FLORIDA DEPARTMENT OF TRANSPORTATION

UTILITY PERMIT

December 14, 2016

PERMIT NO: 2021-H-194-00062

STATE ROAD INFORMATION

County:	Section:	State Road No:	Beginning Mile Post:	Ending Mile Post:
Manatee	13080000	SR-789	5.927	6.251

APPLICANT INFORMATION

The Utility Agency Owner (UAO) shall be identified in this Applicant Information Box. When the UAO is a City or County and desires to have the Utility Builder make a joint permit applicant, as prescribed in Section 2.1(4) of the 2017 Utility Accommodation Manual (UAM), the Utility Builder shall also be identified in this Applicant Information Box. A Utility Builder alone cannot apply for a utility permit without the City or County adding them as a joint applicant.

Utility Agency/Owner (UAO)

Name: Manatee County
Contact Person: Manatee County
Address: 1022 26th Avenue East
City: Bradenton
State: Florida
Zip: 342083926
Telephone: 94170874877487
Email: sia.mollanazar@mymanatee.org

Utility Builder (only applicable when the UAO is a City or County)

Name:
Contact Person:
Address:
City:
State:
Zip:
Telephone:
Email:

WORK DESCRIPTION

The Applicant(s) requests permission from the Florida Department of Transportation (FDOT) to construct, operate, and maintain the utilities as described below and as depicted in the incorporated documentation.

Approximately 4400 LF of 8- to 12-inch gravity sewer installed via open cut, 550 LF of 8-inch gravity sewer installed via close tolerance HDD, 23 proposed manholes, grout filling and abandoning existing gravity sewer and 25 associated manholes, removing and reconnecting approximately 93 service laterals to the proposed sanitary sewer. Additionally the project includes restoration of sidewalks, driveways, and pavement that will be disturbed by the construction of the proposed improvements.

Utility Work No:

Additional sheets are attached and are incorporated into this permit Yes ☑ No ☐

For FDEP certification, the FDOT agency report is attached in accordance with UAM Section 2.4.1 (13) Yes ☐ No ☑

TRAFFIC CONTROL (TCP)

☑ The TCP will comply with the following 600 series index(es) 601, 602, 660

☐ A TCP has been attached and incorporated into this permit application in compliance with UAM Section 2.4.2.

MOT Technician's contact information (may be supplied at the two (2) business day notification to FDOT):

Name: _____ Telephone _____ Email: _____

COMMENCEMENT OF WORK

The UAO and/or Utility Builder shall commence actual construction in good faith within sixty (60) calendar days after approval of the permit application. If the beginning date is more than sixty (60) calendar days from the date of approval, the UAO and/or Utility Builder must review the permit with the FDOT Approving Engineer listed to make sure no changes have occurred to the transportation facility that would affect the permit's continued approval. The UAO and/or Utility Builder shall make good faith efforts to expedite the work and complete the work within the calendar days indicated.

Anticipated Start Date: 6/1/2021

Calendar days needed to completed: 488

Florida Department of Transportation

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APPLICANT SIGNATURE

By the below signature(s) the UAO and/or Utility Builder agree(s) to construct, operate, and maintain the work as noted in the above Work Description, shown in plans and incorporated documents, in compliance with the UAM, all instructions noted in the FDOT Special Instructions Box, and special instructions incorporated into this permit. The UAO and/or Utility Builder declares, the location of all existing utilities that it owns or has an interest in, both aerial and underground, are accurately shown on the plans of the work areas. In accordance with UAM Section 2.8, the UAO and/or Utility Builder further declares that a letter of notification was delivered to the owners of other facilities within the work areas and that those listed below are the only facility owners known to be involved or potentially impacted by the proposed work.

Date Notified:	Name of other facility owners (attach additional sheets if necessary).
8/25/2020	Manatee County Public Works
8/25/2020	TECO Gas
8/25/2020	Charter
8/25/2020	Black & Veatch Tampa 1F
8/25/2020	FPL

Utility Agency/Owner	Utility Builder (when applicable)
Signature: SCOTT MAY (digital signature) Date: 2/4/2021	Signature: _____ Date: _____
Name (printed): SCOTT MAY	Name (printed): _____
Title: _____	Title: _____

FDOT PROJECT INFORMATION

Pursuant to UAM Section 2.1(10), the utility work is within FDOT projects listed below and must have a Utility Work Schedule for each project approved prior to commencement of work within the FDOT project limits:

FDOT construction is proposed or underway. Refer to Financial Project Id: *

1.) This permit falls within the limits of Project # 446681-1 as per the FDOT OWPB Item Segment Search. 1). # 446681-1.PD&E/EMO STUDY. Status: Adopted Not Begun.

FDOT SPECIAL INSTRUCTIONS

In accordance with UAM Section 2.7, FDOT incorporates the below and attached special instructions into this permit.

1. Permit shall be rendered VOID if Manatee Ops Permits is not notified a minimum of TWO (2) BUSINESS DAYS PRIOR TO STARTING WORK. Phone: 941-708-4400. Email: curtis.vilt@dot.state.fl.us. Provide permit number and contact information.

2. If LANE CLOSURE(S) for this Permit are required, the Permittee MUST NOTIFY THE DEPARTMENT (Valerie Everts, 941-708-4433, Email: valerie.everts@dot.state.fl.us)

Additional FDOT Special Instructions are attached and incorporated into this permit. Yes ☐ No ☑

PERMIT APPROVAL

By signature below, FDOT gives permission to the UAO and /or Utility Builder to construct, operate, and maintain the utilities indicated in this Utility Permit in compliance with the UAM, all incorporated documents, and special instructions. Any changes to the approved work must be approved by the FDOT's Approving Engineer and attached and incorporated into this permit in accordance with UAM Section 2.11.

Approving Engineer: Curtis Vilt (digital signature) Date: 4/6/2021

Name: Curtis Vilt

Title: MAINTENANCE MANAGER/PERMITS

Notification of Utility Work to be provided to: Telephone (941) 708-4400 ext. _____ or Email: curtis.vilt@dot.state.fl.us

An FDOT Representative is required to be present on the worksite prior to commencement of work. Yes ☐ No ☐

Rep. Name: _____ Telephone _____ Email: _____

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021

Florida Department of Transportation

UTILITY PERMIT

PERMIT NO: 2021-H-194-00062

CERTIFICATION

I, the undersigned UAO and/or Utility Builder, hereby CERTIFY that the utilities were constructed and inspected in compliance with the UAM all incorporated documents, and special instructions. Pursuant to UAM Section 2.11, all changes have been approved by the FDOT's Approving Engineer and incorporated into this permit along with all other material certifications, test results, bore logs, approved plans changes, as-built plans or other required documentation.

I also CERTIFY that work began on _____ and was completed on _____ and that the area was left in as good or better condition than when the work began.

Utility Agency/Owner	Utility Builder (when applicable)
Signature: _____ Date _____	Signature:_____ Date _____
Name (printed): _____	Name (printed): _____
Title: _____	Title: _____

FINAL INSPECTION OF WORK

☐ The work was inspected and found to be in non-compliance as noted below:

☐ All issues of non-compliance listed above have been brought into compliance and/or FDOT has no outstanding issues that need to be addressed by the UAO and/or Utility Builder. However, this final inspection does not release the UAO and/or Utility Builder of their continuing responsibilities pursuant to Rule 14-46.001, the UAM, all incorporated documents, and special instructions.

FDOT Inspector: _____ Date: _____

Name: _____

Title: _____

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STATE ROAD INFORMATION:

NAME OF OTHER FACILITY OWNERS / DATE NOTIFIED:
Facility Name: MCI/Verizon, Date Notified: 8/25/2020, Facility Name: Frontier, Date Notified: 8/25/2020

FDOT PROJECT INFORMATION:
FDOT construction is proposed or underway. Refer to Financial Project Id: *

1.) This permit falls within the limits of Project # 446681-1 as per the FDOT OWPB Item Segment Search. 1). # 446681-1.PD&E/EMO STUDY. Status: Adopted Not Begun.

2.) To our knowledge, there is no existing ITS/ATMS infrastructure within the limits of this project.
This work is NOT related to an approved Utility Work Schedule.

THE WORK WAS INSPECTED AND FOUND TO BE IN NON-COMPLIANCE AS NOTED BELOW:

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The complete special instructions could not fit in the space allotted on Page 2 of the Utility Permit so they are displayed below.

Special FDOT Instructions

1.Permit shall be rendered VOID if Manatee Ops Permits is not notified a minimum of TWO (2) BUSINESS DAYS PRIOR TO STARTING WORK. Phone: 941-708-4400. Email: curtis.vilt@dot.state.fl.us. Provide permit number and contact information.

2.If LANE CLOSURE(S) for this Permit are required, the Permittee MUST NOTIFY THE DEPARTMENT (Valerie Everts, 941-708-4433, Email: valerie.everts@dot.state.fl.us) TWO (2) WEEKS PRIOR TO STARTING THE LANE CLOSURE(S). FAILURE TO COMPLY WIL RESULTS IN DELAY TO START WORK

3.If Permit work is being proposed during a FDOT Construction Project, it will be the responsibility of the Permittee to coordinate with the FDOT's Contractor.

4.All disturbed areas within the ROW SHALL BE RESTORED with Sod within SEVENTY-TWO (72) HOURS of completion of work.

FDOT PERMIT SET

FOR

BRADENTON BEACH GRAVITY SEWER (SR-789)

BEGIN/END MILE POSTS (5.927/6.251)

MANATEE COUNTY, FLORIDA

FEBRUARY 2021

MANATEE COUNTY PROJECT #6105280

Manatee County
FLORIDA

PROJECT TEAM:

OWNER:
MANATEE COUNTY
1022 26TH AVE. E.
BRADENTON, FL 34208
CONTACT: ALEX GONZALEZ, P.E.
941-708-7450 EXT. 7338

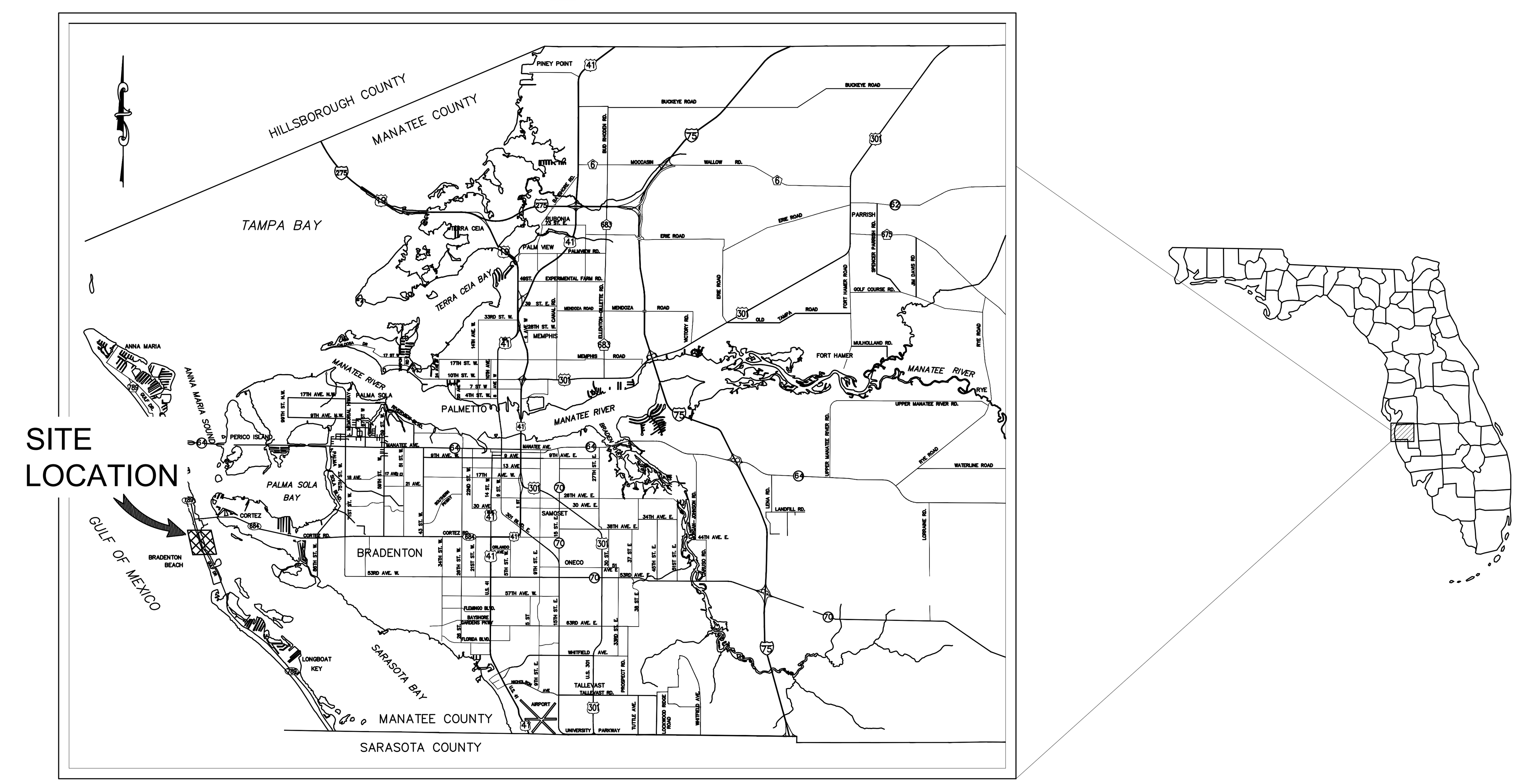
ENGINEER:
KIMLEY-HORN AND ASSOCIATES, INC.
100 2ND AVENUE SOUTH, SUITE 105-N
ST. PETERSBURG, FL 33701
CONTACT: MICHAEL A, SEMAGO, P.E.
727-498-3633

SURVEY:
HYATT SURVEY SERVICES, INC.
2012 LENA ROAD
BRADENTON, FL 34211
CONTACT: JOHN MATTHEWS, PM
491-812-2805

GEOTECH:
ARDAMAN & ASSOCIATES, INC.
78 SARASOTA CENTER BOULEVARD
SARASOTA, FL 34240
CONTACT: JERRY H. KUEHN, P.E.
941-922-3526

SHEET LIST TABLE

Sheet Number	Sheet Title
G-01	COVER SHEET
G-02	GENERAL NOTES
G-03	SURVEY & SUE NOTES
G-04	KEYSHEET
~~C-05~~	~~CONSTRUCTION PHASING PLAN~~
~~C-06~~	~~EXISTING SANITARY SEWER GROUT & DEMOLITION PLAN~~
~~C-07~~	~~SERVICE LATERAL CONSTRUCTION I~~
~~C-08~~	~~SERVICE LATERAL CONSTRUCTION II~~
C-01	GULF DRIVE S [STA. 147+25-142+50]
C-02	GULF DRIVE S [STA. 142+50-137+33]
C-03	GULF DRIVE S [STA. 137+33-133+00]
C-04	GULF DRIVE S [STA. 133+00-128+36]
C-05	13TH STREET S [STA. 200+00-204+00]
C-06	12TH STREET S [STA. 300+00-304+00]
C-07	11TH STREET S [STA. 400+00-405+00]
C-08	10TH STREET S [STA. 500+00-504+50]
C-09	9TH STREET S [STA. 600+00-604+50]
C-10	8TH STREET S [STA. 700+00-705+25]
C-11	7TH STREET S [STA. 800+00-804+95]
~~C-12~~	~~6TH STREET S [STA. 900+00-904+54]~~
~~C-13~~	~~SOUTH 13TH STREET LATERAL~~
C-14	MANHOLE DETAILS
D-01	DETAILS
D-02	DETAILS
D-03	DETAILS



PROJECT VICINITY MAP
N.T.S.

FDOT PERMIT SET

PREPARED BY
Kimley»Horn

100 2ND AVENUE SOUTH, SUITE 105-N
ST. PETERSBURG, FL 33701
PHONE (727) 547-3999
WWW.KIMLEY-HORN.COM CA 00000696

UTILITY CONTACTS:

FRONTIER COMMUNICATIONS
TONI CANNON
3712 W WALNUT ST
TAMPA, FL 33607
813-875-1014

CHARTER COMMUNICATIONS
DAVID AVILA
700 CARILLON PARKWAY, STE6
ST. PETERSBURG, FL 33716
727-329-2841

MCI (VERIZON)
JAMES BARRA
7000 WESTON PARKWAY
CARY, NC 27513-2119
469-886-4091

BLACK AND VEATCH TAMPA (FIBER)
KEN SOULE
5206 EAGLE TRAIL DRIVE
TAMPA, FL 33634
813-539-2274

MANATEE COUNTY
KATHY MCMAHON
4520- 66TH STREET W
BRADENTON, FL 34210
941-792-8811 EXT. 5002

TECO PEOPLES GAS
JOAN DOMNING
8416 PALM RIVER ROAD
TAMPA, FL 33619
813-275-3783

FLORIDA POWER & LIGHT
GREG COKER
941-704-9087

THE SITE CONSTRUCTION STAKEOUT SHALL BE PERFORMED UNDER THE DIRECTION OF A FLORIDA REGISTERED SURVEYOR. AUTOCAD FILES WILL BE FURNISHED TO AID IN THE SITE CONSTRUCTION STAKEOUT. ANY DISCREPANCIES FOUND BETWEEN AUTOCAD FILES AND SITE CONSTRUCTION PLANS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION FOR CLARIFICATION PRIOR TO THAT STAKEOUT.

No.	REVISIONS	DATE	BY

MICHAEL A. SEMAGO, P.E.
FLORIDA LICENSE NUMBER:
87501
DATE:

Digitally signed by Michael A Semago
Date: 2021.02.04 14:47:27 -05'00'

DATE
FEB 2021

PROJECT NO.
148400056

SHEET NUMBER
G-01

GENERAL

1. ALL CONSTRUCTION ACTIVITIES SHALL BE COORDINATED WITH THE PROJECT MANAGEMENT DIVISION. THE PROJECT MANAGER IS: ALEX GONZALEZ, P.E. AND CAN BE REACHED AT (941) 708-7450 X7338
2. SITE VISITS ARE MANDATORY FOR ALL BIDDERS PRIOR TO SUBMITTING ANY OFFICIAL BIDS. THESE SITE VISITS CAN BE ARRANGED THROUGH THE PROJECT MANAGER.
3. ALL CONSTRUCTION ON THIS PROJECT SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF MANATEE COUNTY UTILITY AND TRANSPORTATION STANDARDS AND/OR FDOT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" UNLESS OTHERWISE INDICATED ON THE PLANS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING ALL CONDITIONS AND REQUIREMENTS OF ALL PERMITS AND ALL GOVERNING FEDERAL, STATE, AND LOCAL AGENCIES. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS THAT ARE NOT PROVIDED IN THE BID DOCUMENTS, AT NO ADDITIONAL COST TO THE OWNER.
5. THE INFORMATION PROVIDED IN THESE PLANS IS SOLELY TO ASSIST THE CONTRACTOR IN ASSESSING THE NATURE AND EXTENT OF THE CONDITIONS WHICH MAY BE ENCOUNTERED DURING THE COURSE OF WORK. ALL CONTRACTORS ARE DIRECTED, PRIOR TO BIDDING, TO CONDUCT WHATEVER INVESTIGATION THEY MAY DEEM NECESSARY TO ARRIVE AT THEIR OWN CONCLUSIONS REGARDING THE ACTUAL CONDITIONS THAT WILL BE ENCOUNTERED, AND UPON WHICH THEIR BIDS WILL BE BASED.
6. THE CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS ON THE PLANS AND REVIEW ALL FIELD CONDITIONS THAT MAY AFFECT CONSTRUCTION. SHOULD DISCREPANCIES OCCUR, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO OBTAIN THE ENGINEER'S CLARIFICATION BEFORE COMMENCING WITH CONSTRUCTION.
7. THE CONTRACTOR SHALL NOTIFY SUNSHINE 811 (1-800-432-4770) AT LEAST 2 FULL BUSINESS DAYS PRIOR TO CONSTRUCTION OPERATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ALL UTILITIES FOR THE POSSIBLE RELOCATION OR THE TEMPORARY MOVEMENT OF ANY EXISTING UTILITIES WITHIN THE RIGHTS-OF-WAY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROTECT EXISTING UTILITIES FROM DAMAGE. EXPLORATORY EXCAVATION MAY BE REQUIRED PRIOR TO CONNECTION TO EXISTING UTILITIES.
8. NO WORK, EXCEPT FOR EMERGENCY TYPE, SHALL BE PERFORMED AFTER 7:00 PM AND BEFORE 7:00 AM. FOR ADDITIONAL PROJECT RESTRAINTS, REFER TO SECTION 01310 OF THE SPECIFICATIONS.
9. THE CONTRACTOR SHALL PROVIDE CERTIFIED RECORD DRAWINGS AS OUTLINED IN THE SPECIFICATIONS. RED-LINE DRAWINGS SHALL BE CURRENT WITH EACH PAY APPLICATION SUBMITTED AND WILL BE CHECKED AS PART OF THE PAY APPLICATION REVIEW PROCESS. PAYMENT WILL NOT BE MADE TO CONTRACTOR WITHOUT APPROVED RED-LINE DRAWINGS. THE MOST CURRENT SET OF RED-LINE DRAWINGS SHALL ALSO BE BROUGHT TO EACH MONTHLY PROGRESS MEETING.
10. THE CONTRACTOR SHALL INCLUDE IN HIS BID: BY-PASS PUMPING FACILITIES, PUMPS, FITTINGS, LABOR, ETC. AS NECESSARY, BASED ON METHOD AND SEQUENCE OF CONSTRUCTION TO COMPLETE ALL WORK WHILE MAINTAINING SEWER SERVICE OPERATIONS AT ALL TIMES.
11. THE CONTRACTOR SHALL PROVIDE THE OWNER AND ENGINEER WITH A DETAILED CONSTRUCTION PHASING PLAN BASED ON THE CONNECTION SEQUENCING ON SHEET G-05, FOR APPROVAL PRIOR TO BEGINNING CONSTRUCTION. EXISTING FORCE MAIN AND GRAVITY SEWER SHALL REMAIN IN SERVICE UNTIL ALL CONNECTIONS TO THE EXISTING LIFT STATION ARE CONSTRUCTED.
12. ALL PROPOSED WORK SHALL BE COORDINATED WITH MANATEE COUNTY UTILITIES DEPARTMENT AT LEAST TWO WEEKS IN ADVANCE OF PROPOSED CONSTRUCTION.
13. THE CONTRACTOR SHALL FURNISH SHOP DRAWINGS CONFORMING TO MANATEE COUNTY'S LATEST STANDARDS, TO THE ENGINEER FOR REVIEW OF ALL PIPE CONNECTIONS, TRANSITIONS, AND SPECIAL APPURTENANCES PRIOR TO FABRICATION OR DELIVERY TO THE JOB SITE.
14. UNLESS OTHERWISE INDICATED OR APPROVED, ALL BELOW GROUND DUCTILE IRON PIPE SHALL HAVE PUSH-ON OR MECHANICAL JOINTS, AND ALL ABOVE GROUND DUCTILE IRON PIPE SHALL HAVE FLANGED JOINTS. ALL JOINTS SHALL BE FULLY RESTRAINED PER THE DETAILS IN THESE PLANS.
15. SANITARY SEWERS AND FORCEMAINS CROSSING OVER OR UNDER WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18" BETWEEN THE INVERT OF THE UPPER PIPE AND THE CROWN OF THE LOWER PIPE. WHERE THIS MINIMUM SEPARATION CANNOT BE MAINTAINED, THE CROSSING SHALL BE ARRANGED SO THAT THE SEWER OR FORCE MAIN PIPE JOINTS ARE EQUIDISTANT FROM THE POINT OF CROSSING WITH NO LESS THAN 10' BETWEEN ANY TWO JOINTS. AS AN ALTERNATIVE, THE SEWER OR FORCE MAIN MAY BE PLACED IN A WATERTIGHT CASING PIPE, CONSISTENT WITH F.A.C. RULE 62-555.314.
16. ALL BELOW-GRADE FITTINGS 4-INCHES AND GREATER IN DIAMETER SHALL BE MECHANICAL JOINT DUCTILE IRON WITH PROTECTO 401 LINING FOR THEIR INTERIOR SURFACES AND COAL TAR ENAMEL COATING ON EXTERIOR SURFACES, AS NOTED IN SECTION 02615 OF SPECIFICATIONS.
17. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO SECURE PROPERTY FOR STAGING MATERIALS AND EQUIPMENT.
18. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO ACQUIRE, OR ENTER INTO AGREEMENTS, FOR LANDS FOR LAY DOWN AREAS AND STAGING. THE COUNTY WILL COORDINATE AND ADVISE, TO HELP IDENTIFY POSSIBLE PARCELS. IT IS FINALLY THE CONTRACTOR'S RESPONSIBILITY TO SECURE THE NEEDED AREAS, AND THE COUNTY TAKE NO RESPONSIBILITY FOR DELAYS IN THIS REGARD.
19. COORDINATION AND PUBLIC INFORMATION FOR AND WITH AREA RESIDENTS ARE OF THE UTMOST IMPORTANCE. CONTRACTOR WILL INSURE ADHERENCE TO THE COUNTY'S NOISE ORDINANCE, HAZARD AND SAFETY, AND NUISANCE ABATEMENT DIRECTIONS, PLANS, OBJECTIONS AND ORDINANCES. THE ENGINEER WILL HAVE THE FINAL DISCRETION IN THIS REGARD, AS REPRESENTED ONSITE BY THE COUNTY INSPECTOR AND ENGINEER'S STAFF.
20. ALL ELEVATIONS ARE NAVD88 DATUM

SAFETY

19\. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH THE FLORIDA TRENCH SAFETY ACT, 90-96, LAWS OF FLORIDA EFFECTIVE OCTOBER 1, 1990 AND THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION EXCAVATION SAFETY STANDARDS, 29 CFR 1926.650, SUBPART P, AS AMENDED. THE CONTRACTOR SHALL INCLUDE IN THE TOTAL BID PRICE ALL COSTS FOR COMPLIANCE WITH THESE REGULATIONS.

18\. THE CONTRACTOR SHALL USE SHEET PILING, SHEETING, BRACING, ETC., AS REQUIRED IN ALL EXCAVATION AREAS AND CONFORM TO ALL OSHA REQUIREMENTS.

19\. THE CONTRACTOR SHALL USE ALL NECESSARY SAFETY PRECAUTIONS TO AVOID CONTACT WITH OVERHEAD AND UNDERGROUND UTILITIES, POWER LINES, ETC.

20\. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. THIS EXCLUSION DOES NOT ALLEVIATE THE CONTRACTOR FOR PROVIDING A CONTINUOUS SAFE WORKSPACE.

ENVIRONMENTAL

22. CONTRACTOR SHALL COMPLY TO ALL REQUIREMENT OF THE COASTAL CONSTRUCTION CONTROL LINE PERMIT (CCCL). COMPLIANCE INCLUDES BUT NOT LIMITED TO PROTECTING BEACH EROSION, SAND DUNES AND UPLAND PROPERTIES. CONSTRUCTION SHALL NOT INTERFERE WITH SEA TURTLE AND DUNE PLANT HABITATS. CONSTRUCTION SHALL NOT INTERFERE WITH PUBLIC ACCESS. ANY QUESTIONS SHALL BE DIRECTED TO FDEP (850-245-8570).
23. WHEN A BENTONITE SPILL OR FRACK-OUT OCCURS OR THERE IS A LOSS OF RETURN INDICATING EXCESSIVE SEEPAGE OR LOSS OF DRILLING FLUID, DRILLING MUST BE STOPPED UNTIL THE LOCATION OF THE SPILL IS IDENTIFIED. UNDER NO CIRCUMSTANCES WILL DRILLING CONTINUE WHEN A SPILL IS APPARENT.
24. ONCE LOCATED, THE BENTONITE SPILL MUST BE ISOLATED AND SEEPAGE INTO ANY NEARBY WATER BODIES WILL BE BLOCKED DEPENDING ON THE DEGREE OF THE SPILL, THE ISOLATED BENTONITE MUST BE REMOVED MANUALLY OR MECHANICALLY AND DISPOSED OF BY APPROPRIATE MEANS OR REUSED.
25. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL NECESSARY STORM WATER, EROSION, AND SEDIMENTATION CONTROL MEASURES IN ACCORDANCE WITH THE FDEP "FLORIDA STORM WATER, EROSION AND SEDIMENTATION CONTROL INSPECTOR'S MANUAL". IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONTROL AND PREVENT EROSION AND TRANSPORT OF SEDIMENT TO SURFACE DRAINS AND TO DITCHES DURING CONSTRUCTION.
26. STOCKPILES SHALL BE PROTECTED AT ALL TIMES BY ON-SITE DRAINAGE CONTROLS WHICH PREVENT EROSION OF THE STOCKPILED MATERIAL. CONTROL OF DUST FROM SUCH STOCKPILES IS REQUIRED, DEPENDING UPON THEIR LOCATION AND THE EXPECTED LENGTH OF TIME THE STOCKPILES WILL BE PRESENT. IN NO CASE SHALL ANY STOCKPILED MATERIAL REMAIN AFTER THIRTY (30) CALENDAR DAYS.
27. STORM WATER INLETS IN THE VICINITY OF THE PROJECT SHALL BE PROTECTED BY SEDIMENT TRAPS SUCH AS SECURED HAY BALES, SOD, STONE, ETC., WHICH SHALL BE MAINTAINED AND MODIFIED AS REQUIRED BY CONSTRUCTION PROGRESS, AND WHICH MUST BE APPROVED BY THE ENGINEER BEFORE INSTALLATION. THIS WILL BE MAINTAINED TO PREVENT DEGRADATION OF THE WATERS OF THE COUNTY AND STATE.
28. SEDIMENT BASINS AND TRAPS, PERIMETER BERMS, SEDIMENT BARRIERS, VEGETATIVE BUFFERS, AND OTHER MEASURES INTENDED TO TRAP SEDIMENT AND/OR PREVENT THE TRANSPORT OF SEDIMENT ONTO ADJACENT PROPERTIES, OR INTO EXISTING BODIES OF WATER, MUST BE INSTALLED, CONSTRUCTED, OR IN THE CASE OF VEGETATIVE BUFFERS, PROTECTED FROM DISTURBANCE, AS A FIRST STEP IN THE LAND ALTERATION PROCESS. SUCH SYSTEMS SHALL BE FULLY OPERATIVE BEFORE ANY OTHER DISTURBANCE OF THE SITE BEGINS. EARTHEN STRUCTURES INCLUDING BUT NOT LIMITED TO BERMS, EARTH FILTERS, DAMS OR DIKES SHALL BE STABILIZED AND PROTECTED FROM DRAINAGE DAMAGE OR EROSION WITHIN ONE (1) WEEK OF INSTALLATION.
29. ALL SWALES, DITCHES, AND CHANNELS LEADING FROM THE SITE SHALL BE PROTECTED FROM SILTATION AND EROSION DURING CONSTRUCTION AND BE SODDED WITHIN THREE (3) DAYS OF EXCAVATION.
30. SOIL DISPLACED BY CONSTRUCTION WILL BE REMOVED. EROSION CONTROL SHALL BE IMPLEMENTED IN AREAS WHICH ARE CONSIDERED ENVIRONMENTALLY SENSITIVE. EROSION CONTROL SYSTEMS SHALL BE REQUIRED FOR ALL WORK WITHIN JURISDICTIONAL AREAS. THESE SYSTEMS MAY INCLUDE STAKED HAY BALES, SILT SCREENS, FILTER FABRIC, AND TURBIDITY SCREENS.
31. ALL EROSION AND POLLUTION CONTROL DEVICES SHALL BE CHECKED REGULARLY, ESPECIALLY AFTER EACH RAINFALL AND SHALL BE CLEANED OUT AND/OR REPAIRED AS REQUIRED.
32. THE CONTRACTOR SHALL NOT ENTER UPON OR IN ANY WAY ALTER WETLAND AREAS THAT MAY BE ON OR NEAR THE CONSTRUCTION SITE. ALL WORK IN THE VICINITY OF OPEN WATER AND/OR WETLANDS IS TO BE PERFORMED IN COMPLIANCE WITH THE ENVIRONMENTAL REGULATIONS AND/OR PERMITS FOR THE SITE. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY FINES RESULTING FROM HIS VIOLATION OF ANY REGULATIONS OR PERMIT CONDITIONS.
33. CONTRACTOR SHALL PROVIDE PROTECTIVE MATTING, FUEL CONTAINMENT AND ALL OTHER MATERIALS, EQUIPMENT AND LABOR TO PROTECT THE STAGING AREA DURING CONSTRUCTION.
34. CONTRACTOR SHALL, PRIOR TO BEGINNING CONSTRUCTION, SUBMIT A "FUELING SPILL PREVENTION PLAN" THAT SHALL CLEARLY INDICATE HOW FUEL SPILLS WILL BE PREVENTED WHEN FUELING BOTH WITHIN AND OUTSIDE OF THE STAGING AREA.

