

Diane Miller

From: Michael Strader <MStrader@quible.com>
Sent: Friday, October 1, 2021 9:45 AM
To: manager@townoforiental.com
Cc: Brian Rubino; andrewcox@townoforiental.com; Cathleen Saunders
Subject: RE: P21021- Turtle Pond Culvert Replacement, Oriental

Diane,

Good morning. Appreciate your input and description of previous experienced issues with culvert pipes. We've discussed this among our engineering team and would like to offer the following input:

1. RCP pipe typically comes in 8' and up to 12' lengths. A 60' length would be very unusual and costly.
2. Our experience with joint separation is that it originates from either:
 - a. Poor subgrade
 - b. Poor pipe bedding
 - c. Poor pipe installation, including joint installation
3. If occurrence of issues is particularly during or after large storm events, it is likely due to lack of endwalls/headwalls to keep the pipe in place. When flood waters overtake the pipe, pipe sections can get shifted loose if no endwalls help hold sections together.
4. Upon further research, we're not aware of restrained joints for RCP piping. However, some municipalities have paid for additional conseal sealant to help keep joints watertight. We could consider adding exterior joint wrap or discuss with conseal about specifying an elastomer sealant for this application.
5. Please recognize that the drainage improvement plans do specify establishing a compacted subgrade, proper pipe bedding and haunching, select backfill, headwall, and endwall (where no endwall currently exists).
6. We believe that also incorporating exterior joint wrapping and/or conseal sealant would provide a solid pipe replacement project.

Hopefully this helps explain some but we are certainly open to more ideas and input. We'll reach out to Katy at Barnhill again as well.

Respectfully,

Michael W. Strader, Jr., P.E.
Director of Engineering
Quible & Associates, P.C.
8466 Caratoke Highway, Bldg 400
Powells Point, NC 27966
P.O. Drawer 870
Kitty Hawk, NC 27949
t 252.491.8147
f 252.491.8146
m 252.207.6751
www.quible.com



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From: Diane Miller <manager@townoforiental.com>
Sent: Friday, October 1, 2021 8:35 AM
To: Michael Strader <MStrader@quible.com>
Cc: Brian Rubino <brubino@quible.com>; andrewcox@townoforiental.com
Subject: RE: P21021- Turtle Pond Culvert Replacement, Oriental

Good Morning,

Thank you so much for this information and drawings. WRT RCP pipe, it has been our experience that separation of the pipes during extreme water events has contributed significantly to the erosion of the substrate to several of our roads. Is it possible to have a RCP pipe that is the entire length needed? The joints are where we have had issues, as well as the underlayment (for lack of the proper term) of the pipe itself. That particular site usually takes the brunt of the storms.

Thanks,
D.

Diane H. Miller, MPA, ICMA-CM

*Town Manager
Town of Oriental, NC
507 Church St PO Box 472
Oriental, NC 28571
Ph: 252.249.0555*

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From: Michael Strader [<mailto:MStrader@quible.com>]
Sent: Thursday, September 30, 2021 5:22 PM
To: manager@townoforiental.com
Cc: Brian Rubino
Subject: RE: P21021- Turtle Pond Culvert Replacement, Oriental

Diane,

Good afternoon. Please find the attached pdf containing a copy of our Drainage Improvement Plans for the John Bond Town Beach (according to Google Maps) culvert replacement project for review.

After much deliberation and consideration of precast box culvert versus multiple circular culvert replacement, we propose replacement of the existing single 40" diameter culvert with two 42" diameter RCP culvert pipes and associated endwalls. We did reach out to Katy Oliver at Barnhill Contracting Company to discuss pertinent materials and sourcing but were informed that Barnhill doesn't self-perform rather subcontract out that portion of work. We never heard back but we've proceeded with this approach as materials and sourcing of the proposed RCP culvert pipes should not be an issue. We're actually getting more capacity through the

dual 42" diameter pipes than if we went with 3.5' height x 8' width concrete box culverting, and installation of the dual circular pipes should be much more economical than installing a large box culvert.

We have also been in discussions with WaPro regarding the installation of WaStop in-line check valves on the downstream end of the proposed 42" diameter culvert pipes. Given the anticipated costs of these WaStop in-line check valves, we've only included these as a bid additive item for the Town's consideration. We would be glad to provide further input and documentation on these check valves if the Town wishes to consider. We have attached a budgetary equipment cost for reference. If these are not installed at this time, it is still something that the Town could consider in the future, given the proposed design.

Brian Rubino may be able to speak to the proposed bulkheading and grading of the tributary. As you can see, we've proposed removal of the existing tree on the south side and relocation of the two trees on the north side.

Please review and feel free to utilize for budgetary estimating.

