, FL

LAKE COUNTY
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BORING LOCATION PLAN

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FIGURE 4

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
MATERIALS AND RESEARCH

CITRUS GROVE ROAD
DESIGN PHASE V
FROM SR 91 TO BLACKSTILL ROAD
CROSS SECTION OF SOIL SURVEY

DATE OF SURVEY: 11/19 - 05/20
SURVEY MADE BY: PFEIFFER, LARKINS
SUBMITTED BY: ALEXANDRA G. AYDELOTTE, P.E.

DISTRICT: FIVE
ROAD NO.: CITRUS GROVE
COUNTY: LAKE

SURVEY BEGINS STA. : 242+63 SURVEY ENDS STA. : 287+28

STRATUM NO.	ORGANIC CONTENT		MOISTURE CONTENT		SIEVE ANALYSIS RESULTS PERCENTAGE PASSING						ATTERBERG LIMITS (%)			SOIL CLASSIFICATION		CORROSION TEST RESULTS				
	NO. OF TESTS	% ORGANIC	NO. OF TESTS	% MOISTURE	NO. OF TESTS	10 MESH	40 MESH	60 MESH	100 MESH	200 MESH	NO. OF TESTS	LIQUID LIMIT	PLASTICITY INDEX	AASHTO GROUP	DESCRIPTION	NO. OF TESTS	RESISTIVITY ohms cm	CHLORIDE ppm	SULFATES ppm	pH
1	--	--	--	--	8(4)	99-100	73-83	26-35	5-12	2-5	--	--	--	A-3	LIGHT BROWN TO DARK BROWN, LIGHT ORANGE-BROWN TO ORANGE-BROWN FINE SAND TO FINE SAND WITH SILT	3	23,315-35,702	BDL	BDL-6	5.9-7.7
2	--	--	3	9-10	3(4)	98-100	66-84	28-65	9-29	6-20	1	NP	NP	A-3 A-2-4	LIGHT BROWN TO BROWN, LIGHT ORANGE-BROWN TO ORANGE-BROWN FINE SAND WITH CLAY TO CLAYEY FINE SAND	--	--	--	--	--

EMBANKMENT AND SUBGRADE MATERIAL
STRATA BOUNDARIES ARE APPROXIMATE, MAKE FINAL CHECK AFTER GRADING

1. SOIL BOUNDARIES ARE APPROXIMATE AND REPRESENT SOIL STRATA AT EACH BORING LOCATION ONLY. ANY SUBSOIL 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 SECTION 2-4 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. FOR FURTHER DETAILS SEE SECTION 120-3.
2. GNE DENOTES GROUNDWATER NOT ENCOUNTERED. ESTIMATED SEASONAL HIGH GROUNDWATER LEVEL BELOW BOTTOM OF BORING SHOWN AS "*".
3. REMOVAL OF MUCK AND PLASTIC MATERIAL OCCURING WITHIN THE ROADWAY SHALL BE ACCOMPLISHED IN ACCORDANCE WITH STANDARD PLANS INDEX NO. 120-002, UNLESS OTHERWISE SHOWN ON THE PLANS. THE MATERIAL USED IN EMBANKMENT CONSTRUCTION SHALL BE IN ACCORDANCE WITH FDOT STANDARD PLANS INDEX NO. 120-001 FOR FDOT DESIGN STANDARDS.
4. SOIL PARAMETER NOT TESTED DENOTED AS "--" ABOVE.
5. STRATA NOS. 1 AND 2 SHALL BE TREATED AS SELECT (S) MATERIAL IN ACCORDANCE WITH FDOT STANDARD PLANS INDICES 120-002 AND 120-001.
6. STRATUM NO. 2 MAY RETAIN EXCESS MOISTURE AND MAY BE DIFFICULT TO DRY AND COMPACT.
7. "NP" DENOTES NON-PLASTIC. () DENOTES PERCENT FINES TESTS ONLY. "BDL" DENOTES BELOW DETECTABLE LIMIT.

REVISIONS	DATE
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Certificate of Authorization No: 5950
ALEXANDRA G. AYDELOTTE, P.E. LICENSE NO. 86461
DATE:

SOIL SURVEY

SHEET NO

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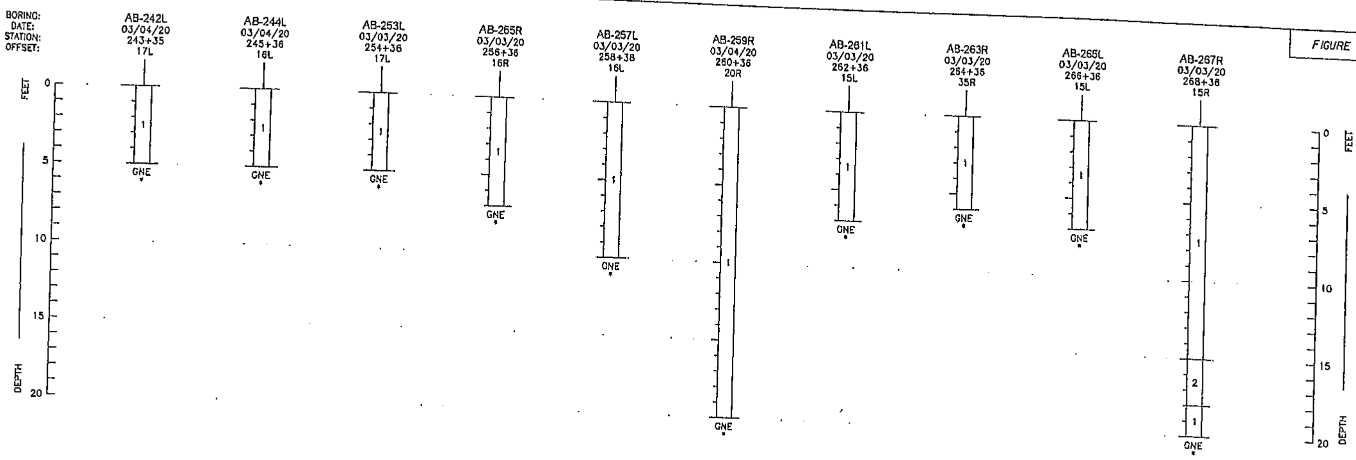
FIGURE 5



LEGEND

GNE GROUNDWATER NOT ENCOUNTERED ON DATE DRILLED

* ESTIMATED NORMAL SEASONAL HIGH GROUNDWATER LEVEL BELOW BOTTOM OF BORING

AOGS AT OR ABOVE GROUND SURFACE

APPROXIMATE STATION AND OFFSET REFERENCED TO CENTERLINE CITRUS GROVE ROAD

STRATUM NO.	AASHTO GROUP	GENERAL DESCRIPTION
1	A-3	FINE SAND TO FINE SAND WITH SILT
2	A-3 A-2-4	FINE SAND WITH CLAY TO CLAYEY FINE SAND

REVISIONS	DATE
----	----

LAKE COUNTY, FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ROAD	RSO NO.
CITRUS GROVE ROAD	19-0910

Ardaman & Associates, Inc.
8008 S. Orange Avenue
Orlando, Fl. 32809
Certificate of Authorization No: 5950
ALEXANDRA G. AYDELOTTE, P.E. LICENSE NO. 86461
DATE:

ROADWAY BORING PROFILES

SHEET NO.

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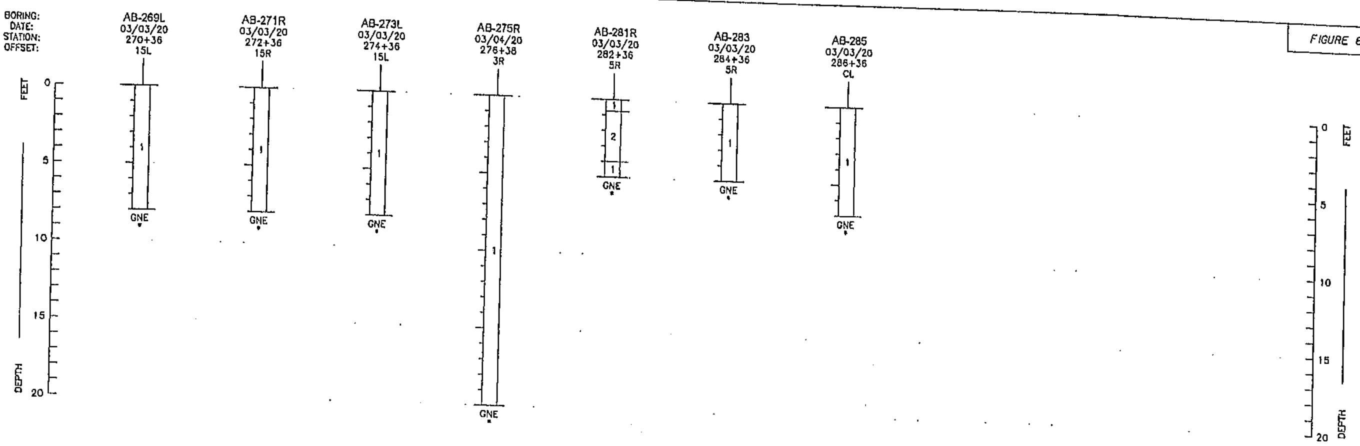
FIGURE 6



LEGEND

GNE GROUNDWATER NOT ENCOUNTERED ON DATE DRILLED

* ESTIMATED NORMAL SEASONAL HIGH GROUNDWATER LEVEL BELOW BOTTOM OF BORING

AOGS AT OR ABOVE GROUND SURFACE

APPROXIMATE STATION AND OFFSET REFERENCED TO CENTERLINE CITRUS GROVE ROAD

STRATUM NO.	AASHTO GROUP	GENERAL DESCRIPTION
1	A-3	FINE SAND TO FINE SAND WITH SILT
2	A-3 A-2-4	FINE SAND WITH CLAY TO CLAYEY FINE SAND

REVISIONS | DATE

LAKE COUNTY, FL

LAKE COUNTY DEPARTMENT OF PUBLIC WORKS ENGINEERING DIVISION

ROAD	RSO NO.
CITRUS GROVE ROAD	19-0910

Ardaman & Associates, Inc.
8008 S. Orange Avenue
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DATE:

ROADWAY BORING PROFILES

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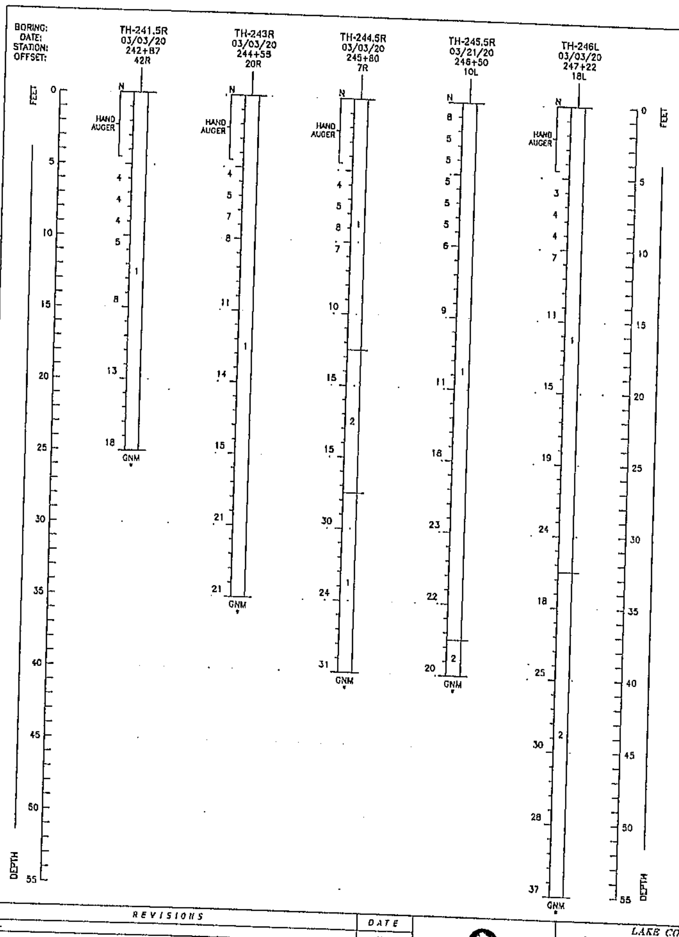
FIGURE 7



LEGEND

GNM GROUNDWATER NOT MEASURED ON DATE DRILLED

* ESTIMATED NORMAL SEASONAL HIGH GROUNDWATER LEVEL BELOW BOTTOM OF BORING

AOGS AT OR ABOVE GROUND SURFACE

N STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT

APPROXIMATE STATION AND OFFSET REFERENCED TO CENTERLINE CITRUS GROVE ROAD

STRATUM NO.	AASHTO GROUP	GENERAL DESCRIPTION
1	A-3	FINE SAND TO FINE SAND WITH SILT
2	A-3 A-2-4	FINE SAND WITH CLAY TO CLAYEY FINE SAND

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REVISIONS	DATE
----	----

LAKE COUNTY, FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

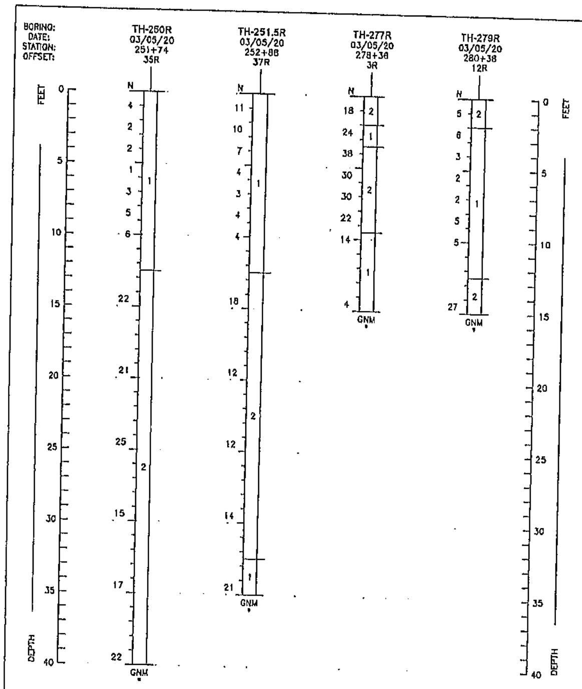
ROAD	RSQ NO.
CITRUS GROVE ROAD	19-0910

Ardaman & Associates, Inc.
8008 S. Orange Avenue
Orlando, FL 32809
Certificate of Authorization No: 5950
ALEXANDRA G. AYDELOTTE, P.E. LICENSE NO. 86461
DATE:

ROADWAY BORING PROFILES

SHEET NO

FIGURE 8



LEGEND

GNM GROUNDWATER NOT MEASURED ON DATE DRILLED

* ESTIMATED NORMAL SEASONAL HIGH GROUNDWATER LEVEL BELOW BOTTOM OF BORING

AOGS AT OR ABOVE GROUND SURFACE

N STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT

APPROXIMATE STATION AND OFFSET REFERENCED TO CENTERLINE CITRUS GROVE ROAD

STRATUM NO.	AASHTO GROUP	GENERAL DESCRIPTION
1	A-3	FINE SAND TO FINE SAND WITH SILT
2	A-3 A-2-4	FINE SAND WITH CLAY TO CLAYEY FINE SAND

REVISIONS	DATE

LAKE COUNTY, FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ROAD	RSO NO.
CITRUS GROVE ROAD	19-0910

Ardaman & Associates, Inc.
8008 S. Orange Avenue
Orlando, FL 32809
Certificate of Authorization No: 5950
ALEXANDRA G. AYDELOTTE, P.E. LICENSE NO. 86461
DATE:

ROADWAY BORING PROFILES

SHEET NO.

Dean, Chris 6/19/2020 8:25:33 AM

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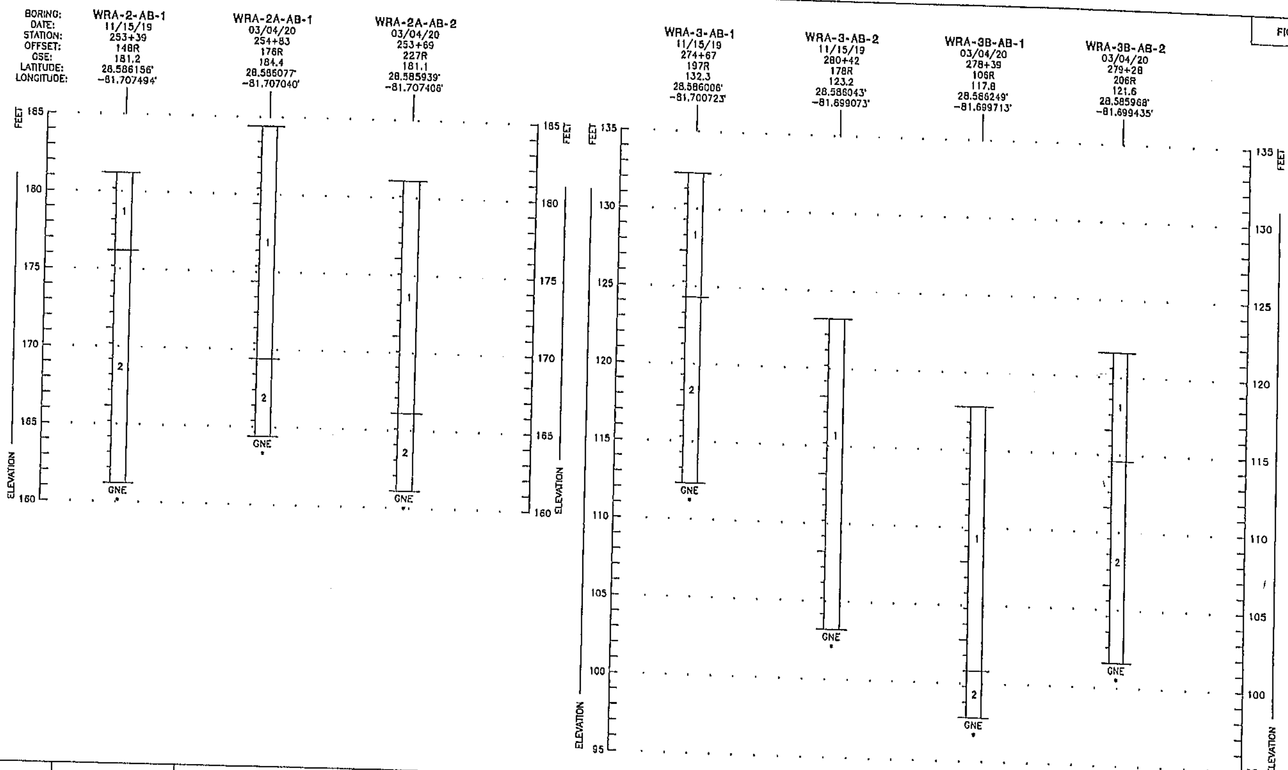
FIGURE 9



STRATUM NO.	AASHTO GROUP	GENERAL DESCRIPTION
1	A-3	FINE SAND TO FINE SAND WITH SILT
2	A-3, A-2-4	FINE SAND WITH CLAY TO CLAYEY FINE SAND

LEGEND

GSE SURVEYED GROUND SURFACE ELEVATION (FEET)

GNE GROUNDWATER NOT ENCOUNTERED ON DATE DRILLED

* ESTIMATED NORMAL SEASONAL HIGH GROUNDWATER LEVEL BELOW BOTTOM OF BORING

LATITUDE AND LONGITUDE COORDINATES OBTAINED FROM HANDHELD GPS UNIT.

APPROXIMATE STATION AND OFFSET REFERENCED TO CENTERLINE CITRUS GROVE ROAD

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REVISIONS	DATE

LAKE COUNTY, FL

LAKE COUNTY DEPARTMENT OF PUBLIC WORKS ENGINEERING DIVISION

ROAD	RSO NO.
CITRUS GROVE ROAD	19-0910

Ardaman & Associates, Inc.
8008 S. Orange Avenue
Orlando, FL 32809
Certificate of Authorization No: 5950
ALEXANDRA C. ANGELOTTE, P.E. LICENSE NO. 86461
DATE:

POND BORING PROFILES

SHEET NO

APPENDIX I

Standard Penetration Test and Auger Boring Procedures

STANDARD PENETRATION TEST

The standard penetration test is a widely accepted test method of *in situ* testing of foundation soils (ASTM D 1586). A 2-foot long, 2-inch O.D. split-barrel sampler attached to the end of a string of drilling rods is driven 18 inches into the ground by successive blows of a 140-pound hammer freely dropping 30 inches. The number of blows needed for each 6 inches of penetration is recorded. The sum of the blows required for penetration of the second and third 6-inch increments of penetration constitutes the test result or N-value. After the test, the sampler is extracted from the ground and opened to allow visual examination and classification of the retained soil sample. The N-value has been empirically correlated with various soil properties allowing a conservative estimate of the behavior of soils under load.

The tests are usually performed at 5-foot intervals. The test holes are advanced to the test elevations by rotary drilling with a cutting bit, using circulating fluid to remove the cuttings and hold the fine grains in suspension. The circulating fluid, which is a bentonitic drilling mud, is also used to keep the hole open below the water table by maintaining an excess hydrostatic pressure inside the hole. In some soil deposits, particularly highly pervious ones, NX-size flush-coupled casing must be driven to just above the testing depth to keep the hole open and/or prevent the loss of circulating fluid.

Representative split-spoon samples from the soils are brought to our laboratory in air-tight jars for further evaluation and testing, if necessary. Samples not used in testing are stored for 30 days prior to being discarded.

AUGER BORINGS

Auger borings are used when continuous sampling of soil strata close to ground surface is desired. A 4-inch diameter, continuous flite, helical auger with a cutting head at its end is screwed into the ground in 5-foot sections. It is powered by the rotating action of the Kelly bar of a rotary drill rig. The sample is recovered by withdrawing the auger out of the ground without rotating it. The soil sample so obtained, is classified and representative samples put in bags or jars and brought back to the laboratory for classification testing.

APPENDIX II

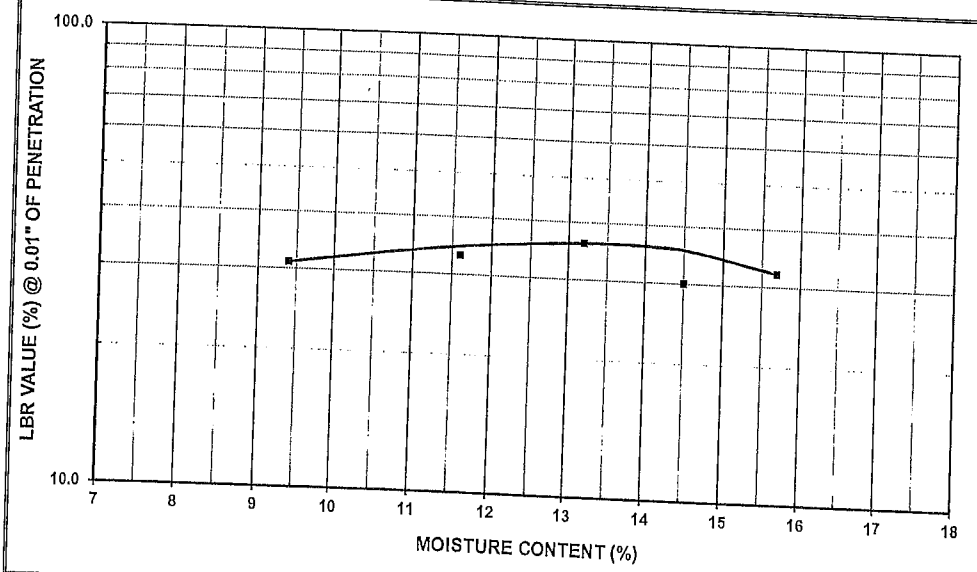
Limerock Bearing Ratio (LBR) Test Results

Ardaman
& Associates, Inc.
Florida Certificate of Authorization No. 00005950

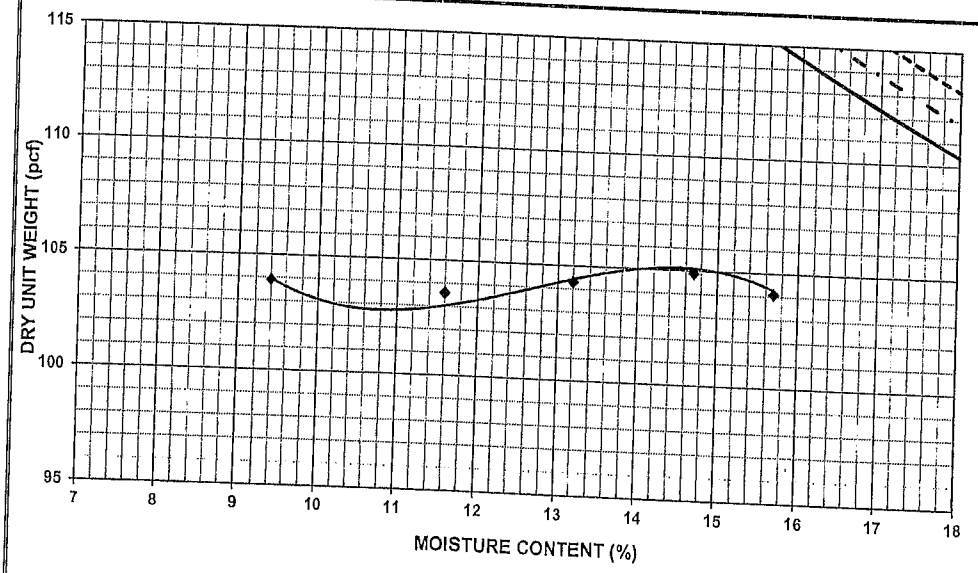
Ardaman & Associates, Inc.
8008 South Orange Avenue
Orlando, Florida 32809
Phone (407) 855-3860
FAX (407) 859-7023

LIMEROCK BEARING RATIO TEST (FM 5-515)

Project Name:	Citrus Grove Road	Date Sampled:	3/16/2020
Project Location:	Lake County	Sampled By:	DP
File Number:	19-60-6418	Date Tested:	3/26/2020
Client Name:	DRMP	Tested By:	MB



LBR VALUE (%)
36



MAX. DRY DENSITY (pcf)
105.1

OPTIMUM MOISTURE (%)
14.2

PERCENT FINES (%)
2

Curves of 100% Saturation for Specific Gravity Equal to:

2.60 ——————

2.65 — · — · —

2.70 – – – – –

SAMPLE NUMBER: Grab Sample

SAMPLE DESCRIPTION: Light brown fine sand (Stratum 1)

SAMPLE LOCATION: Adjacent to Boring AB-244L; Sample depth of 0.5 to 1.5 foot

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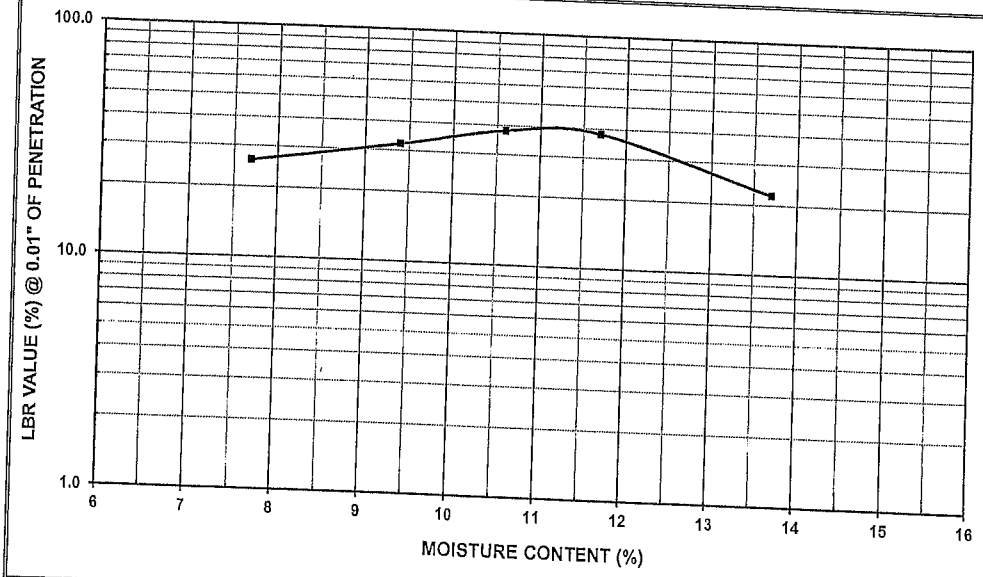
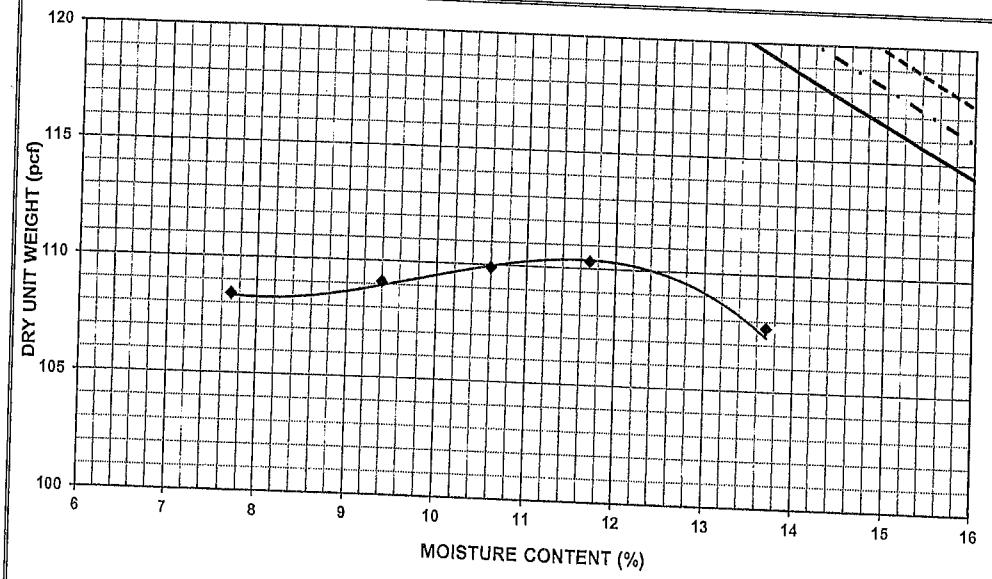
LIMEROCK BEARING RATIO TEST (FM 5-515)

Project Name:	Citrus Grove Road	Date Sampled:	3/16/2020
Project Location:	Lake County	Sampled By:	DP
File Number:	19-60-6418	Date Tested:	3/26/2020
Client Name:	DRMP	Tested By:	MB



LBR VALUE (%)
39



MAX. DRY DENSITY (pcf)	110.4
OPTIMUM MOISTURE (%)	11.5
PERCENT FINES (%)	4

Curves of 100% Saturation for Specific Gravity Equal to:
2.60
2.65
2.70

SAMPLE NUMBER:	Grab Sample
SAMPLE DESCRIPTION:	Light brown fine sand, trace limerock (Stratum 1)
SAMPLE LOCATION:	Adjacent to Boring AB-263R; Sample depth of 0.5 to 1.5 foot

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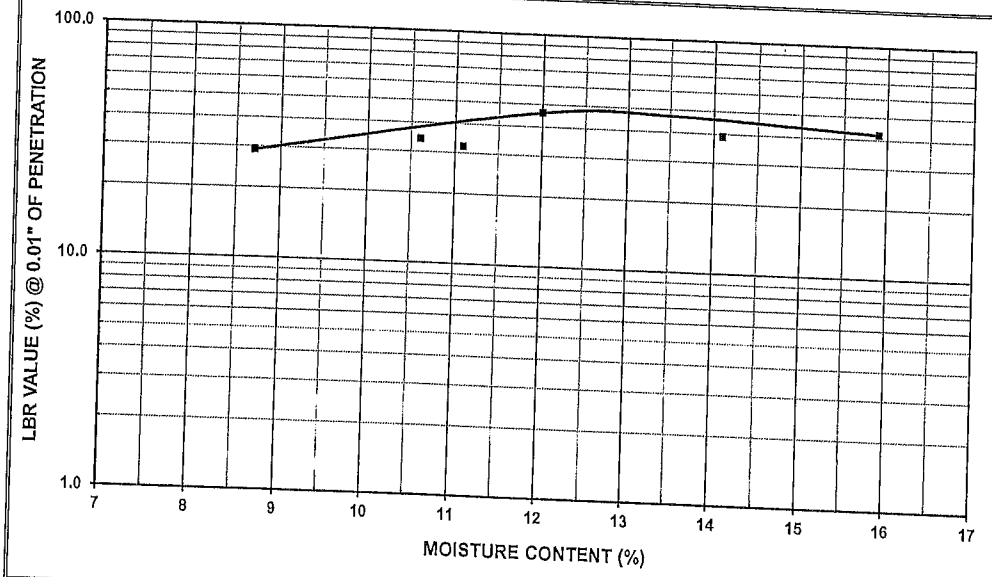
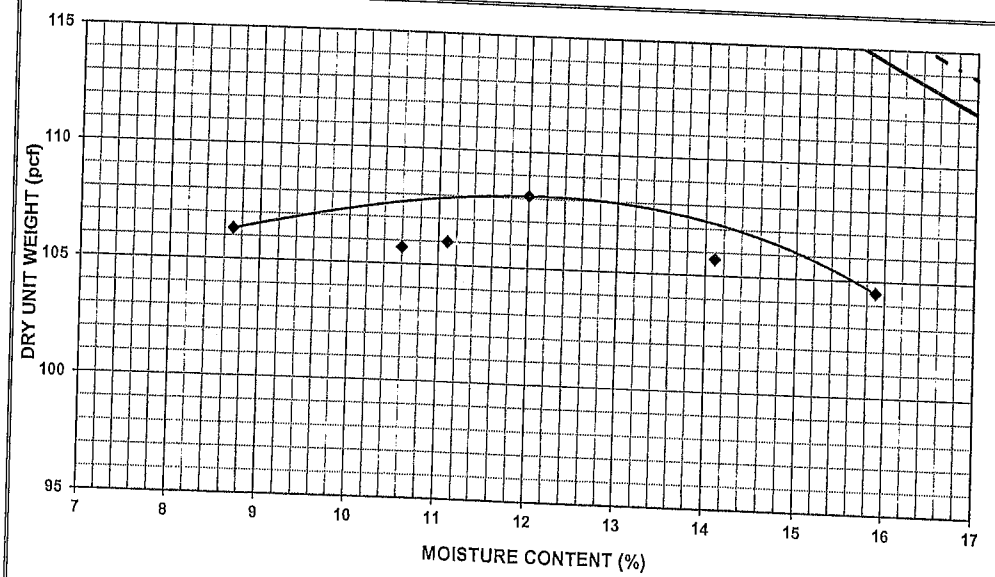
LIMEROCK BEARING RATIO TEST (FM 5-515)

Project Name:	Citrus Grove Road	Date Sampled:	3/16/2020
Project Location:	Lake County	Sampled By:	DP
File Number:	19-60-6418	Date Tested:	3/26/2020
Client Name:	DRMP	Tested By:	MB



LBR VALUE (%)
47



MAX. DRY DENSITY (pcf)
108.1

OPTIMUM MOISTURE (%)
12.3

PERCENT FINES (%)
2

Curves of 100% Saturation for Specific Gravity Equal to:
2.60
2.65
2.70

SAMPLE NUMBER:	Grab Sample
SAMPLE DESCRIPTION:	Light orange-brown fine sand (Stratum 1)
SAMPLE LOCATION:	Adjacent to Boring AB-273L; Sample depth of 0.5 to 1.5 foot

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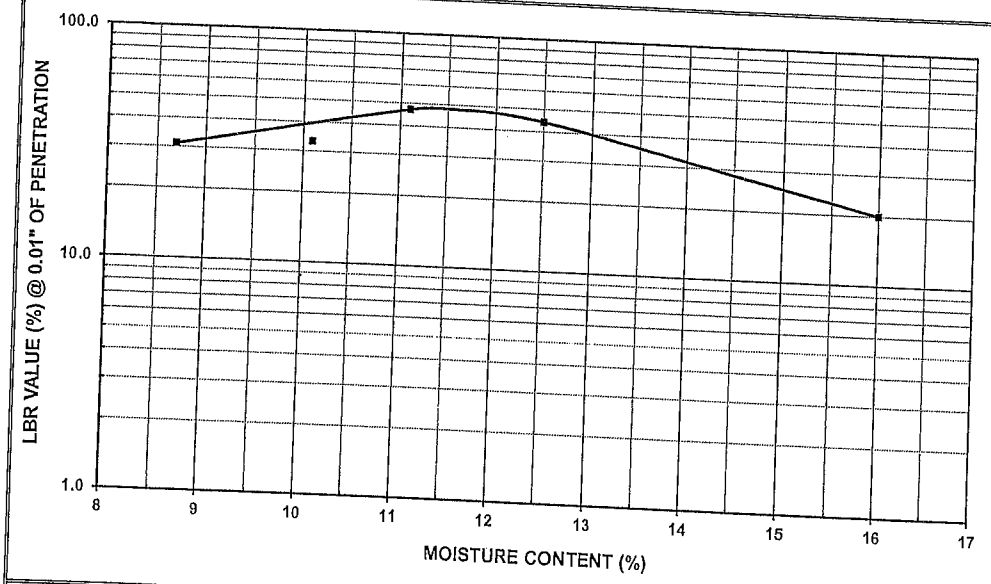
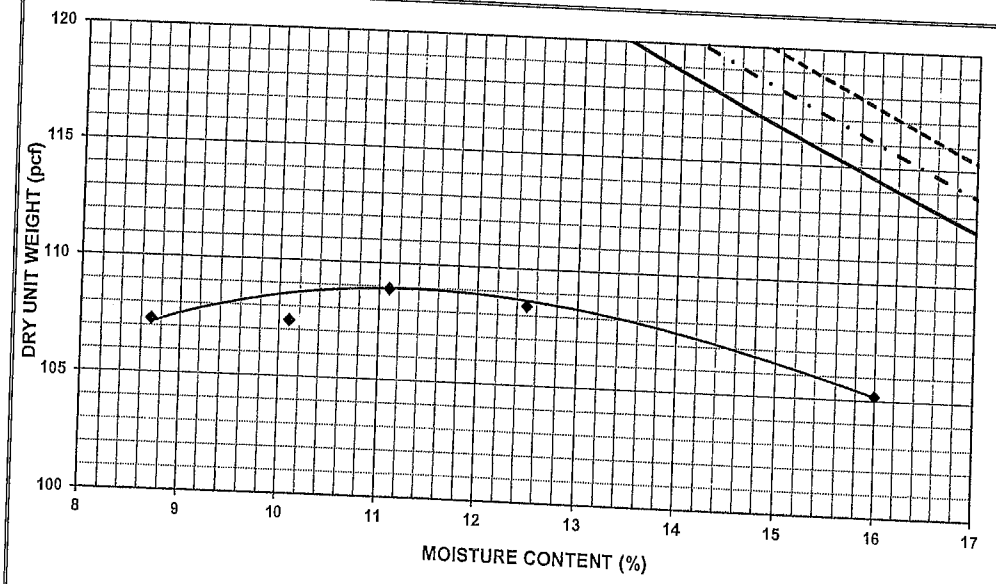
LIMEROCK BEARING RATIO TEST (FM 5-515)

Project Name:	Citrus Grove Road	Date Sampled:	3/16/2020
Project Location:	Lake County	Sampled By:	DP
File Number:	19-60-6418	Date Tested:	3/26/2020
Client Name:	DRMP	Tested By:	MB



LBR VALUE (%)
48



MAX. DRY DENSITY (pcf)
109.0

OPTIMUM MOISTURE (%)
11.4

PERCENT FINES (%)
5

Curves of 100% Saturation for Specific Gravity Equal to:
2.60
2.65
2.70

SAMPLE NUMBER: Grab Sample

SAMPLE DESCRIPTION: Orange-brown fine sand with silt (Stratum 1)

SAMPLE LOCATION: Adjacent to Boring AB-285; Sample depth of 0.5 to 1.5 foot

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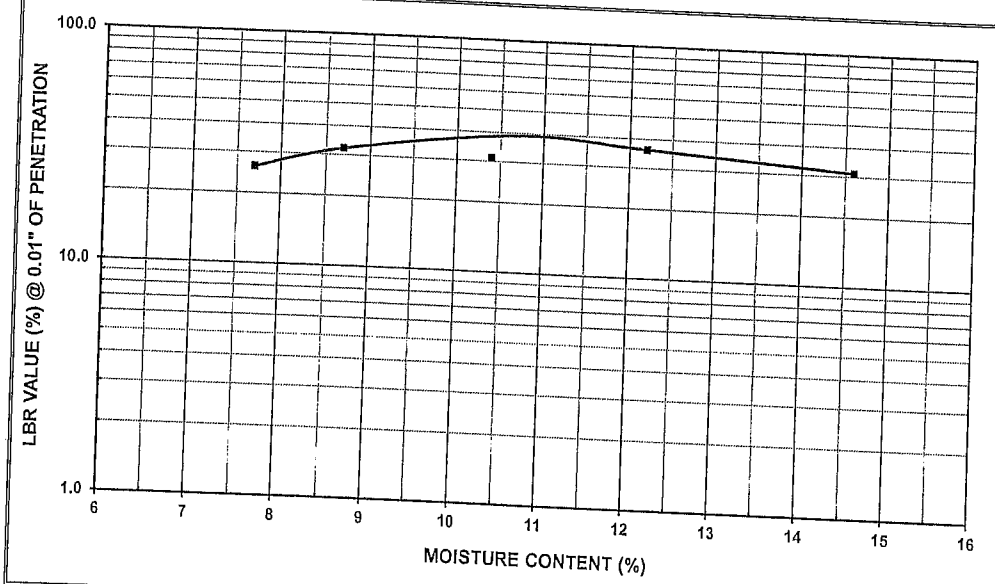
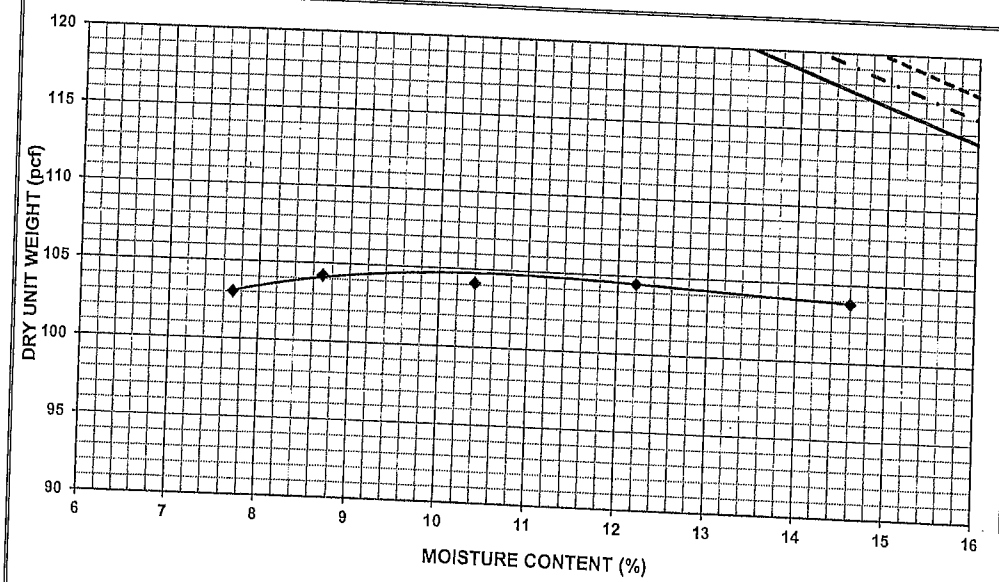
FAX (407) 859-7023

LIMEROCK BEARING RATIO TEST (FM 5-515)

Project Name:	Citrus Grove Road	Date Sampled:	3/16/2020
Project Location:	Lake County	Sampled By:	DP
File Number:	19-60-6418	Date Tested:	3/26/2020
Client Name:	DRMP	Tested By:	MB



LBR VALUE (%)
39



MAX. DRY DENSITY (pcf)
104.7

OPTIMUM MOISTURE (%)
10.7

PERCENT FINES (%)
6

Curves of 100% Saturation for Specific Gravity Equal to:
- 2.60
- 2.65
- 2.70

SAMPLE NUMBER:	Grab Sample
SAMPLE DESCRIPTION:	Light brown fine sand with clay (Stratum 2)
SAMPLE LOCATION:	Adjacent to Boring TH-277R; Sample depth of 0.5 to 1.5 foot

APPENDIX III

Field Permeability Test Calculation Sheets

Ardaman & Associates, Inc.

Falling Head Permeability Test Calculation

Project No.: 19-60-6418
Project Name: Citrus Grove Phase 5
County: Lake

Pond No.	Misc.
Test Location	WRA-3-AB-1
Test Depth (ft)	5-6
Soil Type	1
Diameter of Gravel Pack & Casing, d = D (in)	4.0
Riser Height, H_r (ft)	1.0
Groundwater Depth, D_{wt} (ft)	GNE
Length of Gravel Pack, L (inches)	12.0
Estimated K_h Value (Feet/Day):	43.4

INPUT	H (in.)	T (mins)
1	72.0	0
2	12.0	1.5

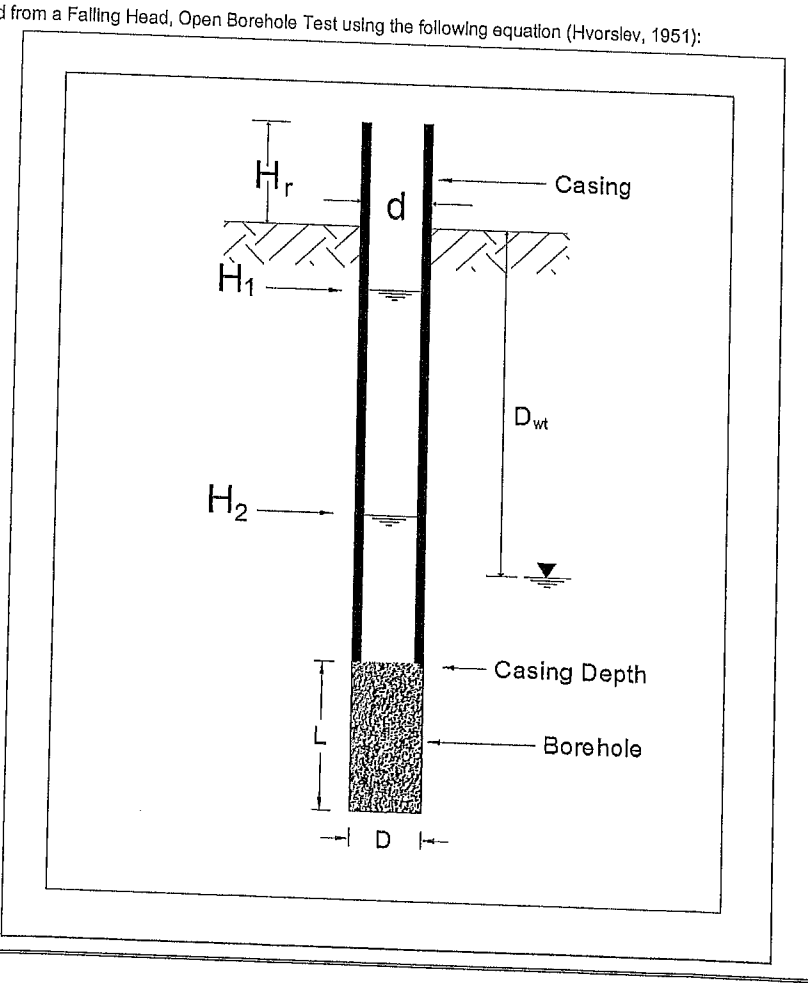
Ratio, m	1.0

Calculations:

Horizontal Soil Permeability can be calculated from a Falling Head, Open Borehole Test using the following equation (Hvorslev, 1951):

$$k_h = \frac{d^2 \ln\left[\frac{mL}{D} + \sqrt{1+\left(\frac{mL}{D}\right)^2}\right]}{8L(t_2 - t_1)} \ln\frac{h_1}{h_2}$$

Where: k_h = horizontal permeability
d = diameter of casing
D = diameter of intake
L = length of gravel pack
h_1 = piezometric head at time t_1
h_2 = piezometric head at time t_2
m = transformation ratio (k_h to k_v)



Ardaman & Associates, Inc.