RIGHT-OF-WAY

35. ALL CONSTRUCTION ACTIVITIES SHALL BE LIMITED TO WITHIN THE BRADENTON BEACH/FDOT RIGHT-OF-WAY AND/OR EASEMENTS SHOWN ON THE DRAWINGS.
36. THE CONTRACTOR SHALL EMPLOY A LAND SURVEYOR REGISTERED IN THE STATE OF FLORIDA TO REFERENCE AND RESTORE PROPERTY CORNER MONUMENTS, PINS, AND LANDMARKS THAT MAY BE DISTURBED BY CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.
37. THE CONTRACTOR, PRIOR TO CONSTRUCTION AND RESTRICTING ANY TRAFFIC, MUST OBTAIN A RIGHT-OF-WAY USE PERMIT AND A TRAFFIC CONTROL PLAN. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS FROM OTHER GOVERNMENTAL AGENCIES HAVING RELEVANT JURISDICTION. ALL MAINTENANCE AND PROTECTION OF TRAFFIC SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF THE CURRENT FLORIDA DEPARTMENT OF TRANSPORTATION "MANUAL OF TRAFFIC CONTROL AND SAFE PRACTICES". A TRAFFIC CONTROL PLAN SHALL BE SUPPLIED BY THE CONTRACTOR AT THE PRE-CONSTRUCTION MEETING.
38. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ALL DAMAGED STORM WATER STRUCTURES, PIPING, ENTRANCE PIPE AND HEADWALLS WHETHER SHOWN ON THE PLANS OR NOT. THE HEADWALLS SHALL BE REPLACED IN ACCORDANCE WITH F.D.O.T. STANDARDS.
39. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH IN THE FIELD THE RIGHT-OF-WAY LINES, BASE LINES, BENCH MARKS (ELEV.), CENTER LINES, AND STATIONING AS REQUIRED TO CONSTRUCT THIS PROJECT.
40. THE CONTRACTOR SHALL COORDINATE THE CUTTING OF DRIVEWAYS WITH THE PROPERTY OWNER PRIOR TO CUT. ALL DRIVEWAYS WILL BE IN PASSABLE CONDITION AT THE END OF THE WORK DAY AND FULLY RESTORED PER SECTION 02575.
41. A RIGHT OF ENTRY AGREEMENT SHALL BE OBTAINED BY THE CONSTRUCTION MANAGER FROM THE PROPERTY OWNER BEFORE ANY CONSTRUCTION IS DONE OUTSIDE OF THE RIGHT-OF-WAY OR EASEMENT.

UTILITIES

42. LOCATIONS, ELEVATIONS AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES ARE SHOWN TO THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE PLANS BUT DO NOT PURPORT TO BE ABSOLUTELY CORRECT. THERE MAY BE OTHER IMPROVEMENTS, UTILITIES, ETC. WHICH ARE WITHIN THE PROJECT AREA AND WHICH HAVE NOT BEEN LOCATED OR IDENTIFIED, MAY NOT BE IN THE EXACT LOCATION SHOWN OR RELOCATED SINCE THE PREPARATION OF THESE PLANS. THE CONTRACTOR SHALL VERIFY, PRIOR TO CONSTRUCTION, THE LOCATIONS, ELEVATIONS AND DIMENSIONS OF ALL EXISTING UTILITIES STRUCTURES AND OTHER FEATURES (WHETHER OR NOT SHOWN ON THE PLANS) THAT MAY AFFECT HIS WORK. ALL EXISTING UTILITIES TO BE EXTENDED, CROSSED OR CONNECTED TO SHALL BE EXPOSED PRIOR TO CONSTRUCTION TO VERIFY LOCATION AND ELEVATION. ANY DISCREPANCIES OR CONFLICTS FOUND SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION FOR RESOLUTION.
43. THE CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES, WATER AND SEWER LINES, STORM DRAINS, UTILITIES, DRIVEWAYS, SIDEWALKS, SIGNS, MAIL BOXES, FENCES, TREES, LANDSCAPING, AND ANY OTHER IMPROVEMENT OR FACILITY IN THE CONSTRUCTION AREA. THE CONTRACTOR SHALL REPAIR AND/OR REPLACE ANY DAMAGED ITEM DUE TO HIS CONSTRUCTION ACTIVITIES TO EQUAL OR BETTER THAN PRE-CONSTRUCTION CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.
44. THE CONTRACTOR SHALL USE APPROPRIATE TECHNIQUES, AS APPROVED, RECOMMENDED OR OFFERED BY FLORIDA POWER AND LIGHT TO PREVENT UNDERMINING OF POWER POLES DURING CONSTRUCTION. IF HOLDING OF POWER POLES IS RECOMMENDED OR REQUIRED BY THE UTILITY, THE CONTRACTOR SHALL COORDINATE THIS ACTIVITY WITH THE UTILITY AND BEAR ALL RELATED COSTS.
45. ANY TEMPORARY SHUTDOWNS FOR MODIFICATIONS OF EXISTING UTILITY SYSTEMS THAT MUST REMAIN IN SERVICE DURING CONSTRUCTION SHALL BE KEPT TO A MINIMUM AND SHALL BE COORDINATED WITH AND APPROVED BY THE MANATEE COUNTY UTILITY OPERATIONS DEPARTMENT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT IS NOTED THAT TEMPORARY SHUTDOWNS MAY BE RESTRICTED TO CERTAIN HOURS AT ANY TIME OF THE DAY OR NIGHT AND WILL BE COMPLETED AT NO ADDITIONAL COST TO THE OWNER.
46. FOR WORK BEING DONE ON EXISTING SANITARY SEWER LINES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE FLOW OF ALL SEWAGE DURING CONSTRUCTION, WHICH MAY REQUIRE BY-PASS PUMPING AND/OR PUMPER TRUCKS. THE CONTRACTOR SHALL SUBMIT A DETAILED BY-PASS PUMPING PLAN PER SECTION 02720.
47. ALL MAINS TO BE ABANDONED IN PLACE SHALL BE GROUTED PER THE SPECIFICATIONS.
48. THE ELEVATIONS OF THE UTILITY SERVICES AND LATERALS HAVE BEEN ASSUMED ON THE BASIS OF TYPICAL ANTICIPATED SOIL COVERAGE. CONTRACTOR SHALL NOT RELY ON THIS INFORMATION FOR CONSTRUCTION, BUT SHALL BE RESPONSIBLE FOR FIELD LOCATIONS (HORIZONTAL AND VERTICAL) OF ALL UTILITIES CROSSING THE PROPOSED FORCE MAIN. CONTRACTOR SHALL INCLUDE IN THE UNIT COST OF THE SUBJECT FORCE MAIN CONSTRUCTION, THE COST OF UTILITY ADJUSTMENTS NECESSARY TO ATTAIN DESIGN MINIMUM SEPARATION FOR UTILITIES CONFLICTING WITH THE CONSTRUCTION OF THE PROPOSED FORCE MAIN. INTERRUPTIONS OF ANY EXISTING UTILITY SERVICES SHALL BE NOTICED TO AFFECTED CUSTOMERS A MINIMUM OF 48 HOURS IN ADVANCE AND SHALL NOT EXCEED 4 HOURS IN DURATION.

RESTORATION

49. ALL RESTORATION WORK PERFORMED THROUGHOUT THE PROJECT SHALL CONFORM TO EXISTING LINES AND GRADES UNLESS SHOWN OTHERWISE.
50. ALL DISTURBED GRASSED AREAS SHALL BE SODDED UNLESS OTHERWISE INDICATED. THE TYPE OF SOD USED TO REPLACE OWNER MAINTAINED AREAS IN RIGHT-OF-WAY SHALL BE COORDINATED WITH THE PROPERTY OWNER.
51. ALL CONCRETE THRUST BLOCKS INSTALLED FOR TESTING PURPOSES AND NOT REQUIRED FOR THE OPERATION OF THE PIPELINE SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR, PRIOR TO FINAL ACCEPTANCE, AT NO ADDITIONAL COST TO THE OWNER.
52. ASPHALT DRIVES THAT ARE CUT SHALL BE RESTORED PER SECTION 02513.
53. CONCRETE DRIVEWAYS OR SIDEWALKS THAT ARE CUT SHALL BE RESTORED TO MATCH EXISTING ACCORDING TO THE CURRENT EDITIONS OF THE F.D.O.T. SPECIFICATIONS FOR ROAD AND BRIDGE DESIGN, SECTION 522, AND SECTION 310 OF THE F.D.O.T. DESIGN STANDARDS.
54. WHENEVER A PERMANENT ROADWAY SURFACE IS NOT REPLACED IMMEDIATELY AFTER BACKFILLING AND COMPACTION OF THE NEWLY INSTALLED PIPE LINE IN AREAS WHERE TRAFFIC MUST PASS, THE CONTRACTOR SHALL INSTALL A TEMPORARY SURFACE CONSISTING OF NINE INCHES OF COMPACTED LIME ROCK BASE AND A COAT OF ASPHALT EMULSION. PERMANENT ROADWAY REPAIR SHALL BE PERFORMED A MAXIMUM OF TWENTY-ONE CALENDAR DAYS AFTER THE INITIAL OPEN CUTTING.
55. RESTORATION OF CURBS, DRIVEWAYS, SIDEWALKS, AND PLACEMENT OF SOD SHALL BE COMPLETED WITHIN FORTY-FIVE CALENDAR DAYS OF INITIAL DISTURBANCE, OR TWENTY-ONE CALENDAR DAYS OF SUBSTANTIAL COMPLETION, WHICHEVER OCCURS FIRST.
56. ALL EXISTING FENCES DISTURBED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED AND REINSTALLED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER UNLESS SHOWN TO BE REMOVED ON CONSTRUCTION PLANS.
57. WHERE CONCRETE REPAIRS ARE NECESSARY AND EXPANSION OR CONTRACTION JOINTS ARE PRESENT, CONTRACTOR SHALL REMOVE AND REPLACE CONCRETE UP TO THE NEXT EXPANSION OR CONTRACTION JOINT.
58. ALL EXISTING WATER/WASTEWATER INFRASTRUCTURE INCLUDING, BUT NOT LIMITED TO, WATER METER BOXES, FIRE HYDRANTS, AND VALVE BOXES SHALL BE ADJUSTED TO FINAL GRADE

CONSTRUCTION

59. THE EXHAUST SYSTEM OF ALL GASOLINE AND DIESEL ENGINES SHALL BE EQUIPPED WITH MUFFLERS THAT MEET THE EQUIPMENT MANUFACTURER'S REQUIREMENTS FOR NOISE SUPPRESSION. THE CONTRACTOR SHALL INSTALL NOISE ABATEMENT BAFFLES POSITIONED TO BREAK LINE-OF-SITE FROM THE NOISE SOURCE TO AFFECTED RESIDENCES, AS APPROVED BY THE ENGINEER.
60. NO MATERIAL SHALL BE STOCKPILED IN ROADWAYS. ALL DIRT AND DEBRIS SHALL BE REMOVED FROM THE JOB SITE DAILY. ROADS SHALL BE SWEPT DAILY AS PART OF DAILY CLEAN UP.
61. THE CONTRACTOR IS TO CONTROL ALL FUGITIVE DUST ORIGINATING ON THIS PROJECT BY WATERING OR OTHER METHODS AS REQUIRED.
62. INGRESS AND EGRESS TO ALL THE PROPERTIES IN THE CONSTRUCTION AREA SHALL BE MAINTAINED AT ALL TIMES.
63. PRIOR APPROVAL WILL BE REQUIRED FOR REMOVAL OR TRIMMING OF ANY TREE WITHIN THE CONSTRUCTION AREA.
64. THE CONTRACTOR SHALL PROVIDE ALL DEWATERING EQUIPMENT NECESSARY TO KEEP ALL EXCAVATIONS DRY. DEWATERING IS REQUIRED TO 18" BELOW TRENCH BOTTOM.
65. ALL PIPING AND FITTINGS USED ON THIS PROJECT SHALL BE AS NOTED ON THE PLANS AND IN THE CONTRACT DOCUMENT AND SHALL BE INSTALLED TO THE LINES AND GRADES SHOWN ON THE PLANS AND PROFILES.
66. ALL PIPE SHALL BE COLOR CODED TO CONFORM TO MANATEE COUNTY STANDARDS.
67. ALL FITTINGS FOR PRESSURE CLASS-RATED PIPE SHALL BE RESTRAINED DUCTILE IRON. RESTRAINED LENGTHS OF PIPE SHALL ADHERE TO THE REQUIREMENTS AS SHOWN ON THE DETAIL SHEETS.
68. WHERE IT IS NECESSARY TO DEFLECT PIPE EITHER HORIZONTALLY OR VERTICALLY, PIPE DEFLECTION SHALL NOT EXCEED 75% OF THE MANUFACTURER'S MAXIMUM ALLOWABLE RECOMMENDED DEFLECTION.
69. ALL ROCKS OR STONES LARGER THAN SIX INCH DIAMETER SHALL BE REMOVED FROM THE BACKFILL MATERIAL. BACKFILL MATERIAL PLACED WITHIN ONE FOOT OF PIPING AND APPURTENANCES SHALL NOT CONTAIN ANY STONES LARGER THAN TWO INCH DIAMETER.
70. ONLY MANATEE COUNTY UTILITY OPERATIONS STAFF ARE AUTHORIZED TO OPERATE VALVES AND PUMP STATIONS ON COUNTY OWNED AND MAINTAINED UTILITY SYSTEMS.
71. CONSTRUCTION DEWATERING SHALL BE CONDUCTED IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS INCLUDING BUT NOT LIMITED TO CHAPTERS 62-621.300 AND 62-620 OF THE FLORIDA ADMINISTRATIVE CODE (FAC).
72. ALL TEST POINT PIPING SHALL BE CUT LOOSE FROM THE CORPORATION STOP AND COMPLETELY REMOVED AND DISPOSED OF BY THE CONTRACTOR PRIOR TO FINAL ACCEPTANCE. A CORPORATION STOP PLUG SHALL BE INSTALLED AND THE CORPORATION STOP SHALL REMAIN IN PLACE.
73. FIELD CONDITIONS MAY NECESSITATE MINOR ALIGNMENT AND GRADE DEVIATION OF THE PROPOSED UTILITIES TO AVOID OBSTACLES, AS ORDERED BY THE ENGINEER.
74. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION FROM THE MANATEE COUNTY UTILITIES DEPARTMENT (MCUD) OFFICE OF INDUSTRIAL COMPLIANCE PRIOR TO DEWATERING. COMPLETION OF A CONSTRUCTION DEWATERING AUTHORIZATION TO DISCHARGE APPLICATION IS REQUIRED. FILL OUT FORM AS COMPLETELY AS POSSIBLE AS MISSING INFORMATION DELAYS THE APPROVAL PROCESS.
75. THE MCUD OFFICE OF INDUSTRIAL COMPLIANCE WILL DETERMINE WHETHER A LETTER OF APPROVAL, A DISCHARGE AUTHORIZATION, OR A DISCHARGE PERMIT IS REQUIRED.
76. FOR SITES SUSPECTED OF CONTAMINATED GROUNDWATER MANATEE COUNTY WILL REQUIRE AN APPLICANT TO DEMONSTRATE THAT THE DISCHARGE MEETS THE MANATEE COUNTY SEWER USE ORDINANCE.
77. IF ANY RECLAIMED OR WATER MAINS INCLUDING SERVICE LINES ARE DAMAGED DURING CONSTRUCTION, THEY SHALL BE REPLACED FROM THE VALVE TO THE OTHER POINT OF CONNECTION OUTSIDE OF THE ROADWAY PER MANATEE COUNTY'S STANDARDS.

FDOT NOTES

ALL WORK PERFORMED WITHIN THE FDOT R/W SHALL CONFORM TO:

1. FDOT STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION (2016) (A.K.A. STANDARD SPECS).
2. FDOT DESIGN STANDARDS FOR DESIGN, CONSTRUCTION, MAINTENANCE AND OPERATIONS ON THE STATE HIGHWAY SYSTEM, 2016, (A.K.A. STANDARD INDEX). COMPLIANCE WITH ALL APPLICABLE INDICES IS REQUIRED.
3. FLORIDA DEPARTMENT OF TRANSPORTATION ROADWAY PLANS PREPARATION MANUAL, VOLUME 1, CHAPTERS 2 AND 25. (REVISED 2013).
4. FLORIDA DEPARTMENT OF TRANSPORTATION FLEXIBLE PAVEMENT DESIGN MANUAL FOR NEW CONSTRUCTION AND PAVEMENT REHABILITATION, JANUARY 2015.
5. ALL TRAFFIC STRIPES AND MARKINGS ARE TO BE LEAD FREE, NON-SOLVENT BASED THERMOPLASTIC. THE PERMITTEE SHALL FURNISH THE DEPARTMENT WITH THE MANUFACTURER'S CERTIFICATION THAT THE THERMOPLASTIC IS "LEAD FREE".
6. LANE CLOSURE MAY NEED TO BE ALTERED DEPENDING ON THE AREA THE WORK IS TAKING PLACE.

TRAFFIC CONTROL NOTES

1. TRAFFIC SHALL BE MAINTAINED IN ACCORDANCE WITH F.D.O.T. DESIGN STANDARDS INDICES NO. 600, 603, 605, 611, 612, 613, 616, AND 660 DEPENDING ON THE OPERATION BEING PERFORMED.
   FOR ALL TWO-LANE WORK, TWO-WAY, WORK WITHIN TRAVEL LANE UTILIZE INDEX 603.
   FOR ALL TWO-LANE WORK, TWO-WAY, WORK NEAR INTERSECTION UTILIZE INDEX 605.
   FOR ALL MULTILANE WORK OUTSIDE SHOULDER UTILIZE INDEX NO. 611.
   FOR ALL MULTILANE WORK ON SHOULDER UTILIZE INDEX NO. 612.
   FOR ALL MULTILANE WORK WITHIN TRAVEL WAY MEDIAN OR OUTSIDE LANE UTILIZE INDEX NO. 613.
   FOR ALL MULTILANE WORK NEAR INTERSECTION MEDIAN OR OUTSIDE LANE UTILIZE INDEX NO. 616.
   FOR PEDESTRIAN CONTROL FOR CLOSURE OF SIDEWALK, UTILIZE FDOT INDEX NO. 660.
2. CONTRACTOR TO COORDINATE WITH FDOT FOR ALL WORK DONE ON A STATE FACILITY.
3. TO AVOID DISRUPTION DUE TO INCLEMENT WEATHER, THE CONTRACTOR SHOULD PERFORM ANY MILLING AND PAVING OPERATIONS DURING THE SAME WORK PERIOD.
4. ALL EXISTING PAVEMENT MARKINGS OUTSIDE THE CONSTRUCTION LIMITS THAT HAVE BEEN ALTERED BECAUSE OF CONSTRUCTION OPERATIONS SHALL BE REPLACED UPON THE COMPLETION OF THE PROJECT AT THE CONTRACTORS EXPENSE.
5. LANE CLOSURES SHALL OCCUR BETWEEN 9:00 P.M. AND 5:00 A.M., UNLESS LANE CLOSURE CALCULATIONS ARE PROVIDED AND APPROVED OR APPROVAL IS GRANTED BY THE DISTRICT PERMIT ENGINEER.

   THE CONTRACTOR SHALL SCHEDULE WORK OPERATIONS SO THAT ALL LANES CAN BE RE-OPENED TO TRAFFIC WITHIN A PERIOD OF 24 HOURS IN CASE OF AN EMERGENCY.
6. PEDESTRIANS, BICYCLES, AND WHEELCHAIRS:
   AT THE END OF EACH WORKDAY OR WHENEVER THE WORK ZONE BECOMES INACTIVE, ANY DROP-OFF ADJACENT TO A SIDEWALK SHALL BE BACKFILLED AT A SLOPE NOT TO EXCEED 1:4, OR SHALL BE PROTECTED IN ACCORDANCE WITH STANDARD INDEX 600
7. PEDESTRIAN AND WHEELCHAIR TRAFFIC SHALL BE ACCOMMODATED UTILIZING STANDARD INDEX 660.
8. ONE PORTABLE VARIABLE MESSAGE SIGN SHALL BE USED IN ADVANCE OF EACH LANE CLOSURE. THE FOLLOWING ARE SUGGESTED MESSAGES TO USE IN THE APPROPRIATE SITUATIONS:

   MESSAGE 1
   "RIGHT" OR "CENTER" OR "LEFT"
   "LANE" "LANE" "LANE"
   "CLOSED" "CLOSED" "CLOSED"
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMMEDIATE REMOVAL OF STORMWATER FROM ROADWAYS UTILIZED FOR TRAFFIC CONTROL IN A MANNER APPROVED BY THE ENGINEER.
10. AT THE END OF EACH WORKING DAY'S ACTIVITY, TEMPORARY PAVEMENT MARKINGS AND TEMPORARY RPM'S SHALL BE INSTALLED PRIOR TO OPENING THE LANES UP FOR TRAFFIC.
11. ALL PAVEMENT MARKINGS, SIGNS, MARKERS, CHANNELIZATION REQUIRED TO PHASE WORK OR SHIFT TRAFFIC, SHALL UTILIZE INDICES FOR PLACEMENT.
12. THE CONTRACTOR SHALL RESTRICT THE OPERATIONS SO THAT THE FIRST LIFT OF ASPHALT IS PLACED ON THE SAME DAY THAT THE LANES ARE MILLED, BEFORE OPENING THE LANES TO TRAFFIC. INSTALL TEMPORARY PAVEMENT MARKINGS AFTER THE FIRST LIFT AND PRIOR TO OPENING.
13. MILLING AND RESURFACING SHALL BE ACCOMPLISHED DURING THE OFF-PEAK HOURS.
14. THE CONTRACTOR IS RESPONSIBLE TO RETIME THE TRAFFIC SIGNALS WITHIN THE PROJECT LIMITS (INCLUDING LIMITS OF WORK ZONE TRAFFIC CONTROL) THAT ARE POTENTIALLY AFFECTED DURING VARIOUS PHASES OF CONSTRUCTION. COORDINATE ALL SIGNAL RETIME EFFORTS WITH VISHAD KAKKAD, P.E., PTOE, COUNTY TRAFFIC ENGINEER, AT 941-749-3500, EXT. 7812.
15. CONTRACTOR TO MAINTAIN VEHICLE DETECTION IN OPERATION FOR LANES THAT WILL REMAIN OPEN. CONTRACTOR TO COORDINATE ALL VEHICLE DETECTION ISSUES WITH PAUL VILLALUZ OF MANATEE COUNTY AT 941-749-3500, EXT. 7859 OR PAUL.VILLALUZ@MYMANATEE.ORG
16. MAINTENANCE OF TRAFFIC AND ANY SIGNAL RETIMING WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
17. ANY SIGNAL RETIMING REQUIRED FOR THE INTERSECTIONS IMPACTED BY THE PROJECT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. SIGNAL TIMING MODIFICATIONS TO BE SUBMITTED TO MANATEE COUNTY TRAFFIC DESIGN, ATTENTION MR. MUKUNDA GOPALAKRISHNA FOR REVIEW AND APPROVAL AT LEAST 15 WORKING DAYS BEFORE PROPOSED CHANGES. THIS DOES NOT GOVERN EMERGENCY SITUATIONS, PENDING THE APPROVAL OF THE ENGINEER.
18. A DETAILED MAINTENANCE OF TRAFFIC PLANS ARE TO BE SUBMITTED TO MANATEE COUNTY AND THE ENGINEER, BY THE CONTRACTOR, FOR REVIEW AND APPROVAL A MINIMUM OF 21 WORKING DAYS PRIOR TO PROPOSED IMPLEMENTATION.

WORK SCHEDULE COORDINATION

1. COORDINATE ALL LIFT STATION SHUT DOWNS WITH NICK WAGNER, 941-792-8811 X 5377 OR NICK.WAGNER@MYMANATEE.ORG
2. CONTRACTOR SHALL ABIDE BY ALL CITY OF BRADENTON BEACH REGULATIONS AND RULES TO INCLUDE, BUT NOT LIMITED TO, WORK HOURS, CITY HOLIDAYS, NOISE REGULATIONS, TRAFFIC CONTROL, AND PROPERTY ACCESS. ANY VARIATION FROM THESE STANDARDS MUST BE APPROVED IN WRITING BY THE CITY OF BRADENTON BEACH IN ADVANCE. CONTRACTOR SHALL APPLY FOR A RIGHT-OF-WAY PERMIT WITH THE CITY OF BRADENTON BEACH PRIOR TO STARTING CONSTRUCTION.
3. CONTRACTOR SHALL MAINTAIN VEHICULAR/PEDESTRIAN TRAFFIC ACCESS TO COMMERCIAL PROPERTIES AND ASSOCIATED PARKING LOTS, AND TO RESIDENTIAL PROPERTIES DURING CONSTRUCTION.
4. CONTRACTOR SHALL COORDINATE DIRECTLY WITH THE COUNTY PUBLIC OUTREACH MANAGER AND APPROVED COUNTY CONSULTANTS TO ADDRESS ANY COMPLAINTS.
5. DOOR HANGERS SHALL BE PROVIDED TO ALL NEIGHBORS/BUSINESSES AFFECTED BY CONSTRUCTION AT LEAST 48 HOURS IN ADVANCE. DOOR HANGERS SHALL PROVIDE INFORMATION ON ESTIMATED DAYS OF IMPACT AND MITIGATION EFFORTS.

ABBREVIATIONS

RJ – RESTRAINED JOINT
R/W – RIGHT-OF-WAY
HDD – HORIZONTAL DIRECTIONAL DRILL
RCP – REINFORCED CONCRETE PIPE
ARV – AIR RELEASE VALVE
HDPE – HIGH DENSITY POLYETHYLENE
PVC – POLYVINYL CHLORIDE
ST – STORM DRAIN
EX. – EXISTING
BT – BURIED TELEPHONE
SS – SANITARY SEWER
FM – FORCE MAIN
WM – WATER MAIN
RW – RECLAIM WATER MAIN
ECP – ELLIPTICAL CONCRETE PIPE

KIMLEY HORN LEGEND

PROPOSED GRAVITY SEWER MAIN INSTALLED VIA OPEN CUT	▬ ▭ ▬ ▭ ▬
PROPOSED GRAVITY SEWER MAIN INSTALLED VIA HDD	▨
EX. SANITARY SEWER	▬ ▭ ▬ ▭ ▬
EX. FORCEMAIN	—X-FM-04—X-FM-04—X-FM-04—X-FM-04—
	—X-WT-16—X-WT-16—X-WT-16—X-WT-16—
PROPOSED MANHOLE	Ⓢ
EXISTING MANHOLE	Ⓢ
PROPOSED SERVICE LATERAL	╲—○
EXISTING SERVICE LATERAL	╲—
EX. BURIED TELEPHONE/FIBER	—BT—BT—BT—BT—BT—
EX. AERIAL ELECTRIC	— OHU — — OHU — —
EX. FIBER OPTICS	—X-FO—X-FO—X-FO—X-FO—
EX. BURIED ELECTRIC	—X BE—X BE—X BE—X BE—X BE—
EX. TV	—BT—BT—BT—BT—BT—
EX. GAS	—X-GAS—X-GAS—X-GAS—X-GAS—

LEGEND:

SIDEWALK/CONCRETE RESTORATION	▩
BRICK DRIVEWAY RESTORATION	▦
SHELL DRIVEWAY RESTORATION	▣
FULL ROAD RESTORATION	░
MILL AND OVERLAY	+ + +
RECORDED EASEMENT	▨

GROUNDWATER / DEWATERING NOTE:

THE PRESENCE OF GROUNDWATER SHOULD BE ANTICIPATED ON THIS PROJECT. CONTRACTOR'S BID SHALL INCLUDE CONSIDERATION FOR THIS ISSUE. WHEN PERFORMING GRADING OPERATIONS DURING PERIODS OF WET WEATHER, PROVIDE ADEQUATE DEWATERING, DRAINAGE AND GROUND WATER MANAGEMENT TO CONTROL MOISTURE OF SOILS.

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No.	REVISIONS	DATE	BY

Kimley»Horn

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PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT 148400056
DATE JAN 2021
SCALE AS SHOWN
DESIGNED BY MAS
DRAWN BY KTM
CHECKED BY WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

MANATEE COUNTY FL

LICENSED PROFESSIONAL
MICHAEL A. SEMAGO, P.E.
FL LICENSE NUMBER
87501
DATE:

Digitally signed by Michael A Semago
DN: cn=Michael A Semago, c=US, o=KIMLEY-HORN AND ASSOCIATES INC., ou=A01410C0000016FA4D5FDC400016E00, email=mike.semago@kimley-horn.com
Date: 2021.02.04 14:48:03 -05'00'

GENERAL NOTES

SHEET NUMBER
G-02

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021

GENERAL NOTES

1. THE FOLLOWING NGS VERTICAL CONTROL MONUMENTS WERE RECOVERED AND UTILIZED FOR THE ELEVATIONS INDICATED HEREIN: "GIS 103" NAVD 1988 ELEVATION 4.27' "J 254" NAVD 1988 ELEVATION 13.48'

2. THIS SURVEY IS REFERENCED TO A PROJECTION OF THE FLORIDA STATE PLANE COORDINATE SYSTEM (WEST ZONE NAD 1983/2011 ADJUSTMENT).

3. RIGHT-OF-WAY AND PARCEL LOCATION INDICATED HEREIN IS THE RESULT OF FOUND BOUNDARY MONUMENTATION TOGETHER WITH AVAILABLE PUBLIC RECORD INFORMATION. TITLE WORK WAS NOT PROVIDED.

4. THIS SURVEY IS SUBJECT TO PERTINENT EASEMENTS, RIGHTS-OF-WAY AND RESTRICTIONS OF RECORD, IF ANY.

5. THIS SURVEY DRAWING WAS PREPARED FOR THE EXCLUSIVE USE OF THE PARTY OR PARTIES CERTIFIED TO BELOW FOR THE EXPRESS PURPOSE STATED HEREON AND/OR CONTAINED IN THE CONTRACT BETWEEN HYATT SURVEY SERVICES, INC. AND THE CLIENT FOR THIS PROJECT. COPYING, DISTRIBUTING AND/OR USING THIS DRAWING, IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN ORIGINALLY INTENDED WITHOUT WRITTEN CONSENT FROM HYATT SURVEY SERVICES, INC. IS STRICTLY PROHIBITED AND RENDERS THE SURVEYOR'S CERTIFICATION, SIGNATURE AND SEAL NULL AND VOID. ANY QUESTIONS CONCERNING THE CONTENT OR PURPOSE OF THIS DRAWING SHOULD BE DIRECTED TO HYATT SURVEY SERVICES, INC.