Respectfully,

Michael W. Strader, Jr., P.E.
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From: Katy Oliver <koliver@barnhillcontracting.com>
Sent: Tuesday, August 31, 2021 1:39 PM
To: Michael Strader <MStrader@quible.com>
Cc: Brian Rubino <brubino@quible.com>
Subject: RE: P21021- Turtle Pond Culvert Replacement, Oriental

Hi, Michael! We do not actually perform this type of work in-house. I have reached out to one of my co-workers for information on who to contact for this.

As soon as I hear back, I will forward that information to you.

Thanks!

Katy Oliver, Project Manager/Estimator



Estimate

Estimate# EST-3742

Bill To
Quible & Associates
P.O. Drawer 870
Kitty Hawk 27949, NC
USA

Estimate Date : August 31, 2021
Expiry Date : September 30, 2021
Reference# : Mike Strader
Sales person : Charlie Sullivan

Ship To
8466 Caratoke Highway, Bldg. 400
Powells Point 27966
USA

Subject :
42-inch WaStops for Oriental, North Carolina

Accepted By Accepted Date

#	Model	Qty	Rate	Amount
1	WS1040-S3-316 WaStop NPS 42" S Ser. Std SS316 - INCLUDES STANDARD MOUNTING TABS - REFER TO ATTACHED DRAWING	2	27,352.00	54,704.00
2	STANDARD GROUND FREIGHT	1	500.00	500.00
Items in Total 3			Sub Total	55,204.00
			Total	\$55,204.00

