Corolla Construction, Inc.

520 Old Stoney Road, Unit J
Corolla, NC 27927
(252) 267-6677 Fax (252) 453-0291
Email: sollifeeast@yahoo.com
NC Unlimited Unclassified General Contractor #64628

1/24/24

Attn: M. Strader
Quible and Associates, P.C.
8466 Caratoke Hwy
Powells Point, NC 27966

Re: Phase 8a Section 2b Bonded Items

Description

The following items will be cash bonded with Currituck County:

$2,635.00	31 Trees x $85/each
$17,102.83	Future asphalt top coat
$19,737.83	Total

Thank you,

Michael Cherry
President

Currituck County
Planning & Inspections Department
153 Courthouse Road, Suite 110
Currituck, North Carolina 27929
252-232-3055
FAX 252-232-3026

MEMORANDUM

TO: Finance Department

FROM: Jason Litteral, Planner II (via Jennie Turner)

DATE: January 25, 2024

SUBJECT: $22,698.50 – Currituck Club, Phase 8A, Section 2B

Please find enclosed Check Number 3431 to guarantee the street asphalt topcoat and street tree installation.

Once the work is complete, funds shall be returned to:

Corolla Construction Inc
520 Old Stoney Rd Unit J
Corolla, NC 27927

This check should go into the bond account.

Please provide a receipt at your earliest convenience. Thank you.

Prepared by and return to:

Wyatt M. Booth, Esq.
Williams Mullen
301 Fayetteville St, Suite 1700
Raleigh, NC 27601

SUPPLEMENTAL DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS

THE CURRITUCK CLUB

for

PHASE 8A, SECTION 2B

THIS SUPPLEMENTAL DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS for Phase 8A, Section 2B, The Currituck Club ("**Supplemental Declaration**") is made this the ____ day of January, 2024 by THE CURRITUCK ASSOCIATES – RESIDENTIAL LLC, a North Carolina limited liability company, successor by conversion to THE CURRITUCK ASSOCIATES – RESIDENTIAL PARTNERSHIP ("**Declarant**"), having address P.O. Box 1908, Rocky Mount, NC 27802-1908.

RECITALS:

R1. Declarant is the developer of The Currituck Club which development has been governed by that Declaration of Covenants, Conditions and Restrictions of August 31, 1995 recorded in Book 377, Page 281 of the Currituck County Registry, and as amended by the following supplementary filings: Book 381, Page 468; Book 388, Page 569; Book 396, Page 639; Book 412, Page 378; Book 416, Page 807; Book 501, Page 148; Book 542, Page 23; Book 586, Page 228; Book 600, Page 832; Book 620, Page 923; Book 632, Page 507; Book 724, Pages 50-51; Book 724, Page 821; Book 737, Page 785; Book 756, Page 901; Book 809, Pages 585-592; Book 966, Page 479; Book 981, Page 510; Book 1124, Page 196; Book 1173, Page 634; Book 1174, Page 528; Book 1183, Page 544; Book 1245, Page 665; Book 1245, Page 671; Book 1314, Page 278; Book 1314, Page 293; Book 1462, Page 573; Book 1532, Page 177, and Book 1720,

Page 664, the initial declaration and all previous supplements and amendments being hereinafter referred to as the "**Declaration**".

R2. Declarant is the owner of the real property described on **Exhibit "A"** attached hereto and incorporated by reference ("**Additional Property**").

R3. Pursuant to Article One, Section 2 of the Declaration, Declarant has the right to bring within the scheme and operation of the Declaration all or any portions of the real property described in Exhibit "B" to the Declaration.

R4. The Additional Property constitutes a portion of the real property described in Exhibit "B" to the Declaration.

R5. Declarant desires to bring the Additional Property within the scheme and operation of the Declaration and to subject the Additional Property to all of the terms, covenants, conditions and restrictions of the Declaration, subject to exceptions provided in this Supplemental Declaration unique to the developmental concept of the Additional Property.

NOW, THEREFORE, the Declarant hereby declares that, except as provided otherwise herein, the Additional Property is and shall be held, transferred, sold, conveyed and occupied subject to and together with the terms, conditions and provisions of the covenants, conditions, restrictions, easements, charges and liens set forth in the Declaration, and that the Additional Property shall constitute and be a part of "The Properties" as that term is defined and provided for in the Declaration.

1. Architectural Control. All references within Article Four and Article Five of the Declaration, or any other provision of the Declaration or Bylaws referring to the Architectural Control Committee ("**Committee**") shall, for purposes of this Supplemental Declaration, mean and refer to the Declarant who shall have all architectural review power and authority assigned to the Committee in the Declaration. In its discretion, the Declarant may exercise its architectural review power and authority through an Architectural Review Board ("**ARB**"), the size and membership of which shall be in the absolute and sole discretion of the Declarant. Architectural design and dimensional guidelines for Phase 8A shall be as established by the Declarant and/or the ARB.

2. Setbacks. For purposes of this Supplemental Declaration and as it applies to the Additional Property, Section 2 of Article Four of the Declaration is modified to provide that setbacks shall be twenty-two (22) feet from the front Lot lines, ten (10) feet from the rear Lot lines, and zero (0) feet from the side Lot lines. There shall be twenty (20) feet of separation required between principal structures, measured wall to wall.

3. Rights Reserved to Declarant. Notwithstanding the provisions of Article Five of the Declaration, the following provisions shall apply to the Additional Property:

a. Section 4 of Article Five of the Declaration is modified to provide that the Declarant reserves unto itself, its successors and assigns, a perpetual alienable and releasable

easement and right on, over, and under the Additional Property to erect, maintain, and use water, irrigation, electric, gas, telephone, sewage, television cables, and any other utility lines and conduits for the purpose of bringing public or private utility services, at this time known or unknown, to the Additional Property on, in, under or over the streets or roads and on, in, under or over any Lot within an area that is within ten (10) feet of any front or rear Lot line and within five (5) feet of any side Lot line, and such other easement and utility areas as may be designated on any recorded plats of the Additional Property;

b. The requirement in Section 17 of Article Five of the Declaration requiring an enclosed garage for two cars shall not be applicable to the Additional Property;

c. The lot coverage requirement in Section 22 of Article Five of the Declaration is modified to conform to guidelines set by the Declarant in compliance with the Currituck County Unified Development Ordinance.

d. Sections 26 and 28 of Article Five of the Declaration shall not be applicable to the Additional Property;

4. The architectural review power and authority of the Declarant and ARB established by this Supplemental Declaration with respect to the Additional Property shall remain in full force and effect unless and until relinquished by the Declarant in a subsequent filing.

Except as hereby supplemented, the Declaration shall remain in full force and effect in accordance with the covenants, conditions, restrictions, terms and provisions therein.

[SIGNATURE PAGE FOLLOWS]

SIGNATURE PAGE TO SUPPLEMENTAL DECLARATION – Phase 8A, Section 2B

IN WITNESS WHEREOF, the Declarant has caused this Supplemental Declaration to be duly executed under seal as of the date first written above.

DECLARANT:

THE CURRITUCK ASSOCIATES – RESIDENTIAL LLC,
a North Carolina limited liability company,

By: Boddie-Noell Enterprises, Inc., a North Carolina corporation
Its: Managing Member

By:_____(SEAL)
Douglas E. Anderson
Its: Executive Vice President

STATE OF NORTH CAROLINA
COUNTY OF _____

I, _____, a Notary Public of the County and State aforesaid, certify that Douglas E. Anderson personally came before me this day and acknowledged that he is the Executive Vice President of Boddie-Noell Enterprises, Inc., a North Carolina corporation, which is the Managing Member of The Currituck Associates – Residential Partnership LLC, a North Carolina limited liability company, and that by authority duly given and as the act of the partnership, the foregoing instrument was signed in its name by him as Executive Vice President of its Managing Member.

Witness my hand and official stamp or seal, this the _____ day of January, 2024.

Official Signature: _____

Print or Type Name: _____

My Commission Expires: _____/_____/_____

(Official Seal or Stamp)

EXHIBIT A

LEGAL DESCRIPTION FOR PHASE 8A, SECTION 2B

Being Lots 431 through 436, inclusive, and Lots 444 through 447, inclusive, as shown and delineated on that certain plat entitled "Final Plat, The Currituck Club, Phase 8A, Section 2B, Poplar Branch Township, Currituck County, North Carolina" dated January ___, 2024 and prepared by John M. Hurdle, P.L.S. of Quible & Associates, P.C. and recorded on January ____, 2024 at Plat Cabinet ____, Slides ____ and ____, in the office of the Register of Deeds of Currituck County, North Carolina.

Subdivider Maintenance Responsibility and Reserve Fund Creation

Affidavit

Contact Information

Currituck County
Planning and Community Development
153 Courthouse Road, Suite 110
Currituck, NC 27929

Phone: 252.232.3055
Fax: 252.232.3026

Website: http://www.co.currituck.nc.us/planning-community-development.cfm

Affidavit

I, Michael Cherry on behalf of Currituck Associates - Residential Partnership, subdivider of Currituck Club PUD, Phase 8A, Section 2B (Subdivision Name) certify that:

- I am responsible for maintenance of all common areas, common features, and private infrastructure until 51% of lots sales within the subdivision.
- I have established a reserve fund to support the continued maintenance and upkeep of common areas, common features, and private infrastructure. The fund has been established at Wells Fargo (Banking Institution).
- I shall establish the Homeowner's/Property Owner's Association (hereinafter "association") prior to the sale of the first lot.
- It is solely my responsibility to notify the County upon 51% lot sales within the subdivision.
- The County is not responsible or liable for maintenance of any common areas, common features, or private infrastructure within the subdivision.

I understand that maintenance responsibility of common areas, common features, and private infrastructure shall not be transferred from the subdivider to the association until *ALL* of the following occur:

- At least 51% of the total number of lots in the subdivision are sold.
- The subdivider provides an affidavit or resolution signed by the association president that accepts maintenance responsibility for the subdivision.
- The subdivider commissions a report prepared by a licensed engineer indicating that all common areas, common features, and private infrastructure elements comply with the minimum standards in the Unified Development Ordinance and the County Code of Ordinances.
- County staff reviews and approves the report prepared by a licensed engineer.
- The reserve fund contains a minimum balance equal to 10% of the construction costs of all common area, common features, and private infrastructure. The total construction cost for all common areas, common features, and private infrastructure is $ 300,000 (*attach cost breakdown sheet*). In the event the association has not collected sufficient assessment funds from the lot owners in the subdivision to meet the minimum balance of $ 30,000 in the reserve fund, the subdivider shall be responsible for the difference needed to meet the minimum balance requirements.

Signature

1/12/24
Date

Notary Certificate

Dare County, North Carolina

I, Julie Jarvis, a Notary Public for Dare County, North Carolina, do hereby certify that Michael Cherry personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal this the 12th day of January, 2024.

(Official Seal)

JULIE JARVIS NOTARY My Comm. Expires 01.17.2024 PUBLIC DARE COUNTY, NC

Notary Signature

My commission expires: 01.17.2024

Reserve Fund Breakdown Phase 8a Section 2B

$40,530.00 Storm water

$90,509.00 Water and Sewer

$91,193.00 Road

$77,768.00 Concrete

$300,000.00 Total

10% = $30,000.00

January 15, 2024

TO: **Corolla Construction Inc.**
520 Old Stoney Rd.
Unit J
Corolla, NC 27927

Attn: Mr. Michael Cherry
solifeeast@yahoo.com

RE: Construction Materials Testing Services
Currituck Club Phase 8A Section 2
Corolla, North Carolina
Terracon Project No: K5231094
Report No. 1

Dear Mr. Cherry:

As requested, a representative of **Terracon** visited the project site between the dates of October 23, 2023, and December 22, 2023. The purpose of our visits was to observe and evaluate the roadway construction activities with respect to Aggregate Base Course (ABC) and Asphalt placement for Windswept Ridge and Ocean Ridge Court.

The roadway pavement section is understood to require at least 5 inches of ABC materials overlain by 2 inches of intermediate mix asphalt (Type RB25.0C), overlain by 1" of surface mix asphalt (Type SF9.5A). The surface mix asphalt will be installed later. The project specifications required testing of the subgrade soils, ABC and asphalt materials be performed for quality assurance, in accordance with the NCDOT requirements. As such, this report includes the compaction testing of the subgrade materials, evaluation of the ABC materials, and asphalt materials placed within the roadway alignment as they relate to thickness, density, aggregate gradation, and asphalt content to date.

SCOPE OF SERVICES

For this project, **Terracon** has performed the following tasks:

- Performed bulk soil sampling from the on-site subgrade soil materials used within the observed roadway alignment. The sample was returned to our Elizabeth City, NC laboratory for natural moisture, full sieve, and Proctor testing in general accordance with NCDOT requirements. The laboratory test results indicated the Tan SAND (SP) materials were in general accordance with project requirements with respect to gradation. The results of these testing procedures are provided on the "Moisture Density Relationship Proctor Curve" and "Particle Size Distribution" test report sheets attached to this report.

- Performed bulk soil sampling from the on-site stockpile of the imported Aggregate Base Course materials used as ABC within the observed roadway alignments. The sample was returned to our Elizabeth City, NC laboratory for natural moisture, full sieve, and Proctor testing in general accordance with NCDOT requirements. The laboratory test results indicated the imported ABC materials were in general accordance with NCDOT requirements with respect to gradation. The results of these testing procedures are provided on the "Moisture Density Relationship Proctor Curve" and "Particle Size Distribution" test report sheets attached to this report.

- During our October 23, 2023, site visit, compaction testing procedures were performed and indicated that the subgrade soil materials (Tan SAND). The compaction testing procedures that were performed on this date indicated the in-place materials were compacted to at least 96.0% of a Standard Proctor (ASTM D698).

- During our December 1, 2023, site visit, compaction and thickness testing procedures were performed and indicated that the ABC materials. The compaction testing procedures that were performed on this date indicated the in-place materials were compacted to at least 100% of a Modified Proctor (ASTM D1557). The thickness test results indicated an in-place ABC thickness ranging from approximately 6 inches to 6.25 inches.

- Performed periodic compaction testing on the asphalt materials placed within the observed roadway alignment. The compaction testing procedures that were performed on the date of December 22, 2023, indicated the in-place asphalt materials were compacted to at least 92% of the materials' Rice Specific Gravity of 2.389 for the RB-25.0C mix type, and the measure in the field thickness was approximately 2 inches. The results of these testing procedures and their associated test locations are provided on the "Asphalt Compaction Test Report" sheet attached to this report.