LEGEND

- SITE CONTROL POINT
- IRON PIPE FOUND
- IRON ROD FOUND
- CONCRETE MONUMENT FOUND
- SUBSURFACE INVESTIGATION
- SIGN
- WOOD UTILITY POLE
- CONCRETE UTILITY POLE
- GUY WIRE
- WATER METER
- WATER VALVE
- SANITARY MANHOLE
- FIRE HYDRANT
- BACKFLOW PREVENTER
- UTILITY BOX
- UTILITY RISER
- ELECTRIC SERVICE BOX
- MAILBOX(ES)
- WOOD POST
- CLEANOUT
- GAS MARKER

R/W RIGHT-OF WAY
ND NAIL W/ DISC
IRC IRON ROD W/ CAP

PINE


PALM


TREE

SITE CONTROL

DESIGNATION	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP# 1	1137931.14	429909.29	4.95'	ND (LB 7203)
CP #2	1137704.01	429981.50	4.59'	ND (LB 7203)
CP #3	1137472.22	430057.81	4.89'	IRC (LB 7203)
CP #4	1137248.25	430129.02	4.88'	IRC (LB 7203)
CP #5	1137016.55	430201.71	4.49'	IRC (LB 7203)
CP #6	1136765.91	430274.86	4.64'	IRC (LB 7203)
CP #7	1136538.30	430330.18	4.85'	IRC (LB 7203)
CP #8	1136302.38	430398.82	5.73'	IRC (LB 7203)

VVH TABLE

VVH NUMBER	UTILITY	SIZE	MATERIAL	DEPTH OF COVER	COLOR	SURFACE TYPE	TRACER FOUND
1	FORCE MAIN	4"	PVC	3.99'	GREEN	SAND	METAL TAPE
2	GAS	4"	POLY	2.99'	YELLOW	SAND	WIRE
3	WATER MAIN	4"	PVC	3.37'	BLUE	GRASS	WIRE
4	BURIED ELECTRIC	2"	PVC	3.94'	BLACK	GRASS	NONE
5	FORCE MAIN	4"	PVC	2.41'	GREEN	ASPHALT	NONE
6	WATER MAIN	16"	DIP	3.04'	BLACK	ASPHALT	NONE
7	BURIED FIBER	4"	PVC	1.64'	PEACH	ASPHALT	NONE
8	WATER MAIN	16"	DIP	3.60'	BLACK	CONCRETE	NONE
9	BURIED TEL.	4"	PVC	1.83'	PEACH	ASPHALT	NONE
10	WATER MAIN	16"	DIP	3.20'	BLACK	ASPHALT	NONE
11	BURIED TEL.	1.25"	DBC	1.08'	BLACK	DIRT	NONE
12	WATER MAIN	16"	DIP	3.23'	BLACK	ASPHALT	NONE
13	2 BURIED FIBER	4"	POLY	1.81'	BLACK	ASPHALT	NONE
14	WATER MAIN	16"	DIP	2.93'	BLACK	ASPHALT	NONE
	2 BURIED TEL.	4"	PVC	2.93'	PEACH		NONE
15 (16)	2 BURIED TEL.	4"	PVC	2.26'	PEACH	ASPHALT	NONE
	WATER MAIN	16"	DIP	2.65'	BLACK		NONE
17	WATER MAIN	16"	DIP	3.30'	BLACK	ASPHALT	NONE
	BURIED TEL.	1.25"	DBC	2.90'	BLACK		NONE
18	BURIED TEL.	4"	PVC	3.20'	PEACH	ASPHALT	NONE
	BURIED TEL.	1.25"	DBC	3.20'	BLACK		NONE
19	GAS	4"	POLY	5.34'	YELLOW	DIRT	WIRE
20	GAS	4"	POLY	3.24'	YELLOW	SHELL	WIRE
21	GAS	4"	POLY	3.74'	YELLOW	SHELL	WIRE
22	GAS	4"	POLY	3.56'	YELLOW	SHELL	WIRE
23	GAS	4"	POLY	3.25'	YELLOW	SHELL	WIRE
24	GAS	4"	POLY	3.40'	YELLOW	SHELL	WIRE
25	WATER MAIN	16"	DIP	3.11'	BLACK	ASPHALT	NONE
26	UNKNOWN	4"	PVC	3.17'	GRAY	ASPHALT	NONE
27	BURIED TEL.	1.25"	DBC	2.34'	BLACK	ASPHALT	NONE

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2021 KIMLEY-HORN AND ASSOCIATES, INC.
100 2ND AVE S, UNIT 105N, ST. PETERSBURG, FL 33701
PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT 148400056
DATE JAN 2021
SCALE AS SHOWN
DESIGNED BY MAS
DRAWN BY KTM
CHECKED BY WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

MANATEE COUNTY FL

LICENSED PROFESSIONAL
MICHAEL ANTHONY SEMAGO LICENSE NUMBER No. 87501 STATE OF FLORIDA PROFESSIONAL ENGINEER
MICHAEL A. SEMAGO, P.E.
DATE:

Digitally signed by Michael A Semago
DN: cn=Michael A Semago, c=US, o=KIMLEY-HORN AND ASSOCIATES INC., ou=A01410C0000016FA4D5FDC400016E00, email=mike.semago@kimley-horn.com
Date: 2021.02.04 14:48:20 -05'00'

SURVEY & SUE NOTES

SHEET NUMBER
G-03

NORTH

GRAPHIC SCALE IN FEET
0 35 70 140

LEGEND
SANITARY SEWER (OPEN CUT)
SANITARY SEWER (CTHDD)
MANHOLE

C-01 C-02 C-03 C-04 C-05 C-06 C-07 C-08 C-09 C-10 C-11 C-12 C-13

GULF DRIVE S
13TH STREET S
12TH STREET S
11TH STREET S
10TH STREET S
9TH STREET S
8TH STREET S
7TH STREET S
6TH STREET S

No.	REVISIONS	DATE	BY

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Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

MANATEE COUNTY FL

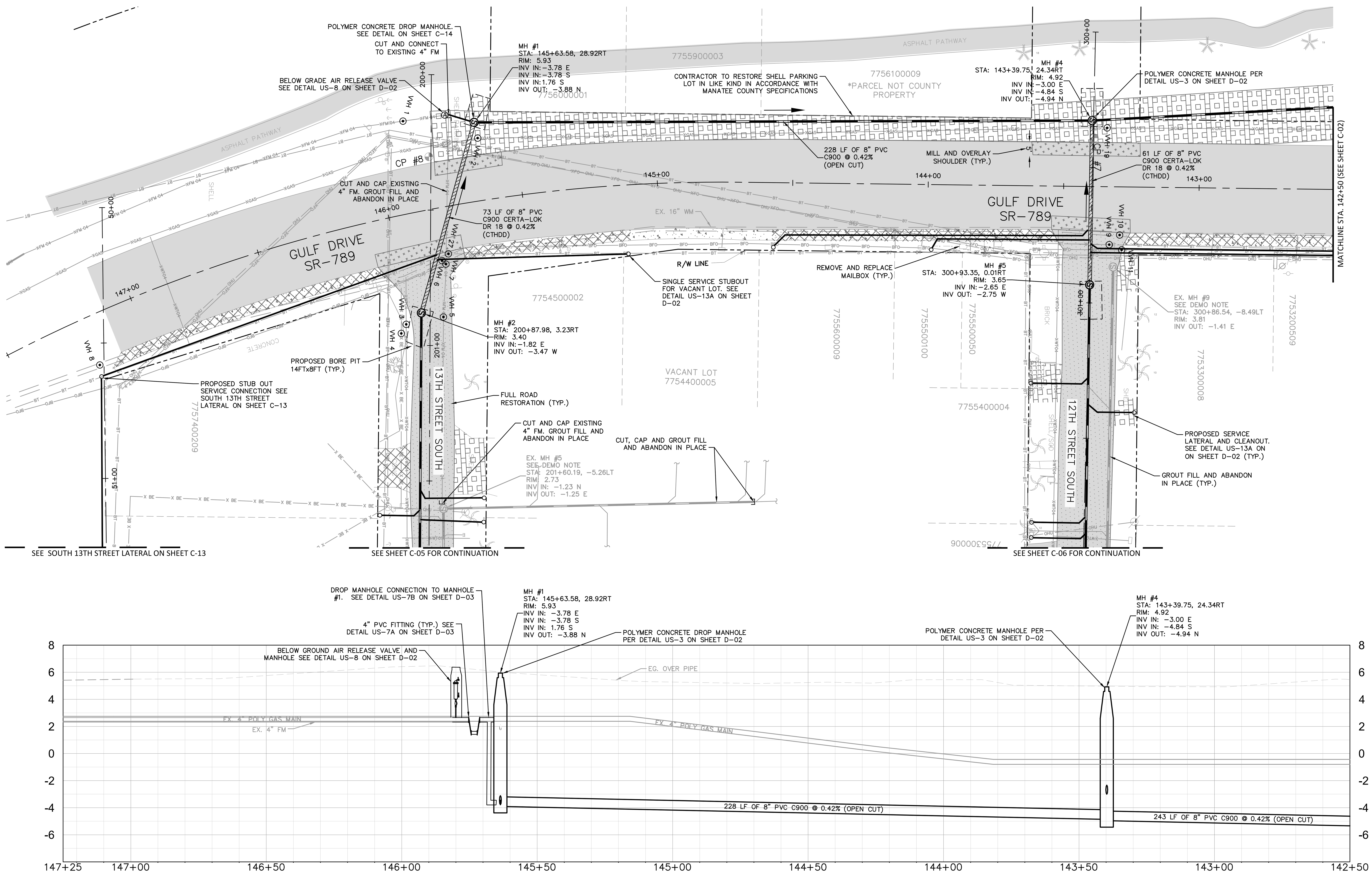
LICENSED PROFESSIONAL ENGINEER
MICHAEL ANTHONY SEMAGO
LICENSE
No. 87281
STATE OF FLORIDA
PROFESSIONAL ENGINEER
DATE:

Digitally signed by Michael A Semago
DN: cn=Michael A Semago, c=US, o=KIMLEY-HORN AND ASSOCIATES INC., ou=A01410C0000016FA4D5FDC400016E00, email=mike.semago@kimley-horn.com
Date: 2021.02.04 14:48:33 -05'00'

KEYSHEET

SHEET NUMBER

G-04



NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'
ALL ELEVATIONS PER NAVD88

LEGEND:

- SIDEWALK/CONCRETE RESTORATION
- BRICK DRIVEWAY RESTORATION
- SHELL DRIVEWAY RESTORATION
- FULL ROAD RESTORATION
- MILL AND OVERLAY
- BORE PIT

GENERAL NOTES:

1. CONSTRUCTION DEWATERING SHALL BE CONDUCTED IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS INCLUDING BUT NOT LIMITED TO CHAPTERS 62-621.300 AND 62-620 OF THE FLORIDA ADMINISTRATIVE CODE (FAC).
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GROUNDWATER / DEWATERING NOTE:

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No.	REVISIONS	DATE	BY

Kimley»Horn

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PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT	148400056
DATE	JAN 2021
SCALE	AS SHOWN
DESIGNED BY	MAS
DRAWN BY	KTM
CHECKED BY	WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

MANATEE COUNTY FL

LICENSED PROFESSIONAL

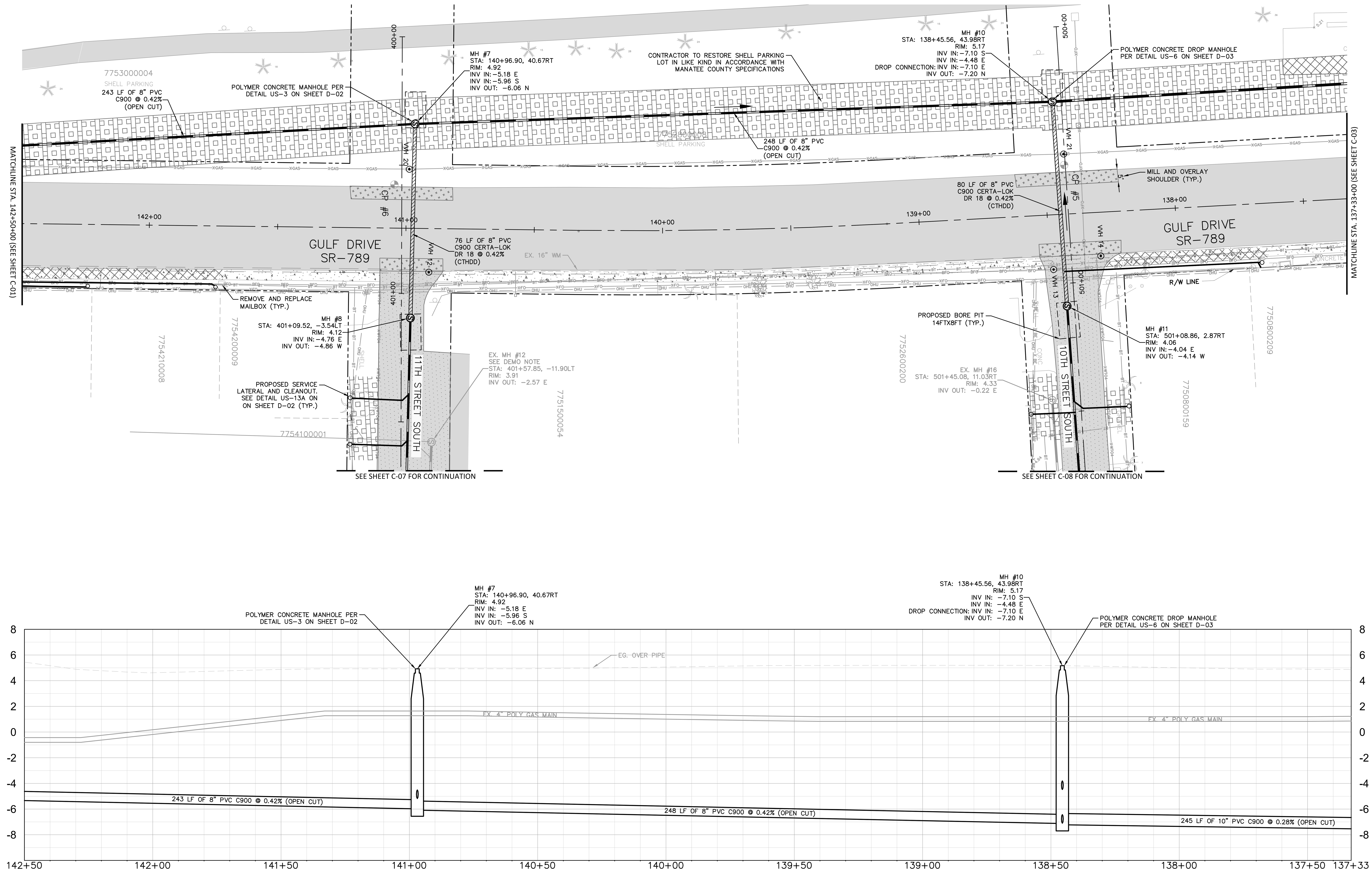
DATE:

GULF DRIVE S [STA. 147+25-142+50]

SHEET NUMBER

C-01

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021



GRAPHIC SCALE IN FEET

0 10 20 40

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'
ALL ELEVATIONS PER NAVD88

LEGEND:

- SIDEWALK/CONCRETE RESTORATION
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- FULL ROAD RESTORATION
- MILL AND OVERLAY
- BORE PIT

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PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT	148400056
DATE	JAN 2021
SCALE	AS SHOWN
DESIGNED BY	MAS
DRAWN BY	KTM
CHECKED BY	WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

MANATEE COUNTY FL

LICENSED PROFESSIONAL

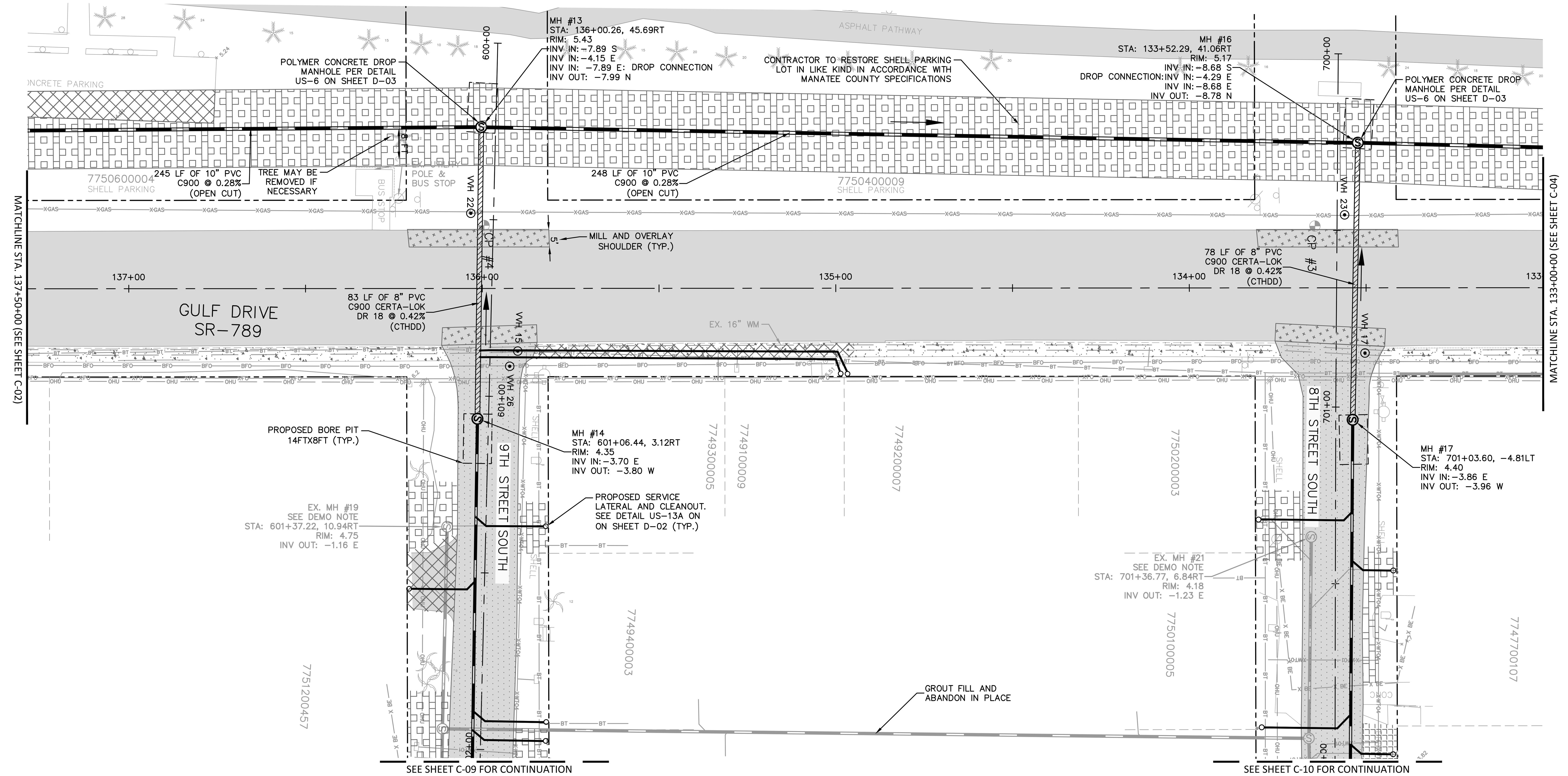
DATE:

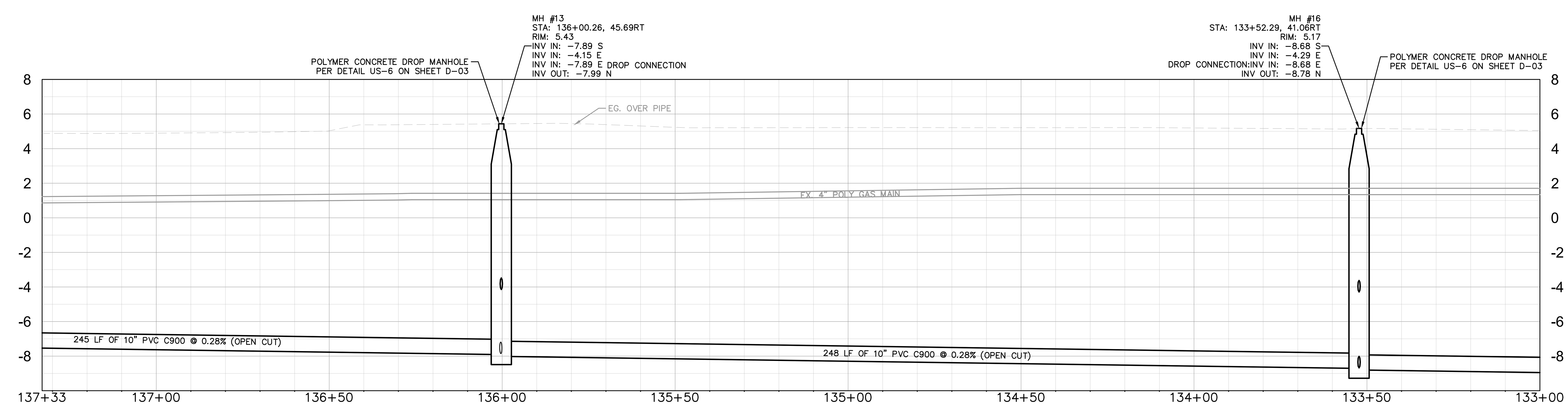
GULF DRIVE S [STA. 142+50-137+33]

SHEET NUMBER

C-02

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021





GRAPHIC SCALE IN FEET

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'
ALL ELEVATIONS PER NAVD88

LEGEND:

- SIDEWALK/CONCRETE RESTORATION
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No.	REVISIONS	DATE	BY

Kimley-Horn

100 2ND AVE S, UNIT 105N, ST. PETERSBURG, FL 33701
PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT	148400056
DATE	JAN 2021
SCALE	AS SHOWN
DESIGNED BY	MAS
DRAWN BY	KTM
CHECKED BY	WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

MANATEE COUNTY FL

LICENSED PROFESSIONAL

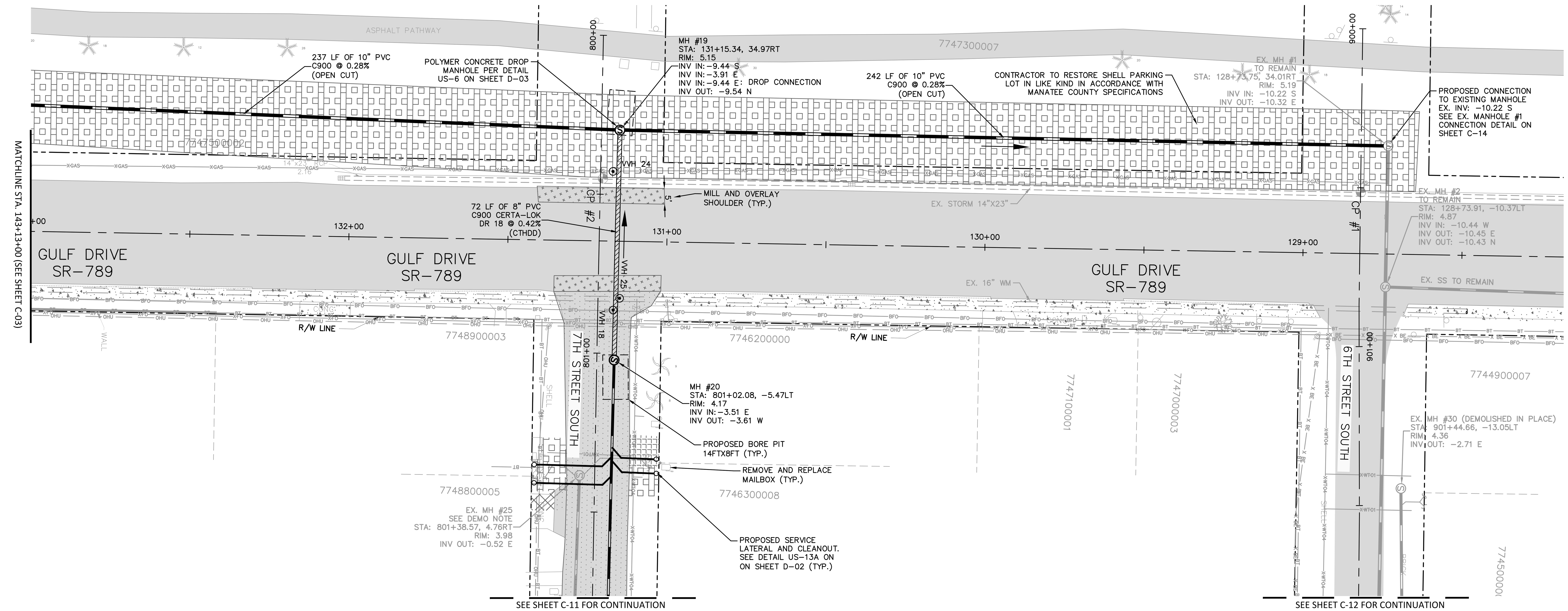
DATE:

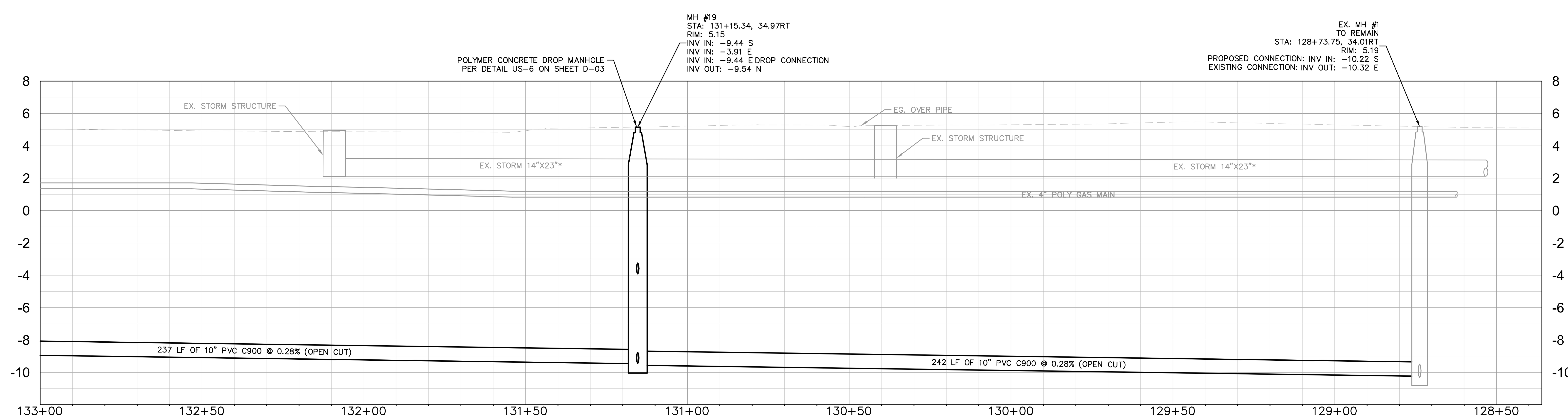
GULF DRIVE S [STA. 137+33-133+00]

SHEET NUMBER

C-03

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021





GRAPHIC SCALE IN FEET

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'
ALL ELEVATIONS PER NAVD88

LEGEND:

- SIDEWALK/CONCRETE RESTORATION
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No.	REVISIONS	DATE	BY

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KHA PROJECT 148400056
DATE JAN 2021
SCALE AS SHOWN
DESIGNED BY MAS
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CHECKED BY WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

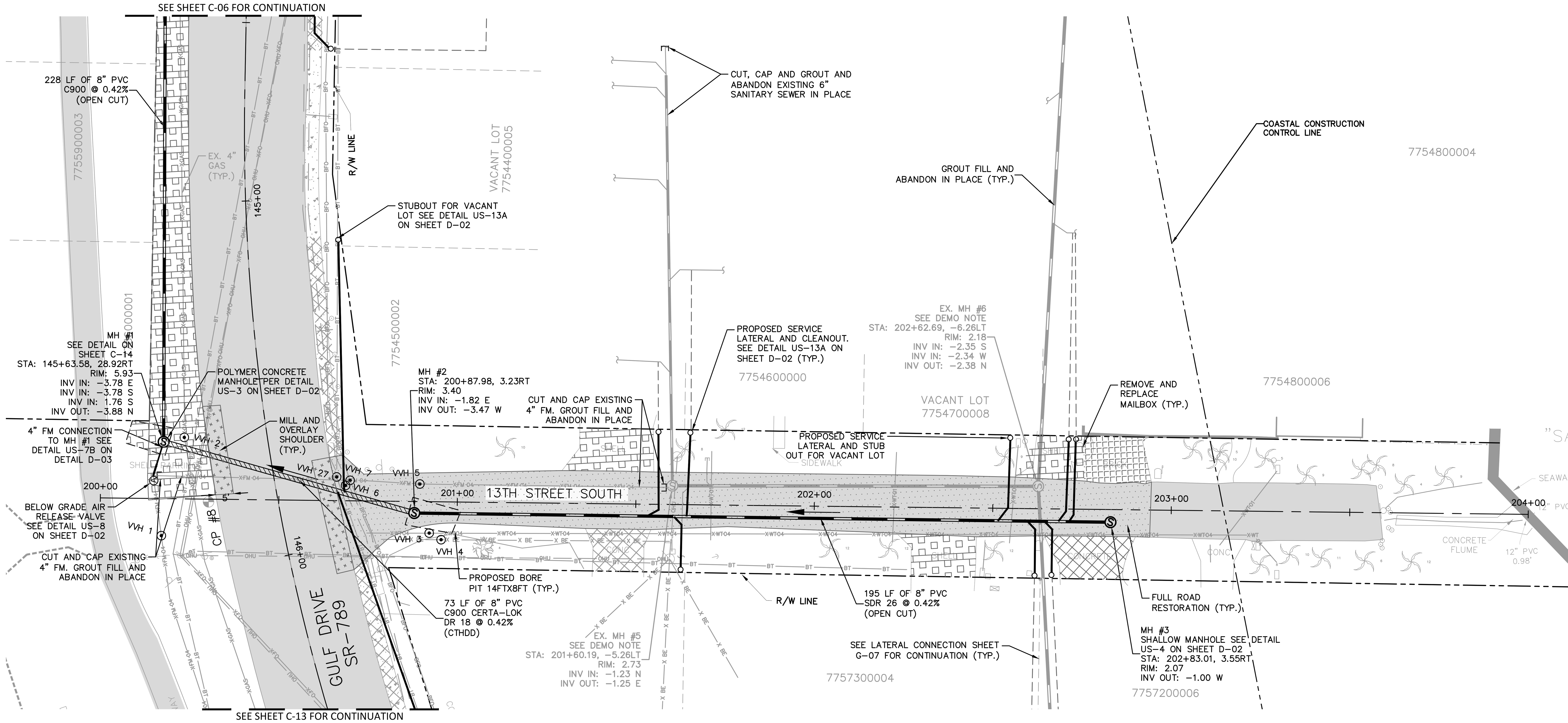
MANATEE COUNTY FL

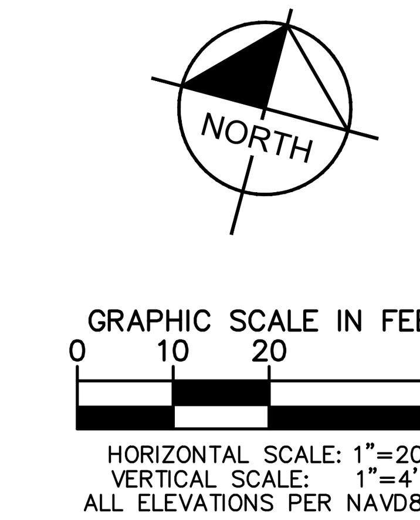
LICENSED PROFESSIONAL

DATE:

GULF DRIVE S [STA. 133+00-128+36]

SHEET NUMBER
C-04





LEGEND:

- SIDEWALK/CONCRETE RESTORATION
- BRICK DRIVEWAY RESTORATION
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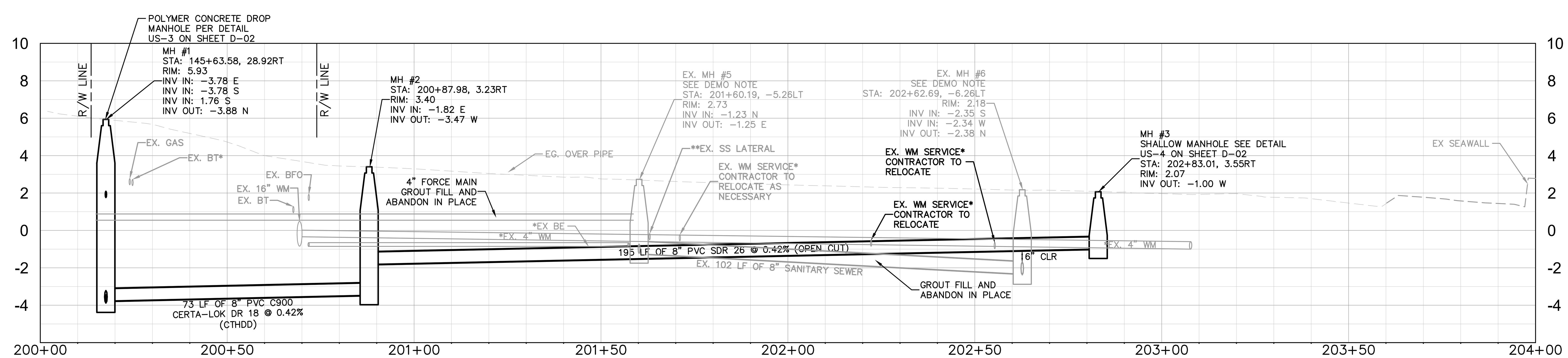
- BORE PIT



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**NOTES:
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No.	REVISIONS	DATE	BY

Kimley»Horn

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PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT	148400056
DATE	JAN 2021
SCALE	AS SHOWN
DESIGNED BY	MAS
DRAWN BY	KTM
CHECKED BY	WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

MANATEE COUNTY FL

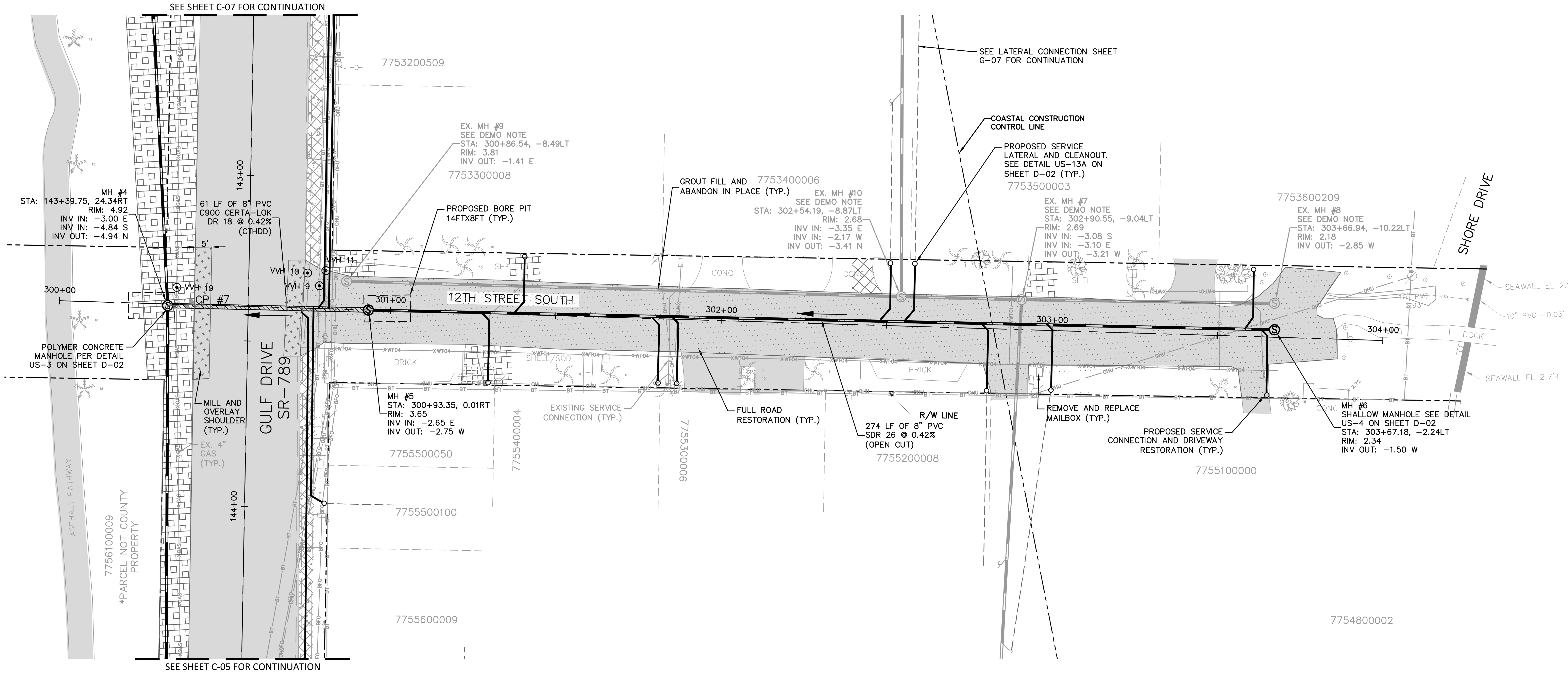
LICENSED PROFESSIONAL

DATE:

