1112 Manatee Avenue West
Bradenton, FL 34205
purchasing@mymanatee.org

Solicitation Addendum

Addendum No.:	3
Solicitation No.:	21-TA003713AJ
Project No.:	6105280
Solicitation Title:	Bradenton Beach Gravity Sewer Replacement
Addendum Date:	July 19, 2021
Procurement Contact:	Abigail Jenkins

IFBC No. 21-TA003713AJ is amended as set forth herein. Responses to questions posed by prospective bidders are provided below. This Addendum is hereby incorporated in and made a part of IFBC No. 21-TA003713AJ.

CHANGE TO:
ADVERTISEMENT PAGE, DEADLINE FOR QUESTIONS AND CLARIFICATIONS REQUESTS

The deadline to submit all questions, inquiries, or requests concerning interpretation, clarification or additional information pertaining to this Invitation for Bid Construction to the Manatee County Procurement Division is July 30, 2021. Questions and inquiries should be submitted via email to the Designated Procurement Contact shown below.

CHANGE TO:
SECTION A, INFORMATION FOR BIDDERS, ARTICLE A.51 SOLICITATION SCHEDULE

The following schedule has been established for this Solicitation process. Refer to the County's website (www.mymanatee.org > Business > *Bids & Proposals*) for meeting locations and updated information pertaining to any revisions to this schedule.

Scheduled Item	Scheduled Date
Non-Mandatory Information Conference	June 17, 2021 @ 11:00 AM, ET
Revised Question and Clarification Deadline	July 30, 2021

Final Addendum Posted	August 13, 2021
Bid Response Due Date and Time	August 20, 2021, 3:00 PM, ET
Due Diligence Review Completed	August 2021
Projected Award	September 2021

REPLACE:
SECTION B, BID FORMS APPENDIX K BID PRICING FORM

Replace Appendix K, Bid Pricing Form with the Attachment Appendix K, Bid Pricing Form issued with this Addendum 3.

REPLACE:
ELECTRONIC BID PRICING FORM

Replace Electronic Bid Pricing Form with the Revised Electronic Bid Pricing Form included with this Addendum 3.

REPLACE:
BID ATTACHMENT 2, TECHNICAL SPECIFICATION, SECTION 01150 MEASUREMENT AND PAYMENT

Replace Bid Attachment 2, Technical Specification, Section 01150, Measurement and Payment with the Revised Bid Attachment 2, Technical Specification, Section 01150, Measurement and Payment issued with this Addendum 3.

REPLACE:

BID ATTACHMENT 3, PLANS/DRAWINGS

Replace Bid Attachment 3, Plans/Drawings with the Revised Bid Attachment 3 Plans/Drawings included with this Addendum 3.

ADD:
BID ATTACHMENT 4, GEOTECHNICAL REPORT

Bid Attachment 4, Geotechnical Report issued with this Addendum 3.

ADD:
BID ATTACHMENT 5, APPROVED FDOT PERMIT PACKAGE

Bid Attachment 5, Approved FDOT Permit Package included with this Addendum 3.

ADD:

ADDITIONAL INFORMATION

During the time between the end of design and the project bid posting, an electrical undergrounding project was constructed within the Bradenton Beach Gravity Sewer Project Limits. The new underground electrical lines and transformers have been added to the plans per the preliminary red lines. MH #16 and MH #21 have been shifted to avoid electrical conflicts and various cleanouts.

Clarifications of Engineer's Changes:

Appendix K, Bid Form has been revised.
Appendix K, Electronic Bid Form has been revised.
The Measurement and Payment section of the Specifications have been revised.
The following plan sheets have been revised in accordance with the responses to bid questions and the Electrical Underground Project.

- Plan Sheet G-02,
- Plan Sheet G-07
- Plan Sheet G-08
- Plan sheets C-01 – C-013
- Plan Sheet D-02
- Plan Sheet D-03

Bid Attachment 4, Geotechnical Report has been added.
Bid Attachment 5, Approved FDOT Permit has been included.

QUESTIONS AND RESPONSES:

Q1. Are soil borings available for this project?
R1. Yes, Geotechnical Report will be provided as part of this addendum.

Q2. Crushed concrete road base is specified. Is locally obtained, commercial grade crushed concrete that meets the LBR 150 acceptable?
R2. No, crushed concrete road base shall be from an FDOT certified pit. Section 02575 Pavement Repair and Restoration has been revised as follows, "Crushed concrete road base shall be from a FDOT certified pit". As an alternative asphalt base may be used as an alternate option to crushed concrete.

Q3. What is the required thickness of the shell drive restoration?
R3. Shell drive restoration for the parking lot area on the west side of Gulf Drive is to follow County standard transportation department detail 401.9 – rural shell road. This will consist of 6" of crushed concrete FDOT certified base with 4" of FDOT bank run shell or 10" of FDOT bank run shell. Residential shell right-of-way restoration has been broken out separately from this bid item. Measurement and payment, bid form, and the plans have been updated accordingly.

Q4. Regarding the brick pavers, the measurement & payment section says we are to "furnish" and install the pavers. Is it the intent to salvage the existing pavers and reset them? This will allow a match to the existing.
R4. Measurement and Payment has been revised as follows: "Measurement of driveway restoration will be per the actual number of square yards restored. Payment shall

represent full compensation for all labor, materials, and equipment for cutting the edges of existing driveways, compacting subgrade and re-installing the concrete pavers, brick pavers, or decorative pavers with new concrete edging to hold the pavers in place. Pavers shall be salvaged and reset. Contractor to ensure all driveways are accurately documented in the pre-construction video. If pavers are damaged during construction, Contractor shall furnish new pavers to match existing driveway pavers. This Bid Item shall include all incidentals necessary to complete the driveway restoration as shown on the Contract Drawings and included in the Specifications, all ready for approval and acceptance by the County."

Q5. Or are we to furnish new pavers?

R5. Refer to response Q4.

Q6. Reference specifications Section 01150, MEASUREMENT AND PAYMENT, page 88/414, BID ITEM – PVC SDR-26 SANITARY SEWER MAIN (OPEN CUT), third paragraph, second sentence, "All compensation for adjustments to bring existing water meter boxes, fire hydrants, and valve boxes to final grade shall be included." How does this sentence fit in with the scope of work for installing gravity sanitary sewer? This sentence needs to be removed from the specifications or bid items added for this work.

R6. There are no changes to existing grade anticipated, contractor to adjust existing Manatee County facilities as necessary to construct the gravity main and services. Measurement and payment has been updated as follows, "If contractor impacts existing water meter boxes, fire hydrants, and valve boxes then they shall adjust appearances to grade"

Q7. Reference specifications Section 01150, MEASUREMENT AND PAYMENT, pages 88 and 89 of 414, BID ITEM - PVC C900 DR 25 SANITARY SEWER MAIN (OPEN CUT), third paragraph, second sentence, "All compensation for adjustments to bring existing water meter boxes, fire hydrants, and valve boxes to final grade shall be included. Also included shall be the recording of their location by station and offset method and all other appurtenances and incidentals required or specified to complete the gravity sewer main." how does this sentence fit in with the scope of work for installing gravity sanitary sewer? This sentence needs to be removed from the specifications or bid items added for this work.

R7. There are no changes to existing grade anticipated, contractor to adjust existing Manatee County facilities as necessary to construct the gravity main and services. Measurement and payment has been updated as follows, "If contractor impacts existing water meter boxes, fire hydrants, and valve boxes then they shall adjust appearances to grade"

Q8. Reference specifications Section 01150, MEASUREMENT AND PAYMENT, page 89/414, BID ITEM NO. 12 – 8" PVC C900 DR 18 CERTALOK (CLOSE TOLERANCE HDD), first paragraph, the 8-inch PVC C900 DR 18 Certalok (10 FT Segments) pipe is not manufactured in 10-foot lengths, what they do manufacture is a product called Certa-Flo and it does come in 10-foot lengths and there are two (2) options, but the pipe is in Iron Pipe Size outside diameter and they are, (IPS) SDR 21 CL-200 & IPS SDR26 CL-160. Here is the link to this type

pipe certification — https://www.napcopipe.com/sites/default/files/media/PI-CL-025.pdf, please tell us what pipe we are to base our price on since Certa-Lok C-900 DR-18 in cast iron outside diameter and 10-foot lengths is not available.

R8. The requirements for using 10 FT segments have been removed from the Measurement and Payment Section. Contractor must use 8" PVC C900 DR 18 pipe.

Q9. The Contractor also faces other problems with the PVC pipe industry at this time and that is guaranteed pricing and availability. Our vendors are telling us that pricing will be determined at time of shipment and cannot get prices from the manufacturer for the bidding process for at least two to three weeks and then availability of the pipe, could be four to five months. Will the County work with the Contractor regarding these issues?

R9. Yes, the County will work with the Contractor as long as they have the proper documentation. Contractor shall notify County and EOR of any material pricing changes as necessary.

Q10. Reference specifications Section 01590, COUNTY'S FIELD OFFICE, is this necessary? This is a waste of tax payers money and there is no room for one on the project site, please delete this requirement.

R10. Field office is not required

Q11. Reference plan sheet G-02, GENERAL NOTE 16, Manatee County no longer allows the Protecto 401 Lining product and currently requires a product called Permox, please review and confirm.

R11. Plan Sheet G-02, General Note 16 has been revised. "All below-grade fittings 4-inches and greater in diameter shall be mechanical joint ductile iron with interior and exterior linings as noted in manatee county approved products list."

Q12. Reference specifications Section 01150, MEASUREMENT AND PAYMENT, page 95/414, BID ITEM NO. 23 – CONNECTION TO EXISTING LIFT STATION WET WELL, first paragraph, second sentence, "wet well liner repair", what type of liner system does the wet well currently have? Whose product is it?

R12. The current liner system in Lift Station 1 is a drop-in fiberglass liner. A fiberglass liner repair will be required when the new connection to the existing lift station wet well is completed. See updated measurement and payment section.

Q13. Reference plan sheet G-06, MANHOLE DEMOLITION DETAIL, instead of core drilling holes and filling manhole with dirt, will the Contractor be allowed to fill the manhole with concrete grout? Grout filling will be less labor intensive and thereby less expensive. Please allow grout filling.

R13. Grout is allowed instead of core drilling holes and filling manhole with dirt, the top cone will still be required to be removed. Manholes less than 5' shall be completely removed.

Q14. Bid documents do not have the Florida Department of Transportation permit, please provide.

R14. Florida Department of Transportation Permit will be provided as part of this addendum.

Q15. Will jack and boring the seven (7) crossings under S.R.-789, Gulf Drive, be allowed as an alternative to the "Close Tolerance HDD" crossings? If so, can the bid form be designed to have jack and bore method of installation as an alternative option for the contractors to bid on in lieu of the directional drill bid item?

R15. Jack and boring under SR-789 will not be allowed, close tolerance direction drill installation must be completed.

Q16. It is customary for most contractors to give their employees vacation time during the Fourth of July and we hereby request the bid due date be postponed at least three (3) weeks. Please accommodate this request.

R16. The bid date has been pushed out to August 20, 2021, reference Addendum 2.

Q17. Please provide contact information for the directional drill contractors consulted during the design process for the close tolerance horizontal directional drill work for this job, so we can solicit to them for this scope of work.

R17. At the discretion of the bidder, the following is a list of certified Contractors for Close Tolerance Horizontal Direction Drill:

- Trenchless Consulting, LLC - Ted Dimitroff – 573-268-2294 (Ted@Trenchlessflowline.com)
- Dixie Directional LLC – Mark Orr – 863-990-2380 (Mark@Dixiedirectional.com)

Q18. What warrants the use of C-900 DR-18 PVC for gravity sewer application? This pipe comes in 20'-0" lengths and does not maintain line and grade and 14'-0" lengths of pipe will be next to impossible to get from the manufacturer due to small quantity. Why not SDR-26 PVC pipe?

R18. Contractor to follow Plans and Specifications, the County prefers to use the 20' lengths of PVC C-900 DR 18 PVC.

Q19. Are soil borings available? If so, please provide.

R19. Refer to Q1.

Q20. Reference Bid Form, Bid Item 8, 12" PVC SDR-26 Sanitary Sewer Main (Open Cut), bid quantity shows 190LF, plans show 182LF, why do these not match? Please correct.

R20. Additional quantity is included in the bid form to account for unknown overruns. Contractor will be paid for actual quantity installed.

Q21. Reference Bid Form, Bid Item 9, 8" PVC SDR-26, Sanitary Sewer Main, (Open Cut), bid quantity shows 2,050LF, plans show 2,007LF, why do these not match? Please correct.

R21. Additional quantity is included in the bid form to account for unknown overruns. Contractor will be paid for actual quantity installed.

Q22. Reference Bid Form, Bid Item 10, 10" PVC C-900 DR-25, Sanitary Sewer Main (Open Cut), bid quantity shows 1,000LF, plans show 972LF, why do these not match? Please correct.

R22. Additional quantity is included in the bid form to account for unknown overruns. Contractor will be paid for actual quantity installed.

Q23. Reference Bid Form, Bid Item 11, 8" PVC C-900 DRR-25 Sanitary Sewer Main (Open Cut), bid quantity shows 975LF, plans show 914LF, why do these not match? Please correct.

R23. Additional quantity is included in the bid form to account for unknown overruns. Contractor will be paid for actual quantity installed.

Q24. Reference Bid Form, Bid Item 12, 8" PVC C-900 DR-18 Certa-Lok (Close Tolerance HDD), bid quantity shows 550LF, plans show 523LF, why do these not match? Please correct.

R24. Additional quantity is included in the bid form to account for unknown overruns. Contractor will be paid for actual quantity installed.

Q25. Regarding the above items 15 – 19, when we prepare our cost estimate for these bid items the costs for labor, materials, depth of dewatering, etc., are considered and allocated to the plan quantities in order to recover our costs, when the bid quantity does not match the plan quantity the unit price is skewed and does not reflect actual cost, please correct the bid quantities for these bid items.

R25. See previous responses. Contractor to price bid unit quantities based on actual installation price per installed unit. Additional quantities included on the bid form are for unknown overruns.

Q26. Reference Bid Form, Bid Item 19, Precast Polymer Concrete Manhole, bid quantity shows 2-each, plans show 3-each, nos. 4, 7, and 22, please review.

R26. Bid Form has been revised - The quantity of precast polymer concrete manhole has been revised to three (3).

Q27. Reference Bid Form, Bid Item 21, Precast Polymer Concrete Drop Manhole, bid quantity shows 6-each, plans show 5-each, nos. 1, 10, 13, 16 and 19, please review.