- Performed laboratory testing procedures at **Terracon's** laboratory located in Elizabeth City, NC. The laboratory testing procedures consisted of asphalt content and asphalt aggregate gradation analysis. The laboratory test procedures were executed in general accordance with NCDOT testing procedures. The asphalt content test results are provided in "Table I – Asphalt Content Test Results" and the asphalt aggregate gradation analysis test results are provided on the attached "Particle Size Distribution" sheets.

Table I – Asphalt Content Test Results

Sample # and Asphalt Type	Sample Location	Asphalt Content (%)(1)
Bulk sample / RB-25.0C	Windswept Ridge	5.4

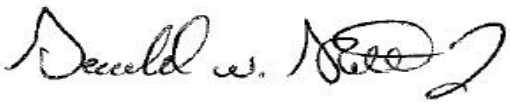
Note (1) = Percent asphalt requirement for Type RB-25.0C is 4.3% +/- 0.7% per the JMF: 20-0567-031 furnished by Allan Myers Chesapeake and the NCDOT allowable tolerance.

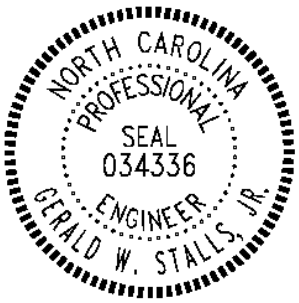
Based on the results of the completed field and laboratory testing procedures, the constructed pavement section at its current status appears to conform to the project plans and NCDOT requirements with respect to ABC and Asphalt average thickness (field results), average density (field results), gradation, and asphalt content. As an exception, the asphalt content test results indicated and asphalt content slightly exceeding the maximum tolerance. In our professional opinion and based on our experience with similar pavement types and projects, this slight variance in the asphalt content is not anticipated to hinder the asphalt performance or lifespan.

During and/or following the installation of the surface mix asphalt materials, quality control including density, aggregate gradation, and asphalt content testing should be performed for verification of conformance with the project plans and NCDOT requirements.

We appreciate the opportunity to offer our services to you, and trust that you will call our Elizabeth City office with any questions that you may have.

Respectfully Submitted,
Terracon





Gerald W. Stalls Jr., P.E.
Senior Project Engineer
NC Lic. #034336

Attachments: Moisture Density Relationship Proctor Curve
Particle Size Distribution Test Report(s):
Aggregate Base Course (ABC)
Asphalt Bulk Sample

FIELD DENSITY TEST REPORT

Report Number: K5231094.0003
Service Date: 10/23/23
Report Date: 01/15/24 Revision 1 - Proctor
Task: Field Services

Terracon
106 Capital Trace, Unit E
Elizabeth City, NC 27909-7731
252-335-9765

Client

Corolla Construction Inc
Attn: Michael Cherry
520 Old Stoney Rd Unit J
Corolla, NC 27927

Project

Currituck Club Phase 8A-Section 2_2023
620 Currituck Clubhouse Dr
Corolla, NC

Project Number: K5231094

Material Information

				Lab Test Data		Project Requirements	
Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Opt. Water Content (%)	Max. Lab Density (pcf)	Water Content (%)	Compaction (%)
2	K5231094.0006	Tan SAND	ASTM D698	14.6	107.8		Min 95.0

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Density (pcf)	Percent Compaction (%)
	Roadway								
1	70'E from Existing asphalt	3"BFG	2	12	117.2	4.6	4.1	112.6	100+
2	160'E from aspahlt	3"BFG	2	12	111.1	3.8	3.5	107.3	99.5
3	260'E from aspahlt	3"BFG	2	12	110.4	3.5	3.3	106.9	99.2
4	95'N from test 2	3"BFG	2	12	108.6	4.4	4.2	104.2	96.7
5	40'E from test 4	3"BFG	2	12	110.5	4.7	4.4	105.8	98.1

Datum: Top of existing grade **Std. Cnt. M:** 687 **Std. Cnt. D:** 2163
S/N: 75685 **Make:** Troxler **Model:** 3430 **Last Cal. Date:** 02/01/2023
Comments: **Test and/or retest results on this report meet project requirements as noted above.**

Services: Perform in-place moisture and density retests as requested or as required by the project specifications to determine degree of compaction and material moisture condition.
Terracon Rep.: Christian Mitchell
Reported To:
Contractor: Corolla Construction
Report Distribution:
(1) Corolla Construction Inc, Michael Cherry

Reviewed By:
Brad Gallop
Project Manager

Test Methods: ASTM D6938

FIELD DENSITY TEST REPORT

Report Number: K5231094.0004
Service Date: 12/01/23
Report Date: 01/15/24 Revision 1 - Proctor
Task: Field Services

Terracon
106 Capital Trace, Unit E
Elizabeth City, NC 27909-7731
252-335-9765

Client

Corolla Construction Inc
Attn: Michael Cherry
520 Old Stoney Rd Unit J
Corolla, NC 27927

Project

Currituck Club Phase 8A-Section 2_2023
620 Currituck Clubhouse Dr
Corolla, NC

Project Number: K5231094

Material Information

				Lab Test Data		Project Requirements	
Mat. No.	Proctor Ref. No.	Classification and Description	Laboratory Test Method	Opt. Water Content (%)	Max. Lab Density (pcf)	Water Content (%)	Compaction (%)
2	K5231094.0008	ABC STONE	ASTM D1557	6.3	131.3		Min 100.0

Field Test Data

Test No.	Test Location	Lift / Elev.	Mat. No.	Probe Depth (in)	Wet Density (pcf)	Water Content (pcf)	Water Content (%)	Dry Density (pcf)	Percent Compaction (%)
	Roadway								
1	70' east of existing asphalt	2"BFG	2	6	148.9	7.2	5.1	141.7	100+
2	160' east of existing asphalt	2"BFG	2	6	149.1	7.8	5.5	141.3	100+
3	260' east of existing asphalt	2"BFG	2	6	147.9	6.8	4.8	141.1	100+
4	95' north of test #2	2"BFG	2	6	148.4	6.3	4.4	142.1	100+
5	40' east of test #4	2"BFG	2	6	148.9	7.6	5.4	141.3	100+

Datum: Final grade **Std. Cnt. M:** 691 **Std. Cnt. D:** 2205
S/N: 75685 **Make:** Troxler **Model:** 3430 **Last Cal. Date:** 02/01/2023
Comments: **Test and/or retest results on this report meet project requirements as noted above.**

Services: Perform in-place moisture and density retests as requested or as required by the project specifications to determine degree of compaction and material moisture condition.
Terracon Rep.: Christian Mitchell
Reported To:
Contractor: Corolla Construction
Report Distribution:
(1) Corolla Construction Inc, Michael Cherry

Reviewed By:
Brad Gallop
Project Manager

Test Methods: ASTM D6938

LABORATORY COMPACTION CHARACTERISTICS OF SOIL REPORT

Report Number: K5231094.0006
Service Date: 12/08/23
Report Date: 12/11/23
Task: Office-Laboratory Services

106 Capital Trace, Unit E
Elizabeth City, NC 27909-7731
252-335-9765

Client

Corolla Construction Inc
Attn: Michael Cherry
520 Old Stoney Rd Unit J
Corolla, NC 27927

Project

Currituck Club Phase 8A-Section 2_2023
620 Currituck Clubhouse Dr
Corolla, NC

Project Number: K5231094

Material Information

Source of Material:
Proposed Use:

Sample Information

Sample Date:
Sampled By:
Sample Location: Stockpile

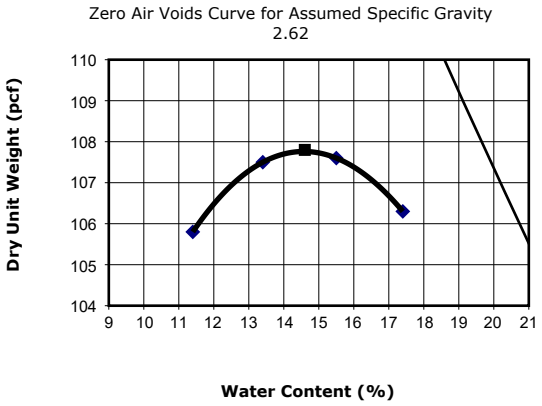
Sample Description: Tan SAND

Laboratory Test Data

Test Procedure: ASTM D698
Test Method: Method A
Sample Preparation: Wet
Rammer Type: Manual
Maximum Dry Unit Weight (pcf): **107.8**
Optimum Water Content (%): **14.6**

	Result	Specifications
Liquid Limit:	Non-plastic	
Plastic Limit:	Non-plastic	
Plasticity Index:	Non-plastic	
In-Place Moisture (%):		

USCS:



Comments:

Services: Moisture-Density Relations

Terracon Rep.: Kim Overton
Reported To:
Contractor:

Report Distribution:
(1) Corolla Construction Inc, Michael Cherry

Reviewed By: _____

Brad Gallop
Project Manager

Test Methods: ASTM D698, ASTM D4318, ASTM D4647, ASTM D4718

PARTICLE SIZE DISTRIBUTION REPORT

Report Number: K5231094.0005
Service Date: 12/08/23
Report Date: 12/11/23
Task: Office-Laboratory Services

106 Capital Trace, Unit E
Elizabeth City, NC 27909-7731
252-335-9765

Client

Corolla Construction Inc
Attn: Michael Cherry
520 Old Stoney Rd Unit J
Corolla, NC 27927

Project

Currituck Club Phase 8A-Section 2_2023
620 Currituck Clubhouse Dr
Corolla, NC

Project Number: K5231094

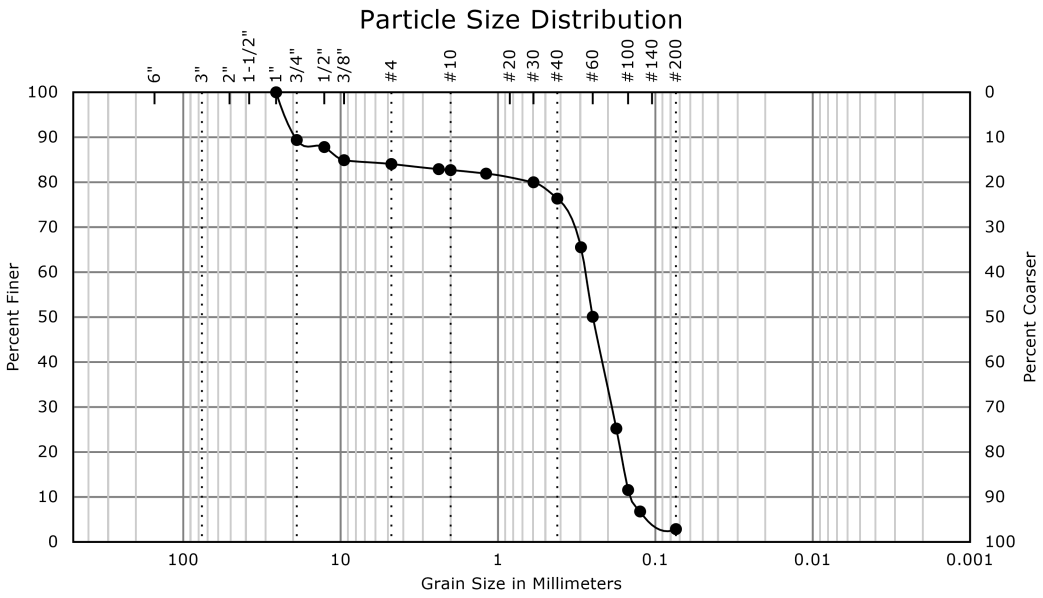
Sample Information

Sample Type: Bulk
Sample Location: Stockpile
Sample Description: Tan SAND
USCS: Poorly-graded sand with gravel (SP)

Laboratory Test Data

Test Method: ASTM D6913
Method: A
Atterberg Limits: Non-Plastic
Sample Preparation: Oven Dried
Sieving Method: Single Sieve-Set Sieving

Sieve Size	Percent Finer	Spec.*	Pass (X=Fail)
1"	100		
3/4"	89		
1/2"	88		
3/8"	85		
#4	84		
#8	83		
#10	83		
#16	82		
#30	80		
#40	76		
#50	66		
#60	50		
#80	25		
#100	12		
#120	7		
#200	3		



% Cobbles	% Gravel - 16.0		% Sand - 81.2			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	10.6	5.3	1.3	6.3	73.5	2.8

*

D_{60} = 0.28	D_{30} = 0.19	D_{10} = 0.145	C_c = 0.9	C_u = 1.9	FM = 2.20

Comments:

Services:
Terracon Rep.: Kim Overton
Reported To:
Contractor:
Report Distribution:
(1) Corolla Construction Inc, Michael Cherry

Reviewed By:

Brad Gallop
Project Manager

Test

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

LABORATORY COMPACTION CHARACTERISTICS OF SOIL REPORT

Report Number: K5231094.0008
Service Date: 12/12/23
Report Date: 01/15/24 Revision 1 - data
Task: Office-Laboratory Services

106 Capital Trace, Unit E
Elizabeth City, NC 27909-7731
252-335-9765

Client

Corolla Construction Inc
Attn: Michael Cherry
520 Old Stoney Rd Unit J
Corolla, NC 27927

Project

Currituck Club Phase 8A-Section 2_2023
620 Currituck Clubhouse Dr
Corolla, NC

Project Number: K5231094

Material Information

Source of Material: Stockpile
Proposed Use:

Sample Information

Sample Date:
Sampled By:
Sample Location: Stockpile

Sample Description: ABC STONE

Laboratory Test Data

Test Procedure: ASTM D1557
Test Method: Method C
Sample Preparation: Wet
Rammer Type: Manual

	Result	Specifications
Liquid Limit:	Non-plastic	
Plastic Limit:	Non-plastic	
Plasticity Index:	Non-plastic	
In-Place Moisture (%):		

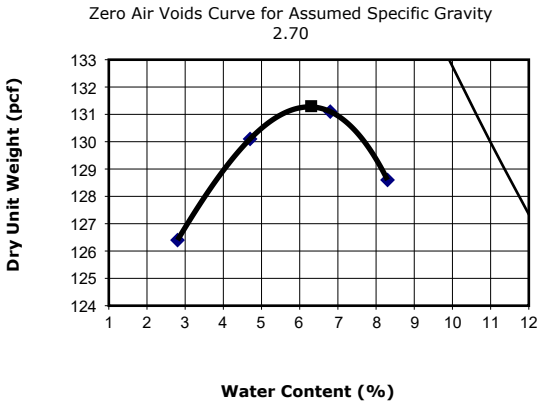
USCS:

Oversized Particles (%): 8.9
Moisture (%): 0.7
Sieve for Oversize Fraction: 3/4

Assumed Bulk Specific Gravity of Oversized Particles: 2.7

Corrected for Oversized Particles (ASTM D4718)
Maximum Dry Unit Weight (pcf): **131.3**
Optimum Water Content (%): **6.3**