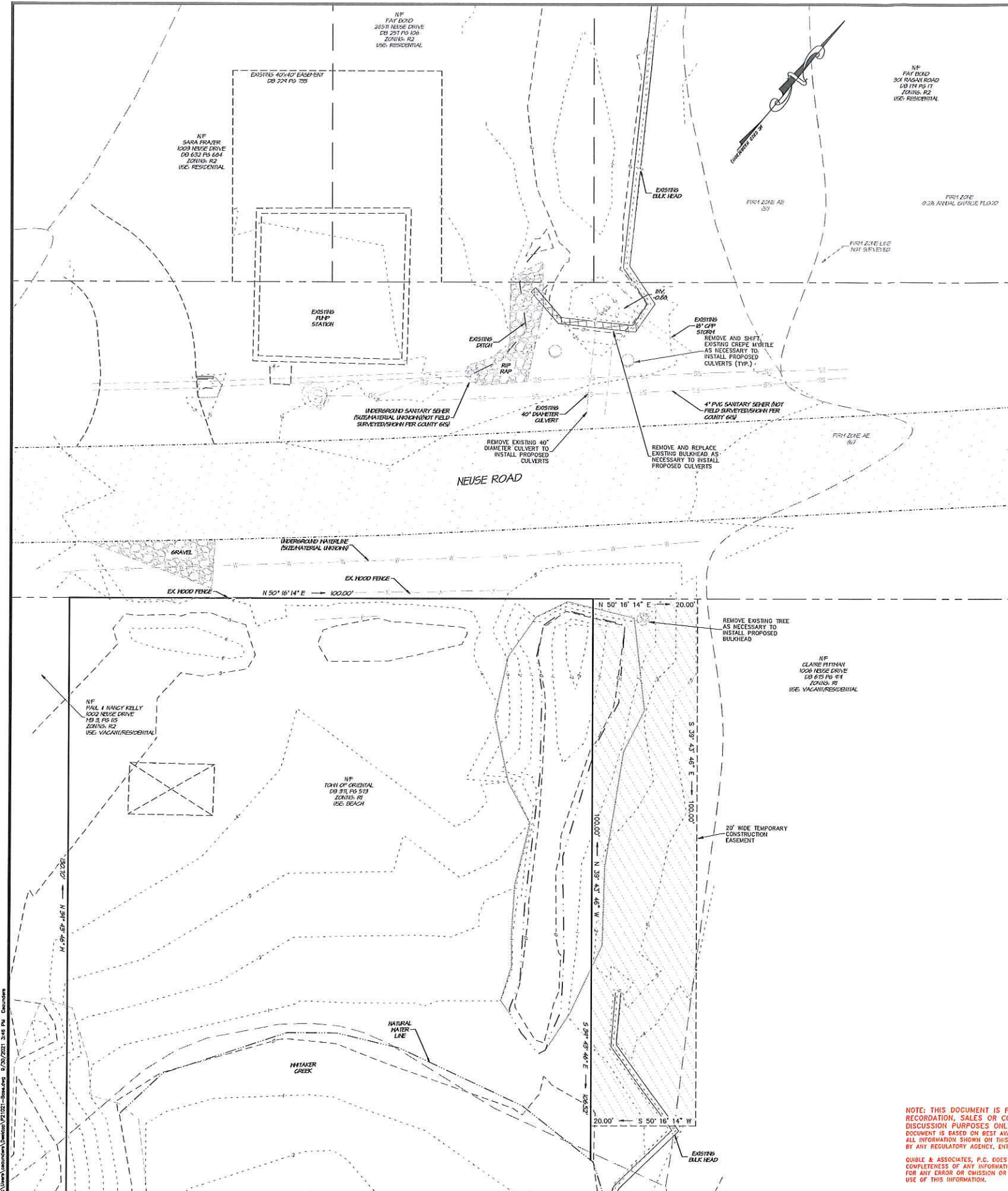
Notes

Thank you for your inquiry. Looking forward to working with you.

Send check payment to
Wapro Inc
Suite 1950
150 N. Michigan Ave.
Chicago, IL 60601

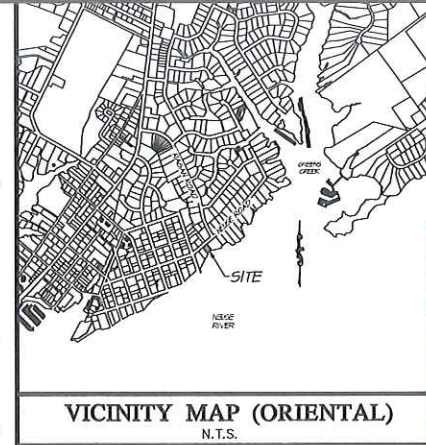
Wire Payment Information
JP Morgan Chase Bank
Routing Number: 071000013
Account Number: 974331928

Terms & Conditions



- LEGEND**
- EXISTING ASPHALT PAVEMENT
 - EXISTING CONCRETE
 - EXISTING GRAVEL
 - PROPOSED DEMOLITION
 - EX. IRON ROD
 - EX. DRILL HOLE
 - EX. MAG NAIL
 - EX. UTILITY POLE
 - EX. FIRE HYDRANT
 - EX. WATER VALVE
 - EX. SEWER MANHOLE
 - EX. WATER METER
 - EX. ELECTRICAL CONNECTION
 - EX. EXTERIOR LIGHT
 - EX. LIGHT POLE
 - EXISTING CONTOUR
 - EXISTING SPOT GRADE

- NOTES:**
- CURRENT OWNERS: TOWN OF ORIENTAL, P.O. BOX 472, ORIENTAL, NC 28571
 - PIN: 6497-1298-43000
 - FIG: J082-442
 - PROPERTY ADDRESS: NEUSE DRIVE ORIENTAL, NC 28571
 - SUBJECT REFERENCES: DB 371, P0573
 - FIELD SURVEY DATE: 6/08/2021
 - HORIZONTAL DATUM IS NAD83(2011), VERTICAL DATUM IS NAVD 1988, DERIVED FROM NC GNSS RTN.
 - ALL DISTANCES ARE US SURVEY FEET AND HORIZONTAL GROUND.
 - PROPERTY IS LOCATED IN NFIP FLOOD ZONES AS SHOWN AND SUBJECT TO CHANGES BASED ON COMMUNITY CD NO. 370279; PANEL 6486; SUFFIX K. (MAP NUMBER 372094800K) EFFECTIVE DATE: 06/19/2020
 - THIS PLAN SUBJECT TO ANY FACTS, INCLUDING BUILDING SETBACK RESTRICTIONS, EASEMENTS, COVENANTS, ETC., THAT MAY BE REVEALED BY A FULL AND ACCURATE TITLE SEARCH.
 - ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THESE DRAWINGS, THE LATEST EDITION OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (DOT) ROADWAY STANDARD DRAWINGS AND SPECIFICATIONS, FEDERAL AND LOCAL REGULATIONS.
 - CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION. THE LOCATION, DIMENSIONS, AND ELEVATION OF EXISTING STRUCTURES, PIPES, AND UTILITIES SHOWN ARE BASED ON THE BEST AVAILABLE DATA AND ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ALL DATA IN THE FIELD PRIOR TO CONSTRUCTION TO HIS OWN SATISFACTION. THE DIAMETERS OF EXISTING PIPES ARE APPROXIMATE AND SHALL BE VERIFIED PRIOR TO PERFORMING FINAL CONNECTIONS. THE CONTRACTOR SHALL PERFORM ANY TEST PIT WORK OR PROVIDE LOCATION SERVICES AS REQUIRED TO AVOID CONFLICTS WITH EXISTING UTILITIES. CONTACT NORTH CAROLINA ONE-CALL AT TELEPHONE NO. 1-800-632-4949, 48 HOURS PRIOR TO PERFORMING ANY EXCAVATION TO HAVE UTILITIES MARKED.
 - VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE CONSTRUCTED AND MAINTAINED FOR ALL DISTURBED AREAS IN ACCORDANCE WITH ALL LOCAL REQUIREMENTS AND THE LATEST EDITION OF THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL. ALL EROSION AND SEDIMENTATION CONTROL DEVICES SHALL BE INSTALLED AS A FIRST STEP IN CONSTRUCTION AND BEFORE EXCAVATION BEGINS.
 - ANY WORK ON ADJACENT PROPERTIES MUST BE COORDINATED WITH THE OWNER OF THAT PROPERTY. ALL TEMPORARY CONSTRUCTION EASEMENTS OR AGREEMENTS MUST BE OBTAINED PRIOR TO WORK ON ADJACENT PROPERTIES.
 - CONTRACTOR SHALL ACHIEVE COMPLETE STABILIZATION OF ALL DISTURBED AREAS.