13TH STREET S [STA. 200+00-204+00]

SHEET NUMBER

C-05



NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'
ALL ELEVATIONS PER NAVD88

LEGEND:

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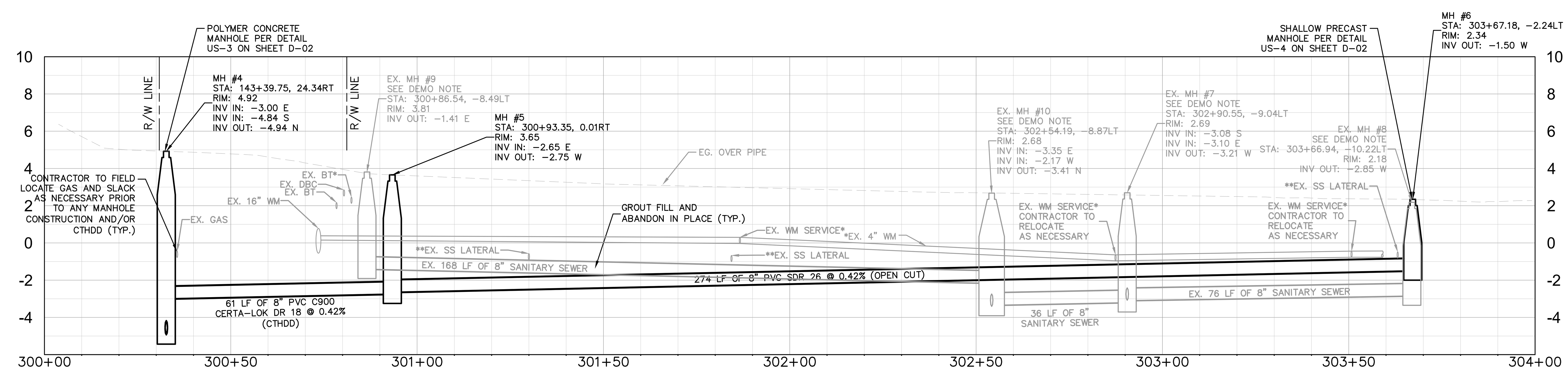

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No.	REVISIONS	DATE	BY

Kimley»Horn

100 2ND AVE S, UNIT 105N, ST. PETERSBURG, FL 33701
PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT	148400056
DATE	JAN 2021
SCALE	AS SHOWN
DESIGNED BY	MAS
DRAWN BY	KTM
CHECKED BY	WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

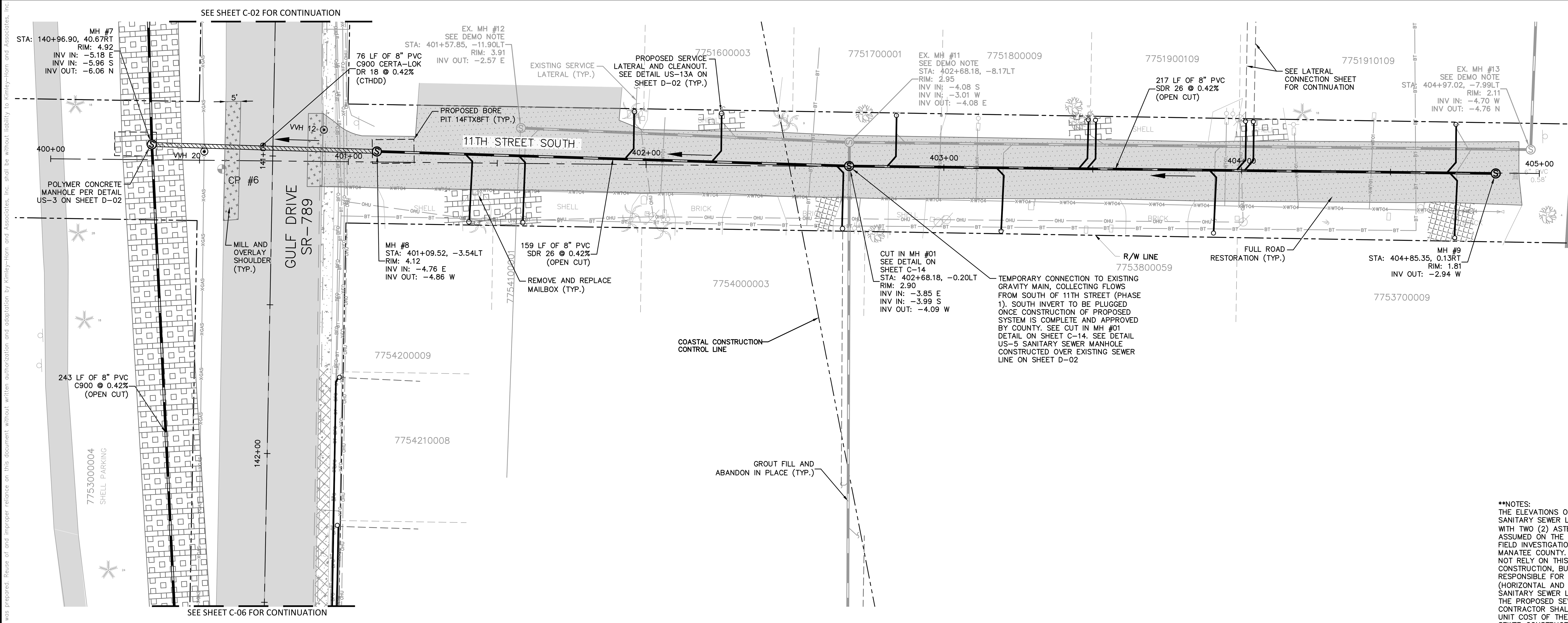
MANATEE COUNTY FL

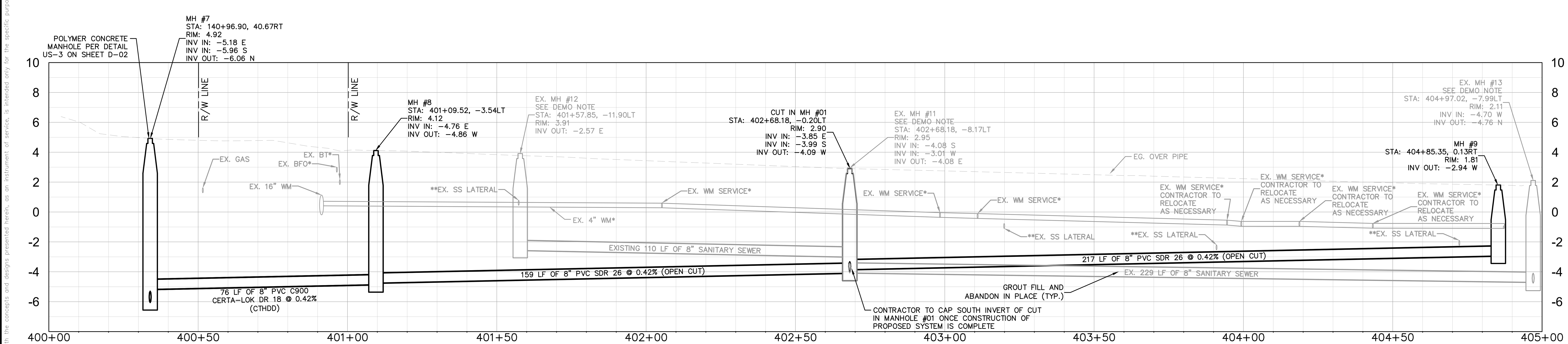
LICENSED PROFESSIONAL
MICHAEL ANTHONY SEMAGO No. 87501 STATE OF FLORIDA PROFESSIONAL ENGINEER
Digitally signed by Michael A Semago
DATE:

12TH STREET S [STA. 300+00-304+00]

SHEET NUMBER
C-06

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021





NORTH

GRAPHIC SCALE IN FEET

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HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'
ALL ELEVATIONS PER NAVD88

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PHONE: 727-547-3999
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KHA PROJECT	148400056
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SCALE	AS SHOWN
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DRAWN BY	KTM
CHECKED BY	WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

MANATEE COUNTY FL

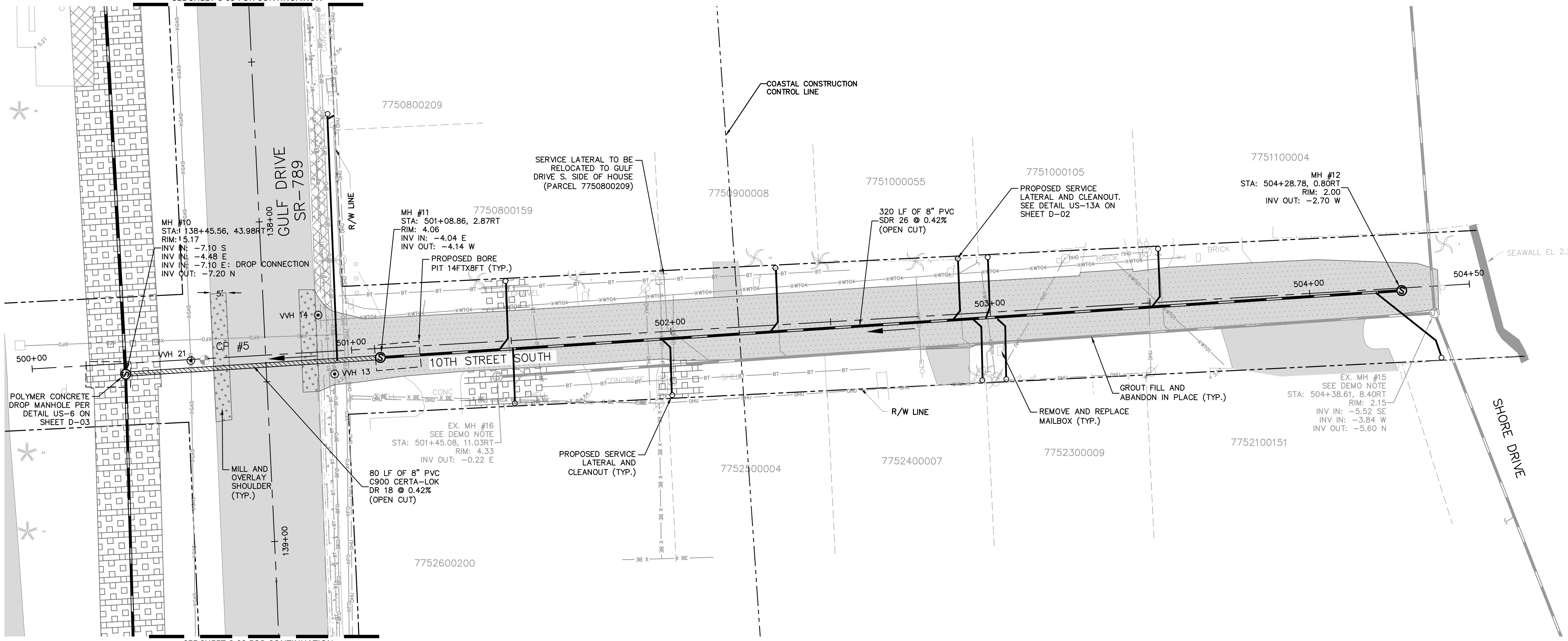
LICENSED PROFESSIONAL
LICENSE NUMBER 87501
DATE:

11TH STREET S [STA. 400+00-405+00]

SHEET NUMBER
C-07

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021

SEE SHEET C-09 FOR CONTINUATION



SEE SHEET C-02 FOR CONTINUATION

NORTH

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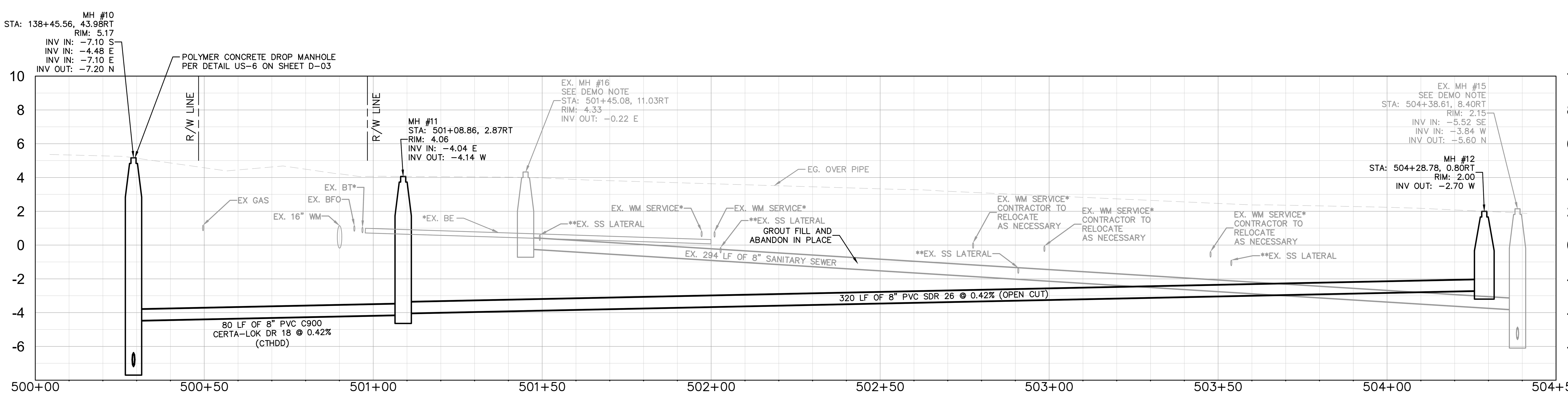

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No.	REVISIONS	DATE	BY

100 2ND AVE S, UNIT 105N, ST. PETERSBURG, FL 33701
PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT	148400056
DATE	JAN 2021
SCALE	AS SHOWN
DESIGNED BY	MAS
DRAWN BY	KTM
CHECKED BY	WEW

BRADENTON BEACH GRAVITY REPLACEMENT

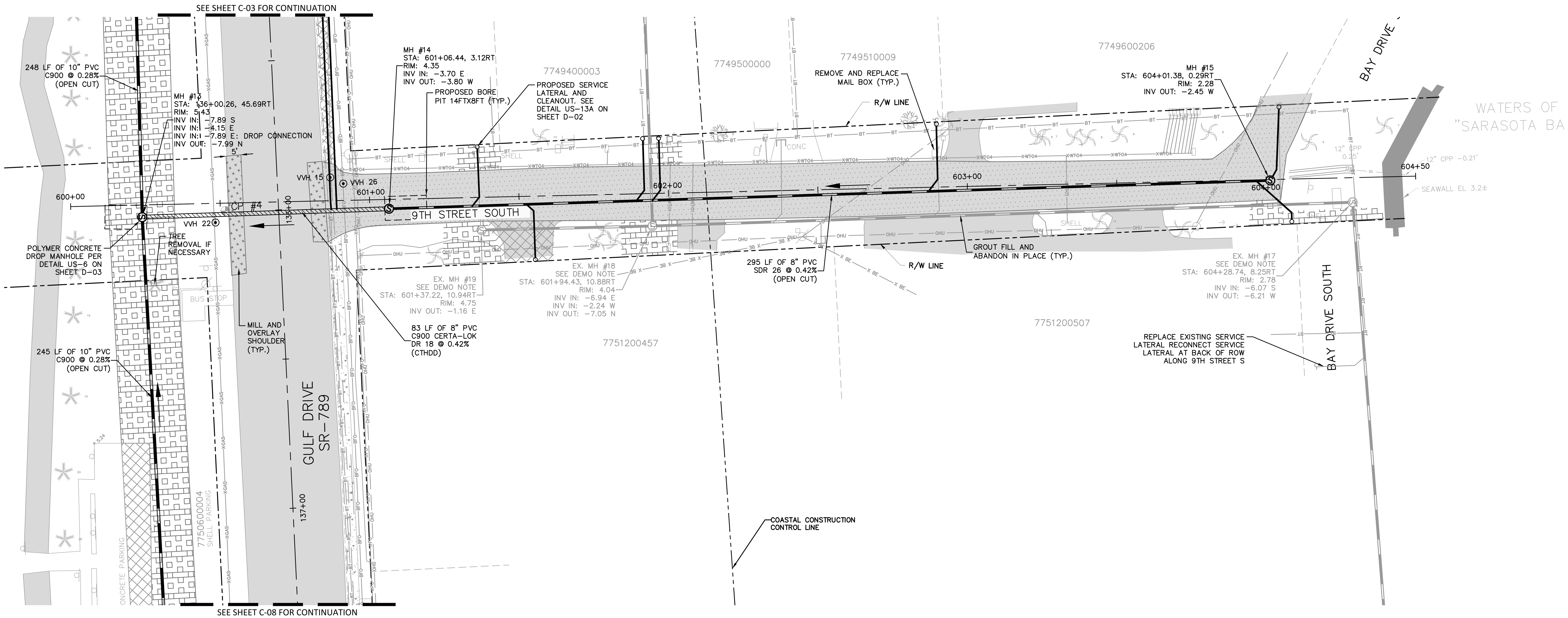
MANATEE COUNTY FL

LICENSED PROFESSIONAL
PE NUMBER 97501
DATE:

10TH STREET S [STA. 500+00-504+50]

SHEET NUMBER
C-08

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021



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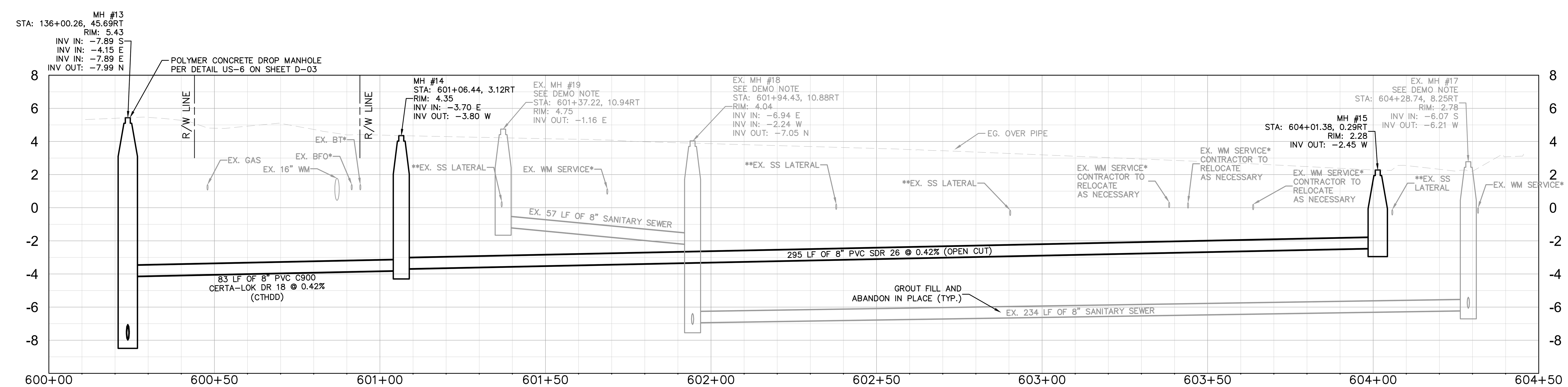

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No.	REVISIONS	DATE	BY

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KHA PROJECT	148400056
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Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

MANATEE COUNTY FL

LICENSED PROFESSIONAL

DATE:

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SHEET NUMBER

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2021-H-194-00062
Curtis Vilt
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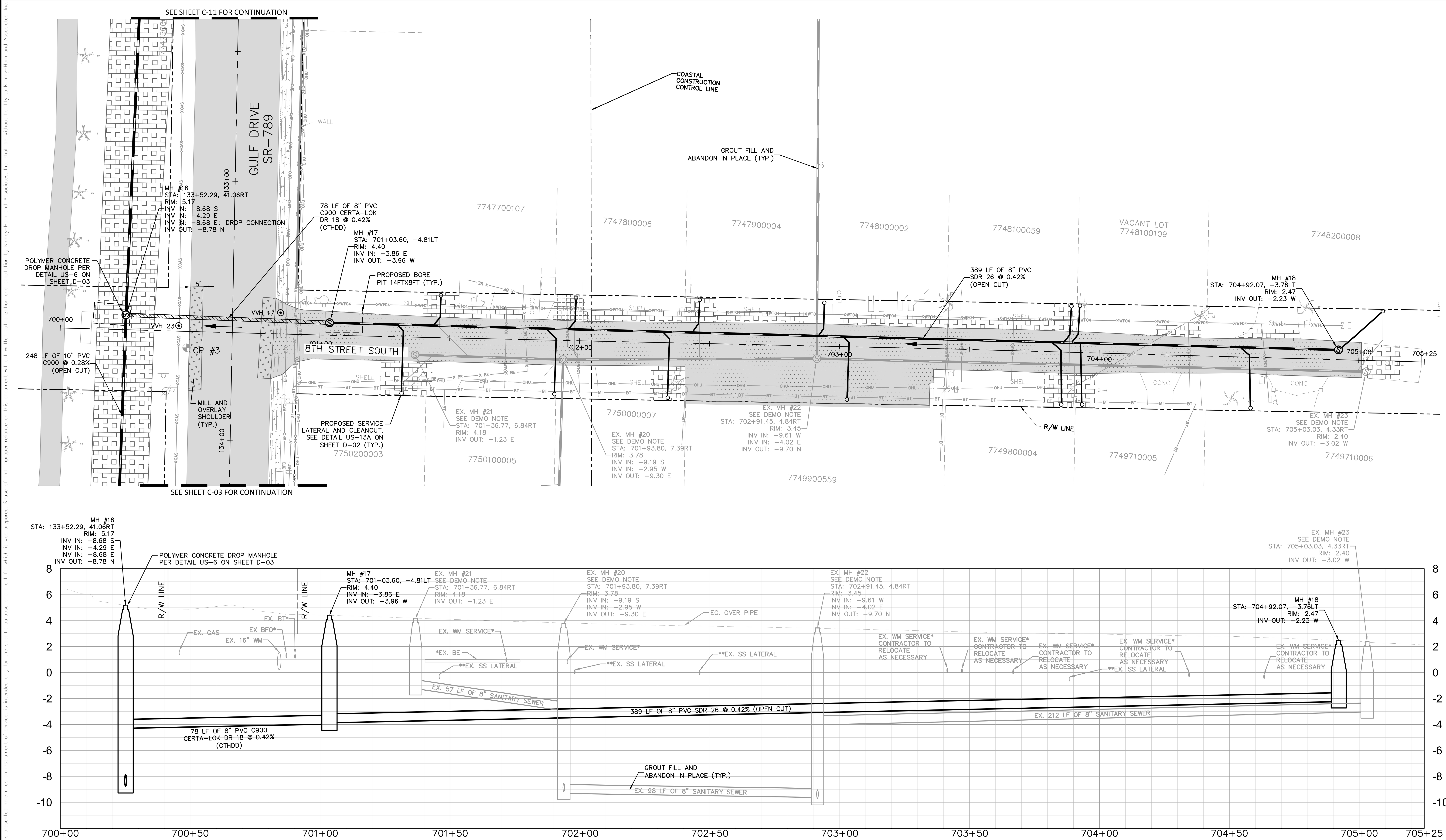

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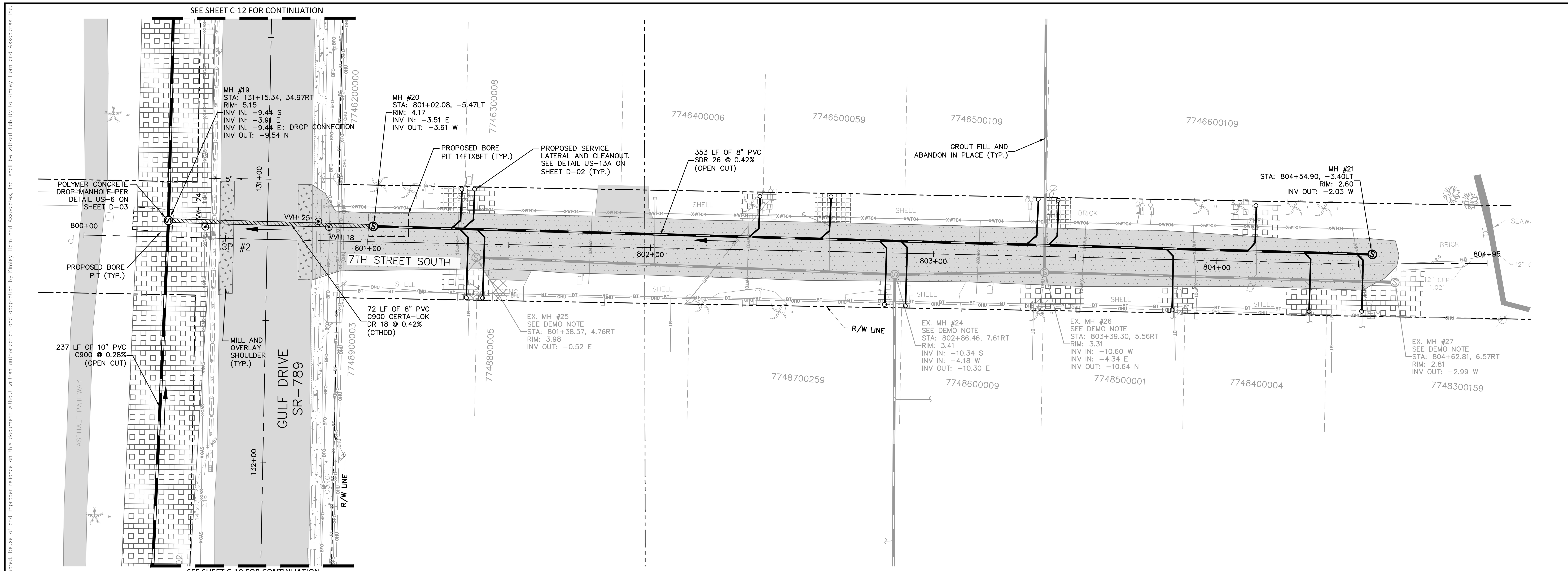
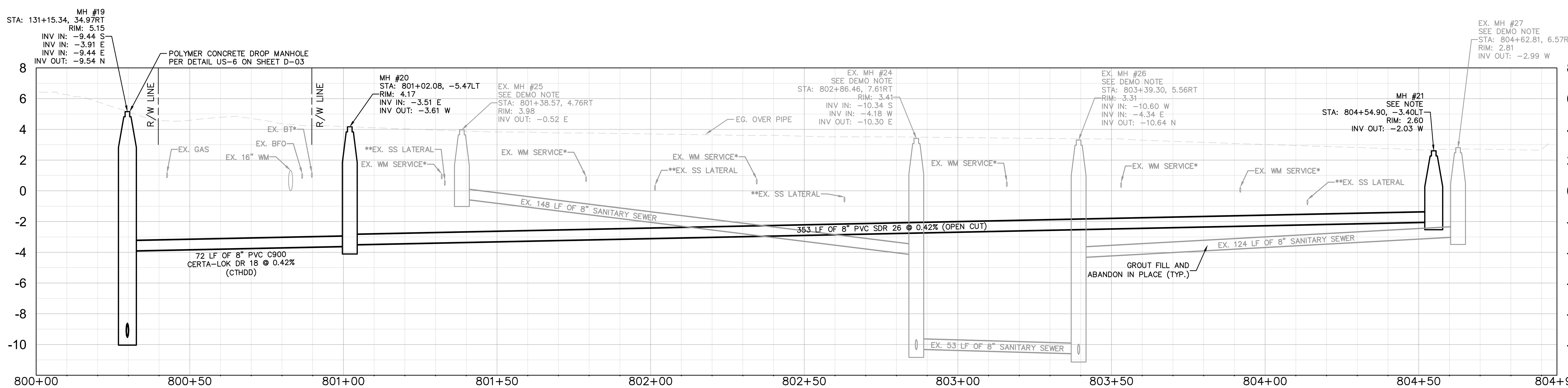
Curtis Vilt
4/6/2021



LEGEND:

- SIDEWALK/CONCRETE RESTORATION
- BRICK DRIVEWAY RESTORATION
- SHELL DRIVEWAY RESTORATION
- FULL ROAD RESTORATION
- MILL AND OVERLAY
- BORE PIT



GENERAL NOTES:

1. CONSTRUCTION DEWATERING SHALL BE CONDUCTED IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS INCLUDING BUT NOT LIMITED TO CHAPTERS 62-621.300 AND 62-620 OF THE FLORIDA ADMINISTRATIVE CODE (FAC).
2. CONTRACTOR TO MAINTAIN MINIMUM PIPE SLOPES PER "MANATEE COUNTY STANDARDS":

   8-INCH MIN SLOPE = 0.42%
   10-INCH MIN SLOPE = 0.28%
   12-INCH MIN SLOPE = 0.22%

3. CONTRACTOR TO MAINTAIN MINIMUM CLEARANCES PER FDEP F.A.C. RULE 62-55.314. SEE DETAIL ON SHEET D-03
4. CONTRACTOR TO VERIFY EXISTING FIELD CONDITIONS BEFORE THE BEGINNING ANY CONSTRUCTION ACTIVITIES
5. CONTRACTOR TO REMOVE ANY UNSUITABLE FILL MATERIALS AND BACKFILL WITH APPROVED MATERIAL PER MANATEE COUNTY SPECIFICATIONS.
6. ONLY MANATEE COUNTY UTILITY OPERATIONS STAFF ARE AUTHORIZED TO OPERATE VALVES AND PUMP STATIONS ON COUNTY OWNED AND MAINTAINED UTILITY SYSTEMS
7. ALL ELEVATIONS PER NAVD88

EX. MANHOLE DEMOLITION NOTE:

1. CONTRACTOR TO CUT AND REMOVE EXISTING MANHOLE CONE, RING, AND COVER. CONTRACTOR TO FILL WITH COMPACTED SOIL TO 98% DENSITY, AASHTO T-180 AND ABANDON REMAINING MANHOLE IN PLACE. SEE MANHOLE DEMOLITION DETAIL MD-01 ON SHEET G-06.

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GROUNDWATER / DEWATERING NOTE:
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**NOTES:
THE ELEVATIONS OF THE EXISTING SANITARY SEWER LATERALS MARKED WITH TWO (2) ASTERISK (**) HAVE BEEN ASSUMED ON THE BASIS OF CCTV & FIELD INVESTIGATIONS MADE BY MANATEE COUNTY. CONTRACTOR SHALL NOT RELY ON THIS INFORMATION FOR CONSTRUCTION, BUT SHALL BE RESPONSIBLE FOR FIELD LOCATIONS (HORIZONTAL AND VERTICAL) OF ALL SANITARY SEWER LATERALS CROSSING THE PROPOSED SEWER MAIN. CONTRACTOR SHALL INCLUDE IN THE UNIT COST OF THE SUBJECT GRAVITY SEWER CONSTRUCTION, THE COST OF MODIFICATIONS/ADJUSTMENTS NECESSARY FOR CONSTRUCTION OF THE PROPOSED SANITARY SEWER. INTERRUPTIONS OF ANY EXISTING UTILITY SERVICES SHALL BE NOTICED TO EFFECTED CUSTOMERS A MINIMUM OF 48 HOURS IN ADVANCE AND SHALL NOT EXCEED 4 HOURS IN DURATION.