Falling Head Permeability Test Calculation

Project No.: 19-60-6418
Project Name: Citrus Grove Phase 5
County: Lake

Pond No.	Pond 2A
Test Location	WRA-2-AB-1
Test Depth (ft)	4-5
Soil Type	1
Diameter of Gravel Pack & Casing, d = D (in)	4.0
Riser Height, H_r (ft)	2.0
Groundwater Depth, D_{wt} (ft)	GNE
Length of Gravel Pack, L (inches)	12.0
Estimated K_h Value (Feet/Day):	52.1

INPUT	H (in.)	T (mins)
1	72.0	0
2	12.0	1.25

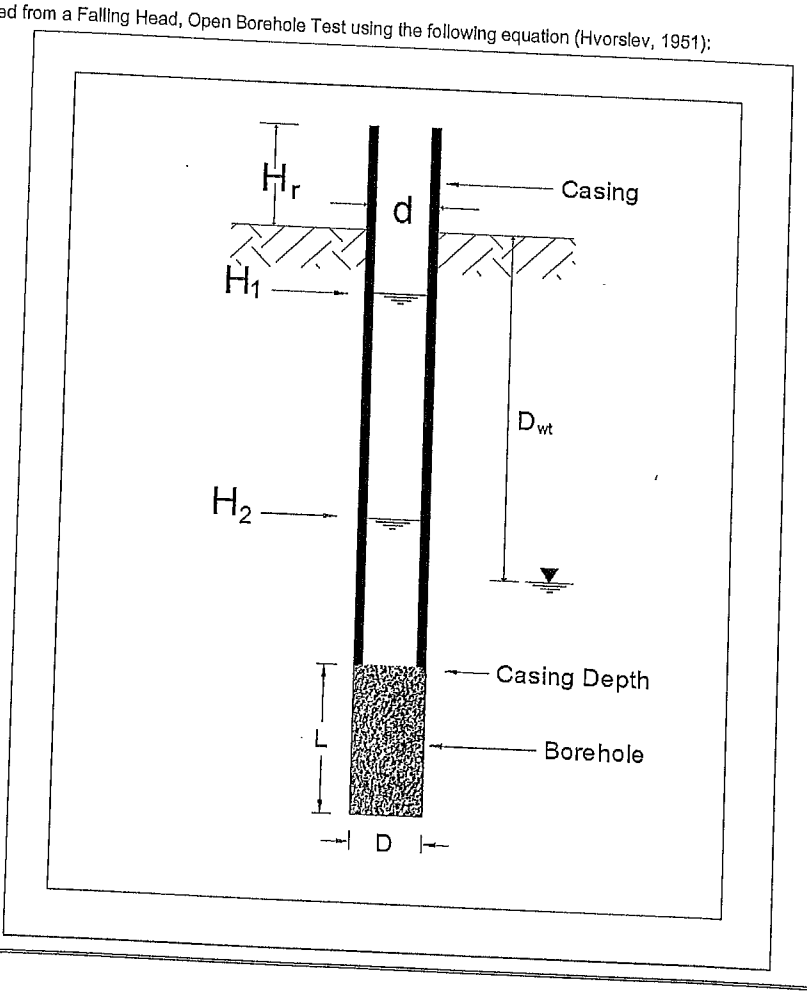
Ratio, m	1.0

Calculations:

Horizontal Soil Permeability can be calculated from a Falling Head, Open Borehole Test using the following equation (Hvorslev, 1951):

$$k_h = \frac{d^2 \ln\left[\frac{mL}{D} + \sqrt{1+\left(\frac{mL}{D}\right)^2}\right]}{8L(t_2 - t_1)} \ln\frac{h_1}{h_2}$$

Where: k_h = horizontal permeability
d = diameter of casing
D = diameter of intake
L = length of gravel pack
h_1 = piezometric head at time t_1
h_2 = piezometric head at time t_2
m = transformation ratio (k_h to k_v)



Ardaman & Associates, Inc.

Falling Head Permeability Test Calculation

Project No.: 19-60-6418
Project Name: Citrus Grove Phase 5
County: Lake

Pond No.	Pond 3A
Test Location	WRA-3-AB-2
Test Depth (ft)	5.5-6.5
Soil Type	1
Diameter of Gravel Pack & Casing, d = D (in)	4.0
Riser Height, H_r (ft)	0.5
Groundwater Depth, D_{wt} (ft)	GNE
Length of Gravel Pack, L (inches)	12.0
Estimated K_h Value (Feet/Day):	65.7

INPUT	H (in.)	T (mins)
1	72.0	0
2	4.8	1.5

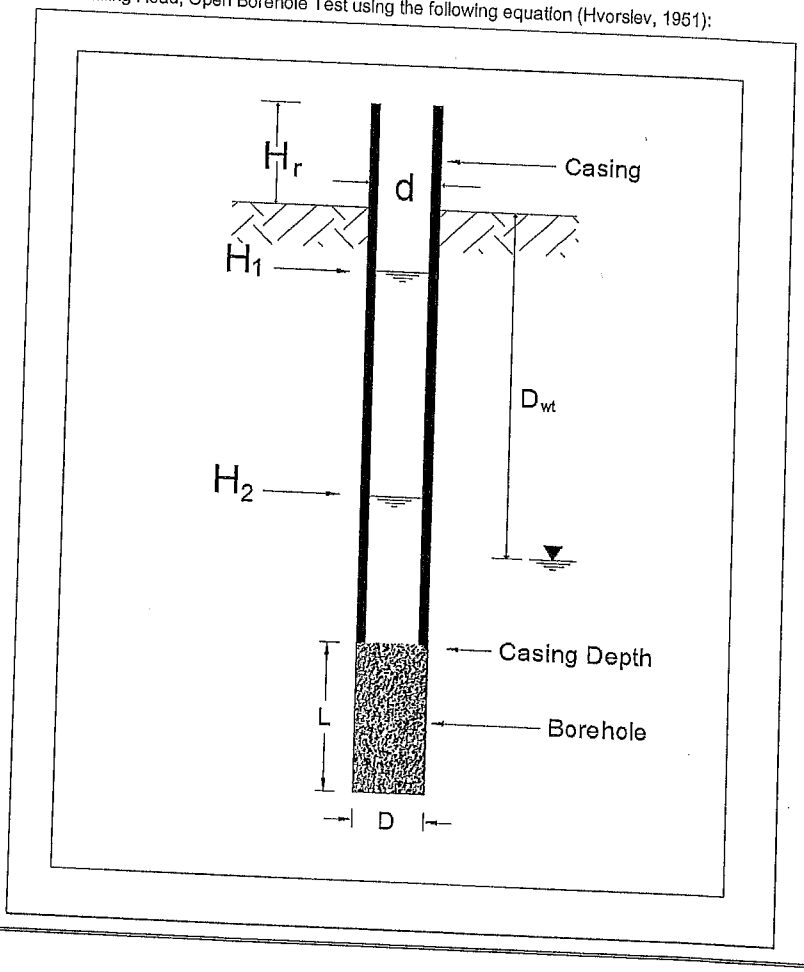
Ratio, m	1.0

Calculations:

Horizontal Soil Permeability can be calculated from a Falling Head, Open Borehole Test using the following equation (Hvorslev, 1951):

$$k_h = \frac{d^2 \ln\left[\frac{mL}{D} + \sqrt{1+\left(\frac{mL}{D}\right)^2}\right]}{8L(t_2 - t_1)} \ln\frac{h_1}{h_2}$$

Where: k_h = horizontal permeability
d = diameter of casing
D = diameter of intake
L = length of gravel pack
h_1 = piezometric head at time t_1
h_2 = piezometric head at time t_2
m = transformation ratio (k_h to k_v)



Ardaman & Associates, Inc.

Falling Head Permeability Test Calculation

Project No.: 19-60-6418
Project Name: Citrus Grove Phase 5
County: Lake

Pond No.	Pond 3A
Test Location	WRA-3B-AB-1
Test Depth (ft)	6-7
Soil Type	1
Diameter of Gravel Pack & Casing, d = D (in)	3.0
Riser Height, H_r (ft)	4.0
Groundwater Depth, D_{wt} (ft)	GNE
Length of Gravel Pack, L (inches)	12.0
Estimated K_h Value (Feet/Day):	46.8

INPUT	H (in.)	T (mins)
1	120.0	0
2	10.0	1.25

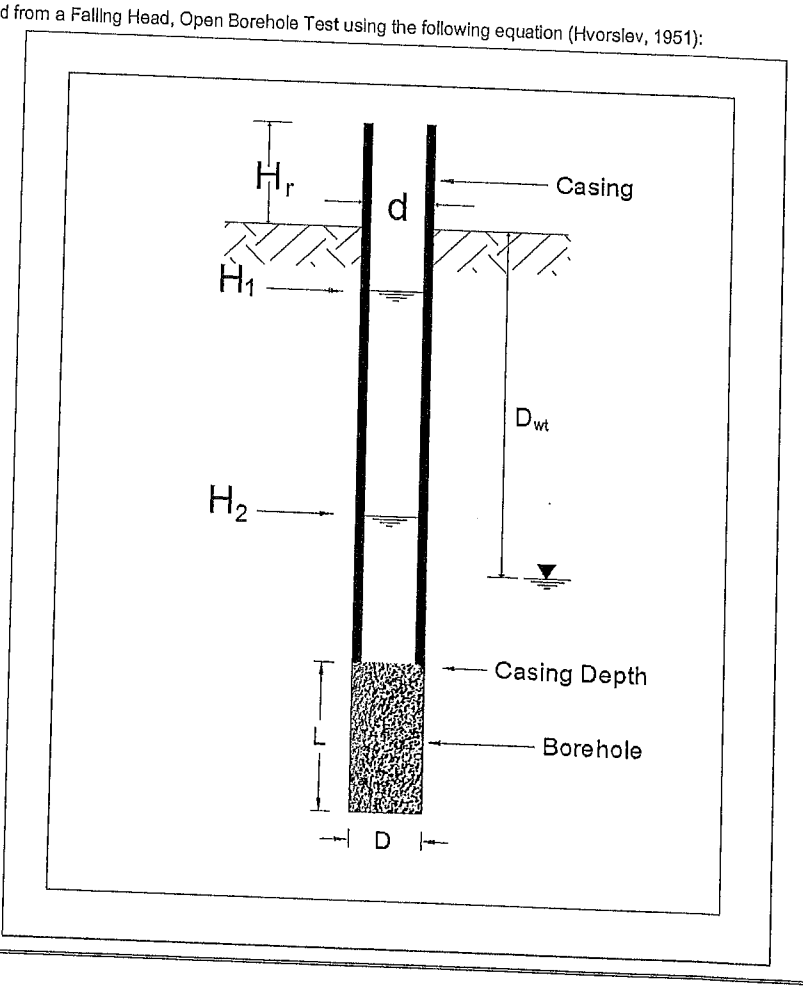
Ratio, m	1.0

Calculations:

Horizontal Soil Permeability can be calculated from a Falling Head, Open Borehole Test using the following equation (Hvorslev, 1951):

$$k_h = \frac{d^2 \ln\left[\frac{mL}{D} + \sqrt{1+\left(\frac{mL}{D}\right)^2}\right]}{8L(t_2 - t_1)} \ln\frac{h_1}{h_2}$$

Where: k_h = horizontal permeability
d = diameter of casing
D = diameter of intake
L = length of gravel pack
h_1 = piezometric head at time t_1
h_2 = piezometric head at time t_2
m = transformation ratio (k_h to k_v)



Ardaman & Associates, Inc.

Falling Head Permeability Test Calculation

Project No.: 19-60-6418
Project Name: Citrus Grove Phase 5
County: Lake

Pond No.	Misc.
Test Location	WRA-2A-AB-1
Test Depth (ft)	5-6
Soil Type	1
Diameter of Gravel Pack & Casing, d = D (in)	3.0
Riser Height, H_r (ft)	0.0
Groundwater Depth, D_{wt} (ft)	GNE
Length of Gravel Pack, L (inches)	12.0
Estimated k_h Value (Feet/Day):	75.9

INPUT	H (in.)	T (mins)
1	60.0	0
2	12.0	0.5

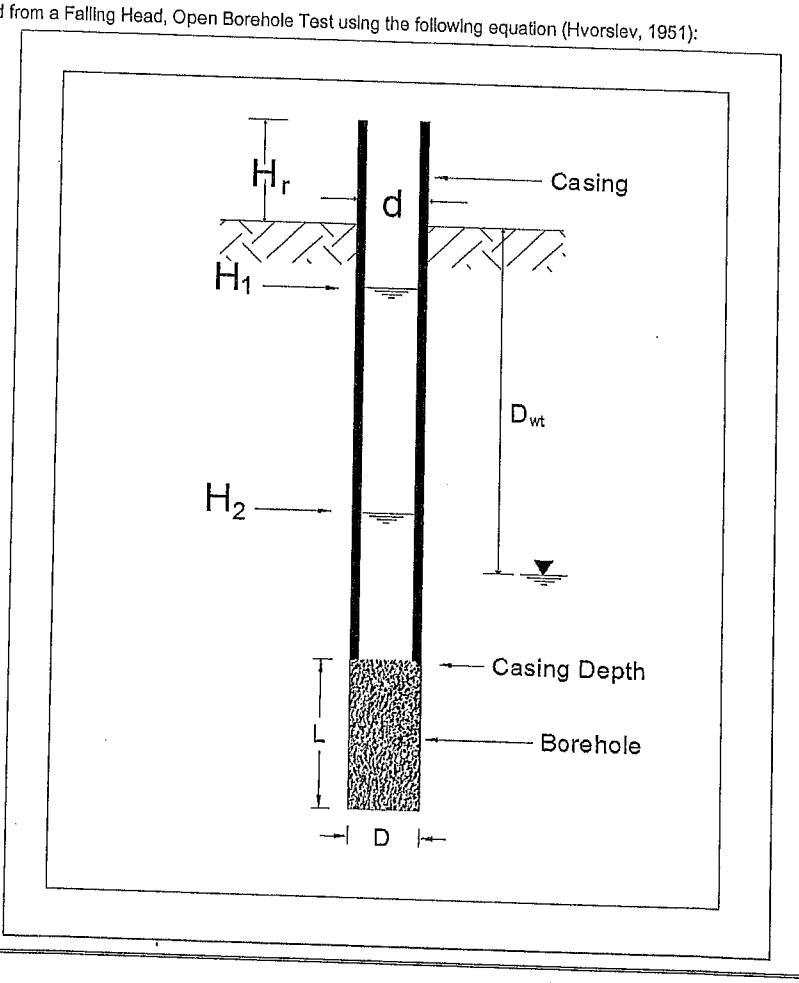
Ratio, m	1.0

Calculations:

Horizontal Soil Permeability can be calculated from a Falling Head, Open Borehole Test using the following equation (Hvorslev, 1951):

$$k_h = \frac{d^2 \ln\left[\frac{mL}{D} + \sqrt{1+\left(\frac{mL}{D}\right)^2}\right]}{8L(t_2 - t_1)} \ln\frac{h_1}{h_2}$$

Where: k_h = horizontal permeability
d = diameter of casing
D = diameter of intake
L = length of gravel pack
h_1 = piezometric head at time t_1
h_2 = piezometric head at time t_2
m = transformation ratio (k_h to k_v)



Ardaman & Associates, Inc.

Falling Head Permeability Test Calculation

Project No.: 19-60-6418
Project Name: Citrus Grove Phase 5
County: Lake

Pond No.	Pond 2A
Test Location	WRA-2A-AB-2
Test Depth (ft)	4-5
Soil Type	1
Diameter of Gravel Pack & Casing, d = D (in)	3.0
Riser Height, H_r (ft)	1.0
Groundwater Depth, D_{wt} (ft)	GNE
Length of Gravel Pack, L (inches)	12.0
Estimated K_h Value (Feet/Day):	72.1

INPUT	H (in.)	T (mins)
1	60.0	0
2	13.0	0.5

Ratio, m	1.0

Calculations:

Horizontal Soil Permeability can be calculated from a Falling Head, Open Borehole Test using the following equation (Hvorslev, 1951):

$$k_h = \frac{d^2 \ln\left[\frac{mL}{D} + \sqrt{1+\left(\frac{mL}{D}\right)^2}\right]}{8L(t_2 - t_1)} \ln\frac{h_1}{h_2}$$

Where: k_h = horizontal permeability
d = diameter of casing
D = diameter of intake
L = length of gravel pack
h_1 = piezometric head at time t_1
h_2 = piezometric head at time t_2
m = transformation ratio (k_h to k_v)

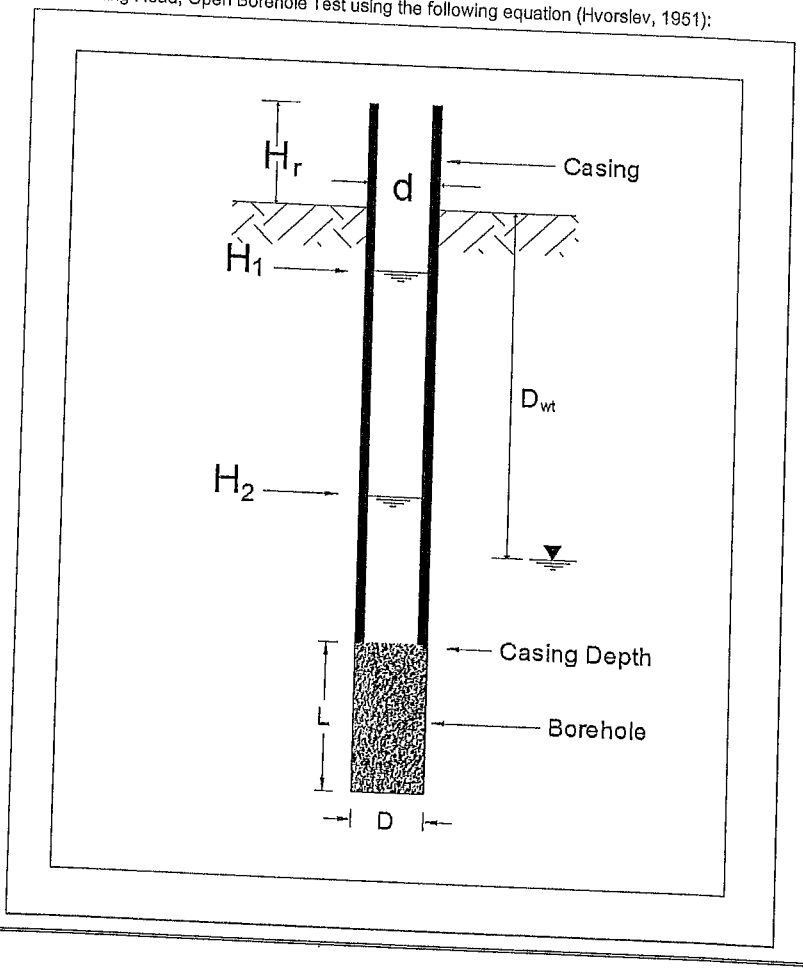


EXHIBIT D-1

Geotechnical Report for Wall Structures
Relative to Final Submittal
Citrus Grove Road Phase 5
From SR 91 to Blackstill Lake Road
Lake County, Florida

Ardaman & Associates, Inc.

CORPORATE HEADQUARTERS

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Branch Office Locations

Florida: Bartow, Cocoa, Fort Myers, Miami, Orlando, Port St. Lucie, Sarasota, Tallahassee, Tampa, West Palm Beach
Louisiana: Baton Rouge, Monroe, New Orleans, Shreveport

Ardaman & Associates, Inc.

Geotechnical, Environmental and
Materials Consultants

April 11, 2022
File No. 19-6418

DRMP, Inc.
941 Lake Baldwin Lane
Orlando, Florida 32814

Attention: Mr. John Burkett, P.E.

Subject: Geotechnical Report for Wall Structures
Relative to Final Submittal
Citrus Grove Road Phase 5
From SR 91 to Blackstill Lake Road
Lake County, Florida

Dear Mr. Burkett:

As requested and authorized, we have completed a geotechnical engineering evaluation relative to Mechanically Stabilized Earth (MSE) walls and a gravity wall proposed to support grade changes for the subject project. The purpose of performing this exploration was to provide geotechnical engineering information for use during the design of the project. This report documents our findings and presents our engineering recommendations relative to the wall design.

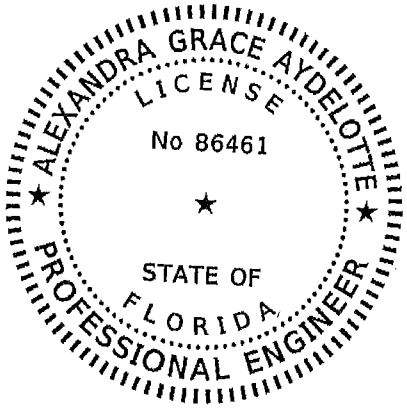
This report has been prepared in accordance with generally accepted geotechnical engineering practices for specific application to the subject project indicated in this report. No other warranty, expressed or implied, is made. The soils information and recommendations submitted herein are based on the data obtained from the soil borings presented on Figures 4 through 6. This report does not reflect any variations which may occur adjacent to or between the borings. The nature and extent of the variations between the test locations may not become evident until during construction.

It is a pleasure assisting you with this project. If you have any questions, or when we may be of further assistance to you, please do not hesitate to contact us.

Very truly yours,
ARDAMAN & ASSOCIATES, INC.
Certificate of Authorization No. 5950

Colin T. Jewsbury, P.E.
Senior Engineer
Florida License No. 58074

Alexandra G. Aydelotte, P.E.
Project Engineer
Florida License No. 86461



THIS ITEM HAD BEEN DIGITALLY SIGNED AND SEALED BY:
Alexandra G Aydelotte 2022.04.11 12:02:27 -04'00'
ON THE DATE ADJACENT TO THE SEAL

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

ARDAMAN & ASSOCIATES, INC.
8008 S. ORANGE AVENUE
ORLANDO, FLORIDA 32809
(407)855-3860
CERTIFICATE OF AUTHORIZATION: 5950
ALEXANDRA G. AYDELOTTE, P.E. NO 86461

AGA/CTJ/jj/nfm
19-6418 Citrus Grove Rd PhV Walls-Final.docx (2019 Geo)

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1.0 INTRODUCTION

1.1 Site Location

The project site for the MSE walls is centered at the location of the new Citrus Grove Road bridge designed (by others) over State Road (SR) 91. In addition, a gravity wall is proposed northwest of the existing intersection of Fosgate Road and Blackstill Lake Road. The proposed walls are located in Sections 9 and 10 of Township 22 South, Range 26 East, in Lake County, Florida. The approximate wall alignments are shown superimposed on a reproduction of the Clermont East, Florida, USGS quadrangle map presented on Figure 1.

The sites for proposed MSE walls RW-1 and RW-2 currently consist of undeveloped vacant land with planted pine. The proposed sites for MSE walls RW-2 and RW-3, and the gravity wall site, currently consist of undeveloped vacant pastureland, grass covered right-of-way areas and the existing Fosgate Road dirt drive.

1.2 Project Considerations

It is our understanding that the project will include the construction of MSE walls to support grade changes for Citrus Grove Road over SR 91 and a gravity wall to support grade changes for a proposed sidewalk. We note that portions of the MSE Walls that fall within the SR 91 right-of-way areas will be designed by others.

The general locations and heights of the walls that are the subject of this report are as follows:

Wall No.	Approximate Centerline Location		Offset	Approximate Maximum Wall Height (Feet)
	Begin Station	End Station		
RW-1	246+30	247+34	Left	24
RW-2	242+98	247+77	Right	28
RW-3	250+89	251+25	Left	14
RW-4	251+31	254+60	Right	15
Gravity Wall	276+85	281+85	Left	6

We understand that the MSE walls will include a minimum of 2 feet of embedment between finished ground and the top of leveling pad. In addition, we understand that the gravity wall will include a minimum of 1 foot of embedment between finished ground and the base of the wall.

1.3 Purpose and Scope of Project

The purposes of this exploration were to explore shallow subsurface conditions within the general wall alignments and to provide recommendations relative to design and construction of the proposed walls. We accomplished these purposes by:

1. Obtaining and evaluating readily available geologic and soil survey data.
2. Conducting Standard Penetration Test (SPT) borings at accessible locations relative to the MSE walls and gravity wall.
3. Observing recovered soil samples in our laboratory and performing tests on selected soil samples to aid in classification.
4. Analyzing and interpreting the field and laboratory data.
5. Performing geotechnical engineering analyses relative to wall design.

1.4 Review of Available Data

1.4.1 USGS Quadrangle Map

The approximate wall locations are shown superimposed on the Clermont East, Florida USGS quadrangle map presented on Figure 1. Based on review of the USGS quadrangle map, the ground surface elevation in the vicinity of the walls is approximately +125 to +195 feet NGVD.

1.4.2 Soil Survey Maps

Based on the Web Soil Survey, as prepared by the U.S. Department of Agriculture Soil Conservation Service, various soil types exist along the proposed wall alignments. The individual soil types and their characteristics are summarized and presented in Table 1. The type and location of the individual soils are also included on the Soil Survey map presented as Figure 2.

1.4.3 Potentiometric Map

Based on review of the "Potentiometric Surface of the Upper Floridan Aquifer in the St. Johns River Water Management District and Vicinity, Florida" Map (dated June, 2010) published by the United States Geological Survey, the potentiometric elevation within the general project alignment is approximately +75 feet NGVD. This potentiometric surface is below the existing ground surface elevations of approximately +125 to +195 feet NGVD, as determined by a review of the U.S.G.S. quadrangle maps. Therefore, the project corridor is not in an area mapped with artesian type conditions.

2.0 FIELD EXPLORATION PROGRAM

2.1 Test Locations

The field exploration program consisted of performing 15 Standard Penetration Test (SPT) borings. The approximate locations of the SPT borings are schematically illustrated on the Boring Location Plan presented as Figures 3A through 3C. These locations were staked in the field by representatives of Ardaman & Associates using hand-held GPS equipment. Corresponding stations, offsets and approximate existing ground surface elevations were subsequently provided by DRMP.

2.2 Standard Penetration Test (SPT) Borings

The SPT borings were advanced to approximate depths ranging from 15 to 55 feet below the existing ground surface, using the methodology outlined in ASTM D-1586. A summary of this field procedure is included in Appendix I. Split-spoon soil samples were recovered at 1.5-foot intervals to a depth of 10.5 feet and at every 5-foot interval thereafter. The recovered samples were visually classified in the field and representative portions were transported to our laboratory in sealed sample jars for further classification and laboratory testing. At the completion of each boring, the borehole was grouted with a Portland cement grout. The results of the borings are presented on the Report of Core Borings sheets, Figures 4 through 6.

3.0 LABORATORY TESTING PROGRAM

3.1 Visual Examination and Classification Testing

Representative soil samples obtained during performance of the SPT borings were packaged and transferred to our laboratory for further visual examination and classification. The soil samples were visually classified in general accordance with the Unified Soil Classification System (ASTM D-2488). The resulting soil descriptions are shown on the Report of Core Borings sheets presented as Figures 4 through 6.

In addition, we conducted 5 percent fines analyses (ASTM D1140) on selected soil samples obtained from the borings. The results of these tests are presented on Figures 4 through 6 adjacent to the soil profiles at the respective depths from which the tested samples were recovered.

4.0 GENERAL SUBSURFACE CONDITIONS

4.1 General

The results of the field exploration and laboratory testing programs are graphically summarized on the Report of Core Borings sheets presented as Figures 4 through 6. The stratification of the boring profiles represents our interpretation of the field boring logs and the results of laboratory examinations of the recovered samples. The stratification lines represent the approximate boundary between soil types. The actual transitions may be more gradual than implied.

The results of the SPT borings indicate the following general soil profile:

Approximate Elevation (feet, NAVD)		General Description
From	To	
+182	+169	Very loose to loose fine sand (SP)
+169	+152	Loose to medium dense fine sand (SP) and clayey fine sand (SC)
+152	+120	Medium dense to dense fine sand (SP) and fine sand with clay (SP-SC)
+120	+106	Medium dense to very dense fine sand (SP), fine sand with clay (SP-SC) and clayey fine sand (SC)

The above soil profile and descriptions are outlined in general terms only. Please refer to Figures 4 through 6 for soil profile details.

4.2 Groundwater Levels

An attempt was made to measure the groundwater level in the boreholes during drilling. As shown on Figures 4 through 6, groundwater was not encountered within the top 10 feet on the dates indicated. Fluctuation in groundwater levels should be anticipated throughout the year primarily due to seasonal variations in rainfall and other factors that may vary from the time the borings were conducted.

The absence of groundwater data at some of the boring locations indicates that groundwater was not encountered within the vertical reach of the borings on the date drilled (referenced "GNE" on Figure 6). For borings referenced "GNM" at the bottom of the boring profiles on Figures 4 and 5, groundwater was not encountered within the top 10 feet and could not be measured below a depth of 10 feet due to the mudded condition of the boreholes. However, this does not necessarily mean that groundwater would not be encountered within the vertical reach of the borings or within the top 10 feet of the borings referenced "GNM" at some other time.

4.3 Normal Seasonal High Groundwater Level

The normal seasonal high groundwater level each year is the level in the August-September period at the end of the rainy season during a year of normal (average) rainfall. The water table elevations associated with a higher than normal rainfall and in the extreme case, flood, would be higher to much higher than the normal seasonal high groundwater level. The normal high water levels would more approximate the normal seasonal high groundwater levels.

The seasonal high groundwater level is affected by a number of factors. The drainage characteristics of the soils, the land surface elevation, relief points such as drainage ditches, lakes,

rivers, swamp areas, etc., and distance to relief points are some of the more important factors influencing the seasonal high groundwater level.

Based on our interpretation of the site conditions using our boring logs, we estimate the normal seasonal high groundwater level at the boring locations to be at a depth greater than 20 feet below ground surface. Ground water may perch temporarily at higher level on top of the clayey soil during periods of heavy and/or prolonged rainfall.

5.0 ENGINEERING EVALUATION AND RECOMMENDATIONS

5.1 General

The following are our recommendations for overall site preparation and foundation support which we feel are best suited for the proposed walls and existing soil conditions. The recommendations are made as a guide for the design engineer during the wall plans development phase of the project.

5.2 Mechanically Stabilized Earth (MSE) Walls

5.2.1 General

We understand that a permanent Mechanically Stabilized Earth (MSE) walls are required to support grade changes for proposed Citrus Grove Road over SR 91. The maximum height of these walls will be on the order of 24 feet for RW-1, 28 feet for RW-2, 14 feet for RW-3 and 15 feet for RW-4.

Calculations were performed to determine the minimum required strap length for external stability of the proposed MSE walls. The strap/mesh lengths were interactively adjusted by 1-foot increments for several wall heights until suitable factors of safety were obtained for all of the design criteria. Geometry of the proposed walls was obtained from the wall plans provided by DRMP.

Our analyses for overturning, sliding, and bearing capacity were performed using the computer program entitled "MSE – External LRFD Version 2.5.1" which was developed by FDOT based on LRFD design procedures.

The following soil parameters were utilized in the calculations:

		Reinforced Soil & Random Backfill	Very loose to loose sand	Loose to medium dense sand	Medium dense sand	Medium dense to dense sand and clayey sand	Medium dense to dense sand
Depth Below Existing Ground Surface (feet)	RW-1	--	0 - 10	--	10 - 25	--	25 - 55
	RW-2	--	0 - 10	10 - 15	15 - 25	--	25 - 55
	RW-3	--	0 - 12½	--	--	12½ - 40	--
	RW-4	--	0 - 12½	--	--	12½ - 40	--
Effective Unit Weight (pcf):		105	100	105	108	53	56
Cohesion (psf):		0	0	0	0	0	0
Internal Friction Angle:		30	29	30	31	33	34

As stipulated in the FDOT Structures Design Guidelines, the following Capacity-Demand Ratios were used in our analyses:

Overturning:	CDR ≥ 1.0
Eccentricity:	CDR ≤ 1.0
Siding:	CDR ≥ 1.0
Bearing Resistance:	CDR ≥ 1.0

In addition to analyzing the wall design for overturning, eccentricity, sliding, and bearing resistance, a slope stability analysis was performed to check the possibility of bottom heave or toe failure. The slope stability analyses were performed using the computer program ReSSA+ published by ADAMA Engineering, Inc. Circular arc type failure modes were analyzed. The analysis was performed utilizing the soil conditions discussed above and a phreatic surface assuming long term steady state conditions in which the soils above the phreatic surface were in a moist state, while the soils below the phreatic surface were in a buoyant state. We have assumed that hydrostatic pressure will be relieved behind the wall. A search feature of the program was utilized to locate the surface that represented the minimum factor of safety. In order to test the external stability of the retaining wall, potential failure surfaces were excluded from entering the reinforced soil mass. The strap/mesh length was adjusted until the results of the calculations indicated factors of safety of approximately 1.5 or greater.

The calculations show that minimum strap/mesh lengths as shown in the following table are required:

MSE Wall RW-1									
Wall Height (ft.)	24	22	21	--	--	--	--	--	--
Reinforcement Length (ft.)	17	16	15	--	--	--	--	--	--
Factored Bearing Resistance (psf)	6,799	6,759	6,474	--	--	--	--	--	--
MSE Wall RW-2									
Wall Height (ft.)	10	12	13	17	19	21	23	25	27
Reinforcement Length (ft.)	8	9	10	12	14	15	17	18	19
Factored Bearing Resistance (psf)	4,629	4,811	5,265	5,636	6,444	6,474	7,036	7,079	7,126
MSE Wall RW-2 Continued									
Wall Height (ft.)	23	25	27	28	--	--	--	--	--
Reinforcement Length (ft.)	17	18	19	20	--	--	--	--	--
Factored Bearing Resistance (psf)	7,036	7,079	7,126	7,402	--	--	--	--	--
MSE Wall RW-3									
Wall Height (ft.)	14	--	--	--	--	--	--	--	--
Reinforcement Length (ft.)	11	--	--	--	--	--	--	--	--
Factored Bearing Resistance (psf)	5,243	--	--	--	--	--	--	--	--
MSE Wall RW-4									
Wall Height (ft.)	15	13	12	--	--	--	--	--	--
Reinforcement Length (ft.)	11	10	9	--	--	--	--	--	--
Factored Bearing Resistance (psf)	5,010	4,977	4,700	--	--	--	--	--	--

We note that the wall heights presented in the above tables are measured from leveling pad to top of coping.

Based on these calculations, it is our opinion that using the minimum strap/mesh lengths shown in the preceding tables, the proposed walls will have adequate factors of safety against overturning, sliding, eccentricity, bearing capacity, and circular arc slope failure. ***Required strap/mesh lengths may be longer than shown in the attached tables to provide internal stability.*** **Required strap/mesh lengths to satisfy internal stability should be provided by the proprietary wall company.** The longer of the two lengths should be incorporated into the design.

Output from the "MSE-External LRFD Version 2.5.1" and ReSSA+ programs are included in Appendix II.

5.2.2 Wall Settlement

A settlement analysis was undertaken using the computer program Settle3D and the results of the SPT borings. Published correlations based on the SPT N-values were used to estimate the elastic moduli of the sandy soils. A Westergaard stress distribution was used in the Settle3D foundation model as was a flexible foundation type and an assumed fill moist unit weight of 105 pounds per cubic foot (pcf). The results of our calculations are summarized in the following table.

Wall No.	WALL SETTLEMENT				Design High Water Elevation (ft.)
	Long Term Settlement (in.)	Short Term Settlement (in.)	Differential Settlement		
			Longitudinal (%) (ft./100ft.)	Transverse (in.)	
RW-1	N/A	2.5	<0.25	N/A	N/A
RW-2	N/A	2.4	<0.25	N/A	N/A
RW-3	N/A	1.8	<0.25	N/A	N/A
RW-4	N/A	1.5	<0.25	N/A	N/A

For the purpose of this report, long term settlement is settlement that occurs following the completion of wall fill placement. Per FDOT guidelines transverse settlement is only applicable for widening of existing embankments.

Output from the Settle 3D computer program is included in Appendix III for informational purposes.

5.3 Gravity Wall

The results of our exploration indicate that the existing soils are suitable for supporting the proposed gravity wall located between approximate Stations 276+85 and 281+85. We understand that the standard design for gravity walls, per FDOT Standard Plans Index 400-011, incorporates the following soil parameters into the analysis.

Soil Classification	Cohesionless (Fine Sand)
Friction Angle	30 degrees
Moist Unit Weight of Backfill	120 pcf
Friction Angle	30 degrees
N-Blow Count	10 blows/ft
Allowable Bearing Capacity	2,500 psf for slopes ≤ 1:1½

Based on our review of the borings, the subsurface conditions along the proposed gravity wall alignment are compatible with the standard design soil parameters presented above.

The gravity wall should be constructed in accordance with FDOT Standard Plans Index 400-011. According to FDOT Standard Plans Index Number 400-011, a gravity wall with no traffic loading and a slope equal to or flatter than 1:1½ shall have a maximum exposed height of 5 feet with a

recommended batter of 5H:12V. For the gravity wall, foundation soils should be prepared in accordance to Section 455 of the FDOT Standard Specifications for Road and Bridge Construction relative to Spread Footings.

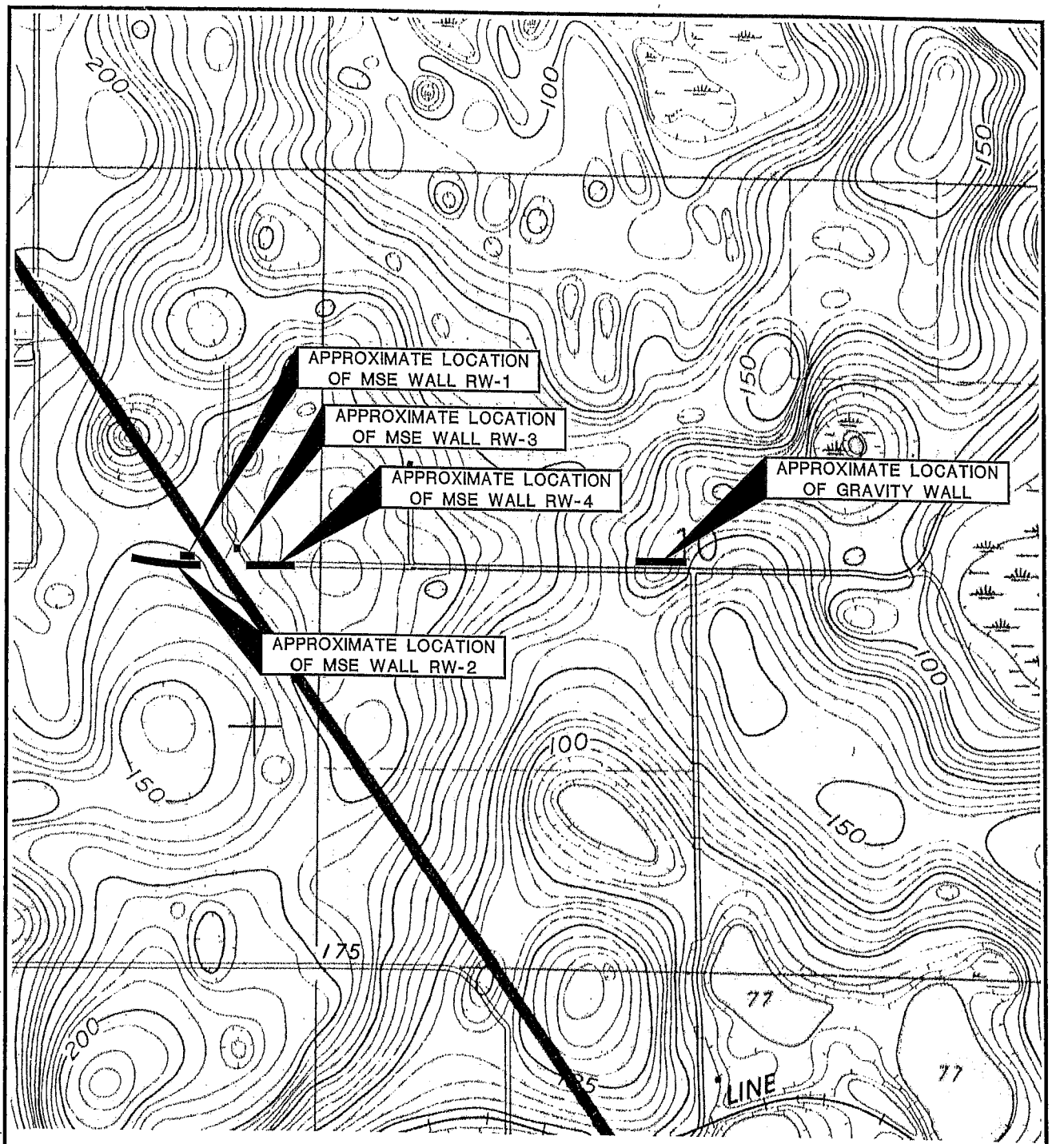
5.4 Construction Considerations

Construction should be performed in accordance with the appropriate sections of the FDOT current edition of the Standard Specifications for Road and Bridge Construction. In accordance with these specifications, the removal of organic materials and any plastic soil should be accomplished in accordance with FDOT Standard Plans Index No. 120-002 unless otherwise indicated on the plans. Backfill should generally consist of clean, fine sand compacted in accordance with Standard Specifications. Fill Placement and Side Slopes for Embankment Construction are presented in the FDOT Standard Plans Index No. 120-001.

TABLE 1

Review of Soil Survey Maps
Citrus Grove Road Phase 5
From SR 91 to Blackstill Lake Road
Lake County, Florida

Soil Map Unit	Description	Permeability		Approximate Depth to Normal Seasonal High Groundwater Level
		Depth (inches)	inch/hour	
8; Candler sand, 0 to 5 percent slopes	Consists of nearly level to gently sloping and excessively drained sandy soil on the uplands.	0 – 80	6 – 20	More than 80 inches.
9; Candler sand, 5 to 12 percent slopes	Consists of sloping and strongly sloping and excessively drained sandy soil on the uplands.	0 – 80	6 – 20	More than 80 inches
17; Arents	Consists of material dug from several areas that have different kinds of soil. This fill material is the result of earth moving operations.	--	--	Varies with the amount of fill material and artificial drainage in any mapped area.
21; Lake sand, 0 to 5 percent slopes	Consists of nearly level to gently sloping and excessively drained sandy soil on the uplands.	0 – 80	20 – 50	More than 80 inches
22; Lake sand, 5 to 12 percent slopes	Consists of sloping to strongly sloping and excessively drained sandy soil on the uplands.	0 – 80	20 – 50	More than 80 inches



SECTIONS 9 AND 10
TOWNSHIP 22 SOUTH
RANGE 26 EAST

OBTAINED FROM U.S.G.S. QUAD MAP: CLERMONT EAST, FLORIDA 1962
(PHOTOREVISED 1980)

N

0 500 1000
SCALE: (FEET)

QUADRANGLE LOCATION

SITE LOCATION MAP

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

SUBSURFACE SOIL EXPLORATION
CITRUS GROVE ROAD
PHASE V
MINNEOLA, LAKE COUNTY, FLORIDA

DRAWN BY: CD	CHECKED BY:	DATE: 03/16/20
FILE NO. 19-6418	APPROVED BY:	FIGURE: 1

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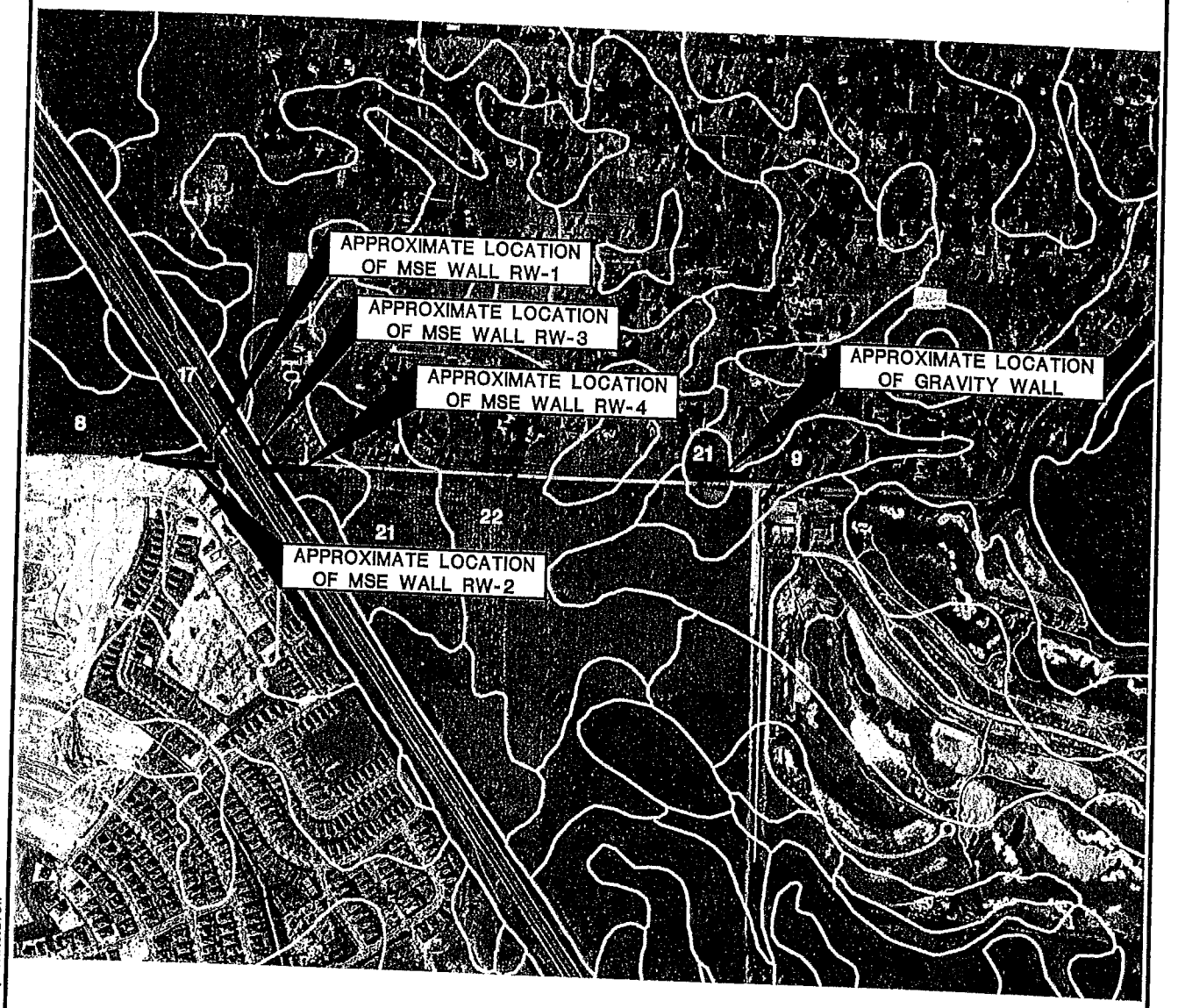

OBTAINED FROM: GOOGLE EARTH PRO
DATED: 03/17/2017

LEGEND

8 - CANDLER SAND, 0 TO 5 PERCENT SLOPES

9 - CANDLER SAND, 5 TO 12 PERCENT SLOPES

17 - ARENTS

21 - LAKE SAND, 0 TO 5 PERCENT SLOPES

22 - LAKE SAND, 5 TO 12 PERCENT SLOPES

N

0 500 1000

SCALE: (FEET)

SOIL SURVEY MAP

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

SUBSURFACE SOIL EXPLORATION
CITRUS GROVE ROAD
PHASE V
MINNEOLA, LAKE COUNTY, FLORIDA

DRAWN BY: CD	CHECKED BY:	DATE: 03/16/20
FILE NO. 19-6418	APPROVED BY:	FIGURE: 2

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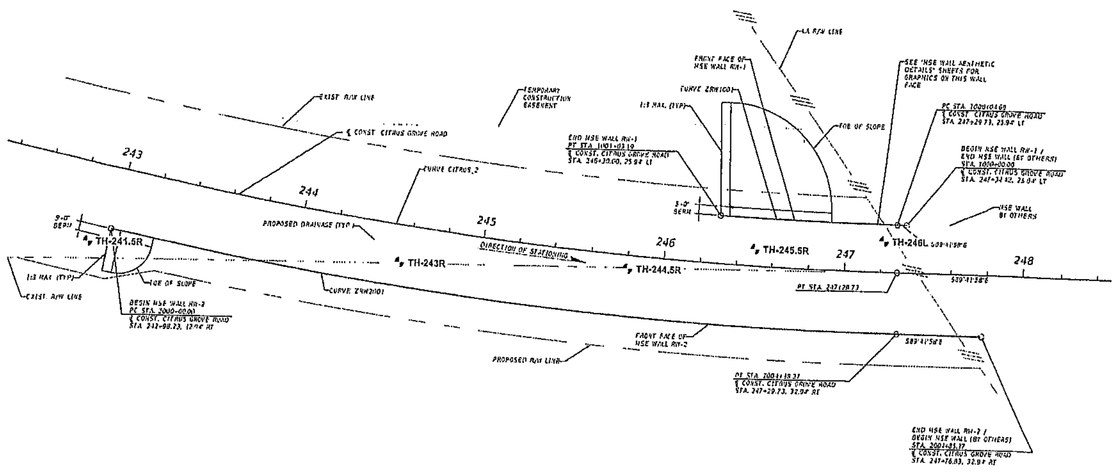
FIGURE 3A



NOTE: THE BASE MAP FOR THE BORING LOCATION PLAN IS A SITE PLAN BY DRMP, INC.