Uncorrected Values
Maximum Dry Unit Weight (pcf): **128.5**
Optimum Water Content (%): **6.8**



Comments:

Services: Moisture-Density Relations

Terracon Rep.: Kim Overton
Reported To:
Contractor: Corolla Construction
Report Distribution:
(1) Corolla Construction Inc, Michael Cherry

Reviewed By: _____

Brad Gallop
Project Manager

Test Methods: ASTM D698, ASTM D4318, ASTM D4647, ASTM D4718

PARTICLE SIZE DISTRIBUTION REPORT

Report Number: K5231094.0007
Service Date: 12/08/23
Report Date: 12/11/23
Task: Office-Laboratory Services

Terracon
106 Capital Trace, Unit E
Elizabeth City, NC 27909-7731
252-335-9765

Client

Corolla Construction Inc
Attn: Michael Cherry
520 Old Stoney Rd Unit J
Corolla, NC 27927

Project

Currituck Club Phase 8A-Section 2_2023
620 Currituck Clubhouse Dr
Corolla, NC

Project Number: K5231094

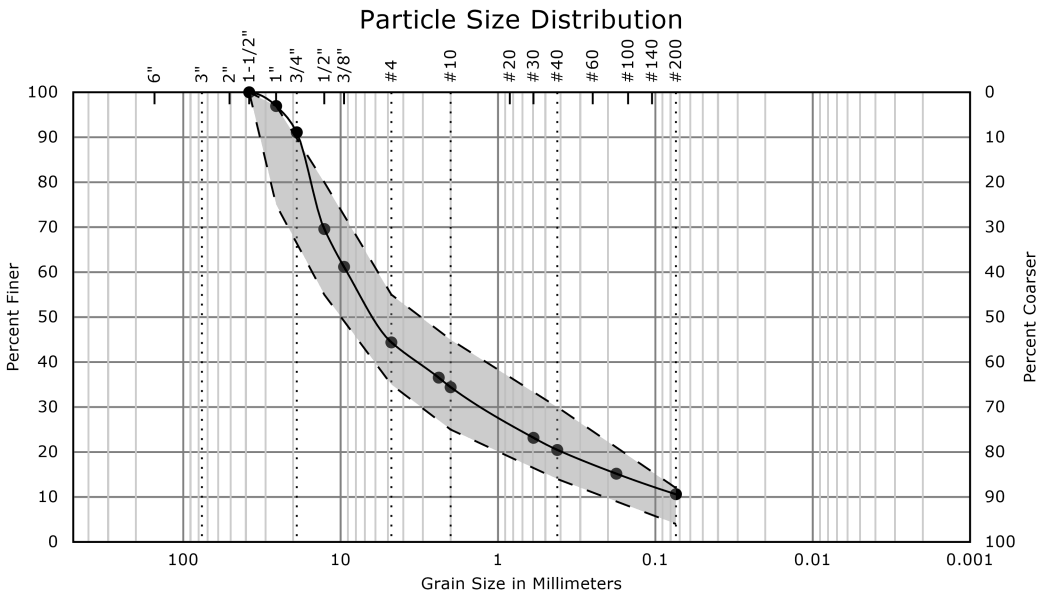
Sample Information

Sample Type: Bulk
Sample Location: Stockpile
Sample Description: ABC STONE
USCS: Well-graded gravel with silt and sand (GW-GM)

Laboratory Test Data

Test Method: ASTM D6913
Method: A
Atterberg Limits: Non-Plastic
Sample Preparation: Oven Dried
Sieving Method: Single Sieve-Set Sieving

Sieve Size	Percent Finer	Spec.*	Pass (X=Fail)
1-1/2"	100	100-100	
1"	97	75-97	
3/4"	91		
1/2"	70	55-80	
3/8"	61		
#4	44	35-55	
#8	37		
#10	34	25-45	
#30	23		
#40	20	14-30	
#80	15		
#200	11	4-12	



% Cobbles	% Gravel - 55.6		% Sand - 33.8			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	8.9	46.7	10.0	13.9	9.9	10.6

* D_{60} = 9.10 | D_{30} = 1.30 | D_{10} = 0.066 (Est.) | C_c = 2.8 | C_u = 138.1 | FM =

Comments:

Services:
Terracon Rep.: Kim Overton
Reported To:
Contractor:
Report Distribution:
(1) Corolla Construction Inc, Michael Cherry

Reviewed By:

Brad Gallop
Project Manager

Test

ASPHALT DENSITY TESTING REPORT

Report Number: K5231094.0009
Service Date: 12/22/23
Report Date: 01/02/24
Task: Field Services

106 Capital Trace, Unit E
Elizabeth City, NC 27909-7731
252-335-9765

Client

Corolla Construction Inc
Attn: Michael Cherry
520 Old Stoney Rd Unit J
Corolla, NC 27927

Project

Currituck Club Phase 8A-Section 2_2023
620 Currituck Clubhouse Dr
Corolla, NC

Project Number: K5231094

General Information

Michael Cherry, Corolla Construction requested Terracon be on site for asphalt field density testing and observation(s) of the following site feature(s): roadway pavement. These site feature(s) are being constructed by Stevenson Sand. The results of observation(s) for today were reported to Michael Cherry. The Terracon representative arrived on site at 1015 and departed at 1412.

The construction documents referenced for this inspection include: Structural plans dated 11/2/2020. Governing Specs: D.O.T.

Site Conditions

Surface Temperature (°F)	Ambient Temperature (°F)	Surface Conditions	Weather Conditions	Comments
50	46	Dry	Clear	

A Klein Tools IR1 was used to obtain the surface temperature readings.

Pre-Placement Review

Prior to the placement of asphalt, the substrate was observed and consisted of aggregate base course. The substrate was previously tested by Terracon. The substrate was observed to be firm and stable.

Asphalt Placement

Asphalt Mix Information

Producer	Mix ID	Plant No.	Laydown Quantity (Tons)
Allan Myers Chesapeake	rb 25.0c	As381	180

Asphalt Mix Placement Information

Asphalt Layer/Type	Location	L/S	Lift/DT	Asphalt Mix Temperature (°F)			Status	Comments
Base/RP	Roadway	2b	1st/2”	296/ **D**	290/ **L**	140/ **C**	Complies	

D = Delivery, L = Laydown, C = Compaction, L/ S = Lot/Sublot, DT = Design Thickness

Asphalt Placement Equipment Information

Equipment	Manufacturer	Model

The contractor used an asphalt paver to lay the asphalt mix. Compaction of the asphalt mix was performed with 7 vibratory and static passes of the steel wheel/drum roller.

ASPHALT DENSITY TESTING REPORT

Report Number: K5231094.0009
Service Date: 12/22/23
Report Date: 01/02/24
Task: Field Services

106 Capital Trace, Unit E
Elizabeth City, NC 27909-7731
252-335-9765

Client

Corolla Construction Inc
Attn: Michael Cherry
520 Old Stoney Rd Unit J
Corolla, NC 27927

Project

Currituck Club Phase 8A-Section 2_2023
620 Currituck Clubhouse Dr
Corolla, NC

Project Number: K5231094

Asphalt Sample Information

A total of 1 asphalt sample(s) were obtained by Terracon for laboratory testing. Asphalt sample(s) will be tested at Terracon laboratory, Elizabeth city, and asphalt laboratory test results will be provided on a separate report by Terracon.

Compliance Statement

Based on the observations noted in this report, asphalt mix placement at the above-referenced locations appear to be completed in general accordance with the project plans and specifications. Compliance regarding asphalt laboratory testing results will be provided in a separate report.

Services:

Terracon Rep.: Daniel Morrison
Reported To: Michael Cherry
Contractor: Stevenson Sand
Report Distribution:
(1) Corolla Construction Inc, Michael Cherry

Reviewed By: _____

Brad Gallop
Project Manager

HMAC FIELD DENSITY TEST REPORT

Report Number: K5231094.0009
Service Date: 12/22/23
Report Date: 01/02/24
Task: Field Services

Terracon
106 Capital Trace, Unit E
Elizabeth City, NC 27909-7731
252-335-9765

Client

Corolla Construction Inc
Attn: Michael Cherry
520 Old Stoney Rd Unit J
Corolla, NC 27927

Project

Currituck Club Phase 8A-Section 2_2023
620 Currituck Clubhouse Dr
Corolla, NC

Project Number: K5231094

Material Information

				Lab Test Data	Project Requirements		
Mat. No.	Reference Number	Classification and Description	Laboratory Test Method	Reference Density (pcf)	Min. Thickness (in)	Min. Comp. (%)	Max. Comp. (%)
1	RB 25.0C	Base Course		156.9		92.0	

Field Test Data

					Core Data					
Test No.	Test Location	Pave. Lift	Mat. No.	Nuclear Density (pcf)	Core Length (in)	Core Density (pcf)	Correction Factor (pcf)	Corrected Density (pcf)	Comp. (%)	
1	10 feet W of center island	1st	1	143.8					91.7	*
2	15 feet SW of test 1	1st	1	143.8					91.7	*
3	8 feet E of center island	1st	1	146.5					93.4	
4	20 feet NE of center island	1st	1	150.3					95.8	
5	20 feet N of center island	1st	1	149.9					95.5	
6	15 feet S of center island	1st	1	145.0					92.4	
7	110 feet W of end of roadway, north lane	1st	1	146.3					93.2	
8	40 feet W of end of paving, north lane	1st	1	150.7					96.0	
9	North lane, 100 feet from west end of paving	1st	1	150.4					95.9	
10	30 feet from west end of paving, north lane	1st	1	146.9					93.6	
11	50 feet from east end of paving, south lane	1st	1	152.1					96.9	
12	130 feet from east end of paving, south lane	1st	1	148.5					94.6	
13	120 feet from west end of paving, south lane	1st	1	148.4					94.6	
14	30 feet from west end of paving, south lane	1st	1	151.5					96.6	

Datum: Top of Base Course
Std. Cnt. M: 680 **Std. Cnt. D:** 2164
S/N: 75685 **Make:** Troxler **Model:** 3430 **Last Cal. Date:** 02/01/2023

Comments: **An asterisk (*) appears next to the test results which do not meet the project requirements as noted above.**

Services:
Terracon Rep.: Daniel Morrison
Reported To: Michael Cherry
Contractor: Stevenson Sand

Report Distribution:
(1) Corolla Construction Inc, Michael Cherry

Reviewed By:
Brad Gallop
Project Manager

Test Method: ASTM D2950

PARTICLE SIZE DISTRIBUTION REPORT

Report Number: K5231094.0010
Service Date: 01/08/24
Report Date: 01/15/24 Revision 1 - data
Task: Office-Laboratory Services

Terracon
106 Capital Trace, Unit E
Elizabeth City, NC 27909-7731
252-335-9765

Client

Corolla Construction Inc
Attn: Michael Cherry
520 Old Stoney Rd Unit J
Corolla, NC 27927

Project

Currituck Club Phase 8A-Section 2_2023
620 Currituck Clubhouse Dr
Corolla, NC

Project Number: K5231094

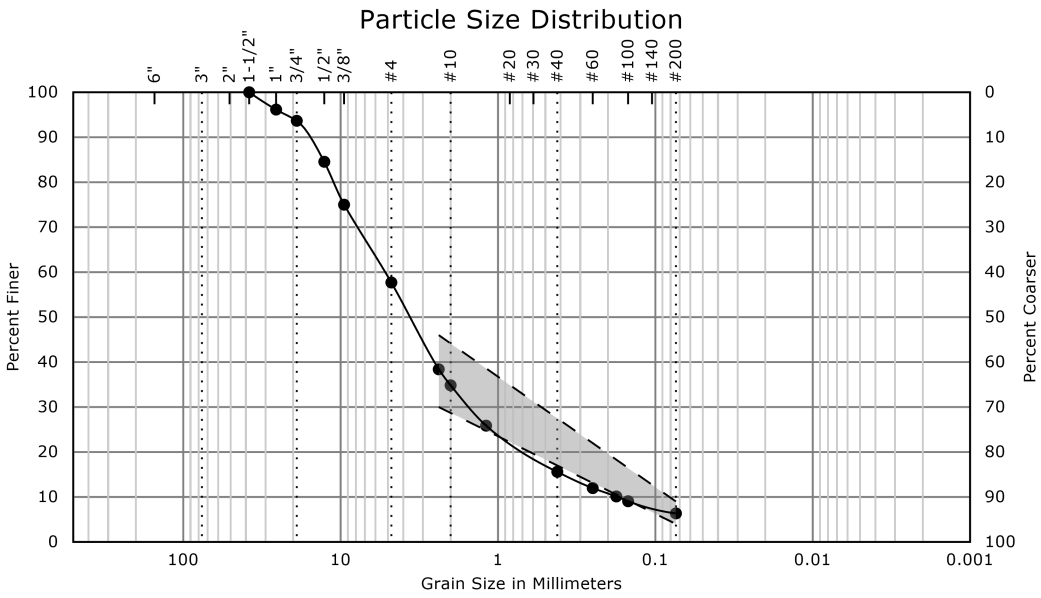
Sample Information

Sample Type: Bulk
Sample Location: Windswept Ridge
Sample Description: RB 25.0C Base
USCS: Well-graded sand with silt and gravel (SW-SM)

Laboratory Test Data

Test Method: ASTM D6913
Method: A
Atterberg Limits: Non-Plastic
Sample Preparation: Oven Dried
Sieving Method: Single Sieve-Set Sieving

Sieve Size	Percent Finer	Spec.*	Pass (X=Fail)
1-1/2"	100		
1"	96		
3/4"	94		
1/2"	85		
3/8"	75		
#4	58		
#8	38	30-46	
#10	35		
#16	26		
#40	16		
#60	12		
#80	10		
#100	9		
#200	6	4-9	



% Cobbles	% Gravel - 42.3		% Sand - 51.3			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	6.3	36.0	22.8	19.3	9.2	6.4

* D_{60} = 5.21 | D_{30} = 1.54 | D_{10} = 0.174 | C_c = 2.6 | C_u = 30.0 | FM =

Comments: Asphalt Content 5.4% Allan Myers Chesapeake JMF 20-0567-031

Services:
Terracon Rep.: Kim Overton
Reported To:
Contractor:
Report Distribution:
(1) Corolla Construction Inc, Michael Cherry

Reviewed By:

Brad Gallop
Project Manager

Test

Water Resources
ENVIRONMENTAL QUALITY

08/23/2022

Project Detail

Serial No: **11-00521** **Received:** 5/19/2011 **Project Type:** DISTRIBUTION EXTENSION