No.	REVISIONS	DATE	BY

100 2ND AVE S, UNIT 105N, ST. PETERSBURG, FL 33701
PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT 148400056
DATE JAN 2021
SCALE AS SHOWN
DESIGNED BY MAS
DRAWN BY KTM
CHECKED BY WEW

BRADENTON BEACH GRAVITY REPLACEMENT

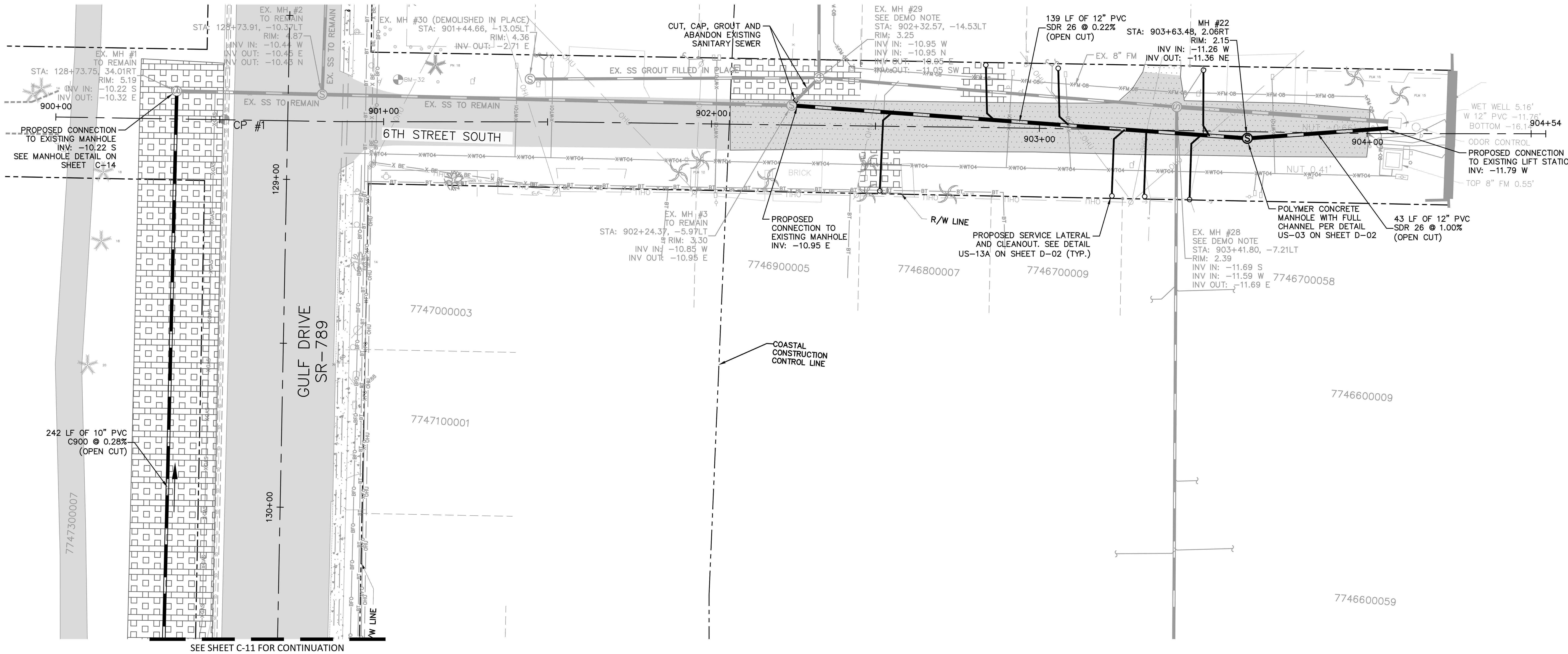
MANATEE COUNTY FL

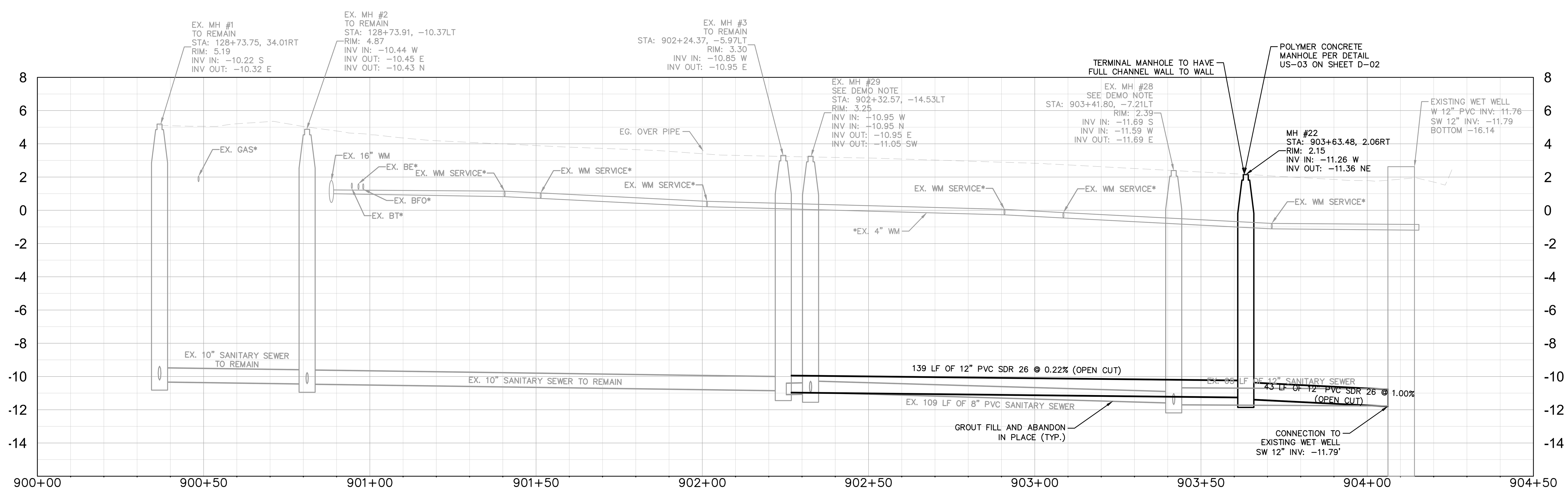
LICENSED PROFESSIONAL

7TH STREET S [STA. 800+00-804+95]

SHEET NUMBER
C-11

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021





GRAPHIC SCALE IN FEET

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'
ALL ELEVATIONS PER NAVD88

LEGEND:

- SIDEWALK/CONCRETE RESTORATION
- BRICK DRIVEWAY RESTORATION
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No.	REVISIONS	DATE	BY

Kimley»Horn

100 2ND AVE S, UNIT 105N, ST. PETERSBURG, FL 33701
PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT	148400056
DATE	JAN 2021
SCALE	AS SHOWN
DESIGNED BY	MAS
DRAWN BY	KTM
CHECKED BY	WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

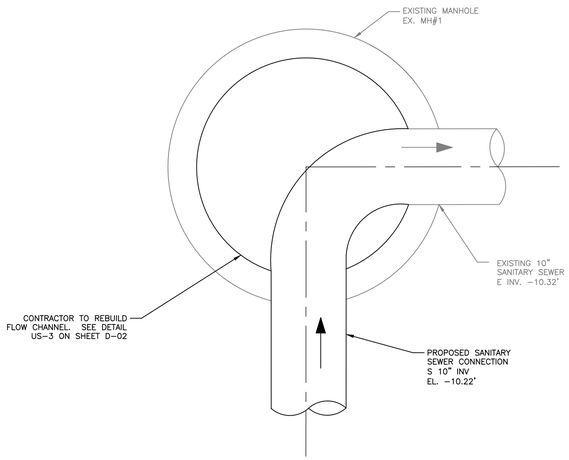
MANATEE COUNTY FL

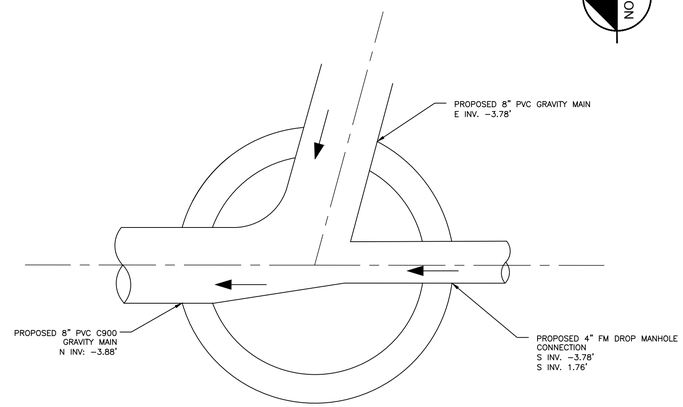
LICENSED PROFESSIONAL
DATE:

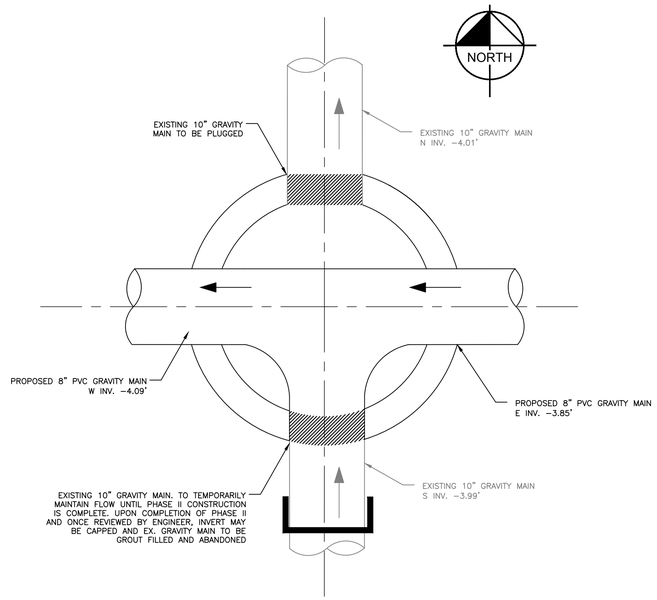
6TH STREET S [STA. 900+00-904+54]

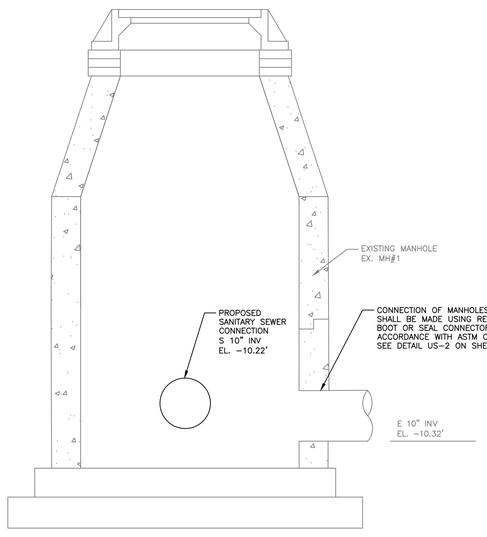
SHEET NUMBER
C-12

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021



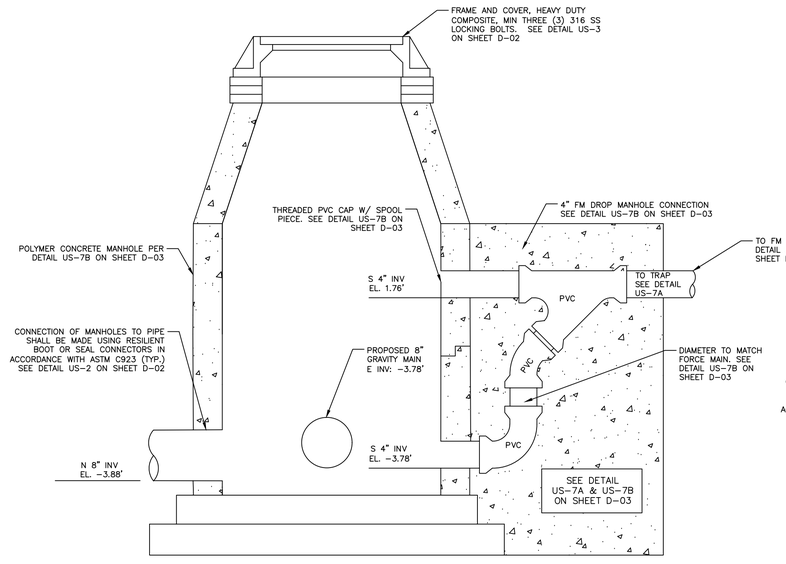






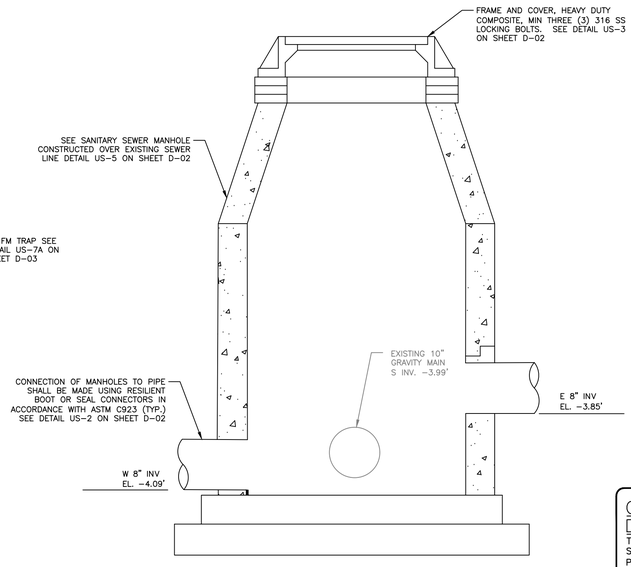
EXISTING MH #1 CONNECTION

N.T.S. SHEET C-04 & C-12



PRECAST POLYMER CONCRETE MANHOLE – MH #1

N.T.S. SHEET C-01 & C-05



CUT IN MANHOLE – CUT IN MH #01

N.T.S. SHEET C-07

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No.	REVISIONS	DATE	BY

Kimley»Horn
© 2021 KIMLEY-HORN AND ASSOCIATES, INC.
100 2ND AVE S, UNIT 105N, ST. PETERSBURG, FL 33701
PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT 148400056
DATE JAN 2021
SCALE AS SHOWN
DESIGNED BY MAS
DRAWN BY KTM
CHECKED BY WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

MANATEE COUNTY FL

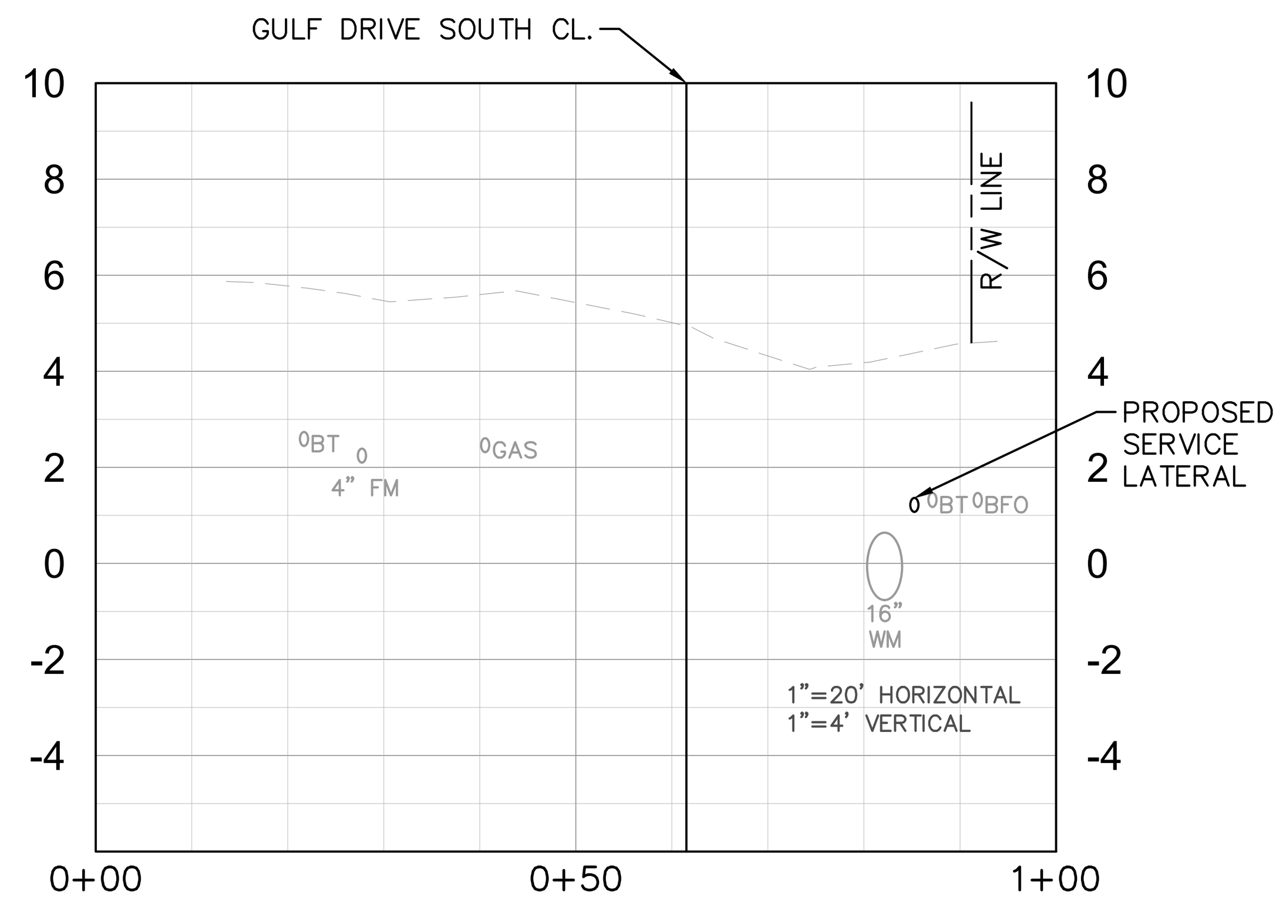
LICENSED PROFESSIONAL
RACHAEL ANTHONY SEMAGO
LICENSE
No. 87581
STATE OF FLORIDA
PROFESSIONAL ENGINEER
DATE:

Digitally signed by Michael A Semago
DN: cn=Michael A Semago, c=US, o=KIMLEY-HORN AND ASSOCIATES INC., su=A01410C0000016FA4D5FDC400016E00, email=mike.semago@kimley-horn.com
Date: 2021.02.04 14:53:56 -05'00'

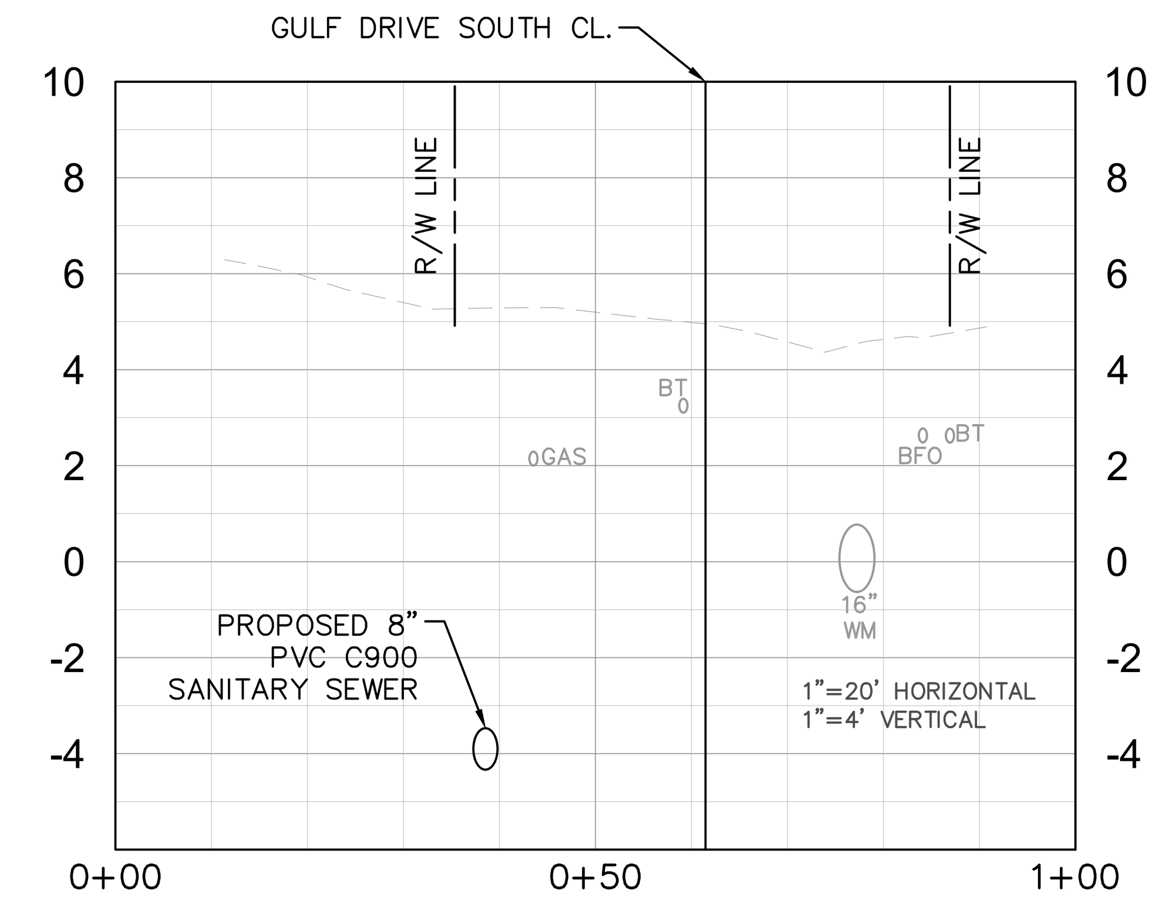
MANHOLE DETAILS

SHEET NUMBER
C-14

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021



CROSS SECTION: 147+00



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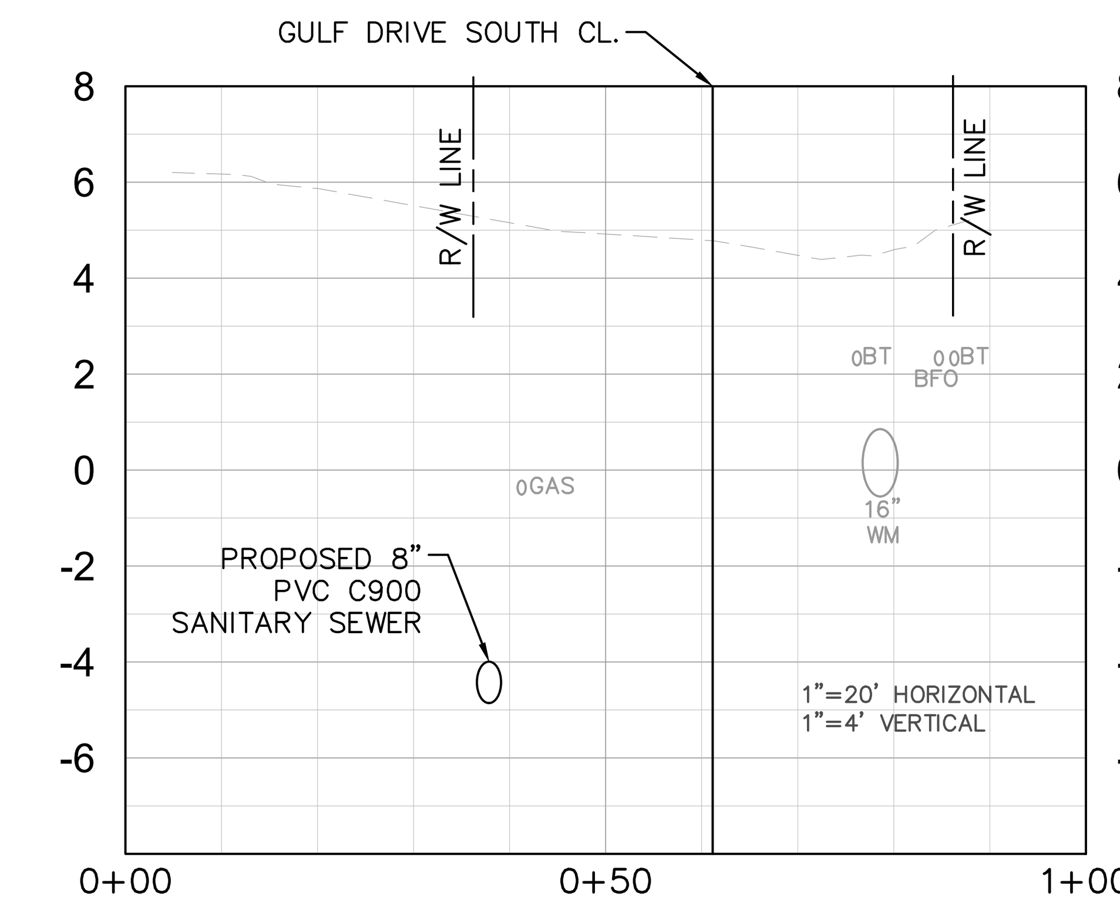

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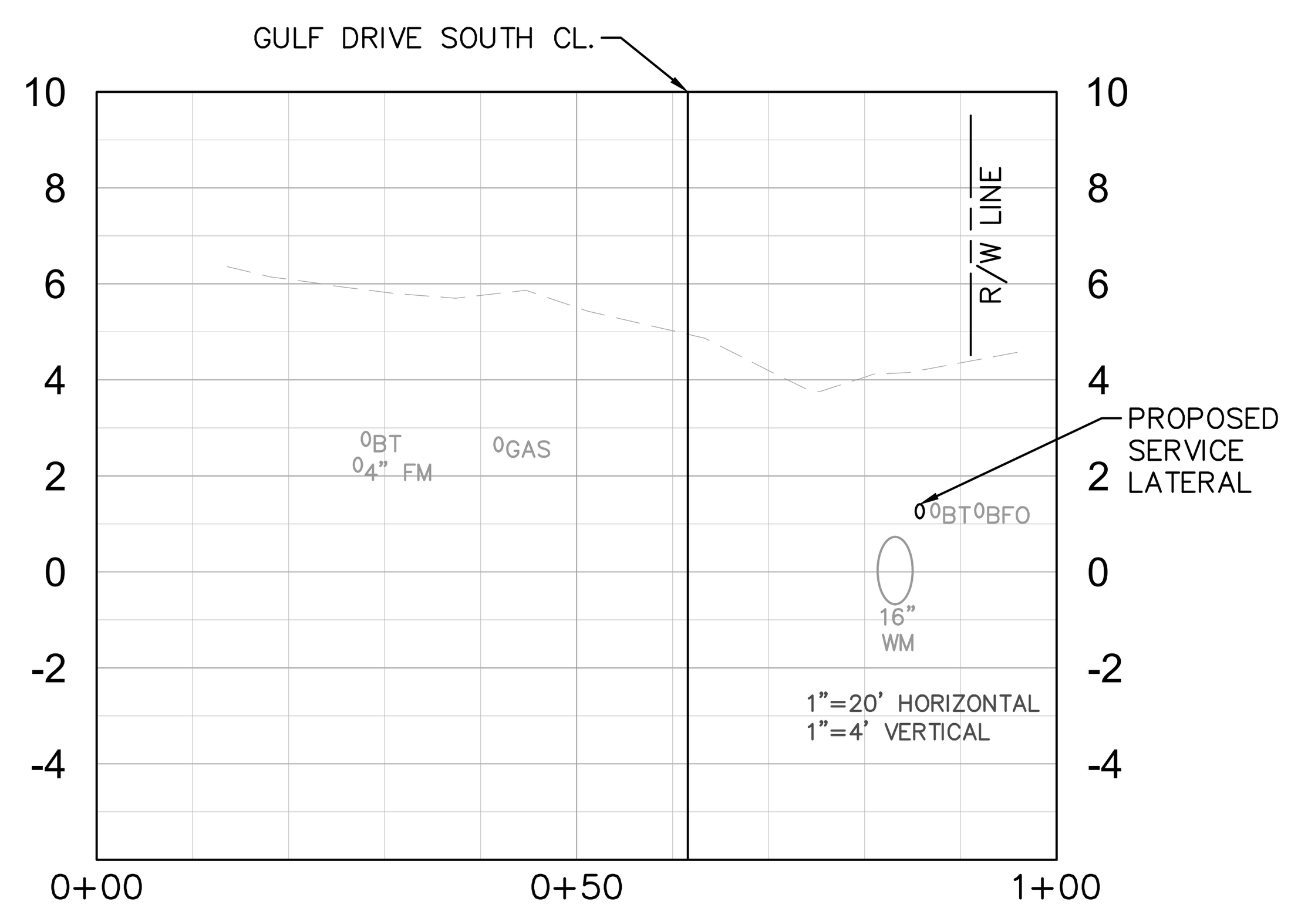

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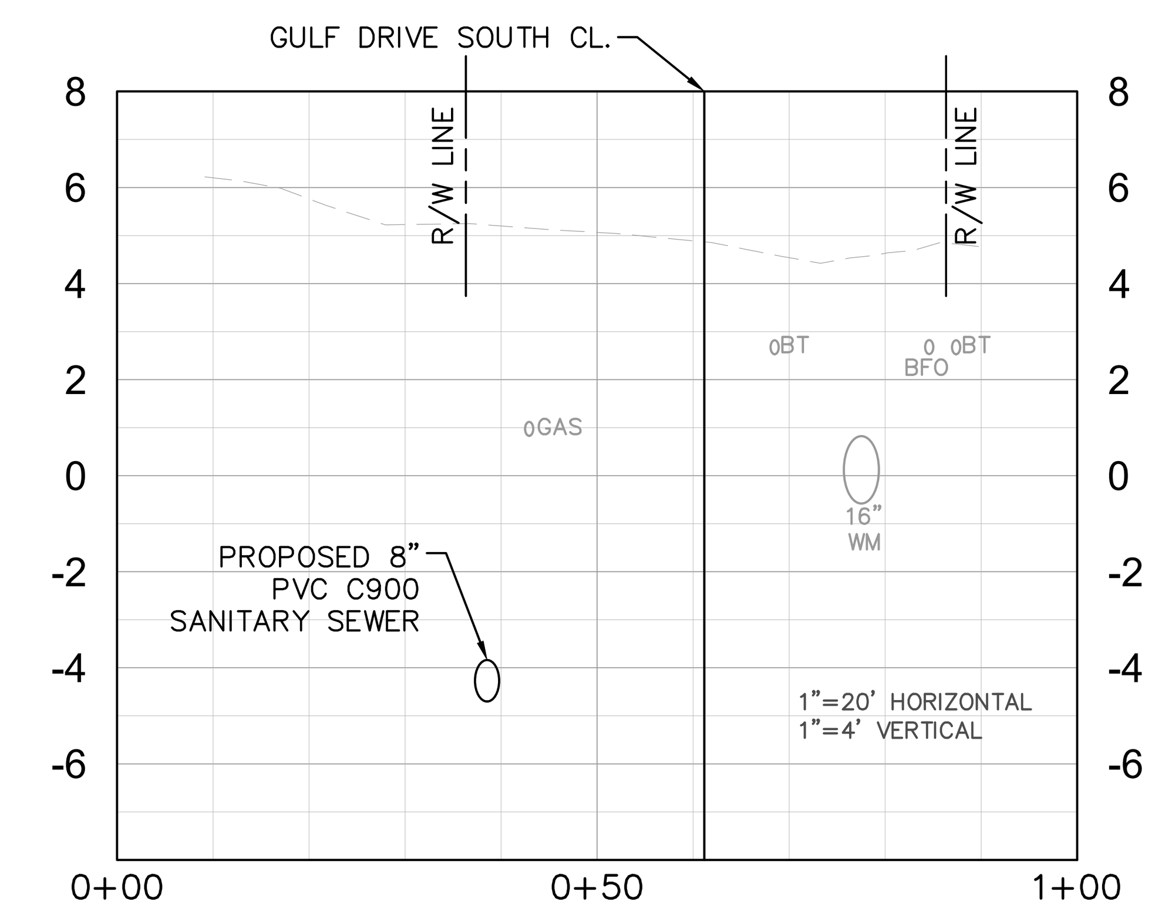

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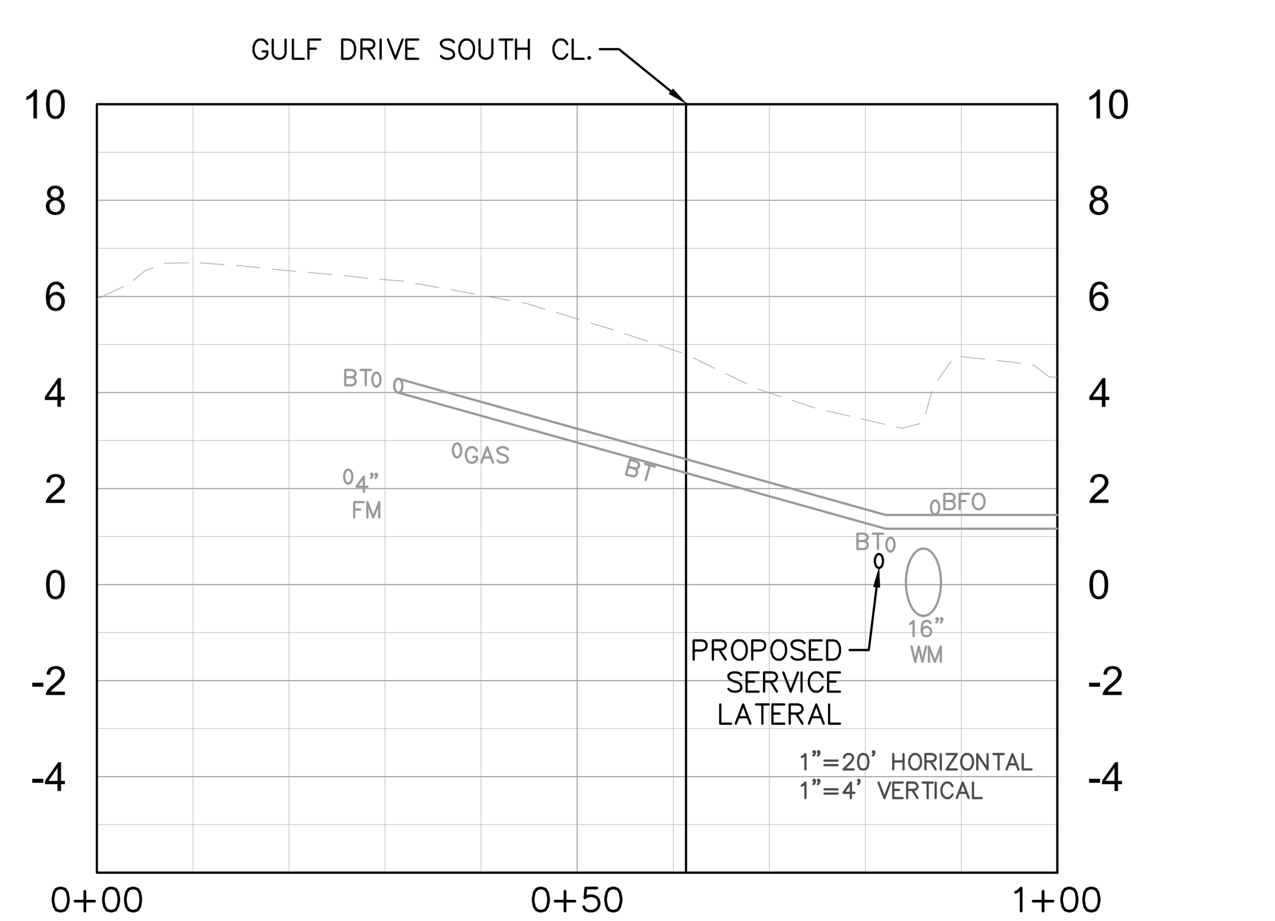