R27. Bid Form has been revised - The quantity of precast polymer concrete drop manhole has been revised to five (5).

Q28. The "FULL ROAD RESTORATION" work shown on plan sheets C-05 – C-11 appears to include portions of work in the right-of-way of S.R.-789, Gulf Drive, please provide a bid item for work in the F.D.O.T. right-of-way and a pavement section for what the F.D.O.T. will require to be constructed.

R28. Plans and Specifications have been updated to show FDOT roadway shoulder full depth restoration.

Q29. Will tracing wire be required to be installed with the pipe installed by "Close Tolerance HDD"?

R29. No tracer wire will not be required on gravity sewers.

Q30. Reference plan sheet C-01, the 4-inch force main, presumed to be from the Coquina Beach rest room and refreshment facility, please provide information for flow volume from lift station, peak and low flow times will be helpful.

R30. Contractor to assume force main connection will be performed over the period of 1-night. Manatee County will schedule lift station shutdowns of the Coquina Beach force main and no bypassing will be necessary.

Q31. Reference plan sheet C-12, the lift station at the east end of 6th Street South, please provide information for volume of flow from this station, peak and low flow times will be helpful.

R31. Lift Station 1 design point is 300 gpm @ 55 TDH. The average daily flow is 95 gpm, low flows occur at night and peak flow occur during the morning/day. The lift station pumps operate consistently during the day and cycle during nighttime hours.

Q32. Please provide Detail US-17A as referred to in detail US-2, US-3, & US-4 on sheet D-02.

R32. Detail US-17A has been added to Sheet D-02.

Q33. Please provide borings or any Geotech information available for this project.

R33. Refer to Q1.

Q34. Please confirm that the existing sanitary sewer system are not comprised of asbestos-cement materials.

R34. Based on the survey, sanitary sewer is mainly clay pipe, for bid purposes assume the sanitary sewer is not asbestos-concrete. If asbestos-cement gravity sewer is encountered in construction Contractor to notify County and EOR. The watermain and abandoned watermain in the area may be asbestos concrete pipe.

Q35. Please clarify what the Existing MH #1, Existing MH #3, & the Existing Wet Well are Polymer Concrete or not.

R35. Existing MH #1 & Existing MH #3 are standard concrete. The existing wet well is standard concrete with a fiberglass drop-in liner.

Q36. Please Provide cross-sectional makeup for the Shell Driveway Restoration areas.

R36. Refer to Q3.

Q37. Can you please provide the pre-bid attendance list?

R37. The Non-mandatory Information Conference was virtual and attendance list is not available.

Q38. Can you please provide the agenda from the pre-bid meeting?

R38. See Power Point PDF included with Addendum 3.

Q39. Reference Bid Form, Bid Item 30, Shell Driveway Restoration, what thickness of shell are we to base our bid on? The Measurement and Payment description for this item does not commit to a thickness and there are no details in the plans for this type of restoration, please clarify.

R39. Refer to Q3.

Q40. Reference Bid Form, Bid Item 30, Shell Driveway Restoration, does the shell base material have to be F.D.O.T. Certified or just meet F.D.O.T. specifications? After all, the area the material will be going down at is a parking area. Please clarify.

R40. Refer to Q3.

Q41. Reference specifications Section 01150, MEASUREMENT AND PAYMENT, Bid Item No. 26, Pavement Full Depth Restoration, fourth sentence, "subbase or compacted suitable excavation material", Manatee County normally requires a

stabilized sub-grade having an LBR-60, since there is no detail for this restoration work, what type sub-grade are we bidding for this item?

R41. Refer to Detail 401.9 on Sheet D-03 added to the plans. Stabilized subgrade is required for the subbase material.

Q42. Reference specifications Section 01150, MEASUREMENT AND PAYMENT, Bid Item No. 35, last sentence, reference to (load tickets), the unit of measure for this item is by the cubic yard, is this in-place cubic yard bank measure, CYBM, or truck measure cubic yard, CYTM? The cubic yard truck measure quantity for a tri-axle dump truck will be 18-CYTM per load. Please clarify.

R42. Bid Item shall measure trucked cubic yard. Bid Item and measurement and payment have been revised.

Q43. Reference specifications Section 02618, CLOSE TOLERANCE HORIZONTAL DIRECTIONAL DRILLING, par. 1.01, sub-par. 'C', first sentence, what type license is this sentence referring to?

R43. The close tolerance horizontal directional drill contractor must have a license or certification for close tolerance horizontal directional drilling Arrowbore™ installation.

Q44. Reference Bid Form, Bid Item 17, in order to construct this service lateral it will require dewatering and excavating down to the Certa-Lok pipe installed between manholes no. 1 and 2 and cutting in an 8"x6" wye, this will be next to impossible to do because of the location of the existing 16-inch water main, buried fiber optic cable and buried telephone cable, why not consider connecting to the existing 6-inch service lateral that is currently serving the vacant lot and other residences? This will require removal of the existing manhole, but it is to be demolished anyway and it is not that deep. Besides the existing clay pipe appears to be in good shape.

R44. Contractor to follow plans and specifications, no easements will be acquired for the project. Work shall be performed in the right-of-way.

Q45. Reference plan sheet C-01 and C-13, the proposed stub out service connection will have to have a wye cut-in to the same Certa-Lok pipe as referenced in Item #1 above. Why not consider adding a manhole on 13th Street South at approximately station 202+62 to intercept the 8-inch line to the south that is currently serving the condominiums south of 13th Street South?

R45. Contractor to follow plans and specifications, no easements will be acquired for the project. Work shall be performed in the right-of-way.

Q46. Three other streets, 12th Street South, 10th Street South and 9th Street South have the same cut-in wye type of design and also have the same degree of difficulty with the same existing utilities, please review and consider connecting to the existing service pipe for these service laterals as well. To do so will be an economic saving to the project.

R46. Contractor to follow plans and specifications, no easements will be acquired for the project. Work shall be performed in the right-of-way.

NOTE:

Items that are ~~struck through~~ are deleted. Items that are <u>underlined</u> have been added or changed. All other terms and conditions remain as stated in the IFBC.

INSTRUCTIONS:
Receipt of this Addendum must be acknowledged as instructed in the solicitation document. Failure to acknowledge receipt of this Addendum may result in the response being deemed non-responsive.

END OF ADDENDUM

AUTHORIZED FOR RELEASE Jacob Erickson, MBA, CPPO, NIGP-CPP

Digitally signed by Jacob Erickson, MBA, CPPO, NIGP-CPP
Date: 2021.07.16 16:06:21 -04'00'

APPENDIX K
BID FORM
BRADENTON BEACH GRAVITY REPLACEMENT
Bid "A" BASED ON 670 CALENDAR DAY FOR COMPLETION
Bidder must provide a prices for each line item for their bid to be considered responsive.

ITEM	DESCRIPTION	QUANTITY		UNIT PRICE	AMOUNT
I. MISCELLANEOUS					
1	Mobilization (10%)	1	LS		
2	Maintenance of Traffic	1	LS		
3	Erosion and Sediment Control	1	LS		
4	Clearing and Grubbing	1	LS		
5	Preconstruction Video	1	LS		
6	Project Signs	1	LS		
7	Record Drawings	1	LS		
				SUBTOTAL	**$ -**
II. PROPOSED IMPROVEMENTS					
8	12" PVC SDR 26 Sanitary Sewer Main (Open Cut)	190	LF		
9	8" PVC SDR 26 Sanitary Sewer Main (Open Cut)	2050	LF		
10	10" PVC C900 DR 25 Sanitary Sewer Main (Open Cut)	1000	LF		
11	8" PVC C900 DR 25 Sanitary Sewer Main (Open Cut)	975	LF		
12	8" PVC C900 DR 18 Certalok (Close Tolerance HDD)	550	LF		
13	Cap and Replace Service Lateral (Right of Way) - 8-inch x 6-inch SDR 26 WYE **(Addendum No. 3)**	**69**	EA		
14	Cap and Replace Service Lateral (Right of Way) - 8-inch x 6-inch PVC C900 WYE (6" Branch to fit SDR 26 Service) CTHDD Tie-Ins **(Addendum No. 3)**	**9**	EA		
15	Cap and Replace Service Lateral (Right of Way) - 8-inch x 6-inch PVC C900 WYE (6" Branch to fit SDR 26 Service) 13th Street Tie-Ins **(Addendum No. 3)**	**8**	EA		
16	Cap and Replace Service Lateral (Right of Way) - 12-inch x 6-inch PVC SDR 26 WYE	7	EA		
17	Construct and Connect Service Lateral (Private Property)	34	EA		
18	Construct Service Lateral (Private Property) **(Addendum No. 3)**	**200**	LF		
19	Cut In Manhole	1	EA		
20	Precast Polymer Concrete Manhole **(Addendum No. 3)**	**3**	EA		
21	Standard Precast Concrete Manhole	14	EA		
22	Precast Polymer Concrete Drop Manhole **(Addendum No. 3)**	**5**	EA		

Bidder Name:

Bidder Signature:

23	Connection to Existing 4" Force Main, Manhole Tie In, Below Grade Air Release Valve, Fittings, and Associated Appurtenances	1	LS		
24	Connection to Existing Lift Station Wet Well	1	EA		
25	Connection to Existing Manhole	3	EA		
26	Demolish Existing Manhole Cone, Ring, and Cover and Fill Abandoned Manhole with Compacted Soil	25	EA		
27	Pavement Full Depth Road Restoration **(Addendum No. 3)**	**4940**	SY		
28	Sidewalk & Concrete Driveway Restoration	400	SY		
29	Brick Driveway Restoration	120	SY		
30	Sodding	900	SY		
31	Shell Road Restoration **(Addendum No. 3)**	**4100**	SY		
32	Shell Restoration **(Addendum No. 3)**	**920**	SY		
33	Mailbox Removal and Replacement	20	EA		
34	Grout Fill and Abandon Existing Sanitary Sewer & 4" Force Main	100	CY		
35	Modify Existing Sanitary Service Lateral	13	EA		
36	Relocate Existing Water Main Service Lateral	3	EA		
37	Removal and Replacement of Unsuitable Material, Including Limerock, Brick, Concrete, Mucky Sand **(Addendum No. 3)**	**1045**	CY		
38	FDOT Pavement Repair and Restoration: Mill and Resurfacing **(Addendum No. 3)**	**360**	SY		
39	FDOT Full Depth Road Restoration **(Addendum No. 3)**	**60**	SY		
40	Bypass Pumping	1	LS		
PROPOSED IMPROVEMENTS SUBTOTAL					**$ -**
SUBTOTAL TOTAL BASE BID					**$ -**
41	Contract Contingency (10%)	10%	LS		$ -
TOTAL BID "A"PRICE INCLUDING TOTAL CONSTRUCTION COSTS BASED ON 670 CALENDAR DAY COMPLETION					**$ -**

Bidder Name:

Bidder Signature:

APPENDIX K
BID FORM
BRADENTON BEACH GRAVITY REPLACEMENT
Bid "B" BASED ON 760 CALENDAR DAY FOR COMPLETION
Bidder must provide a prices for each line item for their bid to be considered responsive.

ITEM	DESCRIPTION	QUANTITY		UNIT PRICE	AMOUNT
I. MISCELLANEOUS					
1	Mobilization (10%)	1	LS		
2	Maintenance of Traffic	1	LS		
3	Erosion and Sediment Control	1	LS		
4	Clearing and Grubbing	1	LS		
5	Preconstruction Video	1	LS		
6	Project Signs	1	LS		
7	Record Drawings	1	LS		
				SUBTOTAL	**$ -**
II. PROPOSED IMPROVEMENTS					
8	12" PVC SDR 26 Sanitary Sewer Main (Open Cut)	190	LF		
9	8" PVC SDR 26 Sanitary Sewer Main (Open Cut)	2050	LF		
10	10" PVC C900 DR 25 Sanitary Sewer Main (Open Cut)	1000	LF		
11	8" PVC C900 DR 25 Sanitary Sewer Main (Open Cut)	975	LF		
12	8" PVC C900 DR 18 Certalok (Close Tolerance HDD)	550	LF		
13	Cap and Replace Service Lateral (Right of Way) - 8-inch x 6-inch SDR 26 WYE **(Addendum No. 3)**	**69**	EA		
14	Cap and Replace Service Lateral (Right of Way) - 8-inch x 6-inch PVC C900 WYE (6" Branch to fit SDR 26 Service) CTHDD Tie-Ins **(Addendum No. 3)**	**9**	EA		
15	Cap and Replace Service Lateral (Right of Way) - 8-inch x 6-inch PVC C900 WYE (6" Branch to fit SDR 26 Service) 13th Street Tie-Ins **(Addendum No. 3)**	**8**	EA		
16	Cap and Replace Service Lateral (Right of Way) - 12-inch x 6-inch PVC SDR 26 WYE	7	EA		
17	Construct and Connect Service Lateral (Private Property)	34	EA		
18	Construct Service Lateral (Private Property) **(Addendum No. 3)**	**200**	LF		
19	Cut In Manhole	1	EA		
20	Precast Polymer Concrete Manhole **(Addendum No. 3)**	**3**	EA		
21	Standard Precast Concrete Manhole	14	EA		
22	Precast Polymer Concrete Drop Manhole **(Addendum No. 3)**	**5**	EA		
23	Connection to Existing 4" Force Main, Manhole Tie In, Below Grade Air Release Valve, Fittings, and Associated Appurtenances	1	LS		

Bidder Name:

Bidder Signature:

24	Connection to Existing Lift Station Wet Well	1	EA		
25	Connection to Existing Manhole	3	EA		
26	Demolish Existing Manhole Cone, Ring, and Cover and Fill Abandoned Manhole with Compacted Soil	25	EA		
27	Pavement Full Depth Road Restoration **(Addendum No. 3)**	**4940**	SY		
28	Sidewalk & Concrete Driveway Restoration	400	SY		
29	Brick Driveway Restoration	120	SY		
30	Sodding	900	SY		
31	Shell Road Restoration **(Addendum No. 3)**	**4100**	SY		
32	Shell Restoration **(Addendum No. 3)**	**920**	SY		
33	Mailbox Removal and Replacement	20	EA		
34	Grout Fill and Abandon Existing Sanitary Sewer & 4" Force Main	100	CY		
35	Modify Existing Sanitary Service Lateral	13	EA		
36	Relocate Existing Water Main Service Lateral	3	EA		
37	Removal and Replacement of Unsuitable Material, Including Limerock, Brick, Concrete, Mucky Sand **(Addendum No. 3)**	**1045**	CY		
38	FDOT Pavement Repair and Restoration: Mill and Resurfacing **(Addendum No. 3)**	**360**	SY		
39	FDOT Full Depth Road Restoration **(Addendum No. 3)**	**60**	SY		
40	Bypass Pumping	1	LS		
PROPOSED IMPROVEMENTS SUBTOTAL					**$ -**
SUBTOTAL TOTAL BASE BID					**$ -**
41	Contract Contingency (10%)	10%	LS		$ -
TOTAL BID "B"PRICE INCLUDING TOTAL CONSTRUCTION COSTS BASED ON 760 CALENDAR DAY COMPLETION					**$ -**

Bidder Name:

Bidder Signature:

SECTION 01150 MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SCOPE

A. The scope of this section of the Contract Documents is to further define the items included in each Bid Item in the Bid Form section of the Contract Documents. Payment will be made based on the specified items included in the description in this section for each bid item.