Water System No.: **NC6027001** **County:** CURRITUCK

Water System Name: SOUTHERN OUTER BANKS WTR SYST

Description: THE CURRITUCK CLUB, PHASE 8A

Contacts

Applicant Name: Yama Jones, Superintendent **Engineer Name:**

Reviewer Name: Ou, Henri (former employee, contact shashi.bhatta@ncdenr.gov)

Events

Event	Event Date	Comments
partial engineer's certification	08/23/2022	PC...Installation of approximately 502 feet of 6-inch water main and 255 feet of 2-inch wate rmain along Windswept Ridge Lane and Ocean Ridge Court...tp
applicant's certification	08/23/2022	AR...Partial...tp
partial final approval	08/23/2022	- Installation of approximately 502 feet of 6-inch water main and 255 feet of 2-inch water main along Windswept Ridge Lane and Ocean Ridge Court
partial engineer's certification	02/26/2020	PC.. 275 feet of 6-inch water main, 203 feet of 2-inch water main along Windswept Ridge Court off of Windswept Ridge Lane..smb
partial final approval	02/26/2020	275 feet of 6-inch water main, 203 feet of 2-inch water main along Windswept Ridge Court off of Windswept Ridge Lane
authorization to construct extension	02/26/2020	with PC documents..smb
applicant's certification	02/26/2020	with PC..smb
authorization to construct expiration reminder	06/01/2015	
authorization to construct extension	06/24/2013	PER FORM FROM PATRICK IRWIN DATED 6/24/13
on hold	06/24/2013	PER FORM FROM PATRICK IRWIN DATED 6/24/13
authorization to construct expiration reminder	06/04/2013	
approval mailed	07/19/2011	
project approval	07/11/2011	OU
authorization to construct	07/11/2011	OU WSMP 03-00674R1
response to comments received	06/30/2011	
Comment Sent	06/14/2011	

Quible

Quible & Associates, P.C.
ENGINEERING • ENVIRONMENTAL SCIENCES • PLANNING • SURVEYING
SINCE 1959

P.O. Drawer 870
Kitty Hawk, NC 27949
Phone: 252-491-8147
Fax: 252-491-8146
web: quible.com

August 15, 2022

Ms. Shashi Bhatta
Public Water Supply Section
NC Department of Environment and Natural Resources
1634 Mail Service Center
Raleigh, North Carolina 27699-1634

Re: Water Main Extension Partial Certification
Currituck Club Phase 8A, Section 2
Currituck County Water System

Dear Ms. Bhatta;

On behalf of Currituck Associates Residential Partnership, as well as the Currituck County Water Department, Quible & Associates, P.C. hereby submits for your review and approval a partial engineer's certification for the project. Approximately 502 lf of 6" PVC C-900 waterline and approximately 255 lf of 2" PVC SDR 21 waterline have been installed. The developer, formerly Currituck Associates/Residential Partnership and currently Currituck Associates Residential, LLC, has phased construction of the subdivision and an asbuilt of the current sections that has been installed is included for reference.

The executed "Applicant Certification Form" has been included for reference with this submission.

Please do not hesitate to contact me at (252) 491-8147, or csaunders@quible.com should you have any questions and/or concerns.

Sincerely,
Quible & Associates, P.C.

Cathleen M. Saunders, P.E.

I, Cathleen M. Saunders, P.E., as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe periodically the construction of the above referenced water main extension, hereby state that the construction of **Currituck Club Phase 8A, Section 2** water main infrastructure has been completed within substantial compliance and intent of the approved plans and specifications. An as-built has been compiled that shows the waterline's installed location as it is a partial certification of the previously approved plans and specifications.

Engineer Signature:		Engineer Name:	Cathleen M. Saunders
Project Name:	Currituck Club Phase 8A (Section 2)	Date:	08/15/2022
Serial No:	11-00521	Water System Name:	Currituck County - SOBWS

This is a:
___ Full certification
X_ Partial certification, covering Section 2 installation including approximately 502 lf of 6" PVC waterline and 255 lf of 2" PVC waterline.

This certification is based upon inspections conducted (select one):
X Periodically
___ Daily
___ Continuously

By (select one):
___ Myself
X Another under my responsible charge

NORTH CAROLINA PROFESSIONAL SEAL 047852 ENGINEER CATHLEEN M. SAUNDERS 8/15/22

Certification

State of North Carolina
Department of Environmental Quality

Applicant Certification Form

In accordance with 15A NCAC 18C .0303 (c), a signed applicant certification must be submitted to the Department, stating that the Operation and Maintenance (O&M) Plan and the Emergency Management Plan requirements have been satisfied and that the system will have a certified operator as required by Section .1300. No construction, alteration, or expansion of a community or non-transient, non-community public water system shall be placed into final service or made available for human consumption until the applicant has submitted the certification and has received Final Approval from the Department.

Certification must be provided by the following individual or their duly authorized representative:

1. For a corporation, limited liability company, home owner association or non-profit organization: *a president, vice president, secretary, or treasurer.*
2. For a partnership or sole proprietorship: *by a general partner or the proprietor.*
3. For a municipality, State, Federal or other agency: *by either a principal executive officer or ranking elected official.*

By the signature below I certify, under penalty of law:

1. The following actions have been completed for the construction, alteration, or expansion of the water system, as defined in the project documents:
   - I, or personnel under my direct supervision, have completed an O&M Plan and an Emergency Management Plan in accordance with 15A NCAC 18C .0307(d) and (e). Based on my evaluation of the plans, or my inquiry of the person or persons directly responsible for preparing the O&M Plan and Emergency Management Plan, the information contained in the plans is, to the best of my knowledge and belief, true, accurate, and complete.
2. The following actions will be completed before the construction, alteration, or expansion of the water system, as defined in the project documents, is placed into final service or made available for human consumption:
   - In accordance with 15A NCAC 18C .0307(d), the O&M Plan will be made accessible to the operator on duty at all times and available to the Department upon request.
   - In accordance with 15A NCAC 18C .0307(e), the Emergency Management Plan will be made accessible to the system operator on duty at all times and available to the Department upon request.
   - In accordance with 15A NCAC 18C .0303(c), the system will have a certified operator as required by 15A NCAC 18 C. 1300.

Signature: _____ Name(Print): Will Ramsey

Title: Utilities Director Date: 6/30/2022

Project Name: The Currituck Club Phase 8A, Section 2 System Name: Southern Outer Banks Water System

Serial No: **11-00521** Water Sys. ID: NC 60-27-001

Certifications can be sent by mail, fax (919-715-4374), or attachment to an e-mail message to PWSSection.PlanReview@ncdenr.gov

Quible

Quible & Associates, P.C.

ENGINEERING • ENVIRONMENTAL SCIENCES • PLANNING • SURVEYING
SINCE 1959

P.O. Drawer 870
Kitty Hawk, NC 27949
Phone: 252-491-8147
Fax: 252-491-8146
web: quible.com

August 23, 2022

Sarah Toppin
NCDEQ Water Quality
Washington Regional Office
943 Washington Square Mall
Washington, NC 27889

Re: Engineer's Certification
Currituck Club Phase 8A – Section 2
Corolla, Currituck County, NC

Dear Ms. Toppin,

I, Cathleen M. Saunders, P.E., as a duly registered Professional Engineer in the State of North Carolina, having been authorized by Currituck Association/Residential Partnership and Pine Island -Currituck, LLC, to observe periodically the installation of the above referenced wastewater system, hereby state to the best of my abilities that due care and diligence was used in observation of the construction, such that the improvements have been completed within substantial compliance and intent of the approved plans and specifications.

This is a:

_ Full certification

X_ Partial certification, covering 693 linear feet of 8" DIP, four (4) manholes, 970 linear feet of 4" force main, and one(1) pump station

This certification is based upon inspections conducted (select one):

X Periodically

___ Daily

___ Continuously

By (select one):

___ Myself

X Another under my responsible charge

The following items are attached and shall be considered part of this certification:

1. One (1) copy of the Sewer Engineering certification;
2. One (1) copy of the Owner's Acceptance Letter;
3. One (1) copy of the record drawings plan;
4. One (1) copy of the project Pump Station specifications;
5. One (1) copy of the previously approved permit WQ0018170 modification.

Please do not hesitate to contact Michael W. Strader, Jr., P.E. or myself at 252.491.8147 should you have any questions and/or concerns. Thank you for your attention to this project.

Sincerely,
Quible & Associates, P.C.

Cathleen M. Saunders, PE
Encl: As stated
Cc: Currituck Association/Residential, LLC

NORTH CAROLINA PROFESSIONAL SEAL 043652 ENGINEER CATHLEEN M. SAUNDERS 8/23/22

ENGINEER'S CERTIFICATION

Complete and submit this form to the permit issuing office (address below) with the following:

- One copy of the project record drawings (plan/profile views and detail drawings of sewer lines) of the wastewater collection system extension. Final record drawings should be clear on the plans. Record drawings should indicate the design and the marked up changes during construction.
- Supporting design calculations (selected pumps, system curve, operating point, available storage if portable generator(s) or storage greater than longest past three year outage reliability option selected) for any pump stations permitted as part of this project
- Changes to the project should be clearly identified on the record drawings or in written summary form. Permit modifications are required for any changes resulting in non-compliance with this permit, regulations or minimum design criteria. Modifications should be submitted prior to certification.

This project shall not be considered complete nor allowed to operate until this Engineer's Certification and all required supporting documentation have been received by the Division. **Therefore, it is highly recommended that this certification be sent in a manner that provides proof of receipt by the Division.**

ENGINEER'S CERTIFICATION

☒ Partial ☐ Final

I, 970 , as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe (☒ periodically, ☐ weekly, ☐ full time) the construction of the Phase 8A~~/Inn Site/Historic Lots~~, Currituck project, consisting of ~~3,058~~ 693 LF of 8-inch gravity sewer~~, 859 LF of 6-inch gravity sewer, 1,176~~ LF of 4-inch force main, ~~a 125 GPM pump station~~ and a 150 GPM pump station, for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance of this permit; 15A NCAC 2T; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials.

North Carolina Professional Engineer's seal, signature, and date:

NORTH CAROLINA PROFESSIONAL SEAL 043652 ENGINEER KATHLEEN M. SAUNDERS 2/9/22

NOTE: SEE ATTACHED RECORD DRAWING FOR SPECIFIC PROJECT LOCATION/PHASING

SEND THIS FORM & SUPPORTING DOCUMENTATION WITH REQUIRED ATTACHMENTS TO THE FOLLOWING ADDRESS

NORTH CAROLINA DIVISION OF WATER QUALITY
Washington Regional Office – Surface Water Protection Section
Attn: Al Hodge, Regional Supervisor
943 Washington Square Mall
Washington, NC 27889

The Permittee is responsible for tracking all partial certifications up until a final certification is received. Any wastewater flow made tributary to the wastewater collection system extension prior to completion of this Engineer's Certification shall be considered a violation of the permit and shall subject the Permittee to appropriate enforcement actions.

Pine Island Currituck LLC
4400 Silas Creek Parkway, Suite 302
Winston Salem, North Carolina 27104

August 23, 2022

Mr. Michael Strader
Quible and Associates
8466 Caratoke Highway, Building 400
Powells Point, North Carolina. 27966

RE: Wastewater Utility Acceptance – Currituck Club Phase 8A, Section 2A

Dear Mr. Strader:

As you are aware, Pine Island Currituck LLC (PICLLC) provides wastewater treatment service to the Pine Island Development, the Currituck Club and certain portions of the Sanderling Development in Dare and Currituck Counties. PICLLC is a regulated public utility company in the State of North Carolina.

PICLLC accepts operation and maintenance of the 693 LF of 8" DI pipe, 4 manholes, 970 linear feet of 4" force main, and one pump station that has been installed off of Windswept Ridge Court as shown on Design Drawings as prepared by Quible & Associates, P.C. and dated 11/02/2020. This is a partial acceptance of the system as permitted within WQ0018170 Modification dated May 5, 2011. The infrastructure is located in Phase 8A, Section 2A of the Currituck Club.

Should you have any questions, please do not hesitate to contact me directly at 919.389.3655 or by email at rblizzard1@me.com. Thank you for your attention.

Sincerely,

Rolf Blizzard
Pine Island Currituck LLC

SECTION 02200 - EARTHWORK

GENERAL

Note: All Work performed under this Section shall be governed by Division 1 - General Requirements, these Specifications and the Drawings.

Scope: The Work covered by this Section of the Specifications consists of furnishing all plant, labor, equipment and materials and of performing all operations in connection with the excavating, filling, backfilling, grading, finish and cleanup as required for the completion of the Work in accordance with the terms and conditions on the Drawings and Specifications.

Work not Included: The shaping of the bedding (if required), bell holes, initial and intermediate backfilling are specified in applicable divisions of the installation of pipe and appurtenances.

Availability of Lands: Rights-of-way, permanent easements and temporary construction easements are shown on the Drawings or described in Division 1 - General Requirements. Lands not shown or described but required for construction shall be the Contractor's responsibility.

Notice to Utility Companies: Utility companies shall be notified in writing prior to construction and given a proposed schedule of progress. Copies of all letters of notification shall be furnished by the Owner. The Contractor shall protect all existing utilities. He shall assist and cooperate with the utility companies in locating and exposing existing facilities.

Responsibility Regarding Existing Utilities and Structures: The existence and location of underground utilities or structures, whether indicated on the Drawings or not, are not guaranteed and shall be investigated and verified in the field by the Contractor before starting Work. Excavation in the vicinity of existing structures and utilities shall be carefully done by hand.

The Contractor shall be held responsible for any damage to, and maintenance for and protection of, existing utilities and structures.

Erosion and Sediment Control Plan: All earthwork shall comply with the provisions for the Soil Erosion and Sedimentation Control Plan as approved by the NCDE&NR, Land Quality Section, as specified in Division 1.

EXCAVATION

Prior Investigation: Prior to general excavation, the Contractor shall make an investigation to the extent necessary to determine the location of existing underground utilities, structures or conflicts.

Protection of Existing: Existing utilities, structures and fencing shall be protected during the construction period and, if damaged or removed by the Contractor in his operations, shall be repaired or replaced by him at no additional cost to the Owner.

Access to Property: Bridging shall be provided to maintain access to public or private premises. Bridging shall be considered as part of excavation and will not be paid for as an extra.

Horizontal and Vertical Alignment: Where detailed horizontal and vertical alignment is not given on the Drawings, the Contractor shall study the required horizontal and vertical alignment in relation to the pipe material and joints being used to insure that the maximum deflections are not exceeded, then additional fittings or joints shall be required.