- DEMOLITION NOTES:**
- CONTRACTOR SHALL LOCATE EXISTING UNDERGROUND SERVICES - TO INCLUDE BUT NOT LIMITED TO ELECTRIC, CABLE, TELEPHONE, GAS, SANITARY SEWER AND WATER - AND SHALL COORDINATE PROPER PROTECTION AND/OR RELOCATE WITH APPROPRIATE OWNER/UTILITY COMPANY.
 - CONTRACTOR SHALL WALK THE SITE AND BE FAMILIAR WITH THE SCOPE OF DEMOLITION REQUIRED. ALL DEMOLITION WORK REQUIRED TO CONSTRUCT NEW IMPROVEMENTS WILL BE PERFORMED BY THE CONTRACTOR AND BE UNCLASSIFIED EXCAVATION.
 - DEMOLITION SHALL INCLUDE BUT IS NOT LIMITED TO THE EXCAVATION, HAULING AND OFFSITE DISPOSAL OF EXISTING CURBS AND CUTTERS, BITUMINOUS CONCRETE PAVEMENTS AND ALL MATERIALS OR VEGETATION CLEARED AND STRIPPED TO THE EXTENT NECESSARY FOR THE INSTALLATION OF NEW IMPROVEMENTS AND WITHIN THE LIMITS OF CLEARING AND GRADING, COORDINATE WITH APPROPRIATE DRAWINGS.
 - THE CONTRACTOR SHALL PROTECT ALL PROPERTY AND STRUCTURES AND UTILITIES ON THE PROPERTY NOT TO BE DEMOLISHED. DAMAGE TO THE PROPERTY DUE TO THE CONTRACTOR'S ACTIVITIES SHALL BE REPLACED IN KIND BY THE CONTRACTOR AT NO COST TO THE OWNER.
 - ALL EXISTING IMPROVEMENTS INDICATED OR REQUIRED TO BE DEMOLISHED SHALL INCLUDE REMOVAL FROM PROJECT AREA.
 - THE CONTRACTOR SHALL PRODUCE A PHOTOGRAPHIC RECORD OF DEVELOPMENT COMMENCING WITH A RECORD OF THE SITE AS IT APPEARS BEFORE DEMOLITION IS BEGUN. AFTERWARDS A PHOTOGRAPHIC RECORD SHALL BE MAINTAINED DURING THE CONSTRUCTION PROCESS.
 - EXISTING PAVEMENT, CURB AND CUTTER, LIGHTS, FENCES, TREE/VEGETATION AND UTILITIES NOT INTENDED FOR DEMOLITION SHALL BE MAINTAINED, PROTECTED, AND UNDISTURBED DURING DEMOLITION. CONTRACTOR SHALL COORDINATE THE REMOVAL OF BITUMINOUS CONCRETE PAVEMENTS AND CURB AND CUTTER WITH THE SITE PLAN.
 - SMOOTH SAW CUT OF EXISTING PAVEMENTS, CURBS AND CURBS AND FUTTERS TO BE DEMOLISHED SHALL BE PROVIDED.
 - ALL DEMOLITION WORK SHALL BE DONE IN STRICT ACCORDANCE WITH FEDERAL, STATE AND LOCAL LAWS AS WELL AS OSHA REGULATIONS.
 - CONTRACTOR'S ACTIVITIES SHALL NOT IMPEDE USAGE OR INGRESS/EGRESS TO ADJACENT PROPERTIES. COORDINATE WITH OWNER MAINTENANCE OF TRAFFIC/PEDESTRIAN CIRCULATION DURING CONSTRUCTION.
 - MAINTAIN POSITIVE DRAINAGE AWAY FROM BUILDINGS AT ALL TIMES DURING DEMOLITION.