B. All contract prices included in the Bid Form section will be full compensation for all shop drawings, working drawings, labor, materials, tools, equipment and incidentals necessary to complete the construction as shown on the Drawings and/or as specified in the Contract Documents to be performed under this Contract. Actual quantities of each item bid on a unit price basis will be determined upon completion of the construction in the manner set up for each item in this section of the Specifications. Payment for all items listed in the Bid Form will constitute full compensation for all work shown and/or specified to be performed under this Contract.

1.02 ESTIMATED QUANTITIES

The quantities shown are approximate and are given only as a basis of calculation upon which the award of the Contract is to be made. The County does not assume any responsibility for the final quantities, nor shall the Contractor claim misunderstanding because of such estimate of quantities. Final payment will be made only for satisfactorily completed quantity of each item.

1.03 WORK OUTSIDE AUTHORIZED LIMITS

No payment will be made for work constructed outside the authorized limits of work.

1.04 MEASUREMENT STANDARDS

Unless otherwise specified for the particular items involved, all measurements of distance shall be taken horizontally or vertically.

1.05 AREA MEASUREMENTS

In the measurement of items to be paid for on the basis of area of finished work, the lengths and/or widths to be used in the calculations shall be the final dimensions measured along the surface of the completed work within the neat lines shown or designated.

1.06 LUMP SUM ITEMS

Where payment for items is shown to be paid for on a lump sum basis, no separate payment will be made for any item of work required to complete the lump sum items. Lump sum contracts shall be complete, tested and fully operable prior to request for final payment. Contractor may be required to provide a break-down of the lump sum

totals.

1.07 UNIT PRICE ITEM

Separate payment will be made for the items of work described herein and listed on the Bid Form. Any related work not specifically listed, but required for satisfactory completion of the work shall be considered to be included in the scope of the appropriate listed work items.

No separate payment will be made for the following items and the cost of such work shall be included in the applicable pay items of work. Final payments shall not be requested by the Contractor or made by the County until as-built (record) drawings have been submitted and approved by the County.

1. Shop Drawings, Working Drawings.
2. Clearing, grubbing and grading except as hereinafter specified.
3. Trench excavation, including necessary pavement removal and rock removal, except as otherwise specified.
4. Dewatering and disposal of surplus water.
5. Structural fill, backfill, and grading.
6. Replacement of unpaved roadways and shrubbery plots.
7. Cleanup and miscellaneous work.
8. Foundation and borrow materials, except as hereinafter specified.
9. Testing and placing system in operation.
10. Any material and equipment required to be installed and utilized for the tests.
11. Pipe, structures, pavement replacement, asphalt and shell driveways and/or appurtenances included within the limits of lump sum work, unless otherwise shown.
12. Maintaining the existing quality of service during construction.
13. Maintaining or detouring of traffic.
14. Appurtenant work as required for a complete and operable system.
15. Seeding and hydromulching.
16. As-built Record Drawings.

BID ITEM NO.1 - MOBILIZATION

Measurement and payment for this Bid Item shall include full compensation for the required 100 percent (100%) Performance Bond, 100 Percent (100%) Payment Bond, all required insurance for the project and the Contractor's mobilization and demobilization costs as shown in the Bid Form. Mobilization includes, but it not limited to: preparation and movement of personnel, equipment, supplies and incidentals such as safety and sanitary supplies/ facilities

Payment for mobilization shall not exceed 10 percent (10%) of the total Contract cost unless the Contractor can prove to the County that his actual mobilization cost exceeds 10 percent (10%).

Partial payments for this Bid Item will be made in accordance with the following schedule:

Percent of Original Contract Amount:	Percent Allowable Payment of Mobilization/Demobilization Bid Item Price:
5	25
10	35
25	45
50	50
75	75
100	100

These payments will be subject to the standard retainage provided in the Contract. Payment of the retainage will be made after completion of the work and demobilization.

BID ITEM NO. 2 – MAINTENANCE OF TRAFFIC

Payment for all work included in this Bid Items will be made at the applicable Contract lump sum bid for the maintenance of traffic during the construction of the proposed improvements. Payment shall represent full compensation for all labor, materials, necessary equipment, coordination, and incidentals necessary to safely complete the work while complying to FDOT Design Standards Index 102-600 Series, ready for approval and acceptance by the County.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor In accordance with the Contract Documents.

BID ITEM NO. 3 – EROSION AND SEDIMENT CONTROL

Payment for all work included, but is not limited to, under this Bid Item shall represent full compensation in accordance with the lump sum price bid for erosion and sediment control, including permitting if required, coordination with federal, state and local agencies and all equipment and manpower necessary to comply with necessary agencies.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

BID ITEM NO. 4 – CLEARING AND GRUBBING

Payment for all work included under this Bid Item shall be quantified by the Contractor and paid for as a lump sum amount for all of the areas that will require clearing and grubbing for the pipe installation and in accordance with the plans and specifications. Clearing and grubbing shall include the removal and disposal of trees, tree roots, rock, abandoned pipe and other features not part of the proposed improvements. The Contractor shall include the cost of any and all permitting required for the burning or disposal of removed trees and vegetation.

Unless otherwise indicated herein these documents or in the construction plans, clearing and grubbing includes a ten (10) foot strip along the pipeline and service

lateral routes (within private property and within Right-of-Way). The Contractor will be responsible for making their own determination as to the quantity of clearing and grubbing.

BID ITEM NO. 5 – PRECONSTRUCTION VIDEO

Payment for all work included in this Bid Items will be made at the applicable Contract lump sum bid for the preconstruction video of the existing site conditions including private property where sanitary service lateral construction is necessary. Payment shall represent full compensation for all labor, materials, necessary equipment, and incidentals necessary to complete the work, ready for approval and acceptance by the County.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor In accordance with the Contract Documents.

BID ITEM NO. 6 – PROJECT SIGNS

Payment for all work included in this Bid Item will be made at the applicable Contract lump sum bid for the necessary signage required during construction. At least two (2) project signs should be used per project. Payment shall represent full compensation for all labor, materials, necessary equipment, and incidentals necessary to complete the work, ready for approval and acceptance by the County.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor In accordance with the Contract Documents.

BID ITEM NO. 7 – RECORD DRAWINGS

Payment for all work included, but is not limited to, under this Bid Item shall represent full compensation in accordance with the lump sum price bid for as-built record drawings or any other required certifications to put proposed project into service. All items are subject to approval by the Engineer and the County.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor In accordance with the Contract Documents and Specifications Section: 01720.

BID ITEM – PVC SDR 26 SANITARY SEWER MAIN (OPEN CUT)

Payment for all work included under this Bid Item shall be made at the applicable Contract unit price bid per linear foot for furnishing and installing the listed diameter sanitary sewer main at the depths shown on the Contract Drawings and designated on the Bid Form for the actual length installed. Measurement for the installed length shall be measured horizontally from center to center of manholes.

Additionally, CCTV inspection, recording and testing of the sewer main while County Inspector is present after construction and additional testing per specification section 02623 shall be included in this Bid Item. Pipe deflection shall not deviate by more

than 1-inch from the design line.

Payment shall represent full compensation for all labor, excavation, including rock as necessary, dewatering, pipe, bedding, materials, backfill, compaction, sheeting, CCTV inspection and testing and equipment and all other appurtenances and incidentals required or specified to complete the gravity sewer main. If contractor impacts existing water meter boxes, fire hydrants, and valve boxes then they shall adjust appearances to grade. No additional compensation will be made by the County for excavation performed below the bottom of the pipe, for rock removal or materials or for repair of any trench settlement. Class of pipe to be as specified or as listed on the Bid Form.

BID ITEM	DESCRIPTION	UNITS
8	12" PVC SDR 26 SANITARY SEWER MAIN (OPEN CUT)	LF
9	8" PVC SDR 26 SANITARY SEWER MAIN (OPEN CUT)	LF

BID ITEM - PVC C900 DR 25 SANITARY SEWER MAIN (OPEN CUT)

Payment for all work included under this Bid Item shall be made at the applicable Contract unit price bid per linear foot for furnishing and installing the listed diameter sanitary sewer main at the depths shown on the Contract Drawings and designated on the Bid Form for the actual length installed. Measurement for the installed length shall be measured horizontally from center to center of manholes.

Additionally, CCTV inspection, recording and testing of the sewer main while County Inspector is present after construction and additional testing per specification section 02623 shall be included in this Bid Item. Pipe deflection shall not deviate by more than 1-inch from the design line.

Payment shall represent full compensation for all labor, excavation, including rock as necessary, dewatering, pipe, bedding, materials, backfill, compaction, sheeting, CCTV inspection and testing and equipment. If contractor impacts existing water meter boxes, fire hydrants, and valve boxes then they shall adjust appearances to grade. Also included shall be the recording of their location by station and offset method and all other appurtenances and incidentals required or specified to complete the gravity sewer main. No additional compensation will be made by the County for excavation performed below the bottom of the pipe, for rock removal or materials or for repair of any trench settlement. Class of pipe to be as specified or as listed on the Bid Form.

BID ITEM	DESCRIPTION	UNITS
10	10" PVC C900 DR25 SANITARY SEWER MAIN (OPEN CUT)	LF
11	8" PVC C900 DR25 SANITARY SEWER MAIN (OPEN CUT)	LF

BID ITEM NO. 12 – 8" PVC C900 DR 18 CERTALOK (CLOSE TOLERANCE HDD)

Payment for all work included under this Bid Item shall be made at the Contract unit price bid per the schedule of prices for furnishing and installing the 8-inch PVC C900 DR 18 Certalok by close tolerance horizontal directional drill and associated connection pipe sections as shown on the Contract Drawings. Restoration of any disturbed areas, from either drill rigs, equipment, pressure relief and pilot holes, shall be included as part of this Bid Item.

Additionally, CCTV inspection, recording and testing of the sewer main while County Inspector is present after construction and additional testing per specification section 02623 shall be included in this Bid Item. Pipe deflection shall not deviate by more than 1-inch from the design line.

Measurement and Payment shall be made for the actual length of the listed diameter pipe close tolerance directional drilled and installed including final connections to manholes, and will represent full compensation for all labor, materials, excavation, including rock, dewatering, bedding, backfill, compaction, CCTV inspection and testing, pipe restraints, mud trailer, and equipment required to complete these Bid Items for a fully operational sewer system. Restoration of relief holes conforming to the Contract specifications and FDOT permit shall be included in this bid item. No additional compensation shall be made for excavation below the bottom of the pipe, for rock removal or bedding and backfill material, or for repair of any trench settlement. No additional compensation shall be made for extensive dewatering or any water treatment services or equipment that may be required for contaminated groundwater.

BID ITEM NO. 13 – CAP AND REPLACE SERVICE LATERAL (RIGHT OF WAY) - 8-inch x 6-inch SDR 26 WYE

Payment for all work included in this Bid Item shall be made at the applicable Contract unit price bid for each service lateral replacement from main sewer line to the property line as shown on the Contract Drawings and listed on the Bid Form. Payment shall represent full compensation at all depths and lengths to cut, cap and connect existing service lateral up to right of way and all associated appurtenances to construct proposed service lateral from property line to proposed sewer main as shown on the Contract Drawings.

Replaced service laterals shall comply to Contract Documents including Manatee County Standard Details. A cleanout shall be installed in conjunction with all service later replacements at the back of right of way and at any change in direction as specified in Contract Documents. All service laterals shall be single service. Service laterals that are double services shall be converted to two (2) single service laterals as shown on Contract Documents. This Bid Item shall represent full compensation, including but not limited to "8-inch SDR-26 x 6-inch SDR-26" service Wye, fittings, plugs, pad including cast iron ring and cover, vertical extension, concrete encasement, 2" PVC Pipe (painted green) where applicable, 6" SDR-26 Pipe, cleanouts and associated appurtenances as shown on Contract Documents and Manatee County Standard Details. No payment for service lateral construction or connection on private property, driveway rehabilitation, or driveway restoration shall be made under this Bid Item.

All service locations shown on the Contract Drawings are approximate and it shall be the responsibility of the Contractor to locate existing service laterals and determine, subject to approval by the County, the best location for each service lateral and cleanout. Locations of all single service connections at the main line sewer and at the property line shall be recorded on the as-built drawings per specifications section 01720 and shall be furnished to County by the Contractor.

Each service lateral replacement in right of way shall include, but not limited all labor, materials, equipment, fittings, connections, excavation, including rock, bedding, backfill, compaction, testing and disinfection, temporary bypassing, and equipment required to complete these Bid Items in accordance with Contract Documents.

BID ITEM NO. 14 – CAP AND REPLACE SERVICE LATERAL (RIGHT OF WAY) - 8-inch x 6-inch PVC C900 WYE (6" BRANCH TO FIT SDR 26 SERVICE) - CTHDD TIE-INS

Payment for all work included in this Bid Item shall be made at the applicable Contract unit price bid for each service lateral replacement from main sewer line to the property line as shown on the Contract Drawings and listed on the Bid Form. Payment shall represent full compensation at all depths and lengths to cut, cap and connect existing service lateral up to right of way and all associated appurtenances to construct proposed service lateral from property line to proposed sewer main as shown on the Contract Drawings.

Replaced service laterals shall comply to Contract Documents including Manatee County Standard Details. A cleanout shall be installed in conjunction with all service later replacements at the back of right of way and at any change in direction as specified in Contract Documents. All service laterals shall be single service. Service laterals that are double services shall be converted to two (2) single service laterals as shown on Contract Documents. This Bid Item shall represent full compensation, including but not limited to "8-inch C900 x 6-inch SDR-26" service Wye, fittings, plugs, pad including cast iron ring and cover, vertical extension, concrete encasement, 2" PVC Pipe (painted green) where applicable, 6" SDR-26 Pipe, cleanouts and associated appurtenances as shown on Contract Documents and Manatee County Standard Details. No payment for service lateral construction or connection on private property, driveway rehabilitation or driveway restoration shall be made under this Bid Item.