Topsoil Removal: In cultivated areas, lawns and public improved areas, topsoil shall be stripped to minimum depth of four inches, stockpiled as directed, and care taken in so doing to avoid mixing of subsoil and top soil. Topsoil shall be kept free from trash, brush and other debris, and shall only be handled when dry.

Trench Dimensions

Maximum Width: For general pipe laying, the maximum width of trench measured at the top of the pipe shall be the actual pipe O.D. plus twenty-four inches. Where this dimension is exceeded, additional bedding or backfill requirements may be imposed by the Engineer. Such additional Work as may be required shall be performed by or installed by the Contractor at no additional cost to the Owner.

For installation of appurtenances, the trench shall be widened only to the extent necessary for proper installation.

Depth: The trench shall be excavated to a depth that will insure a minimum of thirty-six (36) inches of cover for the installed pipe as measured from the top of the pipe barrel to the ground surface at the centerline of the trench unless otherwise shown on the Drawings or directed. This requirement is to establish a minimum depth only.

Excavations shall be made to the approximate grades and/or depths shown on the Drawings or to such grade as may be required by the following paragraphs.

When the specified bedding condition requires granular bedding material, the trench shall be deepened by the amount of bedding material as shown on the Drawings.

Gravity Sewer: Where gravity sewers are to be bedded in shaped bottom trenches of undisturbed material, trench depth shall be above the pipe bottom by at least the distance shown on the Drawings. Excavation below the depth defined herein shall be treated as over-excavation.

Trenching

The Contractor shall perform all excavation described of whatever substance encountered to dimensions and depths shown on the Drawings or as specified herein. Where rock, as defined in "Rock Excavation," is encountered the requirements of that specification shall also be met. Material suitable for backfill shall be stockpiled near the site. Rock or other material undesirable for backfill shall be stored outside the Work area in a neat manner, as directed by the Owner or his Engineer.

The Contractor shall keep excavation as close to pipe laying operations as possible during the prosecution of the Work. The Owner or his Engineer reserves the right to stop the excavation at any time, when, in his opinion, the excavation is opened too far in advance of the pipe laying. In developed or improved areas, trenches shall not be left open overnight.

Dewatering: The Contractor shall prevent the accumulation of water in trench excavation and shall remove, by well-point system and/or by other means satisfactory to the Owner or his Engineer, any water or other liquid waste which accumulates in the excavation. The Contractor shall provide the proper equipment to remove the water and other liquids from the excavation and its adjacent area. The Contractor shall prevent damage of any sort to public or private property or cause undue nuisance to the public. All water removed from the excavation site shall be piped to a storm drainage system or to a natural drainage area nearest to the excavation.

Sheeting and Shoring: The Contractor shall furnish and place all necessary bracing, sheeting or shoring necessary to construct and protect the excavation, existing utilities, structures of all types and as necessary for the safety of the employees. All sheeting shall be removed by the Contractor during backfilling operations unless directed otherwise by the Owner or his Engineer.

Preparation of Trench Floor: Upon completion or excavation, inspect the trench floor and proceed as follows:

Water...Where water is encountered at or above the level of the pipe and where the trench floor consists of predominately silt or clay soils (types MH, ML, CH, CL) and where stone bedding is not otherwise required, provide stone bedding as shown for the following embedments on the detail Drawings:

Pressure Mains. . . . . Type 2
Gravity Sewer . . . . . Class C-2

Keep bedding dewatered during pipe laying and backfill. Stone bedding thus installed shall be at no additional expense to Owner.

Stability: Where material encountered at or below the level of the pipe is determined, by Engineer, to be unstable or otherwise incapable of supporting the pipe, prepare trench bottom as specified under Unstable Subgrade.

Over-excavation: All over-excavation, except that authorized in "Unstable Subgrade" or "Rock Excavation," shall be replaced as specified in "Foundation" at no additional expense to Owner.

Stone and Object: Inspect trench bottom for stones or other objects which will interfere with proper installation of the pipe. Where granular bedding is not required, such stones or objects shall be removed and replaced with compacted select backfill material to required grade.

Foundation

Provide foundation for all undercut pipe, pipe bedding, appurtenances or structures as follows.

Definitions (for use in this Section of the Specifications):

FOUNDATION: the material placed between the bottom of pipe, appurtenance or related s tructure, or their bedding, and the top surface of stable, undisturbed earth.

UNDERCUT: the distance between the bottom of pipe, appurtenance or related structure and the top of stable, undisturbed earth.

UNDERCUT UP TO 12 INCHES: fill with approved embedment material placed in layers not exceeding 6 inches, compacted to at least 90% Standard Proctor Density.

UNDERCUT MORE THAN 12 INCHES: fill entire undercut with crushed stone (as described on page 5 of this Section) placed as above.

Unstable Subgrade

In the event that undisturbed foundation material encountered is considered by Engineer to be unstable, an adequate foundation, approved by Engineer, shall be provided by Contractor and paid for as Extra Work.

When ordered in writing by Engineer, unstable material shall be removed and either disposed of or stabilized and replaced in a manner satisfactory to Engineer. When so directed, material disposed of shall be replaced with approved backfill material placed in layers not exceeding 6 inches, compacted to at least 90% Standard Proctor Density. Measurement for payment shall be made as specified in "Rock Excavation."

When ordered in writing by Engineer, replacement material shall be crushed stone (as described on Page 5 of this Section) placed as described above. Payment for crushed stone, so ordered, shall be made by the Owner.

The Contractor's particular attention is called to the fact that no payment shall be made for replacing excess, unauthorized excavation beyond the limits shown in the Drawings or used to correct conditions which have resulted from the Contractor's negligence, or from Work during wet weather or other wet trench conditions resulting from the Contractor's choice of working area or weather conditions. The Contractor will be paid for stabilizing subgrade only when it can be

shown that unstable subgrade conditions existed prior to excavation and when the Owner or his Engineer determines that a payment authorization is justified by natural ground conditions.

Should Engineer determine that a special foundation, such as piles, pile caps, concrete grades, etc., is necessary to provide adequate support, resulting Work shall proceed as directed in a Change Order issued for this Work.

Rock Excavation (If Encountered)

Rock is generally defined as any material which cannot be excavated by usual hand or machine methods and is more specifically defined as materials which cannot be excavated without drilling, blasting or splitting, or as boulders more than 1 cubic yard in volume.

Where rock is encountered, the Contractor shall strip from the same all overlaying earth and shall then notify the Owner or his Engineer that rock is ready for measurement. The Owner or his Engineer shall measure elevations along the surface of the rock, or they may, at their discretion, postpone such measurement until after excavation is completed.

Upon receiving notice that measurement has been made or is postponed, Contractor shall remove the rock to a depth of at least 6 inches below the pipe, dispose of the rock removed and backfill the undercut trench with approved backfill material thoroughly tamped in place, up to the level of the pipe bottom.

Crushed Stone

Definition: Unless stated otherwise, crushed stone shall conform to ASTM C-33 with gradation number 67.

Placement: Unless otherwise specified, this material shall be placed and consolidated, if necessary, to achieve maximum density in place.

FINAL BACKFILL

General: Backfill, as referred to in this section of the Specifications, is that material placed above the initial and intermediate backfill as specified in applicable divisions for the installation of pipe and appurtenances.

Material: Backfill material shall consist of loam, clay, silt, sand or gravel which is free of cinders, ashes, refuse vegetable or organic material, frozen soil or stones more than 8 inches in their greatest dimension. Where excavated material does not provide sufficient quantity of material as described herein to complete the backfill, such additional material as may be required shall be furnished by the Contractor.

Placement: Final backfill shall be placed by either hand or mechanical methods at the Contractor's option. When backfilling flexible gravity sewer pipe (PVC, Truss), the Contractor shall provide 30 inches of cover over the top of the pipe before wheel loading the trench, and 48 inches of cover before using hydro-hammers or similar equipment for compaction. Otherwise, no special placement method or procedure shall be required provided the required degree of compaction is obtained throughout the backfill.

Compaction

Unimproved Areas: In unimproved areas, such as cross-county and wooded section of the line, which are not subject to public travel, the backfill shall be lightly compacted by the machine placing the backfill. The trench shall be overfilled by the amount of anticipated settlement and left neatly rounded.

Under Sidewalks and Pavement, Other Traffic Areas and Lawns: Soil backfill density shall be achieved of not less than 90% maximum dry density as determined by AASHTO T-99, Method A.

Appurtenances and Existing Structures: Soil backfill placed under or around installed appurtenances or placed under or around existing structures or utilities shall be compacted to achieve not less than 90% maximum dry density as determined by AASHTO T-99, Method A. The volume receiving the specified degree of compaction shall include all disturbed soil beneath a line, inclined to 45 degrees and passing one foot from the structure at finished grade.

N.C.D.O.T. Right-of-Way: In area covered by permit or special agreement, the backfill requirements shall be as described in the above paragraphs or as required by the permit or agreement, whichever is greater.

Finishing

Disposal of Materials: Such portions of the excavated materials as needed shall be used for backfilling and grading about the completed Work to the elevations as shown on the Drawings or as directed. All excavated material in excess of the quantity required for this purpose shall be disposed of, as described in Division 1 - General Requirements, by the Contractor in those areas designated by the Owner or his Engineer.

Finish and Cleaning

The Contractor shall leave the mounding of earth over the trenches in a neat and uniform condition acceptable to the Owner or his Engineer. The Contractor shall make such provisions as may be necessary to divert surface water across or away from the line of the trench.

In cultivated or improved areas where topsoil has been stripped, the topsoil shall be replaced as uniformly as possible over the disturbed areas.

Cleanup of excess materials, debris, etc., shall be done promptly as practicable and shall not be left until the end of the construction period.

RESTORATION

General: All areas disturbed by this Work shall be restored to a condition equal to or better than the condition prior to construction as determined by the Owner or his Engineer.

Grass Plots: Grass plots, sod shrubbery, ornamental trees, signs, fences, mail boxes, etc. shall be restored to the condition existing prior to making the excavation as determined by the Engineer. The cost of doing this Work shall be included in the cost of various applicable items.

Alleys, Driveways, Roadways: Roadways, alleys and driveways constructed with pavement, stabilized soil or gravel that are traversed by the excavation Work shall be restored to the condition existing prior to making the excavation as determined by the Engineer. The Contractor may reclaim existing material by stockpiling or other acceptable means, or he may furnish and compact new material. New or reused material shall be compacted to a minimum of 95% of the maximum density as determined by AASHTO T-99, Method A. The cost of doing this Work and the furnishing of any new material required shall be included in the cost of the Work and no separate payment shall be made, unless a separate bid item is provided in the Contract.

Paved Ditch, Sidewalk, Curb and Gutter Removal and Replacement: Paved ditch, sidewalk, curb and gutter removal and replacement required in the construction of this Work shall be done by the Contractor. The Contractor shall either stock pile or dispose of this material as directed by the Owner or his Engineer. All brick, concrete or built-up asphalt sidewalk replacement and curb and gutter replacement shall be replaced with like material in a manner and condition equal to or better than that existing at the time of removal as determined by the Engineer. Materials and method of replaced state highway sidewalks or curbs or ditches shall conform to the Specifications of the agency having jurisdiction.

Fine Grading: All finished areas shall be graded smooth, hand-raked where necessary and shall meet the elevations and contours shown on the Drawings. All lumber, earth clods or rocks larger than four inches and other undesirable materials shall be removed from the site at the completion of construction.

FINISH GRADING AND SEEDING

GENERAL: Sewer contractor to seed to the most restrictive of the following seeding recommendations:

N.C.D.O.T. Right-of-Way: In those areas covered by permit or agreement, the conditions of the permit or agreement shall prevail.

Soil Conservation Service Recommendations:

Landscaped Areas

In landscaped areas finished grading shall result in a uniform finish free of clods, rills or depressions. Hand-raking shall be performed where required to achieve the degree of finish or provide suitable surface for seeding.

Areas requiring seeding shall be seeded as required to achieve a finish of equal type, quality and density to surrounding areas. Sufficient mulch shall be applied to maintain the surface and protect the new vegetation until stabilized.

Unimproved Areas: Unimproved areas created by this construction shall be finish graded and seeded to stabilize soil. Seeding shall be applied as follows below. Remaining open areas shall be landscaped by owners.

Warm Season Grasses

Species	Pounds of Seed per 1,000 Feet	Optimum Time for Seeding
Common Bermuda Stolongs	1 bushel	April - July
Common Bermuda (Hulled)	2-3	April - July
Common Bermuda (unhulled)	2-3	Jan. - March
Centipede Grass	2-3	March - May
Bahia Grass	2-3	March - July
Weeping Love Grass	2	March - July

Fertilizer Recommendations

Apply 10-10-10 at rates of 25 lbs/1,000 square feet in early spring (April) and late summer (August) to build up food reserves and increase winter hardiness. Apply nitrogen at rates of 1-2 lb/1,000 square feet every 4 to 8 weeks during summer. Do NOT apply large amounts of nitrogen in the growing season (early fall) since this makes warm season grasses more susceptible to winter kill. These are general recommendations - soil test to be sure in fertilizing warm-season grasses.

Cool Season Grasses

Species	Pounds of Seed per 1,000 feet	Optimum Time for Seeding
Italian Rye Grass (Temporary Cover)	1-2	Sept. - Dec.
Tall Fescue	5-7	Sept. - Nov.

American Beach Grass	Sprig 1,000 plants per 2,500 feet	Nov. - Feb.

Tall Fescue is not recommended for sandy areas. Its shallow root system has a tendency to die-out during the summer arid months. If top soil is added, tall fescue has a better chance of survival.

Fertilizer

Proper fertilization for cool-season grasses should be guided by soil tests. In the absence of a soil test, follow these general recommendations:

Apply 25 lbs/1,000 square feet of 10-10-10 in early fall (September) and late winter (February).

Do not apply nitrogen on cool season grasses between June-September when these grasses are dormant. This may increase chances for disease to invade and kill these plants.

Liming

The sands of the Outer Banks generally require little or no liming. Lime according to soil test only.

Mulch

Apply 4,000 lb/acre straw, anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blade set nearly straight can be used as 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 bar spots, and the longer repairs are delayed, the more costly they become. Prompt action will keep sediment loss and repair cost down. New seedlings should be inspected frequently and maintenance performed as needed. If rills and gullies develop, they must be filled in, re-seeded, and mulched as soon as possible. Diversions may be needed until new plants take hold.

MAINTENANCE REQUIREMENTS EXTEND BEYOND THE SEEDING PHASE. Weak or damaged spots must be relimed, fertilized, mulched, and reseeded as promptly as possible. Refertilization may be needed to maintain productive stands.