LEGEND

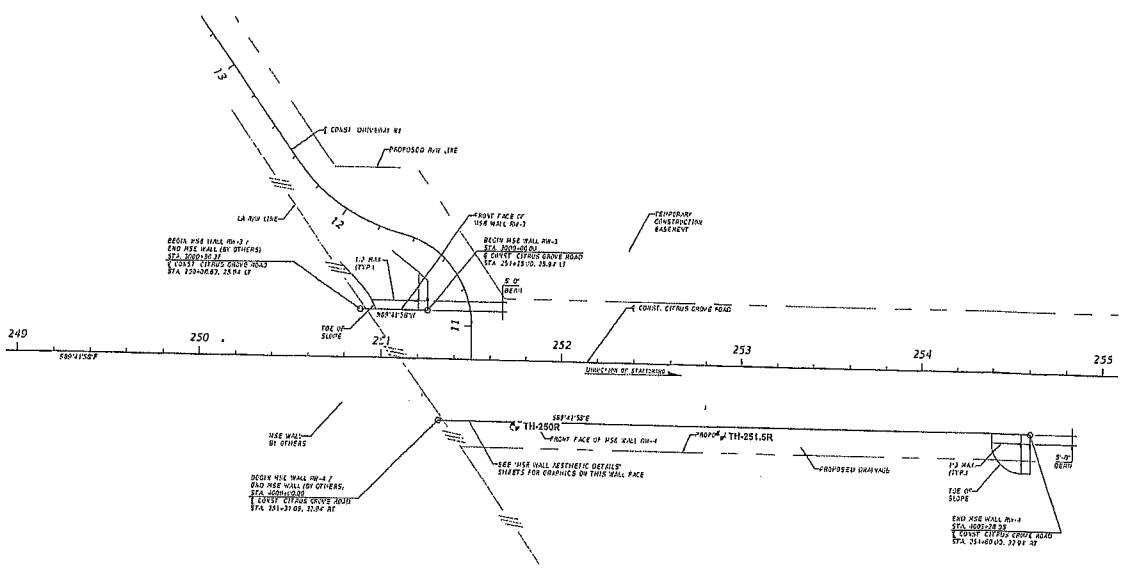
TH — STANDARD PENETRATION TEST (SPT) BORING LOCATION

MSE WALLS RW-1 AND RW-2

REVISIONS	DATE	LAKE COUNTY, FL	LAKE COUNTY DEPARTMENT OF PUBLIC WORKS ENGINEERING DIVISION	Ardaman & Associates, Inc. 8008 S. Orange Avenue Orlando, Fl. 32809 Certificate of Authorization No. 5950	BORING LOCATION PLAN	SHEET NO.
			ROAD: CITRUS GROVE ROAD — RSO NO.: 17-0003	ALEXANDRA G. AYDELOTTE, P.E. LICENSE NO. 64461 DATE:		

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

FIGURE 3B



NOTE: THE BASE MAP FOR THE BORING LOCATION PLAN IS A SITE PLAN BY DRMP, INC.

LEGEND

TH STANDARD PENETRATION TEST (SPT) BORING LOCATION

N

MSE WALLS RW-3 AND RW-4

REVISIONS	DATE
----	----

LAKE COUNTY, FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ROAD	RSO NO.
CITRUS GROVE ROAD	17-0003

Ardamon & Associates, Inc.
8003 S. Orange Avenue
Orlando, FL 32809
Certificate of Authorization No: 5950
ALEXANDRA D. ARDELOTTE, P.E. LICENSE NO. 86461
DATE:
Drawn, Chkd 1/26/2021 10:30:02 AM

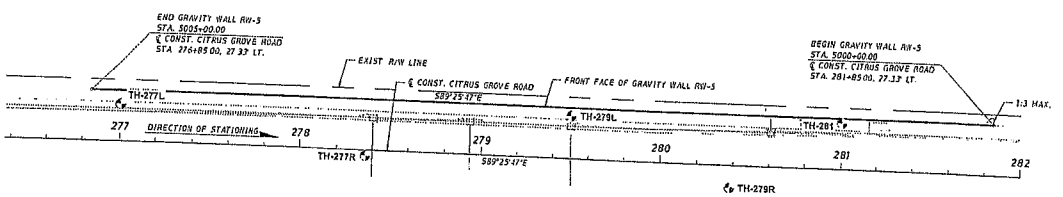
BORING LOCATION PLAN

SHEET NO.

P:\Projects\19-19-418\Geo\19418-SE0-03.dwg

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

FIGURE 3C



NOTE: THE BASE MAP FOR THE BORING LOCATION PLAN IS A SITE PLAN BY DRMP, INC.

LEGEND

⊕TH STANDARD PENETRATION TEST (SPT) BORING LOCATION

REVISIONS	DATE
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LAKE COUNTY FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ROAD	RSD NO.
CITRUS GROVE ROAD	17-0003

Ardaman & Associates, Inc.
8008 S. Orange Avenue
Orlando, FL 32809
Certificate of Authorization No: 6950
ALEXANDRA G. AYDELOTTE, P.E. LICENSE NO. 86461
DATE:
Drwn: Chk'd: 1/28/2021 10:10:07 AM

BORING LOCATION PLAN

SHEET NO.

F:\Orlando\19\19-0478\Geo\19478-SE3-03.dwg

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FIGURE 4

LEGEND

[fine sand symbol]	FINE SAND	[clayey fine sand symbol]	CLAYEY FINE SAND
[silty fine sand symbol]	SILTY FINE SAND		

N	STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT
GSE	APPROXIMATE GROUND SURFACE ELEVATION (ft NAVD)
−200	PERCENT PASSING NO. 200 SIEVE SIZE (PERCENT FINES)(ASTM D-1140)
GNM	GROUNDWATER NOT MEASURED (i.e., NOT ENCOUNTERED IN THE TOP 10 FEET AND NOT MEASURED BELOW 10 FEET DUE TO THE MUDDED CONDITION OF THE BOREHOLE)
SP,SP-SM SM,SC,CH	UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

STANDARD PENETRATION TEST DATA

SPOON I.D.= 1.375"
SPOON O.D.= 2.0"
HAMMER DROP= 30"
HAMMER WEIGHT= 140 lbs.
HAMMER TYPE= AUTOMATIC

SHELL CONTENT

TRACE: <5%
FEW: 5 TO 10%
LITTLE: 15 TO 25%
SOME: 30 TO 45%
MOSTLY: 50 TO 100%

NOTES:

1. UPON COMPLETION OF THE BORING, THE BOREHOLE WAS GROUTED WITH PORTLAND CEMENT GROUT.
2. ALL SPT BORINGS WERE PERFORMED USING AN AUTOMATIC HAMMER TO THE BORING TERMINATION DEPTH. AUTOMATIC HAMMER N-VALUES MAY BE CONVERTED TO EQUIVALENT SAFETY HAMMER N-VALUES BY MULTIPLYING BY 1.24.
3. ARTESIAN CONDITIONS WERE NOT NOTED BY THE DRILLER DURING BOREHOLE DRILLING. HOWEVER, BASED ON REVIEW OF THE POTENTIOMETRIC MAPS OF THE AREA. IF THE CONTRACTOR SHOULD ENCOUNTERED ARTESIAN CONDITIONS DURING CONSTRUCTION, THE ESTIMATED ELEVATION OF THE ARTESIAN HEAD IS APPROXIMATELY +75 FEET NGVD. THE CONTRACTOR SHALL BE PREPARED TO HANDLE ARTESIAN WATER LEVELS UP TO +75 FEET NGVD.
4. STATION AND OFFSET REFERENCED TO CENTERLINE CONSTRUCTION CITRUS GROVE ROAD BASELINE.
5. APPROXIMATE GROUND SURFACE ELEVATIONS PROVIDED BY DRMP.

ENGINEERING CLASSIFICATION

I GRANULAR MATERIALS

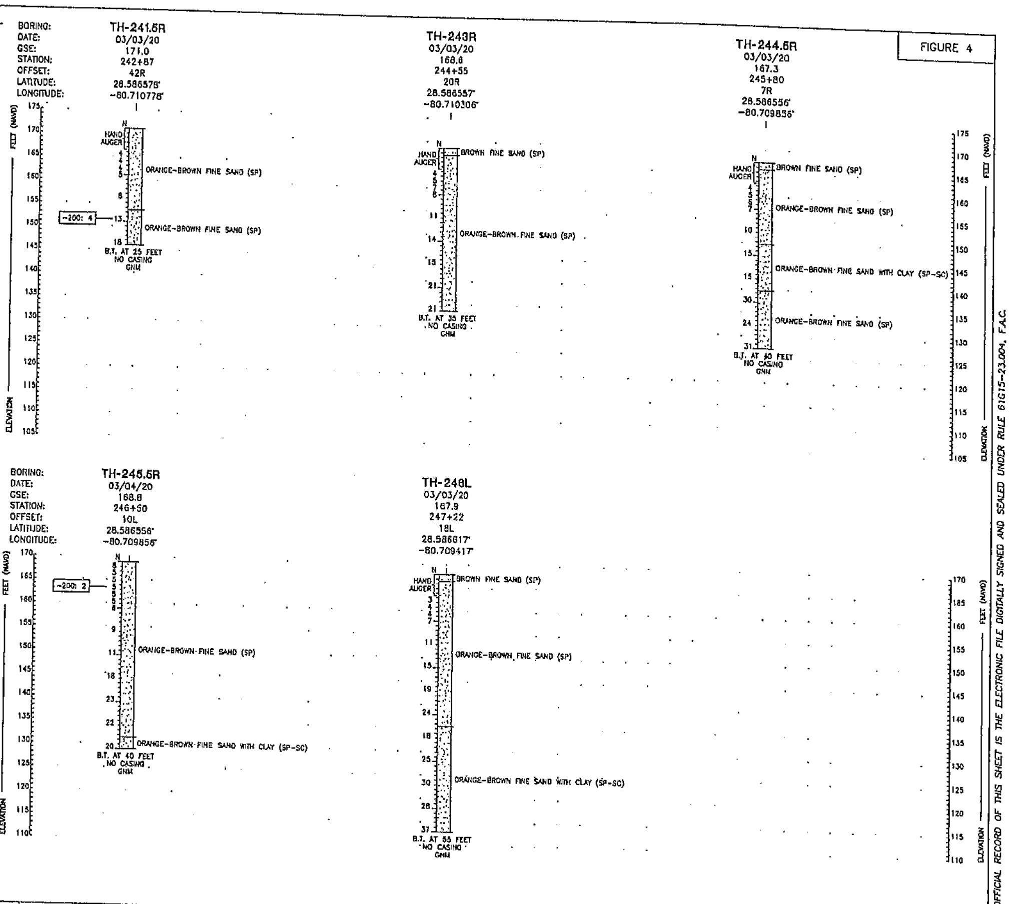
RELATIVE DENSITY	AUTOMATIC HAMMER SPT N-VALUE (BLOW/FOOT)
VERY LOOSE	<3
LOOSE	3 TO 8
MEDIUM	8 TO 24
DENSE	24 TO 40
VERY DENSE	>40

II SILTS AND CLAYS

CONSISTENCY	UNCONFINED COMPRESSIVE STRENGTH, QU, TSF	AUTOMATIC HAMMER SPT N-VALUE (BLOW/FOOT)
VERY SOFT	<1/4	<1
SOFT	1/4 TO 1/2	1 TO 3
FIRM	1/2 TO 1	3 TO 6
STIFF	1 TO 2	6 TO 12
VERY STIFF	2 TO 4	12 TO 24
HARD	>4	>24

WHILE THE BORINGS ARE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THEIR RESPECTIVE LOCATIONS AND FOR THEIR RESPECTIVE VERTICAL REACHES, LOCAL VARIATIONS CHARACTERISTIC OF THE SUBSURFACE MATERIALS OF THE REGION ARE ANTICIPATED AND MAY BE ENCOUNTERED. THE BORING LOGS AND RELATED INFORMATION ARE BASED ON THE DRILLER'S LOGS AND VISUAL EXAMINATION OF SELECTED SAMPLES IN THE LABORATORY. THE DELINEATION BETWEEN SOIL TYPES SHOWN ON THE LOGS IS APPROXIMATE AND THE DESCRIPTION REPRESENTS OUR INTERPRETATION OF SUBSURFACE CONDITIONS AT THE DESIGNATED BORING LOCATIONS ON THE PARTICULAR DATE DRILLED. DESIGNATED BORING LOCATIONS ON THE PARTICULAR DATE DRILLED.

GROUNDWATER ELEVATIONS SHOWN ON THE BORING LOGS REPRESENT GROUNDWATER SURFACES ENCOUNTERED ON THE DATES SHOWN. FLUCTUATIONS IN WATER TABLE LEVELS SHOULD BE ANTICIPATED THROUGHOUT THE YEAR. ABSENCE OF WATER SURFACE DATA IN THE BORING IMPLIES THAT NO GROUNDWATER DATA IS AVAILABLE, BUT DOES NOT NECESSARILY MEAN THAT GROUNDWATER WILL NOT BE ENCOUNTERED AT THIS LOCATION OR WITHIN THE VERTICAL REACHES OF THIS BORING IN THE FUTURE.



REVISIONS	DATE
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Ardaman & Associates, Inc.
8008 S. Orange Avenue
Orlando, Fl. 32809
Certificate of Authorization No: 5950

LAKE COUNTY, FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ROAD	RSO NO.
CITRUS GROVE ROAD	17-0003

Ardaman & Associates, Inc.
8008 S. Orange Avenue
Orlando, Fl. 32809
Certificate of Authorization No: 5950
ALEXANDRA G. AYDELOTTE, P.E. LICENSE NO. 86461
DATE:

MSE WALLS RW-1 AND RW-2

REPORT OF CORE BORINGS

SHEET NO. BW-14

Drew. Chris 3/30/2021 4:23:04 PM

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FIGURE 5

LEGEND

- FINE SAND
- CLAYEY FINE SAND
- SILTY FINE SAND

N	STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT
GSE	APPROXIMATE GROUND SURFACE ELEVATION (ft NAVD)
-200	PERCENT PASSING NO. 200 SIEVE SIZE (PERCENT FINES)(ASTM D-1140)
GNM	GROUNDWATER NOT MEASURED (i.e., NOT ENCOUNTERED IN THE TOP 10 FEET AND NOT MEASURED BELOW 10 FEET DUE TO THE MUDDED CONDITION OF THE BOREHOLE)
SP,SP-SM SM,SC,CH	UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

STANDARD PENETRATION TEST DATA

SPOON I.D.= 1.375"
SPOON O.D.= 2.0"
HAMMER DROP= 30"
HAMMER WEIGHT= 140 lbs.
HAMMER TYPE= AUTOMATIC

SHELL CONTENT

TRACE: <5%
FEW: 5 TO 10%
LITTLE: 15 TO 25%
SOME: 30 TO 45%
MOSTLY: 60 TO 100%

NOTES:

1. UPON COMPLETION OF THE BORING, THE BOREHOLE WAS GROUTED WITH PORTLAND CEMENT GROUT.
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4. STATION AND OFFSET REFERENCED TO CENTERLINE CONSTRUCTION CITRUS GROVE ROAD BASELINE.
5. APPROXIMATE GROUND SURFACE ELEVATIONS PROVIDED BY DRMP.

ENGINEERING CLASSIFICATION

I GRANULAR MATERIALS

RELATIVE DENSITY	AUTOMATIC HAMMER SPT N-VALUE (BLOW/FOOT)
VERY LOOSE	<3
LOOSE	3 TO 8
MEDIUM	8 TO 24
DENSE	24 TO 40
VERY DENSE	>40

II SILTS AND CLAYS

CONSISTENCY	UNCONFINED COMPRESSIVE STRENGTH, QU, TSF	AUTOMATIC HAMMER SPT N-VALUE (BLOW/FOOT)
VERY SOFT	<1/4	<1
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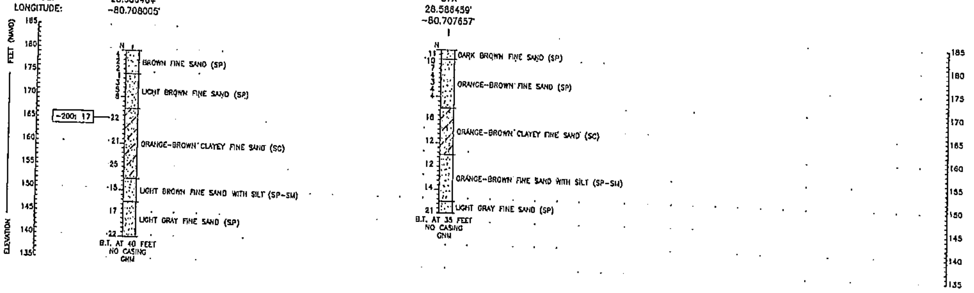
BORING:	TH-260R	TH-251.5R
DATE:	03/05/20	03/05/20
GSE:	179.5	181.8
STATION:	251+74	252+88
OFFSET:	35R	37R
LATITUDE:	28.586464'	28.586459'
LONGITUDE:	-80.708005'	-80.707657'



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REVISIONS	DATE
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Ardaman & Associates, Inc.
8008 S. Orange Avenue
Orlando, Fl. 32809
Certificate of Authorization No: 5950

LAKE COUNTY, FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ROAD	RSO NO.
CITRUS GROVE ROAD	17-0003

Ardaman & Associates, Inc.
8008 S. Orange Avenue
Orlando, Fl. 32809
Certificate of Authorization No: 5950
ALEXANDRA G. AYDELOTTE, P.E. LICENSE NO. 86461
DATE:

MSE WALLS RW-3 AND RW-4

REPORT OF CORE BORINGS

SHEET NO. BW-15

Drew. Cluts 3/30/2021 4:23:05 PM

T:\Orlando\19\19-6418\Geo\196418-GEO-04.dwg

FIGURE 6

LEGEND

FINE SAND — CLAYEY FINE SAND

N	STANDARD PENETRATION RESISTANCE IN BLOWS PER FOOT
GSE	APPROXIMATE GROUND SURFACE ELEVATION (ft NAVD)
-200	PERCENT PASSING NO. 200 SIEVE SIZE (PERCENT FINES)(ASTM D-1140)
GNE	GROUNDWATER NOT ENCOUNTERED ON DATE DRILLED
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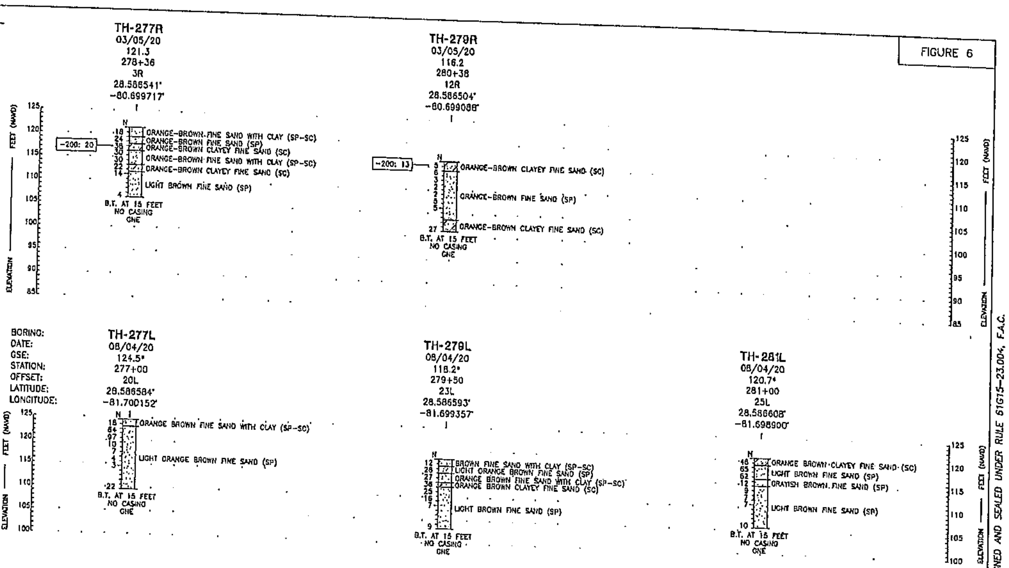
5. APPROXIMATE GROUND SURFACE ELEVATIONS PROVIDED BY DRMP.
6. * STATIONS, OFFSETS AND GROUND SURFACE ELEVATION APPROXIMATED FROM PLAN SHEETS.



ENGINEERING CLASSIFICATION

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REVISIONS	DATE
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LAKE COUNTY, FL

LAKE COUNTY
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ROAD	RSO NO.
CITRUS GROVE ROAD	17-0003

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Certificate of Authorization No: 5950
ALEXANDRA G. AYDELOTTE, P.E. LICENSE NO. 86461
DATE:

GRAVITY WALL

REPORT OF CORE BORINGS

SHEET NO. BW-16

Drew, Chris 3/30/2021 3:23:13 PM

APPENDIX I

Standard Penetration Test (SPT) Boring Procedure

STANDARD PENETRATION TEST

The standard penetration test is a widely accepted test method of *in situ* testing of foundation soils (ASTM D 1586). A 2-foot long, 2-inch O.D. split-barrel sampler attached to the end of a string of drilling rods is driven 18 inches into the ground by successive blows of a 140-pound hammer freely dropping 30 inches. The number of blows needed for each 6 inches of penetration is recorded. The sum of the blows required for penetration of the second and third 6-inch increments of penetration constitutes the test result or N-value. After the test, the sampler is extracted from the ground and opened to allow visual examination and classification of the retained soil sample. The N-value has been empirically correlated with various soil properties allowing a conservative estimate of the behavior of soils under load.

The tests are usually performed at 5-foot intervals. However, more frequent or continuous testing is done by our firm through depths where a more accurate definition of the soils is required. The test holes are advanced to the test elevations by rotary drilling with a cutting bit, using circulating fluid to remove the cuttings and hold the fine grains in suspension. The circulating fluid, which is a bentonitic drilling mud, is also used to keep the hole open below the water table by maintaining an excess hydrostatic pressure inside the hole. In some soil deposits, particularly highly pervious ones, NX-size flush-coupled casing must be driven to just above the testing depth to keep the hole open and/or prevent the loss of circulating fluid.

Representative split-spoon samples from the soils at every 2.5 feet of drilled depth are brought to our laboratory in air-tight jars for further evaluation and testing, if necessary. Samples not used in testing are stored for 30 days prior to being discarded.

APPENDIX II

MSE Wall External Stability Analysis and ReSSA+ Computer Program Output

MSE WALL - LRFD External Stability Analysis

version 2.5.1

MSE WALLS RW1 AND RW2

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR >= 1	Eccen-tricity CDR <= 1	Sliding CDR >= 1	Bearing Resitance CDR >= 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* ϕ [bf] (deg)	* γ[fs] (pcf)	* ϕ [fs] (deg)	* c[fs] (psf)	* ϕ u (deg)	* q1 (psf)	* q2 (psf)	CW
1	24.0	22.0	2.0	17.0	OK	2.23	0.90	1.33	1.38	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	0.89
2	22.0	20.0	2.0	16.0	OK	2.30	0.87	1.34	1.50	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	0.92
3	21.0	19.0	2.0	15.0	OK	2.19	0.91	1.30	1.47	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	0.94
4	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!													#DIV/0!
5	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!													#DIV/0!
6	10.0	8.0	2.0	8.0	OK	2.09	0.95	1.19	1.93	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	1.00
7	12.0	10.0	2.0	9.0	OK	1.99	1.00	1.18	1.71	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	1.00
8	13.0	11.0	2.0	10.0	OK	2.16	0.92	1.24	1.79	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	1.00
9	17.0	15.0	2.0	12.0	OK	2.01	1.00	1.23	1.50	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	1.00
10	19.0	17.0	2.0	14.0	OK	2.26	0.88	1.32	1.61	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	1.00
11	21.0	19.0	2.0	15.0	OK	2.19	0.91	1.30	1.61	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	1.00
12	23.0	21.0	2.0	17.0	OK	2.41	0.83	1.37	1.61	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	0.98
13	25.0	23.0	2.0	18.0	OK	2.33	0.86	1.36	1.47	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	0.94
14	27.0	25.0	2.0	19.0	OK	2.27	0.88	1.35	1.40	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	0.89
15	23.0	21.0	2.0	17.0	OK	2.41	0.83	1.37	1.51	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	0.87
16	25.0	23.0	2.0	18.0	OK	2.33	0.86	1.36	1.40	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	0.85
17	27.0	25.0	2.0	19.0	OK	2.27	0.88	1.35	1.31	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	0.89
18	28.0	26.0	2.0	20.0	OK	2.36	0.85	1.38	1.33	0.0	100.0	20.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	0.87
19	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!													#DIV/0!
20	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!													#DIV/0!

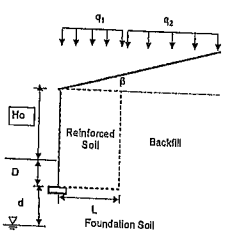
* Indicates required input

Note:

Disclaimer: No Warranty, expressed or implied, is made by the author or the Florida Department of Transportation (FDOT) as to the accuracy and the functioning of this program or the results it produces; nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the author or the FDOT in any connection therewith.

H — Wall Height H = Ho + D
Ho — Wall Height above ground (feet)
D — Wall Embeddment Depth (feet)
L — Reinforcing Strap Length (feet)
CDR — Capacity-Demand Ratio for:
- Overturning = Mr / Mo => 1.0
- Eccentricity = e / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / qvb => 1.0

β — Slope of backfill soil (degrees)
λ — Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes
d — Water depth below base of leveling pad (feet)
γ[rf] — Reinforced fill unit weight (pounds per cubic foot)
γ[bf] — Backfill soil unit weight (pounds per cubic foot)
ϕ[bf] — Backfill soil angle of internal friction (degrees)
γ[fs] — Foundation Soil unit weight (pounds per cubic foot)
ϕ[fs] — Foundation Soil angle of internal friction (degrees)
c[fs] — Foundation Soil cohesion (pounds per square foot)
ϕu — Base Angle of Internal Friction (degrees) (Sliding)
q1 — Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes
q2 — Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes
Cw — Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



qvb (psf)	qr (psf)	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{lv} (lbs/ft)	α (deg)	Ft (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
5436	6799	0.00	42840	0	0	7438	0.0	10080	2000	15120	24734	42840	65272	364140	554808	162960	162960	3.80	2.50	12.01	27.86	16.44	19.34	0.333	0.000	0.000
4954	6759	0.00	36960	0	0	7000	0.0	8470	1833	12705	21339	36960	56896	295680	455168	128462	128462	3.48	2.26	11.48	27.86	16.44	19.34	0.333	0.000	0.000
4841	6474	0.00	33075	0	0	6563	0.0	7718	1750	11576	19096	33075	51214	248063	384103	113190	113190	3.42	2.21	10.58	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	5.14	1.00	0.00	1.000	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	5.14	1.00	0.00	1.000	0.000	0.000
2542	4629	0.00	8400	0	0	3500	0.0	1760	833	2625	4850	8400	14840	33600	59360	16042	16042	1.91	1.08	5.84	27.86	16.44	19.34	0.333	0.000	0.000
3037	4811	0.00	11340	0	0	3938	0.0	2520	1000	3780	6547	11340	19247	51030	86609	25620	25620	2.26	1.33	6.34	27.86	16.44	19.34	0.333	0.000	0.000
3153	5265	0.00	13650	0	0	4375	0.0	2958	1083	4436	7881	13650	22803	68250	114013	31547	31547	2.31	1.38	7.23	27.86	16.44	19.34	0.333	0.000	0.000
4141	5636	0.00	21420	0	0	5250	0.0	5058	1417	7586	12367	21420	34167	128520	205002	64062	64062	2.99	1.87	8.25	27.86	16.44	19.34	0.333	0.000	0.000
4357	6444	0.00	27930	0	0	6125	0.0	6318	1583	9476	16125	27930	43831	195510	306814	86339	86339	3.09	1.97	10.06	27.86	16.44	19.34	0.333	0.000	0.000
4841	6474	0.00	33075	0	0	6563	0.0	7718	1750	11576	19096	33075	51214	248063	384103	113190	113190	3.42	2.21	10.58	27.86	16.44	19.34	0.333	0.000	0.000
5075	7036	0.00	41055	0	0	7438	0.0	9258	1917	13886	23703	41055	62862	348968	534325	145034	145034	3.53	2.31	12.39	27.86	16.44	19.34	0.333	0.000	0.000
5550	7079	0.00	47250	0	0	7875	0.0	10938	2083	16406	27280	47250	71663	425250	644963	182292	182292	3.86	2.54	12.91	27.86	16.44	19.34	0.333	0.000	0.000
6030	7126	0.00	53865	0	0	8313	0.0	12758	2250	19136	31099	53865	81030	511718	769787	225383	225383	4.18	2.78	13.44	27.86	16.44	19.34	0.333	0.000	0.000
5075	7036	0.00	41055	0	0	7438	0.0	9258	1917	13886	23703	41055	62862	348968	534325	145034	145034	3.53	2.31	12.39	27.86	16.44	19.34	0.333	0.000	0.000
5550	7079	0.00	47250	0	0	7875	0.0	10938	2083	16406	27280	47250	71663	425250	644963	182292	182292	3.86	2.54	12.91	27.86	16.44	19.34	0.333	0.000	0.000
6030	7126	0.00	53865	0	0	8313	0.0	12758	2250	19136	31099	53865	81030	511718	769787	225383	225383	4.18	2.78	13.44	27.86	16.44	19.34	0.333	0.000	0.000
6144	7402	0.00	58800	0	0	8750	0.0	13720	2333	20580	33948	58800	88130	588000	881300	249247	249247	4.24	2.83	14.34	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	5.14	1.00	0.00	1.000	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	5.14	1.00	0.00	1.000	0.000	0.000

** Note: This spreadsheet does not analyze Global Stability or Wall Settlement.

qvb Maximum Vertical Pressure at base of the structure (psf); qvb = Rv_2 / L'
qr Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
h h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
W_1 Reinforced fill weight (lbs/ft)
W_2 Sloped backfill weight over reinforced area (lbs/ft)
W_3 Flat backfill weight over reinforced area (lbs/ft)
q_{lv} Surcharge vertical force over reinforced area (lbs/ft)
α Resultant earth pressure inclination (deg)
Ft Total resultant horizontal backfill force (lbs/ft)
qt Total resultant horizontal surcharge force (q_s) (lbs/ft)
Fd Driving force (Sum of factored horizontal components of total horizontal forces) (lbs/ft)
Fr Resisting force (Sum of factored resisting forces * Tan ϕ_b) (lbs/ft)
Rv Sum of factored vertical forces acting within reinforced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
Rv_2 Sum of factored vertical forces acting within reinforced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
Mr Sum of Resisting Moments without live load (lbs-ft/ft)
Mr_2 Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
Mo Sum of Overturning Moments(lbs-ft/ft)
Mo_2 Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
e Eccentricity {L/2 - [(Mr-Mo)/Rv)] (ft) [for overturning]
e_2 Eccentricity {L/2 - [(Mr_2-Mo_2)/Rv_2)] (ft) [for bearing stress calculation]
L' Effective foundation width (feet): L'= L - 2*e_2

Nc Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(ϕ_f) if f>0; for f=0 Nc=5.14
Ng Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(ϕ_f)
Nq Embedment Bearing Resistance Factor ; Nq = [e^Pi*tan(ϕ_f)]*N(ϕ_f); N(ϕ_f)=tan^2(Pi/4 + ϕ_f/2)
Kabh Backfill earth pressure coefficient when retained soil is horizontal
Kabs Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
Kabs2 Backfill earth pressure coefficient for broken back slopes

MSE WALL - LRFD External Stability Analysis

version 2.5.1

MSE WALLS RW3 and RW4

	H (ft)	* Ho (ft)	* D (ft)	* L (ft)	Minimum Reinforcement Length Requirement	Over-turning CDR > = 1	Eccen-tricity CDR < = 1	Sliding CDR > = 1	Bearing Resitance CDR > = 1	* β (deg)	* λ (ft)	* Water d (ft)	* γ[rf] (pcf)	* γ[bf] (pcf)	* ϕ [bf] (deg)	* γ[fs] (pcf)	* ϕ [fs] (deg)	* c[fs] (psf)	* ϕ u (deg)	* q1 (psf)	* q2 (psf)	CW
1	14.0	12.0	2.0	11.0	OK	2.32	0.86	1.30	1.71	0.0	100.0	12.5	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	0.88
2	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
3	15.0	13.0	2.0	11.0	OK	2.07	0.96	1.24	1.49	0.0	100.0	12.5	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
4	13.0	11.0	2.0	10.0	OK	2.16	0.92	1.24	1.69	0.0	100.0	12.5	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	0.88
5	12.0	10.0	2.0	9.0	OK	1.99	1.00	1.18	1.66	0.0	100.0	12.5	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	0.92
6	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	0.96
7	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
8	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
9	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
10	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
11	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
12	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
13	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
14	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
15	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
16	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
17	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
18	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
19	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!
20	0.0				OK	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0	100.0	0.0	105.0	105.0	30.0	100.0	29.0	0.0	30.0	250	250	#DIV/0!

* Indicates required input

Note:

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H Wall Height H = Ho + D

Ho Wall Height above ground (feet)

D Wall Embeddment Depth (feet)

L Reinforcing Strap Length (feet)

CDR Capacity-Demand Ratio for :

- Overturning = Mr / Mo => 1.0
- Eccentricity = a / (L/4) =< 1.0
- Sliding = Fr / Fd => 1.0
- Bearing Resistance = qr / q_{vb} => 1.0

β Slope of backfill soil (degrees)

λ Horizontal distance from the back of the wall to the top of the slope (for broken-back slopes) (feet)
Use λ >= 2*H when modeling infinite slopes

d Water depth below base of leveling pad (feet)

γ[rf] Reinforced fill unit weight (pounds per cubic foot)

γ[bf] Backfill soil unit weight (pounds per cubic foot)

ϕ[bf] Backfill soil angle of internal friction (degrees)

γ[fs] Foundation Soil unit weight (pounds per cubic foot)

ϕ[fs] Foundation Soil angle of internal friction (degrees)

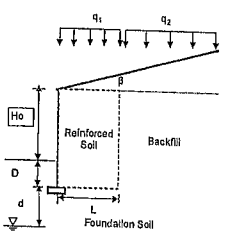
c[fs] Foundation Soil cohesion (pounds per square foot)

ϕu Base Angle of Internal Friction (degrees) (Sliding)

q1 Surcharge load over reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

q2 Surcharge load behind reinforced soil mass (pounds per square foot) - Should be zero when modeling infinite slopes

Cw Cw = 0.5 for d =< 0, Cw=1.0 for d => 1.5*L + D



MSE WALL - LRFD External Stability Analysis
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qvb (psf)	qr (psf)	h (ft)	W1 (lbs/ft)	W2 (lbs/ft)	W3 (lbs/ft)	q_{lv} (lbs/ft)	α (deg)	Fl (lbs/ft)	qt (lbs/ft)	Fd (lbs/ft)	Fr (lbs/ft)	Rv (lbs/ft)	Rv2 (lbs/ft)	Mr (lbs-ft/ft)	Mr_2	Mo (lbs-ft/ft)	Mo_2 (lbs-ft/ft)	e (ft)	e_2 (ft)	L' (ft)	Nc [fs]	Nq [fs]	Ng [fs]	Kabh [bf]	Kabs [bf]	Kabs2 [bf]
3279	5243	0.00	16170	0	0	4813	0.0	3430	1167	5145	9336	16170	26642	88935	146531	38302	38302	2.37	1.44	8.12	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
3643	5010	0.00	17325	0	0	4813	0.0	3938	1250	5906	10003	17325	28201	95288	155107	45938	45938	2.65	1.63	7.74	27.86	16.44	19.34	0.333	0.000	0.000
3153	4977	0.00	13650	0	0	4375	0.0	2958	1083	4436	7881	13650	22803	68250	114013	31547	31547	2.31	1.38	7.23	27.86	16.44	19.34	0.333	0.000	0.000
3037	4700	0.00	11340	0	0	3938	0.0	2520	1000	3780	6547	11340	19247	51030	86609	25620	25620	2.26	1.33	6.34	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000
#DIV/0!	#DIV/0!	0.00	0	0	0	0	#DIV/0!	0	0	0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!	27.86	16.44	19.34	0.333	0.000	0.000

** Note: This spreadsheet does not analyze Global Stability or Wall Settlement.

qvb Maximum Vertical Pressure at base of the structure (psf): $qvb = Rv_2 / L'$
qr Minimum Factored bearing resistance including footing embedment (i.e. overburden) term (qNq)
h h = Wall height for backfill stress calculations (H+Ltanβ for infinite slopes and H+λTanα for broken back slopes with λ < 2*H) (ft)
W_1 Reinforced fill weight (lbs/ft)
W_2 Sloped backfill weight over reinforced area (lbs/ft)
W_3 Flat backfill weight over reinforced area (lbs/ft)
q_{lv} Surcharge vertical force over reinforced area (lbs/ft)
α Resultant earth pressure inclination (deg)
Fl Total resultant horizontal backfill force (lbs/ft)
qt Total resultant horizontal surcharge force (q_2) (lbs/ft)
Fd Driving force (Sum of factored horizontal components of total horizontal foces) (lbs/ft)
Fr Resisting foce (Sum of factored resisting foces * Tan ϕ_u) (lbs/ft)
Rv Sum of factored vertical forces acting within reingorced soil mass without live load (q1L) used in sliding CDR calculation (lbs/ft)
Rv_2 Sum of factored vertical forces acting within reingorced soil mass including live load - used in calculation of qvb for bearing CDR (lbs/ft)
Mr Sum of Resisting Moments without live load (lbs-ft/ft)
Mr_2 Sum of Resisting Moments including live load - used in calculation of e_2 for bearing CDR (lbs-ft/ft)
Mo Sum of Overturning Moments(lbs-ft/ft)
Mo_2 Sum of Overturning Moments from case S-1-b (lbs-ft/ft)
e Eccentricity (L/2 - [(Mr-Mo)/Rv]) (ft) [for overturning]
e_2 Eccentricity ($L/2 - [(Mr_2-Mo_2)/Rv_2]$) (ft) [for bearing stress calculation]
L' Effective foundation width (feet): $L' = L - 2*e_2$

Nc Cohesion Bearing Resistance Factor : Nc = (Nq-1)cot(ϕ) if f>0; for f=0 Nc=5.14
Ng Footing Width Bearing Resistance Factor : Ng = 2*(Nq+1)*tan(ϕ)
Nq Embedment Bearing Resistance Factor : Nq = [e^PI*tan(ϕ)]*N(ϕ); N(ϕ)=tan^2(PI/4 + ϕ/2)
Kabh Backfill earth pressure coefficient when retained soil is horizontal
Kabs Backfill earth pressure coefficient when retained soil is at slope β (infinite slope)
Kabs2 Backfill earth pressure coefficient for broken back slopes

Ardaman & Associates, Inc.

Citrus Grove Phase V

PROJECT IDENTIFICATION

Title:	Citrus Grove Phase V
Project Number:	113-19-60-6418 -
Client:	DRMP
Designer:	Alexandra G. Aydelotte, P.E.
Station Number:	243+00

Description:
MSE Wall RW-2 Wall Height 10 ft ; Strap Length 8ft

Company's information:

Name:	Ardaman & Associates, Inc.
Street:	8008 S. Orange Avenue Orlando, FL 32809
Telephone #:	407-855-3860
Fax #:	407-859-8121
E-Mail:	www.ardaman.com

Original file path and name: O:\Geotech ..... rus Grove Rd Phase 5 Lake Cty FL\Walls\243+00.MSEp
Original date and time of creating this file: Tue Jul 14 15:45:53 2020

PROGRAM MODE: Analysis of a General Slope using NO reinforcement material.

INPUT DATA (EXCLUDING REINFORCEMENT LAYOUT)

SOIL DATA

Soil Layer #:	Unit weight, γ [lb/ft ^{3}]	Internal angle of friction, ϕ [deg.]	Cohesion, c [lb/ft ^{2}]
1	105.0	30.0	0.0
2	100.0	29.0	0.0
3	108.0	31.0	0.0
4	118.0	34.0	0.0

REINFORCEMENT

Analysis of slope WITHOUT reinforcement.

WATER

Unit weight of water = 62.45 [lb/ft ^{3}]
Water pressure is defined by phreatic surface in Effective Stress Analysis.

SEISMICITY

Not Applicable

DRAWING OF SPECIFIED GEOMETRY - GENERAL

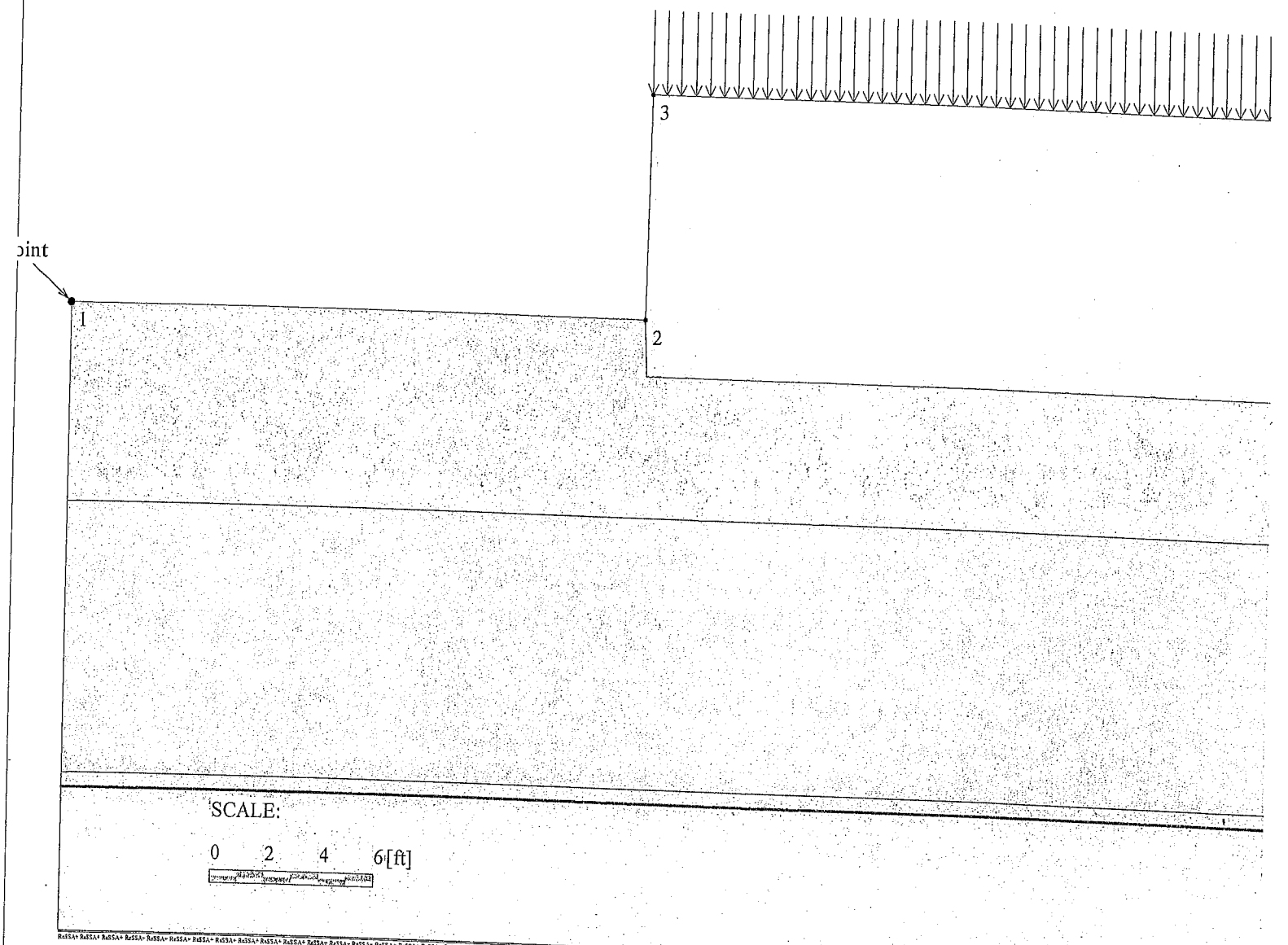
-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.
-- Xw,Yw represents the coordinates of phreatic surface.