All service locations shown on the Contract Drawings are approximate and it shall be the responsibility of the Contractor to locate existing service laterals and determine, subject to approval by the County, the best location for each service lateral and cleanout. Locations of all single service connections at the main line sewer and at the property line shall be recorded on the as-built drawings per specifications section 01720 and shall be furnished to County by the Contractor.

Each service lateral replacement in right of way shall include, but not limited all labor, materials, equipment, fittings, connections, excavation, including rock, bedding, backfill, compaction, testing and disinfection, temporary bypassing, and equipment required to complete these Bid Items in accordance with Contract Documents.

BID ITEM NO. 15 – CAP AND REPLACE SERVICE LATERAL (RIGHT OF WAY) - 8-inch x 6-inch PVC C900 WYE (6" BRANCH TO FIT SDR 26 SERVICE) -13TH STREET TIE-INS

Payment for all work included in this Bid Item shall be made at the applicable Contract unit price bid for each service lateral replacement from main sewer line to the property line as shown on the Contract Drawings and listed on the Bid Form. Payment shall represent full compensation at all depths and lengths to cut, cap and connect existing service lateral up to right of way and all associated appurtenances to construct proposed service lateral from property line to proposed sewer main as shown on the Contract Drawings.

Replaced service laterals shall comply to Contract Documents including Manatee County Standard Details. A cleanout shall be installed in conjunction with all service later replacements at the back of right of way and at any change in direction as specified in Contract Documents. All service laterals shall be single service. Service laterals that are double services shall be converted to two (2) single service laterals as shown on Contract Documents. This Bid Item shall represent full compensation, including but not limited to "8-inch C900 x 6-inch SDR-26" service Wye, fittings, plugs, pad including cast iron ring and cover, vertical extension, concrete encasement, 2" PVC Pipe (painted green) where applicable, 6" SDR-26 Pipe, cleanouts and associated appurtenances as shown on Contract Documents and Manatee County Standard Details. No payment for service lateral construction or connection on private property, driveway rehabilitation or driveway restoration shall be made under this Bid Item.

All service locations shown on the Contract Drawings are approximate and it shall be the responsibility of the Contractor to locate existing service laterals and determine, subject to approval by the County, the best location for each service lateral and cleanout. Locations of all single service connections at the main line sewer and at the property line shall be recorded on the as-built drawings per specifications section 01720 and shall be furnished to County by the Contractor.

Each service lateral replacement in right of way shall include, but not limited all labor, materials, equipment, fittings, connections, excavation, including rock, bedding, backfill, compaction, testing and disinfection, temporary bypassing, and equipment required to complete these Bid Items in accordance with Contract Documents.

BID ITEM NO. 16 – CAP AND REPLACE SERVICE LATERAL (RIGHT OF WAY) - 12-inch x 6-inch SDR 26 WYE

Payment for all work included in this Bid Item shall be made at the applicable Contract unit price bid for each service lateral replacement from main sewer line to the property line as shown on the Contract Drawings and listed on the Bid Form. Payment shall represent full compensation at all depths and lengths to cut, cap and connect existing service lateral up to right of way and all associated appurtenances to construct proposed service lateral from property line to proposed sewer main as shown on the Contract Drawings.

Replaced service laterals shall comply to Contract Documents including Manatee County Standard Details. A cleanout shall be installed in conjunction with all service later replacements at the back of right of way and at any change in direction as

specified in Contract Documents. All service laterals shall be single service. Service laterals that are double services shall be converted to two (2) single service laterals as shown on Contract Documents. This Bid Item shall represent full compensation, including but not limited to "12-inch SDR-26 x 6-inch SDR-26" service Wye, fittings, plugs, pad including cast iron ring and cover, vertical extension, concrete encasement, 2" PVC Pipe (painted green) where applicable, 6" SDR-26 Pipe, cleanouts and associated appurtenances as shown on Contract Documents and Manatee County Standard Details. No payment for service lateral construction or connection on private property, driveway rehabilitation or driveway restoration shall be made under this Bid Item.

All service locations shown on the Contract Drawings are approximate and it shall be the responsibility of the Contractor to locate existing service laterals and determine, subject to approval by the County, the best location for each service lateral and cleanout. Locations of all single service connections at the main line sewer and at the property shall be recorded on the as-built drawings per specifications section 01720 and shall be furnished to County by the Contractor.

Each service lateral replacement in right of way shall include, but not limited all labor, materials, equipment, fittings, connections, excavation, including rock, bedding, backfill, compaction, testing and disinfection, temporary bypassing, and equipment required to complete these Bid Items in accordance with Contract Documents.

BID ITEM NO. 17 – CONSTRUCT AND CONNECT SERVICE LATERAL (PRIVATE PROPERTY)

Payment for work included under this Bid Item shall be made at the Contract unit price bid for each (length up to 100-LF) property service lateral piping with associated fittings including cut, cap, and connecting on private property. Payment shall represent full compensation for 6-inch diameter SDR-26 pipe service lateral construction (up to 100-LF) on private property, this shall be measured from right-of-way cleanout as stated in Contract Documents to shortest point of connection to existing service lateral as shown on Contract Documents or as alternately requested by the property owner with approval from County, including all bends, fittings, cleanouts, WYE's, sleeves, all other appurtenances, all labor, equipment, and materials necessary to complete each service connection on private property. This Bid Item shall include cleanouts at all changes in direction on private property. The elevation depth below grade as shown in the service connection detail on the Contract Drawings for the lateral invert shall be maintained by the Contractor installing the sanitary sewer service line.

All service locations shown on the Contract Drawings are approximate and it shall be the responsibility of the Contractor to contact all homeowners for locating the owner's existing service lateral and determine, subject to approval by the County, the best locations and depth for each service lateral. No payment for construction in right-of-way shall be made under this Bid Item.

All work on customers sanitary sewer service lines on private property shall be completed by a plumber licensed in Manatee County. The Contractor shall not commence work on private property until the right-of-entry approval is obtained by Owner and a copy of the right-of-entry approval is provided to the Contractor. Refer to SECTION: 02591 RIGHT-OF-ENTRY SANITARY SEWER SERVICE –

CONSTRUCTION ON PRIVATE PROPERTY.

All restoration on private property shall be included in this bid item including fencing, landscaping, irrigation, water service, shell/rock, sod, concrete pavers, pavement, etc. Contractor shall coordinate with the homeowner prior to construction of the private lateral and shall be included in the bid price.

Also included in payment shall be all excavation, including rock as necessary, bedding, backfill, compaction, testing, CCTV, extensions, caps, and all restoration as shown on the Contract Drawings, furnished and installed watertight, ready for approval by the County.

BID ITEM NO. 18 – CONSTRUCT SERVICE LATERAL (PRIVATE PROPERTY)

Payment for work included under this Bid Item shall be made at the Contract linear feet price bid for each additional linear feet of 6-inch diameter SDR-26 service lateral pipe which exceeds length of 100-LF, measured from back of right-of-way cleanout as shown on Contract Documents to shortest point of connection to existing service lateral as shown on Contract Documents or as alternately requested by the property owner and reviewed by County. This Bid Item shall account for any additional lengths of service laterals over 100-LF, measured from right-of-way cleanout to shortest point of connection and approved by Manatee County. Payment for this Bid Item shall include all appurtenances including all labor, equipment, and materials necessary to construct additional service lateral length over 100-LF on private property. The elevation depth below grade as shown in the service connection detail on the Contract Drawings for the lateral invert shall be maintained by the Contractor installing the sanitary sewer service line. No payment for construction in right-of-way, connection to existing lateral on private property, or linear feet of 6-inch diameter SDR-26 on private property under 100-LF shall be made under this Bid Item.

All service locations shown on the Contract Drawings are approximate and it shall be the responsibility of the Contractor to contact all homeowners for locating the owner's existing service lateral and determine, subject to approval by the County, the best locations and depth for each service lateral. Additional service lateral length shall be approved by County prior to any construction of additional service laterals.

All work on customers sanitary sewer service lines on private property shall be completed by a plumber licensed in Manatee County. The Contractor shall not commence work on private property until the right-of-entry approval is obtained by Owner and a copy of the right-of-entry approval is provided to the Contractor. Refer to SECTION: 02591 RIGHT-OF-ENTRY SANITARY SEWER SERVICE – CONSTRUCTION ON PRIVATE PROPERTY.

All restoration on private property shall be included in this bid item including fencing, landscaping, irrigation, water service, shell/rock, sod, concrete pavers, pavement, etc. Contractor shall coordinate with the homeowner prior to construction of the private lateral and shall be included in the bid price.

Also included in payment shall be all excavation, including rock as necessary, bedding, backfill, compaction, testing, extensions, caps and all restoration as shown on the Contract Drawings, furnished and installed watertight, ready for approval by the County acceptance.

BID ITEM NO. 19 – CUT IN MANHOLE

Payment for work under this Bid Item shall be made at the Contract unit price bid for each cut in manhole including, cast in-place base slab and section, pre-cast risers, gaskets, cone, ring, and cover, furnished and installed including heavy duty composite frame and locking cover, frame and cover shall have min. three (3) 316 SS locking bolts, construction of inverts, sealing of lift holes, rainwater protector, waterstops, grade adjustment rings, manhole boot connectors, bench, plugs, etc. Included in this bid item is the removal of pipe within the manhole required to transfer flows from the existing gravity system to the new gravity system. South invert of cut in MH #1 on 11th Street South shall temporarily receive flow from existing sewer system (south of 11th Street South) until proposed system (Phase 2) is complete and approved by Manatee County. Upon approval from County, south invert shall be plugged per Contract Documents. All repair work, caps, and grout shall be included in this Bid item.

Additionally, CCTV inspection, recording and testing of the sewer main while County Inspector is present before any excavation over the pipe and after construction shall be included in this Bid Item. Pipe deflection shall not deviate by more than 1-inch from the design line.

Measurement shall be for each manhole installed complete and accepted. Payment shall be made per unit price for the category of depth as determined by the proposed rim and invert. All stubs and plugs shown or called for on the Contract Drawings shall be included in the unit price bid for manholes. Excavation, including rock as necessary, bedding, backfill, dewatering, sheeting, testing and any and all other items necessary for a completed system in accordance with the Contract Documents shall be included. Payment shall represent full compensation for all labor, materials, equipment and incidental items necessary to complete each concrete manhole structure, ready for approval and service by the County.

BID ITEM NO. 20 – PRECAST POLYMER CONCRETE MANHOLE

Payment for work under this Bid Item shall be made at the Contract unit price bid for each precast polymer concrete manhole furnished and installed including heavy duty composite frame and locking cover, frame and cover shall have min. three (3) 316 SS locking bolts, construction of inverts, sealing of lift holes, rainwater protector, grade adjustment rings, joint sealants, pipe connection to manhole, manhole boot connectors, polymer bench and polymer grout, concrete ballast, etc.

Additionally, CCTV inspection, recording and testing of the sewer main while County Inspector is present after construction shall be included in this Bid Item. Pipe deflection shall not deviate by more than 1-inch from the design line.

Measurement shall be for each manhole installed complete and accepted. Payment shall be made per unit price for the category of depth as determined by the proposed rim and invert. All stubs and plugs shown or called for on the Contract Drawings shall be included in the unit price bid for manholes. Excavation, including rock as necessary, bedding, backfill, dewatering, sheeting, CCTV inspection, testing and equipment and any and all other items necessary for a completed system in accordance with the Contract Documents shall be included. Payment shall represent

full compensation for all labor, materials, equipment and incidental items necessary to complete each polymer concrete manhole structure, ready for approval and service by the County.

BID ITEM NO. 21 – STANDARD PRECAST CONCRETE MANHOLE

Payment for work under this Bid Item shall be made at the Contract unit price bid for each precast concrete manhole furnished and installed including heavy duty composite frame and locking cover, frame and cover shall have min. three (3) 316 SS locking bolts, construction of inverts, drop connections if applicable, sealing of lift holes, rainwater protector, grade adjustment rings, pipe connection to manhole, manhole boot connectors, concrete ballast, bench, etc.

Additionally, CCTV inspection, recording and testing of the sewer main while County Inspector is present after construction shall be included in this Bid Item. Pipe deflection shall not deviate by more than 1-inch from the design line.

Measurement shall be for each manhole installed complete and accepted. Payment shall be made per unit price for the category of depth as determined by the proposed rim and invert. All stubs and plugs shown or called for on the Contract Drawings shall be included in the unit price bid for manholes. Excavation, including rock as necessary, bedding, backfill, dewatering, sheeting, CCTV inspection, testing and equipment and any and all other items necessary for a completed system in accordance with the Contract Documents shall be included. Payment shall represent full compensation for all labor, materials, equipment and incidental items necessary to complete each precast concrete manhole structure, ready for approval and service by the County.

BID ITEM NO. 22 – PRECAST POLYMER CONCRETE DROP MANHOLE

Payment for work under this Bid Item shall be made at the Contract unit price bid for each precast concrete drop manhole furnished and installed including heavy duty composite frame and locking cover, frame and cover shall have min. three (3) 316 SS locking bolts, construction of inverts, drop connections and associated fitting, sealing of lift holes, rainwater protector, grade adjustment rings, pipe connection to manhole, manhole boot connectors, pipe fittings, concrete encasement, concrete ballast, and pipe penetrations, etc.

Additionally, CCTV inspection, recording and testing of the sewer main while County Inspector is present after construction shall be included in this Bid Item. Pipe deflection shall not deviate by more than 1-inch from the design line.

Measurement shall be for each manhole installed complete and accepted. Payment shall be made per unit price for the category of depth as determined by the proposed rim and invert. All stubs and plugs shown or called for on the Contract Drawings shall be included in the unit price bid for manholes. Excavation, including rock as necessary, bedding, backfill, dewatering, sheeting, CCTV inspection, testing and equipment and any and all other items necessary for a completed system in accordance with the Contract Documents shall be included. Payment shall represent full compensation for all labor, materials, equipment and incidental items necessary to complete each concrete manhole structure, ready for approval and service by the County.