END OF SECTION 02200

SECTION 02730 - GRAVITY SEWERS

GENERAL

Note: All Work performed under this Section shall be covered by Division 1 - General Requirements, these Specifications and the Drawings.

Scope: The Work covered herein consists of furnishing all plant, labor, equipment and materials and of performing all operations in connection with the bedding, installation and initial and intermediate backfill of gravity sewer pipe and appurtenances; and testing of finished construction, all in accordance with the terms and conditions of the contract.

Work not Included

Clearing, excavation, final backfill and restoration are specified in Division 2, Sections 02200 - Earthwork.

Requirements for horizontal and vertical separation between water and sewer pipes and appurtenances are specified in "Separation of Water Lines and Sanitary (or Combined Sewer) and Storm Sewer SHD 80" of this Section.

Submittals

The Contractor shall submit shop Drawings and/or samples of the following items in accordance with Division 1 - General Requirements.

Pipe, joints, adapters and specials for each type of material stating manufacturer and sufficient detail to show compliance with the material specifications and handling and installation instructions.

Special Provisions

Sewer pipe shall be either of the following except where shown otherwise on the Drawings:

Size	Material
4-inch and larger	SDR 35 PVC, DIP

Pipe material for all sewer pipes which cross either water mains and services or drainage culverts and do not meet minimum separation distances as described in "Separation of Water Lines and Sanitary (or Combined Sewer) and Storm Sewer SHD 80" of this Section shall be ductile iron material with mechanical joints as described on page in this Section.

Minimum cover above sewer main and laterals shall be 3 feet where practicable. Where depth of cover is less than 3 feet, under non-paved areas, ductile iron material shall be used for sewer main and cast iron pipe shall be used for service laterals. Where depth of cover under paved sections is less than 3 feet, ductile iron material shall be used for sewer main and cast iron soil pipe shall be used for service laterals.

Sewer Pipe Materials and Installation

PVC Sewer Pipe: 4-inch and larger.

Pipe: ASTM D3034 "Type PSM Poly (Vinyl Chloride (PVC) Sewer Pipe and Fittings" SDR 35, integral bells, elastomeric gasket joints.

Fittings: ASTM D3044; SDR 35; elastomeric joints; no saddles.

Joints: Elastomeric conforming to ASTM D3034 and ASTM D3212 "Joints for Drain and Sewer

Plastic Pipes Using Flexible Elastomeric Seals".

Storage and Handling: Conforming to manufacturer's recommendations.

Installation: General installation and embedment conforming to manufacturer's recommendations and this Section.

Tests: Test all installed pipe for water tightness and deflections as described in this Section.

Ductile Iron Sewer Pipe: 4-inch and smaller.

Pipe: AWWA C151 "Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water and Other Liquids," thickness class 50 (unless shown otherwise), cement-lined conforming to AWWA C104.

Fittings: Material and installation conforming to AWWA C110 grey or ductile iron.

Joints: Material and installation conforming to AWWA C111 push-on, unless otherwise shown otherwise.

Storage and Handling: AWWA C600 and approved shop Drawings.

Installation: AWWA C600, general installation and embedment conforming to manufacturer's recommendations and as described in this Section.

Tests: Test all installed pipe for water tightness and deflections as described in this Section.

GENERAL GRAVITY SEWER PIPE INSTALLATION

Alignment

Installation of sewer mains shall result in a continuous, straight pipe between manholes true to the line and grade shown on the Drawings. Deviation from line and grade shall not exceed plus or minus one-quarter-inch.

The Contractor shall provide and use a laser alignment device for installation of all gravity sewer for which alignment and slope are shown on the Drawings, except when specified otherwise in this Section of the Specifications or when alternate methods are approved, in writing, by the Engineer.

General Installation Requirements

Dry trench conditions shall be maintained by the Contractor throughout the course of pipe-laying, embedment and final backfill.

Pipe support shall be provided by laying the pipe on bedding material which has been shaped to receive the pipe. The shaped bedding shall provide uniform pipe support within the dimensions shown on the Drawings, or as specified under "Embedment," and throughout the length of the pipe barrel. Blocking or mounds shall not be used to establish grade.

Bell holes shall be excavated in the bedding material to allow unobstructed assembly of the joint. Bell holes shall be no larger than necessary and shall be carefully filled with bedding or initial backfill material after the joint is assembled.

Direction of pipe-laying shall be from the low end toward the higher end where possible.

Bell and spigot joints shall be laid generally with bell ends facing upstream.

Initial backfill (up to the centerline of the pipe) shall be carefully placed and compacted to completely fill the space beneath the pipe without moving the pipe from its proper position.

Clean pipe shall be maintained throughout construction. Prevent entry of excavation materials and foreign objects into the pipe and remove that which does enter. Cover pipe with a tight-fitting plug when installation is delayed.

Miscellaneous Connectors: Connectors other than pipe joints (i.e. adaptors, bushings, flexible joints and joints for pipe closures) shall conform to approved shop Drawings and shall be Mission, Fernco or approved equal.

Connections to Structures or Existing Manholes:

Connections to existing manholes or structures shall be by an approved coupling or adaptor for pipe and as detailed on the Drawings for manholes and structures. For connections of new Work to existing manholes or structures, make opening in existing with dimensions approximately as shown for precast manholes. Provide new or modified bench and channel for new pipe as specified for new manholes. Restore existing structure to condition existing prior to the Work unless additional repairs are specified elsewhere.

The Contractor shall provide an approved, flexible joint in pipes connecting to manholes or structures within 2 feet of the exterior of the wall.

Service Connections

Install service connections at the locations shown on the Drawings or as otherwise directed. Configuration of each connection shall be approved by Engineer and shall be arranged to provide suitable service to existing or potential dwellings or structures to be served. Generally, configuration shall be derived from the combination of: elevation at customer's structure or outlet; minimum pipe slopes as specified here; minimum pipe cover; and topography between the existing or proposed structures and the sewer.

Service connections consist of the service wye installed in the sewer main, 6-inch or 4-inch PVC pipe, pipe bends, reducing wyes and 6-inch or 4-inch PVC screw caps to construct a single or double service lateral connection as shown on detail sheet. Double service lateral connections shall be made to sewer main with 6-inch PVC. Single service lateral connections shall be made to sewer main with 4-inch PVC unless otherwise shown on Drawings.

Saddle connections - same as above except that service saddle replaces service wye. Use only for connections to existing Work. Make clean hole in sewer using approved tools suitable for the purpose.

Manhole connections shall be as specified for sewer pipe and as shown on detail drawings.

Pipe shall be installed with the slopes as shown on drawings.

Use plastic pipe where cover is 36 inches or more and where gravity sewer lines are not located under road pavement. Use ductile iron pipe where cover is less than 36" and located under pavement. Install with alignment and grade approved or ordered by Engineer.

Cleanouts

Install where directed and as shown on the detail Drawings.

Materials: Install wye, bend connector and pipe as specified for service connections. Use PVC, ABS or cast iron as described in this Section and as shown on Drawings.

Embedment:: Flexible and Semi-Rigid Sewer Pipe

Embedment materials: Embedment materials listed herein include a number of processed materials plus the soil classifications listed under the Unified Soil Classification System (USCS) (Method D 2487 and Practice D 2488). These materials are grouped into six broad categories according to their suitability for this application.

Class I, Grade - Angular, 6 to 40mm (1.0 to 1.5-inch), graded stone, including a number of ill materials that have regional significance such as coral, slag, cinders, crushed stone and crushed shells.

Class I, Ungraded - Angular stone as above, 1/4 to 3/4-inch, ungraded (one size aggregate).

Class II - Coarse sands and gravels with maximum particle size of 40mm (1.5-inch), including various graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. Soil type GW, GP, SW and SP are included in this class.

Class III - Fine sand and clayey gravels, including fine sands, sand-clay mixtures and gravel-clay mixtures. Soil types GM, GC, SM and SC are included in this class.

Class IV - Silt, silty clays and clays, including inorganic clays and silts of medium to high plasticity and liquid limits. Soil types CL and ML are included in this class. These materials are not recommended for bedding, haunching or initial backfill for flexible sewer pipe. Use of these materials may require additional effort to obtain specified compaction.

Class V - This class included the organic soils OL, OH and PT as well as CH, MH and soils containing frozen earth, debris, rocks larger than 40mm (1.5-inch) in diameter, and other foreign materials. These materials are not recommended for bedding, haunching or initial backfill for flexible or semi-rigid sewer pipes.

General

Check foundation for uniform grade, firmness, stability and adequate preparation as specified under "Excavation" in Section 02200 - Earthwork.

Correct wet, unstable or running soil conditions, as specified under "Excavation" in Section 02200 - Earthwork before commencing with pipe and embedment soil construction.

Flexible Pipe

Bedding

Shape bedding carefully to dimension on the Drawings and to grade along the entire length of the pipe barrel. Excavate bell holes for joints.

Bed pipe on foundation of native material where such material is Class I, II, III or IV and meets the requirements of installed bedding as specified in this Section.

Install bedding to a depth of approximately four to six inches beneath the pipe barrel. Engineer may elect to use a lesser or greater depth if unstable subgrade or running water are encountered. Provide uniform bedding for entire pipe barrel.

Class I material: Install with light compaction. If ungraded Class I material is used for bedding it must also be used for haunching and initial backfill to the top of the pipe.

Class II material: Install using hand or mechanical tamping to achieve at least 85% standard proctor

density. Avoid saturation of this material. Carefully shape bedding after compaction.

Class III material: Install as with Class II except achieve at least 90% standard proctor density.

Class IV material: Install as with Class III material. Carefully control moisture content of bedding material as required to specified dry density.

Haunching:

Material beneath spring line shall be carefully placed and compacted to completely fill the area beneath the pipe barrel and joints.

Prevent movement of the pipe during haunching. Place and compact material evenly on each side of the pipe.

Layers of haunching material placed and compacted shall not exceed 6 inches in depth.

Do not use graded Class I, II, III or IV material for haunching where pipe is installed in Class I ungraded material.

Class I, II, III and IV material: Install each material for haunching where pipe is installed on Class I ungraded material.

Initial Backfill:

Install initial backfill in layers not exceeding 6 inches in thickness.

Dept or initial backfill shall extend at least 6 inches above installed pipe. Where final backfill material contains stones greater than 6 inches in any dimension, initial backfill shall extend at least 12 inches above installed pipe.

Class I, II, III and IV material: Install each material as specified under "Bedding" in this Section.

Semi-Rigid Pipe: Bedding, haunching and initial backfilling shall comply with that specified for flexible pipe except that the compaction effort shall meet with minimum density requirements specified for rigid pipe.

Embedment: Rigid Gravity Sewer Pipe

General: This specification applies to pipe materials considered to be rigid. Embedment Detail Drawings referred to herein appear on the gravity sewer Detail Drawing.

Embedment Materials

Select trench material shall be free of brush, trash, debris and stones larger than 1.5 inches in any dimension.

Native granular material is any soil classified as sand or gravel by the Unified Soil Classification System (50% larger than size 200). This material shall also be free of brush, trash, debris and stones larger than 1.5 inches in any dimension.

Crushed stone is specified in Section 02200 - Earthwork.

Embedment Class

Description of the embedment classes is shown on the Drawings. Unless otherwise stated, embedment

Class C shall mean either C-1 or C-2, and Class B either B-1 or B-2 at the Contractor's option.

Generally, embedment class shall be Class C for rigid pipe unless shown otherwise on the Drawings or the depth of cover exceeds the maximum stated in this Section for the material.

GRAVITY SEWER TESTS

Water tightness

General

All gravity sewers shall be tested for water tightness by one of the following methods:

Infiltration test (pipe)

Exfiltration test (pipe)

Conditions under which each test may be used and criteria for passing or failing are stated under the description of the respective test.

The Contractor shall provide the materials, labor and equipment to conduct all tests. Water for testing shall be provided by the Contractor unless stated otherwise in Division 1 - General Requirements.

Test sections shall be determined by the Engineer. Generally, a test section shall be one structure and the downstream pipe to the inlet of the next structure. Several such pipe sections shall be tested as one test section if directed by the Engineer.

All tests for record shall be conducted in the presence of the Engineer or his representative.

Test sections which fail any of the tests described herein shall be corrected and retested by the Contractor at no additional expense to the Owner.

Infiltration Test

Infiltration testing shall be used only when groundwater equals or exceeds a depth of four feet above the top of the pipe throughout the length of the test section. If the above condition exists and flow in the pipe is, in the Engineer's opinion, below the allowable, the pipe and manholes shall be considered to have passed the test and no measurement need be made.

Procedure shall be to plug the inlet pipes to the upstream manhole in the test section and all other openings. Place an approved measuring device (quick insert weir or equal) in the pipe at the downstream end of the test section. Allow flow to reach maximum and remain unchanged for thirty minutes or more. Record this figure as infiltration. Compute the inch-miles of pipe in the test section.

A test section passes the infiltration test if the flow from both pipe and manhole is less than 100 gallons per day per inch-mile of pipe within the section.

Exfiltration Test

Exfiltration testing may be used for all gravity sewer pipe and structures where infiltration testing cannot be used.

Procedure shall be to plug the inlet pipes in the manholes at each end of the test section and all other openings. Fill the sewer and upstream manhole with water to the lesser of four feet above the top of the outlet pipe or the top of the manhole. Allow to stand overnight. Refill if necessary to the depth above.

Measure the height of water twice, two hours apart, and compute the rise or fall. Convert measurements to gallons per day. Compute the inch-mile of pipe in the test section.

A test section passes the exfiltration test if the computed exfiltration from both pipe and manhole is less than 100 and equal to or greater than zero gallons per day per inch-mile of pipe within the test section.

Deflection Test

Deflection tests shall be performed not less than 30 days after completion of installation.

Test shall consist of passing an approved go/no-go gauge through each section of installed pipe. Failure of gauge to pass through without significant force shall be grounds for rejection of installed pipe. Test gauge shall consist of a rigid mandrel with outside diameter within plus or minus 0.01 inch of that shown below. Mandrel shall be cylindrical with cross section being either circular or an odd number of points, not less than nine, spaced uniformly about the circumference.

Mandrels for PVC pipe shall be sized for 5% deflection of the base inside diameter as calculated in Appendix X1 of ASTM D3034-81. Mandrel dimensions shall be:

Nominal Pipe Diameter SDR35 pipe (in.)	Mandrel Diameter (in.)
6	5.45
8	7.28
10	9.08
12	10.78
15	13.20

SEPARATION OF WATER LINES AND SANITARY (OR COMBINED SEWERS) AND STORM SEWER SHD 80

Parallel Installation

Water lines shall be at least ten feet horizontally from a sewer main, sewer service connection or sewer manhole whenever possible. The distance shall be measured edge-to-edge. When local conditions prevent a horizontal separation of ten feet, the water line may be closer to a sewer or sewer manhole provided that:

The water main and sewer line shall be laid in separate trenches, and

The bottom of the water line is at least 18 inches above the top of the sewer.