GEOMETRY
Soil profile contains 4 layers (see details in next page)

WATER GEOMETRY
Phreatic line was specified.

UNIFORM SURCHARGE
Load Q1 = 250.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 41.10 and ends at X1e = 100.00 [ft].
Surcharge load, Q2.....None
Surcharge load, Q3.....None

STRIP LOAD
.....None.....



TABULATED DETAILS OF GENERAL SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line.

	#	Xi	Yi
Top of Layer 1	1	20.00	168.50
	2	41.00	168.50
	3	41.10	176.50
	4	100.00	176.50
Top of Layer 2	5	20.00	168.50
	6	41.00	168.50
	7	41.10	166.50
	8	100.00	166.50
Top of Layer 3	9	20.00	161.50
	10	100.00	161.50
Top of Layer 4	11	20.00	146.50
	12	100.00	146.50
Top of Phreatic Line	14	20.00	151.50
	15	100.00	151.50

TABULATED DETAILS OF SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line. Y values are tabulated in the right most column.

#	X	Y1	Y2	Y3	Y4	(phreatic) Yw
1	20.00	168.50	168.50	161.50	146.50	151.50
2	41.00	168.50	168.50	161.50	146.50	151.50
3	41.10	176.50	166.50	161.50	146.50	151.50
4	100.00	176.50	166.50	161.50	146.50	151.50

RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.) The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each entry point (considering all specified exit points)

Entry Point #	Entry Point (X, Y) [ft]		Exit Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	20.00	168.50	20.00	168.50	20.00	168.50	0.00	N/A	#10 - Overhanging Cliff
2	20.00	168.50	20.00	168.50	20.00	168.50	0.00	N/A	#10 - Overhanging Cliff
3	20.00	168.50	20.00	168.50	20.00	168.50	0.00	N/A	#10 - Overhanging Cliff
4	20.00	168.50	20.00	168.50	20.00	168.50	0.00	N/A	#10 - Overhanging Cliff
5	20.00	168.50	20.00	168.50	20.00	168.50	0.00	N/A	#10 - Overhanging Cliff
6	55.69	176.50	30.41	168.70	41.08	178.98	14.82	1.86	
7	57.42	176.50	29.07	168.70	40.66	182.02	17.65	1.83	OK
8	59.16	176.50	26.72	168.51	39.58	186.17	21.84	1.86	
9	60.90	176.50	27.86	168.60	40.55	188.55	23.64	1.91	
10	62.63	176.50	25.22	168.63	39.46	193.78	28.90	1.98	
11	64.37	176.50	23.91	168.63	39.19	198.00	33.11	2.07	
12	66.11	176.50	23.97	168.59	39.59	201.58	36.50	2.17	
13	67.84	176.50	22.71	168.57	39.22	207.01	41.83	2.27	
14	69.58	176.50	21.48	168.54	38.78	213.30	47.98	2.37	
15	71.32	176.50	21.51	168.53	39.28	217.10	51.72	2.48	
16	73.05	176.50	20.20	168.54	39.03	222.90	57.54	2.60	
17	74.79	176.50	18.52	168.67	39.11	226.85	61.72	2.71	
18	76.53	176.50	18.52	168.67	39.89	229.14	64.13	2.83	
19	78.26	176.50	17.19	168.69	39.98	233.14	68.36	2.94	
20	80.00	176.50	15.92	168.68	40.08	237.16	72.62	3.06	

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-entry' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.) The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each exit point (considering all specified entry points).

Exit Point #	Exit Point (X,Y) [ft]		Entry Point (X,Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	9.77	168.64	62.63	176.50	31.49	204.26	41.72	2.37	
2	10.91	168.76	60.90	176.50	31.83	198.95	36.73	2.32	
3	12.24	168.73	60.90	176.50	32.51	198.05	35.64	2.26	
4	13.59	168.69	60.90	176.50	33.19	197.15	34.56	2.21	
5	14.97	168.62	60.90	176.50	33.87	196.25	33.48	2.17	
6	16.38	168.54	60.90	176.50	34.55	195.36	32.40	2.12	
7	17.42	168.71	60.90	176.50	35.24	194.47	31.32	2.08	
8	18.89	168.59	59.16	176.50	35.64	189.78	27.01	2.05	
9	20.29	168.51	59.16	176.50	36.21	189.61	26.43	1.98	
10	21.28	168.73	59.16	176.50	36.90	188.82	25.44	1.95	
11	22.63	168.68	59.16	176.50	37.59	188.03	24.46	1.92	
12	23.92	168.72	57.42	176.50	37.94	184.35	21.00	1.89	
13	25.27	168.66	57.42	176.50	38.64	183.67	20.11	1.87	
14	26.62	168.61	57.42	176.50	39.34	183.00	19.21	1.85	
15	27.96	168.55	57.42	176.50	40.05	182.33	18.33	1.85	
16	29.07	168.70	57.42	176.50	40.66	182.02	17.65	1.83	OK
17	30.41	168.70	55.69	176.50	41.08	178.98	14.82	1.86	
18	31.80	168.59	55.69	176.50	41.80	178.41	14.02	1.90	
19	32.99	168.68	55.69	176.50	42.44	178.10	13.34	1.93	
20	34.43	168.53	55.69	176.50	43.18	177.53	12.55	2.04	
21	35.70	168.54	55.69	176.50	43.84	177.18	11.86	2.17	
22	36.92	168.59	57.42	176.50	44.87	178.52	12.72	2.39	
23	38.13	168.70	59.16	176.50	46.96	177.14	12.21	3.49	
24	20.00	168.50	20.00	168.50	20.00	168.50	0.00	N/A	#10 - Overhanging Cliff
25	20.00	168.50	20.00	168.50	20.00	168.50	0.00	N/A	#10 - Overhanging Cliff

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

CRITICAL RESULTS OF ROTATIONAL AND TRANSLATIONAL STABILITY ANALYSES

Rotational (Circular Arc; Bishop) Stability Analysis with slip surfaces excluded from this polygon:

Minimum Factor of Safety = 1.83

Critical Circle: Xc = 40.66[ft], Yc = 182.02[ft], R = 17.65[ft]. (Number of slices used = 53)

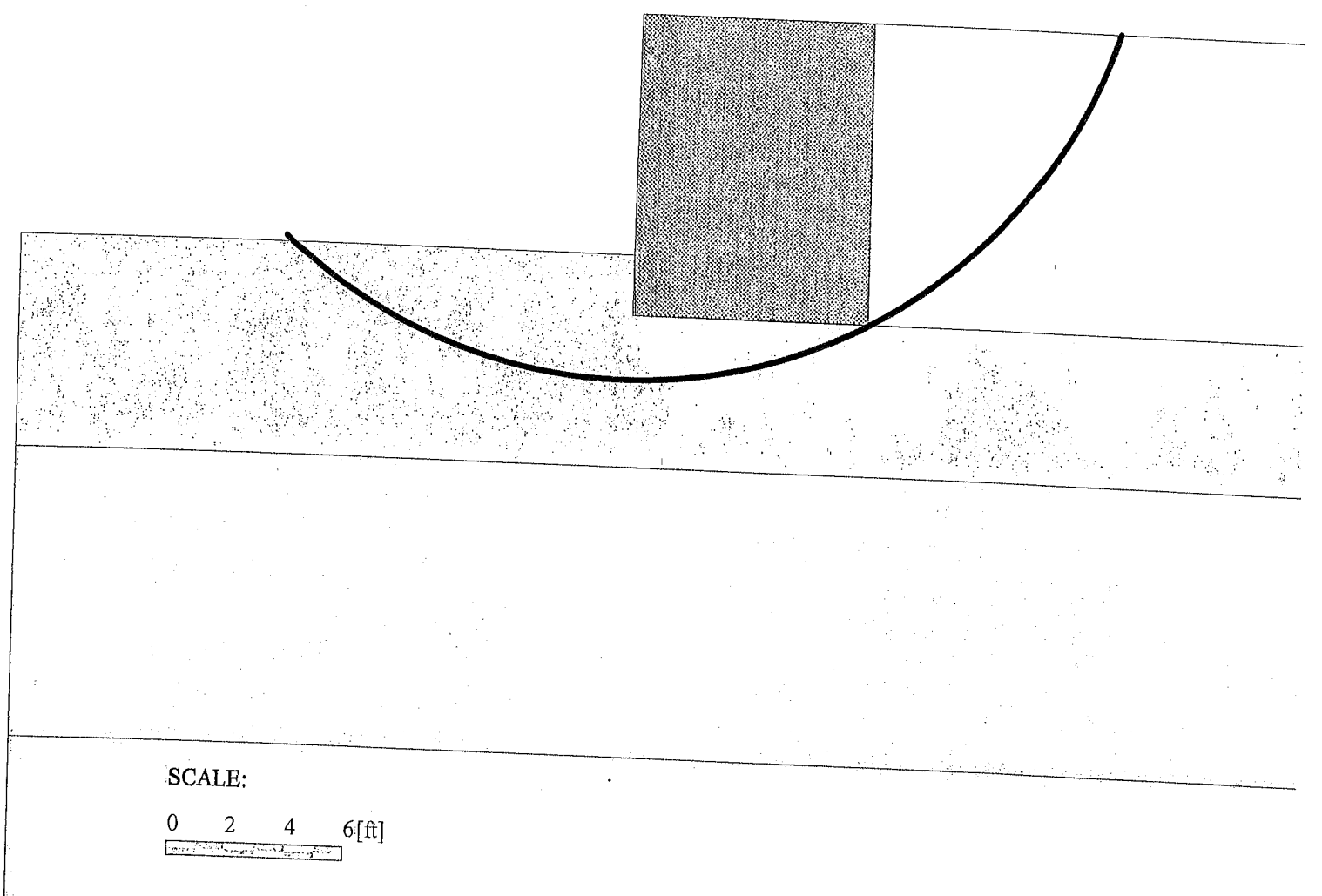
Translational (2-Part Wedge; Spencer), Direct Sliding, Stability Analysis

NOT CONDUCTED

Three-Part Wedge Stability Analysis

NOT CONDUCTED

REINFORCEMENT LAYOUT: DRAWING



SCALE:

0 2 4 6[ft]

Ardaman & Associates, Inc.

Citrus Grove Phase V

PROJECT IDENTIFICATION

Title:	Citrus Grove Phase V
Project Number:	113-19-60-6418 -
Client:	DRMP
Designer:	Alexandra G. Aydelotte, P.E.
Station Number:	244+00

Description:
MSE Wall RW-2 Wall Height 14 ft ; Strap Length 11 ft

Company's information:

Name:	Ardaman & Associates, Inc.
Street:	8008 S. Orange Avenue Orlando, FL 32809
Telephone #:	407-855-3860
Fax #:	407-859-8121
E-Mail:	www.ardaman.com

Original file path and name: O:\Geotech ..... rus Grove Rd Phase 5 Lake Cty FL\Walls\244+00.MSEp
Original date and time of creating this file: Tue Jul 14 15:45:53 2020

PROGRAM MODE: Analysis of a General Slope using NO reinforcement material.

INPUT DATA (EXCLUDING REINFORCEMENT LAYOUT)

SOIL DATA

Soil Layer #:	Unit weight, γ [lb/ft ^{3}]	Internal angle of friction, ϕ [deg.]	Cohesion, c [lb/ft ^{2}]
1	105.0	30.0	0.0
2	100.0	29.0	0.0
3	108.0	31.0	0.0
4	118.0	34.0	0.0

REINFORCEMENT

Analysis of slope WITHOUT reinforcement.

WATER

Unit weight of water = 62.45 [lb/ft ^{3}]
Water pressure is defined by phreatic surface in Effective Stress Analysis.

SEISMICITY

Not Applicable

DRAWING OF SPECIFIED GEOMETRY - GENERAL

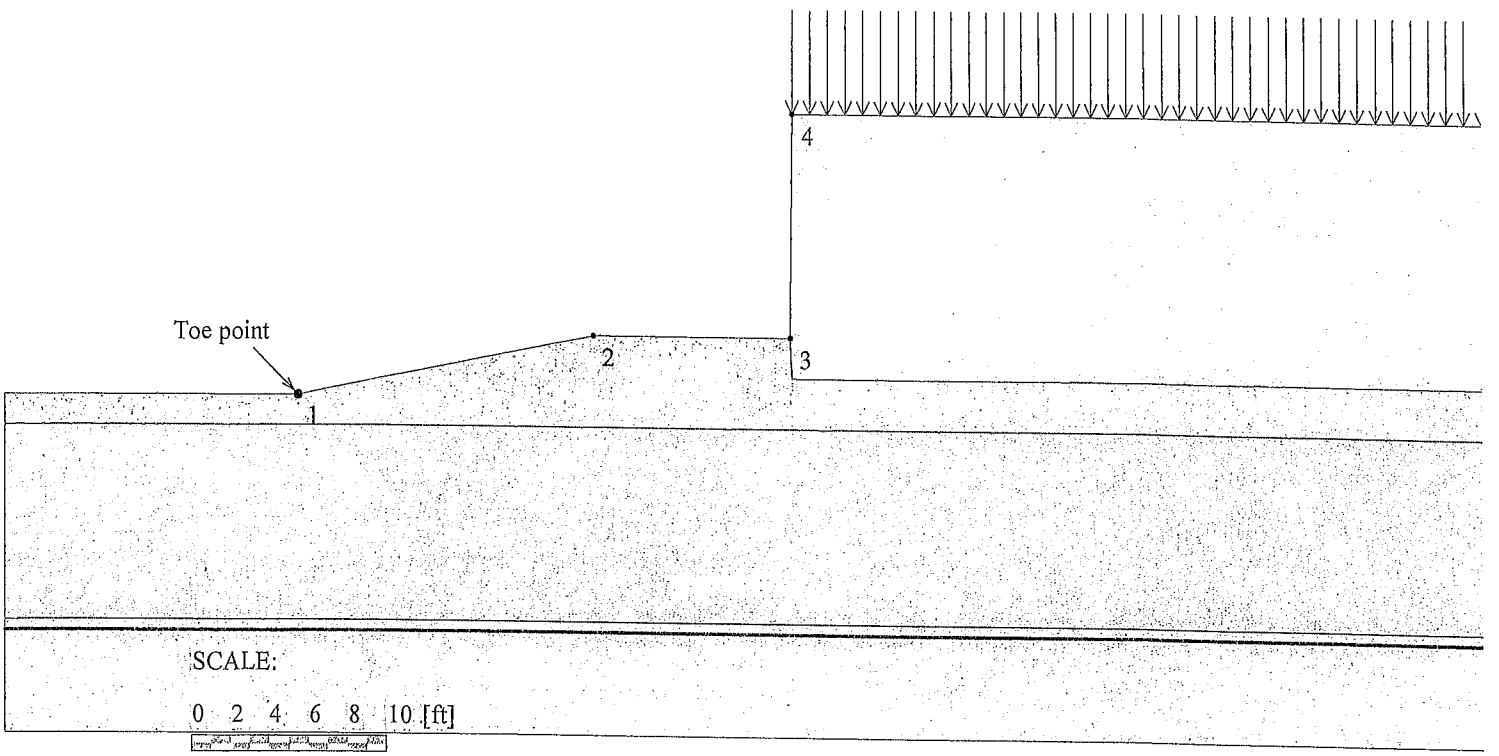
-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.
-- Xw,Yw represents the coordinates of phreatic surface.

GEOMETRY
Soil profile contains 4 layers (see details in next page)

WATER GEOMETRY
Phreatic line was specified.

UNIFORM SURCHARGE
Load Q1 = 250.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 45.10 and ends at X1e = 100.00 [ft].
Surcharge load, Q2.....None
Surcharge load, Q3.....None

STRIP LOAD
.....None.....



TABULATED DETAILS OF GENERAL SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line.

	#	Xi	Yi
Top of Layer 1	1	20.00	163.00
	2	35.00	166.00
	3	45.00	166.00
	4	45.10	177.00
	5	100.00	177.00
Top of Layer 2	6	20.00	163.00
	7	35.00	166.00
	8	45.00	166.00
	9	45.10	164.00
	10	100.00	164.00
Top of Layer 3	11	20.00	161.50
	12	100.00	161.50
Top of Layer 4	13	20.00	146.50
	14	100.00	146.50
Top of Phreatic Line	16	20.00	151.50
	17	100.00	151.50

TABULATED DETAILS OF SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line. Y values are tabulated in the right most column.

#	X	Y1	Y2	Y3	Y4	(phreatic) Yw
1	20.00	163.00	163.00	161.50	146.50	151.50
2	35.00	166.00	166.00	161.50	146.50	151.50
3	45.00	166.00	166.00	161.50	146.50	151.50
4	45.10	177.00	164.00	161.50	146.50	151.50
5	100.00	177.00	164.00	161.50	146.50	151.50

RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each entry point (considering all specified exit points)

Entry Point #	Entry Point (X, Y) [ft]		Exit Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	20.00	163.00	20.00	163.00	20.00	163.00	0.00	N/A	#10 - Overhanging Cliff
2	20.00	163.00	20.00	163.00	20.00	163.00	0.00	N/A	#10 - Overhanging Cliff
3	20.00	163.00	20.00	163.00	20.00	163.00	0.00	N/A	#10 - Overhanging Cliff
4	61.80	177.00	30.88	165.25	44.10	177.03	17.70	1.98	
5	67.26	177.00	27.35	164.56	42.19	187.18	27.06	1.80	OK
6	72.72	177.00	23.49	163.99	39.93	201.42	40.88	1.86	
7	78.17	177.00	19.91	163.26	37.06	220.94	60.18	1.99	
8	83.63	177.00	16.85	163.03	34.48	245.33	84.17	2.17	
9	89.09	177.00	16.95	163.00	33.79	269.12	107.44	2.39	
10	94.54	177.00	9.33	163.10	29.94	304.87	143.26	2.62	
11	100.00	177.00	12.89	163.09	34.12	309.80	148.24	2.86	

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-entry' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

****

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each exit point (considering all specified entry points).

Exit Point #	Exit Point (X, Y) [ft]		Entry Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	9.50	163.23	72.72	177.00	32.26	210.74	52.68	1.98	
2	13.43	163.03	72.72	177.00	33.91	208.87	50.21	1.92	
3	16.62	163.15	72.72	177.00	35.59	206.85	47.63	1.88	
4	20.33	163.15	72.72	177.00	37.33	204.83	45.02	1.86	
5	23.57	164.04	67.26	177.00	39.86	189.24	30.01	1.81	
6	27.35	164.56	67.26	177.00	42.19	187.18	27.06	1.80	OK
7	30.84	165.25	67.26	177.00	44.49	185.27	24.23	1.82	
8	34.14	166.10	67.26	177.00	46.91	183.06	21.23	1.90	
9	37.76	166.12	67.26	177.00	48.82	181.56	19.00	2.10	
10	41.38	166.02	67.26	177.00	51.17	178.95	16.21	2.74	
11	20.00	163.00	20.00	163.00	20.00	163.00	0.00	N/A	#10 - Overhanging Cliff

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

CRITICAL RESULTS OF ROTATIONAL AND TRANSLATIONAL STABILITY ANALYSES

Rotational (Circular Arc; Bishop) Stability Analysis with slip surfaces excluded from this polygon:

Minimum Factor of Safety = 1.80

Critical Circle: Xc = 42.19[ft], Yc = 187.18[ft], R = 27.06[ft]. (Number of slices used = 55)

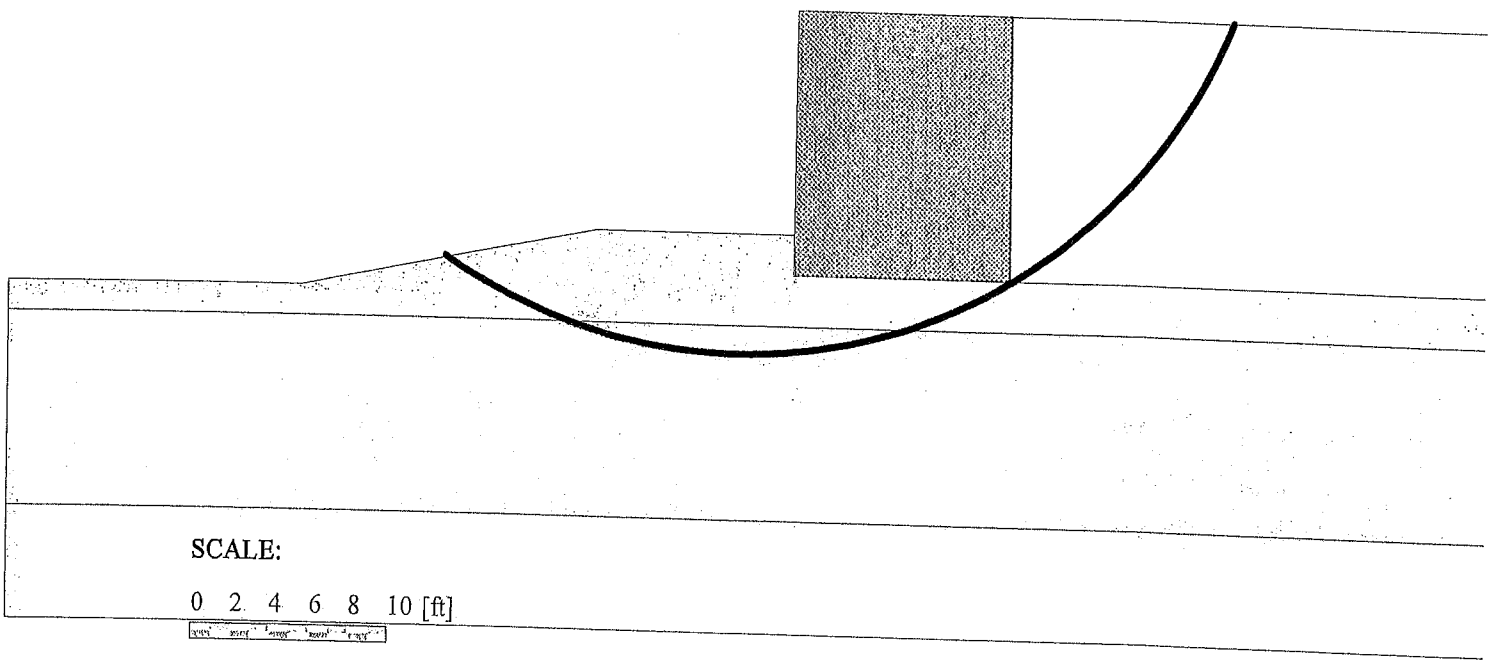
Translational (2-Part Wedge; Spencer), Direct Sliding, Stability Analysis

NOT CONDUCTED

Three-Part Wedge Stability Analysis

NOT CONDUCTED

REINFORCEMENT LAYOUT: DRAWING



Ardaman & Associates, Inc.

Citrus Grove Phase V

PROJECT IDENTIFICATION

Title:	Citrus Grove Phase V
Project Number:	113-19-60-6418 -
Client:	DRMP
Designer:	Alexandra G. Aydelotte, P.E.
Station Number:	245+00

Description:
MSE Wall RW-2 Wall Height 17 ft ; Strap Length 12 ft

Company's information:

Name:	Ardaman & Associates, Inc.
Street:	8008 S. Orange Avenue Orlando, FL 32809
Telephone #:	407-855-3860
Fax #:	407-859-8121
E-Mail:	www.ardaman.com

Original file path and name: O:\Geotech ..... rus Grove Rd Phase 5 Lake Cty FL\Walls\245+00.MSEp
Original date and time of creating this file: Tue Jul 14 15:45:53 2020

PROGRAM MODE: Analysis of a General Slope using NO reinforcement material.

INPUT DATA (EXCLUDING REINFORCEMENT LAYOUT)

SOIL DATA

Soil Layer #:	Unit weight, γ [lb/ft ^{3}]	Internal angle of friction, ϕ [deg.]	Cohesion, c [lb/ft ^{2}]
1	105.0	30.0	0.0
2	100.0	29.0	0.0
3	108.0	31.0	0.0
4	118.0	34.0	0.0

REINFORCEMENT

Analysis of slope WITHOUT reinforcement.

WATER

Unit weight of water = 62.45 [lb/ft ^{3}]
Water pressure is defined by phreatic surface in Effective Stress Analysis.

SEISMICITY

Not Applicable

DRAWING OF SPECIFIED GEOMETRY - GENERAL

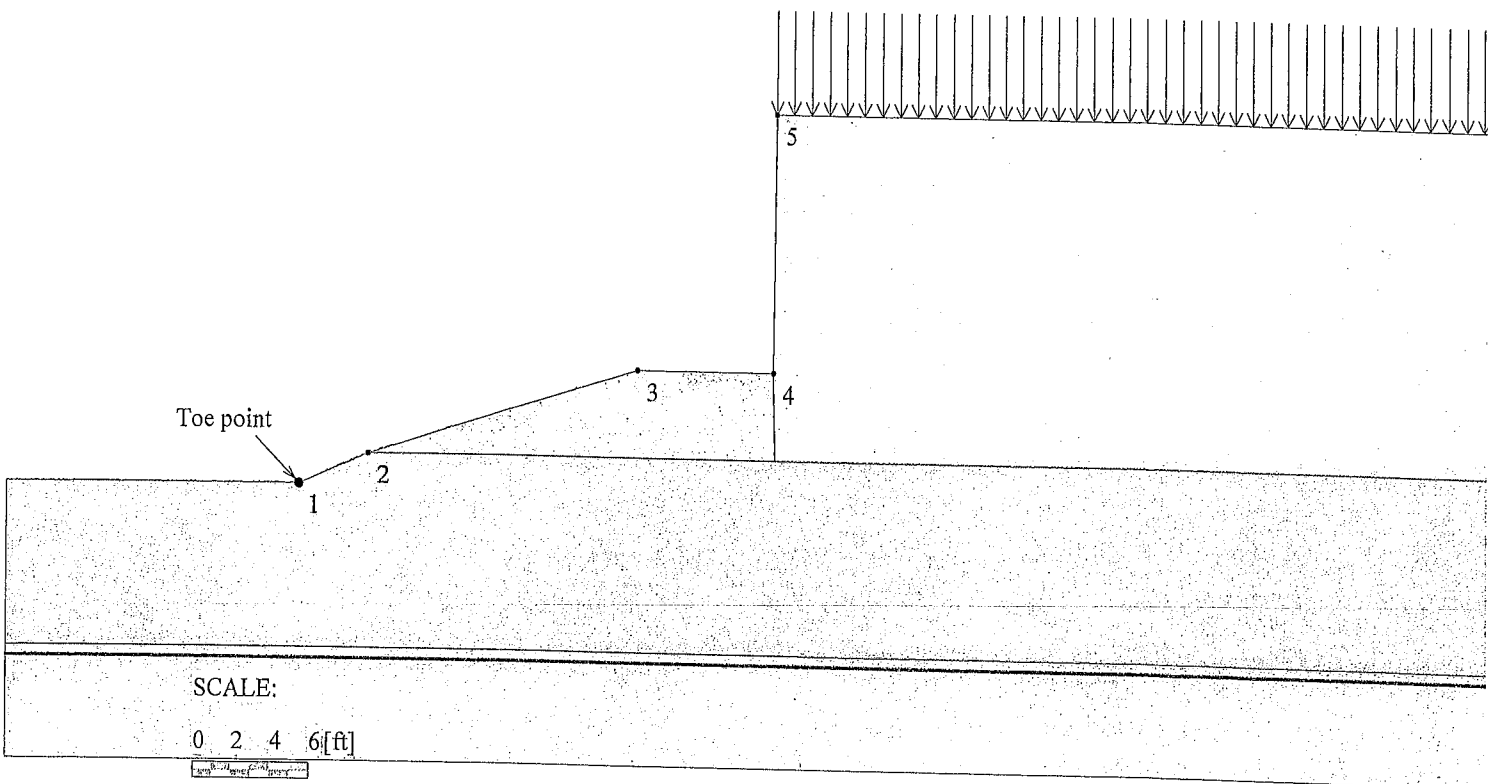
-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.
-- Xw,Yw represents the coordinates of phreatic surface.

GEOMETRY
Soil profile contains 4 layers (see details in next page)

WATER GEOMETRY
Phreatic line was specified.

UNIFORM SURCHARGE
Load Q1 = 250.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 44.10 and ends at X1e = 100.00 [ft].
Surcharge load, Q2.....None
Surcharge load, Q3.....None

STRIP LOAD
.....None.....



TABULATED DETAILS OF GENERAL SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line.

	#	Xi	Yi
Top of Layer 1	1	20.00	160.00
	2	23.50	161.50
	3	37.00	165.80
	4	44.00	165.80
	5	44.10	178.50
	6	100.00	178.50
Top of Layer 2	7	20.00	160.00
	8	23.50	161.50
	9	37.00	165.80
	10	44.00	165.80
	11	44.10	161.50
	12	100.00	161.50
Top of Layer 3	13	20.00	160.00
	14	23.50	161.50
	15	100.00	161.50
Top of Layer 4	16	20.00	146.50
	17	100.00	146.50
Top of Phreatic Line	19	20.00	151.50
	20	100.00	151.50

TABULATED DETAILS OF SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line. Y values are tabulated in the right most column.

#	X	Y1	Y2	Y3	Y4	(phreatic) Yw
1	20.00	160.00	160.00	160.00	146.50	151.50
2	23.50	161.50	161.50	161.50	146.50	151.50
3	37.00	165.80	165.80	161.50	146.50	151.50
4	44.00	165.80	165.80	161.50	146.50	151.50
5	44.10	178.50	161.50	161.50	146.50	151.50
6	100.00	178.50	161.50	161.50	146.50	151.50

RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each entry point (considering all specified exit points)

Entry Point #	Entry Point (X,Y) [ft]		Exit Point (X,Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	20.00	160.00	20.00	160.00	20.00	160.00	0.00	N/A	#10 - Overhanging Cliff
2	20.00	160.00	20.00	160.00	20.00	160.00	0.00	N/A	#10 - Overhanging Cliff
3	62.29	178.50	14.86	160.41	35.11	178.53	27.18	2.06	
4	65.43	178.50	19.00	160.26	36.79	183.17	29.02	1.84	
5	68.57	178.50	17.02	160.16	35.66	189.41	34.67	1.76	
6	71.72	178.50	12.93	160.14	33.38	197.97	43.00	1.74	OK
7	74.86	178.50	14.78	160.20	34.12	204.48	48.32	1.75	
8	78.00	178.50	12.56	160.23	32.83	213.97	57.43	1.80	
9	81.14	178.50	12.67	160.16	32.49	223.14	66.03	1.86	
10	84.29	178.50	10.58	160.15	31.16	234.71	77.34	1.94	
11	87.43	178.50	10.72	160.10	30.84	245.32	87.56	2.03	
12	90.57	178.50	6.68	160.08	28.50	260.94	103.19	2.12	
13	93.71	178.50	4.88	160.02	27.33	274.88	117.03	2.22	
14	96.86	178.50	4.17	160.15	27.31	286.52	128.48	2.32	
15	100.00	178.50	4.38	160.10	27.11	299.62	141.36	2.43	

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-entry' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

****

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each exit point (considering all specified entry points).

Exit Point #	Exit Point (X,Y) [ft]		Entry Point (X,Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	4.98	160.01	74.86	178.50	29.23	209.67	55.26	1.83	
2	6.85	160.12	71.72	178.50	30.44	200.51	46.78	1.81	
3	9.04	160.03	71.72	178.50	31.30	200.06	45.81	1.77	
4	10.81	160.15	74.86	178.50	32.05	206.96	51.41	1.76	
5	12.93	160.14	71.72	178.50	33.38	197.97	43.00	1.74	OK
6	14.68	160.30	71.72	178.50	34.59	196.39	41.22	1.75	
7	17.09	160.10	71.72	178.50	35.50	195.74	40.12	1.75	
8	19.00	160.16	71.72	178.50	36.42	195.03	38.98	1.75	
9	20.86	160.86	71.72	178.50	38.08	193.36	36.78	1.78	
10	23.39	161.49	71.72	178.50	39.75	192.17	34.77	1.80	
11	25.37	162.19	71.72	178.50	41.35	190.77	32.75	1.84	
12	27.29	162.92	71.72	178.50	43.16	188.81	30.36	1.91	
13	29.34	163.61	68.57	178.50	44.39	183.10	24.62	1.97	
14	31.26	164.38	68.57	178.50	45.98	181.83	22.83	2.09	
15	33.51	164.87	68.57	178.50	47.54	180.70	21.15	2.26	
16	35.41	165.68	68.57	178.50	49.05	179.69	19.56	2.49	
17	37.69	165.87	71.72	178.50	51.98	179.53	19.77	3.24	
18	20.00	160.00	20.00	160.00	20.00	160.00	0.00	N/A	#10 - Overhanging Cliff
19	20.00	160.00	20.00	160.00	20.00	160.00	0.00	N/A	#10 - Overhanging Cliff
20	20.00	160.00	20.00	160.00	20.00	160.00	0.00	N/A	#10 - Overhanging Cliff

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

CRITICAL RESULTS OF ROTATIONAL AND TRANSLATIONAL STABILITY ANALYSES

Rotational (Circular Arc; Bishop) Stability Analysis with slip surfaces excluded from this polygon:

Minimum Factor of Safety = 1.74

Critical Circle: Xc = 33.38[ft], Yc = 197.97[ft], R = 43.00[ft]. (Number of slices used = 55)

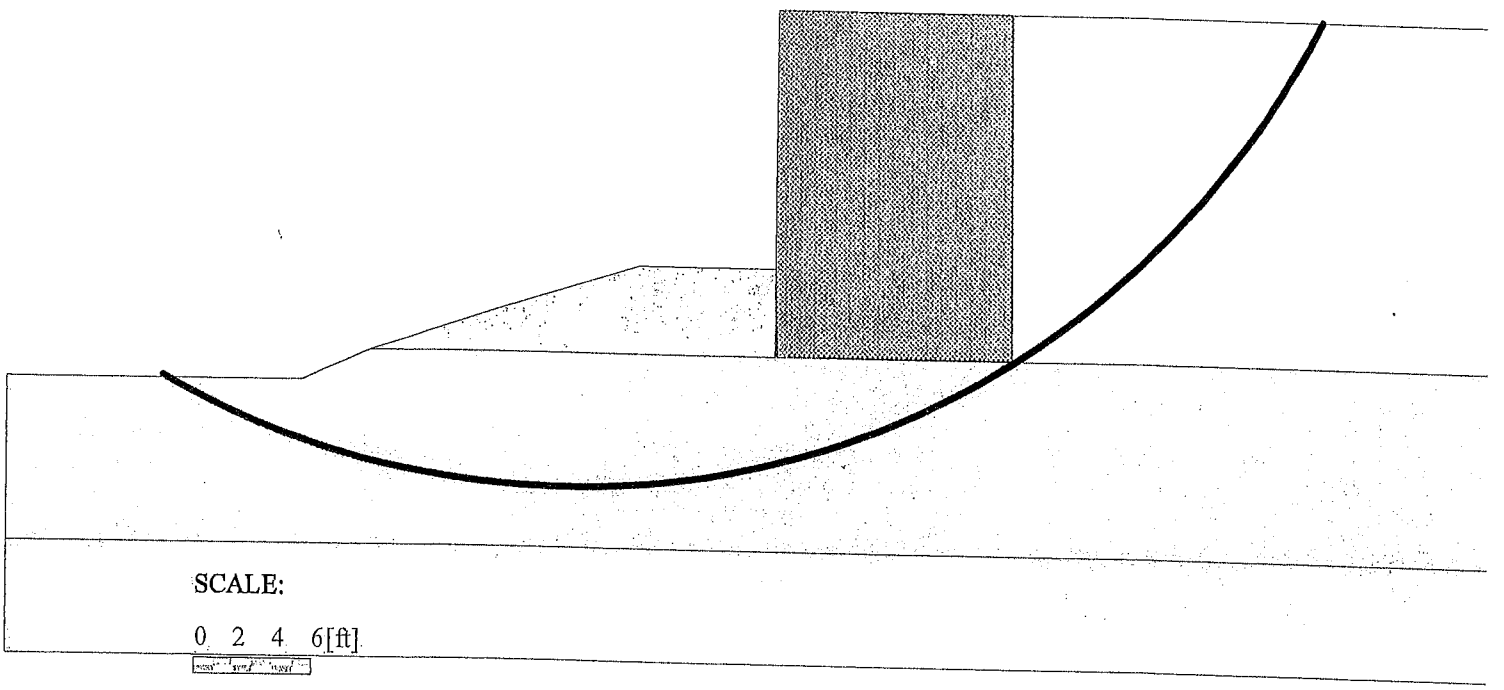
Translational (2-Part Wedge; Spencer), Direct Sliding, Stability Analysis

NOT CONDUCTED

Three-Part Wedge Stability Analysis

NOT CONDUCTED

REINFORCEMENT LAYOUT: DRAWING



Ardaman & Associates, Inc.

Citrus Grove Phase V

PROJECT IDENTIFICATION

Title:	Citrus Grove Phase V
Project Number:	113-19-60-6418 -
Client:	DRMP
Designer:	Alexandra G. Aydelotte, P.E.
Station Number:	246+00

Description:
MSE Wall RW-2 Wall Height 25 ft ; Strap Length 18 ft

Company's information:

Name:	Ardaman & Associates, Inc.
Street:	8008 S. Orange Avenue Orlando, FL 32809
Telephone #:	407-855-3860
Fax #:	407-859-8121
E-Mail:	www.ardaman.com

Original file path and name: O:\Geotech ..... Grove Rd Phase 5 Lake Cty FL\Walls\246+00 (1).MSEp
Original date and time of creating this file: Tue Jul 14 15:45:53 2020

PROGRAM MODE: Analysis of a General Slope using NO reinforcement material.

INPUT DATA (EXCLUDING REINFORCEMENT LAYOUT)

SOIL DATA

Soil Layer #:	Unit weight, γ [lb/ft ^{3}]	Internal angle of friction, ϕ [deg.]	Cohesion, c [lb/ft ^{2}]
1	105.0	30.0	0.0
2	100.0	29.0	0.0
3	108.0	31.0	0.0
4	118.0	34.0	0.0

REINFORCEMENT

Analysis of slope WITHOUT reinforcement.

WATER

Unit weight of water = 62.45 [lb/ft ^{3}]
Water pressure is defined by phreatic surface in Effective Stress Analysis.

SEISMICITY

Not Applicable

DRAWING OF SPECIFIED GEOMETRY - GENERAL

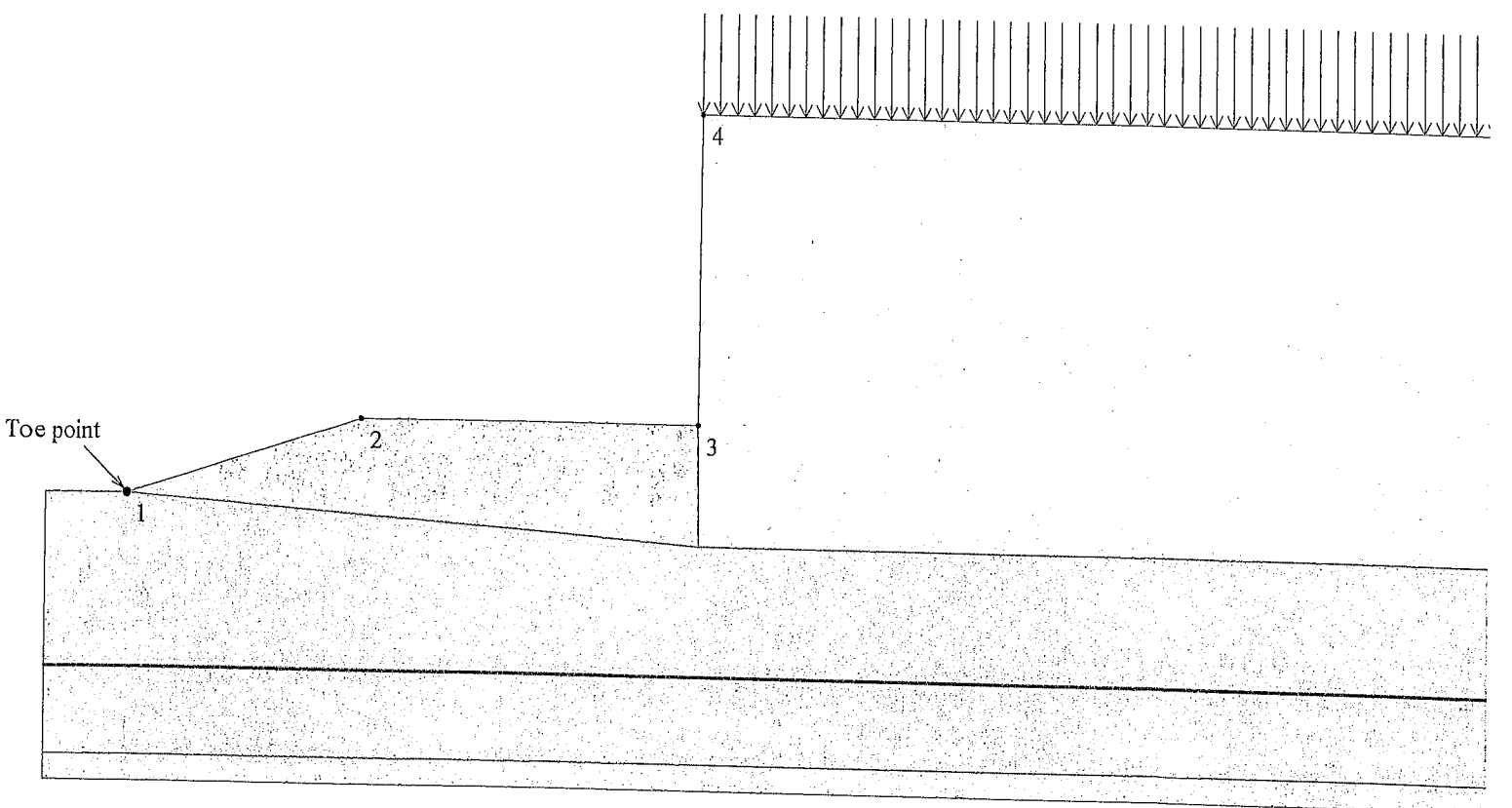
-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.
-- Xw,Yw represents the coordinates of phreatic surface.

GEOMETRY
Soil profile contains 4 layers (see details in next page)

WATER GEOMETRY
Phreatic line was specified.

UNIFORM SURCHARGE
Load Q1 = 250.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 64.10 and ends at X1e = 120.00 [ft].
Surcharge load, Q2.....None
Surcharge load, Q3.....None

STRIP LOAD
.....None.....



SCALE:

0 2 4 6 8 10 [ft]

TABULATED DETAILS OF GENERAL SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line.

	#	Xi	Yi
Top of Layer 1	1	30.00	161.50
	2	44.00	166.00
	3	64.00	166.00
	4	64.10	184.00
	5	120.00	184.00
Top of Layer 2	6	30.00	161.50
	7	44.00	166.00
	8	64.00	166.00
	9	64.10	159.00
	10	120.00	159.00
Top of Layer 3	11	30.00	161.50
	12	64.00	159.00
	13	120.00	159.00
Top of Layer 4	14	30.00	146.50
	15	120.00	146.50
Top of Phreatic Line	17	30.00	151.50
	18	120.00	151.50

TABULATED DETAILS OF SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line. Y values are tabulated in the right most column.

#	X	Y1	Y2	Y3	Y4	(phreatic) Yw
1	30.00	161.50	161.50	161.50	146.50	151.50
2	44.00	166.00	166.00	160.47	146.50	151.50
3	64.00	166.00	166.00	159.00	146.50	151.50
4	64.10	184.00	159.00	159.00	146.50	151.50
5	120.00	184.00	159.00	159.00	146.50	151.50

RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each entry point (considering all specified exit points)

Entry Point #	Entry Point (X, Y) [ft]		Exit Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff
2	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff
3	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff
4	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff
5	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff
6	94.29	184.00	23.19	161.98	54.09	188.00	40.40	2.30	
7	97.14	184.00	26.43	161.77	55.87	191.70	41.99	2.22	
8	100.00	184.00	26.50	161.67	56.06	196.49	45.68	2.17	
9	102.86	184.00	29.70	161.57	57.89	200.16	47.79	2.14	
10	105.72	184.00	22.92	161.96	54.99	208.04	56.13	2.13	
11	108.57	184.00	23.02	161.85	55.16	214.02	61.27	2.13	OK
12	111.43	184.00	20.43	161.54	53.86	221.68	68.81	2.16	
13	114.29	184.00	25.95	161.87	57.28	224.19	69.75	2.18	
14	117.14	184.00	19.75	161.86	54.48	234.36	80.40	2.23	
15	120.00	184.00	19.86	161.77	54.62	241.88	87.32	2.27	

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-entry' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

****

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each exit point (considering all specified entry points).