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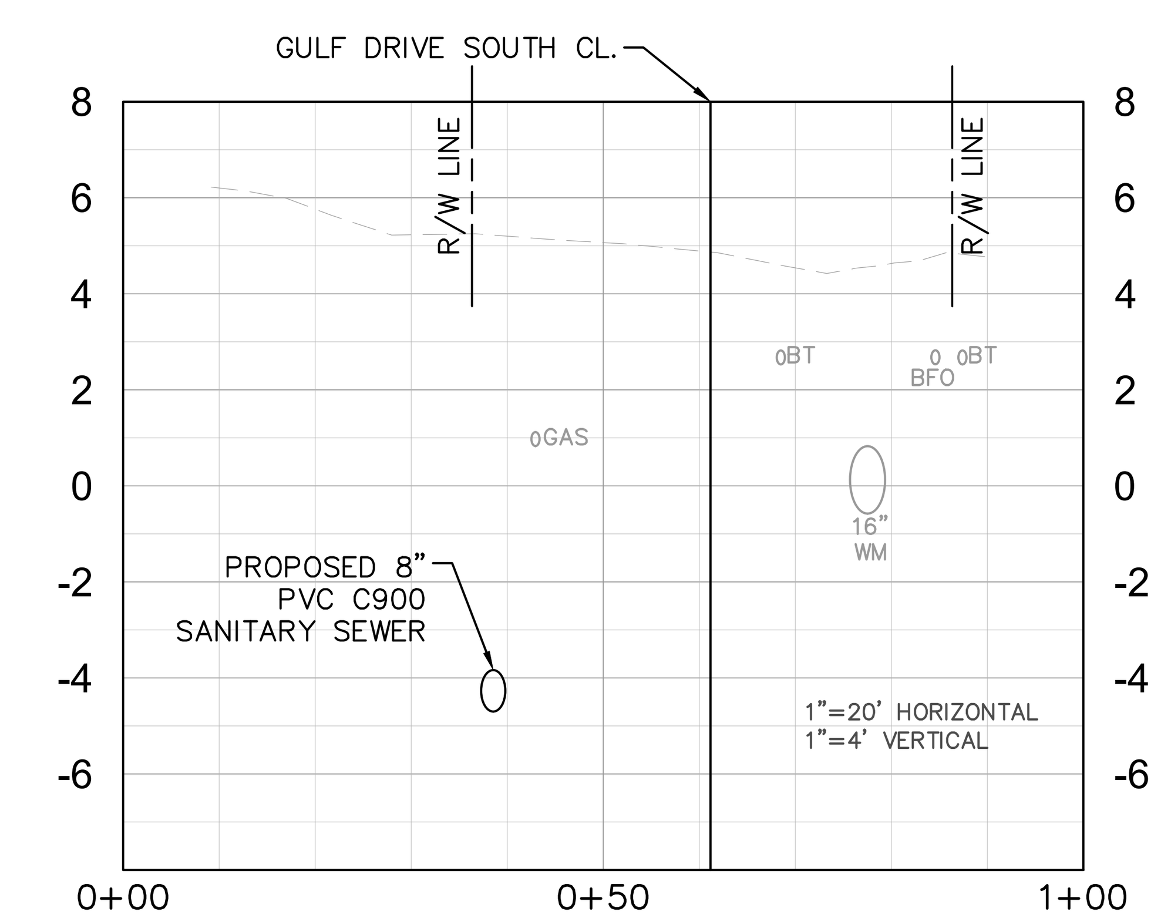

CROSS SECTION: 144+50

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No.	REVISIONS	DATE	BY

Kimley»Horn

100 2ND AVE S, UNIT 105N, ST. PETERSBURG, FL 33701
PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

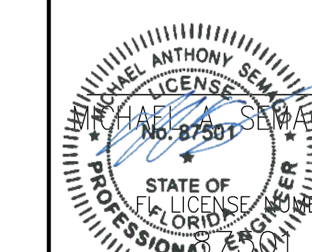
KHA PROJECT	148400056
DATE	DEC 2020
SCALE	AS SHOWN
DESIGNED BY	MAS
DRAWN BY	KTM
CHECKED BY	WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

MANATEE COUNTY FL

LICENSED PROFESSIONAL



MICHAEL A. SEMAGO, P.E.
FL LICENSE NUMBER
87501
DATE:

Digitally signed by Michael A Semago
DN: cn=Michael A Semago, c=US, o=KIMLEY-HORN AND ASSOCIATES INC., ou=A01410C0000016FA4D5FDC400016E00, email=mike.semago@kimley-horn.com
Date: 2021.02.04 14:54:18 -05'00'

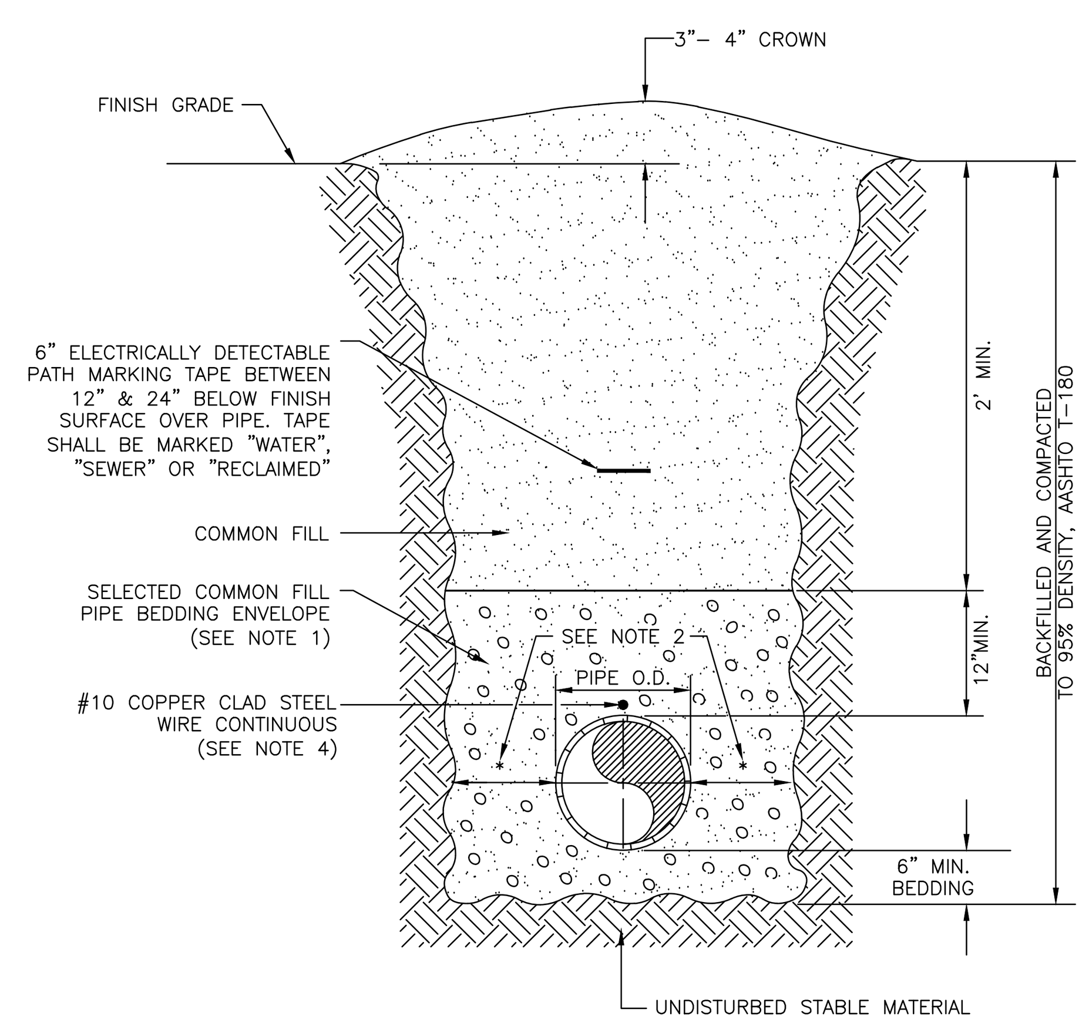
FDOT CROSS SECTIONS

SHEET NUMBER
C-15

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021

NOTES:

1. USE OF TYPE A-2 AND A-3 PIPE BEDDING TO BE DETERMINED IN THE FIELD BY THE ENGINEER.
2. PROVIDE ADEQUATE CLEARANCE TO PLACE AND COMPACT STAGE 1 BEDDING MATERIAL IN TRENCH AREA BELOW PIPE SPRINGLINE. PIPE EMBEDMENT MUST BE COMPACTED OUT TO THE TRENCH WALL OR 2.5 TIMES THE PIPE OD, WHICHEVER IS LESS.
3. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
4. TRACER WIRE NOT REQUIRED FOR GRAVITY SEWERS.



MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV.BY	DATE	
		February 25, 2020 DATE OF APPROVAL

TRENCH WITH UNIMPROVED SURFACE TYPE A-1 PIPE BEDDING — UG-11

NOTES:

1. BITUMINOUS PAVEMENT SHALL BE REMOVED IN CLEAN STRAIGHT LINES BY SAW CUTTING. WHERE BITUMINOUS PAVEMENT ADJOINS A TRENCH, THE EDGES ADJACENT TO THE TRENCH SHALL BE TRIMMED TO A NEAT STRAIGHT LINES BEFORE RESURFACING TO ENSURE THAT ALL AREAS TO BE RESURFACED ARE ACCESSIBLE TO ROLLERS OR TAMPERS USED TO COMPACT THE SUB-GRADE OR PAVING MATERIALS.
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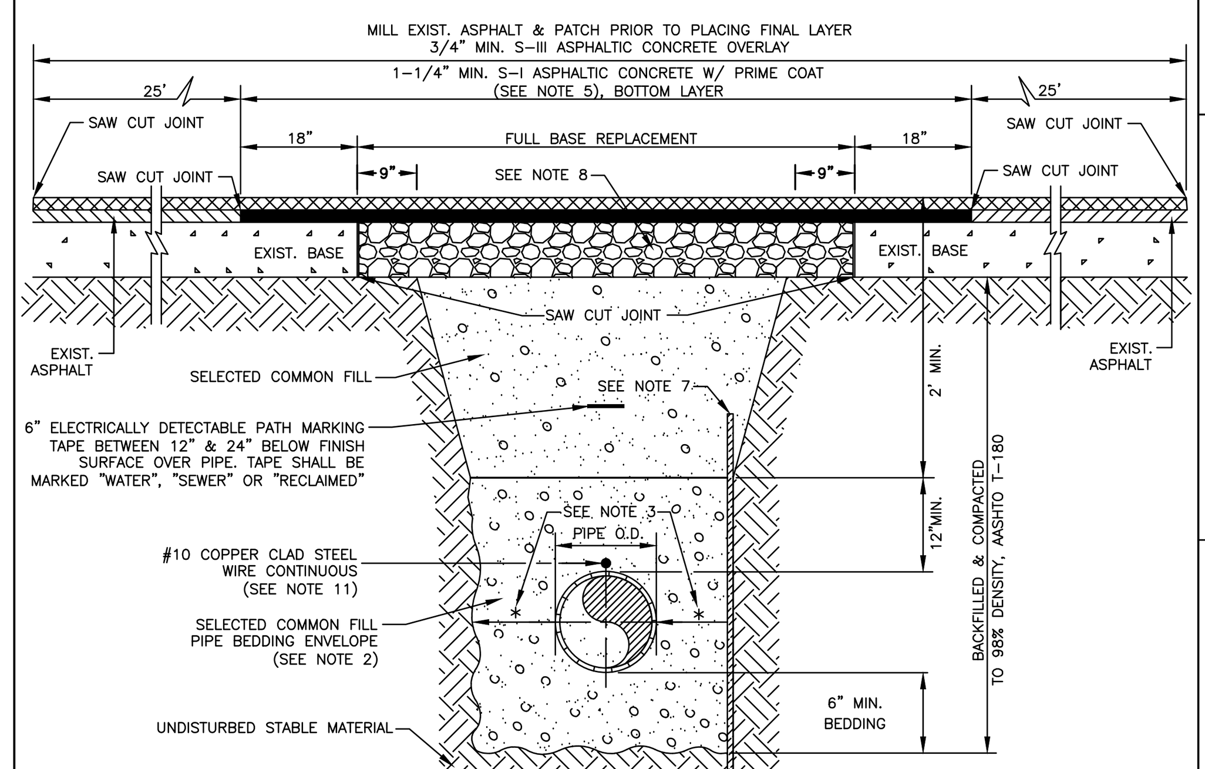
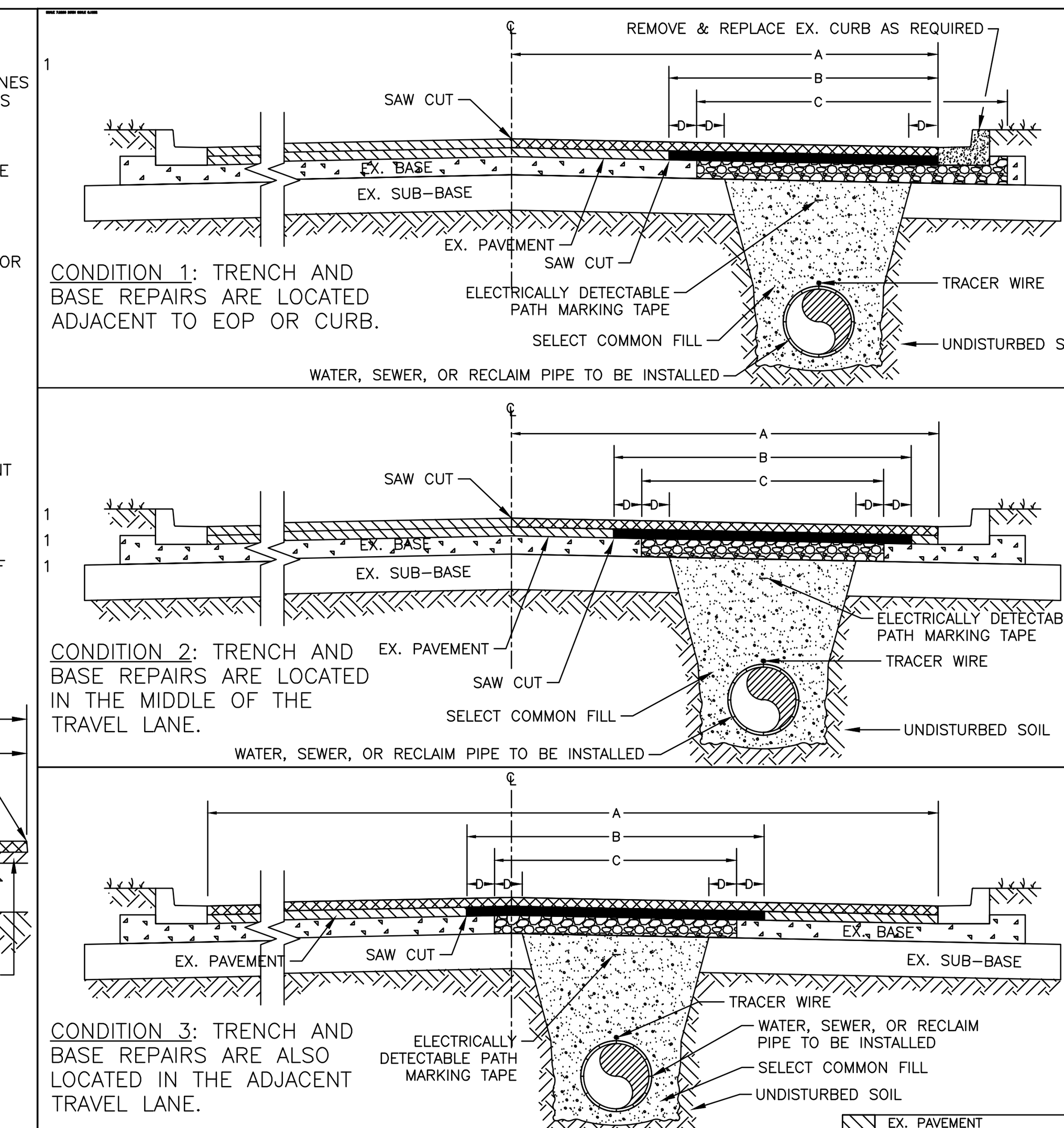
4. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
5. ASPHALTIC CONCRETE STRUCTURE COURSE WITH PRIME COAT SHALL BE THE SAME DEPTH AND TYPE AS EXISTING OR A MINIMUM OF 1-1/4 INCH S-I, WHICHEVER IS GREATER.
6. MILL 25' BACK FROM TRENCH CROSSING SAW CUTS. ADJUST MILLING PER INDIVIDUAL SITE TO NOT IMPACT BASE. BUTT JOINT TO EXIST ASPHALT. FINAL OVERLAY TO MATCH EXISTING WITH NO DISCERNABLE "BUMP" AT JOINT. MILLING LIMITS THAT IMPACT INTERSECTION SHALL BE ADDRESSED ON A CASE BY CASE BASIS AND APPROVED BY MANATEE COUNTY.
7. SHEETING ORDERED LEFT IN PLACE TO BE CUT OFF 24" BELOW FINISHED GRADE OR 12" BELOW SUBGRADE.
8. NEW BASE SHALL MATCH EXISTING; OR BE CRUSHED CONCRETE, 8" MIN. THICKNESS, LBR ≥150, WHICHEVER IS GREATER.
9. TEMPORARY PATCHES WILL BE INSTALLED TO PROVIDE A SMOOTH ALL WEATHER SURFACE AT ALL TIMES. PERMANENT REPLACEMENT TO BE MADE AS SOON AS POSSIBLE.
10. RESTORE SIGNAGE & MARKING WITH THERMOPLASTIC PER FDOT STANDARDS, LATEST EDITION.
11. TRACER WIRE NOT REQUIRED FOR GRAVITY SEWERS.
12. NOTES 5. THRU 10. ARE MINIMUM REQUIREMENTS FOR A TRENCH IN A LOCAL ROAD. REFER TO LATEST EDITION OF MANATEE COUNTY HIGHWAY AND TRAFFIC STANDARDS FOR ADDITIONAL REQUIREMENTS.



MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV.BY	DATE	
		February 25, 2020 DATE OF APPROVAL

TRENCH WITH ASPHALT PAVEMENT SURFACE TYPE A-1 PIPE BEDDING (CROSSING) — UG-12



A = MILL EXIST. ASPHALT & PLACE 3/4" MIN. S-III ASPHALTIC CONCRETE OVERLAY.
B = 1-1/4" MIN. S-I ASPHALTIC CONCRETE W/ PRIME COAT.
C = FULL BASE REPLACEMENT.
D = 9 INCHES

(hatch)	EX. PAVEMENT
(hatch)	UNDISTURBED SOIL
(hatch)	EX. BASE
(hatch)	SELECT COMMON FILL
(hatch)	BASE REPLACEMENT
(hatch)	S-I
(hatch)	S-III
(hatch)	NEW CURB

NOTE:

1. THIS DETAIL IS BASED ON A TWO-LANE ROADWAY AND SHALL BE FOLLOWED WHEN A PIPE IS INSTALLED WITHIN THE LIMITS OF A ROADWAY AND RUNS PARALLEL WITH THE EDGE OF PAVEMENT. THIS DETAIL CAN ALSO BE UTILIZED FOR RESTORATION NEEDS OF ROADWAYS WITH ADDITIONAL LANES. CONDITION 3 ONLY EXTENDS TO NEXT ADJACENT LANE ON MULTI-LANE ROADS.
2. THE MILL AND OVERLAY SHALL BE FIELD ADJUSTED TO MEET THE NEEDS FOR PAVEMENT RESTORATION DUE TO CONSTRUCTION ACTIVITIES AND SHALL BE COORDINATED WITH THE COUNTY.
3. SEE TRENCH WITH ASPHALT PAVEMENT TYPE A-1 PIPE BEDDING (CROSSING) DETAIL FOR NOTES 1 TO 12 THAT ARE ALSO APPLICABLE TO ASPHALT PAVEMENT RESTORATION.

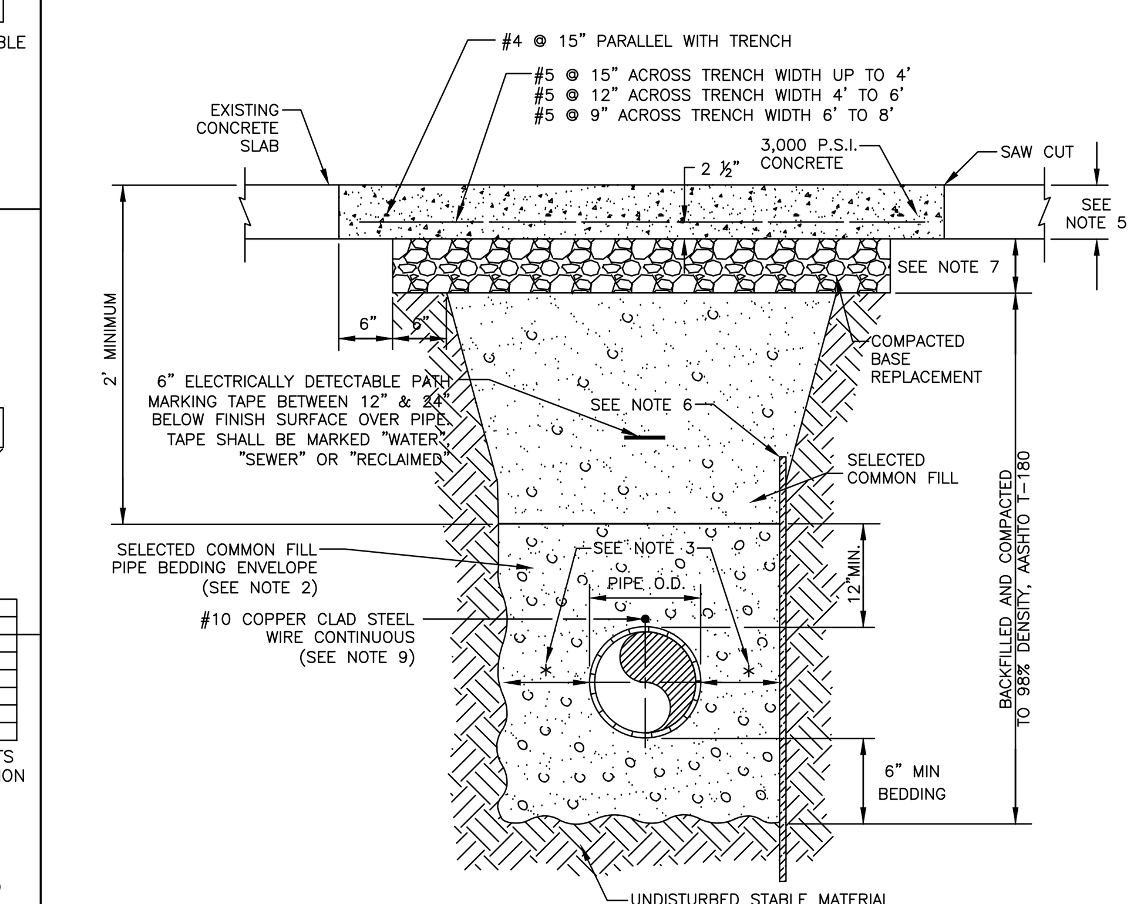
MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV.BY	DATE	
		February 25, 2020 DATE OF APPROVAL

TRENCH WITH ASPHALT PAVEMENT SURFACE TYPE A-1 PIPE BEDDING (LONGITUDINAL) — UG-12B

NOTES:

1. CONCRETE PAVEMENT SHALL BE REMOVED WITH SAWED EDGES AND CUT AT A MINIMUM DEPTH OF ONE AND ONE-HALF (1-1/2"). IF A SAW CUT IN CONCRETE PAVEMENT FALLS WITHIN THREE FEET (3') OF A CONTRACTION JOINT, COLD JOINT, EXPANSION JOINT OR EDGE, THE CONCRETE SHALL BE REMOVED TO THE JOINT OR EDGE. THE EDGES OF EXISTING CONCRETE PAVEMENT ADJACENT TO TRENCHES, WHICH HAD BEEN DAMAGED SUBSEQUENT TO SAW CUTTING OF PAVEMENT, SHALL BE SAW CUT TO NEAT STRAIGHT LINES FOR THE PURPOSE OF REMOVING THE DAMAGED PAVEMENT AREAS.
2. USE OF TYPE A-2 AND A-3 PIPE BEDDING TO BE DETERMINED IN THE FIELD BY THE ENGINEER.
3. PROVIDE ADEQUATE CLEARANCE TO PLACE AND COMPACT STAGE 1 BEDDING MATERIAL IN TRENCH AREA BELOW PIPE SPRINGLINE. PIPE EMBEDMENT MUST BE COMPACTED OUT TO THE TRENCH WALL OR 2.5 TIMES THE PIPE OD, WHICHEVER IS LESS.
4. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
5. THICKNESS TO MATCH EXISTING OR BE 8" MINIMUM, WHICHEVER IS GREATER.
6. SHEETING ORDERED LEFT IN PLACE TO BE CUT OFF 24" BELOW FINISHED GRADE OR 12" BELOW SUBGRADE.
7. BASE SHALL BE CRUSHED CONCRETE, 8" MIN. THICKNESS, LBR ≥150.
8. TEMPORARY PATCHES WILL BE INSTALLED TO PROVIDE A SMOOTH ALL WEATHER SURFACE AT ALL TIMES. PERMANENT REPLACEMENT TO BE MADE AS SOON AS POSSIBLE.
9. TRACER WIRE NOT REQUIRED FOR GRAVITY SEWERS.
10. NOTES 5 THRU 8 ARE MINIMUM REQUIREMENTS. REFER TO MANATEE COUNTY HIGHWAY AND TRAFFIC STANDARDS FOR ADDITIONAL REQUIREMENTS.



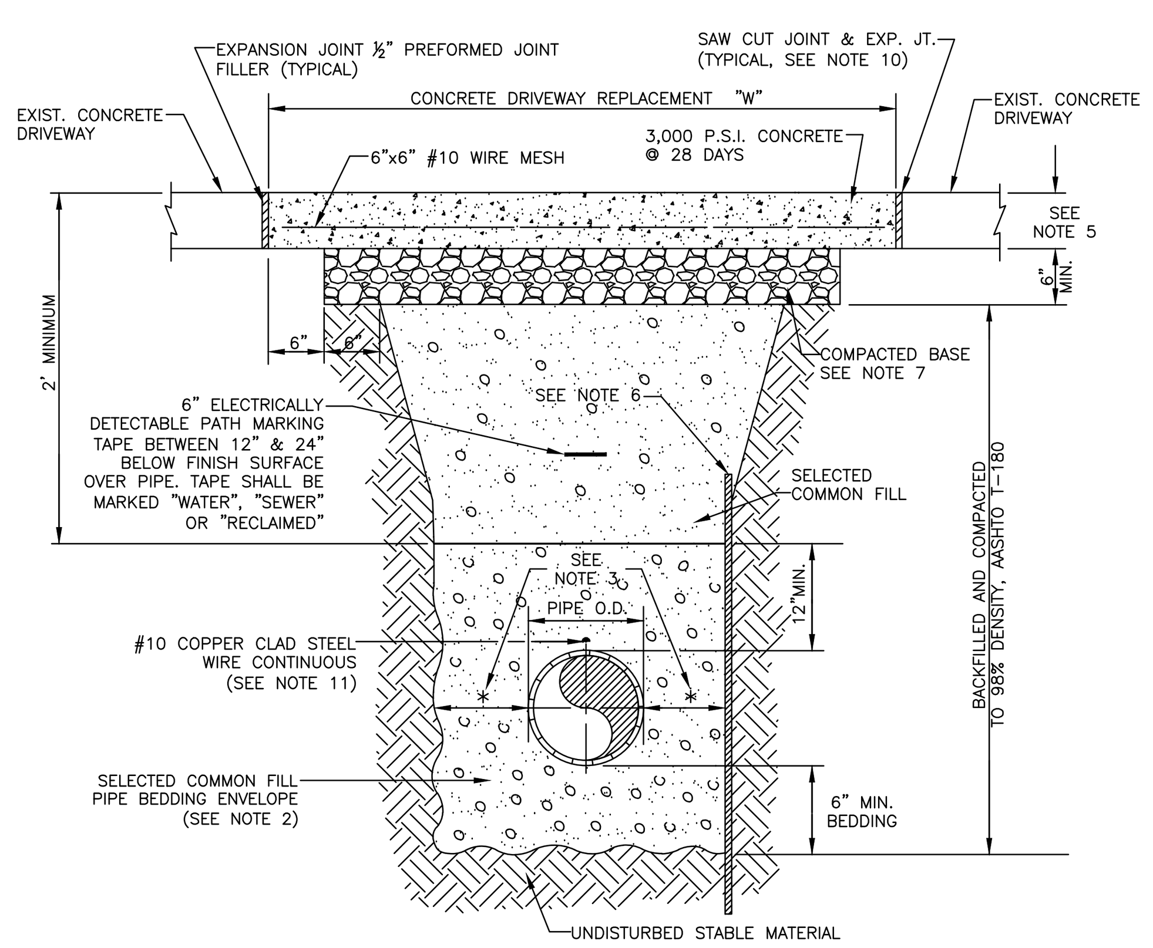
MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV.BY	DATE	
		February 25, 2020 DATE OF APPROVAL

TRENCH WITH CONCRETE PAVEMENT SURFACE TYPE A-1 PIPE BEDDING — UG-13

NOTES:

1. CONCRETE PAVEMENT SHALL BE REMOVED WITH SAWED EDGES AND CUT AT A MINIMUM DEPTH OF ONE AND ONE-HALF (1-1/2"). IF A SAW CUT IN CONCRETE PAVEMENT FALLS WITHIN THREE FEET (3') OF A CONTRACTION JOINT, COLD JOINT, EXPANSION JOINT OR EDGE, THE CONCRETE SHALL BE REMOVED TO THE JOINT OR EDGE. THE EDGES OF EXISTING CONCRETE PAVEMENT ADJACENT TO TRENCHES, WHICH HAD BEEN DAMAGED SUBSEQUENT TO SAW CUTTING OF PAVEMENT, SHALL BE SAW CUT TO NEAT STRAIGHT LINES FOR THE PURPOSE OF REMOVING THE DAMAGED PAVEMENT AREAS.
2. USE OF TYPE A-2 AND A-3 PIPE BEDDING TO BE DETERMINED IN THE FIELD BY THE ENGINEER.
3. PROVIDE ADEQUATE CLEARANCE TO PLACE AND COMPACT STAGE 1 BEDDING MATERIAL IN TRENCH AREA BELOW PIPE SPRINGLINE. PIPE EMBEDMENT MUST BE COMPACTED OUT TO THE TRENCH WALL OR 2.5 TIMES THE PIPE OD, WHICHEVER IS LESS.
4. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
5. THICKNESS TO MATCH EXISTING OR BE 6" MINIMUM, WHICHEVER IS GREATER.
6. SHEETING ORDERED LEFT IN PLACE TO BE CUT OFF 24" BELOW FINISH GRADE OR 12" BELOW SUBGRADE.
7. BASE SHALL BE COMPACTED 6" MINIMUM THICKNESS OF APPROVED MATERIAL.
8. DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST ADOPTED CONSTRUCTION STANDARDS OF THE MANATEE COUNTY TRANSPORTATION DEPARTMENT.
9. IF THE DRIVEWAY IS 12' OR WIDER, SAWCUT AN EXPANSION JOINT ALONG THE CENTER OF THE DRIVEWAY (3/16" WIDE AND 1½" DEEP) AFTER THE CONCRETE HAS SET.
10. IF THERE IS AN EXISTING EXPANSION JOINT WITHIN 3' OF THE PROPOSED JOINT, EXTEND DRIVEWAY REPLACEMENT TO THE EXISTING JOINT.
11. TRACER WIRE NOT REQUIRED FOR GRAVITY SEWERS.



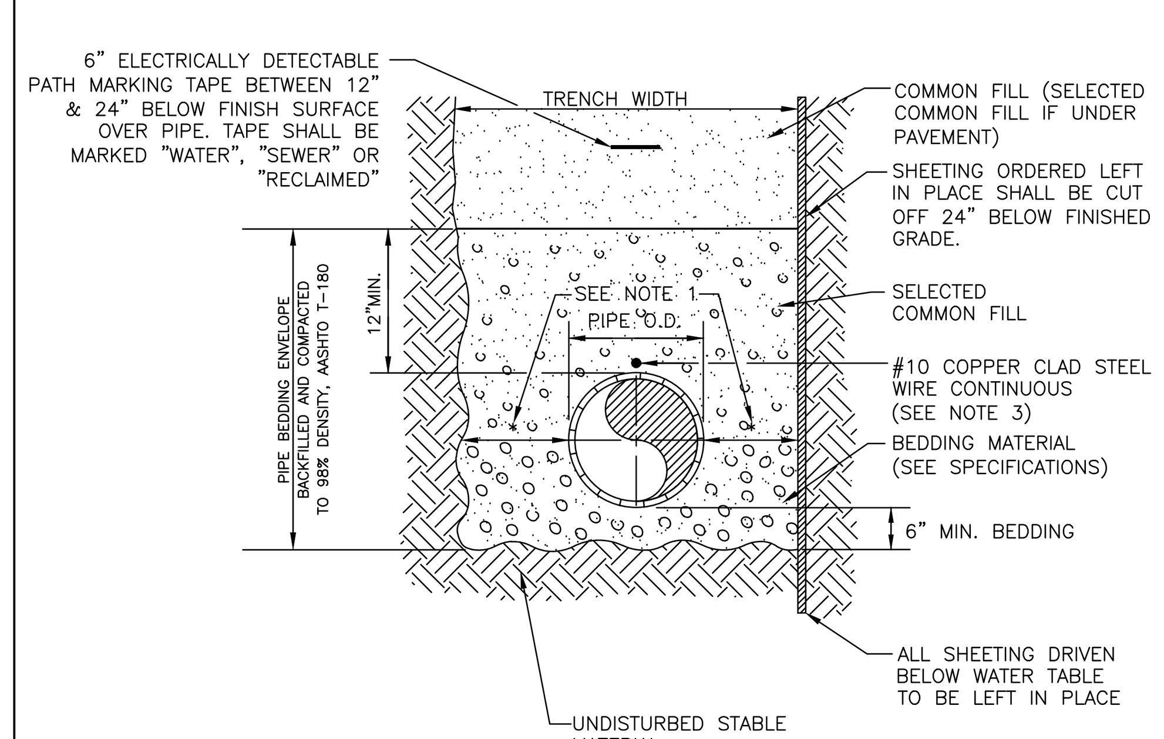
MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV.BY	DATE	
		February 25, 2020 DATE OF APPROVAL

TRENCH WITH CONCRETE DRIVEWAY SURFACE TYPE A-1 PIPE BEDDING — UG-14

NOTES:

1. PROVIDE ADEQUATE CLEARANCE TO PLACE AND COMPACT STAGE 1 BEDDING MATERIAL IN TRENCH AREA BELOW PIPE SPRINGLINE. PIPE EMBEDMENT MUST BE COMPACTED OUT TO THE TRENCH WALL OR 2.5 TIMES THE PIPE OD, WHICHEVER IS LESS.
2. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.
3. TRACER WIRE NOT REQUIRED FOR GRAVITY SEWERS.