The water main may be laid in the same trench with the sewer with the water main located at one side on a bench of undisturbed earth and with the elevation of the bottom of the water main at least 18 inches above the top of the sewer.

For water mains closer than 10 feet to a sanitary sewer manhole:

The sewer shall be constructed of ductile iron pipe as described on in this Section;

The sewer manhole shall be of watertight construction and tested in place.

Crossing

Crossing a Water Main Over a Sewer: Whenever it is necessary for a water main to cross over a sewer, the water main shall be laid at such an elevation that the bottom of the water main is at least 18 inches

above the top of the sewer, unless local conditions or barriers prevent the 18-inch vertical separation, in which case both the water main and sewer shall be constructed of ferrous materials and with joints that are equivalent to water main standards for a distance of 10 feet on each side of the point of crossing.

Crossing a Water Main Under a Sewer: Whenever it is necessary for a water main to cross under a sewer, both the water main and the sewer shall be constructed of ferrous materials and with joints equivalent to water main standards for a distance of 10 feet on each side of the point of crossing. A section of water main pipe shall be centered at the point of crossing.

Water lines passing under sewers shall, in addition, be protected by providing:

A vertical separation of at least 18 inches between the bottom of the sewer and the top of the water line.

Adequate structural support for the sewers to prevent excessive deflection of the joints and settling on and breaking the water line.

Sanitary and/or Combined Sewers or Sewer Manholes

No water pipe shall pass through or come in contact with any part of a sewer or sewer manhole.

Modification to Sewers

If modifications to existing sewer are necessary and cannot be otherwise avoided, the Work may be performed by the Owner or Contractor. Such Work performed by the Contractor shall be performed only after the acceptance of a change order for the Work.

SECTION 02731 - PUMP STATION

PART ONE - GENERAL

Note: All Work performed under this Section shall be covered by Division 1 - General Requirements, these Specifications and the Drawings.

Submittals:

The Contractor shall submit shop drawings and/or samples of the following items in accordance with Division 1 - General Requirements.

PART TWO - PRODUCTS

PRECAST CONCRETE STRUCTURES:

GENERAL:

Each raw sewage pump station shall consist of a separate sewage wetwell and valve vault constructed of precast concrete manhole sections designed, fabricated, installed and finished in accordance with this specification.

Precast manhole sections shall be designed and manufactured in accordance with ASTM C478-79 except that:

A. Minimum wall thickness shall be as shown on drawings.

B. Joints shall conform to ASTM C-443 "Joints for Circular Concrete Sewer and culvert Pipe, Using Rubber Gaskets" (Paragraph 7).

C. Pump basins shall be furnished with appropriate number of cored openings in the manhole wall suitable for installation of a continuous boot of 3/8-inch minimum thick neoprene and corrosion-resistant internal and external compression rings. Installed boot shall result in flexible water-tight connections meeting the performance requirements of ASTM 443 and as shown on the Drawings. Locate openings as shown on Drawings. Verify location prior to ordering sections.

D. All other pipe openings shall be integrally-cast openings in the basin wall as shown on the Drawings.

Precast bases designed and manufactured in accordance with ASTM C 478-79 shall be furnished and installed in accordance with this specification and as shown on the Drawings.

Separate bases conforming to the above requirements may be utilized in place of integrally-cast bases.

Precast flat tops designed and manufactured in accordance with ASTM C 478-79 shall be furnished and installed in accordance with this specification and as shown on the Drawings. Tops shall have access opening cast in to allow a minimum clear opening as shown on drawings and located to provide removal of pumps and access to equipment as shown on the Drawings. Covers shall be embedded or fastened.

Manhole steps shall be steel rod totally encapsulated in polypropylene plastic or approved equal corrosion-resistant material. Steps shall conform to requirements of ASTM C 478-79.

Stone for basin foundations shall be as shown on drawings or as approved by Engineer.

Manufacture and Handling:

Precast concrete sections shall be cast, cured and marked in accordance with the requirements of ASTM C478-49. Joints shall be planned in advance to provide adequate distance of solid concrete between joints and openings.

Lift holes or dimples shall not be cast into the structures without prior approval from the Engineer of their dimensions and sealing.

Exercise care in manufacture, transport and handling to avoid chipping or cracking, particularly in the area of the joints.

Installation:

A. Tolerances: Final installation shall meet the following tolerances:

   a. Plumbness - within one-quarter-inch per foot of height;

   b. Elevation - centerline pipe openings within one inch.

B. Foundation: Stabilize foundation soil as required. Add and compact stone. Adjust height and make level to achieve a compacted depth of stone exceeding the minimum depth shown on the Drawings which will result in finished installation meeting the tolerances above.

C. Placement: Exercise care in placing sections to avoid damage to sections, obtain proper installation of joints, obtain alignment of steps and meet the tolerances above. Pay particular attention to installing joints as recommended by the manhole manufacturer. Plaster completed joints.

D. Pump Basins: Verify depth of basins before ordering.

Embedded items to be installed at the time of manufacture include frame for cover, if required for installation.

All fastenings shall use expansion anchors suitable for the service.

Place bottom fillets as shown on the Drawings.

Provide embedded steel pipe sleeve with intermediate collar and rubber compression seal for all pipes two-inch diameter or less passing through basin walls. Sleeves and seals shall be similar to Link-Seal as manufactured by Thunderline Corporation, Wayne, Michigan.

E. Basin Covers: Pump basin access frame and cover assemblies shall be aluminum, with stainless steel hardware, designed to support live load of 150 pounds per square foot or equal approved by Engineer. Covers shall be as shown on drawings.

Assemblies shall fit opening provided in flat top.

Assemblies shall provide for locking, with hold open catch.

Assemblies shall provide for anchoring guide rails as recommended by pump manufacturer.

Covers to have hasp for padlock (lock to be provided by Owner).

PART 3 - EXECUTION

LEAKAGE TESTS

Each pump basin shall be tested for water-tightness by the infiltration or exfiltration method. Conditions under which each test may be used and criteria for passing or failing are stated under the description of the respective test in Section 02730 - Gravity Sewers and as described in this Section.

The Contractor shall provide the materials, labor and equipment to conduct all tests. Water for testing shall be provided by the Contractor unless stated otherwise.

Tests for record shall be conducted in the presence of the Engineer or his representative.

Upon failing any of the tests described herein, the Contractor shall correct the problem and retest the basin.

A. Infiltration Tests

Infiltration testing shall be used only when groundwater equals or exceeds a depth of four feet above the top of the highest reservoir pipe. If the above condition exists and leakage, in the Engineer's opinion, is below the allowable, a basin is considered to have passed the test and no measurement need be made.

Procedure shall be to plug the inlet pipes, allow flow to reach maximum and remain unchanged for thirty minutes or more, measure the height of water twice, two hours apart, and compute the rise and fall. Record this figure as infiltration in gallons per hour.

B. Exfiltration Tests

Exfiltration testing shall be used where infiltration testing cannot be used.

Procedure shall be to plug the inlet pipes. Fill the basin with water to the lesser of four feet above the top of the inlet pipe or the top of the basin. Allow to stand overnight. Refill if necessary to the depth above.

Record this figure as exfiltration in gallons per hour.

C. Pass/Fail Criteria

Pump basin shall pass if no measurable leakage exists.

PUMPING EQUIPMENT FOR SEWAGE PUMP STATIONS #21

A. General: The Contractor shall furnish and install pumps, appropriate lift out system, piping, valves and controls as shown on the Drawings and specified in these Specifications.

B. Pumps:

Pump Station
Furnish and install two (2) submersible non-clog sewage pumps. Each pump shall be capable of delivering 150 U.S. GPM at 47 TDH. The pump motor shall be rated 7.5 HP maximum, at 3450 RPM, 60 Hertz with a 4.625 inch cast iron impeller. Motor shall be for single (1) phase, 230 volts. Pumps shall be MYERS MODEL 3RH or equal approved by Engineer. See pump curve at the end of these Specifications.

C. Pump Design: Each pump shall be capable of handling raw unscreened domestic sewage consisting of water, fibrous materials, and three (3) inch diameter spherical solids. The pumps shall be capable of handling liquids with temperatures to 104 degrees F continuous and 160 degrees F intermittent, and shall be capable of running dry for extended periods of time.

D. Pump Construction: The volute, seal plates, impeller and motor housing shall be constructed of high quality ASTM A-48 class 30 cast iron. Pumps shall be painted with a water based air dry enamel of 2.0 mil minimum thickness. All exposed hardware shall be 300 series stainless steel. The pump construction shall contain no points of critical clearance nor require periodic adjustment of replacement to maintain operating efficiency. Discharge connection shall be a standard 125 pound, 4 inch flange. All gaskets shall be of the compression square ring type eliminating critical slip fits and possibility of damage during service associated with the sliding O-ring sealing arrangements.

Impeller diameters shall be 4.625 inches. Impeller to be of the non-clog design with pump out vanes on the back side. The impeller shall be dynamically balanced to ISO G6.3 specifications.

The double mechanical shaft seal shall be of the single spring design operating in an oil filled seal cavity. Pump-out vanes in the back of the impeller shroud shall develop a radially increasing pressure differential from the impeller hub outward. This pressure differential shall be transmitted by means of a Buna-N elastomer diaphragm to the oil in the seal cavity, thus producing a higher pressure inside the seal cavity than immediately adjacent to the seal face in the pump case forcing the oil in the seal cavity to be the seal face lubricant. The materials of construction shall be carbon for the rotating faces and ceramic for the stationary faces, lapped and polished to a tolerance of one light band, 300 series stainless steel hardware and with all elastomer parts of Buna-N. The seal shall be commercially available and not a manufacturers proprietary design. A moisture sensor detection system consisting of two probe utilized as a positive/negative pole shall be integrated within the oil-filled seal chamber. Units utilizing one probe and grounding through the pump case or a float device are not acceptable.

The pump shall be designed to be non-overloading throughout the entire pump curve. The rotor and stator assembly shall be of the standard frame design and secured to the pump seal plate by four threaded fasteners allowing for easy serviceability. Motor designs incorporating shrink press fit assembly between the stator and motor housing shall not be acceptable. The motor shall be constructed with the windings operating in a sealed environment containing dielectric oil, making it capable oil operating in a totally, partially of non-submerged condition for extended periods of time without damage due to the heat being generated. Air-filled motors shall not be acceptable. The motor windings shall be of Class F insulation. The motor shall meet the standard NEMA design B for three phase. The pump shaft shall be of 416 stainless steel. The lower bearing shall be of

the single row ball type to accept radial and thrust loads, and the upper bearing of the ball design for radial loads. Bearings shall operate in an oil bath atmosphere for superior life. Permanently lubricated bearings are not acceptable.

Thermal sensors shall be used to monitor stator temperatures. The stator shall be equipped with a thermal switch embedded in the end coil of the stator winding. This shall be used in conjunction with and supplemental to external overload protection and wired to the control panel.

Each pump shall be equipped with a motor power cable and sensor cable. Sizes shall be as specified by pump manufacturer with lengths to suit installation. Pump installation contractor to verify lengths with plans and site specific requirements prior to ordering cables. The cable entry design shall be such that it precludes specific torque requirements to insure a watertight and submersible seal. All incoming lead wires shall be spliced in the motor terminal housing. After splicing, the terminal housing shall be filled with epoxy to seal the outer cable jacket and the individual strands to prevent water from entering the motor housing. A secondary rubber pressure grommet shall be provided as an additional sealing point and strain relief at the point of cable entry. Cable entry designs utilizing terminal boards to connect power cord leads with motor leads shall not be acceptable.

TESTING, START-UP AND DOCUMENTATION FOR PUMP STATION

A. Pump Test: The pump manufacturer shall perform the following inspections and tests in accordance with Hydraulic Institute type B standards before shipment from the factory:

   a. A check of the motor voltage and frequency of each pump shall be made as shown on the name plate.

   b. A motor and cable insulation test for moisture content or insulation defects shall be made for each pump per UL criteria.

   c. Each pump shall be completely submerged and run to determine that the unit meets the hydraulic performance point.

   d. A written report shall be available showing the aforementioned tests have been performed in accordance with the specifications.

B. Start-Up: The pumps shall be tested at start-up by a qualified representative of the manufacturer. A start-up report as provided by the manufacturer shall be completed before final acceptance of the pumps.

C. Documentation: The manufacturer shall supply a minimum of three (3) sets of standard submittal data which shall consist of but not limited to the following:

a. Pump catalog data
b. Pump performance curve
c. Break Away Fitting (BAF) data
d. Access cover data
e. Typical installation drawing
f. Control panel data
g. Panel wiring schematic
h. Accessory data
i. Installation & Operation Manuals with Parts List

CONTROL EQUIPMENT FOR PUMP STATION

All control equipment manufacturing and wiring shall be done in accordance with the NEC, latest revisions. Control equipment shall generally consist of the following:

A. A main control panel housing motor overcurrent protection and starters, control circuit transformer and control circuit switches, alternator, relays and indicators.

B. Level switches.

C. Alarm indicator light and bell on 6-inch by 6-inch salt-treated post at pump station. Alarms at pump station shall be on separate circuit from pumps and controls.

D. All control equipment shall bear the Underwriters Laboratory label. Main control panel shall be either UL listed or be constructed of UL listed components.

E. Panel enclosures shall be NEMA 4X enclosures. Enclosures shall be constructed of fiberglass.

F. The main control panel shall have:

a. a dead front with separate removable inside panel to protect electrical equipment.

b. a lock hasp on outside door. (lock to be provided by owner)

c. a main circuit breaker for each pump.

d. a magnetic starter with three lag overload protection for each pump. One starter provided with adjustable on delay.

e. main circuit breaker for alarm and control circuits.

f. separate auxiliary circuit breakers for alarm and control circuits.

g. yellow run light for each pump.

h. H-O-A switch for each pump

i. red seal failure light for each pump

j. alarm switch for On-Off and Test.

k. weatherproof outside flashing red alarm light.

l. weatherproof outside alarm bell.

m. an alternator relay to alternate pumps on each successive cycle.

n. an override circuit to start both pumps if level rises in sump or to start second pump if one pump fails.

o. a terminal strip for connecting pumps and controls.

p. an elapsed time meter for each pump.

q. a schematic diagram fixed on the inside of door.

r. a built-in receptacle suitable for connecting to portable generator. (contractor to coordinate receptacle selection with wastewater treatment plant operator to insure compatibility of receptacle to existing portable generator)

s. a built-in duplex GFI receptacle suitable for 115-volt portable light or other appliance.

t. a thermostatically controlled condensation heater inside control panel.

u. automatic telephone dialer:

automatic telephone dialer shall be triggered when the alarm float is activated. Dialer shall be capable of handling 3 phone numbers. Phone numbers shall include system operators and owners. Contractor to verify that dialer will work on existing phone lines. No magnetic recording tapes allowed. Battery back up shall be supplied.