PERMANENT VEGETATION

SEED MIXTURE	APPLICATION RATES/ACRE
REBEL II FESCUE	130 LBS.
COMMON BERMUDA 'SAHARA' (HULLED)	215 LBS.

SEEDING DATES: APRIL 1 - AUGUST 31

SEED MIXTURE	APPLICATION RATES/ACRE
REBEL II FESCUE	250 LBS.
COMMON BERMUDA 'SAHARA' (UNHULLED)	215 LBS.

SEEDING DATES: SEPT. 1 - MARCH 31

TEMPORARY VEGETATION

SEED MIXTURE	APPLICATION RATES/ACRE
RYE GRASS	120 LBS.

SEEDING DATES: APRIL 16 - AUG. 15

SEED MIXTURE	APPLICATION RATES/ACRE
GERMAN MILLET	40 LBS.

SEEDING SPECIFICATIONS

SEEDBED PREPARATION: LOOSEN SOILS TO A DEPTH OF 6-8 INCHES USING A RIPPER, HARROW, OR CHISEL PLOW. BREAK UP CLODS. REMOVE UNACCEPTABLE GROWTH (STICKS, ROOTS), STONES (>3"), AND OTHER MATERIALS, AND WORK THE TOP 3-4 INCHES OF THE SOIL INTO A SEEDBED. THE AREA TO BE SEEDBED SHALL BE RE-COMPACTED UTILIZING A CULTIPACKER ROLLER AND A SMOOTH EVEN SOIL SURFACE WITH A LOOSE, UNIFORMLY FINE TEXTURE SHALL BE THE FINISHED GRADE.

SOIL AMENDMENTS: OBTAIN A SOIL TEST TO DETERMINE APPLICATION RATES AND FOLLOW RECOMMENDATIONS OF SOIL TESTS. WHEN A SOIL TEST IS NOT POSSIBLE, APPLY 3,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10-10-10 STARTER FERTILIZER.

MULCHING: APPLY 4,000 LB/ACRE GRAH STRAW OR EQUIVALENT COVER OF ANOTHER SUITABLE MULCH. ANCHOR STRAW BY TACKLING WITH ASPHALT, NETTING, ROPING OR BY CRIMPING WITH A MULCH ANCHORING TOOL.

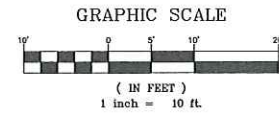
MAINTENANCE: SATISFACTORY STABILIZATION AND EROSION CONTROL REQUIRES A COMPLETE VEGETATIVE COVER. EVEN SMALL BREACHES IN VEGETATIVE COVER CAN EXPAND RAPIDLY AND, IF LEFT UNATTENDED, CAN ALLOW SERIOUS SOIL LOSS FROM AN OTHERWISE STABLE SURFACE. A SINGLE HEAVY RAIN IS OFTEN SUFFICIENT TO GREATLY ENLARGE BARE SPOTS, AND THE LONGER REPAIRS ARE DELAYED, THE MORE COSTLY THEY BECOME. PROMPT ACTION WILL KEEP SEDIMENT LOSS AND REPAIR COST DOWN. NEW SEEDINGS SHOULD BE INSPECTED FREQUENTLY AND MAINTENANCE PERFORMED AS NEEDED. IF HILLS AND GULLIES DEVELOP, THEY MUST BE FILLED IN, RE-SEED, AND MULCHED AS SOON AS POSSIBLE. DIVERSIONS MAY BE NEEDED UNTIL NEW PLANTS TAKE HOLD.

MAINTENANCE REQUIREMENTS EXTEND BEYOND THE SEEDING PHASE. (COMPLETE VEGETATIVE COVER IS REQUIRED REGARDLESS OF COUNTY ISSUANCE OF A CERTIFICATE OF OCCUPANCY AND FINAL PAYMENT WILL NOT BE AWARDED UNTIL COMPLETE ESTABLISHMENT OF VEGETATIVE COVER.) WEAK OR DAMAGED SPOTS MUST BE RELIEVED, FERTILIZED, MULCHED, AND RESEED AS PROMPTLY AS POSSIBLE. REFERTILIZATION MAY BE NEEDED TO MAINTAIN PRODUCTIVE STANDS.

- SHEET INDEX**
- 1 EXISTING CONDITIONS/DEMOLITION PLAN
 - 2 DRAINAGE IMPROVEMENT PLAN



NOTE: THE DATA GIVEN ON THESE PLANS IS BELIEVED TO BE ACCURATE, BUT THE ACCURACY IS NOT GUARANTEED. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL LEVELS, LOCATIONS, TYPES, AND DIMENSIONS OF THE EXISTING UTILITIES PRIOR TO CONSTRUCTION. IF A DISCREPANCY IS FOUND, WORK SHALL CEASE AND THE ENGINEER NOTIFIED. WORK MAY CONTINUE UPON ENGINEERS NOTICE TO PROCEED.