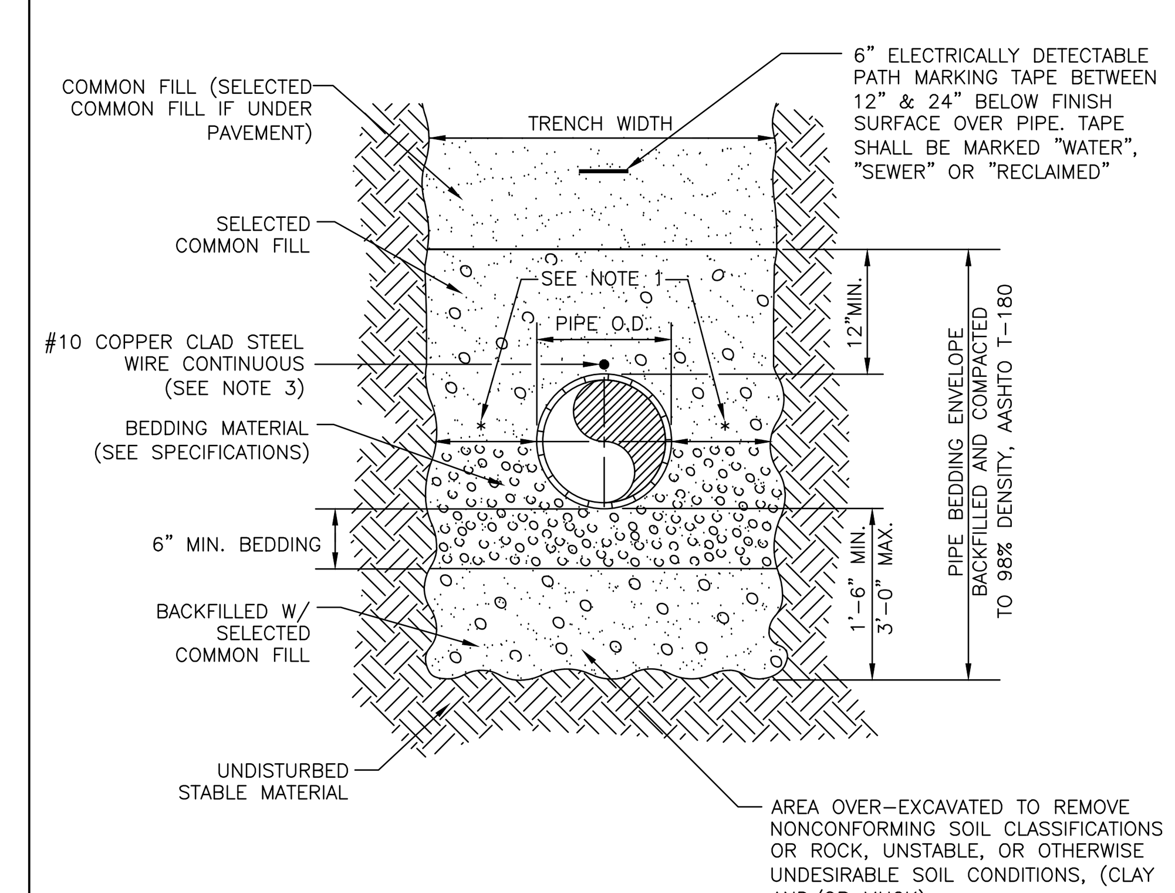
MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV.BY	DATE	
		February 25, 2020 DATE OF APPROVAL

TRENCH WITH TYPE A-2 PIPE BEDDING — UG-15

NOTES:

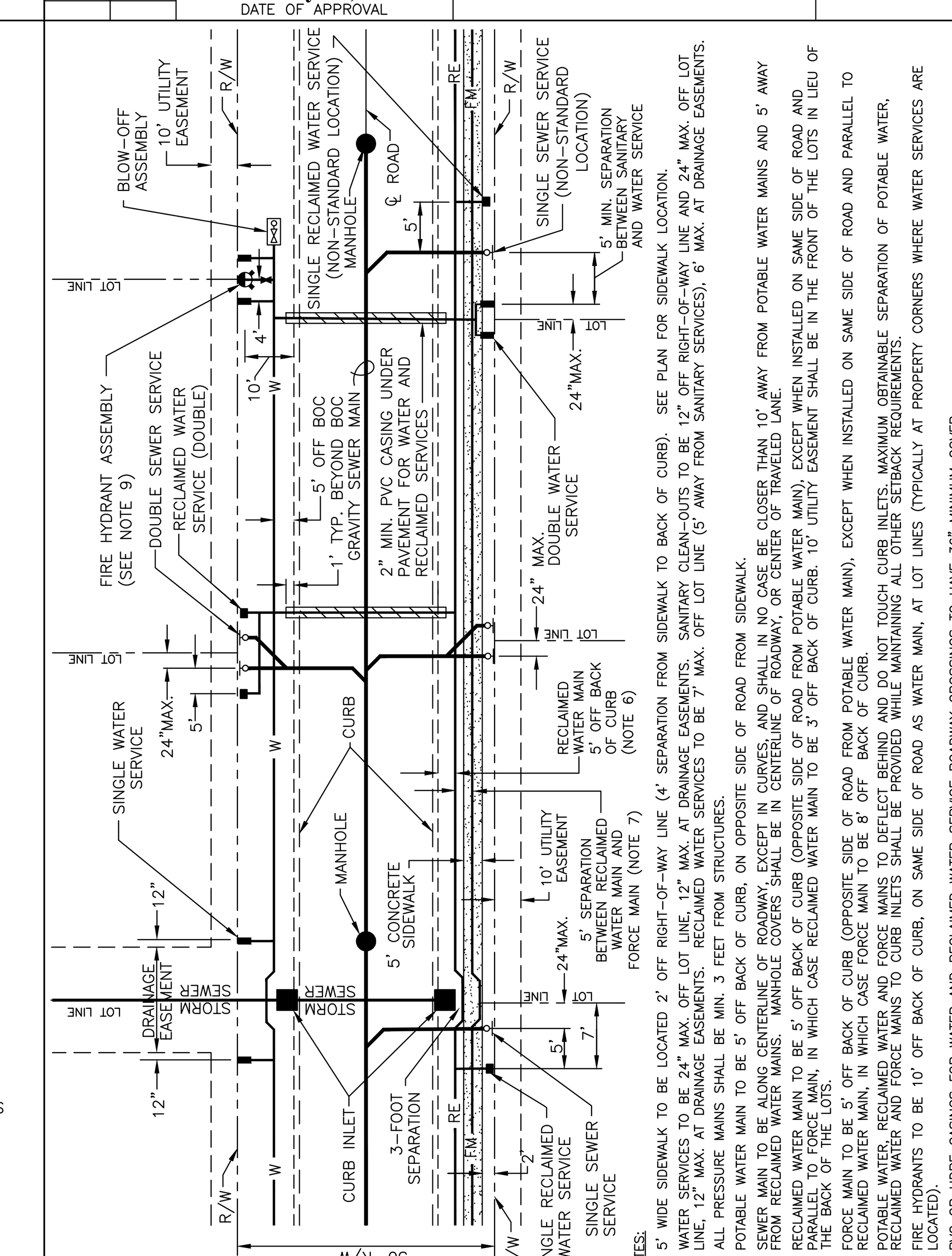
1. PROVIDE ADEQUATE CLEARANCE TO PLACE AND COMPACT STAGE 1 BEDDING MATERIAL IN TRENCH AREA BELOW PIPE SPRINGLINE. PIPE EMBEDMENT MUST BE COMPACTED OUT TO THE TRENCH WALL OR 2.5 TIMES THE PIPE OD, WHICHEVER IS LESS.
2. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.
3. TRACER WIRE NOT REQUIRED FOR GRAVITY SEWERS.



MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV.BY	DATE	
		February 25, 2020 DATE OF APPROVAL

TRENCH WITH TYPE A-3 PIPE BEDDING — UG-16



MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV.BY	DATE	
		February 25, 2020 DATE OF APPROVAL

UTILITY LAYOUT FOR 50' R/W — UG-17

No.	REVISIONS	DATE	BY

Kimley»Horn

100 2ND AVE S, UNIT 105N, ST. PETERSBURG, FL 33701
PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT	148400056
DATE	JAN 2021
SCALE	AS SHOWN
DESIGNED BY	MAS
DRAWN BY	KTM
CHECKED BY	WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

MANATEE COUNTY FL

LICENSED PROFESSIONAL

MICHAEL ANTHONY SEMAGO, P.E. LICENSE No. 87507 STATE OF FLORIDA PROFESSIONAL ENGINEER

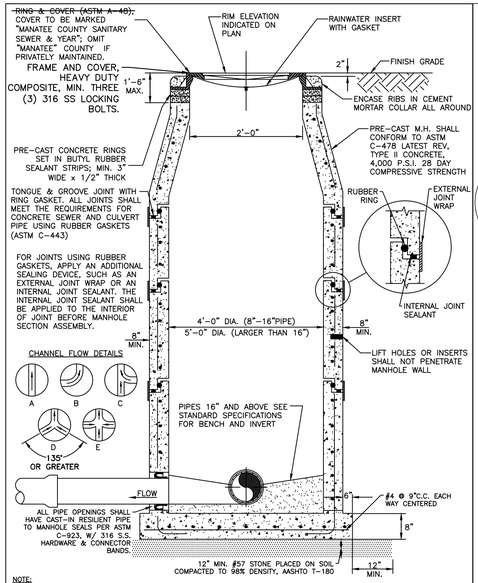
Digitally signed by Michael A Semago
DN: cn=Michael A Semago, c=US, o=KIMLEY-HORN AND ASSOCIATES INC., 0.9.2342.19200300.100.1.1=A01410C0000016F4AD5FDC400016E00, email=mike.semago@kimley-horn.com
Date: 2021.02.04 14:54:36 -05'00'

DATE:

DETAILS

SHEET NUMBER
D-01

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021



NOTE:

DROP MANHOLES, MANHOLES WITH OPPOSING FLOW (DETAILS D & E), MANHOLES UPSTREAM OF A LIFT STATION WET WELL (SEE US-17A), MANHOLES WITH GRAVITY SEWERS GREATER THAN 12 INCHES IN DIAMETER, MANHOLES RECEIVING A FORCE MAIN AND THE FIRST TWO GRAVITY MANHOLES DOWNSTREAM OF MANHOLES RECEIVING A FORCE MAIN SHALL BE A POLYMER CONCRETE MANHOLE (SEE US-3); OR EXISTING PORTLAND CONCRETE MANHOLE SHALL RECEIVE AN APPROVED LINER.

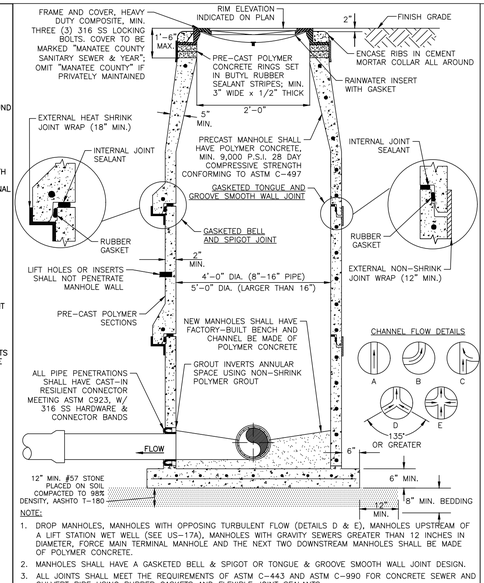
MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV.BY	DATE

February 25, 2020
DATE OF APPROVAL

STANDARD PRE-CAST SANITARY SEWER MANHOLE FOR UNDISTURBED FLOW

US-2



NOTE:

1. DROP MANHOLES, MANHOLES WITH OPPOSING TURBULENT FLOW (DETAILS D & E), MANHOLES UPSTREAM OF A LIFT STATION WET WELL (SEE US-17A), MANHOLES WITH GRAVITY SEWERS GREATER THAN 12 INCHES IN DIAMETER, FORCE MAIN TERMINAL MANHOLE AND THE NEXT TWO DOWNSTREAM MANHOLES SHALL BE MADE OF POLYMER CONCRETE.
2. MANHOLES SHALL HAVE A GASKETED BELL & SPIGOT OR TONGUE & GROOVE SMOOTH WALL JOINT DESIGN.
3. ALL JOINTS SHALL MEET THE REQUIREMENTS OF ASTM C-443 AND ASTM C-990 FOR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKETS AND FLEXIBLE JOINT SEALANTS.
4. ALL FRP/STEEL REINFORCEMENT, MANHOLE RISERS, CONES, BASES, AND FLAT LIDS SHALL BE DESIGNED BY MANUFACTURER TO MEET LOADING REQUIREMENTS OF ASTM C-478, ASTM C-857, ACI 350, AND ACI 440.1R AS MODIFIED FOR POLYMER CONCRETE MANHOLES.

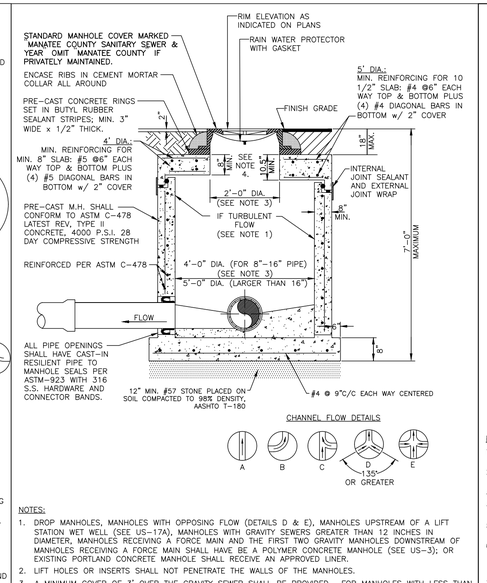
MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV.BY	DATE

February 25, 2020
DATE OF APPROVAL

STANDARD PRE-CAST POLYMER CONCRETE SANITARY SEWER MANHOLE FOR TURBULENT FLOW

US-3



NOTES:

1. DROP MANHOLES, MANHOLES WITH OPPOSING FLOW (DETAILS D & E), MANHOLES UPSTREAM OF A LIFT STATION WET WELL (SEE US-17A), MANHOLES WITH GRAVITY SEWERS GREATER THAN 12 INCHES IN DIAMETER, MANHOLES RECEIVING A FORCE MAIN AND THE FIRST TWO GRAVITY MANHOLES DOWNSTREAM OF MANHOLES RECEIVING A FORCE MAIN SHALL HAVE BE A POLYMER CONCRETE MANHOLE (SEE US-3); OR EXISTING PORTLAND CONCRETE MANHOLE SHALL RECEIVE AN APPROVED LINER.
2. LIFT HOLES OR INSERTS SHALL NOT PENETRATE THE WALLS OF THE MANHOLES.
3. A MINIMUM COVER OF 3' OVER THE GRAVITY SEWER SHALL BE PROVIDED. FOR MANHOLES WITH LESS THAN 4' OF COVER OVER THE GRAVITY SEWER, THE MANHOLE INSIDE DIAMETER SHALL BE 5'-0" AND THE FRAME AND COVER SHALL BE 32" OPENING.
4. MANHOLE SHALL BE AASHTO H-20 RATED, WHEN LOCATED WITHIN THE RIGHT OF WAY.

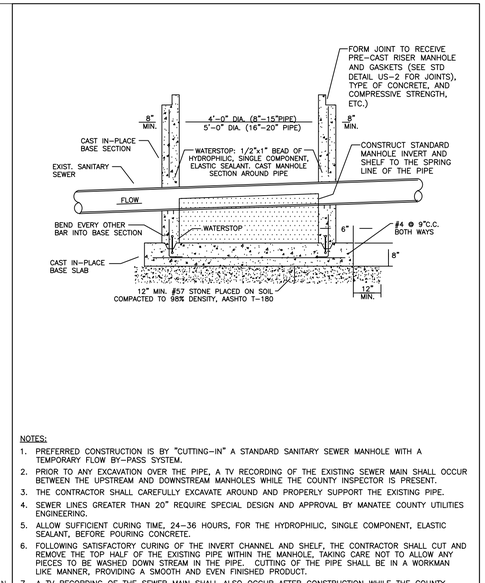
MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV.BY	DATE

February 25, 2020
DATE OF APPROVAL

STANDARD PRE-CAST PORTLAND CEMENT SHALLOW MANHOLE

US-4



NOTES:

1. PREFERRED CONSTRUCTION IS BY "CUTTING-IN" A STANDARD SANITARY SEWER MANHOLE WITH A TEMPORARY FLOW BY-PASS SYSTEM.
2. PRIOR TO ANY EXCAVATION OVER THE PIPE, A TV RECORDING OF THE EXISTING SEWER MAIN SHALL OCCUR BETWEEN THE UPSTREAM AND DOWNSTREAM MANHOLES WHILE THE COUNTY INSPECTOR IS PRESENT.
3. THE CONTRACTOR SHALL CAREFULLY EXCAVATE AROUND AND PROPERLY SUPPORT THE EXISTING PIPE.
4. SEWER LINES GREATER THAN 20" REQUIRE SPECIAL DESIGN AND APPROVAL BY MANATEE COUNTY UTILITIES ENGINEERING.
5. ALLOW SUFFICIENT CURING TIME, 24-36 HOURS, FOR THE HYDROPHILIC, SINGLE COMPONENT, ELASTIC SEALANT, BEFORE POURING CONCRETE.
6. FOLLOWING SATISFACTORY CURING OF THE INVERT CHANNEL AND SHELF, THE CONTRACTOR SHALL CUT AND REMOVE THE TOP HALF OF THE EXISTING PIPE WITHIN THE MANHOLE, TAKING CARE NOT TO ALLOW ANY PIECES TO BE WASHED DOWN STREAM IN THE PIPE. CUTTING OF THE PIPE SHALL BE IN A WORKMAN LIKE MANNER, PROVIDING A SMOOTH AND EVEN FINISHED PRODUCT.
7. A TV RECORDING OF THE SEWER MAIN SHALL ALSO OCCUR AFTER CONSTRUCTION WHILE THE COUNTY INSPECTOR IS PRESENT. PIPE DEFLECTION SHALL NOT DEVIATE BY MORE THAN 1 INCH FROM THE DESIGN LINE.
8. THERE SHALL BE NO VISIBLE LEAKS IN THE MANHOLE.

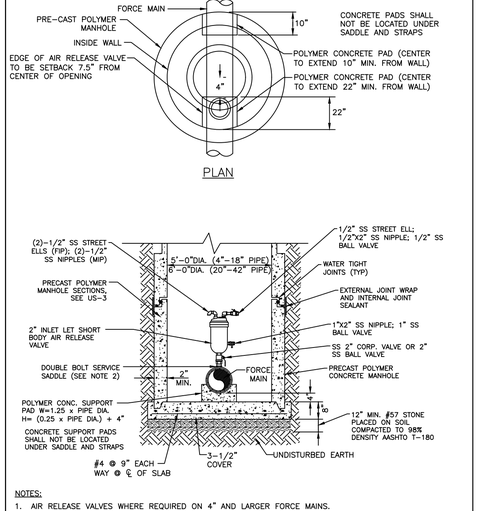
PUBLIC WORKS DEPARTMENT

REV.BY	DATE

February 25, 2020
DATE OF APPROVAL

SANITARY SEWER MANHOLE CONSTRUCTED OVER EXISTING SEWER LINE

US-5



NOTES:

1. AIR RELEASE VALVES WHERE REQUIRED ON 4" AND LARGER FORCE MAINS.
2. ARV TO BE SIZED ACCORDING TO MANUFACTURER'S RECOMMENDATION FOR FORCE MAIN SIZE, MINIMUM 2" ARV REQUIRED.
3. SERVICE SADDLE, NIPPLES AND CORPORATION BALL VALVE SHALL BE 316 STAINLESS STEEL.
4. FOR MANHOLES WITH LESS THAN 44 INCHES OF COVER FROM TOP-OF-PIPE TO TOP-OF-FRAME, FRAME & COVER TO HAVE A 32-INCH OPENING. MINIMUM ALLOWABLE COVER IS 36 INCHES.
5. ALL PIPE PENETRATING MANHOLE SHALL HAVE RESILIENT PIPE TO MANHOLE SEALS PER ASTM-923.
6. FINAL GRADE TO BE SLOPED AWAY FROM MANHOLE.
7. MANHOLE SHALL BE AASHTO H-20 RATED, WHEN LOCATED WITHIN THE RIGHT OF WAY.
8. ALL STAINLESS STEEL SHALL BE 316 STAINLESS STEEL.

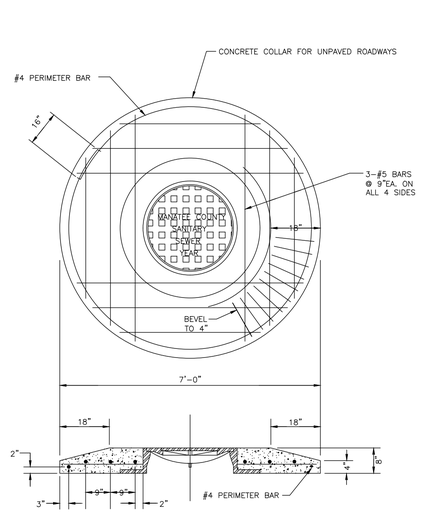
PUBLIC WORKS DEPARTMENT

REV.BY	DATE

DATE OF APPROVAL

BELOW GRADE AIR RELEASE VALVE FOR FORCE MAINS

US-8



NOTES:

1. OMIT "MANATEE COUNTY". IF PRIVATELY MAINTAINED.
2. PORTLAND CEMENT SHALL CONFORM TO ASTM C150, TYPE 1, AND CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 P.S.I.

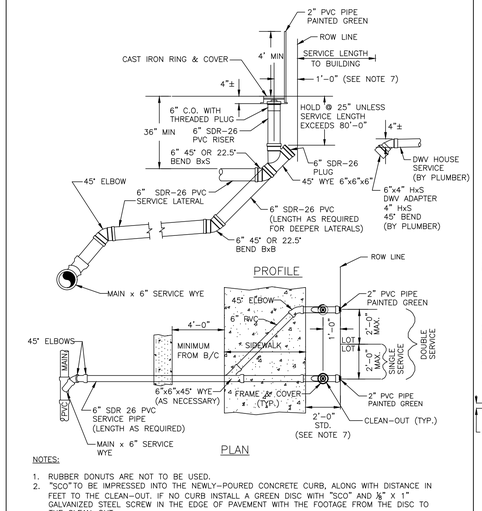
MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV.BY	DATE

February 25, 2020
DATE OF APPROVAL

MANHOLE COVER & CONCRETE COLLAR FOR UNPAVED ROADWAYS

US-10



NOTES:

1. RUBBER DONUTS ARE NOT TO BE USED.
2. "SCO" TO BE IMPRESSED INTO THE NEWLY-POURED CONCRETE CURB, ALONG WITH DISTANCE IN FEET TO THE CLEAN-OUT. IF NO CURB INSTALL A GREEN DISC WITH "SCO" AND ⅜" X 1" GALVANIZED STEEL SCREW IN THE EDGE OF PAVEMENT WITH THE FOOTAGE FROM THE DISC TO THE CLEAN-OUT.
3. SANITARY SEWER CLEAN-OUTS SHALL NOT BE LOCATED IN DRAINAGE SWALES, EASEMENTS, SIDEWALKS OR DRIVEWAYS.
4. NO SERVICE CONNECTIONS TO BE MADE TO THE CLEAN-OUT RISER. ALL DOMESTIC CONNECTIONS SHALL BE MADE TO THE STUB-OUT PROVIDED.
5. SEWER SERVICE SHALL BE 5' MIN. FROM WATER SERVICE OR FIRE HYDRANT.
6. CLEAN-OUT ADAPTER TO BE SOLVENT-WELDED TO RISER TOP. CLEAN-OUT THREADS SHALL BE WRAPPED WITH TEFLON PLUMBERS TAPE TO SEAL PLUG WATERTIGHT.
7. WHEN THE DISTANCE BETWEEN THE EDGE OF THE SIDEWALK & THE ROW LINE IS ONE FOOT (CUL-DE-SAC W/MEDIAN) THE DISTANCE BETWEEN THE CENTER OF THE CLEAN-OUT RISER & THE ROW LINE SHALL BE 6".

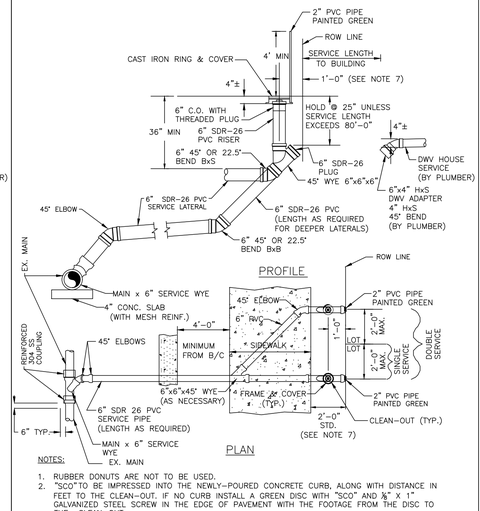
MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV.BY	DATE

February 25, 2020
DATE OF APPROVAL

SINGLE AND DOUBLE SERVICE CONNECTION

US-13A



NOTES:

1. RUBBER DONUTS ARE NOT TO BE USED.
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MANATEE COUNTY
PUBLIC WORKS DEPARTMENT

REV.BY	DATE

February 25, 2020
DATE OF APPROVAL

CUT-IN SINGLE AND DOUBLE SERVICE WYES

US-13B

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2021 KIMLEY-HORN AND ASSOCIATES, INC.
100 2ND AVE S, UNIT 105N, ST. PETERSBURG, FL 33701
PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT 148400056

DATE JAN 2021

SCALE AS SHOWN

DESIGNED BY MAS

DRAWN BY KTM

CHECKED BY WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

MANATEE COUNTY FL

LICENSED PROFESSIONAL ENGINEER
MICHAEL ANTHONY SEMAGO
LICENSE NO. 87507
STATE OF FLORIDA
PROFESSIONAL ENGINEER
DATE:

Digitally signed by Michael A Semago
DN: cn=Michael A Semago, c=US, o=KIMLEY-HORN AND ASSOCIATES INC., ou=A01410C0000016FA4D5FDC400016E00, email=mike.semago@kimley-horn.com
Date: 2021.02.04 14:54:52 -05'00'

DETAILS

SHEET NUMBER

D-02

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021

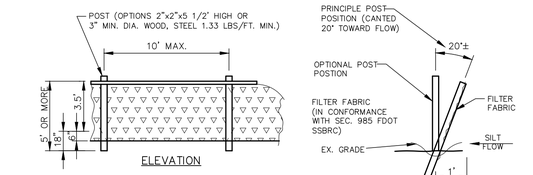
LOCATION OF PUBLIC WATER SYSYEM MAINS IN ACCORDANCE WITH F.A.C. RULE 62-555.314

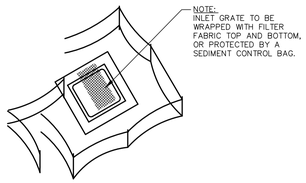
Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @ Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)	Water Main 3 ft. minimum	Water Main 12 inches is the minimum, except for storm sewer, then 6 inches is the minimum and 12 inches is preferred	Alternate 3 ft. minimum Water Main
Vacuum Sanitary Sewer	Water Main 10 ft. preferred 3 ft. minimum	Water Main 12 inches preferred 6 inches minimum	Alternate 3 ft. minimum Water Main
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)	Water Main 10 ft. preferred 6 ft. minimum (3)	Water Main 12 inches is the minimum, except for gravity sewer, then 6 inches is the minimum and 12 inches is preferred	Alternate 6 ft. minimum Water Main
On-Site Sewage Treatment & Disposal System	10 ft. minimum	---	---

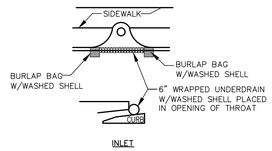
(1) Water main should cross above other pipe. When water main must be below other pipe, the minimum separation is 12 inches.
(2) Reclaimed water regulated under Part III of Chapter 62-610, F.A.C.
(3) 3 ft. for gravity sanitary sewer where the bottom of the water main is laid at least 6 inches above the top of the gravity sanitary sewer.
(4) Reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

Disclaimer – This document is provided for your convenience only. Please refer to F.A.C. Rule 62-555.314 for additional construction requirements.

F.A.C. RULE 62-55.314 MAIN CLEARANCES DETAIL

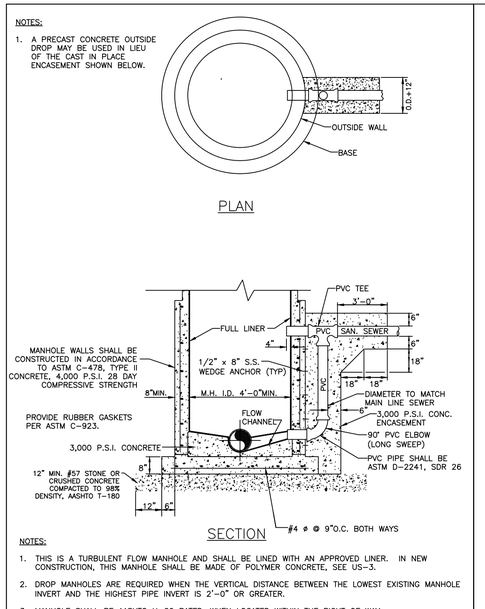




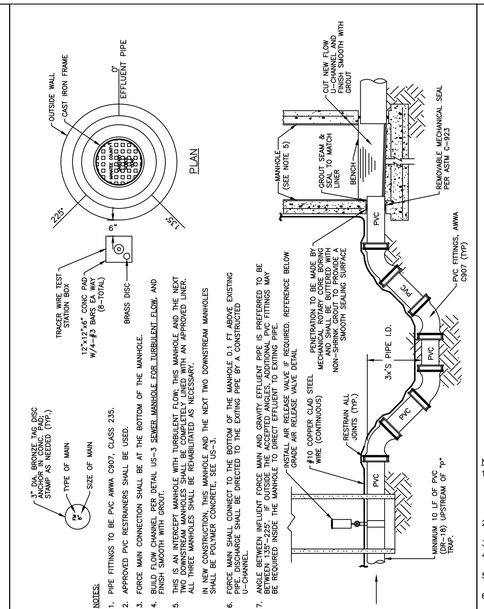


EROSION AND SEDIMENTATION CONTROL BEST MANAGEMENT PRACTICES

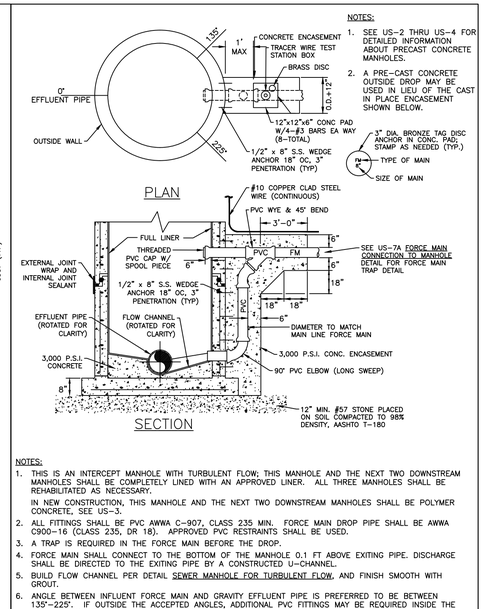
N.T.S.