Exit Point #	Exit Point (X, Y) [ft]		Entry Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	4.46	161.86	108.57	184.00	45.64	224.07	74.61	2.26	
2	7.41	162.01	105.72	184.00	47.12	215.21	66.39	2.24	
3	10.69	161.87	105.72	184.00	48.81	213.27	63.99	2.22	
4	14.05	161.68	105.72	184.00	50.17	212.73	62.53	2.18	
5	16.78	161.89	108.57	184.00	52.07	216.98	65.43	2.17	
6	20.28	161.64	108.57	184.00	53.80	214.79	62.83	2.16	
7	23.02	161.85	108.57	184.00	55.16	214.02	61.27	2.13	OK
8	25.89	162.00	108.57	184.00	56.91	211.78	58.66	2.14	
9	29.70	161.57	105.72	184.00	58.15	205.16	52.06	2.13	
10	32.66	162.60	105.72	184.00	60.73	202.18	48.52	2.19	
11	35.53	163.81	102.86	184.00	62.52	196.18	42.14	2.21	
12	38.59	164.87	102.86	184.00	64.88	194.08	39.29	2.27	
13	41.85	165.79	100.00	184.00	66.53	188.92	33.83	2.33	
14	45.27	166.03	100.00	184.00	68.49	187.63	31.72	2.40	
15	47.93	166.51	100.00	184.00	70.24	186.36	29.86	2.52	
16	51.44	166.07	100.00	184.00	72.00	185.11	28.03	2.72	
17	54.22	166.45	102.86	184.00	75.36	184.04	27.50	3.41	
18	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff
19	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff
20	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

CRITICAL RESULTS OF ROTATIONAL AND TRANSLATIONAL STABILITY ANALYSES

Rotational (Circular Arc; Bishop) Stability Analysis with slip surfaces excluded from this polygon:

Minimum Factor of Safety = 2.13

Critical Circle: Xc = 55.16[ft], Yc = 214.02[ft], R = 61.27[ft]. (Number of slices used = 53)

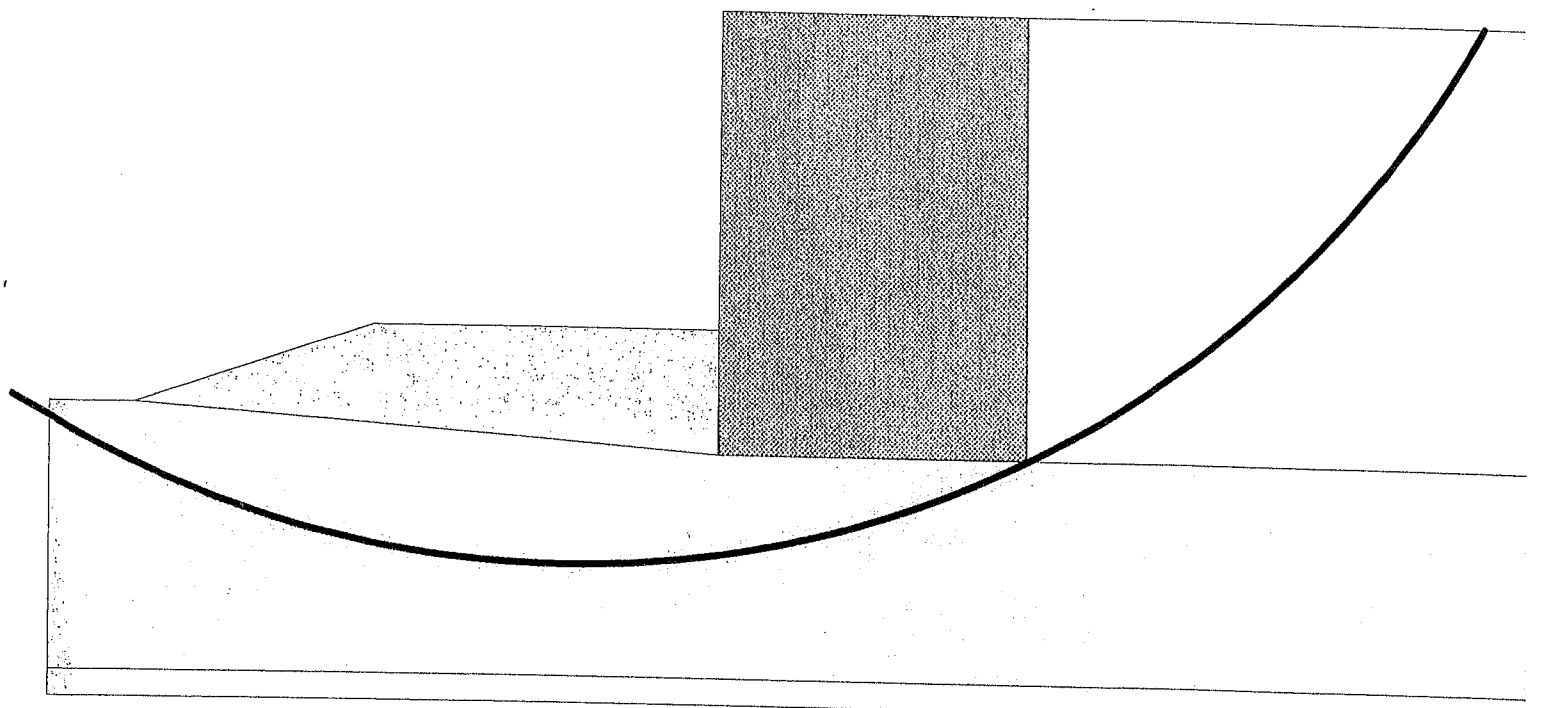
Translational (2-Part Wedge; Spencer), Direct Sliding, Stability Analysis

NOT CONDUCTED

Three-Part Wedge Stability Analysis

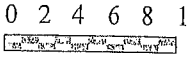
NOT CONDUCTED

REINFORCEMENT LAYOUT: DRAWING



SCALE:

0 2 4 6 8 10 [ft]



Ardaman & Associates, Inc.

Citrus Grove Phase V

PROJECT IDENTIFICATION

Title:	Citrus Grove Phase V
Project Number:	113-19-60-6418 -
Client:	DRMP
Designer:	Alexandra G. Aydelotte, P.E.
Station Number:	246+00

Description:
MSE Wall RW-2 Wall Height 23 ft ; Strap Length 17 ft

Company's information:

Name:	Ardaman & Associates, Inc.
Street:	8008 S. Orange Avenue Orlando, FL 32809
Telephone #:	407-855-3860
Fax #:	407-859-8121
E-Mail:	www.ardaman.com

Original file path and name: O:\Geotech ..... Grove Rd Phase 5 Lake Cty FL\Walls\246+00 (2).MSEp
Original date and time of creating this file: Tue Jul 14 15:45:53 2020

PROGRAM MODE: Analysis of a General Slope using NO reinforcement material.

INPUT DATA (EXCLUDING REINFORCEMENT LAYOUT)

SOIL DATA

Soil Layer #:	Unit weight, γ [lb/ft ^{3}]	Internal angle of friction, ϕ [deg.]	Cohesion, c [lb/ft ^{2}]
1	105.0	30.0	0.0
2	100.0	29.0	0.0
3	108.0	31.0	0.0
4	118.0	34.0	0.0

REINFORCEMENT

Analysis of slope WITHOUT reinforcement.

WATER

Unit weight of water = 62.45 [lb/ft ^{3}]
Water pressure is defined by phreatic surface in Effective Stress Analysis.

SEISMICITY

Not Applicable

DRAWING OF SPECIFIED GEOMETRY - GENERAL

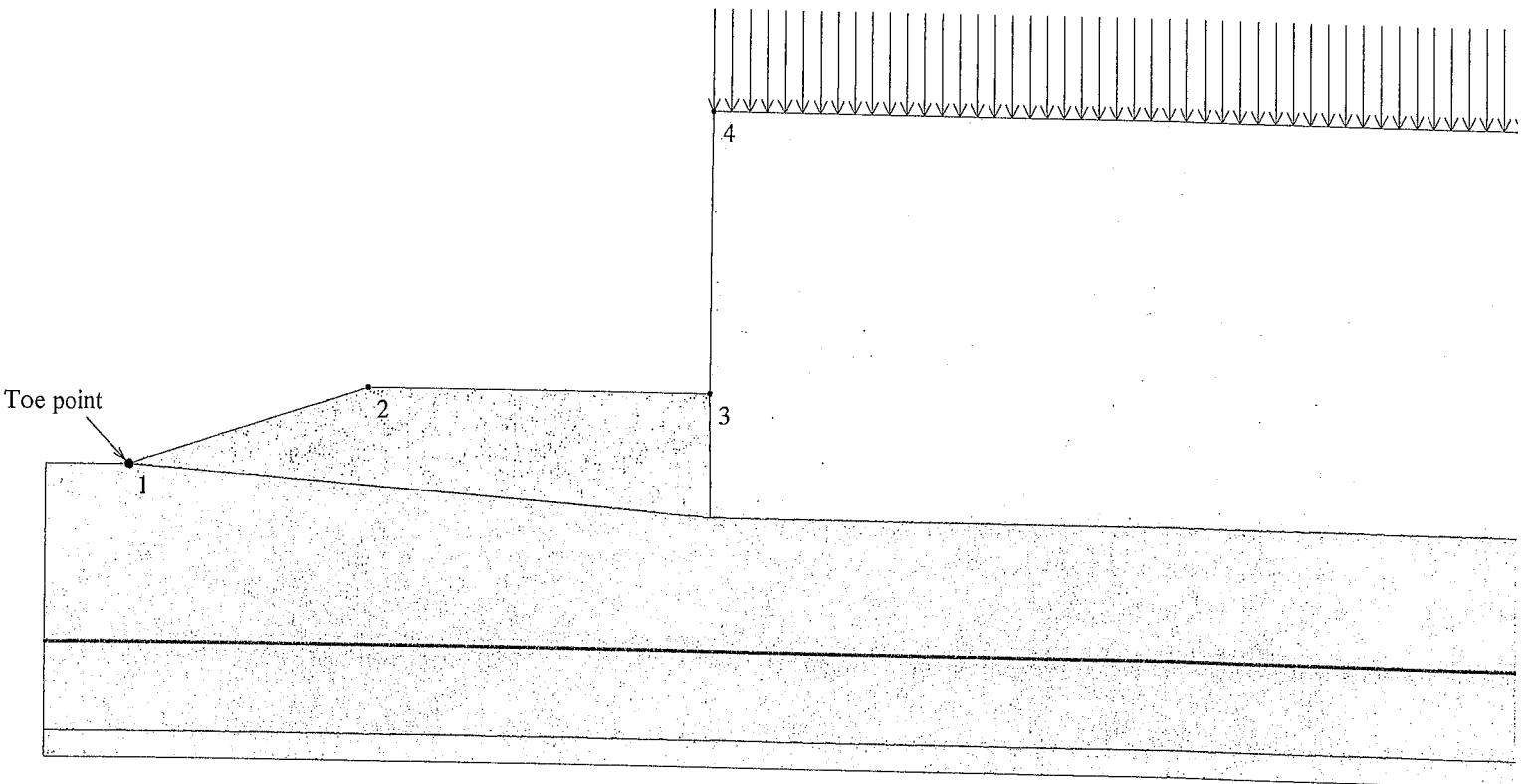
-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.
-- Xw,Yw represents the coordinates of phreatic surface.

GEOMETRY
Soil profile contains 4 layers (see details in next page)

WATER GEOMETRY
Phreatic line was specified.

UNIFORM SURCHARGE
Load Q1 = 250.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 64.10 and ends at X1e = 120.00 [ft].
Surcharge load, Q2.....None
Surcharge load, Q3.....None

STRIP LOAD
.....None.....



SCALE:

0 2 4 6 8 10 [ft]

TABULATED DETAILS OF GENERAL SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line.

	#	Xi	Yi
Top of Layer 1	1	30.00	161.50
	2	44.00	166.00
	3	64.00	166.00
	4	64.10	182.00
	5	120.00	182.00
Top of Layer 2	6	30.00	161.50
	7	44.00	166.00
	8	64.00	166.00
	9	64.10	159.00
	10	120.00	159.00
Top of Layer 3	11	30.00	161.50
	12	64.00	159.00
	13	120.00	159.00
Top of Layer 4	14	30.00	146.50
	15	120.00	146.50
Top of Phreatic Line	17	30.00	151.50
	18	120.00	151.50

TABULATED DETAILS OF SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line. Y values are tabulated in the right most column.

#	X	Y1	Y2	Y3	Y4	(phreatic) Yw
1	30.00	161.50	161.50	161.50	146.50	151.50
2	44.00	166.00	166.00	160.47	146.50	151.50
3	64.00	166.00	166.00	159.00	146.50	151.50
4	64.10	182.00	159.00	159.00	146.50	151.50
5	120.00	182.00	159.00	159.00	146.50	151.50

RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.) The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each entry point (considering all specified exit points)

Entry Point #	Entry Point (X, Y) [ft]		Exit Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff
2	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff
3	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff
4	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff
5	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff
6	94.29	182.00	26.34	161.87	55.24	189.06	39.68	2.36	
7	97.14	182.00	23.32	161.75	53.86	195.11	45.22	2.29	
8	100.00	182.00	29.70	161.58	57.25	197.93	45.62	2.24	
9	102.86	182.00	29.70	161.57	57.63	202.76	49.77	2.24	OK
10	105.72	182.00	29.70	161.56	57.90	208.26	54.56	2.24	
11	108.57	182.00	23.00	161.83	54.93	218.01	64.61	2.25	
12	111.43	182.00	20.40	161.55	53.62	226.50	72.95	2.28	
13	114.29	182.00	19.61	161.92	53.95	233.24	79.16	2.32	
14	117.14	182.00	19.73	161.83	54.17	240.82	86.17	2.37	
15	120.00	182.00	16.38	161.92	53.10	249.85	95.29	2.44	

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-entry' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

****

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.) The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each exit point (considering all specified entry points).

Exit Point #	Exit Point (X, Y) [ft]		Entry Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	4.09	162.12	105.72	182.00	45.29	221.23	72.04	2.40	
2	7.32	162.03	105.72	182.00	46.96	219.11	69.49	2.37	
3	10.40	162.09	102.86	182.00	47.99	212.14	62.60	2.32	
4	13.78	161.89	102.86	182.00	49.68	210.20	60.19	2.30	
5	16.74	161.89	108.57	182.00	51.87	221.20	68.94	2.28	
6	20.11	161.75	105.72	182.00	53.04	213.58	61.41	2.24	
7	22.91	161.94	105.72	182.00	54.77	211.38	58.81	2.24	
8	26.63	161.54	105.72	182.00	56.50	209.18	56.23	2.25	
9	29.70	161.57	102.86	182.00	57.63	202.76	49.77	2.24	OK
10	32.62	162.63	102.86	182.00	59.85	200.92	46.99	2.25	
11	35.52	163.84	100.00	182.00	61.78	194.15	40.11	2.29	
12	39.06	164.46	100.00	182.00	64.08	192.17	37.33	2.34	
13	41.85	165.77	100.00	182.00	66.32	190.39	34.72	2.39	
14	45.25	166.05	97.14	182.00	67.69	185.46	29.66	2.47	
15	48.38	166.02	97.14	182.00	69.40	184.26	27.83	2.58	
16	51.39	166.12	97.14	182.00	71.14	183.07	26.03	2.77	
17	54.43	166.21	100.00	182.00	74.30	182.53	25.71	3.40	
18	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff
19	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff
20	30.00	161.50	30.00	161.50	30.00	161.50	0.00	N/A	#10 - Overhanging Cliff

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

CRITICAL RESULTS OF ROTATIONAL AND TRANSLATIONAL STABILITY ANALYSES

Rotational (Circular Arc; Bishop) Stability Analysis with slip surfaces excluded from this polygon:

Minimum Factor of Safety = 2.24

Critical Circle: Xc = 57.63[ft], Yc = 202.76[ft], R = 49.77[ft]. (Number of slices used = 53)

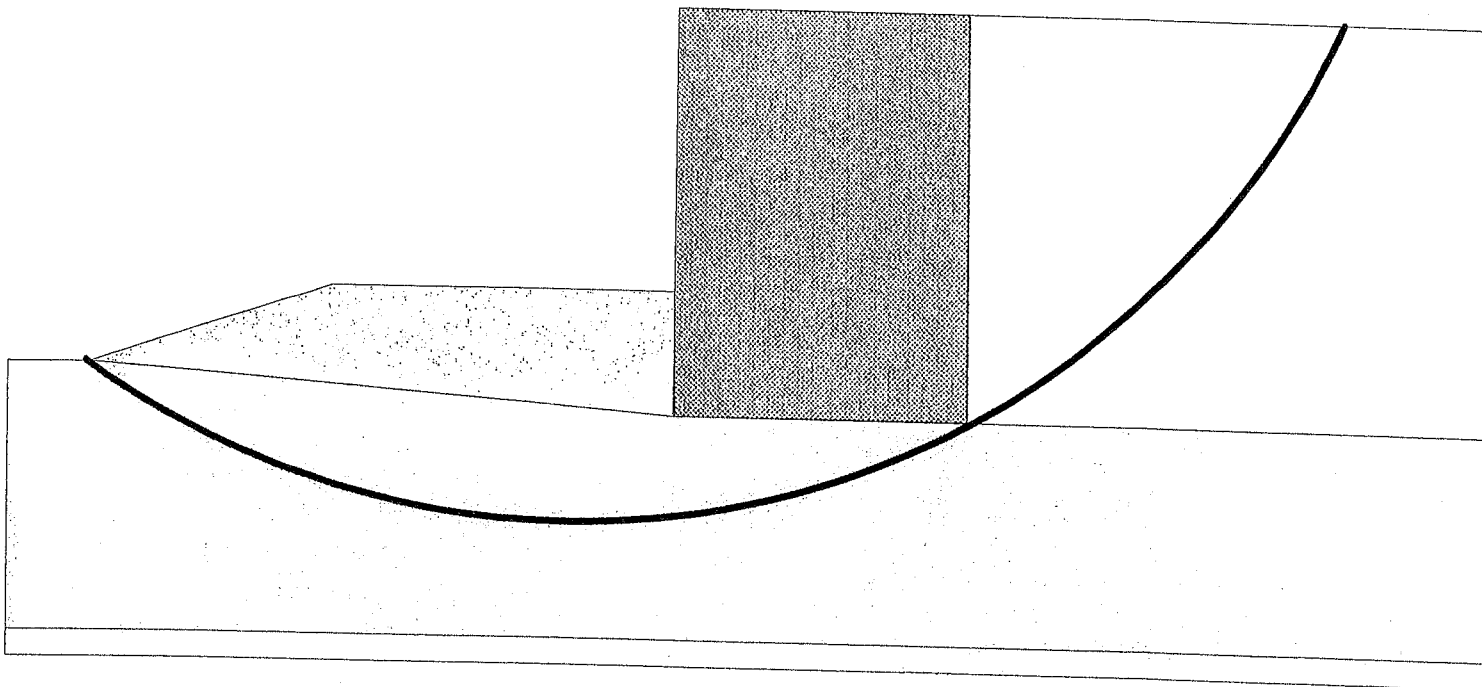
Translational (2-Part Wedge; Spencer), Direct Sliding, Stability Analysis

NOT CONDUCTED

Three-Part Wedge Stability Analysis

NOT CONDUCTED

REINFORCEMENT LAYOUT: DRAWING



SCALE:

0 2 4 6 8 10 [ft]

Ardaman & Associates, Inc.

Citrus Grove Phase V

PROJECT IDENTIFICATION

Title:	Citrus Grove Phase V
Project Number:	113-19-60-6418 -
Client:	DRMP
Designer:	Alexandra G. Aydelotte, P.E.
Station Number:	247+00

Description:
MSE Wall RW-2 Wall Height 28 ft ; Strap Length 20 ft

Company's information:

Name:	Ardaman & Associates, Inc.
Street:	8008 S. Orange Avenue Orlando, FL 32809
Telephone #:	407-855-3860
Fax #:	407-859-8121
E-Mail:	www.ardaman.com

Original file path and name: O:\Geotech ..... Grove Rd Phase 5 Lake Cty FL\Walls\247+00 (1).MSEp
Original date and time of creating this file: Tue Jul 14 15:45:53 2020

PROGRAM MODE: Analysis of a General Slope using NO reinforcement material.

INPUT DATA (EXCLUDING REINFORCEMENT LAYOUT)

SOIL DATA

Soil Layer #:	Unit weight, γ [lb/ft ^{3}]	Internal angle of friction, ϕ [deg.]	Cohesion, c [lb/ft ^{2}]
1	105.0	30.0	0.0
2	100.0	29.0	0.0
3	108.0	31.0	0.0
4	118.0	34.0	0.0

REINFORCEMENT

Analysis of slope WITHOUT reinforcement.

WATER

Unit weight of water = 62.45 [lb/ft ^{3}]
Water pressure is defined by phreatic surface in Effective Stress Analysis.

SEISMICITY

Not Applicable

DRAWING OF SPECIFIED GEOMETRY - GENERAL

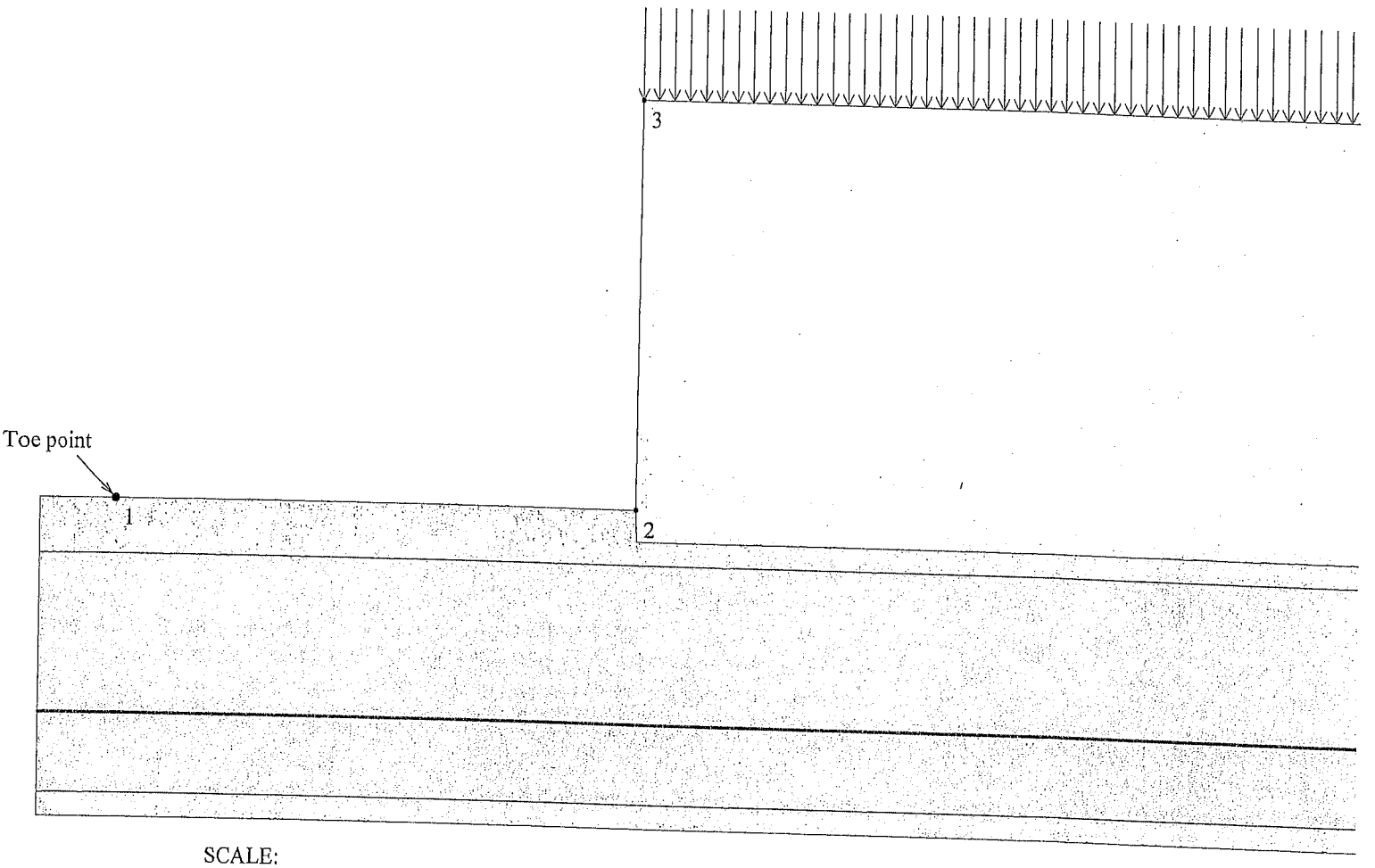
-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.
-- Xw,Yw represents the coordinates of phreatic surface.

GEOMETRY
Soil profile contains 4 layers (see details in next page)

WATER GEOMETRY
Phreatic line was specified.

UNIFORM SURCHARGE
Load Q1 = 250.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 64.10 and ends at X1e = 120.00 [ft].
Surcharge load, Q2.....None
Surcharge load, Q3.....None

STRIP LOAD
.....None.....



SCALE:

0 2 4 6 [ft]

TABULATED DETAILS OF GENERAL SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line.

	#	Xi	Yi
Top of Layer 1	1	30.00	165.00
	2	64.00	165.00
	3	64.10	191.00
	4	120.00	191.00
Top of Layer 2	5	30.00	165.00
	6	64.00	165.00
	7	64.10	163.00
	8	120.00	163.00
Top of Layer 3	9	30.00	161.50
	10	120.00	161.50
Top of Layer 4	11	30.00	146.50
	12	120.00	146.50
Top of Phreatic Line	14	30.00	151.50
	15	120.00	151.50

TABULATED DETAILS OF SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line. Y values are tabulated in the right most column.

#	X	Y1	Y2	Y3	Y4	(phreatic) Yw
1	30.00	165.00	165.00	161.50	146.50	151.50
2	64.00	165.00	165.00	161.50	146.50	151.50
3	64.10	191.00	163.00	161.50	146.50	151.50
4	120.00	191.00	163.00	161.50	146.50	151.50

RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each entry point (considering all specified exit points)

Entry Point #	Entry Point (X,Y) [ft]		Exit Point (X,Y) [ft]		Critical Circle (Xc,Yc,R) [ft]			Fs	STATUS
1	30.00	165.00	30.00	165.00	30.00	165.00	0.00	N/A	#10 - Overhanging Cliff
2	30.00	165.00	30.00	165.00	30.00	165.00	0.00	N/A	#10 - Overhanging Cliff
3	30.00	165.00	30.00	165.00	30.00	165.00	0.00	N/A	#10 - Overhanging Cliff
4	30.00	165.00	30.00	165.00	30.00	165.00	0.00	N/A	#10 - Overhanging Cliff
5	30.00	165.00	30.00	165.00	30.00	165.00	0.00	N/A	#10 - Overhanging Cliff
6	95.57	191.00	23.33	165.33	54.82	191.20	40.75	1.98	
7	98.29	191.00	38.76	165.31	62.83	191.35	35.46	1.73	
8	101.00	191.00	38.59	165.42	63.08	194.61	38.10	1.72	
9	103.72	191.00	32.47	165.33	59.92	200.85	44.89	1.69	OK
10	106.43	191.00	35.97	165.02	61.86	203.34	46.25	1.70	
11	109.14	191.00	35.68	165.20	61.88	208.07	50.25	1.70	
12	111.86	191.00	29.70	165.06	58.95	215.49	58.30	1.72	
13	114.57	191.00	29.70	165.05	59.21	220.31	62.64	1.75	
14	117.29	191.00	29.70	165.05	59.38	225.65	67.48	1.78	
15	120.00	191.00	29.70	165.04	59.45	231.60	72.90	1.81	

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-entry' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

****

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each exit point (considering all specified entry points).

Exit Point #	Exit Point (X,Y) [ft]		Entry Point (X,Y) [ft]		Critical Circle (Xc,Yc,R) [ft]			Fs	STATUS
1	3.97	165.63	114.57	191.00	46.49	234.05	80.55	1.96	
2	7.19	165.60	111.86	191.00	47.88	226.26	73.05	1.93	
3	10.94	165.15	114.57	191.00	49.48	231.30	76.56	1.87	
4	14.12	165.11	111.86	191.00	50.92	223.61	69.11	1.83	
5	17.27	165.09	109.14	191.00	52.29	216.73	62.40	1.80	
6	20.28	165.15	109.14	191.00	54.05	214.74	59.99	1.78	
7	23.41	165.14	106.43	191.00	55.37	208.73	54.05	1.75	
8	25.90	165.53	109.14	191.00	57.21	211.98	56.01	1.73	
9	29.70	165.07	106.43	191.00	58.58	206.10	50.18	1.70	
10	32.47	165.33	103.72	191.00	59.92	200.85	44.89	1.69	OK
11	35.68	165.20	109.14	191.00	61.88	208.07	50.25	1.70	
12	38.82	165.19	106.43	191.00	63.36	202.36	44.54	1.70	
13	41.93	165.19	103.72	191.00	64.81	197.29	39.41	1.72	
14	44.77	165.36	103.72	191.00	66.38	196.26	37.70	1.76	
15	48.20	165.13	103.72	191.00	67.99	195.17	35.97	1.83	
16	50.94	165.36	103.72	191.00	69.63	194.02	34.22	1.93	
17	54.19	165.25	103.72	191.00	71.31	192.82	32.45	2.08	
18	57.14	165.25	111.86	191.00	73.73	201.01	39.42	2.20	
19	60.40	165.29	111.86	191.02	79.70	191.02	32.16	3.61	
20	30.00	165.00	30.00	165.00	30.00	165.00	0.00	N/A	#10 - Overhanging Cliff

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

CRITICAL RESULTS OF ROTATIONAL AND TRANSLATIONAL STABILITY ANALYSES

Rotational (Circular Arc; Bishop) Stability Analysis with slip surfaces excluded from this polygon:

Minimum Factor of Safety = 1.69

Critical Circle: Xc = 59.92[ft], Yc = 200.85[ft], R = 44.89[ft]. (Number of slices used = 54)

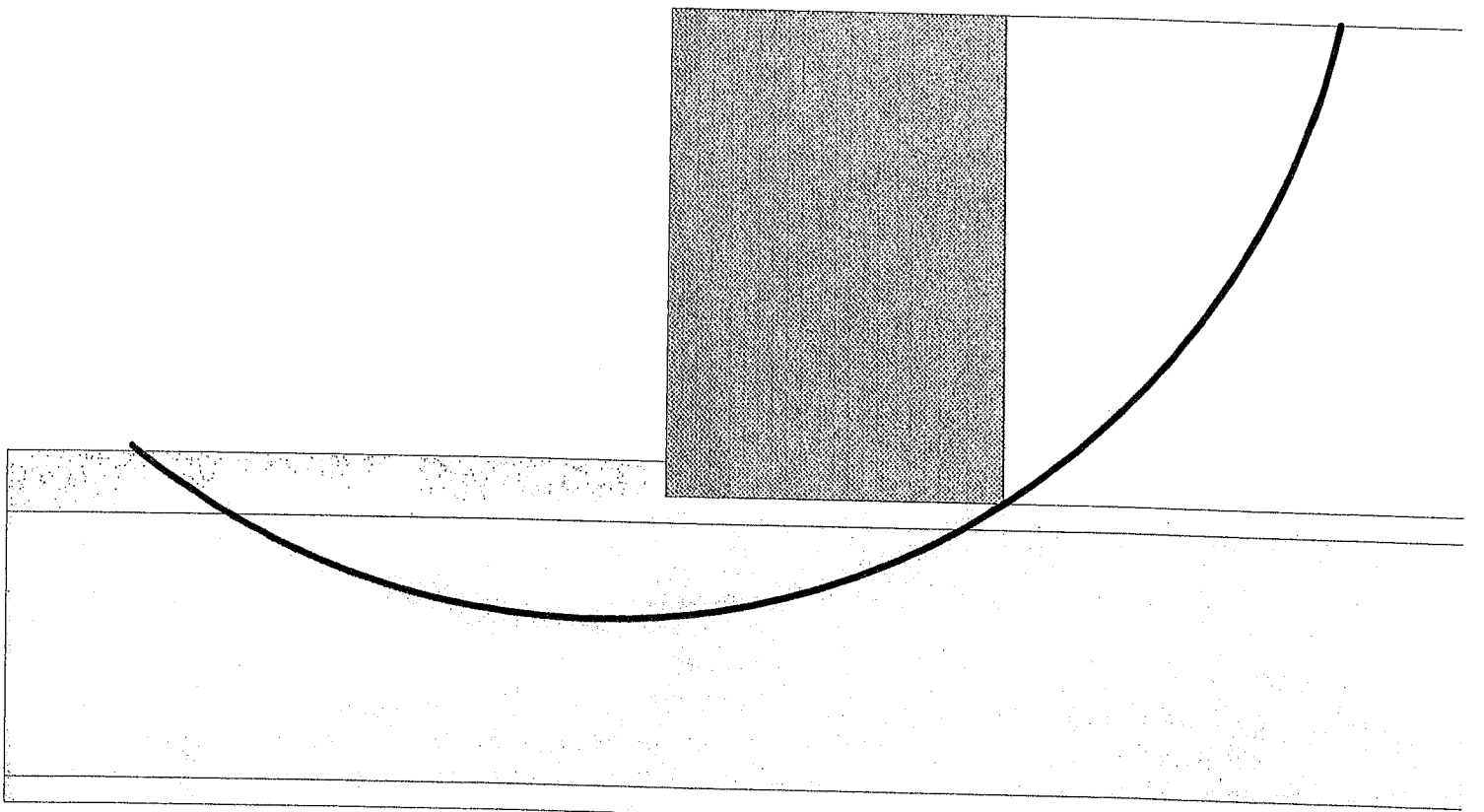
Translational (2-Part Wedge; Spencer), Direct Sliding, Stability Analysis

NOT CONDUCTED

Three-Part Wedge Stability Analysis

NOT CONDUCTED

REINFORCEMENT LAYOUT: DRAWING



SCALE:

0 2 4 6[ft]

Ardaman & Associates, Inc.

Citrus Grove Phase V

PROJECT IDENTIFICATION

Title:	Citrus Grove Phase V
Project Number:	113-19-60-6418 -
Client:	DRMP
Designer:	Alexandra G. Aydelotte, P.E.
Station Number:	247+00

Description:
MSE Wall RW-1 Wall Height 24 ft ; Strap Length 17 ft

Company's information:

Name:	Ardaman & Associates, Inc.
Street:	8008 S. Orange Avenue
	Orlando, FL 32809
Telephone #:	407-855-3860
Fax #:	407-859-8121
E-Mail:	www.ardaman.com

Original file path and name: O:\Geotech ..... Grove Rd Phase 5 Lake Cty FL\Walls\247+00 (2).MSEp
Original date and time of creating this file: Tue Jul 14 15:45:53 2020

PROGRAM MODE: Analysis of a General Slope using NO reinforcement material.

INPUT DATA (EXCLUDING REINFORCEMENT LAYOUT)

SOIL DATA

Soil Layer #:	Unit weight, γ [lb/ft ^{3}]	Internal angle of friction, ϕ [deg.]	Cohesion, c [lb/ft ^{2}]
1	105.0	30.0	0.0
2	100.0	29.0	0.0
3	108.0	31.0	0.0
4	118.0	34.0	0.0

REINFORCEMENT

Analysis of slope WITHOUT reinforcement.

WATER

Unit weight of water = 62.45 [lb/ft ^{3}]
Water pressure is defined by phreatic surface in Effective Stress Analysis.

SEISMICITY

Not Applicable

DRAWING OF SPECIFIED GEOMETRY - GENERAL

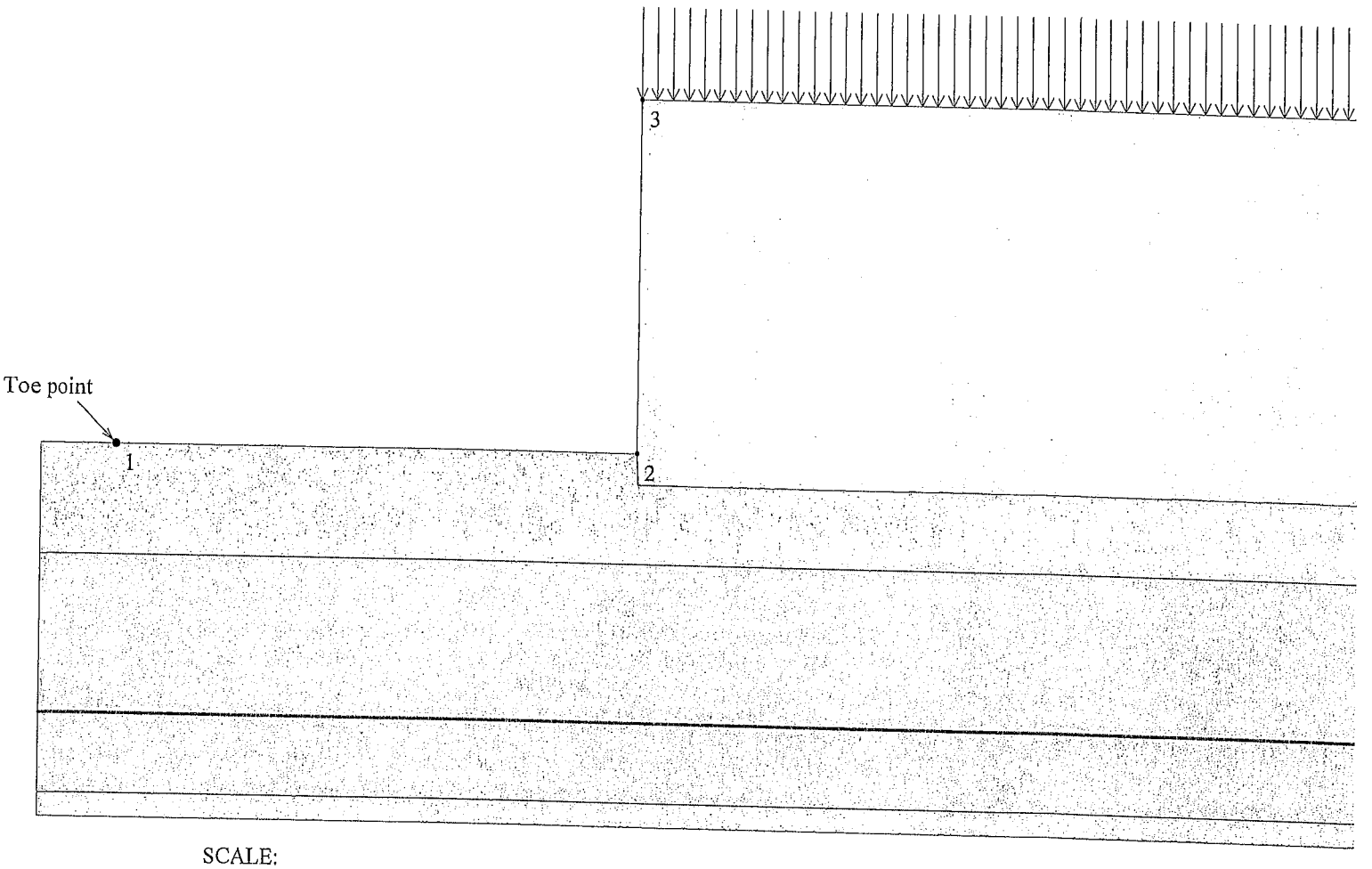
-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.
-- Xw,Yw represents the coordinates of phreatic surface.

GEOMETRY
Soil profile contains 4 layers (see details in next page)

WATER GEOMETRY
Phreatic line was specified.

UNIFORM SURCHARGE
Load Q1 = 250.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 64.10 and ends at X1e = 120.00 [ft].
Surcharge load, Q2.....None
Surcharge load, Q3.....None

STRIP LOAD
.....None.....



SCALE:

0 2 4 6[ft]

TABULATED DETAILS OF GENERAL SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line.

	#	Xi	Yi
Top of Layer 1	1	30.00	168.50
	2	64.00	168.50
	3	64.10	191.00
	4	120.00	191.00
Top of Layer 2	5	30.00	168.50
	6	64.00	168.50
	7	64.10	166.50
	8	120.00	166.50
Top of Layer 3	9	30.00	161.50
	10	120.00	161.50
Top of Layer 4	11	30.00	146.50
	12	120.00	146.50
Top of Phreatic Line	14	30.00	151.50
	15	120.00	151.50

TABULATED DETAILS OF SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line. Y values are tabulated in the right most column.

#	X	Y1	Y2	Y3	Y4	(phreatic) Yw
1	30.00	168.50	168.50	161.50	146.50	151.50
2	64.00	168.50	168.50	161.50	146.50	151.50
3	64.10	191.00	166.50	161.50	146.50	151.50
4	120.00	191.00	166.50	161.50	146.50	151.50

RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each entry point (considering all specified exit points)

Entry Point #	Entry Point (X, Y) [ft]		Exit Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	30.00	168.50	30.00	168.50	30.00	168.50	0.00	N/A	#10 - Overhanging Cliff
2	30.00	168.50	30.00	168.50	30.00	168.50	0.00	N/A	#10 - Overhanging Cliff
3	30.00	168.50	30.00	168.50	30.00	168.50	0.00	N/A	#10 - Overhanging Cliff
4	30.00	168.50	30.00	168.50	30.00	168.50	0.00	N/A	#10 - Overhanging Cliff
5	91.43	191.00	26.29	168.99	54.78	192.07	36.66	1.96	
6	94.29	191.00	41.96	168.72	63.08	191.69	31.21	1.68	
7	97.14	191.00	41.68	168.91	63.25	195.44	34.19	1.63	
8	100.00	191.00	41.97	168.66	63.30	199.78	37.74	1.60	OK
9	102.86	191.00	38.73	168.73	62.01	205.16	43.23	1.61	
10	105.72	191.00	32.23	168.89	58.88	213.50	51.96	1.63	
11	108.57	191.00	35.80	168.60	60.73	217.03	54.47	1.67	
12	111.43	191.00	29.70	168.55	57.86	226.03	64.01	1.72	
13	114.29	191.00	29.70	168.54	58.11	232.08	69.60	1.77	
14	117.14	191.00	29.70	168.54	58.24	238.89	75.91	1.82	
15	120.00	191.00	26.01	168.77	57.02	247.48	84.60	1.89	

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-entry' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

****

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each exit point (considering all specified entry points).

Exit Point #	Exit Point (X, Y) [ft]		Entry Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	4.84	168.60	108.57	191.00	44.83	234.79	77.33	2.02	
2	7.87	168.61	114.29	191.00	46.77	247.80	88.22	1.95	
3	10.38	168.94	111.43	191.00	48.21	238.11	78.84	1.90	
4	14.30	168.50	108.57	191.00	49.55	229.55	70.50	1.85	
5	16.80	168.85	108.57	191.00	51.28	227.18	67.76	1.82	
6	20.16	168.71	105.72	191.00	52.54	219.77	60.46	1.77	
7	23.03	168.82	108.57	191.00	54.37	224.01	63.46	1.73	
8	26.66	168.52	105.72	191.00	55.68	216.73	56.26	1.69	
9	29.70	168.56	105.72	191.00	57.45	214.52	53.69	1.67	
10	32.23	168.89	105.72	191.00	58.88	213.50	51.96	1.63	
11	35.31	168.95	102.86	191.00	60.51	206.25	45.01	1.63	
12	38.71	168.78	100.00	191.00	61.75	200.85	39.50	1.60	
13	41.97	168.66	100.00	191.00	63.30	199.78	37.74	1.60	OK
14	44.92	168.79	97.14	191.00	64.85	194.44	32.48	1.64	
15	47.91	168.86	97.14	191.00	66.48	193.38	30.76	1.70	
16	51.02	168.84	97.14	191.00	68.15	192.28	29.02	1.80	
17	54.38	168.63	100.00	191.00	70.10	194.29	30.09	1.95	
18	57.30	168.71	102.86	191.00	71.95	196.47	31.39	2.15	
19	60.77	168.52	105.72	191.00	77.43	191.39	28.29	3.32	
20	30.00	168.50	30.00	168.50	30.00	168.50	0.00	N/A	#10 - Overhanging Cliff

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

CRITICAL RESULTS OF ROTATIONAL AND TRANSLATIONAL STABILITY ANALYSES

Rotational (Circular Arc; Bishop) Stability Analysis with slip surfaces excluded from this polygon:

Minimum Factor of Safety = 1.60

Critical Circle: Xc = 63.30[ft], Yc = 199.78[ft], R = 37.74[ft]. (Number of slices used = 53)

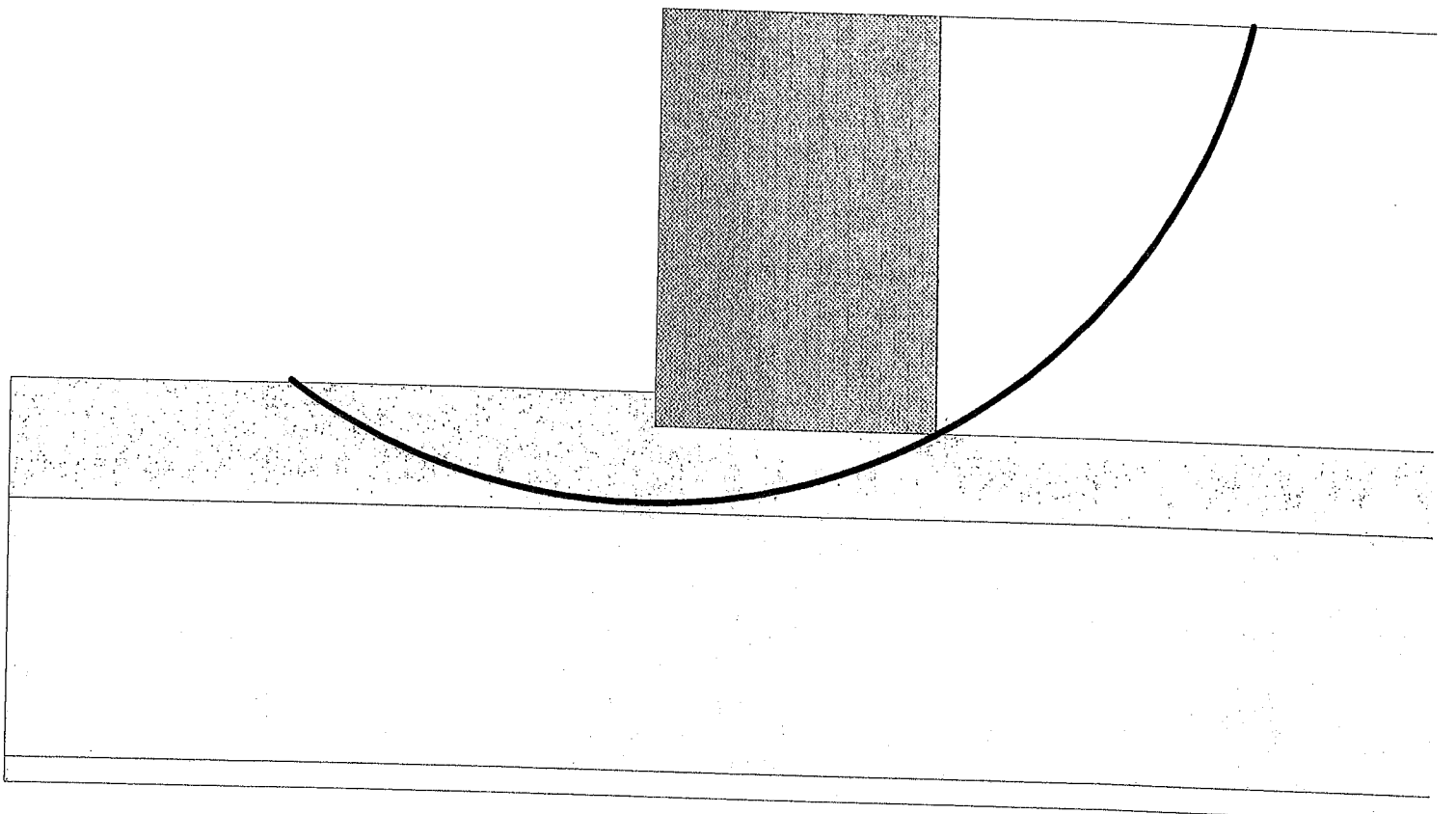
Translational (2-Part Wedge; Spencer), Direct Sliding, Stability Analysis

NOT CONDUCTED

Three-Part Wedge Stability Analysis

NOT CONDUCTED

REINFORCEMENT LAYOUT: DRAWING



SCALE:

0 2 4 6[ft]

Ardaman & Associates, Inc.