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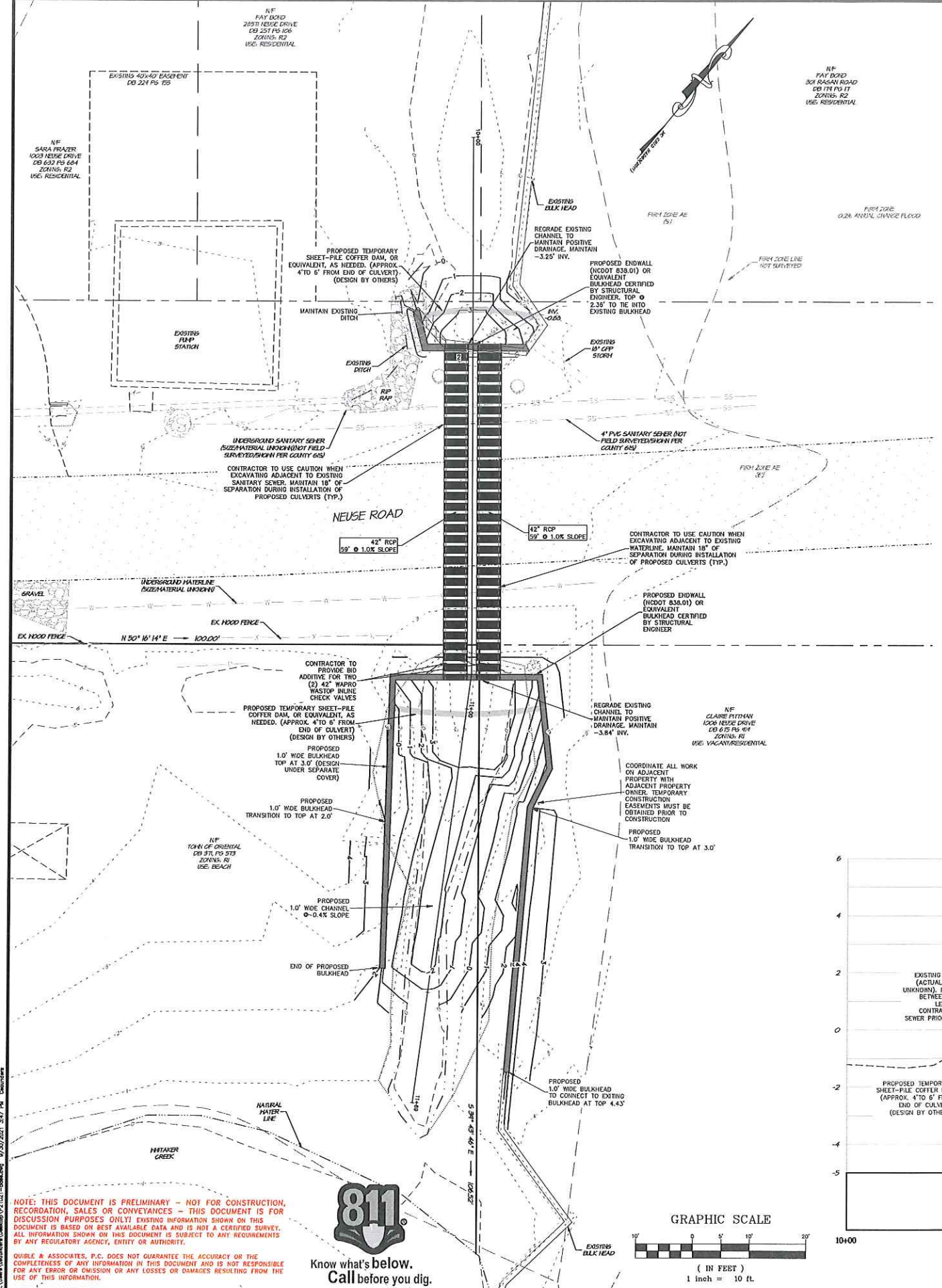
NC Drawing: C-0028
Quible & Associates, P.C.
 SINCE 1929
 PLANNING • CONSULTING • SURVEYING
 ENGINEERING • ENVIRONMENTAL SCIENCES • SURVEYING
 1000 NEUSE DRIVE, SUITE 100, ORIENTAL, NC 28571
 252.776.2786
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 252.776.2791
 252.776.2792
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 252.776.2797
 252.776.2798
 252.776.2799