BID ITEM NO. 23 – CONNECTION TO EXISTING 4" FORCE MAIN, MANHOLE TIE IN, BELOW GRADE, AIR RELEASE VALVE, FITTINGS, AND ASSOCIATED APPURTENANCES

Payment for all work included, but is not limited to, under these Bid Items shall be made at the applicable Contract lump sum price bid for the force main connection, manhole tie in, below grade air release valve, fittings, and associated appurtenances. Payment for all work included, but is not limited to, under this Bid Item shall represent full compensation in accordance with the lump sum price bid for all labor, below grade air release valve and associated appurtenances and precast polymer concrete ARV manhole, PVC C900 DR 18 pipe, P-trap and drop assembly PVC C907 fittings, ductile iron sleeve couplings as necessary, mechanical joint restraints, demolition of no more than 20-LF of 4-inch force main, blue fluoropolymer coated high-strength low alloy steel or uncoated 316 stainless steel hardware, grout, excavation, dewatering, bedding, backfill, compaction, testing, equipment, bypassing/pumper trucks, the temporary shutdown of the existing lift station to connect the proposed force main, and all temporary line stops, restraints, or thrust blocks for force main connections. All material and labor to connect the proposed 4" force main to the proposed manhole per County details on the Contract shall be included. Contractor shall make provisions to have an adequate number of septage trucks available to make the necessary force main connections.

Coordinate with Nick Wagner (Lift Station Superintendent) with Manatee County for shutdown of Lift Stations. At least four days' notice needs to be provided to Nick to coordinate shutdown. Phone Number: 941-792-8811 EXT 5377. Connection must also be made outside of peak hours between 9PM and 5AM.

Measurement for periodic payments of this item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

BID ITEM NO. 24 – CONNECTION TO EXISTING LIFT STATION WET WELL

Payment for all work included, but is not limited to, under this Bid Item shall represent full compensation for the proposed gravity main connection to the existing wet well. Payment for work under this Bid Item will be made for each connection as shown in the Contract Documents and shall represent full compensation for all labor, material, fittings, jack-in manhole boot per ASTM C-923, fiberglass wet well liner repair, preparation, cleaning, excavation, dewatering, bedding, backfill, compaction, grout, testing, and equipment to complete this Bid Item in accordance with the Contract Documents.

Coordinate with Nick Wagner (Lift Station Superintendent) with Manatee County for shutdown of Lift Stations. At least four days' notice needs to be provided to Nick to coordinate shutdown. Phone Number: 941-792-8811 EXT 5377. Connection must also be made outside of peak hours between 9PM and 5AM.

BID ITEM NO. 25 – CONNECTION TO EXISTING MANHOLE

Payment for all work included in these Bid Items shall be made at the applicable Contract unit price bid per each manhole connection. Payment shall represent full

compensation for all labor, materials, and equipment. This bid item includes, but is not limited to, connecting the new main to existing manholes, rebuilding the existing bench, coring as necessary, all necessary grout required to seal the manhole connection, and installing the jack-in manhole boot per ASTM C-923.

Coordinate with Nick Wagner (Lift Station Superintendent) with Manatee County for shutdown of Lift Stations. At least four days' notice needs to be provided to Nick to coordinate shutdown. Phone Number: 941-792-8811 EXT 5377. Connection must also be made outside of peak hours between 9PM and 5AM.

BID ITEM NO. 26 – DEMOLISH EXISTING MANHOLE CONE, RING, AND COVER AND FILL ABANDONED MANHOLE WITH COMPACTED SOIL

Payment for all work included, but is not limited to, under this Bid Item shall represent full compensation in accordance with the unit price bid per demolished and abandoned manhole as shown on the Contract Drawings and listed on the Bid Form. Payment shall represent full compensation at all depths for demolishing existing manhole cone or flat top to 3-feet below proposed grade, installing a minimum of four (4) core drill holes on manhole base, and backfilling the remaining structure with compacted soil. Additionally, dewatering and sheeting/shearing shall be represented in this Bid Item. Manholes less than 5-feet in depth shall be completely removed and backfilled. All soil backfill shall be compacted to 98% density, AASHTO T-180 per Contract Documents and Manatee County Specifications. Manholes outside of the roadway may be backfilled with soil compacted to 95% density, AASHTO T-180 or greater per Contract Documents and Manatee County Specifications. No payment for grout, fill and abandoning of the existing sanitary sewer main shall be made under this Bid Item. Payment will include all equipment, labor, appurtenances, compacted soils, required to demolish and abandon the existing manhole in accordance with County Standards and Contract drawings.

BID ITEM NO. 27 – PAVEMENT FULL DEPTH ROAD RESTORATION

Payment for all work included under this Bid Item will be made at the Contract unit price bid per square yard of base, subbase and asphalt furnished, installed, and tested conforming with these Specifications and as listed on the Bid Form. Measurement will be based on the actual number of square yards of road restoration installed, tested, complete and approved. The measurement will be from face of curb to face of curb or as specified, but not greater than the width of the existing roadway prior to construction. Payment will include complete restoration of the roadway section in accordance with the applicable details on the Contract Drawings. Pavement section must follow Detail 401.7 as shown in the Plans, however base coarse must be crushed concrete or asphalt base with an LBR greater than or equal to 150. Crushed concrete road base must be from a FDOT Certified Pit. No payment for restoration of a private driveway within or outside the right-of-way shall be made under this Bid Item. No additional payment shall be made for installing layers of base, subbase, or asphalt thicker than what is specified on the Contract documents. Payment shall include all items and incidentals necessary to complete the road restoration, including restoring pavement markings and signalization loops, in accordance with the requirements of Manatee County ready for approval and acceptance by the County.

BID ITEM NO. 28 – SIDEWALK & CONCRETE DRIVEWAY RESTORATION

Payment for all work included under this Bid Item will be made at the Contract unit price bid per square yard of concrete sidewalk and concrete driveway installed as shown in the Contract Drawings and as listed on the Bid Form. Measurement will be based on the actual number of square yards of concrete sidewalk and concrete driveway installed, tested, completed and approved. No payment for restoration of a private driveway within or outside the right-of-way shall be made under this Bid Item. Sidewalks shall meet the requirements of the Manatee County Transportation Design Standards.

BID ITEM NO. 29 – BRICK DRIVEWAY RESTORATION

Payment for all work included under this Bid Item will be made at the Contract unit price bid per square yard of brick driveway restoration as shown in the Contract Drawings and as listed on the Bid Form. Measurement of driveway restoration will be per the actual number of square yards restored. Payment shall represent full compensation for all labor, materials, and equipment for cutting the edges of existing driveways, compacting subgrade and re-installing the concrete pavers, brick pavers, or decorative pavers with new concrete edging to hold the pavers in place. Pavers shall be salvaged and reset. Contractor to ensure all driveways are accurately documented in the pre-construction video. If pavers are damaged during construction, Contractor shall furnish new pavers to match existing driveway pavers. This Bid Item shall include all incidentals necessary to complete the driveway restoration as shown on the Contract Drawings and included in the Specifications, all ready for approval and acceptance by the County.

BID ITEM NO. 30 – SODDING

Payment for all work included in these Bid Items will be made at the applicable Contract unit price bid per square yard for furnishing and installing sodding as shown on the Contract Drawings and listed on the Bid Form. Payment shall represent full compensation for all labor, materials, necessary equipment, and incidentals necessary to complete the work, ready for approval and acceptance by the County.

BID ITEM NO. 31 – SHELL ROAD RESTORATION

Payment for all work included in these Bid Items will be made at the applicable Contract unit price bid per square yard of base, subbase, and FDOT Bank Run shell furnished as listed on the Bid Form. Measurement will be based on the actual number of square yards of road restoration installed, tested, complete and approved. Payment will include complete restoration of the roadway section in accordance with the applicable details on the Contract Documents, 4" FDOT Bank Run shell compacted and level, base with compacted suitable excavation material all in accordance with the Contract Documents. Density for backfill compaction shall be 98% per AASHTO T-180 density. Measurement of restoration will be per the actual number of square yards replaced. No additional payment shall be made for installing layers of base, subbase, or asphalt thicker than what is specified in the Contract Documents. FDOT Bank Run shell road base must be from a FDOT Certified Pit. Payment shall represent full compensation for all labor, materials and equipment for compacting subgrade, furnishing and installing the shell, include all

incidentals necessary to complete the restoration as shown on the Contract Drawings and included in the Specifications, all ready for approval and acceptance by the County.

BID ITEM NO. 32 – SHELL RESTORATION

Payment for all work included in these Bid Items will be made at the applicable Contract unit price bid per square yard of shell restoration as listed on the Bid Form. Density for backfill compaction shall be 95% per AASHTO T-180 density. Measurement of restoration will be per the actual number of square yards replaced. Contractor shall match existing shell/rock material. Payment shall represent full compensation for all labor, materials and equipment for compacting subgrade, furnishing and installing the shell/rock, including all incidentals necessary to complete the restoration as shown on the Contract Drawings and included in the Specifications, all ready for approval and acceptance by the County.

BID ITEM NO. 33 – MAILBOX REMOVAL AND REPLACEMENT

Payment for all work included in this Bid Item shall be per each mailbox removed and replaced as shown in the construction plans. Payment shall represent full compensation for all labor, excavation, compaction, material, preparation, installation and equipment required to complete this Bid Item.

BID ITEM NO. 34 – GROUT FILL AND ABANDON EXISTING SANITARY SEWER & 4" FORCE MAIN

Payment for all work included, but is not limited to, under this Bid Item shall represent full compensation in accordance with the unit price bid per cubic yard of grout fill that is required to abandon all of the existing sanitary sewer & 4" force main section to be deactivated. Approved grout mix shall conform to Manatee County Specifications Section: 02064. Payment will include all equipment, labor, fittings, mud plugs, valves, caps, grout, and appurtenances required to abandon the existing sanitary sewer in accordance with Manatee County Specifications & Standards.

BID ITEM NO. 35 – MODIFY EXISTING SANITARY SERVICE LATERAL

Payment for all work included in this Bid Item shall be per each modified existing 6-inch sanitary sewer lateral in right-of-way and directly in conflict with proposed sewer main. County shall review each modified service lateral for direct conflict before any modifications are performed. All service locations shown on the Contract Drawings are approximate and it shall be the responsibility of the Contractor to locate existing 6-inch service laterals, determine modifications (if necessary), and review with County prior to modifications. Payment shall represent full compensation for all labor, excavation, compaction, material, fittings, spool pieces, preparation, bypassing, temporary installation and equipment required to complete this Bid Item.

BID ITEM NO. 36 – RELOCATE EXISTING WATER MAIN SERVICE LATERAL

Payment for all work included in this Bid Item shall be per each permanent or temporary relocation of existing water main service lateral in conflict with proposed sanitary sewer construction. County shall review each conflicted service lateral for

direct conflict before any relocations are performed. All service locations shown on the Contract Drawings are approximate and it shall be the responsibility of the Contractor to locate existing water main service laterals, determine relocation (if necessary), and review with County prior to temporary or permanent relocation. Payment shall represent full compensation for all labor, excavation, compaction, material, fittings, spool pieces, preparation, bypassing, temporary installation and equipment required to complete this Bid Item.

BID ITEM NO. 37 – REMOVAL AND REPLACEMENT OF UNSUITABLE MATERIAL, INCLUDING LIMEROCK, BRICK, CONCRETE, MUCKY SAND

Payment for all work included, but is not limited to, under this Bid Item shall represent full compensation in accordance with the unit price bid per cubic yard of removal and replacement of unsuitable material encountered during excavation for pipeline and manhole installation; including but not limited to limerock, brick, concrete, and mucky sand. Unsuitable material shall be replaced with suitable backfill material per Contract Documents and Manatee County Specifications. Payment shall represent full compensation for all labor, materials, equipment, and dewatering for properly removing and disposing of all unsuitable material, including the import of suitable backfill material. Contractor shall notify Owner/Engineer when unsuitable materials are encountered. Contractor shall provide backup documentation (load tickets) to County Inspector at time of export or import or material.

BID ITEM NO. 38 – FDOT PAVEMENT REPAIR AND RESTORATION: MILL AND RESURFACE

Payment for all work included in these Bid Items will be made at the applicable Contract unit price bid per square yard for milling and asphaltic concrete resurfacing for the roadway restoration associated with the Close Tolerance Horizontal Direction Drill (CTHDD) gravity main construction on FDOT roadway as listed on the Bid Form. Contractor will be required to mill 1.5-inches and resurface with 1.5-inches of Asphalt Type FC 12.5. Payment shall represent full compensation for all labor, materials and equipment for milling, asphaltic concrete and all incidentals necessary to complete the roadway repair and restoration as shown on the Contract Drawings and in accordance with FDOT specifications.

BID ITEM NO. 39 – FDOT FULL DEPTH ROAD RESTORATION

Payment for all work included in these Bid Items will be made at the applicable Contract unit price bid per square yard for all of the base, subbase and asphalt furnished, installed, and tested conforming to FDOT specifications and as listed on the Bid Form. This payment is for FDOT full depth road restoration associated with the service lateral connections to the main line. Payment will include complete full depth restoration in accordance with FDOT specifications to match existing or 1.50" FC-12.5, 5" Type SP Structural Course, 8" Optional Base Group 6, and 12" Type B Stabilization. Payment shall include all items and incidentals necessary to complete the FDOT road restoration, including restoring pavement markings and signalization loops, in accordance the requirements of FDOT specifications.

BID ITEM NO. 40 – BYPASS PUMPING

Payment for all work included in this Bid Item shall represent full compensation in

accordance with the lump sum price bid for bypassing the existing manholes and gravity sewer pipe to be removed and replaced. Payment shall represent full compensation in accordance with the lump sum price bid for all labor, equipment, pumps, piping, fittings, and temporary line stops required to bypass the existing manholes and gravity sewer pipe in order to complete the proposed improvements while maintaining sewer flows.

Measurement for periodic payments of this lump sum bid item will be in accordance with the approved Schedule of Values, to be supplied by the Contractor in accordance with the Contract Documents.

BID ITEM NO. 41 – CONTRACT CONTINGENCY

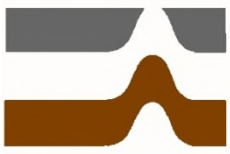
Payment for all work under this Bid Item shall be made only at the County's discretion. This Bid Item shall not exceed 10% of the Bidders Total Base Bid. The Bidder shall calculate and enter a dollar amount for this Bid Item.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SUBSURFACE SOIL EXPLORATION
AND
GEOTECHNICAL ENGINEERING EVALUATION
GRAVITY SEWER,
BRADENTON BEACH,
MANATEE COUNTY, FLORIDA



Ardaman & Associates, Inc.

CORPORATE HEADQUARTERS

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Ardaman & Associates, Inc.