Citrus Grove Phase V

PROJECT IDENTIFICATION

Title:	Citrus Grove Phase V
Project Number:	113-19-60-6418 -
Client:	DRMP
Designer:	Alexandra G. Aydelotte, P.E.
Station Number:	247+00

Description:
MSE Wall RW-2 Wall Height 25 ft ; Strap Length 18 ft

Company's information:

Name:	Ardaman & Associates, Inc.
Street:	8008 S. Orange Avenue Orlando, FL 32809
Telephone #:	407-855-3860
Fax #:	407-859-8121
E-Mail:	www.ardaman.com

Original file path and name: O:\Geotech ..... Grove Rd Phase 5 Lake Cty FL\Walls\247+00 (3).MSEp
Original date and time of creating this file: Tue Jul 14 15:45:53 2020

PROGRAM MODE: Analysis of a General Slope using NO reinforcement material.

INPUT DATA (EXCLUDING REINFORCEMENT LAYOUT)

SOIL DATA

Soil Layer #	Unit weight, γ [lb/ft ^{3}]	Internal angle of friction, ϕ [deg.]	Cohesion, c [lb/ft ^{2}]
1	105.0	30.0	0.0
2	100.0	29.0	0.0
3	108.0	31.0	0.0
4	118.0	34.0	0.0

REINFORCEMENT

Analysis of slope WITHOUT reinforcement.

WATER

Unit weight of water = 62.45 [lb/ft ^{3}]
Water pressure is defined by phreatic surface in Effective Stress Analysis.

SEISMICITY

Not Applicable

DRAWING OF SPECIFIED GEOMETRY - GENERAL

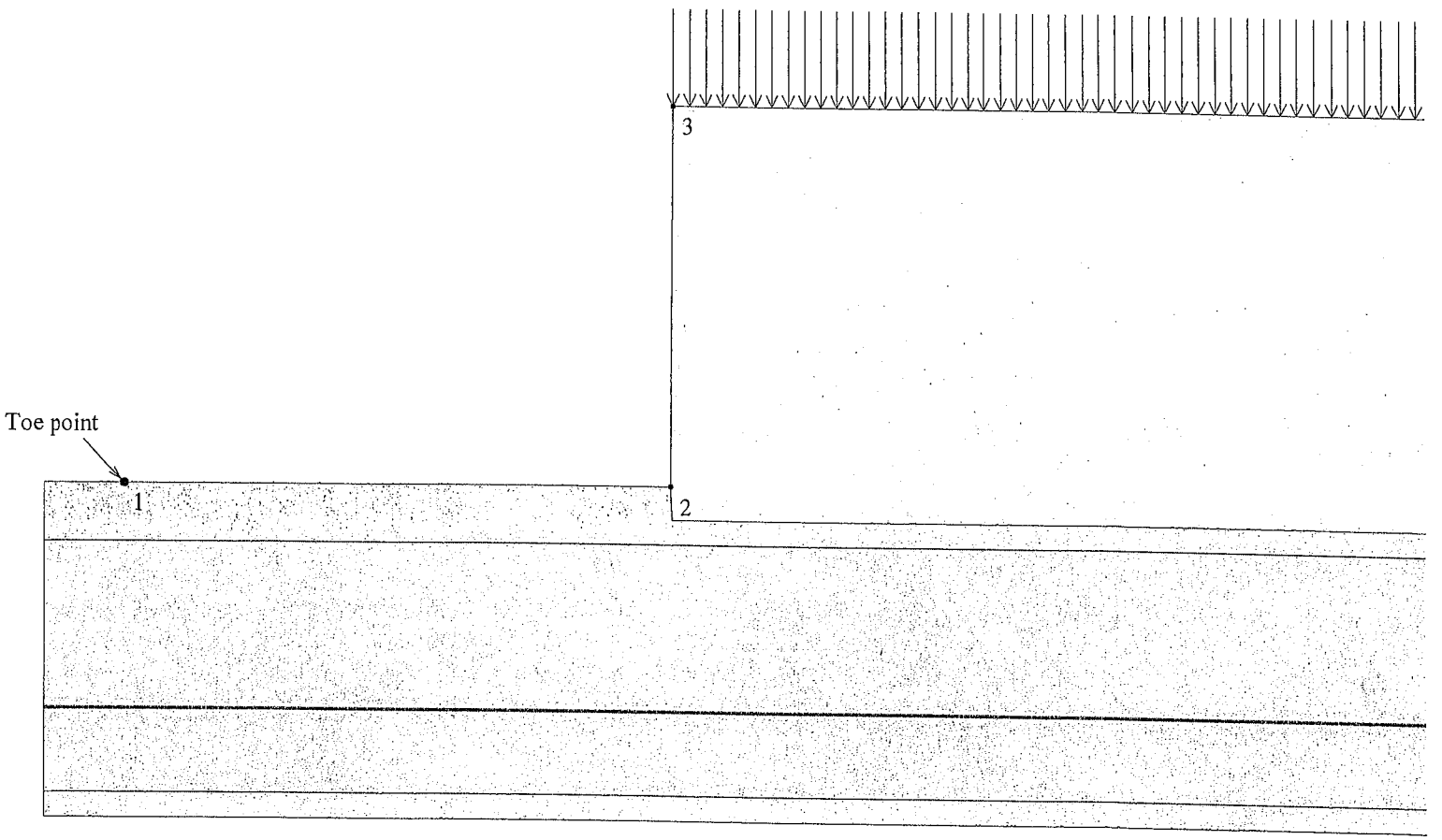
-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.
-- Xw,Yw represents the coordinates of phreatic surface.

GEOMETRY
Soil profile contains 4 layers (see details in next page)

WATER GEOMETRY
Phreatic line was specified.

UNIFORM SURCHARGE
Load Q1 = 250.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 64.10 and ends at X1e = 120.00 [ft].
Surcharge load, Q2.....None
Surcharge load, Q3.....None

STRIP LOAD
.....None.....



SCALE:

0 2 4 6 [ft]

TABULATED DETAILS OF GENERAL SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line.

	#	Xi	Yi
Top of Layer 1	1	30.00	165.00
	2	64.00	165.00
	3	64.10	188.00
	4	120.00	188.00
Top of Layer 2	5	30.00	165.00
	6	64.00	165.00
	7	64.10	163.00
	8	120.00	163.00
Top of Layer 3	9	30.00	161.50
	10	120.00	161.50
Top of Layer 4	11	30.00	146.50
	12	120.00	146.50
Top of Phreatic Line	14	30.00	151.50
	15	120.00	151.50

TABULATED DETAILS OF SPECIFIED GEOMETRY

Soil profile contains 4 layers. Coordinates in [ft.]
Water was described by phreatic line. Y values are tabulated in the right most column.

#	X	Y1	Y2	Y3	Y4	(phreatic) Yw
1	30.00	165.00	165.00	161.50	146.50	151.50
2	64.00	165.00	165.00	161.50	146.50	151.50
3	64.10	188.00	163.00	161.50	146.50	151.50
4	120.00	188.00	163.00	161.50	146.50	151.50

RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each entry point (considering all specified exit points)

Entry Point #	Entry Point (X, Y) [ft]		Exit Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	30.00	165.00	30.00	165.00	30.00	165.00	0.00	N/A	#10 - Overhanging Cliff
2	30.00	165.00	30.00	165.00	30.00	165.00	0.00	N/A	#10 - Overhanging Cliff
3	30.00	165.00	30.00	165.00	30.00	165.00	0.00	N/A	#10 - Overhanging Cliff
4	30.00	165.00	30.00	165.00	30.00	165.00	0.00	N/A	#10 - Overhanging Cliff
5	92.86	188.02	32.87	165.03	58.46	188.02	34.40	1.87	
6	95.57	188.00	35.68	165.30	60.21	190.96	35.49	1.76	
7	98.29	188.00	39.06	165.03	62.12	193.42	36.57	1.73	
8	101.00	188.00	35.90	165.07	60.59	198.85	41.84	1.71	OK
9	103.72	188.00	35.66	165.22	60.80	203.18	45.53	1.71	
10	106.43	188.00	32.54	165.22	59.44	209.18	51.54	1.73	
11	109.14	188.00	35.85	165.08	61.25	212.49	53.79	1.76	
12	111.86	188.00	35.57	165.21	61.54	217.36	58.26	1.80	
13	114.57	188.00	29.70	165.05	58.57	226.69	68.07	1.84	
14	117.29	188.00	29.70	165.04	58.68	233.04	73.91	1.88	
15	120.00	188.00	32.49	165.16	60.50	236.90	77.02	1.93	

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-entry' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

****

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each exit point (considering all specified entry points).

Exit Point #	Exit Point (X, Y) [ft]		Entry Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	4.81	165.11	111.86	188.00	45.72	235.53	81.45	2.08	
2	7.67	165.24	111.86	188.00	46.98	235.14	80.20	2.01	
3	10.68	165.29	111.86	188.00	48.70	232.65	77.35	1.97	
4	13.88	165.26	109.14	188.00	50.07	224.54	69.46	1.92	
5	17.04	165.23	106.43	188.00	51.37	217.31	62.37	1.87	
6	19.74	165.45	109.14	188.00	53.14	221.53	65.28	1.83	
7	23.19	165.29	103.72	188.00	54.35	208.92	53.61	1.80	
8	26.67	165.02	106.43	188.00	56.24	212.28	55.75	1.77	
9	29.70	165.07	103.72	188.00	57.54	206.13	49.61	1.73	
10	32.81	165.06	103.72	188.00	59.32	204.17	47.25	1.73	
11	35.90	165.07	101.00	188.00	60.59	198.85	41.84	1.71	OK
12	38.88	165.16	101.00	188.00	62.41	197.08	39.65	1.72	
13	41.95	165.19	98.29	188.00	63.68	192.50	34.90	1.73	
14	44.83	165.36	98.29	188.00	65.28	191.51	33.20	1.76	
15	48.22	165.13	98.29	188.00	66.90	190.47	31.48	1.82	
16	51.21	165.18	101.00	188.00	68.76	192.62	32.57	1.91	
17	54.34	165.12	109.14	188.00	71.10	202.05	40.56	2.04	
18	57.45	165.12	106.43	188.00	72.84	196.04	34.54	2.22	
19	60.80	165.00	106.43	188.00	77.69	188.25	28.74	3.49	
20	30.00	165.00	30.00	165.00	30.00	165.00	0.00	N/A	#10 - Overhanging Cliff

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

CRITICAL RESULTS OF ROTATIONAL AND TRANSLATIONAL STABILITY ANALYSES

Rotational (Circular Arc; Bishop) Stability Analysis with slip surfaces excluded from this polygon:

Minimum Factor of Safety = 1.71

Critical Circle: Xc = 60.59[ft], Yc = 198.85[ft], R = 41.84[ft]. (Number of slices used = 54)

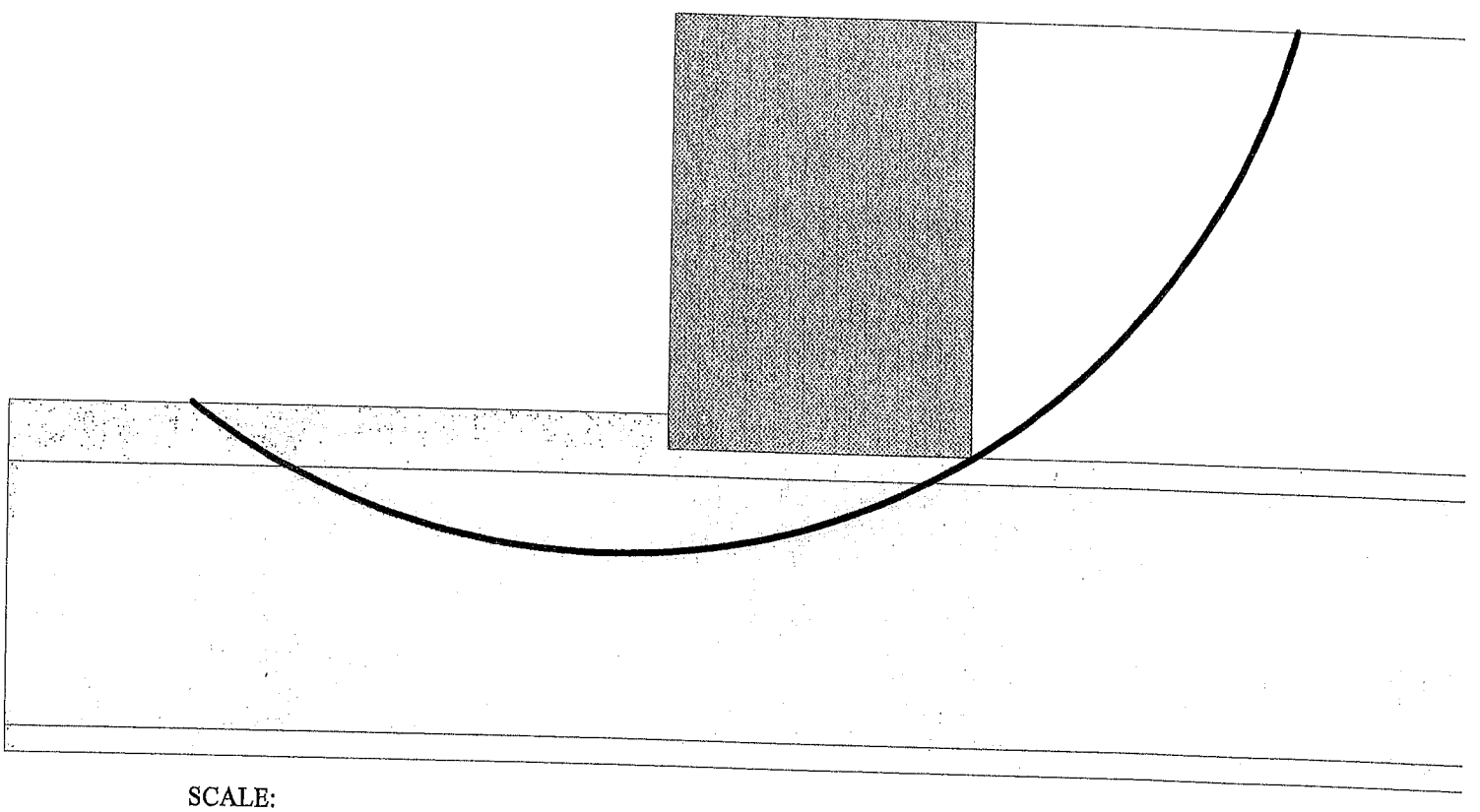
Translational (2-Part Wedge; Spencer), Direct Sliding, Stability Analysis

NOT CONDUCTED

Three-Part Wedge Stability Analysis

NOT CONDUCTED

REINFORCEMENT LAYOUT: DRAWING



SCALE:

0 2 4 6[ft]

Ardaman & Associates, Inc.

Citrus Grove Phase V

PROJECT IDENTIFICATION

Title:	Citrus Grove Phase V
Project Number:	113-19-60-6418 -
Client:	DRMP
Designer:	Alexandra G. Aydelotte, P.E.
Station Number:	251+00

Description:
MSE Wall RW-3 Wall Height 14 ft ; Strap Length 11 ft

Company's information:

Name:	Ardaman & Associates, Inc.
Street:	8008 S. Orange Avenue Orlando, FL 32809
Telephone #:	407-855-3860
Fax #:	407-859-8121
E-Mail:	www.ardaman.com

Original file path and name: O:\Geotech ..... rus Grove Rd Phase 5 Lake Cty FL\Walls\251+00.MSEp
Original date and time of creating this file: Tue Jul 14 15:45:53 2020

PROGRAM MODE: Analysis of a General Slope using NO reinforcement material.

INPUT DATA (EXCLUDING REINFORCEMENT LAYOUT)

SOIL DATA

Soil Layer #:	Unit weight, γ [lb/ft ^{3}]	Internal angle of friction, ϕ [deg.]	Cohesion, c [lb/ft ^{2}]
1	105.0	30.0	0.0
2	100.0	29.0	0.0
3	115.0	33.0	0.0

REINFORCEMENT

Analysis of slope WITHOUT reinforcement.

WATER

Unit weight of water = 62.45 [lb/ft ^{3}]
Water pressure is defined by phreatic surface in Effective Stress Analysis.

SEISMICITY

Not Applicable

DRAWING OF SPECIFIED GEOMETRY - GENERAL

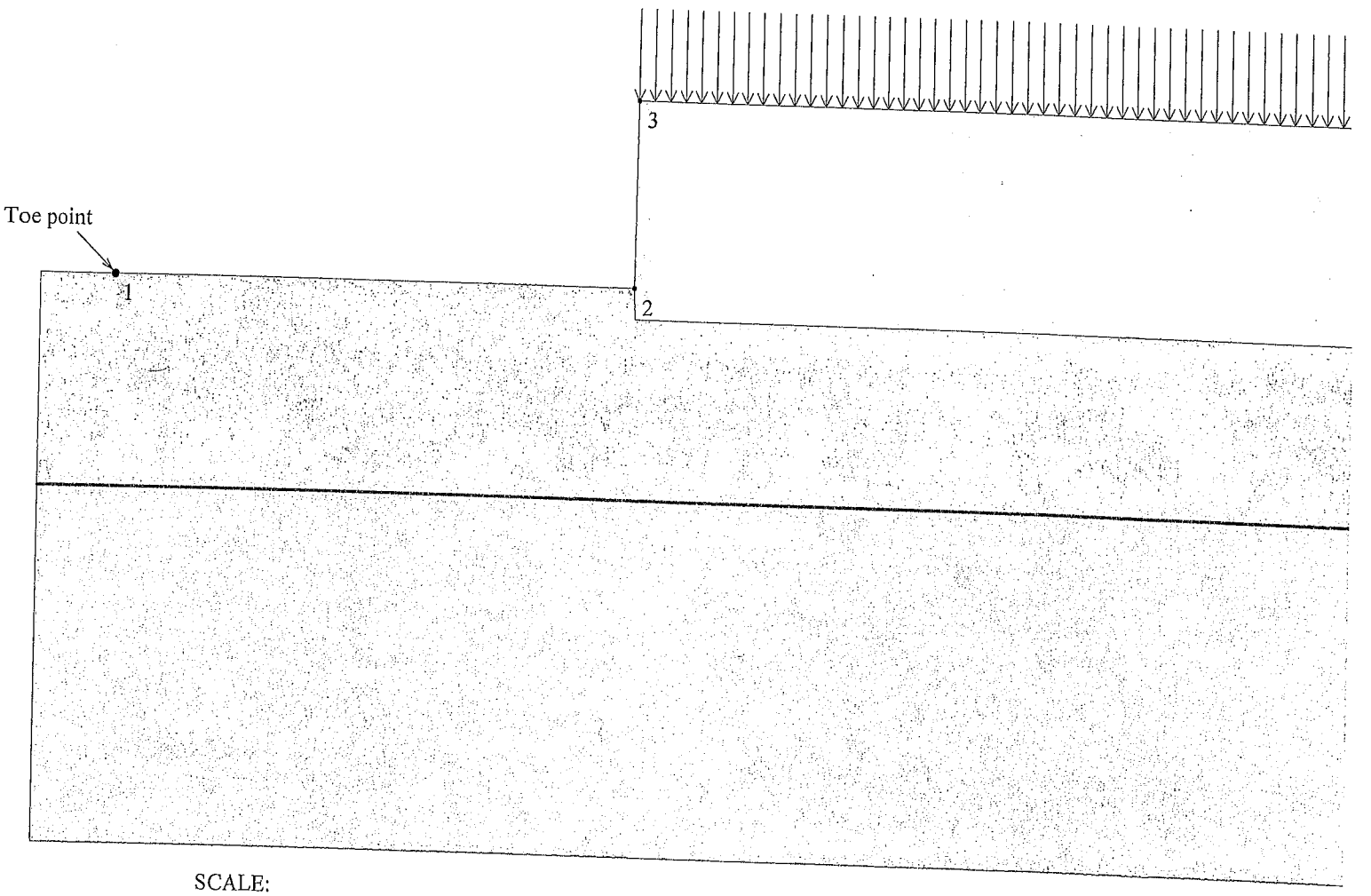
-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.
-- Xw,Yw represents the coordinates of phreatic surface.

GEOMETRY
Soil profile contains 3 layers (see details in next page)

WATER GEOMETRY
Phreatic line was specified.

UNIFORM SURCHARGE
Load Q1 = 250.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 64.10 and ends at X1e = 120.00 [ft].
Surcharge load, Q2.....None
Surcharge load, Q3.....None

STRIP LOAD
.....None.....



SCALE:

0 2 4 6[ft]

TABULATED DETAILS OF GENERAL SPECIFIED GEOMETRY

Soil profile contains 3 layers. Coordinates in [ft.]
Water was described by phreatic line.

Top of Layer 1
Top of Layer 2
Top of Layer 3
Top of Phreatic Line

#	Xi	Yi
1	30.00	181.00
2	64.00	181.00
3	64.10	193.00
4	120.00	193.00
5	30.00	181.00
6	64.00	181.00
7	64.10	179.00
8	120.00	179.00
9	30.00	167.50
10	120.00	167.50
12	30.00	167.50
13	120.00	167.50

TABULATED DETAILS OF SPECIFIED GEOMETRY

Soil profile contains 3 layers. Coordinates in [ft.]
Water was described by phreatic line. Y values are tabulated in the right most column.

#	X	Y1	Y2	Y3	(phreatic) Yw
1	30.00	181.00	181.00	167.50	167.50
2	64.00	181.00	181.00	167.50	167.50
3	64.10	193.00	179.00	167.50	167.50
4	120.00	193.00	179.00	167.50	167.50

RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each entry point (considering all specified exit points)

Entry Point #	Entry Point (X, Y) [ft]		Exit Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	30.00	181.00	30.00	181.00	30.00	181.00	0.00	N/A	#10 - Overhanging Cliff
2	30.00	181.00	30.00	181.00	30.00	181.00	0.00	N/A	#10 - Overhanging Cliff
3	81.43	193.01	48.14	181.32	62.73	193.02	18.70	1.84	
4	84.65	193.00	48.26	181.13	63.10	197.33	21.97	1.76	OK
5	87.86	193.00	48.06	181.24	63.43	202.46	26.20	1.76	
6	91.07	193.00	44.86	181.27	62.33	209.34	33.06	1.82	
7	94.29	193.00	41.74	181.24	61.09	218.07	41.60	1.91	
8	97.50	193.00	41.89	181.14	61.67	224.72	47.86	2.03	
9	100.72	193.00	38.86	181.09	60.31	236.26	59.19	2.16	
10	103.93	193.00	39.03	181.02	60.90	244.32	66.97	2.30	
11	107.14	193.00	35.29	181.22	59.58	258.12	80.64	2.45	
12	110.36	193.00	35.82	181.06	60.97	262.67	85.40	2.60	
13	113.57	193.00	32.34	181.17	60.63	271.72	94.86	2.75	
14	116.79	193.00	32.14	181.24	62.06	276.37	99.73	2.90	
15	120.00	193.00	29.70	181.03	61.78	285.61	109.39	3.05	

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-entry' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

****

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each exit point (considering all specified entry points).

Exit Point #	Exit Point (X, Y) [ft]		Entry Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	4.19	181.36	100.72	193.00	42.93	266.19	93.25	2.82	
2	8.04	181.03	97.50	193.00	43.79	254.17	81.40	2.70	
3	10.56	181.31	97.50	193.00	45.43	251.18	78.08	2.60	
4	14.02	181.14	97.50	193.00	47.07	248.20	74.76	2.51	
5	17.26	181.08	94.29	193.00	48.40	234.69	62.00	2.42	
6	20.17	181.18	94.29	193.00	49.78	233.82	60.39	2.31	
7	23.21	181.22	94.29	193.00	51.44	231.22	57.42	2.22	
8	26.30	181.26	91.07	193.00	52.58	220.85	47.51	2.13	
9	29.70	181.07	91.07	193.00	54.24	218.64	44.88	2.05	
10	32.64	181.17	91.07	193.00	55.91	216.44	42.26	1.98	
11	35.97	181.02	91.07	193.00	57.39	215.23	40.36	1.91	
12	39.01	181.07	87.86	193.00	58.59	206.87	32.39	1.84	
13	41.81	181.30	87.86	193.00	60.30	205.01	30.07	1.80	
14	45.14	181.12	87.86	193.00	61.85	203.78	28.15	1.76	
15	48.26	181.13	84.65	193.00	63.10	197.33	21.97	1.76	OK
16	51.18	181.29	84.65	193.00	64.73	196.22	20.17	1.79	
17	54.56	181.04	84.65	193.00	66.40	195.06	18.36	1.90	
18	57.48	181.18	84.65	193.00	68.12	193.86	16.55	2.15	
19	60.74	181.05	87.86	193.00	71.26	193.92	16.62	3.05	
20	30.00	181.00	30.00	181.00	30.00	181.00	0.00	N/A	#10 - Overhanging Cliff

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

CRITICAL RESULTS OF ROTATIONAL AND TRANSLATIONAL STABILITY ANALYSES

Rotational (Circular Arc; Bishop) Stability Analysis with slip surfaces excluded from this polygon:

Minimum Factor of Safety = 1.76

Critical Circle: Xc = 63.10[ft], Yc = 197.33[ft], R = 21.97[ft]. (Number of slices used = 52)

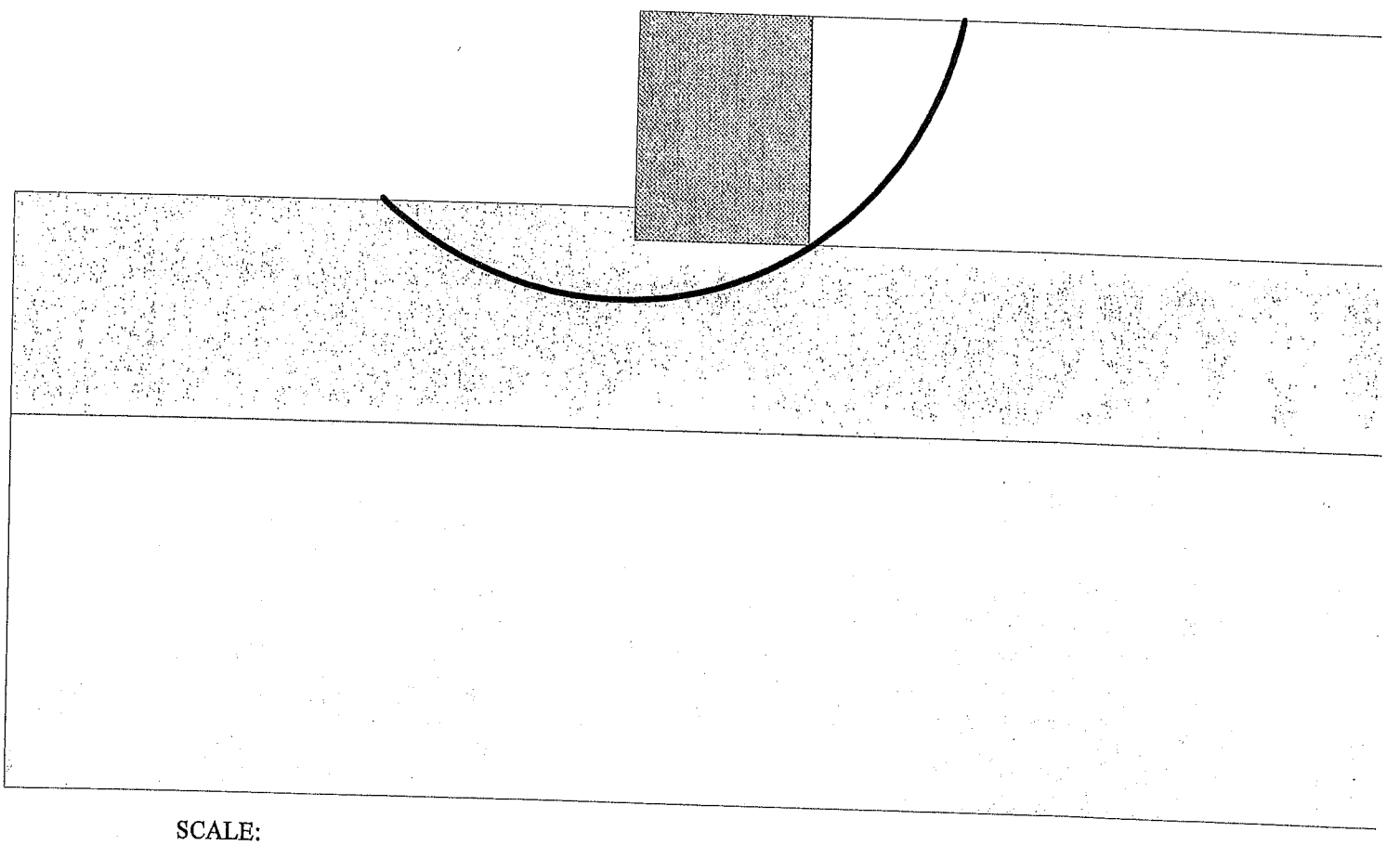
Translational (2-Part Wedge; Spencer), Direct Sliding, Stability Analysis

NOT CONDUCTED

Three-Part Wedge Stability Analysis

NOT CONDUCTED

REINFORCEMENT LAYOUT: DRAWING



SCALE:

0 2 4 6[ft]

Ardaman & Associates, Inc.

Citrus Grove Phase V

PROJECT IDENTIFICATION

Title:	Citrus Grove Phase V
Project Number:	113-19-60-6418 -
Client:	DRMP
Designer:	Alexandra G. Aydelotte, P.E.
Station Number:	252+00

Description:
MSE Wall RW-4 Wall Height 15 ft ; Strap Length 11 ft

Company's information:

Name:	Ardaman & Associates, Inc.
Street:	8008 S. Orange Avenue Orlando, FL 32809
Telephone #:	407-855-3860
Fax #:	407-859-8121
E-Mail:	www.ardaman.com

Original file path and name: O:\Geotech ..... Grove Rd Phase 5 Lake Cty FL\Walls\252+00 (1).MSEp
Original date and time of creating this file: Tue Jul 14 15:45:53 2020

PROGRAM MODE: Analysis of a General Slope using NO reinforcement material.

INPUT DATA (EXCLUDING REINFORCEMENT LAYOUT)

SOIL DATA

Soil Layer #:	Unit weight, γ [lb/ft ^{3}]	Internal angle of friction, ϕ [deg.]	Cohesion, c [lb/ft ^{2}]
1	105.0	30.0	0.0
2	100.0	29.0	0.0
3	115.0	33.0	0.0

REINFORCEMENT

Analysis of slope WITHOUT reinforcement.

WATER

Unit weight of water = 62.45 [lb/ft ^{3}]
Water pressure is defined by phreatic surface in Effective Stress Analysis.

SEISMICITY

Not Applicable

DRAWING OF SPECIFIED GEOMETRY - GENERAL

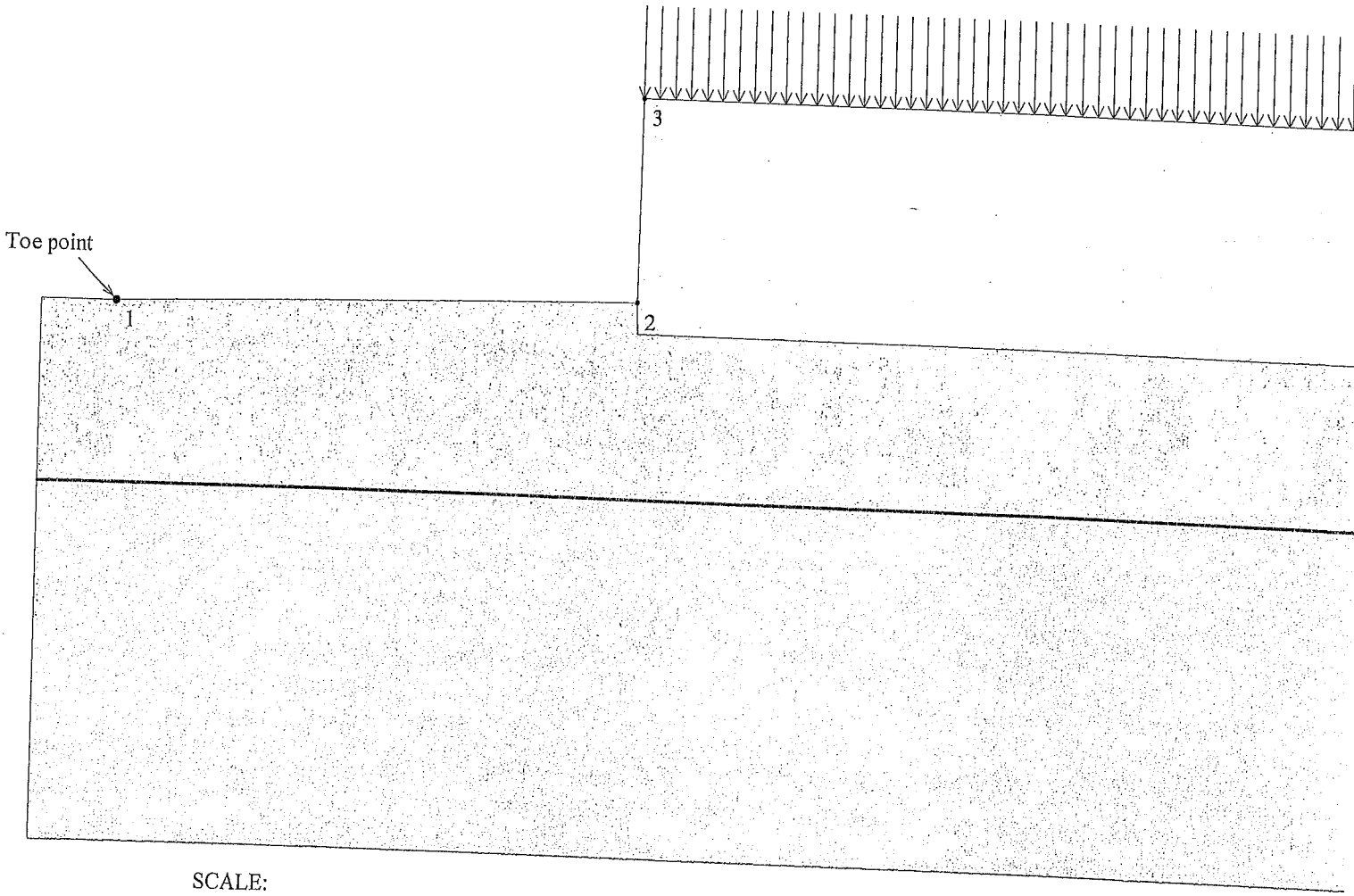
-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.
-- Xw,Yw represents the coordinates of phreatic surface.

GEOMETRY
Soil profile contains 3 layers (see details in next page)

WATER GEOMETRY
Phreatic line was specified.

UNIFORM SURCHARGE
Load Q1 = 250.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 64.10 and ends at X1e = 120.00 [ft].
Surcharge load, Q2.....None
Surcharge load, Q3.....None

STRIP LOAD
.....None.....



SCALE:

0 2 4 6[ft]

TABULATED DETAILS OF GENERAL SPECIFIED GEOMETRY

Soil profile contains 3 layers. Coordinates in [ft.]
Water was described by phreatic line.

Top of Layer 1
Top of Layer 2
Top of Layer 3
Top of Phreatic Line

#	Xi	Yi
1	30.00	179.00
2	64.00	180.00
3	64.10	193.00
4	120.00	193.00
5	30.00	179.00
6	64.00	180.00
7	64.10	178.00
8	120.00	178.00
9	30.00	167.50
10	120.00	167.50
12	30.00	167.50
13	120.00	167.50

TABULATED DETAILS OF SPECIFIED GEOMETRY

Soil profile contains 3 layers. Coordinates in [ft.]
Water was described by phreatic line. Y values are tabulated in the right most column.

#	X	Y1	Y2	Y3	(phreatic) Yw
1	30.00	179.00	179.00	167.50	167.50
2	64.00	180.00	180.00	167.50	167.50
3	64.10	193.00	178.00	167.50	167.50
4	120.00	193.00	178.00	167.50	167.50

RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each entry point (considering all specified exit points)

Entry Point #	Entry Point (X,Y) [ft]		Exit Point (X,Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	30.00	179.00	30.00	179.00	30.00	179.00	0.00	N/A	#10 - Overhanging Cliff
2	30.00	179.00	30.00	179.00	30.00	179.00	0.00	N/A	#10 - Overhanging Cliff
3	30.00	179.00	30.00	179.00	30.00	179.00	0.00	N/A	#10 - Overhanging Cliff
4	83.86	193.00	48.15	179.77	62.67	195.39	21.32	1.66	
5	87.15	193.00	45.01	179.66	61.29	201.46	27.20	1.64	OK
6	90.43	193.00	41.93	179.52	59.91	208.83	34.38	1.69	
7	93.72	193.00	45.00	179.60	61.89	213.46	37.84	1.76	
8	97.00	193.00	38.62	179.48	58.72	225.48	50.21	1.85	
9	100.29	193.00	38.73	179.41	59.38	232.09	56.59	1.97	
10	103.57	193.00	35.85	179.23	57.60	245.66	69.90	2.09	
11	106.86	193.00	35.43	179.34	57.89	255.50	79.40	2.22	
12	110.14	193.00	32.21	179.27	56.74	268.07	92.13	2.35	
13	113.43	193.00	32.80	179.11	58.11	273.17	97.40	2.49	
14	116.71	193.00	29.70	179.03	57.65	282.92	107.59	2.62	
15	120.00	193.00	25.99	179.21	58.01	288.20	113.61	2.75	

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-entry' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

****

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each exit point (considering all specified entry points).

Exit Point #	Exit Point (X,Y) [ft]		Entry Point (X,Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	4.23	179.35	100.29	193.00	41.60	261.20	89.97	2.49	
2	7.54	179.24	100.29	193.00	42.83	260.82	88.89	2.40	
3	10.60	179.30	97.00	193.00	44.20	246.66	75.28	2.30	
4	14.05	179.12	97.00	193.00	45.88	243.74	72.03	2.23	
5	16.78	179.31	97.00	193.00	47.56	240.83	68.79	2.16	
6	20.20	179.17	93.72	193.00	48.71	229.90	58.20	2.07	
7	23.22	179.21	93.72	193.00	50.40	227.35	55.28	2.00	
8	26.31	179.26	90.43	193.00	51.66	217.43	45.83	1.93	
9	29.70	179.07	90.43	193.00	53.36	215.27	43.25	1.87	
10	32.51	179.34	90.43	193.00	55.09	213.25	40.73	1.82	
11	35.84	179.28	90.43	193.00	56.60	212.14	38.87	1.75	
12	39.09	179.28	90.43	193.00	58.36	210.09	36.34	1.72	
13	42.13	179.41	87.15	193.00	59.70	202.58	29.07	1.67	
14	45.01	179.66	87.15	193.00	61.29	201.46	27.20	1.64	OK
15	48.15	179.77	83.86	193.00	62.67	195.39	21.32	1.66	
16	51.25	179.86	83.86	193.00	64.34	194.40	19.57	1.69	
17	54.30	179.98	83.86	193.00	66.05	193.37	17.81	1.80	
18	57.39	180.02	87.15	193.00	68.16	195.92	19.21	2.03	
19	60.56	180.09	90.43	193.00	71.96	194.72	18.55	3.03	
20	30.00	179.00	30.00	179.00	30.00	179.00	0.00	N/A	#10 - Overhanging Cliff

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

CRITICAL RESULTS OF ROTATIONAL AND TRANSLATIONAL STABILITY ANALYSES

Rotational (Circular Arc; Bishop) Stability Analysis with slip surfaces excluded from this polygon:

Minimum Factor of Safety = 1.64

Critical Circle: Xc = 61.29[ft], Yc = 201.46[ft], R = 27.20[ft]. (Number of slices used = 53)

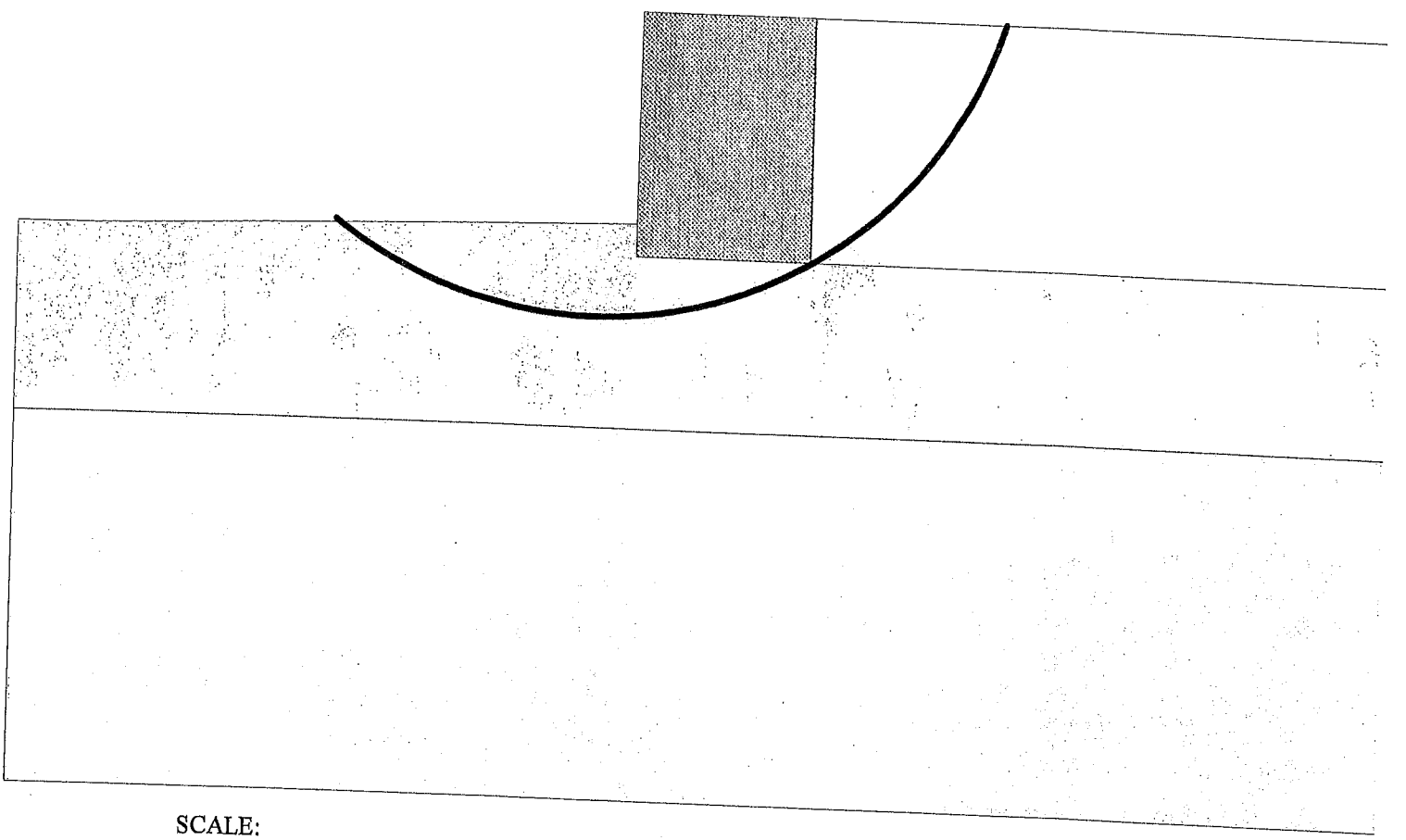
Translational (2-Part Wedge; Spencer), Direct Sliding, Stability Analysis

NOT CONDUCTED

Three-Part Wedge Stability Analysis

NOT CONDUCTED

REINFORCEMENT LAYOUT: DRAWING



SCALE:

0 2 4 6[ft]

Ardaman & Associates, Inc.

Citrus Grove Phase V

PROJECT IDENTIFICATION

Title:	Citrus Grove Phase V
Project Number:	113-19-60-6418 -
Client:	DRMP
Designer:	Alexandra G. Aydelotte, P.E.
Station Number:	252+00

Description:
MSE Wall RW-4 Wall Height 13 ft ; Strap Length10 ft

Company's information:

Name:	Ardaman & Associates, Inc.
Street:	8008 S. Orange Avenue Orlando, FL 32809
Telephone #:	407-855-3860
Fax #:	407-859-8121
E-Mail:	www.ardaman.com

Original file path and name: O:\Geotech ..... Grove Rd Phase 5 Lake Cty FL\Walls\252+00 (2).MSEp
Original date and time of creating this file: Tue Jul 14 15:45:53 2020

PROGRAM MODE: Analysis of a General Slope using NO reinforcement material.

INPUT DATA (EXCLUDING REINFORCEMENT LAYOUT)

SOIL DATA

Soil Layer #:	Unit weight, γ [lb/ft ^{3}]	Internal angle of friction, ϕ [deg.]	Cohesion, c [lb/ft ^{2}]
1	105.0	30.0	0.0
2	100.0	29.0	0.0
3	115.0	33.0	0.0

REINFORCEMENT

Analysis of slope WITHOUT reinforcement.

WATER

Unit weight of water = 62.45 [lb/ft ^{3}]
Water pressure is defined by phreatic surface in Effective Stress Analysis.