NO.	DATE	REVISIONS

EXISTING CONDITIONS/DEMOLITION PLAN
JOHN BOND TOWN BEACH
PUBLIC BEACH ACCESS

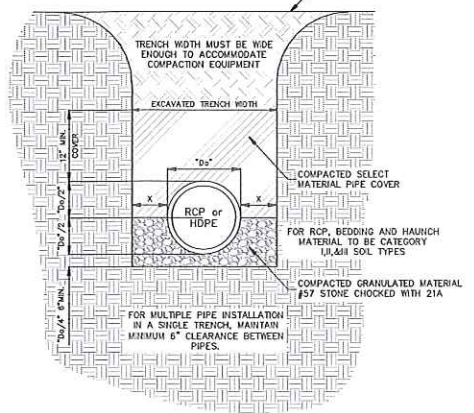
ORIENTAL TOWNSHIP
 PAULICO
 NORTH CAROLINA

PROJECT NO. P21021
 DESIGNED BY JJC
 DRAWN BY JJC
 CHECKED BY MWS
 ISSUE DATE 09/30/21
 SHEET NO. 1 OF 2 SHEETS

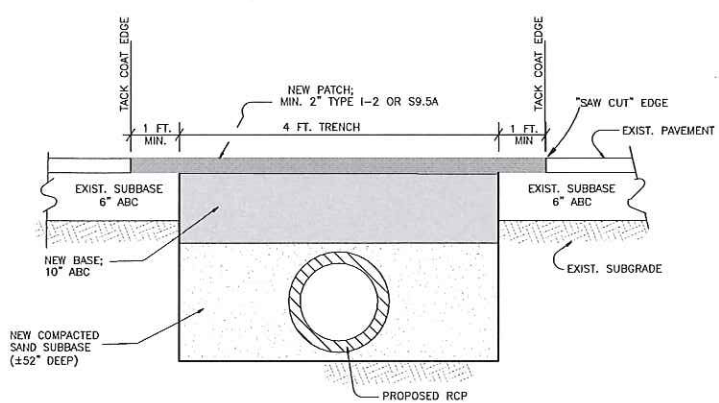


RCP PIPE		HDPE PIPE	
DIA. "D"	"X"	DIA. "D"	"X"
0" - 24"	0"	4" - 6"	6.5"
27" - 36"	12"	8" - 12"	9"
42" - 72"	15"		

NOTES:
 1. SELECT MATERIAL PIPE COVER SHALL BE 12" (MINIMUM) DEEP OVER TOP OF PIPE.
 2. SELECT MATERIAL BACKFILL SHALL BE CBR 20 COMPACTED TO 95% DENSITY. BACKFILL COMPACTED IN 12" LIFTS.



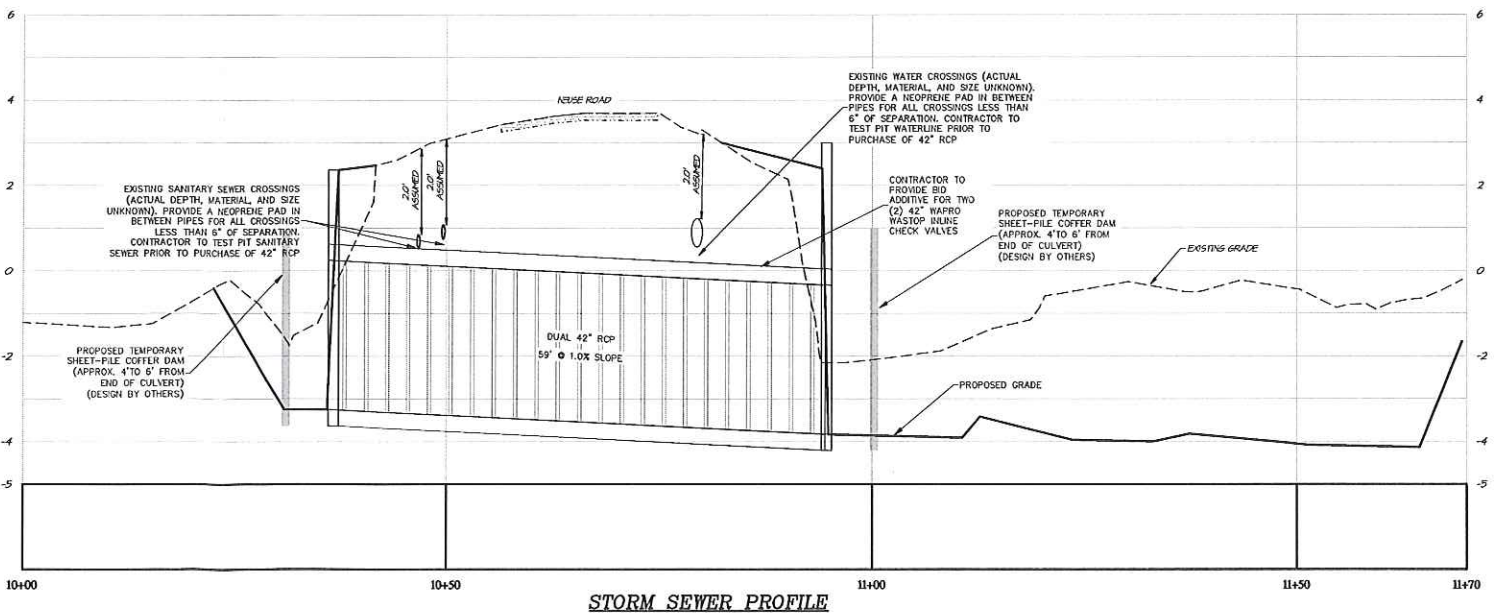
STORM TRENCH DETAIL
N.T.S.