Geotechnical, Environmental and
Materials Consultants

October 14, 2020
File No. 19-7257

TO: Kimley-Horn & Associates, Inc.
100 Second Ave. South, Suite 105N
St. Petersburg, FL 33701

Attention: Mike Semago
Email: mike.semago@kimley-horn.com

SUBJECT: Subsurface Soil Exploration and Geotechnical Engineering Evaluation
Gravity Sewer, Bradenton Beach, Manatee County, Florida

Dear Mr. Semago:

As requested, we have completed a subsurface soil exploration and geotechnical engineering evaluation for the subject project. We understand that the project will include construction of approximately 3,000 lineal feet gravity sewer. The proposed method of installation is not known at this time.

SITE LOCATION

The proposed gravity sewer is located on Bradenton Beach, Manatee County, Florida. We understand that the alignment is to be located along 7th Street South, 8th Street South, 9th Street South, 10th Street South, 11th Street South, 12th Street South, 13th Street South and Gulf Drive South.

REVIEW OF SOIL SURVEY MAPS

Based on the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) "Web Soil Survey," (https://websoilsurvey.nrcs.usda.gov/app/) the soils along the gravity sewer are mapped primarily as the "8 – Canaveral fine sand, 0 to 5 percent slopes" soil series, but with the "2 – Beaches" soil series to the west. The soils map for the general area of the proposed gravity sewer is included in Appendix I of this report.

The mapped locations of the individual soil units and selected characteristics of each, according to the NRCS, are summarized in Appendix I of this report. The characteristics listed are the general ratings for corrosion of concrete, corrosion of steel and for shallow excavations, as reported by the NRCS. These ratings represent the "dominant condition" for the soil map unit and are not site specific.

FIELD EXPLORATION PROGRAM

Standard Penetration Test Borings

Our scope of work included performing thirteen (13) Standard Penetration Test (SPT) borings to a depth of 20 feet below the existing ground surface. The number of test borings, boring depths and approximate locations were determined by Kimley-Horn & Associates. The approximate boring locations are shown on the attached Figure 1.

The SPT borings were performed using the methodology outlined in ASTM D1586. A summary of the boring procedures is included in Appendix II. Split-spoon soil samples recovered during performance of the borings were visually classified in the field and representative portions of the soil samples were transported to our laboratory for further visual classification and laboratory testing.

Where encountered, the groundwater level at each of the boring locations was measured during drilling. The SPT borings were then plugged with cement grout (placed by tremie method, from bottom to top).

Test Boring Locations

The depths and approximate locations of the borings were requested by Kimley-Horn & Associates (KHA). Locations were adjusted in the field as necessary to avoid existing utilities or other obstructions, and to maintain a safe working distance from overhead power lines.

The approximate locations of the borings are schematically illustrated on Figure 1. The locations were determined in the field by visual reference to available site features and should be considered accurate only to the degree implied by the method used.

LABORATORY TESTING PROGRAM

The field soil boring logs and recovered soil samples were transported to our Sarasota office following the completion of the field exploration activities. Each representative sample was examined by a geotechnical engineer in our laboratory for visual classification and assignment of laboratory tests.

The soil descriptions shown on the soil profiles are based on a visual classification procedure in general accordance with the Unified Soil Classification System (ASTM D-2487 or D-2488).

Corrosivity Tests

The laboratory testing program also included corrosivity series testing. This series of tests includes determining electrical resistivity, soil pH, sulfates content and chlorides content (FM 5-550, 5-551, 5-552 and 5-553).

The tests were performed on three (3) composite samples. Each composite sample was formed by thoroughly mixing individual samples from selected borings and depths. The test results are summarized in the table below:

Sample	Borings	Depth (feet)	Soil Classification	pH	Chloride (ppm)	Sulfate (ppm)	Resistivity (ohm-cm)
C-1	BB-03	7½ - 20	SM	8.33	600	153	780
C-2	BB-05	4½ - 10½	SP/SP-SM	8.77	45	117	2670
C-3	BB-10	2 - 7½	SM/SP-SM	8.29	30	105	3730

Based upon Table 1.3.2-1 of the FDOT "Structures Design Guidelines" (Vol I, Sec. 1.3), sample C-1 would be classified as an "extremely aggressive" environment to steel and a "moderately aggressive" environment to concrete. Sample C-2 would be classified as a "moderately aggressive" environment to concrete and steel. Sample C-3 would be classified as a "slightly aggressive" environment to concrete and a "moderately aggressive" environment to steel. This assumes that the structure (pipeline) is not considered a "marine structure" (see Sec. 1.3.2.B).

GENERAL SUBSURFACE CONDITIONS

General Soil Profile

The results of the field exploration program are graphically summarized on the soil boring profiles presented on Figure 2. 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 soils encountered from the ground surface to a depth of approximately 20 feet (end of boring) consisted primarily of very loose to very dense fine sand (SP), fine sand with silt (SP-SM), and silty fine sand (SM) with varying amounts of shell. Some exceptions to this included:

- A layer of hard sandy silt & rock encountered at a depth of approximately 13 to 15 feet at boring BB-01.
- Sandy soils mixed with concrete or brick debris at a depth of approximately 2 to 6 feet at boring BB-03 and 3 to 3½ feet at boring BB-04.
- Organic silty fine sand (mucky sand) at a depth of approximately 2 to 3½ feet at boring BB-05.
- Sandy soils mixed with large stones at a depth of approximately 4½ to 6 feet at boring BB-06.
- Hard limerock at a depth of approximately 3 to 4½ feet at borings BB-09 and BB-10.

The occurrences of hard silt, rock, large stones, concrete and brick were all at borings located along the west side of Gulf Drive. This may indicate the presence of a coastal revetment that has been buried beneath the current ground surface. Due to the relatively small diameter of SPT samples (approximately 1¾ inch), similar materials may also be present at locations and depths beyond what was detected in the SPT borings.

The above soil profile description is in general terms only. Please refer to Figure 2 for soil profile details.

Groundwater Level

The groundwater level in the boreholes was measured during drilling. As shown on Figure 2, the groundwater level was encountered at depths of approximately 1.5 to 4.6 feet below the ground surface. Fluctuations 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. Groundwater levels may also be influenced by tidal fluctuations.

The normal seasonal high groundwater level each year typically occurs in August to September, which is the period near the end of the rainy season during a year of normal (average) rainfall patterns. The seasonal high groundwater level is affected by a number of factors, such as the drainage characteristics of the soils, the land surface elevation, relief points (such as lakes, rivers, swamp areas, etc.) and distance to relief points.

We estimate that the normal seasonal high groundwater level probably occurs within a depth of approximately 1 to 2 feet below the ground surface along most of the proposed pipeline alignment. The water table elevations associated with a flood may be higher than the normal seasonal high groundwater levels, however.

ENGINEERING EVALUATION AND RECOMMENDATIONS - CUT AND COVER

General

The results of this exploration indicate that most of the existing soils encountered are generally suitable for supporting the proposed pipelines and associated structures. One exception to this is the layer of “mucky sand” that was encountered at boring BB-05 at a depth of 2 to 3½ feet. This soil should be excavated and removed where it underlies the gravity sewer and associated structures. In addition, the hard sandy silt, limerock, and soils containing a significant amount of rock, large stones, concrete or brick would not for a suitable pipe bedding material or trench backfill, and may need to be undercut and replaced with suitable bedding material.

The following are our recommendations for overall site preparation and foundation support which we feel are best suited for the proposed pipelines and associated structures relative to the soil conditions encountered in the borings performed to-date. The recommendations are made as a guide for the design engineer, parts of which should be incorporated into the project's specifications.

Pipelines and Associated Structures

Excavation

Based on the conditions encountered during the field exploration, we anticipate that most of the soils encountered from the ground surface to a depth of 20 feet can generally be excavated with standard earth moving equipment (i.e., front-end loaders, backhoes and excavators). Exceptions to this may include:

- Hard sandy silt & rock (such as encountered at boring BB-01).
- Sandy soils mixed with concrete, brick or large stones (such as encountered at borings BB-03, BB-04 and BB-06).

- Hard limerock (such as encountered at borings BB-09 and BB-10).
- Sandy soils that are in a dense to very dense state (SPT N-value greater than approximately 30). Note that the N-values are listed adjacent to the boring logs on Figures 2 to 4.

The above exceptions may be more difficult to excavate than typical loose to medium dense soils (SPT N-values less than approximately 30). Please also refer to the "General Soil Profile" section on page 3 of this report and the individual soil profiles (boring logs) on Figure 2 for additional information.

The soils below the bottom of the excavations should not be disturbed by the excavation process. If soils become disturbed and difficult to compact, they should be over-excavated below the pipeline and other structures to a depth necessary to remove all disturbed soils. Over-excavated areas should be replaced with compacted backfill meeting the "Backfill Requirements" presented in a subsequent section of this report.

The excavations should be safely braced or sloped to prevent injury to personnel or damage to equipment. Temporary safe slopes in dewatered soils should be cut no steeper than 1.5 horizontal (H) to 1 vertical (V), in accordance with OSHA, 29 CFR Part 1926 Subpart P. Flatter slopes should be used if deemed necessary based on actual conditions encountered. Surcharge loads should be kept at least 5 feet from excavations. Spoil banks adjacent to excavations should be sloped no steeper than 2.0H to 1.0V. Provisions for maintaining workers' safety within and adjacent to excavations is the sole responsibility of the Contractor.

Dewatering

The control of the groundwater may be required to achieve the necessary depths of excavation and subsequent construction, backfilling and compaction requirements presented in the following sections. The actual method(s) of dewatering should be determined by the Contractor. However, regardless of the method(s) used, we suggest drawing down the groundwater table sufficiently (i.e., 2 to 3 feet) below the bottom of the excavation(s) to preclude "pumping" and/or compaction-related problems with the foundation soils. We recommend that the dewatering be accomplished in advance of the excavation.

Pipeline Bedding

Pipe bedding material should be compacted to achieve a density equivalent to 95 percent of the maximum dry density, as determined by the Modified Proctor (ASTM D-1557), to a minimum depth of 6 inches below the bottom of the pipe. Compact deeper if recommended by the pipe manufacturer.

To provide proper bedding, we recommend that the following soils be over-excavated to a depth of at least 6 inches below the bottom of the pipe and replaced with a suitable backfill.

- Hard sandy silt & rock (such as encountered at boring BB-01).
- Sandy soils mixed with concrete, brick or large stones (such as encountered at borings BB-03, BB-04 and BB-06).
- Hard limerock (such as encountered at borings BB-09 and BB-10).

The organic silty fine sand (mucky sand), such as was encountered at a depth of approximately 2 to 3½ feet at boring BB-05, should be fully removed where it occurs within the pipeline trench area. This should include an area equal to the width of the pipe plus at least 1 foot to each side of the pipe. It should be disposed of off-site and not used as backfill.

We recommend that the bedding for the pipe be preshaped by means of a template prior to placement of the pipe to ensure that the upward reaction on the bottom of the pipe will be well distributed over the width of the bedding contact. Based on the cost involved with preshaping the bedding material and the construction time requirements, an alternative procedure may be to utilize a level bed for the pipe and require a higher pipe strength class that will adequately carry the load on a lower class of bedding. It would be prudent to perform an economic analysis of the two alternatives, or specify both design conditions within the contract documents and allow the Contractor to decide the most efficient method.

If level bedding is utilized, it will be necessary to place and compact the haunching backfill (backfill between the bedding and the springline of the pipe) to the springline of the pipe. This material should be placed in simultaneous layers on each side of the pipe and must be compacted in such a manner as to ensure an intimate contact with the sides of the pipe. Do not use blocking under the pipe to raise the pipe to grade.

The final backfill above the haunching or springline of the pipe must extend all the way to the trench walls and should be placed in level lifts not exceeding 12 inches. Each lift should be compacted to at least 95 percent of the maximum dry density, as determined by the Modified Proctor (ASTM D-1557). Care should be taken not to damage the pipe or deflect it by compacting directly above the pipe where there is insufficient cover material present. Minimum cover criteria should be in accordance with the pipe manufacturer's recommendations.

Where the utility line will traverse roadways and/or other permanent structures such as sidewalks, all backfill should be compacted to 95 percent of maximum dry density, as determined by the Modified Proctor (ASTM D-1557), from the top of the pipe to the ground surface. The design engineer may wish to specify greater compaction for the pavement subgrade, to be consistent with the pavement design requirements.

A geotechnical engineer or a designated representative from Ardaman & Associates, Inc. should observe and test all prepared and compacted areas to verify that all bedding, haunching and final backfill are prepared and compacted in accordance with the aforementioned specifications

Backfill Requirements

As a general guide to aid the Contractor regarding materials to use for fill in the excavations, we recommend using fine sand (SP) to fine sand with silt (SP-SM) that contains less than 1 percent organic matter and no greater than 12 percent by dry weight of material passing the U.S. Standard No. 200 sieve size. Soils with more than 12 percent passing the No. 200 sieve will be more difficult to compact due to their inherent nature to retain soil moisture.

Based on the soil samples obtained during our subsurface investigation, the on-site fine sand (SP) and fine sand with silt (SP-SM) soils (those without roots, organic matter, rock, concrete/brick

debris or large stones) appear suitable for use as structural backfill for the pipe. Material removed from below the groundwater table will be wet and will require time to dry sufficiently.

The silty fine sand (SM) could be used in some applications as structural backfill, but will be more difficult to moisture condition and compact due to its inherent nature to retain moisture.

Resistance to Horizontal Forces on Pipeline Structures

Horizontal forces which act on structures such as thrust blocks or anchor blocks can be resisted to some extent by the earth pressures that develop in contact with the buried vertical face (buried vertical face is perpendicular and in front of the applied horizontal load) of the block structures and by shearing resistance mobilized along the base of the block structures and soil subgrade interface.

Allowable earth pressure resistance may be determined using an equivalent fluid density of 110 pounds per cubic foot (pcf) for moist soil above the water table and 70 pcf for submerged soils below the water table[1]. The passive earth pressures are developed from ground surface[2] to the bottom of the block structure.

The values presented above presume that the block structures are surrounded by well compacted sand backfill extending at least 5 feet horizontally beyond the vertical buried face. In addition, it is presumed that the block structures can withstand horizontal movements on the order of one-quarter (1/4) to three-eighths (3/8) inch before mobilizing full passive resistance. The factors of safety assumed in the above recommendations are 2.5 for passive pressure with submerged conditions, and 3.0 for passive pressure without submerged conditions.