SEISMICITY

Not Applicable

DRAWING OF SPECIFIED GEOMETRY - GENERAL

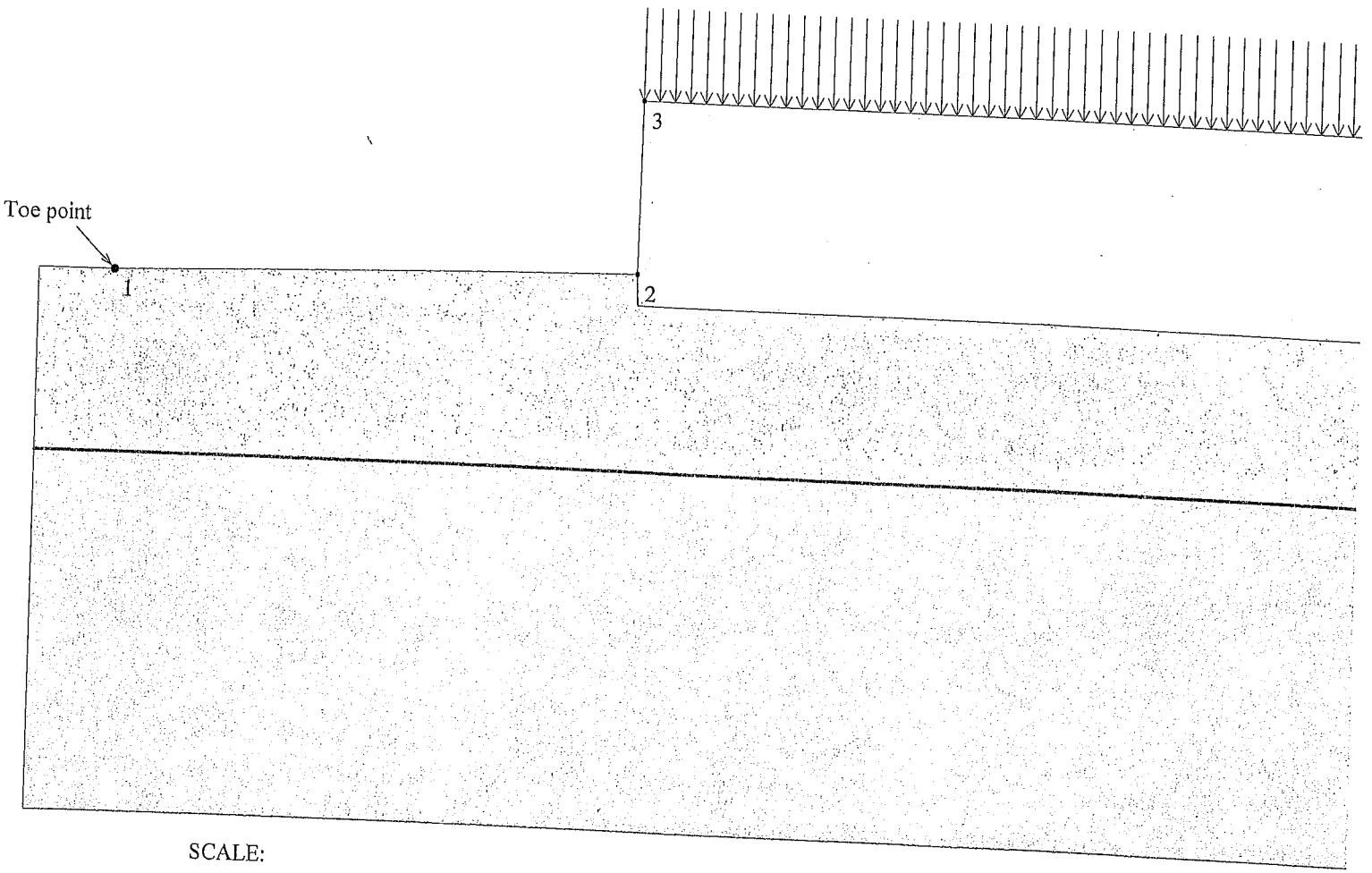
-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.
-- Xw,Yw represents the coordinates of phreatic surface.

GEOMETRY
Soil profile contains 3 layers (see details in next page)

WATER GEOMETRY
Phreatic line was specified.

UNIFORM SURCHARGE
Load Q1 = 250.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 64.10 and ends at X1e = 120.00 [ft].
Surcharge load, Q2.....None
Surcharge load, Q3.....None

STRIP LOAD
.....None.....



SCALE:

0 2 4 6[ft]

TABULATED DETAILS OF GENERAL SPECIFIED GEOMETRY

Soil profile contains 3 layers. Coordinates in [ft.]
Water was described by phreatic line.

	#	Xi	Yi
Top of Layer 1	1	30.00	179.00
	2	64.00	180.00
	3	64.10	191.00
	4	120.00	191.00
Top of Layer 2	5	30.00	179.00
	6	64.00	180.00
	7	64.10	178.00
	8	120.00	178.00
Top of Layer 3	9	30.00	167.50
	10	120.00	167.50
Top of Phreatic Line	12	30.00	167.50
	13	120.00	167.50

TABULATED DETAILS OF SPECIFIED GEOMETRY

Soil profile contains 3 layers. Coordinates in [ft.]
Water was described by phreatic line. Y values are tabulated in the right most column.

#	X	Y1	Y2	Y3	(phreatic) Yw
1	30.00	179.00	179.00	167.50	167.50
2	64.00	180.00	180.00	167.50	167.50
3	64.10	191.00	178.00	167.50	167.50
4	120.00	191.00	178.00	167.50	167.50

RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each entry point (considering all specified exit points)

Entry Point #	Entry Point (X,Y) [ft]		Exit Point (X,Y) [ft]		Critical Circle (Xc,Yc,R) [ft]			Fs	STATUS
1	30.00	179.00	30.00	179.00	30.00	179.00	0.00	N/A	#10 - Overhanging Cliff
2	30.00	179.00	30.00	179.00	30.00	179.00	0.00	N/A	#10 - Overhanging Cliff
3	80.57	191.00	51.48	179.65	63.67	191.38	16.91	1.76	
4	83.86	191.00	48.35	179.58	62.40	196.82	22.24	1.71	OK
5	87.15	191.00	48.20	179.66	62.70	202.42	26.98	1.73	
6	90.43	191.00	45.15	179.53	61.30	210.86	35.25	1.81	
7	93.72	191.00	44.91	179.62	61.68	218.04	41.92	1.92	
8	97.00	191.00	41.85	179.49	60.28	229.04	52.87	2.05	
9	100.29	191.00	38.73	179.39	59.05	240.66	64.55	2.20	
10	103.57	191.00	35.71	179.26	57.62	254.59	78.45	2.36	
11	106.86	191.00	35.50	179.32	59.02	259.46	83.51	2.51	
12	110.14	191.00	32.78	179.12	58.61	268.75	93.28	2.67	
13	113.43	191.00	32.59	179.17	60.04	273.74	98.47	2.82	
14	116.71	191.00	29.70	179.03	59.69	283.25	108.45	2.97	
15	120.00	191.00	25.99	179.21	59.44	293.17	118.77	3.12	

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-entry' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

****

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each exit point (considering all specified entry points).

Exit Point #	Exit Point (X,Y) [ft]		Entry Point (X,Y) [ft]		Critical Circle (Xc,Yc,R) [ft]			Fs	STATUS
1	4.70	179.13	97.00	191.00	40.79	263.31	91.59	2.74	
2	8.01	179.04	97.00	191.00	42.44	259.90	87.89	2.64	
3	10.54	179.28	97.00	191.00	44.10	256.51	84.20	2.55	
4	13.72	179.29	93.72	191.00	45.31	242.58	70.73	2.45	
5	17.27	179.06	93.72	191.00	46.97	239.63	67.45	2.36	
6	19.97	179.31	90.43	191.00	48.25	227.06	55.50	2.27	
7	23.06	179.31	90.43	191.00	49.91	224.57	52.62	2.18	
8	26.31	179.22	90.43	191.00	51.33	223.43	50.80	2.09	
9	29.70	179.06	90.43	191.00	53.01	220.88	47.88	2.02	
10	32.73	179.20	87.15	191.00	54.35	210.88	38.35	1.94	
11	35.96	179.20	87.15	191.00	56.06	208.92	35.88	1.87	
12	38.72	179.53	87.15	191.00	57.79	206.98	33.42	1.82	
13	42.04	179.46	87.15	191.00	59.34	205.76	31.48	1.76	
14	45.06	179.65	83.86	191.00	60.78	197.90	24.09	1.73	
15	48.35	179.58	83.86	191.00	62.40	196.82	22.24	1.71	OK
16	51.33	179.76	83.86	191.00	64.04	195.68	20.37	1.72	
17	54.41	179.87	83.86	191.00	65.72	194.48	18.47	1.81	
18	57.66	179.85	83.86	191.00	67.57	192.91	16.40	2.06	
19	60.69	179.99	87.15	191.00	70.88	192.80	16.37	2.99	
20	30.00	179.00	30.00	179.00	30.00	179.00	0.00	N/A	#10 - Overhanging Cliff

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

CRITICAL RESULTS OF ROTATIONAL AND TRANSLATIONAL STABILITY ANALYSES

Rotational (Circular Arc; Bishop) Stability Analysis with slip surfaces excluded from this polygon:

Minimum Factor of Safety = 1.71

Critical Circle: Xc = 62.40[ft], Yc = 196.82[ft], R = 22.24[ft]. (Number of slices used = 53)

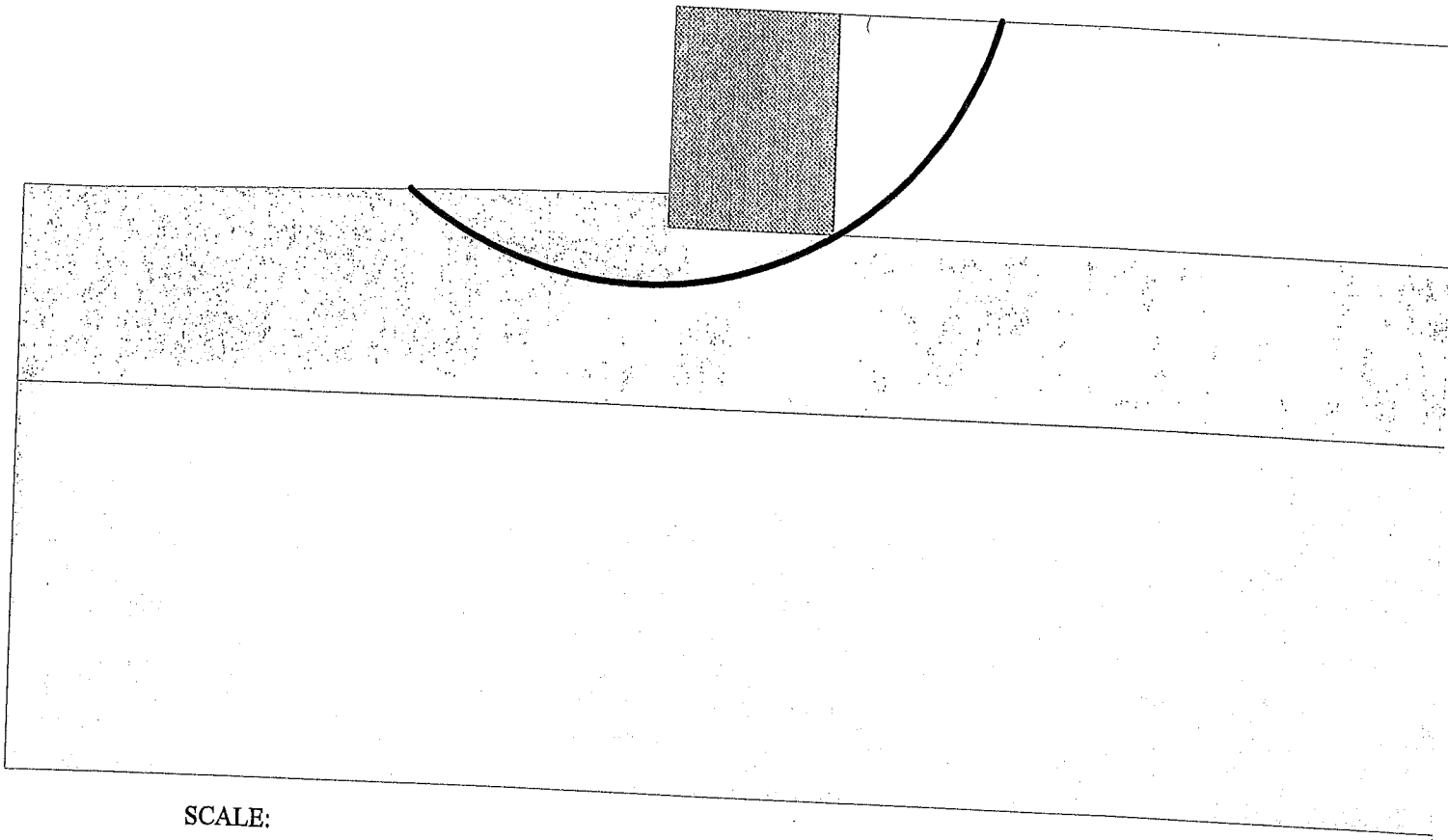
Translational (2-Part Wedge; Spencer), Direct Sliding, Stability Analysis

NOT CONDUCTED

Three-Part Wedge Stability Analysis

NOT CONDUCTED

REINFORCEMENT LAYOUT: DRAWING



SCALE:

0 2 4 6[ft]

Ardaman & Associates, Inc.

Citrus Grove Phase V

PROJECT IDENTIFICATION

Title:	Citrus Grove Phase V
Project Number:	113-19-60-6418 -
Client:	DRMP
Designer:	Alexandra G. Aydelotte, P.E.
Station Number:	252+00

Description:
MSE Wall RW-4 Wall Height 12 ft ; Strap Length 9 ft

Company's information:

Name:	Ardaman & Associates, Inc.
Street:	8008 S. Orange Avenue Orlando, FL 32809
Telephone #:	407-855-3860
Fax #:	407-859-8121
E-Mail:	www.ardaman.com

Original file path and name: O:\Geotech ..... Grove Rd Phase 5 Lake Cty FL\Walls\252+00 (3).MSEp
Original date and time of creating this file: Tue Jul 14 15:45:53 2020

PROGRAM MODE: Analysis of a General Slope using NO reinforcement material.

INPUT DATA (EXCLUDING REINFORCEMENT LAYOUT)

SOIL DATA

Soil Layer #:	Unit weight, γ [lb/ft ^{3}]	Internal angle of friction, ϕ [deg.]	Cohesion, c [lb/ft ^{2}]
1	105.0	30.0	0.0
2	100.0	29.0	0.0
3	115.0	33.0	0.0

REINFORCEMENT

Analysis of slope WITHOUT reinforcement.

WATER

Unit weight of water = 62.45 [lb/ft ^{3}]
Water pressure is defined by phreatic surface in Effective Stress Analysis.

SEISMICITY

Not Applicable

DRAWING OF SPECIFIED GEOMETRY - GENERAL

-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.
-- Xw,Yw represents the coordinates of phreatic surface.

GEOMETRY

Soil profile contains 3 layers (see details in next page)

WATER GEOMETRY

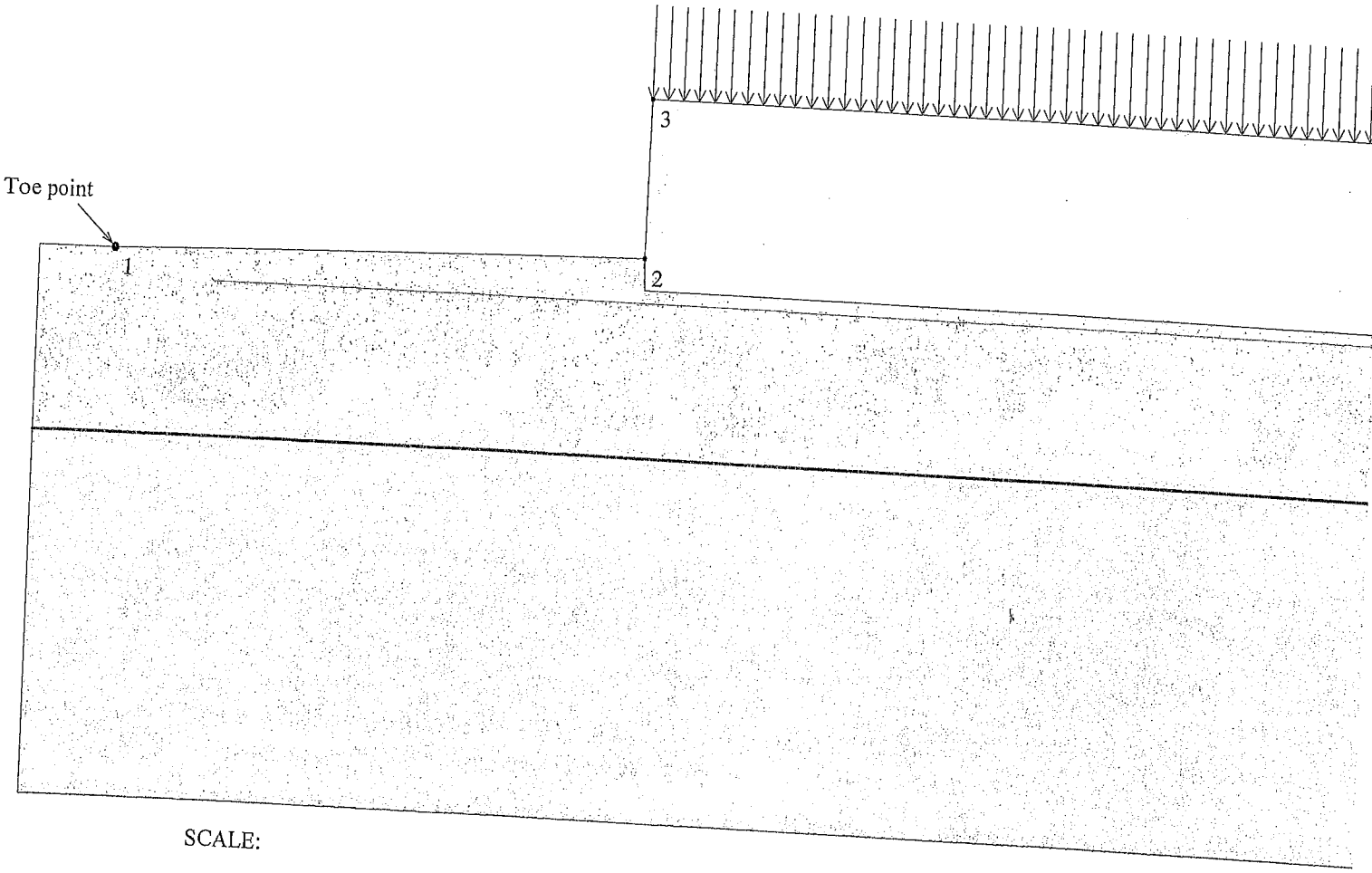
Phreatic line was specified.

UNIFORM SURCHARGE

Load Q1 = 250.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 64.10 and ends at X1e = 120.00 [ft].
Surcharge load, Q2.....None
Surcharge load, Q3.....None

STRIP LOAD

.....None.....



SCALE:

0 2 4 6[ft]

TABULATED DETAILS OF GENERAL SPECIFIED GEOMETRY

Soil profile contains 3 layers. Coordinates in [ft.]
Water was described by phreatic line.

Top of Layer 1
Top of Layer 2
Top of Layer 3
Top of Phreatic Line

#	Xi	Yi
1	30.00	179.00
2	64.00	180.00
3	64.10	190.00
4	120.00	190.00
5	30.00	179.00
6	64.00	180.00
7	64.10	178.00
8	120.00	178.00
9	30.00	167.50
10	120.00	167.50
12	30.00	167.50
13	120.00	167.50

TABULATED DETAILS OF SPECIFIED GEOMETRY

Soil profile contains 3 layers. Coordinates in [ft.]
Water was described by phreatic line. Y values are tabulated in the right most column.

#	X	Y1	Y2	Y3	(phreatic) Yw
1	30.00	179.00	179.00	167.50	167.50
2	64.00	180.00	180.00	167.50	167.50
3	64.10	190.00	178.00	167.50	167.50
4	120.00	190.00	178.00	167.50	167.50

RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.) The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each entry point (considering all specified exit points)

Entry Point #	Entry Point (X, Y) [ft]		Exit Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	30.00	179.00	30.00	179.00	30.00	179.00	0.00	N/A	#10 - Overhanging Cliff
2	30.00	179.00	30.00	179.00	30.00	179.00	0.00	N/A	#10 - Overhanging Cliff
3	79.72	190.00	51.43	179.70	63.21	191.34	16.56	1.73	
4	83.07	190.00	48.33	179.59	61.91	197.47	22.44	1.70	OK
5	86.43	190.00	48.20	179.66	62.25	203.54	27.71	1.75	
6	89.79	190.00	45.07	179.56	61.11	211.86	36.06	1.87	
7	93.14	190.00	42.06	179.42	59.72	222.73	46.78	2.01	
8	96.50	190.00	41.77	179.51	60.17	231.54	55.19	2.17	
9	99.86	190.00	38.65	179.41	58.96	244.21	67.91	2.33	
10	103.22	190.00	38.66	179.40	59.91	251.84	75.49	2.51	
11	106.57	190.00	35.87	179.21	59.53	261.24	85.37	2.68	
12	109.93	190.00	32.16	179.31	59.75	266.89	91.82	2.85	
13	113.29	190.00	32.75	179.13	61.25	271.80	96.95	3.02	
14	116.64	190.00	29.70	179.03	60.99	281.03	106.69	3.18	
15	120.00	190.00	25.98	179.22	60.83	290.65	116.75	3.35	

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-entry' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

****

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.) The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each exit point (considering all specified entry points).

Exit Point #	Exit Point (X, Y) [ft]		Entry Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	4.60	179.16	96.50	190.00	40.77	267.53	95.48	2.91	
2	7.92	179.07	96.50	190.00	42.00	267.31	94.59	2.79	
3	10.94	179.12	93.14	190.00	43.59	248.45	76.63	2.69	
4	13.65	179.29	93.14	190.00	44.90	247.73	75.23	2.57	
5	17.22	179.08	93.14	190.00	46.56	244.49	71.69	2.47	
6	19.93	179.31	89.79	190.00	47.85	230.44	58.26	2.37	
7	23.04	179.30	89.79	190.00	49.51	227.73	55.19	2.28	
8	26.30	179.21	89.79	190.00	50.92	226.53	53.34	2.17	
9	29.70	179.05	89.79	190.00	52.60	223.74	50.22	2.10	
10	32.70	179.21	86.43	190.00	53.92	212.72	39.67	2.00	
11	35.93	179.22	86.43	190.00	55.63	210.60	37.05	1.92	
12	38.70	179.52	86.43	190.00	57.36	208.49	34.45	1.86	
13	42.18	179.38	83.07	190.00	58.57	200.31	26.59	1.79	
14	45.04	179.66	83.07	190.00	60.30	198.65	24.36	1.74	
15	48.33	179.59	83.07	190.00	61.91	197.47	22.44	1.70	OK
16	51.26	179.82	83.07	190.00	63.68	195.80	20.24	1.73	
17	54.53	179.79	79.72	190.00	64.90	190.39	14.82	1.80	
18	57.53	179.93	83.07	190.00	67.06	193.19	16.32	2.00	
19	60.75	179.94	83.07	190.00	69.41	190.54	13.68	2.75	
20	30.00	179.00	30.00	179.00	30.00	179.00	0.00	N/A	#10 - Overhanging Cliff

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

CRITICAL RESULTS OF ROTATIONAL AND TRANSLATIONAL STABILITY ANALYSES

Rotational (Circular Arc; Bishop) Stability Analysis with slip surfaces excluded from this polygon:

Minimum Factor of Safety = 1.70

Critical Circle: Xc = 61.91[ft], Yc = 197.47[ft], R = 22.44[ft]. (Number of slices used = 53)

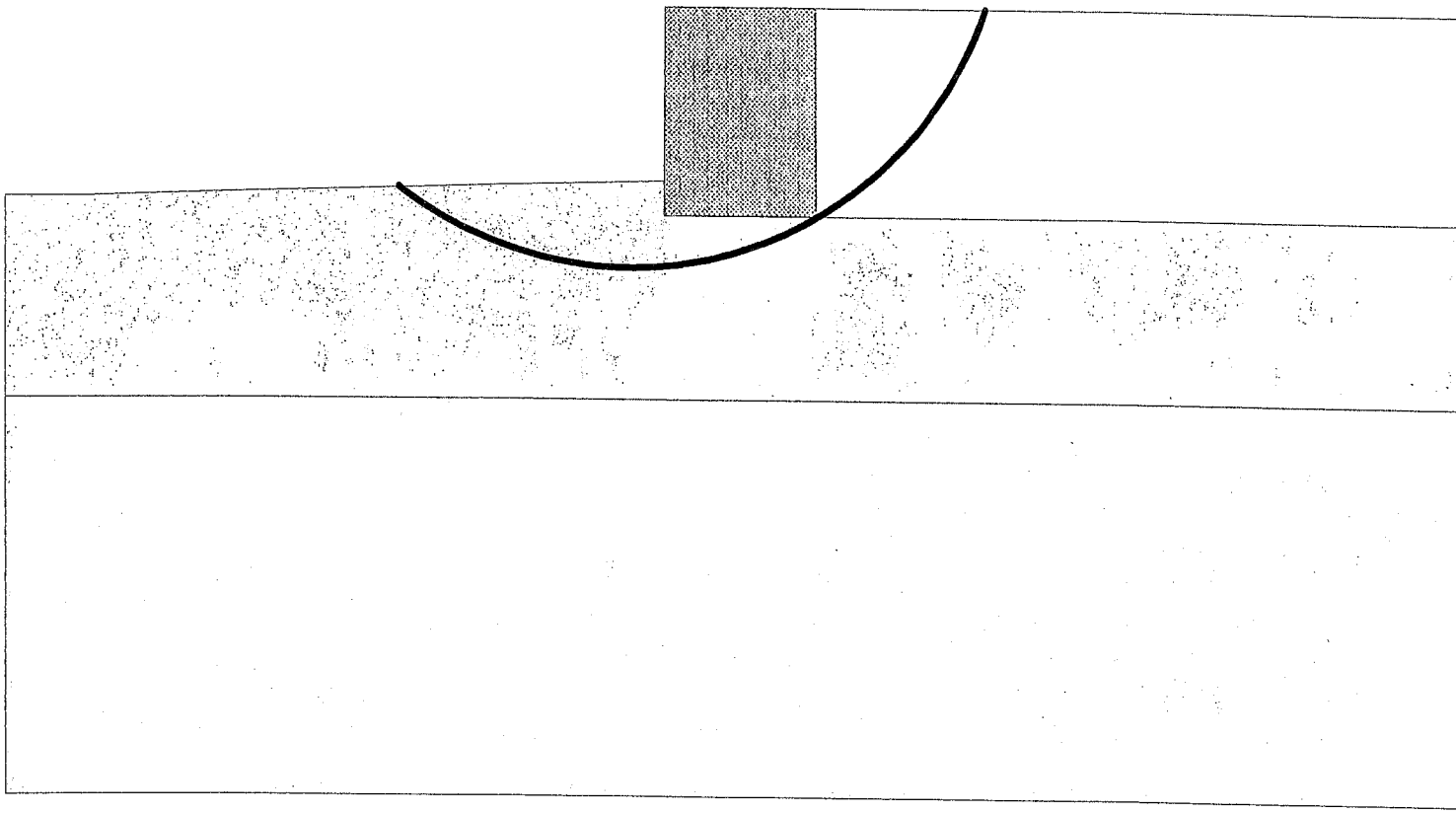
Translational (2-Part Wedge; Spencer), Direct Sliding, Stability Analysis

N O T C O N D U C T E D

Three-Part Wedge Stability Analysis

N O T C O N D U C T E D

REINFORCEMENT LAYOUT: DRAWING

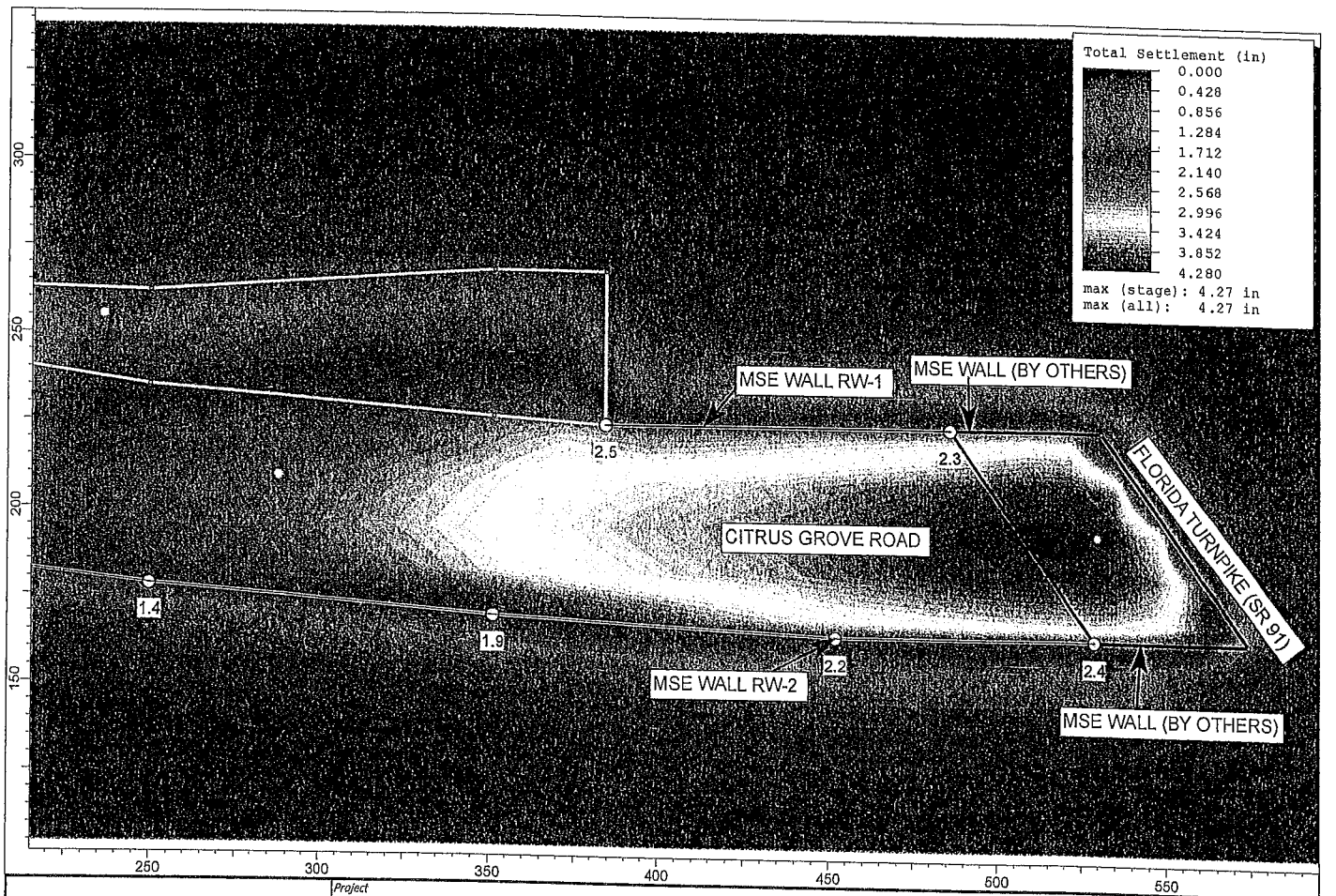


SCALE:

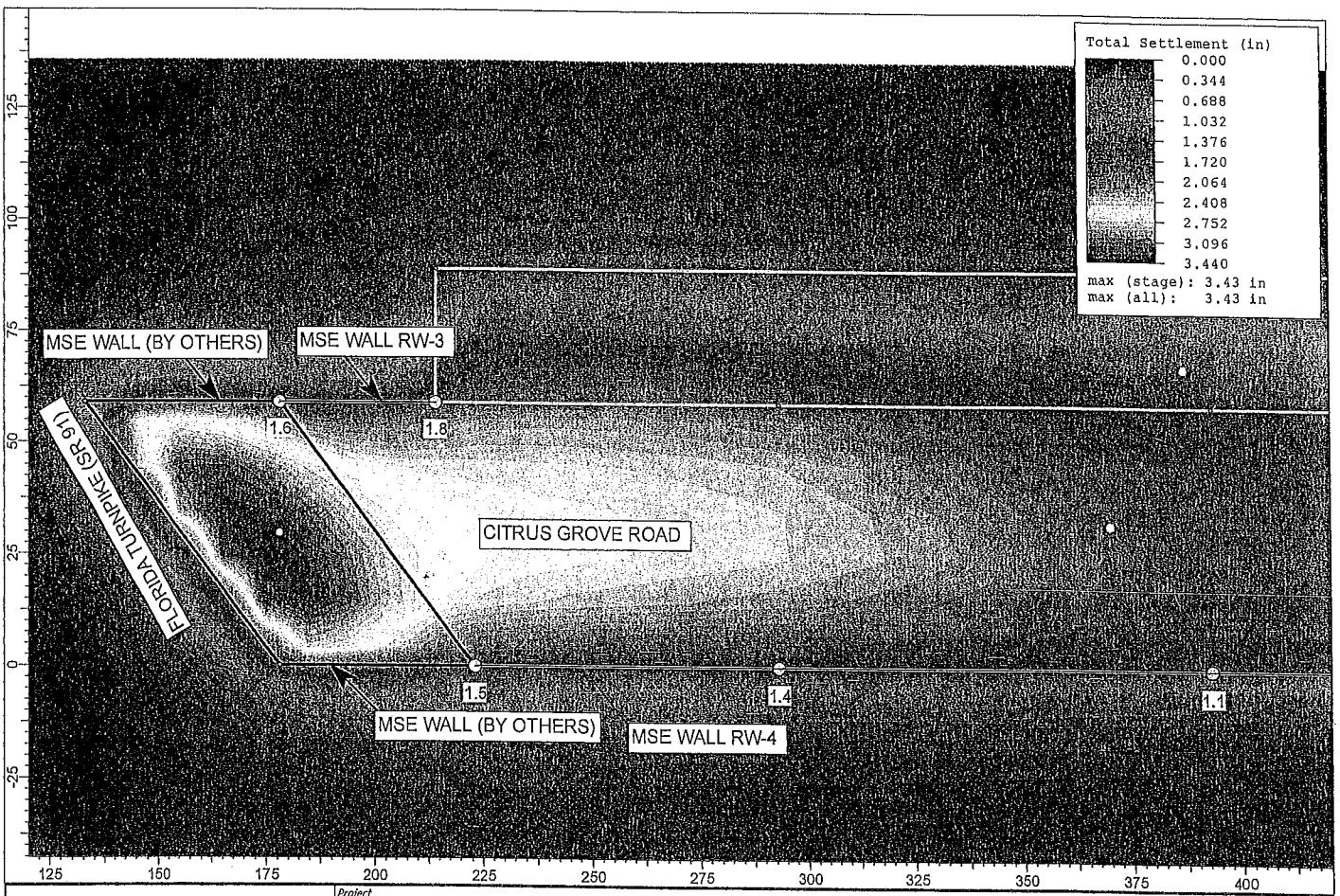
0 2 4 6[ft]

APPENDIX III

Settle3D Computer Program Output



Ardaman & Associates, Inc.	Project	Citrus Grove Road Phase V	
	Analysis Description	MSE Walls RW-1 and RW-2	
	Drawn By	Alexandra G. Aydelotte, P.E.	Company: Ardaman & Associates, Inc.
	Date	1/28/2021, 1:35:11 PM	File Name: RW1_RW2.s3z



Ardaman & Associates, Inc.

Project	Citrus Grove Road Phase V		
Analysis Description	MSE Walls RW-3 and RW-4		
Drawn By	Alexandra G. Aydelotte, P.E.	Company	Ardaman & Associates, Inc.
Date	01/28/2021, 2:15:11 PM	File Name	RW3_RW4.s3z

ADDENDUM #1

Citrus Grove Road Phase 5
Project No. 2023-08, Bid No. 23-562

This addendum is being issued to make the following changes, corrections, clarifications and additions to the bidding document. The information in this addendum modifies and changes the original bidding documents and takes precedence over the original documents. **Receipt of this addendum shall be acknowledged by the bidder by signing and dating the appropriate line on page W-4 of the bid proposal**. Failure to acknowledge this addendum may preclude consideration of the bid proposal for award.

The bid opening date remains August 31, 2023. All requests for information must be submitted by August 21, 2023.

A non-mandatory pre-bid meeting for the referenced project was held at 9:00 a.m. on August 3, 2023, via a telephone conference. The following were in attendance:

Name	Company	Phone Number	Email Address
Richard Spiegel	Jr. Davis Construction		
Dave Vann	Boykin Construction		
Ryan	SDC		
Joel Christianson	Superior Asphalt		
Les Westlake	Lake County Public Works	(352) 253-6001	Les.westlake@lakecountyfl.gov
Oz Nunez	Lake County Public Works	(352) 253-6041	osvaldo.nunez@lakecountyfl.gov
Joe Hinton	Lake County Public Works	(352) 253-9027	joseph.hinton@lakecountyfl.gov
Terry Scott	Lake County Public Works	(352) 253-9024	Terry.scott@lakecountyfl.gov
Deb Marchese	Lake County Public Works	(353) 253-6007	deborah.marchese@lakecountyfl.gov

This project is located between Minneola and Montverde in south Lake County and consists of constructing a new two-lane roadway approximately 4,074 feet in length connecting on either side to a newly constructed bridge over the Turnpike. Other work associated with this project includes constructing a 12' multiuse trail, curb and gutter, MSE wall, storm pipe and structures, stabilized radio tower access, sodding, striping, and other incidental miscellaneous construction. The Engineer's estimated project cost is $6,711,891.33.

Work performed under this contract shall be based on a lump sum bid. Quantities, if shown in the construction plans, are estimated for bidding purposes only and shall be verified by the contractor.

Pay special attention to all notes shown in the construction plans.

Any fences to be relocated shall be moved to the right of way line. If there is an existing gate at a driveway, then match the width of the driveway to the width of the gate. Contractor shall coordinate any fence relocation with the property owner.

Contractor shall video the project limits prior to beginning construction. The video shall be on a thumb drive and provided to Lake County before construction begins. Detail should be given to all existing fence lines, driveways, hedge lines, etc., to document existing conditions prior to construction.

Bid to sod all disturbed areas matching all existing grass types. Contractor shall be responsible for watering all sod until there is established growth.

All utilities shown in the construction plans to be relocated shall be the responsibility of the utility provider to relocate. Contractor is responsible for the coordination of all utility relocation.

Contractor shall provide two complete sets of red-lined record drawings upon completion of the project. One submitted set is to be on a flash drive while the other in paper format. The record drawings must show all additions, omissions, and adjustments made throughout construction of the project. The record drawings are to be signed and sealed by a professional engineer or surveyor, licensed to do business in the State of Florida. The record drawings are to be a complete set of construction plans, but only sheets that display changes must be signed and sealed by the engineer or surveyor.

Contractor shall add a line item to the bid tabulation sheet in Division W of the bidding document for any items that may be required but not shown on the tabulation sheet.

No oral interpretations will be made to any bidder as to the meaning of the Specifications, or any other Contract Documents. Every request for such an interpretation must be in writing, and shall be received by the Office of Procurement Services not less than ten (10) calendar days prior to the date set for opening of bids. Every interpretation made to a bidder will be made by an addendum to the Contract Documents, which, when issued, will be sent as promptly as is practicable to all persons to whom the Specifications have been issued by the County. All such addenda shall become part of the Contract Documents. No substitution of any kind or riders of any nature to the bids will be considered except by the above described method. For purposes of this Contract the term "Interpretations" shall include the approval of product substitution. All requests for interpretation shall be submitted to Amy Munday, Senior Contracting Officer, at amy.munday@lakecountyfl.gov and copied to Deb Marchese, Construction Program Coordinator, at deborah.marchese@lakecountyfl.gov .

Each Contractor shall visit the site of the proposed work and fully acquaint himself with conditions relating to construction and labor so that he may fully understand the facilities, difficulties and restrictions attending the execution of work under the contract.

Contractor will need to make sure they have the following plans.

- Citrus Grove Road Design Phase 5 Plans from West SR 91 to Blackstill Lake Road.
- Citrus Grove Road Design Phase 5 Plans from West SR 91 to Blackstill Lake Road Structures Plans.
- Citrus Grove Road Design Phase 5 Plans from West SR 91 to Blackstill Lake Road Signing and Pavement Marking Plans.
- Esplanade Landscape Plans
- Temporary Driveway Plan

Questions Asked at the Pre-Bid Meeting:

Q1: There is an asphalt driveway shown on Plan 2, Sheet 17 of the roadway plans that is right after the turnpike. Is this driveway part of the scope of the project?

A1: Yes, please see the Temporary Driveway Plan that is included in the bid package. This depicts how that driveway is to be constructed.

Deborah C Marchese

Deborah Marchese, Construction Program Specialist

8-9-23

Date

ADDENDUM #2

Citrus Grove Road Phase 5
Project No. 2023-08, Bid No. 23-562

This addendum is being issued to make the following changes, corrections, clarifications and additions to the bidding document. The information in this addendum modifies and changes the original bidding documents and takes precedence over the original documents. **Receipt of this addendum shall be acknowledged by the bidder by signing and dating the appropriate line on page W-4 of the bid proposal**. Failure to acknowledge this addendum may preclude consideration of the bid proposal for award.

The bid opening date for this project has been moved to September 7, 2023. All requests for information must be submitted by August 28, 2023.

Deborah C. Marchese
Deborah Marchese, Construction Program Specialist

8-22-23
Date

ADDENDUM #3

Citrus Grove Road Phase 5
Project No. 2023-08, Bid No. 23-562

This addendum is being issued to make the following changes, corrections, clarifications and additions to the bidding document. The information in this addendum modifies and changes the original bidding documents and takes precedence over the original documents. **Receipt of this addendum shall be acknowledged by the bidder by signing and dating the appropriate line on page W-4 of the bid proposal**. Failure to acknowledge this addendum may preclude consideration of the bid proposal for award.

The bid opening date for this project has been moved to September 14, 2023. All requests for information must be submitted by September 4, 2023.

Deborah C. Marchese
Deborah Marchese, Construction Program Supervisor

8-31-23
Date

ADDENDUM #4

Citrus Grove Road Phase 5
Project No. 2023-08, Bid No. 23-562

This addendum is being issued to make the following changes, corrections, clarifications and additions to the bidding document. The information in this addendum modifies and changes the original bidding documents and takes precedence over the original documents. **Receipt of this addendum shall be acknowledged by the bidder by signing and dating the appropriate line on page W-4 of the bid proposal**. Failure to acknowledge this addendum may preclude consideration of the bid proposal for award.

Questions asked via email

Q1: When is the anticipated completion of the bridge?

A1: At this time, the Turnpike contractor's estimated completion date is November 2024.

Q2: What work on and/or around the bridge is NOT included in the Turnpike contract?

A2: Contractors shall bid to construct Citrus Grove Road per plan.

Q3: It appears that Pond WRA-3 is already built. Is this configuration acceptable or will new plans be issued detailing how this existing pond is to be reshaped?

A3: The Pond WRA-3 has already been built by Willow Ridge subdivision and has already been re-shaped; however, outfall pipe of this roadway plan needs to be built. Please see attached revised plan sheets 1, 21, 33, 35, and 63 contained within Addendum #4.

Q4: As there are already 2 pipes from the new subdivision discharging into this pond, will this pond be sufficient to receive the inflow from another pipe?

A4: Yes, pond capacity is sufficient for both sites.

Q5: At Pond WRA-3, there is an existing privacy wall that is not shown on the plans. Is the contractor to install the shown access driveway just up to the privacy wall?

A5: As shown on sheet 21 of the revised construction plans this driveway has been removed from this project.

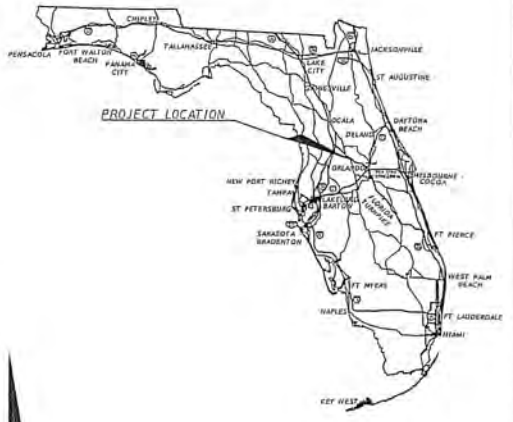
COMPONENTS OF CONTRACT PLANS SET
ROADWAY PLANS
SIGNING AND PAVEMENT MARKING PLANS
STRUCTURES PLANS

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS

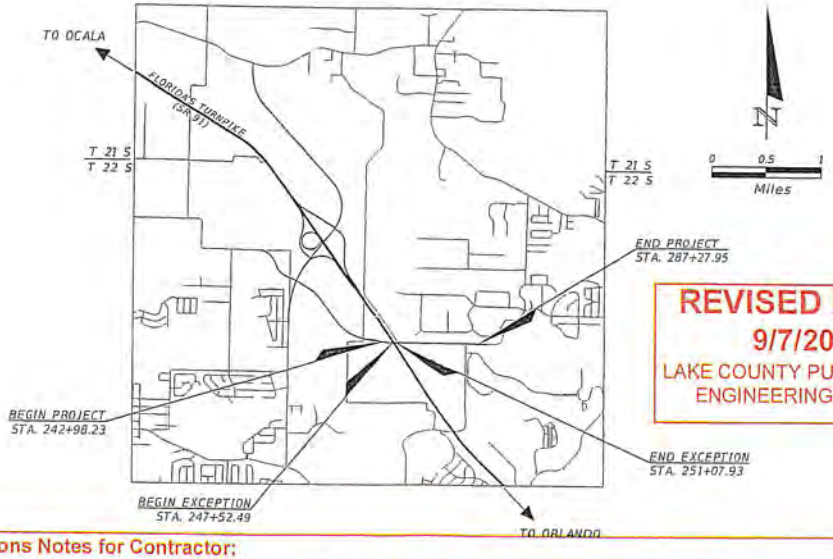
CONTRACT PLANS

RSQ NO. 19-0910

CITRUS GROVE ROAD
DESIGN PHASE V
FROM WEST SR 91 TO BLACKSTILL LAKE ROAD



INDEX OF ROADWAY PLANS



REVISED PLANS
9/7/2023
LAKE COUNTY PUBLIC WORKS
ENGINEERING DIVISION

ROADWAY SHOP DRAWINGS TO BE SUBMITTED TO:
JOHN R. BURKETT, P.E. NO. 40064
DRMP, INC.
941 LAKE BALDWIN LANE
ORLANDO, FL 32814

PLANS PREPARED BY:
DRMP, INC.
941 LAKE BALDWIN LANE
ORLANDO, FL 32814

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO REPRODUCTION

ROADWAY PLANS
ENGINEER OF RECORD:
JOHN R. BURKETT, P.E. NO. 40064
DRMP, INC.
941 LAKE BALDWIN LANE
ORLANDO, FL 32814
(407) 896-0594

LAKE COUNTY DEPT. OF PUBLIC WORKS
PROJECT MANAGER:
OSVALDO NUNEZ

GOVERNING STANDARD PLANS:
Florida Department of Transportation, FY2020-2021 Standard plans for Road and Bridge Construction and applicable Interim Revisions (IRs).

Standard Plans for Road Construction and associated IRs are available at the following website:
http://www.fdot.gov/design/Standardplans.shtm

APPLICABLE IRs: n/a

Standard Plans for Bridge Construction are included in the Structures Plans Component.

GOVERNING STANDARD SPECIFICATIONS:
Florida Department of Transportation, July 2020 Standard Specifications for Road and Bridge Construction at the following website:

http://www.fdot.gov/programmanagement/Implemented/SpecBooks

Revisions Notes for Contractor:

1. Pond WRA-3 Will not be built with this roadway plan since it has been built with subdivision development.
2. Turnout for Pond WRA-3 at STA. 278+00 RT will not be built. Contractor to follow Typical Section for Trail and adjust in the field as necessary.
3. Pond WRA-3 when built has a bottom of 115' elevation (vs. 112' from this plan design), therefore structures S-28 & s-30 inverts have been revised. See Sheet No. 33 - Drainage Structures Tabulation.
4. There is an existing (built) masonry perimeter wall, in which the subdivision developer will remove and replace wall panel where 24" stormwater pipe from S-28 to S-30 will be located. Coordination from Contractor with subdivision developer will be required.
5. Contractor shall field adjust the 24" stormwater pipe to avoid existing wall footings.