MANATEE COUNTY PUBLIC WORKS DEPARTMENT			OUTSIDE DROP CONNECTION TO EX. PORTLAND CEMENT MANHOLE	US-6
REV.BY	DATE	February 25, 2020 DATE OF APPROVAL		



MANATEE COUNTY PUBLIC WORKS DEPARTMENT			FORCE MAIN CONNECTION TO EX. PORTLAND CONCRETE MANHOLE (3-6 FEET DEEP)	US-7A
REV.BY	DATE	February 25, 2020 DATE OF APPROVAL		



MANATEE COUNTY PUBLIC WORKS DEPARTMENT			FORCE MAIN CONNECTION TO EX. PORTLAND CONCRETE MANHOLE (>6 FEET DEEP)	US-7B
REV.BY	DATE	February 25, 2020 DATE OF APPROVAL		

No.	REVISIONS	DATE	BY

Kimley»Horn
© 2021 KIMLEY-HORN AND ASSOCIATES, INC.
100 2ND AVE S, UNIT 105N, ST. PETERSBURG, FL 33701
PHONE: 727-547-3999
WWW.KIMLEY-HORN.COM CA 00000696

KHA PROJECT 148400056
DATE JAN 2021
SCALE AS SHOWN
DESIGNED BY MAS
DRAWN BY KTM
CHECKED BY WEW

Manatee County FLORIDA

BRADENTON BEACH GRAVITY REPLACEMENT

MANATEE COUNTY FL

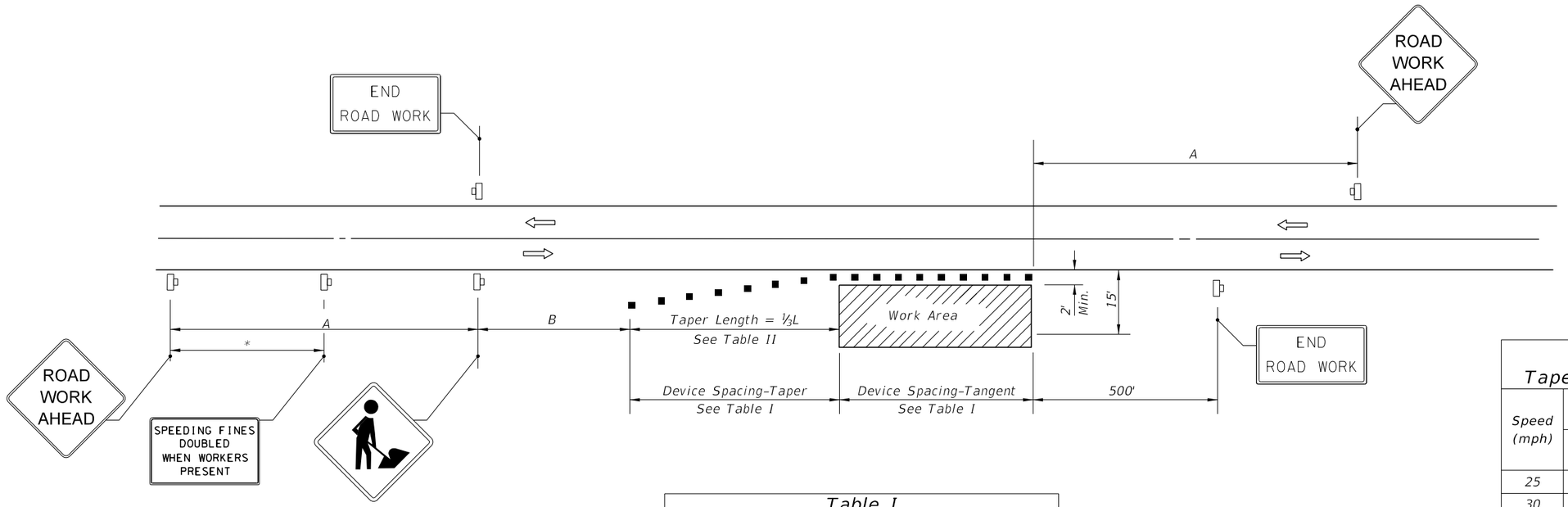
LICENSED PROFESSIONAL MICHAEL ANTHONY SEMAGO LICENSE No. 87501 STATE OF FLORIDA PROFESSIONAL ENGINEER
DATE:

Digitally signed by Michael A Semago
DN: cn=Michael A Semago, c=US, o=KIMLEY-HORN AND ASSOCIATES INC., ou=A01410C0000016FA4D5FDC400016E00, email=mike.semago@kimley-horn.com
Date: 2021.02.04 14:55:10 -05'00'

DETAILS

SHEET NUMBER
D-03

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021



DISTANCE BETWEEN SIGNS		
Speed	Spacing (ft.)	
	A	B
40 mph or less	200	200
45 mph	350	350
50 mph or greater	500	500

*Midway between signs.

Table I
Device Spacing

Speed (mph)	Max. Distance Between Devices (ft.)			
	Cones or Tubular Markers		Type I or Type II Barricades or Vertical Panels or Drums	
	Taper	Tangent	Taper	Tangent
25	25	50	25	50
30 to 45	25	50	30	50
50 to 70	25	50	50	100

Table II
Taper Length - Shoulder

Speed (mph)	½L (ft)			Notes
	8' Shldr.	10' Shldr.	12' Shldr.	
25	28	35	42	$L=\frac{WS^2}{60}$
30	40	50	60	
35	55	68	82	
40	72	90	107	
45	120	150	180	L=WS
50	133	167	200	
55	147	183	220	
60	160	200	240	
65	173	217	260	
70	187	233	280	

8' minimum shoulder width

½L = Length of shoulder taper in feet

W = Width of total shoulder in feet (combined paved and unpaved width)

S = Posted speed limit (mph)

SYMBOLS

Work Area

■ Channelizing Device (See Index 102-600)

Work Zone Sign

Lane Identification + Direction of Traffic

GENERAL NOTES

1. When four or more work vehicles enter the through traffic lanes in a one hour period or less (excluding establishing and terminating the work area), the advanced FLAGGER sign shall be substituted for the WORKERS sign. For location of flaggers and FLAGGER signs, see Index 102-603.
2. SHOULDER WORK sign may be used as an alternate to the WORKER symbol sign only on the side where the shoulder work is being performed.
3. When a side road intersects the highway within the TTC zone, additional TTC devices shall be placed in accordance with other applicable TCZ Indexes.
4. For general TCZ requirements and additional information, refer to Index 102-600.

DURATION NOTES

1. Signs and channelizing devices may be omitted if all of the following conditions are met:
   a. Work operations are 60 minutes or less.
   b. Vehicles in the work area have high-intensity, rotating, flashing, oscillating, or strobe lights operating.

CONDITIONS

WHERE ANY VEHICLE, EQUIPMENT, WORKERS OR THEIR ACTIVITIES ENCROACH THE AREA CLOSER THAN 15' BUT NOT CLOSER THAN 2' TO THE EDGE OF TRAVEL WAY.

2/26/2020 12:30:16 PM

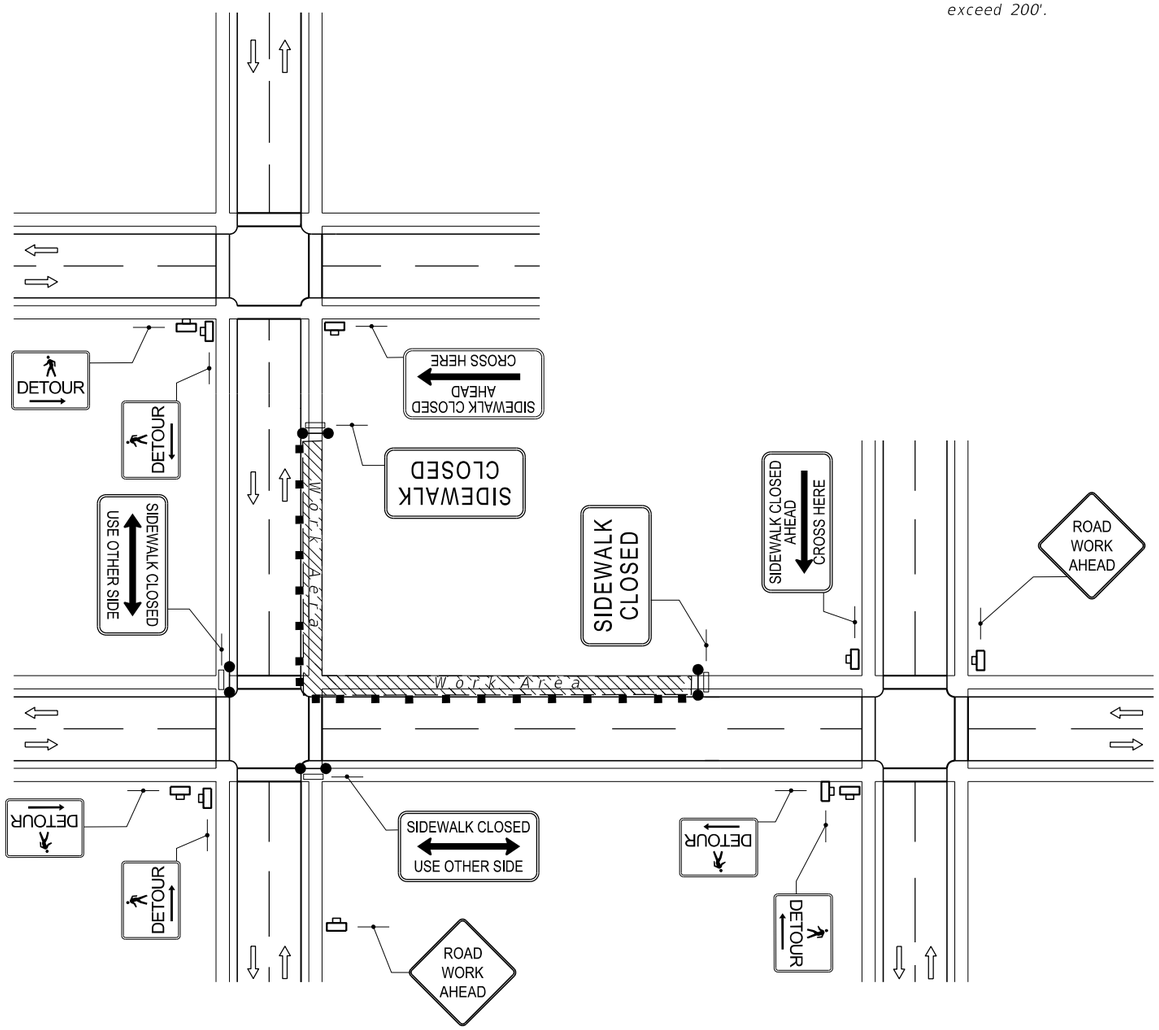
LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2020-21 STANDARD PLANS	TWO-LANE, TWO-WAY, WORK ON SHOULDER	INDEX	SHEET
11/01/17						102-602	1 of 1

SYMBOLS

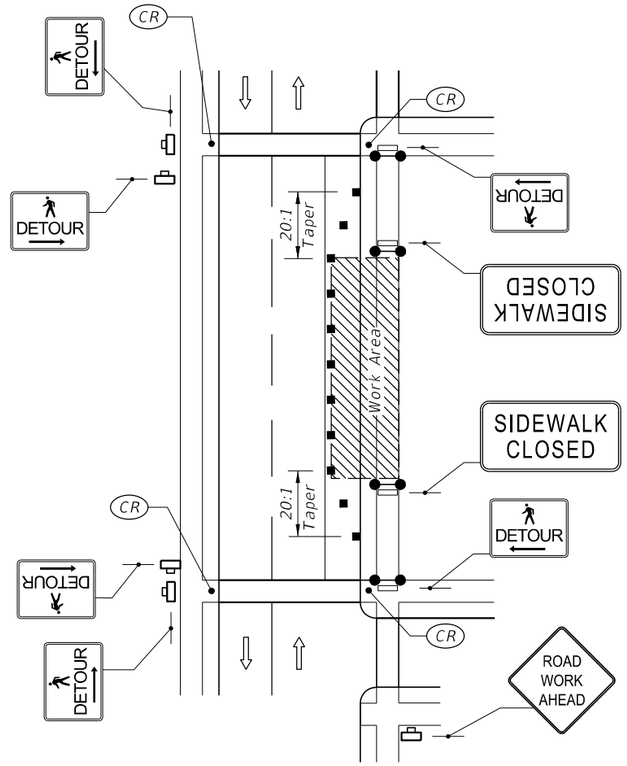
- Work Area
- Channelizing Device
- Work Zone Sign
- CR — Required Locations For Either Temporary Or Permanent Curb Ramps.
- Lane Identification + Direction of Traffic
- Pedestrian Longitudinal Channelizing Device (LCD) with Mounted Work Zone Sign or separate Work Zone Sign
- Pedestrian Longitudinal Channelizing Device (LCD)
- Temporary Sidewalk

GENERAL NOTES:

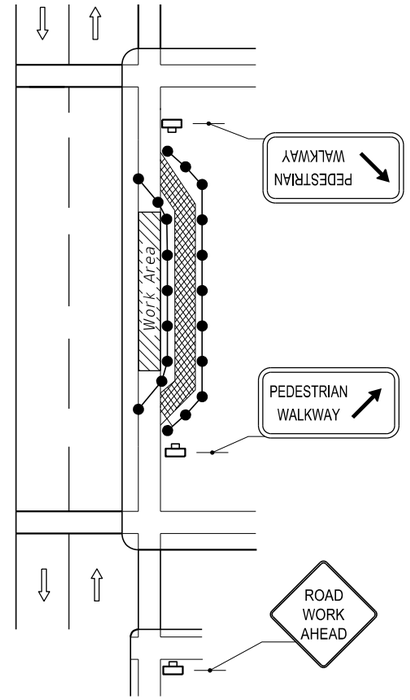
1. When encroaching work requires a sidewalk closure for 60 minutes or greater, provide an alternate pedestrian route.
2. For spacing of vehicular Channelizing Devices, see applicable vehicular temporary traffic control Indexes.
3. Cover or deactivate pedestrian traffic signal display(s) controlling closed crosswalks.
4. For post mounted signs located near or adjacent to a sidewalk, maintain a minimum 7' clearance from the bottom of the sign panel to the surface of the sidewalk.
5. Provide a 5' wide temporary walkway, except where space restrictions warrant a minimum width of 4'. Provide a 5' x 5' passing space for temporary walkways less than 5' in width at intervals not to exceed 200'.
6. Provide a cross-slope with a maximum value of 0.02 for all temporary walkways.
7. Maintain temporary walkway surfaces and ramps that are stable, firm, slip-resistant, and free of any obstructions or hazards such as holes, debris, mud, construction equipment, and stored material.
8. Remove temporary walkways immediately after reopening of the sidewalk, unless otherwise noted in the plans.
9. Meet the requirements of Index 522-002 for temporary curb ramps.
10. Place pedestrian longitudinal channelizing device(s) across the full width of the closed sidewalk. For temporary walkways, similar to the Sidewalk Diversion, place LCDs to delineate both sides of the temporary walkway.
11. For sidewalk diversions, ensure that there is sufficient R/W for placement of temporary sidewalk and pedestrian longitudinal channelizing devices.



CROSSWALK CLOSURE AND PEDESTRIAN DETOUR



SIDEWALK DETOUR



SIDEWALK DIVERSION

2/26/2020 12:43:24 PM

LAST REVISION	REVISION	DESCRIPTION:				
11/01/17			FDOT	FY 2020-21 STANDARD PLANS	PEDESTRIAN CONTROL FOR CLOSURE OF SIDEWALKS	INDEX 102-660 / SHEET 1 of 1

FLORIDA DEPARTMENT OF TRANSPORTATION
STORMWATER POLLUTION PREVENTION

The Law

The Federal Clean Water Act was established in 1972 to protect our waterways. As a result, the National Pollutant Discharge Elimination System (NPDES) program was developed. The NPDES permit program addresses water pollution by regulating point sources that discharge pollutants to surface waters. The Florida Department of Environmental Protection (FDEP) administers the NPDES program for Municipal Separate Storm Sewer Systems (MS4) and Construction activities.

CONSTRUCTION ACTIVITIES

- ***Is your construction site regulated?***
  Yes, if your construction activity will ultimately disturb one acre or more and has the potential to discharge stormwater to surface waters or into a MS4. Disturbance includes clearing, grading, excavation, and demolition.
- ***What are you required to do?***
  - ✓ Prepare and implement a Stormwater Pollution Prevention Plan (SWPPP)
  - ✓ Submit a Notice of Intent (NOI or application) and the appropriate fee to FDEP
  - ✓ Submit a Notice of Termination (NOT) to FDEP and to the local MS4 once the site meets the eligibility requirements for termination

For more information on NPDES Stormwater Construction Activities, contact FDEP for more information at (866) 336-6312 or visit http://www.dep.state.fl.us/water/stormwater/index.htm.

HOW CAN YOU HELP STOP STORMWATER POLLUTION?

- ✓ Do not pour oil or any chemicals down any storm drain or in the street
- ✓ Use fertilizers and herbicides carefully and only use the recommended amount*
- ✓ Report illicit discharges**
- ✓ Recycle used oil and dispose of chemicals properly. For more information on the proper disposal of wastes contact FDEP at (850) 245-8707 or visit: http://www.dep.state.fl.us/waste/categories/hwRegulation/
- ✓ Maintain proper sediment and erosion controls on your construction site

*Contact your County Agricultural Extension Office for answers to your pest and weed problems.

****Illicit Discharges**: Report any material other than stormwater being discharged into a storm drain or into the street.

County Agricultural Extension Office			
Charlotte Co.	(941) 764-4340	Highlands Co.	(863) 402-6540
Collier Co.	(239) 252-4800	Lee Co.	(239) 533-7505
DeSoto Co.	(863) 993-4846	Manatee Co.	(941) 722-4524
Glades Co.	(863) 946-0244	Okeechobee Co.	(863) 763-6469
Hardee Co.	(863) 773-2164	Polk Co.	(863) 519-8677
Hendry Co.	(863) 674-4092	Sarasota Co.	(941) 861-9900

County / FDOT Environmental Contacts	
Charlotte Co.	(941) 575-3632
Highlands Co.	(863) 402-6500
Lee County	(239) 533-9400
Manatee County	(941) 748-4501
Polk County	(863) 534-7377
Sarasota County	(941) 861-5000
FDOT Right of Way	(863) 519-2762

FDOT MAINTENANCE YARDS	
Arcadia Operations	(863) 993-4634
Bartow Operations	(863) 519-4100
Fort Myers Operations	(239) 985-7800
Labelle Operations	(863) 674-4027
Manatee Operations	(941) 708-4400
Sebring Operations	(863) 386-6104

SPILL REPORTING	
State Watch Office (Spill Report Hotline typically 25 gallons or more)	(800) 320-0519

For more information on NPDES stormwater regulations, please contact, FDOT District Maintenance, at (863) 519-2762

GENERAL COMMENT STAMPS

THE DEPARTMENT MUST BE NOTIFIED 48 HOURS IN ADVANCED OF STARTING WORK AND IF NO LANE CLOSURES ARE REQUIRED CONTACT 941-708-4400. FAILURE TO CALL MAY RESULT IN A DELAY TO BEGIN WORK.

IF A LANE CLOSURE IS WITHIN THE PROJECT LIMITS, THE PERMITTEE MUST NOTIFY THE DEPARTMENT 7 DAYS PRIOR TO A LANE CLOSURE TO ALLOW THE DEPARTMENT TO INFORM THE MOTORING PUBLIC. FAILURE TO CALL MAY RESULT IN A DELAY TO BEGIN WORK.

LANE CLOSURES AND OTHER WORK MAY BE RESTRICTED BY THE FDOT DUE TO HEAVY TRAFFIC AND POTENTIAL BACKUPS CAUSED BY THIS CONSTRUCTION. NIGHT WORK MAY BE REQUIRED.

APPLICANT IS RESPONSIBLE FOR NOTIFYING OWNERS OF ALL EXISTING AERIAL AND BURIED UTILITIES OF PROPOSED DRIVEWAY AND RESOLVING ANY CONFLICTS BEFORE CONSTRUCTION BEGINS.

IN ACCORDANCE WITH FLORIDA STATUS 335.18 PERMITTEE SHALL BE REQUIRED TO BEAR THE COST OF FUTURE ACCESS MODIFICATIONS, TRAFFIC CONTROL DEVICES OR OTHER IMPROVEMENTS, WHEN DETERMINED BY THE FLORIDA DEPARTMENT OF TRANSPORTATION TO BE IN CONJUNCTION WITH ACCEPTED ENGINEERING PRACTICES.

ALL CONSTRUCTION AND/OR MAINTENANCE ON THE DEPARTMENT'S RIGHT-OF-WAY SHALL CONFORM TO THE FEDERAL MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) THE DEPARTMENT'S ROADWAY AND TRAFFIC DESIGN STANDARDS AND BRIDGE CONSTRUCTION.

PERMITTEE/CONTRACTOR MUST WAIT 30 DAYS TO ALLOW ASPHALT FRICTION COURSE TO CURE BEFORE PLACING THERMOPLASTIC STRIPING.

ALL CONTRACTORS AND SUBCONTRACTORS SHALL BE RESPONSIBLE FOR COMPLIANCE WITH PERMITTED M.O.T. PLAN.

SOD ALL PORTIONS OF DISTURBED RIGHT-OF-WAY.

NOTE: ALL ABOVE GROUND APPURTENANCES TO BE LOCATED AT RIGHT-OF-WAY LINE.

DENSITY REPORTS ARE TO BE SUBMITTED PRIOR TO PLACEMENT OF PAVEMENT.

"PRIOR TO EXCAVATING CONTACT THE CLERK OF THE CIRCUIT COURT FOR POSSIBLE GASOLINE CONFLICT."

THE APPLICANT SHALL NOT, DURING AND AFTER COMPLETION OF PERMITTED CONSTRUCTION, INTRODUCE ANY FORM OR METHOD OF SITE DRAINAGE DISCHARGE INTO THE DRAINAGE FACILITIES ON THE DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY OR EASEMENT. ANY DISCHARGE SHALL BE IN VOILATION OF THIS PERMIT.

"PERMITTEE IS CAUTIONED THAT UTILITIES MAY BE LOCATED WITHIN THE CONSTRUCTION AREA."

IT IS THE RESPONSIBILITY OF THE PERMITTEE TO DETERMINE AND COMPLY WITH ALL COUNTY AND MUNICIPAL ORDINANCES THAT ARE RELATIVE TO THE CONSTRUCTION OR OTHER ACTIVITY DESCRIBED ON THIS PERMIT AND ARE MORE STRINGENT THAN DEPARTMENT OF TRANSPORTATION REQUIREMENTS.

N.P.D.E.S. REQUIRES THAT STORM WATER CONTROL MEASURES BE IMPLEMENTED ON ANY PROJECT ON PUBLIC TRANSPORTATION FACILITY RIGHTS-OF-WAY INCLUDING, BUT NOT LIMITED TO MEASURES DESCRIBED IN THE CURRENT F.D.O.T. STANDARD.

"IF CONSTRUCTION, RECONSTRUCTION, REPAIR OR MAINTENANCE ACTIVITY NECESSITATES THE CLOSING OF ONE OR MORE TRAVEL LANES OF ANY ROAD ON THE STATE PRIMARY, COUNTY ROAD OR CITY STREET SYSTEM, FOR A PERIOD OF TIME EXCEEDING TWO HOURS, THE PARTY PERFORMING SUCH WORK WILL BE RESPONSIBLE TO GIVE NOTICE TO THE APPROPRIATE LOCAL LAW ENFORCEMENT AGENCY WHICH HAS JURISDICTION WHERE SUCH ROAD IS LOCATED PRIOR TO COMMENCING WORK ON THIS PROJECT".

ADHERE TO SPECIAL INSTRUCTIONS IN THE CURRENT UTILITY ACCOMODATIONS MANUAL.

Kimley»Horn

February 3, 2021

Florida Department of Transportation

Re: Bradenton Beach Gravity Sewer - FDOT Permit Submittal

To whom it may concern:

The portion of the above-referenced project submitted to FDOT for review includes seven proposed close tolerance 8-inch horizontal directional drill crossing under Gulf Drive (SR 789). The 8-inch pipe will be fully restrained. The proposed drills include crossings at the following street intersections:

- Gulf Drive (SR 789) & 13th Street South: 71 LF at elevation -3.0' NAVD88
- Gulf Drive (SR 789) & 12th Street South: 61 LF at elevation -2.0' NAVD88
- Gulf Drive (SR 789) & 11th Street South: 76 LF at elevation -4.0' NAVD88
- Gulf Drive (SR 789) & 10th Street South: 80 LF at elevation -3.5' NAVD88
- Gulf Drive (SR 789) & 9th Street South: 83 LF at elevation -3.0' NAVD88
- Gulf Drive (SR 789) & 8th Street South: 78 LF at elevation -3.0' NAVD88
- Gulf Drive (SR 789) & 7th Street South: 72 LF at elevation -3.0' NAVD88

Per the *2017 Utility Accommodations Manual*, Section 3.16.9.1, if either the depth of the water table or the confining layer is established, the minimum depth should be either two (2) feet below the top of the confining layer to the top of the reamer, or two (2) feet below the water table to the top of the reamer. The estimated reamer size is 9.050-inches. In the attached Geotechnical report, Bore numbers: #01, #03, #04, #06, #07, #09, #11, #13 are located directly to the west of SR 789 and establishes the water table between elevation 0.5' and 1.5' (NAVD88).

The lowest or minimum water table elevation from the geotechnical borings is 0.5' (NAVD88). Two (2) feet below this water table elevation is -1.5' (NAVD88). The highest directional bore in the project is -2.0' (NAVD 88), which is half a foot lower than the FDOT requirement. Compliance with this requirement can be verified in the attached plan set.

Relieve holes for each horizontal direction drill will be located on the east and west shoulder of SR 789. There will be no interruption to traffic or construction in travel lanes. Following successful close tolerance horizontal direction drill, relieve holes will be filled with flowable fill and the shoulder will be milled and resurfaced to ensure restoration to in situ conditions.

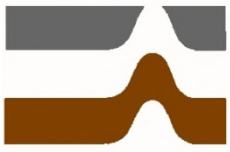
Sincerely,

KIMLEY-HORN AND ASSOCIATES, INC.

Michael Semago, P.E.
Project Manager

Approved
2021-H-194-00062
Curtis Wilt
4/6/2021

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



Ardaman & Associates, Inc.

CORPORATE HEADQUARTERS

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

Branch Office Locations

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

MEMBERS:

ASTM International
American Concrete Institute
Geoprofessional Business Association
Society of American Military Engineers
American Council of Engineering Companies

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.

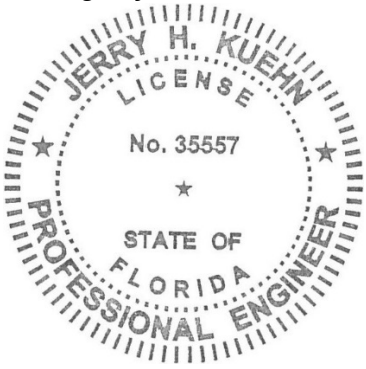
This study is based on a relatively shallow exploration and is not intended to be an evaluation for sinkhole potential. This study does not include an evaluation of the environmental (ecological or hazardous/toxic material related) condition of the site and subsurface.

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.
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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

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021

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

N

0 50 100

APPROXIMATE SCALE: 1"=100'

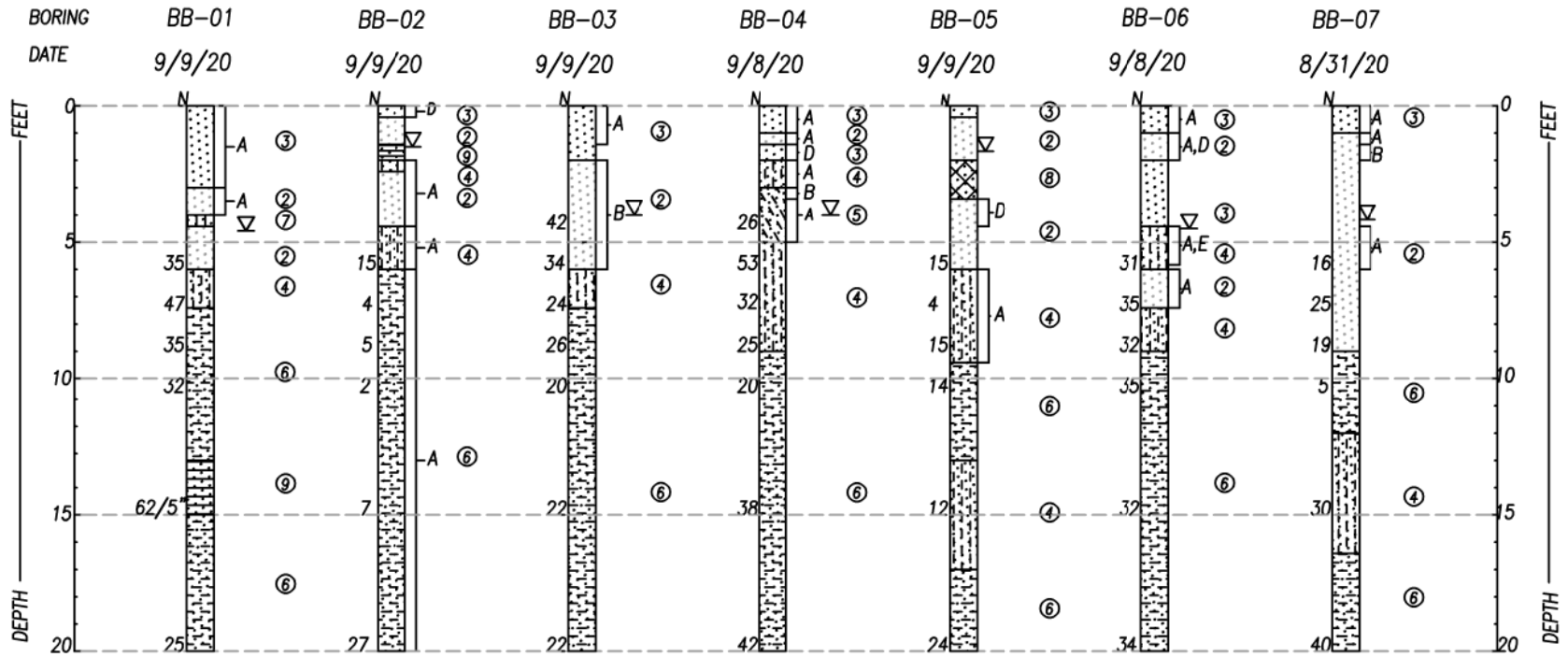
TEST LOCATION PLAN

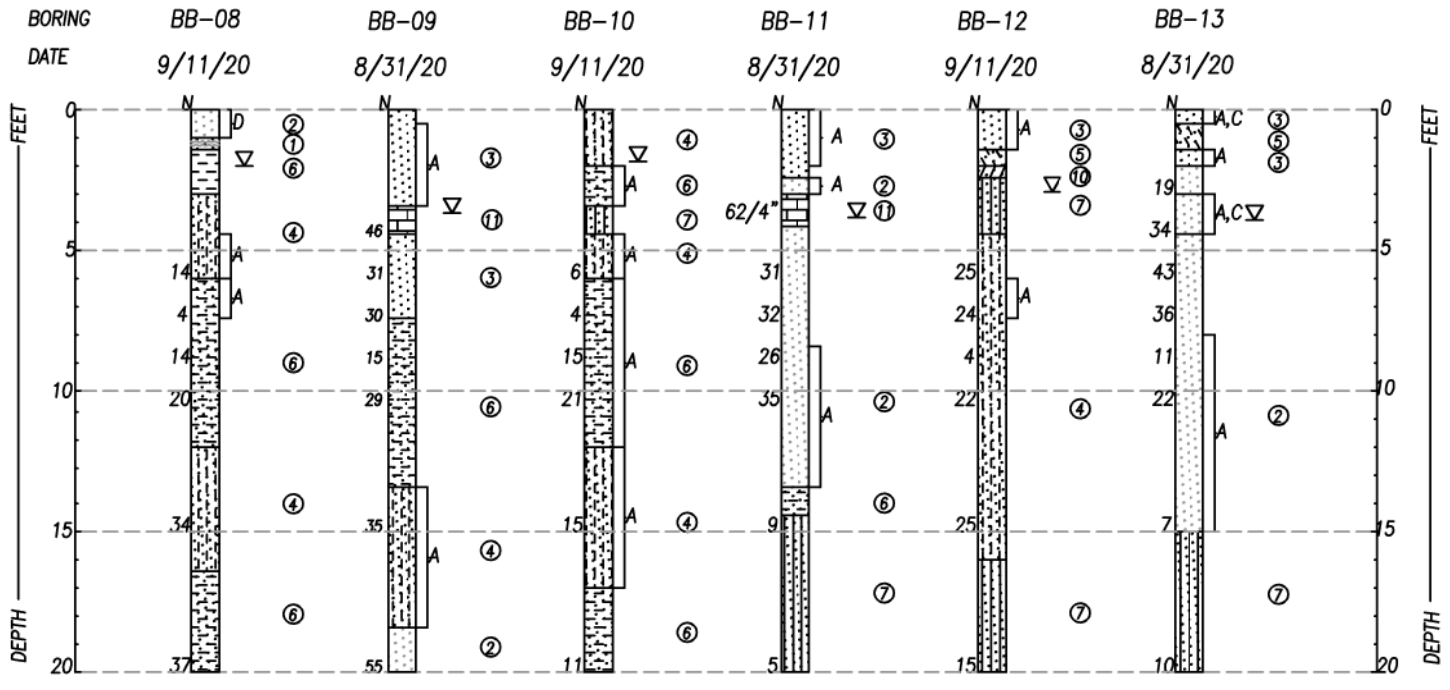
Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

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

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021





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

DRAWN BY:	CHECKED BY:	DATE:
AUR	MEM	10/1/20
FILE NO. 19–36–7257	APPROVED BY: MEM	FIGURE: 2

Approved
2021-H-194-00062
Curtis Vilt
4/6/2021