1 Equivalent fluid density (moist soil) = $K_p \gamma_m$/S.F. = 110 pcf
Equivalent fluid density (submerged soil) = $K_p (\gamma_s-\gamma_w)$/S.F. = 70 pcf

Where: K_p = effective coefficient of passive earth pressure = 3.0
S.F. = safety factor = (values given above)
γ_m = unit weight of moist soil = 110 pcf
γ_s = unit weight of saturated soils = 120 pcf
γ_w = unit weight of water = 62.4 pcf

2 Assuming there is no excavation in the vicinity of the block structure that would reduce the available passive pressure.

The sliding shearing resistance mobilized along the base of the block structure may be determined by the following formula:

Allowable Shearing Resisting Force, $P = V \tan(2/3\ \phi)/S.F$

Where: P = Shearing Resistance Force (pounds)
V = Net Vertical Force (total weight of block and soil overlying the structure minus uplift forces including buoyancy forces) (pounds)
ϕ = Angle of Internal Friction of Soil = 30 degrees
S.F. = Safety Factor = 1.5

The vertical earth pressures developed by the overburden weight of soil can be calculated using the following unit weights:

- Compacted moist soil = 110 pcf
- Saturated soil = 120 pcf (buoyant unit weight of saturated soil = 58 pcf)

Vertical pressure distributions in accordance with the above do not take into account vertical forces from construction equipment, wheel loads or other surcharge loads.

Foundation Support and Estimated Settlements

The permanent structures such as anchor blocks, thrust blocks, air release valves, blow offs, etc., bearing at least 18 inches below adjacent grade and at least 18 inches wide can be designed for the following maximum vertical bearing capacities:

- 1,500 psf on undisturbed natural granular soils.
- 2,000 psf on compacted natural or backfilled subgrade; this value assumes compaction of at least 95 percent of the Modified Proctor maximum density (ASTM D-1557, AASHTO T-180) to a depth of 1 foot below the structure.

Pipe settlement during and after construction should be negligible (less than 1/2 inch) provided the bedding and backfilling criteria in the above sections are satisfied. The volume of soil displaced by the pipe, compared to the weight of the pipe when full, will result in little if any net increase in bearing stress to the subsurface soils.

Uplift Resistance

Permanent structures submerged below the groundwater table will be subjected to uplift forces caused by buoyancy. The components resisting this buoyancy include: 1) the total weight of the pipe or structure divided by an appropriate factor of safety; 2) the buoyant weight of soil overlying the pipe or structure; and 3) the shearing forces that act on shear planes that radiate vertically upward from the perimeter of the pipe or the edges of the structure to the ground surface. The allowable unit shearing resistance may be determined by the following formula:

Allowable Shearing Resistance, $F=K_o\gamma_m h(2/3\ \tan\phi)/S.F.$ (above water table)

Allowable Shearing Resistance, $F=K_o[\gamma_m h_w+\gamma_b(h-h_w)](2/3\ \tan\phi)/S.F.$ (below water table)

where: F = unit shearing resistance (psf)
K_o = coefficient of earth pressure at rest = 0.5
γ_m = unit weight of moist soil = 110 pcf
γ_b = buoyant unit weight of soil = 58 pcf
h = vertical depth (feet) below grade at which shearing resistance is determined
h_w = vertical depth (feet) below grade to groundwater table
ϕ = angle of internal friction of the soil = 30 degrees
S.F. = safety factor = 2.0

The values given for the above parameters assume that the permanent structures are covered by clean, well-compacted, granular backfill that extends horizontally at least 2 feet beyond the structures.

Earth Pressure on Shoring and Bracing

If temporary shoring and bracing are required for any excavations, the system should be designed to resist lateral earth pressures. The design earth pressure will be a function of the flexibility of the shoring and bracing system. For a flexible system restrained laterally by braces placed as the excavation proceeds, the design earth pressure for shoring and bracing can be computed using a uniform earth pressure distribution with depth. It is recommended that soils be dewatered around the excavations. For such dewatered excavations, we recommended using the following uniform pressure distribution over the full braced height as follows:

Uniform Soil Pressure Distribution, $p = 0.65 K_a \gamma_s H$

where: p = uniform pressure distribution for design of braced excavation
K_a = coefficient of active earth pressure = 0.33
γ_s = unit weight of saturated soils = 120 pcf
H = depth of excavation

An appropriate factor of safety should be applied for the design of the braced excavations.

Lateral pressure distributions determined in accordance with the above do not take hydrostatic pressures or surcharge loads into account. To the extent that such pressures and forces may act on the walls, they should be included in the design.

Construction equipment and excavated fill should be kept a minimum distance of 5 feet from the edge of the braced or shored excavation. Backfill material placed adjacent to (maintaining a minimum 5-foot horizontal clearance) the braced or shored excavation should have a minimum slope of 2.0H to 1.0V or flatter, if required by site specific conditions and/or to meet OSHA requirements.

Means and methods of excavation and bracing should be the responsibility of the Contractor; however, excavation and/or bracing should, at a minimum, comply with the requirements of the Occupational Safety Health Administration (OSHA).

Lateral Earth Pressures

Lateral loads acting on the embedded structure will include at-rest earth pressures as well as hydrostatic pressures and surcharge loads. The lateral earth pressure will be a function of both the depth below ground surface and the soil unit weight (submerged or moist) plus hydrostatic pressure (if applicable). The following equations can be used to determine the lateral at-rest earth pressure:

$\sigma_h = K_o \gamma_m h$ (above water table)
$\sigma_h = K_o[\gamma_m h_w + \gamma_b(h-h_w)]$ (below water table)

where: σ_h = lateral earth pressure (psf)
K_o = coefficient of at rest earth pressure (0.5) (this value assumes that the backfill is lightly compacted yet not overcompacted)
γ_m = moist unit weight of soil = 110 pcf for compacted moist soil above the water table.
γ_b = buoyant unit weight of soil = 58 pcf for compacted saturated soil below the water table.
h= vertical depth (feet) below grade at which lateral earth pressure is determined.
h_w = vertical depth (feet) below grade to groundwater table

For design, an appropriate factor of safety should be applied to the lateral earth pressure calculated using the above equation. Lateral pressure distributions determined in accordance with the above do not include hydrostatic pressures or surcharge loads. Where applicable, they should be incorporated in the design.

Pipeline Directional Drill Locations

We understand that the installation method(s) for the pipeline have not been determined, but that portions may be installed by directional drill. The SPT borings provide soil stratigraphy data that can be used for the directional drill design.

Classification in accordance with the Unified Soil Classification System and the SPT N-values were used to estimate unit weights, the angles of internal friction, cohesion and the shear modulus for the types of soils encountered in the borings. These are summarized in the following table:

Summary of Soil Parameters							
Boring No	Depth Range (ft)	(see Note 1) Soil Classification	(see Note 4) Internal Friction Angle (degrees)	Saturated Soil Weight (pcf)	(see Note 2) Moist Soil Weight (pcf)	(see Note 3) Cohesion (psf)	Shear Modulus (ksf)
BB-01	0 - 5	SP/SM	33	128	114	---	400
	5 - 13	SP-SM/SM	36 - 38	132	---	---	700
	13 - 15	ML	---	135	---	18,000	280
	15 - 20	SM	35	130	---	---	520
BB-02	0 - 6	SP/ML/SP-SM	32	120	107	---	300
	6 - 17	SM	28	115	---	---	150
	17 - 20	SM	35	130	---	---	560
BB-03	0 - 2	SP	33	128	114	---	400
	2 - 6	SP	36 - 38	132	120	---	700
	6 - 20	SP-SM/SM	35	130	---	---	520
BB-04	0 - 3	SP	33	128	114	---	400
	3 - 6	SP-SM	36 - 41	133	---	---	800
	6 - 12	SM	35	130	---	---	540
	12 - 20	SM	36 - 39	133	---	---	730
BB-05	0 - 5	SP/SM	30	120	103	---	200
	5 - 17	SP/SP-SMSM	31	123	---	---	220
	17 - 20	SP-SM/SM	34	129	---	---	500
BB-06	0 - 4	SP	33	128	114	---	400
	4 - 20	SP-SM/SM	36 - 37	132	---	---	650
BB-07	0 - 9	SP	33	128	114	---	420
	9 - 12	SM	28	115	---	---	150
	12 - 20	SP-SM/SM	36 - 37	132	---	---	670
BB-08	0 - 5	SW/SP/SM/SP-SM	30	120	103	---	180
	5 - 12	SM	31	124	---	---	250
	12 - 20	SP-SM/SM	36 - 38	132	---	---	690
BB-09	0 - 4	SP	32	125	108	---	300
	4 - 5	Limerock	---	---	---	---	---
	5 - 13	SP/SM	35	130	---	---	540
	13 - 20	SP/SP-SM	36 - 40	135	---	---	800
BB-10	0 - 8	SP-SM/SM	28	115	92	---	150
	8 - 20	SP-SM/SM	32	125	---	---	320
BB-11	0 - 3	SP	32	125	108	---	300
	3 - 4	Limerock	---	---	---	---	---
	4 - 13	SP	36	131	---	---	630
	13 - 20	SM	29	118	---	---	160
BB-12	0 - 5	SP/SP-SM/ML/SM	32	120	107	---	300
	5 - 16	SP-SM	34	129	---	---	500
	16 - 20	SM	32	125	---	---	300
BB-13	0 - 3	SP/SP-SM	33	125	112	---	400
	3 - 8	SP	36 - 38	133	---	---	710
	8 - 20	SP/SP-SM	30	120	---	---	170

Notes: pcf = pounds per cubic foot psf = pounds per square foot ksf = kips per square foot

(1) Disregarding rock, concrete or brick within the soils, where these are present.

(2) Estimate for a drained soil above the groundwater table.

(3) No value indicates a soil that is generally considered cohesionless.

(4) If a range is listed, use the value which yields a more conservative result.

(5) The values listed above are based upon emperical correlations with the average soil conditions encountered. Appropriate safety factors should be used with these values.

(6) The soil layers presented above are generalized and should be used for design purposes only. The above values should not be used to assess constructability of the proposed pipeline.

The following should be noted when reviewing the data in the above table.

- Buoyant Soil Unit Weight = Saturated Soil Unit Weight – Water Unit Weight
- The groundwater table may, at times, be very near the ground surface. This should be considered in calculating minimum effective soil overburden weights.
- Values given in the table are based on empirical correlations with the soil conditions encountered in the referenced boring. Appropriate safety factors should be used with these values.

We caution that the soil layers shown in the table are very generalized and should be used for design purposes only. In particular, the soil parameters are not specifically representative of limerock, rock, concrete or brick where they occur within the soil profile (either as a specific layer or mixed with the soils). The soil stratigraphy on the boring profiles (Figure 2) is more detailed than presented in the above table. The information in the above table should not be used for assessing the constructability of the proposed pipeline. The success of the directional drill program will depend on the means and methods of the directional drill contractor.

QUALITY CONTROL

We recommend establishing a comprehensive quality control program to verify that all excavation, bedding, and backfilling is conducted in accordance with the appropriate plans and specifications. Materials testing and inspection services should be provided by Ardaman & Associates, Inc. In-situ density tests should be conducted during bedding and backfilling activities to verify that the required densities are achieved.

Backfill for the proposed pipeline should be tested at a minimum frequency of one in-place density test for each lift for each 200 lineal feet of pipe. Additional tests should be performed beneath foundations and in backfill for other associated structures. In-situ density values should be compared to laboratory Proctor moisture-density results for each of the different natural and fill soils encountered.

CLOSURE

The analyses and recommendations submitted herein are based on the data obtained from the soil borings presented on Figure 1. 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 borings may not become evident until during construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations presented in this report after performing on-site observations during the construction period and noting the characteristics of the variations.

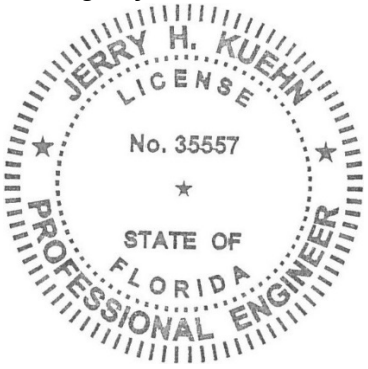
This study is based on a relatively shallow exploration and is not intended to be an evaluation for sinkhole potential. This study does not include an evaluation of the environmental (ecological or hazardous/toxic material related) condition of the site and subsurface.

This report has been prepared for the exclusive use of Kimley-Horn & Associates in accordance with generally accepted geotechnical engineering practices. In the event any changes occur in the design, nature, or location of the proposed improvements, we should review the applicability of conclusions and recommendations in this report. We recommend a general review of final design and specifications by our office to verify that earthwork and foundation recommendations are properly interpreted and implemented in the design specifications. A representative of Ardaman & Associates should attend the pre-bid and preconstruction meetings to verify that the bidders/contractor understand the recommendations contained in this report.

We are pleased to be of assistance to you on this phase of the project. Please contact us when we may be of further service to you or should you have any questions.

Very truly yours,

ARDAMAN & ASSOCIATES, INC.
Fl. Registry No. 5950



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Jerry H. Kuehn, P.E.
Senior Project Engineer
Fl. License No. 35557

Sofia Roman-Echevarria, E.I.
Staff Engineer

JHK/SRE:ly

APPENDIX I

Soils Map and Selected Soil Characteristics From NRCS “Web Soil Survey”

82° 41' 59" W

82° 41' 35" W

27° 27' 51" N

27° 27' 23" N

Map Scale: 1:4,290 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Manatee County, Florida
Survey Area Data: Version 17, Jun 8, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 5, 2020—Mar 10, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Beaches	5.6	14.9%
8	Canaveral fine sand, 0 to 5 percent slopes	27.5	73.0%
100	Waters of the Gulf of Mexico	4.6	12.2%
Totals for Area of Interest		**37.7**	**100.0%**

Corrosion of Concrete

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2	Beaches		5.6	14.9%
8	Canaveral fine sand, 0 to 5 percent slopes	Low	27.5	73.0%
100	Waters of the Gulf of Mexico		4.6	12.2%
Totals for Area of Interest			**37.7**	**100.0%**

Description

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens concrete. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the concrete in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Corrosion of Steel

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2	Beaches		5.6	14.9%
8	Canaveral fine sand, 0 to 5 percent slopes	High	27.5	73.0%
100	Waters of the Gulf of Mexico		4.6	12.2%
Totals for Area of Interest			**37.7**	**100.0%**

Description

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Shallow Excavations

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2	Beaches	Not rated	5.6	14.9%
8	Canaveral fine sand, 0 to 5 percent slopes	Very limited	27.5	73.0%
100	Waters of the Gulf of Mexico	Not rated	4.6	12.2%
Totals for Area of Interest			**37.7**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	27.5	73.0%
Null or Not Rated	10.2	27.0%
Totals for Area of Interest	**37.7**	**100.0%**

Description

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Rating Options

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

APPENDIX II

Soil Boring, Sampling and Test Methods

SOIL BORING, SAMPLING AND TESTING METHODS

Standard Penetration Test

The Standard Penetration Test (SPT) is a widely accepted 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 following tables relate N-values to a qualitative description of soil density and, for cohesive soils, an approximate unconfined compressive strength (Qu):

Cohesionless Soils:

N-Value	Description
0 to 4	Very loose
4 to 10	Loose
10 to 30	Medium dense
30 to 50	Dense
Above 50	Very dense

Cohesive Soils:

N-Value	Description	Qu (ton/ft^2)
0 to 2	Very soft	Below 1/4
2 to 4	Soft	1/4 to 1/2
4 to 8	Medium stiff	1/2 to 1
8 to 15	Stiff	1 to 2
15 to 30	Very stiff	2 to 4
Above 30	Hard	Above 4

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 each sampling interval and from every different stratum are brought to our laboratory in air-tight jars for further evaluation and testing, if necessary. After thorough examination and testing of the samples, the samples are discarded unless prior arrangements have been made. After completion of a test boring, the hole is kept open until a steady state groundwater level is recorded. The hole is then sealed, if necessary, and backfilled.