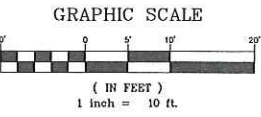
"SAW CUT" CONSTRUCTION/PATCH DETAIL
N.T.S.

NOTE: COMPACT BACKFILL IN 6" LAYERS TO 85% OF THE MAXIMUM DENSITY AS DETERMINED BY AASHTO METHOD T-99

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STORM SEWER PROFILE
 HORIZONTAL: 1"=10'
 VERTICAL: 1"=2'
 (EXAGGERATED 5 TIMES)



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LEGEND

- EXISTING ASPHALT PAVEMENT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EX. IRON ROD
- EX. DRILL HOLE
- EX. MAG NAIL
- EX. UTILITY POLE
- EX. FIRE HYDRANT
- EX. WATER VALVE
- EX. SEWER MANHOLE
- EX. WATER METER
- EX. ELECTRICAL CONNECTION
- EX. EXTERIOR LIGHT
- EX. LIGHT POLE
- EXISTING CONTOUR
- EXISTING SPOT GRADE
- PROPOSED STORM PIPE
- PROPOSED SWALE
- PROPOSED CONTOUR
- PROPOSED SPOT GRADE (TOP OF ASPHALT & FLOW LINE) (UNLESS OTHERWISE NOTED)

NOTES:

1. CURRENT OWNERS: TOWN OF ORIENTAL, P.O. BOX 472, ORIENTAL, NC 28571
2. PIN: 6497-1298-43000
3. PID: J082-442
4. PROPERTY ADDRESS: NEUSE DRIVE ORIENTAL, NC 28571
5. SUBJECT REFERENCES: DB 371, PG573.
6. FIELD SURVEY DATE: 6/08/2021
7. HORIZONTAL DATUM IS NAD83(2011), VERTICAL DATUM IS NAVD 1988, DERIVED FROM NC CLASS B.M.
8. ALL DISTANCES ARE US SURVEY FEET AND HORIZONTAL GROUND.
9. PROPERTY IS LOCATED IN NFIP FLOOD ZONES AS SHOWN AND SUBJECT TO CHANGES BASED ON COMMUNITY CD NO. 370278, PANEL 6486, SUFFIX K, (MAP NUMBER 3720648600K) EFFECTIVE DATE: 06/19/2020
10. THIS PLAN SUBJECT TO ANY FACTS, INCLUDING BUILDING SETBACK RESTRICTIONS, EASEMENTS, COVENANTS, ETC., THAT MAY BE REVEALED BY A FULL AND ACCURATE TITLE SEARCH.
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15. CONTRACTOR SHALL ACHIEVE COMPLETE STABILIZATION OF ALL DISTURBED AREAS.

NC License# C-0028
 SINCE 1929

Quible & Associates, P.C.
 ENGINEERING • PLANNING
 ENVIRONMENTAL SCIENCES • SURVEYING

P.O. BOX 27948
 RALEIGH, NC 27611
 TEL: 919-873-4141
 FAX: 919-873-4142
 www.quibleandassociates.com

DRAINAGE IMPROVEMENT PLAN

JOHN BOND TOWN BEACH
PUBLIC BEACH ACCESS

PAMLICO
 ORIENTAL TOWNSHIP
 NORTH CAROLINA

NO.	DATE	REVISIONS

PROJECT NO. **P21021**

DESIGNED BY **JJC**

DRAWN BY **JJC**

CHECKED BY **MWS**

ISSUE DATE **09/30/21**

SHEET NO.
2
 OF 2 SHEETS