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

SHEET NO.
1

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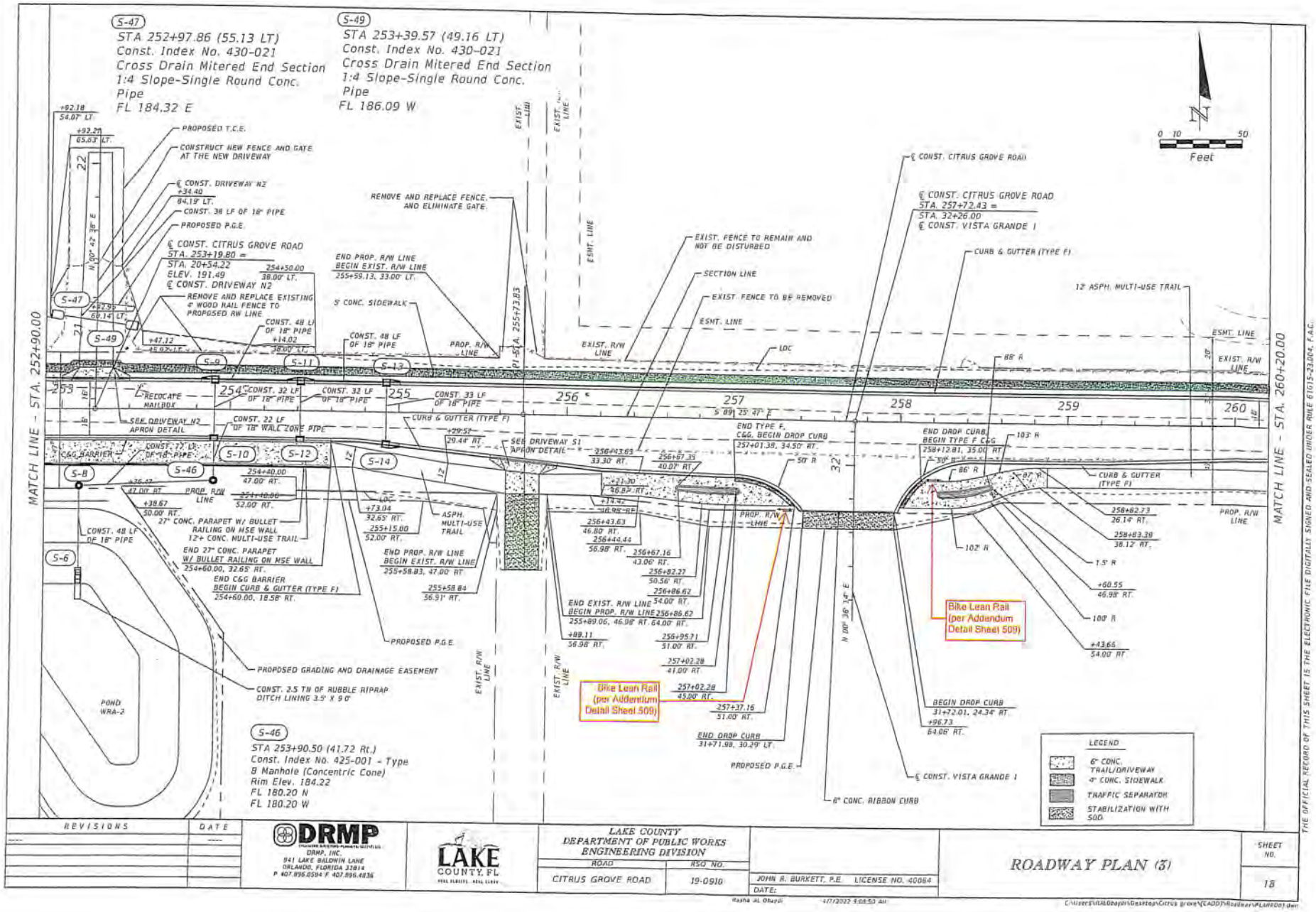
S-47
STA 252+97.86 (55.13 LT)
Const. Index No. 430-021
Cross Drain Mitered End Section
1:4 Slope-Single Round Conc.
Pipe
FL 184.32 E
S-49
STA 253+39.57 (49.16 LT)
Const. Index No. 430-021
Cross Drain Mitered End Section
1:4 Slope-Single Round Conc.
Pipe
FL 186.09 W
MATCH LINE - STA. 252+90.00
MATCH LINE - STA. 260+20.00
PROPOSED T.C.E.
CONSTRUCT NEW FENCE AND GATE AT THE NEW DRIVEWAY
℄ CONST. DRIVEWAY N2
CONST. 38 LF OF 18" PIPE
PROPOSED P.G.E.
℄ CONST. CITRUS GROVE ROAD
STA. 253+19.80 =
STA. 20+54.22
ELEV. 191.49
℄ CONST. DRIVEWAY N2
REMOVE AND REPLACE EXISTING 4" WOOD RAIL FENCE TO PROPOSED RW LINE
REMOVE AND REPLACE FENCE, AND ELIMINATE GATE
END PROP. R/W LINE
BEGIN EXIST. R/W LINE
5' CONC. SIDEWALK
CONST. 48 LF OF 18" PIPE
PROP. R/W LINE
EXIST. R/W LINE
EXIST. FENCE TO REMAIN AND NOT BE DISTURBED
SECTION LINE
EXIST. FENCE TO BE REMOVED
ESMT. LINE
LOC
℄ CONST. CITRUS GROVE ROAD
STA. 257+72.43 =
STA. 32+26.00
℄ CONST. VISTA GRANDE 1
CURB & GUTTER (TYPE F)
12' ASPH. MULTI-USE TRAIL
RELOCATE MAILBOX
SEE DRIVEWAY N2 APRON DETAIL
CONST. 32 LF OF 18" PIPE
CONST. 33 LF OF 18" PIPE
CONST. 22 LF OF 18" WALL ZONE PIPE
CONST. 27 LF OF 18" PIPE
C&G BARRIER
SEE DRIVEWAY S1 APRON DETAIL
END TYPE F, C&G, BEGIN DROP CURB
END DROP CURB, BEGIN TYPE F C&G
CURB & GUTTER (TYPE F)
27" CONC. PARAPET W/ BULLET RAILING ON MSE WALL
12'+ CONC. MULTI-USE TRAIL
ASPH. MULTI-USE TRAIL
END 27" CONC. PARAPET W/ BULLET RAILING ON MSE WALL
END C&G BARRIER
BEGIN CURB & GUTTER (TYPE F)
END PROP. R/W LINE
BEGIN EXIST. R/W LINE
END EXIST. R/W LINE
BEGIN PROP. R/W LINE
PROPOSED GRADING AND DRAINAGE EASEMENT
CONST. 3.5 TN OF RUBBLE RIPRAP DITCH LINING 3.5' X 9.0'
POND WRA-2
Bike Lean Rail (per Addendum Detail Sheet 509)
BEGIN DROP CURB
END DROP CURB
6" CONC. RIBBON CURB
S-46
STA 253+90.50 (41.72 Rt.)
Const. Index No. 425-001 - Type B Manhole (Concentric Cone)
Rim Elev. 184.22
FL 180.20 N
FL 180.20 W
LEGEND
6" CONC. TRAIL/DRIVEWAY
4" CONC. SIDEWALK
TRAFFIC SEPARATOR
STABILIZATION WITH SOD
0 10 50
Feet
N
REVISIONS
DATE
DRMP
DRMP, INC.
941 LAKE BALDWIN LANE
ORLANDO, FLORIDA 32814
P 407.896.0594 F 407.896.4836
LAKE COUNTY, FL
LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
ROAD
CITRUS GROVE ROAD
RSO NO.
19-0910
JOHN R. BURKETT, P.E. LICENSE NO. 40064
DATE:
ROADWAY PLAN (3)
SHEET NO.
18
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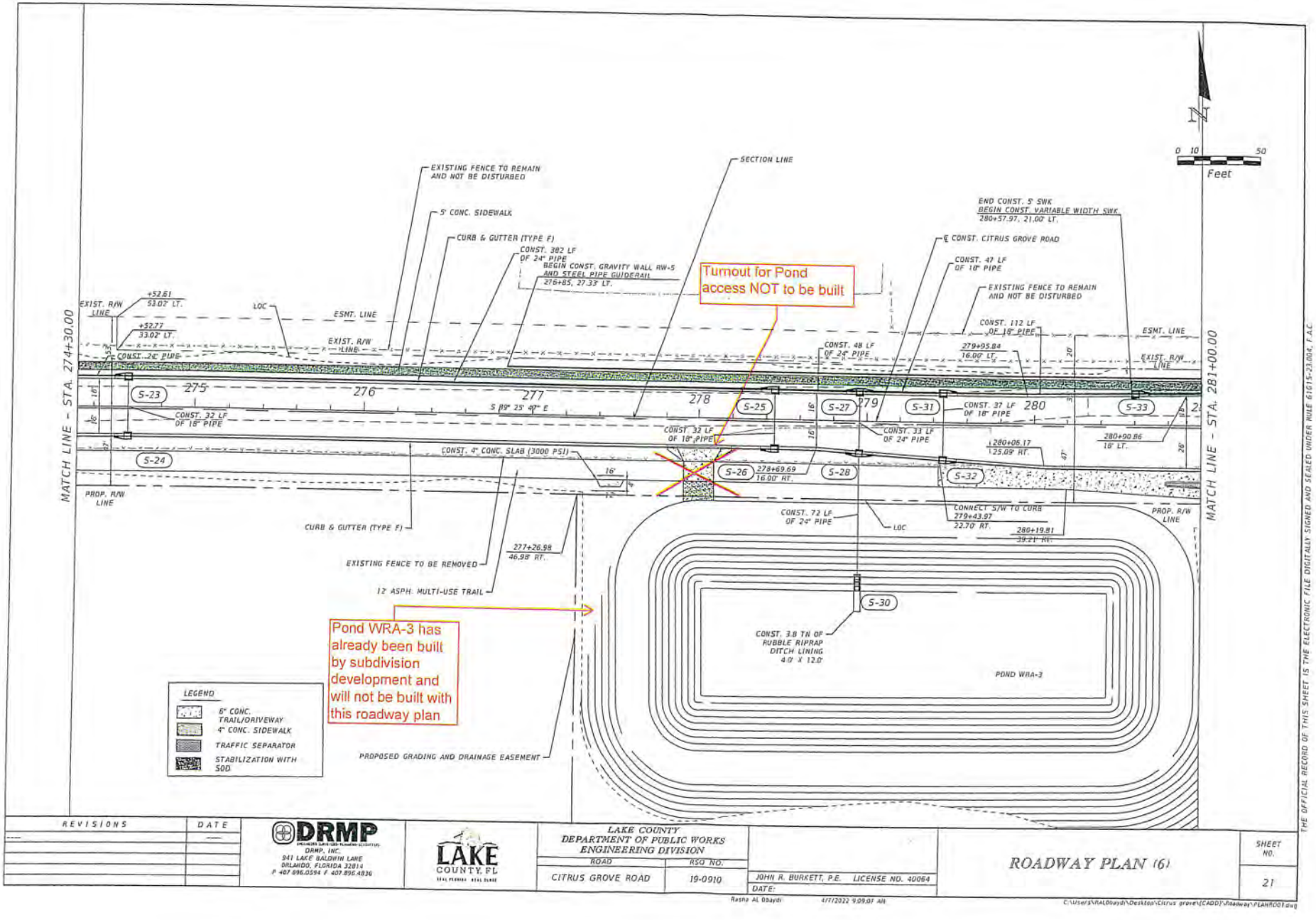

REVISIONS	DATE

DRMP
DRMP, INC.
941 LAKE BALDWIN LANE
ORLANDO, FLORIDA 32814
P 407.896.0594 F 407.896.4836

LAKE COUNTY, FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ROAD	RSO NO.
CITRUS GROVE ROAD	19-0910

JOHN R. BURKETT, P.E. LICENSE NO. 40064
DATE:

ROADWAY PLAN (6)

SHEET NO. 21

Rasha Al Obaydi 4/7/2022 9:09:07 AM

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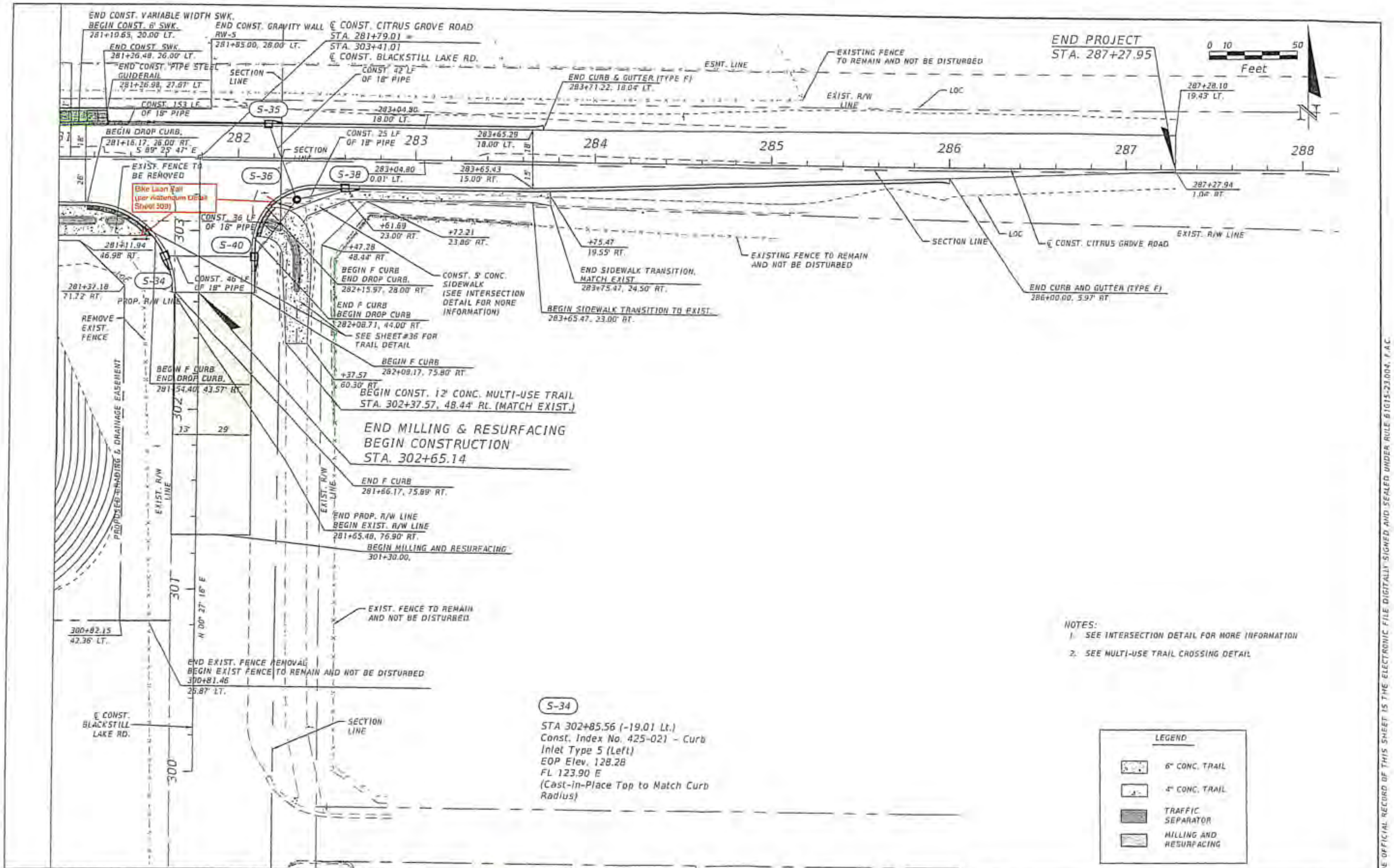

REVISIONS	DATE	DRMP	LAKE COUNTY, FL	LAKE COUNTY DEPARTMENT OF PUBLIC WORKS ENGINEERING DIVISION		ROADWAY PLAN (7)	SHEET NO.
		DRMP, INC. 941 LAKE BALDWIN LANE ORLANDO, FLORIDA 32814 P 407.896.0594 F 407.896.4836		ROAD: CITRUS GROVE ROAD	RSQ NO.: 19-0910	JOHN R. BURKETT, P.E. LICENSE NO. 40064 DATE:	22

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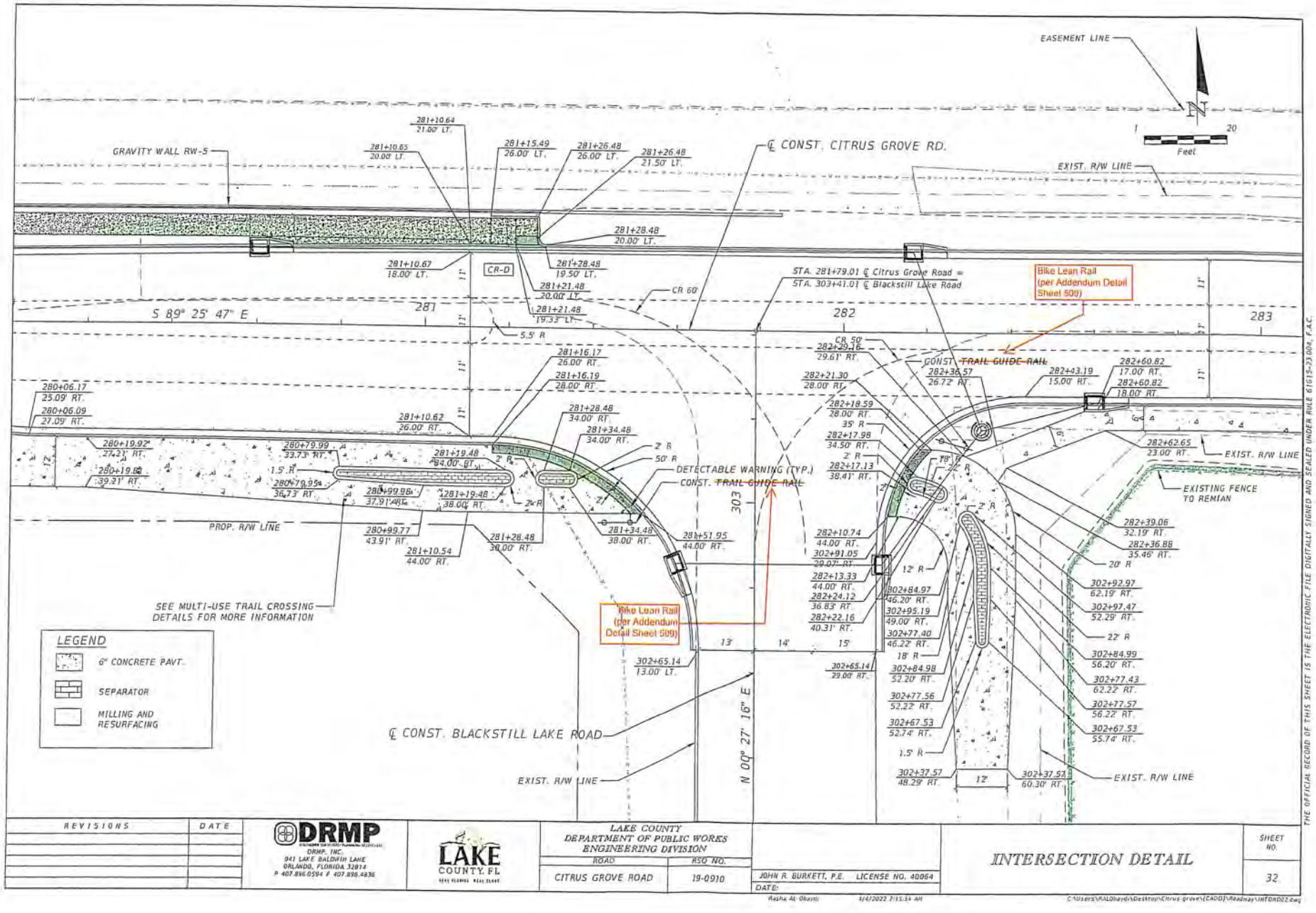

REVISIONS	DATE

DRMP
DRMP, INC.
941 LAKE BALDWIN LANE
ORLANDO, FLORIDA 32814
P 407.896.0594 F 407.896.4836

LAKE COUNTY, FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ROAD	RSO NO.
CITRUS GROVE ROAD	19-0910

JOHN R. BURKETT, P.E. LICENSE NO. 40064
DATE:
Rasha Al Obaydi 1/4/2022 7:15:34 AM

INTERSECTION DETAIL

SHEET NO. 32

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S-1
STA 244+40.00 (17.25 Lt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Right)
EOP Elev. 179.05
FL 174.20 E
FL 174.20 S
FL 174.20 W

S-2
STA 244+40.00 (16.83 Rt.)
Const. Index No. 425-032 - Curb & Gutter Barrier Inlet
Theo. Gutter Line Elev. 178.94
FL 174.40 N

S-3
STA 247+16.70 (16.87 Lt.)
Const. Index No. 425-031 - Adjacent Barrier Inlet
Grate Elev. 189.54
Structure to Include Resilient Connector for Pipe
FL 184.80 S
FL 184.80 W

S-4
STA 247+16.70 (16.87 Rt.)
Const. Index No. 425-031 - Adjacent Barrier Inlet
Grate Elev. 189.54
FL 185.00 N

S-6
STA 253+10.93 (94.39 Rt.)
Const. Index No. 430-011 - U-Type Concrete Endwall With Baffles (1:4 Slope)
FL 176.00 N

S-8
STA 253+10.93 (45.34 Rt.)
Const. Index No. 425-001 - Type 8 Manhole (Concentric Cone)
Rim Elev. 183.66
FL 179.60 E
FL 176.20 S

S-9
STA 253+90.50 (17.25 Lt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Left)
EOP Elev. 190.47
FL 185.20 E
FL 185.20 S

S-10
STA 253+90.50 (16.83 Rt.)
Const. Index No. 425-032 - Curb & Gutter Barrier Inlet
Theo. Gutter Line Elev. 190.61
Structure to Include Resilient Connector for Pipe
FL 185.10 N
FL 181.00 S

S-11
STA 254+41.60 (17.25 Lt.)
Const. Index No. 425-021 - Curb Inlet Type 6
EOP Elev. 190.27
FL 185.40 S
FL 185.90 E
FL 185.40 W

S-12
STA 254+41.60 (16.83 Rt.)
Const. Index No. 425-032 - Curb & Gutter Barrier Inlet
Theo. Gutter Line Elev. 190.41
FL 185.50 N

S-13
STA 254+92.50 (17.25 Lt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Right)
EOP Elev. 190.47
FL 186.10 S
FL 186.10 W

S-14
STA 254+92.50 (18.91 Rt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Left)
EOP Elev. 190.44
FL 186.20 N

S-15
STA 260+80.00 (17.25 Lt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Left)
EOP Elev. 189.74
FL 185.40 S
FL 185.40 E

S-16
STA 260+80.00 (17.71 Rt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Right)
EOP Elev. 189.73
FL 185.50 N

S-17
STA 263+80.00 (17.25 Lt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Left)
EOP Elev. 177.69
FL 173.30 S
FL 173.30 W
FL 170.00 E

S-18
STA 263+80.00 (17.25 Rt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Right)
EOP Elev. 177.69
FL 173.40 N

S-19
STA 266+80.00 (17.25 Lt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Left)
EOP Elev. 165.73
FL 161.40 S
FL 161.40 W
FL 156.20 E

S-20
STA 266+80.00 (17.25 Rt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Right)
EOP Elev. 165.73
FL 161.50 N

S-21
STA 270+70.00 (17.25 Lt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Left)
EOP Elev. 151.13
FL 146.80 S
FL 146.30 W
FL 137.50 E

S-22
STA 270+70.00 (17.25 Rt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Right)
EOP Elev. 151.13
FL 146.90 N

S-23
STA 274+60.00 (17.25 Lt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Left)
EOP Elev. 134.31
FL 130.00 S
FL 129.50 W
FL 123.00 E

S-24
STA 274+60.00 (17.25 Rt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Right)
EOP Elev. 134.31
FL 130.10 N

S-25
STA 278+45.00 (17.25 Lt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Left)
EOP Elev. 121.10
FL 116.30 W
FL 116.80 S
FL 116.30 E

S-26
STA 278+45.00 (17.25 Rt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Right)
EOP Elev. 121.10
FL 116.90 N

S-27
STA 278+95.51 (17.25 Lt.)
Const. Index No. 425-021 - Curb Inlet Type 6
EOP Elev. 120.90
FL 115.30 E
FL 116.10 W
FL 115.30 S

S-28
STA 278+95.51 (18.97 Rt.)
Const. Index No. 425-021 - Curb Inlet Type 6
EOP Elev. 120.87
FL 115.20 N
~~FL 112.20 S~~ 115.20 S

S-30
STA 278+95.51 (92.78 Rt.)
Const. Index No. 430-011 - U-Type Concrete Endwall With Baffles (1:4 Slope)
~~FL 112.00 N~~ 115.00 N

S-31
STA 279+46.00 (17.25 Lt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Right)
EOP Elev. 121.10
FL 115.50 E
FL 116.70 S
FL 115.50 W

S-32
STA 279+46.00 (22.33 Rt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Left)
EOP Elev. 121.10
FL 116.80 N

S-33
STA 280+60.50 (18.38 Lt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Right)
EOP Elev. 123.00
FL 115.90 E
FL 115.90 W

S-35
STA 282+16.81 (-19.25 Lt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Right)
EOP Elev. 128.06
FL 123.40 S
FL 121.00 W

S-36
STA 282+32.97 (23.29 Rt.)
Const. Index No. 425-001 - Type 8 Manhole (Concentric Cone)
Rim Elev. 129.70
FL 123.50 SW
FL 123.50 E
FL 123.50 N

S-38
STA 282+60.17 (16.25 Rt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Left)
EOP Elev. 129.59
FL 125.30 W

S-40
STA 302+85.56 (30.31 Rt.)
Const. Index No. 425-021 - Curb Inlet Type 5 (Right)
EOP Elev. 128.06
FL 123.70 W
FL 123.70 NE

S-42 S-44
See Pond Detail Sheet

S-34 S-46 S-47 S-49 S-101 S-103
See respective plan sheet

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REVISIONS	DATE

DRMP
DRMP, INC.
941 LAKE BALDWIN LANE
ORLANDO, FLORIDA 32814
P 407.896.0594 F 407.896.4636

LAKE COUNTY, FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ROAD	RSD NO.
CITRUS GROVE ROAD	19-0910

JOHN L. MINTON, P.E. LICENSE NO. 54657
DATE:
Rasha Al-Obaidi 4/7/2023 1:53:59 PM

DRAINAGE STRUCTURE TABULATION

SHEET NO. 33

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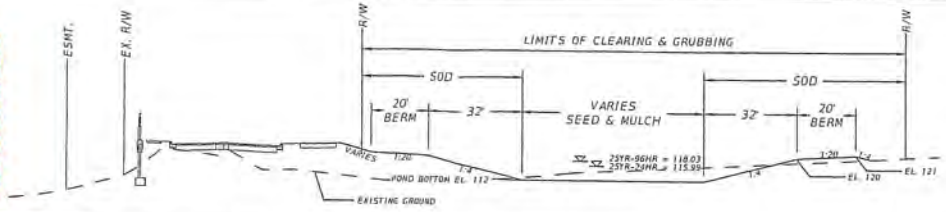
Pond WRA-3 has already been built. It will not need to be built with this roadway plan.

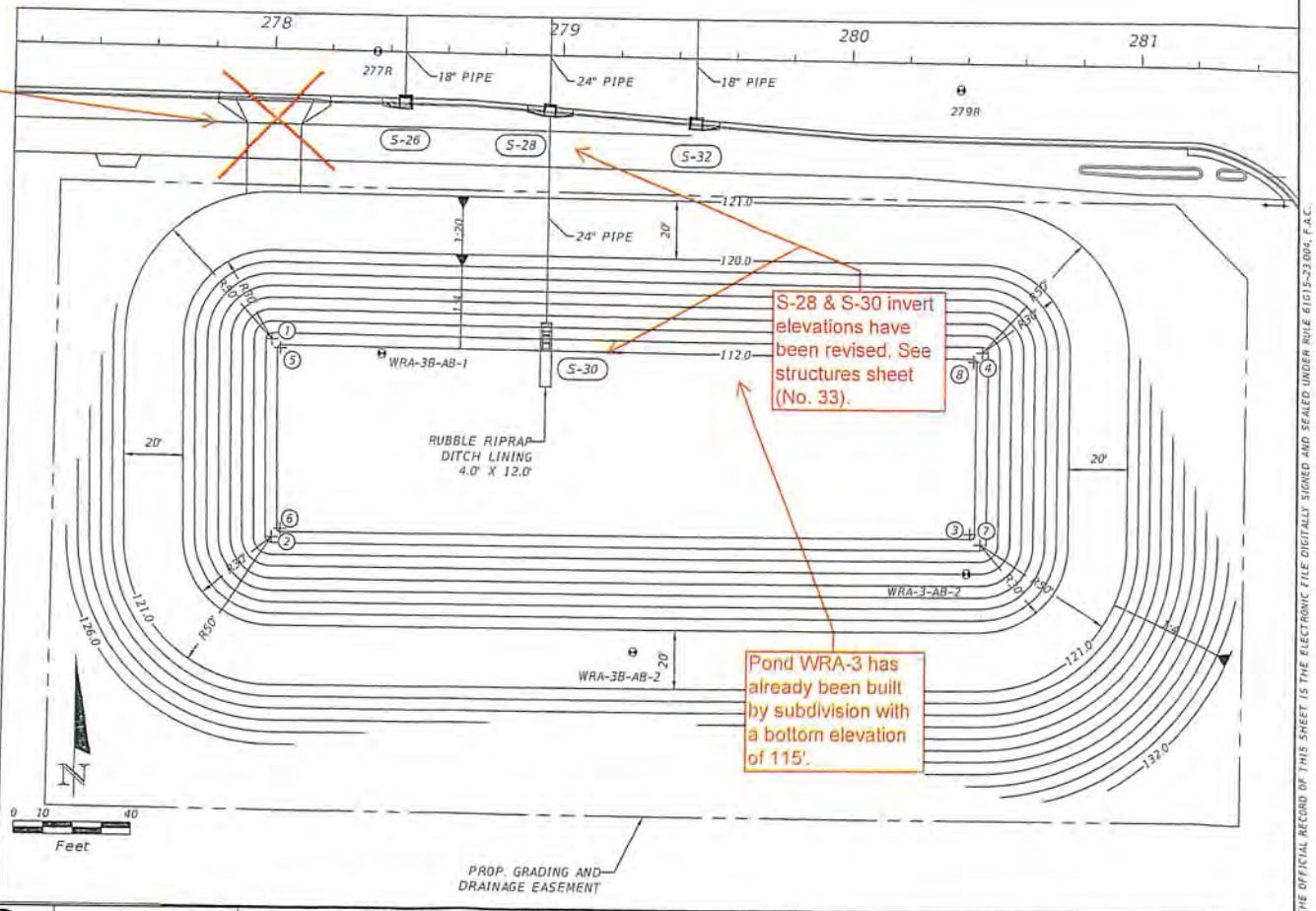


Turnout NOT to be built

POND CONTROL POINTS			
ID	STATION	OFFSET (FT)	RADIUS (FT)
1	278+00.56	99.29 RT	30.00
2	278+01.88	166.63 RT	50.00
3	280+42.73	161.09 RT	1.00
4	280+46.22	98.82 RT	50.00
5	278+03.62	102.28 RT	1.00
6	278+04.80	163.63 RT	1.00
7	280+46.46	164.77 RT	30.00
8	280+43.22	101.83 RT	1.00

NOTES:

1. INITIAL CONSTRUCTION OF THE POND SHALL BE TO ROUGH GRADE BY UNDER-EXCAVATING THE POND BOTTOM AND SIDE SLOPES BY APPROXIMATELY 12 INCHES.
2. AFTER THE DRAINAGE AREA CONTRIBUTING TO THE POND HAS BEEN FULLY STABILIZED, THE INTERIOR SIDE SLOPES AND POND BOTTOM SHALL BE EXCAVATED TO FINAL DESIGN SPECIFICATIONS (LINES AND GRADES). THE EXCESS SOIL AND UNSUITABLE MATERIAL SHALL BE CAREFULLY EXCAVATED AND REMOVED FROM THE POND SO THAT ALL ACCUMULATED SILTS, CLAYS, AND ORGANICS AND OTHER FINE SEDIMENT MATERIAL ARE REMOVED FROM THE POND AREA. THE EXCAVATED MATERIAL SHOULD BE DISPOSED OF BEYOND THE LIMITS OF THE PROJECT.
3. ONCE THE POND HAS BEEN EXCAVATED TO FINAL GRADE, THE ENTIRE POND BOTTOM SHOULD BE DEEP RAKED A MINIMUM OF 2' AND LOOSENED FOR OPTIMAL INFILTRATION AND SEED AND MULCHED.
4. NO FILL OR OTHER CONSTRUCTION MATERIALS SHALL BE STORED AND/OR PLACED WITHIN THE LIMITS OF THE POND EXCAVATION/FILL AREAS.



REVISIONS	DATE
—	—

DRMP, INC.
941 LAKE BALDWIN LANE
ORLANDO, FLORIDA 32814
P 407.896.0594 F 407.896.4836

LAKE COUNTY, FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ROAD	RSO NO.
CITRUS GROVE ROAD	19-0910

JOHN L. HINTON, P.E. LICENSE NO. 54657
DATE:

POND DETAIL
WRA-3

SHEET NO. 35

Kimberly Santiago-Ortiz 1/12/2021 3:48:28 PM

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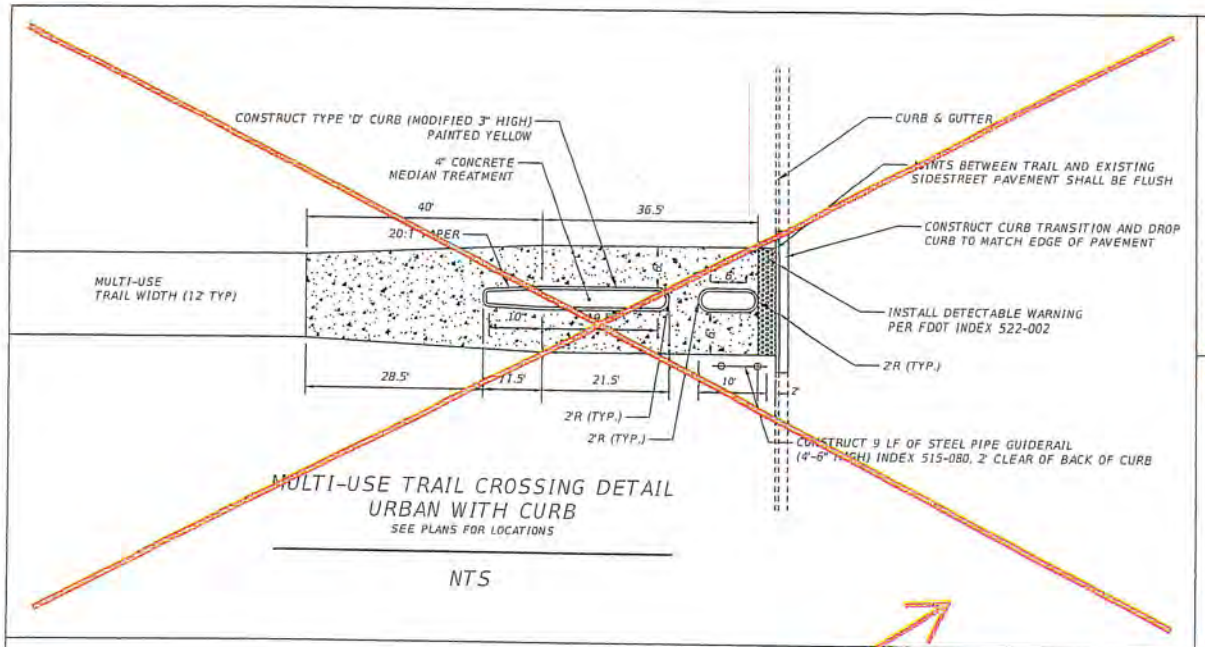
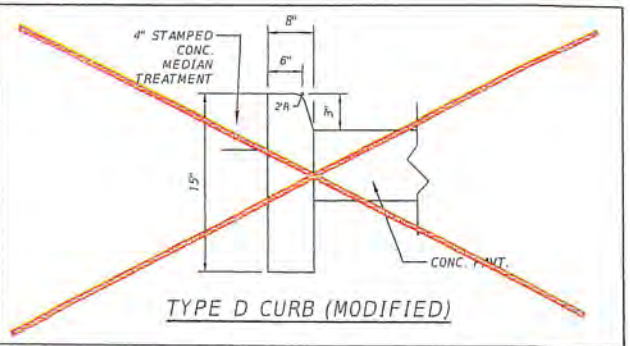
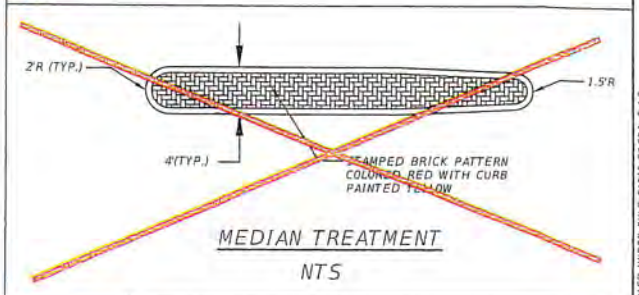


MULTI-USE TRAIL CROSSING DETAIL
URBAN WITH CURB
SEE PLANS FOR LOCATIONS

NTS



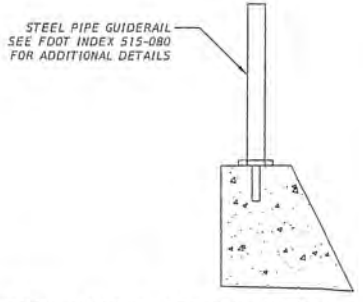
TYPE D CURB (MODIFIED)



MEDIAN TREATMENT

NTS

FOR THE MULTI-USE TRAIL CROSSING, TYPE "D" CURB (MODIFIED) AND MEDIAN TREATMEN DETAIL, REFER TO (USE) **ADDEMDUM DETAIL SHEET 509**



STEEL PIPE GUIDERAIL DETAIL
FOR GRAVITY WALL
SEE PLANS FOR LOCATIONS

NTS

REVISIONS	DATE

DRMP
DRMP, INC.
941 LAKE BALDWIN LANE
ORLANDO, FLORIDA 32814
P 407.896.0594 F 407.896.4836

LAKE COUNTY, FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ROAD	RSO NO.
CITRUS GROVE ROAD	19-0910

JOHN R. BURKETT, P.E. LICENSE NO. 40064
DATE:

Rasha Al Obaydi 3/29/2022 3:23:53 PM

SPECIAL DETAIL
MULTI-USE TRAIL

SHEET NO. 36

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Subsoil Exc.		Regular Exc.		Embankment	
A(sf)	V(cy)	A(sf)	V(cy)	A(sf)	V(cy)

REVISIONS	DATE
—	—

DRMP
DRMP, INC.
941 LAKE BALDWIN LANE
ORLANDO, FLORIDA 32814
P 407.896.0594 F 407.896.4836

LAKE COUNTY, FL

LAKE COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ROAD	RSD NO.
CITRUS GROVE ROAD	19-0910

JOHN R. BURKETT, P.E. LICENSE NO. 40064
DATE:
Rasha AL Obaydi 11/10/2021 8:22:29 PM

CROSS SECTION

SHEET NO. 63

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

ADDENDUM #5

Citrus Grove Road Phase 5
Project No. 2023-08, Bid No. 23-562

This addendum is being issued to make the following changes, corrections, clarifications and additions to the bidding document. The information in this addendum modifies and changes the original bidding documents and takes precedence over the original documents. **Receipt of this addendum shall be acknowledged by the bidder by signing and dating the appropriate line on page W-4 of the bid proposal**. Failure to acknowledge this addendum may preclude consideration of the bid proposal for award.

Sheet 509, as called out in Answer 9 on Addendum #4, was inadvertently not included with Addendum #4. Please see Sheet 509 attached hereto.

Deborah C. Marchese

Deborah Marchese, Construction Program Supervisor

9-7-23

Date

Q6: Is the contractor to tunnel under the existing privacy wall to install the pipe run from S-28 to S-30?

A6: The Willow Ridge Developer will remove and replace the section of wall where the outfall pipe will cross. Contractor shall field adjust the outfall pipe to avoid the column footings.

Q7: Who is responsible for any damages that may occur to this wall?

A7: If the wall is damaged by the developer while moving the one panel, then they would be responsible to repair/ replace. If wall is damaged by Citrus Grove Road contractor or subcontractors, then they would be responsible to repair/ replace. Citrus Grove contractor shall take all precautions to protect this wall as they would any other appurtenances on private property.

Q8: We are hearing from MSE wall manufacturers that the details shown on the bird will be difficult to achieve on a concrete panel. Would the County allow the logo that was just installed on the Turnpike job at the new CR 455 bridge?

A8: No, the County would not allow the change.

Q9: Can the location of Item 0515-2221, Pedestrian/Bicycle Railing, Steel only,54' Type 1 be identified please?

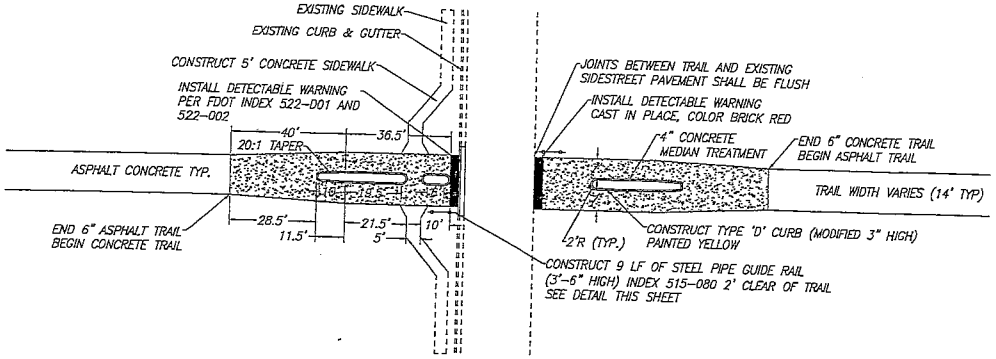
A9: Yes, please see revised sheets 18, and 22 identifying the locations of the proposed "Bike Lean" rails. It should also be noted there is an error in the Bid Tabulation; the height of the rail should be 42" not 54' and the bid item number should be 515-1-1 Pipe Handrail- Guiderail, steel. Contractor shall use detail sheet 509 contained within this addendum to construct the "Bike Lean" rail. Contractor shall include in their bid a cost to provide a "Ribbon curb" to fasten the rail to.

Deborah C. Marchese

Deborah Marchese, Construction Program Supervisor

9-7-23

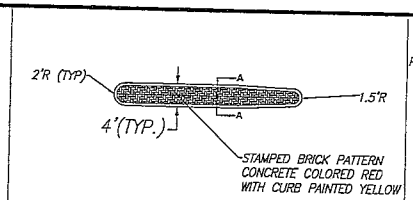
Date



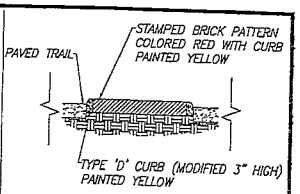
TYPICAL MID BLOCK CROSSING DETAIL
URBAN WITH EXISTING CURB & SIDEWALK
SEE PLANS FOR LOCATIONS

NTS

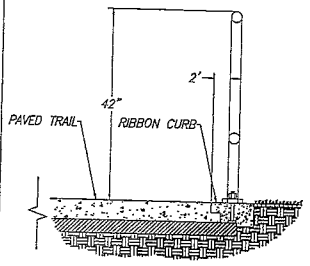
TYPICAL MID BLOCK CROSSING DETAIL
RURAL WITH ASPHALT PAVEMENT
SEE PLANS FOR LOCATIONS



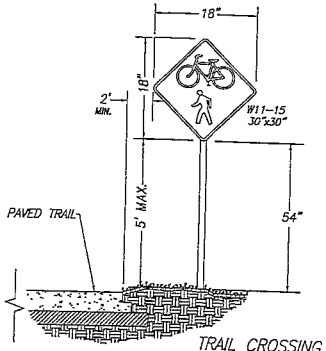
MEDIAN TREATMENT
NTS



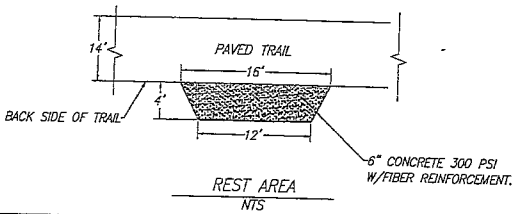
MEDIAN TREATMENT
SECTION "A" DETAIL
NTS



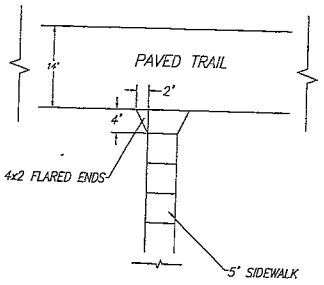
BIKE LEAN RAIL
NTS

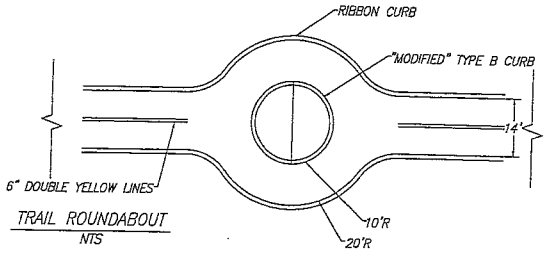


TRAIL CROSSING
NTS

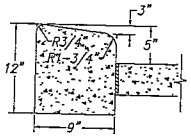


REST AREA
NTS

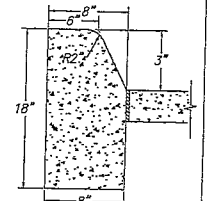




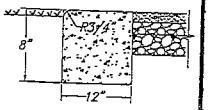
TRAIL ROUNDABOUT
NTS



MODIFIED TYPE "B"
NTS



MODIFIED TYPE "D"
NTS



RIBBON CURB
NTS

SECTION	TOWNSHIP	RANGE

DESIGNED:	DATE:
DRAWN:	DATE:
APPROVED:	DATE:

LAKE COUNTY, FL

DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
350 SINCLAIR AVE.
TAVARES, FLORIDA 32778

STANDARD
MULTI-USE TRAIL DETAIL

509