A hammer with an automatic drop release (auto-hammer) is sometimes used. In this case, a correction factor is applied to the raw blow counts, since the energy efficiency of the auto-hammer is greater than that of the safety hammer. Based upon calibration of the auto-hammer (per ASTM D4633) and standard practice, we use a multiplier of 1.24 to correct the auto-hammer blow counts to equivalent safety hammer “N” values.

Hand Auger Borings

Hand auger borings are used, if soil conditions are favorable, when the soil strata are to be determined within a shallow (approximately 5 to 9 feet) depth or when access is not available to power drilling equipment. A 3-inch diameter, hand bucket auger with a cutting head is simultaneously turned and pressed into the ground. The bucket auger is retrieved to the surface at approximately 6-inch intervals and its contents emptied for inspection. The soil sample so obtained is classified and representative samples put in bags or jars and transported to the laboratory for further classification and testing.

Laboratory Test Methods

Soil samples returned to our laboratory are examined by a geotechnical engineer or geotechnician to obtain more accurate descriptions of the soil strata. Laboratory testing is performed on selected samples as deemed necessary to aid in soil classification and to further define engineering properties of the soils. The test results are presented on the soil boring logs at the depths at which the respective sample was recovered, except that grain size distributions or selected other test results may be presented on separate tables, figures or plates as described in this report. The soil descriptions shown on the logs are based upon a visual-manual classification procedure in general accordance with the Unified Soil Classification System (ASTM D-2488-84) and standard practice. Following is a list of abbreviations which may be used on the boring logs or elsewhere in this report.

-200 - Fines Content (percent passing the No. 200 sieve); ASTM D1140
DD - Dry Density of Undisturbed Sample; ASTM D2937
Gs - Specific Gravity of Soil; ASTM D854
k - Hydraulic Conductivity (Coefficient of Permeability)
LBR - Limerock Bearing Ratio, FM1-T180, FM5-515
LL - Liquid Limit; ASTM D423
OC - Organic Content; ASTM D2974
pH - pH of Soil; ASTM D2976
PI - Plasticity Index (LL-PL); ASTM D424
PL - Plastic Limit; ASTM D424
Qp - Unconfined Compressive Strength by Pocket Penetrometer;
Qu - Unconfined Compressive Strength; ASTM D2166 (soil), D7012 (rock)
SL - Shrinkage Limit; ASTM D427
ST - Splitting Tensile Strength; ASTM D3967 (rock)
USCS - Unified Soil Classification System; ASTM D2487, D2488
w - Water (Moisture) Content; ASTM D2216

Soil Classifications

The soil descriptions presented on the soil boring logs are based upon the Unified Soil Classification System (USCS), which is the generally accepted method (ASTM D-2487 and D-2488) for classifying soils for engineering purposes. The following modifiers are the most commonly used in the descriptions.

For Sands:	Modifier	Fines, Sand or Gravel Content*
	with silt or with clay	5% to 12% fines
	silty or clayey	12% to 50% fines
	with gravel or with shell	15% to 50% gravel or shell

For Silts or Clays:	Modifier	Fines, Sand or Gravel Content*
	with sand	15% to 30% sand and gravel; and % sand > % gravel
	sandy	30% to 50% sand and gravel; and % sand > % gravel
	with gravel	15% to 30% sand and gravel; and % sand < % gravel
	gravelly	30% to 50% sand and gravel; and % sand < % gravel

* may be determined by laboratory testing or estimated by visual/manual procedures. Fines content is the combined silt and clay content, or the percent passing the No. 200 sieve.

The USCS also uses a set of Group Symbols, which may also be listed on the soil boring logs. The following is a summary of these.

Group Symbol	General Group Name*	Group Symbol	General Group Name*
GW	Well-graded gravel	SW	Well-graded sand
GP	Poorly graded gravel	SP	Poorly graded sand
GW-GM	Well-graded gravel with silt	SW-SM	Well-graded sand with silt
GW-GC	Well-graded gravel with clay	SW-SC	Well-graded sand with clay
GP-GM	Poorly graded gravel with silt	SP-SM	Poorly graded sand with silt
GP-GC	Poorly graded gravel with clay	SP-SC	Poorly graded sand with clay
GM	Silty gravel	SM	Silty sand
GC	Clayey gravel	SC	Clayey sand
GC-GM	Silty, clayey gravel	SC-SM	Silty, clayey sand
CL	Lean clay	ML	Silt
CL-ML	Silty clay	MH	Elastic silt
CH	Fat clay	OL or OH	Organic silt or organic clay

* Group names may also include other modifiers, per standard or local practice.

Other soil classification standards may be used, depending on the project requirements. The AASHTO classification system is commonly used for highway design purposes and the USDA soil textural classifications are commonly used for septic (on-site sewage disposal) system design purposes**.**

REFERENCE: GOOGLE EARTH PRO 2019, IMAGERY DATED 1/2019

LEGEND

APPROXIMATE LOCATION OF BORING LOCATIONS

0 50 100

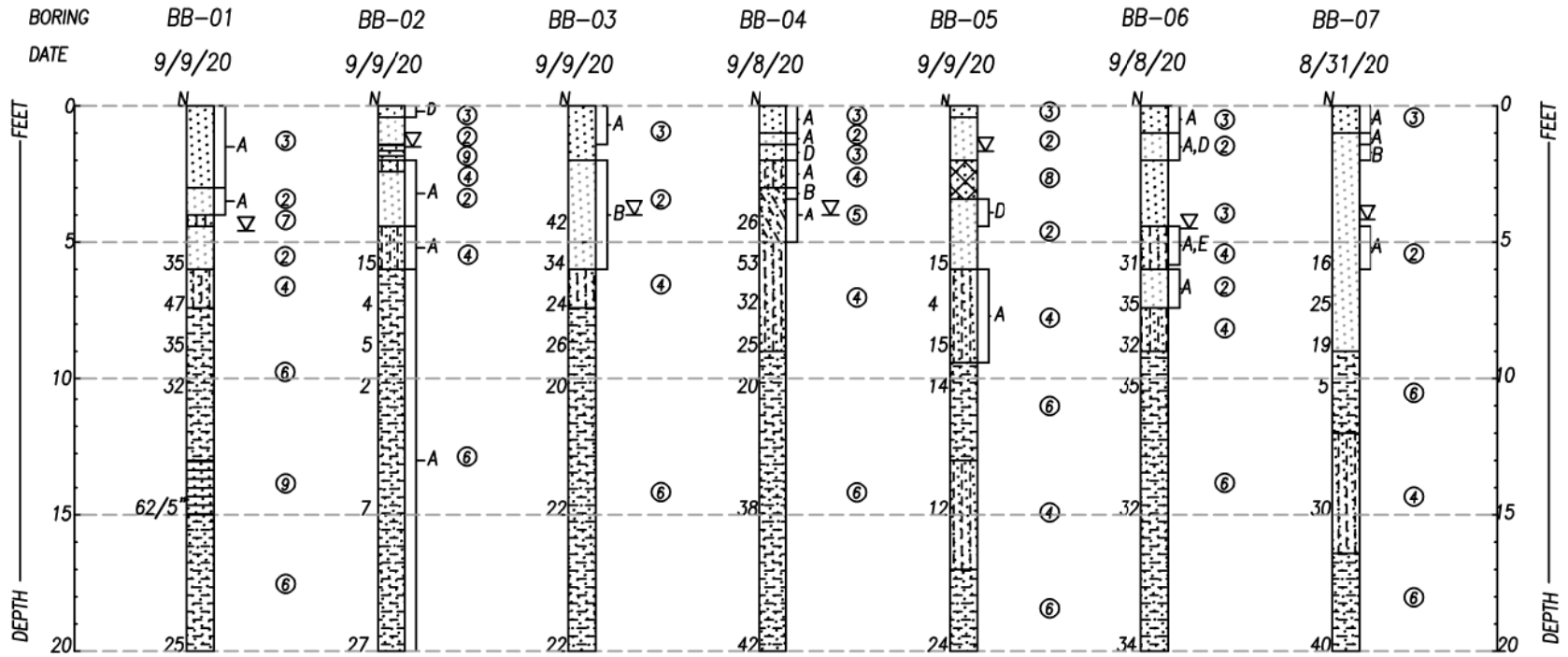
APPROXIMATE SCALE: 1"=100'

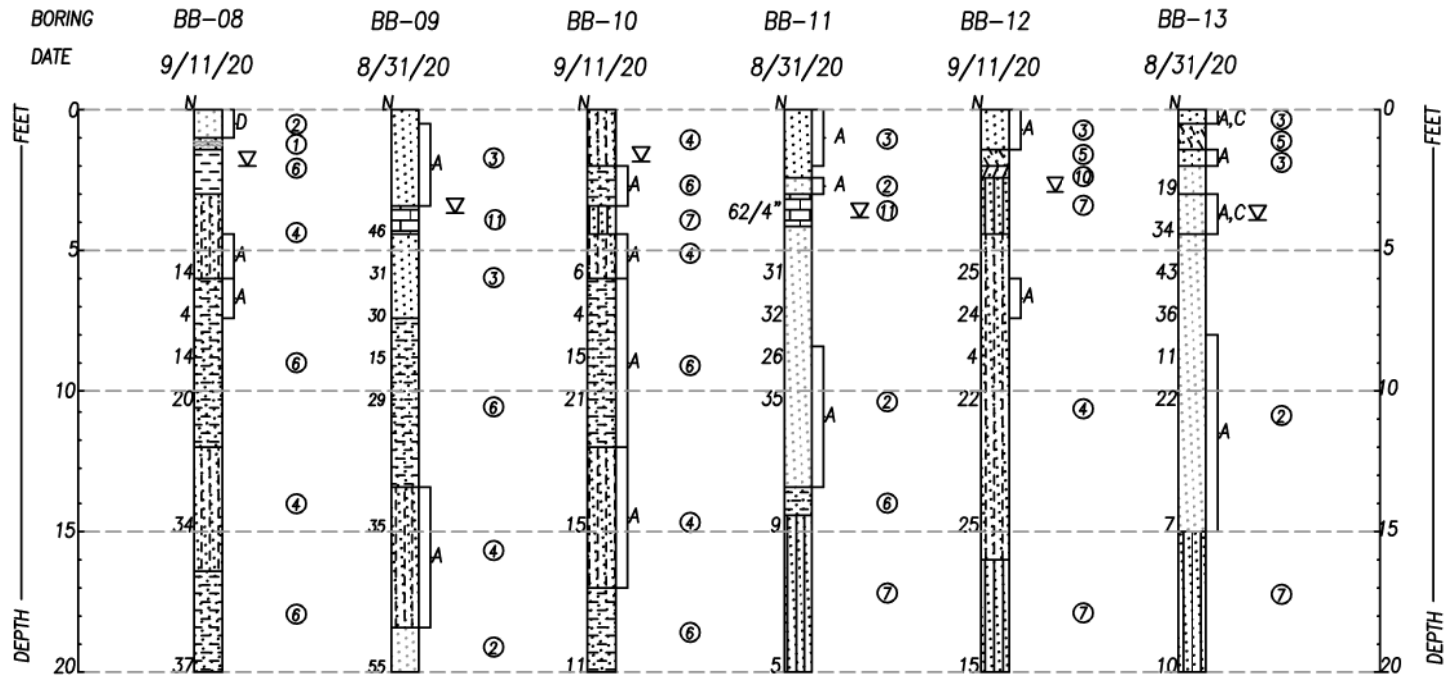
TEST LOCATION PLAN

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

BRADENTON BEACH GRAVITY SEWER
GULF DRIVE SOUTH
MANATEE COUNTY, FLORIDA

DRAWN BY:	CHECKED BY:	DATE:
AUR	MEM	10/1/20
FILE NO.	APPROVED BY:	FIGURE:
19-36-7257	MEM	1





LEGEND

①	Gray Shelly Sand (SW)
②	Light Gray to Dark Brown Fine Sand (SP)
③	Pale Brown to Dark Brown Fine Sand (SP)
④	Light Gray to Dark Gray Fine Sand with Silt (SP–SM)
⑤	Brown to Dark Brown Fine Sand with Silt (SP–SM)
⑥	Light Gray to Gray Silty Fine Sand (SM)
⑦	Brown to Dark Brown Silty Fine Sand (SM)
⑧	Brown Organic Silty Fine Sand (Mucky Sand)
⑨	Gray Sandy Silt (ML) and Rock
⑩	Dark Brown Silt (ML)
⑪	Limerock

A	WITH SHELL
B	WITH CONCRETE DEBRIS/BRICK DEBRIS
D	WITH ROOTS
E	WITH LARGE STONES
(SP)	UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) SYMBOL
▽	GROUNDWATER LEVEL MEASURED ON DATE DRILLED
N	SPT N–VALUE IN BLOWS PER FOOT

NOTE

AUTO HAMMER VALUES CONVERTED TO EQUIVALENT MANUAL HAMMER N–VALUES

SOIL BORING PROFILES

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

BRADENTON BEACH GRAVITY SEWER
GULF DRIVE SOUTH
MANATEE COUNTY, FLORIDA

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