H. Level switches shall:

a. be mercury tube switches sealed in a solid polyurethane float.

b. have sealed power cord with weight attached above the float to hold switch in place.

c. be suspended from a stainless steel float bracket through holes provided with rubber snubbers to protect the cord and to hold cord at any set height.

d. set to heights shown on Drawings.

Contractor shall provide Owner two sets of operation and maintenance instructions with parts list for the pump station and controls.

All wire leads for pumps and floats shall pass through a watertight and gas-tight conduit to the control panel. Conduit shall be of sufficient size to enable all leads to pass through.

System Operation: On sump level rise lower mercury switch shall energize, then upper level switch shall energize and start lead pump. With lead pump operating, sump level shall lower to low-water level and turn off lower float switch, stopping pump. Alternating relay shall index on stopping of pump to start lag pump on next operation. If sump level continues to rise with lead pump on, alarm float switch shall energize and signal alarm and activate auto-dialer. When lag float switch is energized, override switch shall then start lag pump. Water level shall then lower to low-water level and both pumps stop. On power outage, one pump shall delay restarting for fifteen seconds. All switch levels shall be adjustable from the surface.

LIFT OUT SYSTEMS FOR SEWAGE PUMP STATION

Each pump shall have an individual lift-out system. System shall consist of vertical guide rails, mounting plates and guides, stainless steel lifting chain and a self-sealing connection between the pump discharge flange and the stationary discharge piping. System shall allow complete removal of the pump from the basin by use of the lifting chain.

Rails shall be galvanized pipe, sized in accordance with the pump manufactures recommendations, and shall be fixed at the top and bottom of the basin and braced in accordance with manufacturer's instructions and as shown on the Drawings.

A guide system base plate shall be fastened to the basin floor and shall support the guide rails, discharge elbow and the pump when it is lowered.

Guide brackets shall hold the pump in place relative to the guide rails and shall align the self-sealing connections.

Lifting chains (two required) shall be of adequate size, stainless steel chain and shall be connected to transfer lifting loads to the pump. Upper end of chain shall be secured at the top of the basin within easy reach from above.

Self-sealing connection shall be a slip-apart design which can be easily made by lowering the pump into place. Connection shall not leak during or after operation of the pump.

Plumbing: Discharge pipe shall be 4" Sch 40 ductile iron pipe with flange fittings as shown on Drawings.

Discharge pipe shall pass perfectly through a cast-in place booted pipe opening in the basin wall as shown on the Drawings.

END OF SECTION 02731

SECTION 02733 - FORCE MAINS

GENERAL

Note: All Work performed under this Section shall be covered by Division 1 - General Requirements, this Section of the Specifications and the Drawings.

Scope: Work included in this Division of the Specifications consists of furnishing all materials, plant, labor and equipment and of performing all operations in connection with the fabrication, delivery to the job site, bedding, installation and backfill of all pressure mains and their appurtenances complete and ready for backfill in accordance with these Specifications and as shown on the Drawings subject to the terms and conditions of the Contract.

Submittals: The Contractor shall submit shop Drawings and/or samples of the following items in accordance with Division 1 - General Requirements.

Special Provisions

Force main shall be either PVC SDR 21, CL200 or ductile iron pipe (DIP).

PIPE MATERIALS AND INSTALLATION

Force Main Materials

Sewer Force Main: 6" and smaller, ductile iron pipe.

Ductile Iron Pipe: Ductile iron pipe shall conform to AWWA C151, "American National Standard for Ductile Iron Pipe, Centrifugally Cast-in Metal Molds or Sand Lined Molds, for Water and Other Liquids". Pipe provided shall be thickness Class 50 unless shown otherwise on the drawings or elsewhere in these specifications. Pipe shall be cement lined with bituminous seal coat conforming to AWWA C104.

Joints: Joints for ductile iron pipe shall conform to AWWA C-111. The type of joint to be used shall be elastomeric push-on joint for general below grade use and either flanged or mechanical joints where shown on the drawings or specified elsewhere.

Fittings: Fittings for use with ductile iron pipe shall be cement lined, ductile iron fittings conforming to AWWA C110. Push-on joints shall be used for general below grade use and either flanged or mechanical joints where shown on the drawings or specified elsewhere.

Sewer Force Main: 6" and smaller; (PVC SDR 21, CL200)

Pipe: ASTM D2241 Poly (vinyl Chloride)(PVC) pressure rated pipe (SDR series), SDR 21.

Fittings: ASTM D3034; elastomeric joints; no saddles.

Joints: Elastomeric conforming to ASTM D3034 and ASTM D3212 "Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals".

Storage and handling: Conform to manufacturer's recommendations.

Installation: General installation and bedding conforming to this Section.

Test: Pressure test all installed pipe as described in "Hydrostatic Testing" of this Section.

GENERAL PIPE INSTALLATION SPECIFICATIONS

Stringing, Cleaning: Pipe and fittings shall be strung out along the route of construction with the bells facing in the direction in which the Work is to proceed. Pipe shall be placed where it will cause the least interference with traffic. Pipe shall be handled by mechanical equipment. Before the pipe is lowered into the trench, it will be swabbed or brushed out, if required, to insure that no dirt or foreign material remains in the finished line. Trench water shall be kept out of pipes and the pipe kept closed by means of a test plug whenever Work is not in progress. The Contractor shall provide the means for dewatering the trench and the cost thereof shall be included in the price for installing the pipe.

Preparation of Trench and Bedding: Pipe shall be laid in a level trench. Irregularities shall be smoothed out or filled in with sand and tamped as required. Holes shall be scooped out where the joints occur leaving the entire barrel of the pipe bearing on the pipe bed.

Deflections: Deflections from a straight line or grade made necessary by vertical curves or horizontal curves or offsets shall not exceed the manufacturer's recommendations. If the specified or required alignment requires deflections in excess of those recommended, the Contractor shall either provide special bends as approved by the Owner or his Engineer or a sufficient number of shorter lengths of pipe to provide angular deflections within the required limit.

Jointing: Jointing shall be carried out following the recommendations of the manufacturer of the pipe. All joints shall be watertight and any leaks or defects discovered shall be immediately repaired to the satisfaction of the Owner or his Engineer. Any pipe which has been disturbed after being laid shall be taken up, the joints cleaned and the pipe properly relaid. Any superfluous material inside the pipe shall be flushed or removed by means of an approved follower or scraper after joints are made. Installation of fittings and pipe joints shall be in strict accordance with the manufacturer's recommendations.

Thrust Blocks: Thrust blocks shall be installed at all fittings within the system which change direction of flow or create unbalanced forces about the fitting. When directed, thrust blocks shall also be installed on each side of pipe where bends are made by deflecting pipe or joints and soil conditions do not provide adequate support for the pipe.

Thrust blocks shall be constructed of concrete which develops a 28-day strength of 2,500 psi and shall have a bearing area or volume as indicated on the Drawings. Concrete shall be kept behind the bells of fittings so as not to interfere with the joint or bolts and shall not run against gasket or pipe.

Thrust blocks shall be constructed so as to bear against undisturbed soil unless special provisions are made which are approved prior to construction. If the soil encountered has insufficient bearing capacity to resist thrusts special provisions shall be made as required by the Owner or his Engineer. Special provisions may include removal of poor soil and replacement with suitable material; installation of tie rods and collars; or installation of pile and thrust block.

Bedding, Initial and Intermediate Backfill

Regardless of the bedding type specified, the pipe barrel shall be supported uniformly throughout its length. Bell or coupling holes shall be provided such that no pipe loads are supported by bells or couplings.

Unless shown otherwise on the Drawings, bedding and initial backfill shall be type one when subgrade is stable (as examined by the Engineer) and trench width at the top of the pipe does not exceed that specified.

Material for initial and intermediate backfill (as defined on the Drawings and below) shall be selected barrow material, granular material as defined under Section 02200 - Earthwork or selected trench material free of organics, refuse, stones larger than one inch and frozen material.

Initial backfill is that which is placed from the pipe bedding material up to the centerline of the pipe. Initial backfill shall be hand-placed and carefully tamped under pipe haunches.

Intermediate backfill is that which is placed from the initial backfill to one foot above the top of the pipe. Intermediate backfill shall be placed and tamped. Material shall be placed and tamped in layers not exceeding six inches thick when compaction required exceeds 80% of maximum dry density.

Minimum Compaction:

Class 2 - unimproved areas
Class 1 - roadways, road shoulders, driveways, walkways and slopes greater than 20%

Pipe	Backfill Zone	% of Maximum Dry Density Class 2	Class 1
PVC SCH 40 CL160, SDR26 CL200, SDR21	Initial Intermediate	80%	90%
Ductile Iron	Initial Intermediate	80%	90%

APPURTENANCES: MATERIALS AND INSTALLATION
HYDROSTATIC TESTING

General

The Contractor shall be required to perform leakage tests on newly constructed mains as outlined herein. The Owner or the Contractor will furnish the gauge for making the tests and shall approve the measuring device. The Contractor shall furnish the pump, pipe, connections and all other necessary apparatus, and shall furnish the necessary assistance to conduct the tests.

Leakage tests shall be performed on all sections of line. Testing shall be conducted as the Work progresses unless otherwise directed.

All testing for record shall be performed in the presence of the Owner or his Engineer or representative.

Where any section of a main is provided with concrete thrust blocking or encasement, hydrostatic testing shall not be performed until at least five days have elapsed after the concrete was installed. If high-early strength cement is used in the concrete for thrust blocks and encasement, the hydrostatic tests shall not be performed until at least one day has elapsed, unless otherwise directed by the Owner or his Engineer.

Test Procedures

After completion of preparation and after test connections are made in a manner satisfactory to the Owner or his Engineer each section of pipe shall be slowly filled with water and pressurized. All pressures shall be based on the elevation of the lowest point in the test section and corrected to the elevation of the test gauge.

All air shall be expelled from the pipe. If permanent air vents are not located at all high points, the Contractor shall install corporation cocks at such points so the air can be expelled as the line is filled with water. After all air has been expelled, the corporation cocks shall be closed and testing begun.

Leakage Test

After all air has been expelled from a test section, all connections made and other preparations completed, the test section shall be subjected to leakage test pressure. This test pressure shall be sustained by a pump, and the quantity of water delivered to the system by the pump for a specified duration of time shall be measured. At the end of the designated time period, the quantity of water delivered to the test section shall be equal to or less than the allowable leakage computed for the test section.

If any test of the pipe discloses leakage greater than that specified, the Contractor, at his own expense, shall locate and repair defective joints and/or material until the leakage is within the specified allowance.

The Owner shall be furnished a written report of the results of the leakage test that identifies the specific length of pipe tested, the pressure, the duration of the test, the amount of actual leakage and the leakage allowance. The report shall be signed by the Contractor and the Owner or his Engineer.

Hydrostatic Test Pressure, Duration and Allowance

Leakage Test

The design working pressure (p) shall be calculated for the lowest point in a test section (see Standard Detail Sheet). Test pressure shall be 1-1/2 times the design working pressure with the following exceptions:

a) Test pressure shall not exceed the pressure class of the pipe plus 50 psi.

b) Test pressure shall not cause the working pressure of any valve or other appurtenance to be exceeded.

c) Minimum test pressure shall be 100 psi. (Revised 3/16/00)

The test pressure shall be corrected to the elevation of the test gauge.

Duration of the leakage test shall be two hours for sewage force mains.

The leakage allowance shall be the following gallons per day per mile of pipe per inch or nominal diameter at test pressure computed above.

Material	Allowance
AC	10
PVC	10
DI	10

The allowable leakage for a test section - L in gallons per hour - shall be calculated as follows:

$$Lgph = \frac{\text{Length (ft.)} \times \text{Dia. (in.)} \times 10}{5280}$$

SECTION 03310 - CONCRETE WORK

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The Work included in this Section of the Specifications includes furnishing all material, plant, labor and equipment necessary and completing all concrete work shown on the Drawings and specified herein; complete and ready for use in accordance with the requirements of the Contract.

1.2 STANDARDS AND SPECIFICATIONS

A. Concrete Work shall conform to all requirements of ACI 301 (latest edition), Specifications for Structural Concrete for Buildings, except as modified by the Supplemental Requirements below. Design and construction of all concrete structures shall also conform to Building Code Requirements for Reinforced Concrete (ACI 318 latest edition) Working Street Design.

B. Class of Concrete: Unless otherwise shown on Drawings, concrete shall be air-entrained with a 28-day compressive strength as follows:

Compressive Strength	Location
3,500 psi	All structural slabs
2,500 psi	Non-str. fill, pipe support and thrust blocks
3,000 psi	All other

C. Storage of Materials: Cement and aggregates shall be stored so as to prevent deterioration, segregation or intrusion of foreign materials. Liquid admixtures shall be protected from freezing and from settling out of solution. No deteriorated or damaged materials shall be used for concrete or concrete construction.

D. Submittals: Submit five copies of shop drawings for reinforcing steel, if different from the Drawings, to the Engineer for approval. Obtain approval of shop drawings prior to fabricating any material or proceeding with the Work. Shop drawings shall indicate bending diagrams, assembly diagrams, splicing and lap of bars, shapes, dimensions and details of bar reinforcing and accessories. Drawings shall be prepared in accordance with the "Manual of Standard Practice for Detailing Reinforced Concrete Structures" ACI 315. Scaled dimensions from structure Drawings shall not be used in detailing the lengths of reinforcing bars.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All materials shall be furnished by the Contractor and shall be new.

B. Cement shall be air entrained and shall otherwise conform to Type I or Type II C150, Specifications for Portland Cement.

C. Aggregates shall conform to the requirements of ASTM Specification C-33 unless otherwise specified. Coarse aggregates for concrete having exterior surface exposed:

(a) 95% to 100% shall pass a 1-1/2-inch sieve,

(b) 35% to 70% shall pass a 3/4-inch sieve,
(c) 10% to 20% shall pass a 3/8-inch sieve, and
(d) not over 5% shall pass a No. 4 sieve

*(Percentages are by weight)

D. Water shall be clean and free from injurious amounts of oil, salt, acid, alkali, organic matter or other deleterious substances.

E. Air-entraining admixtures shall conform to ASTM C-260.

F. Reinforcing steel shall be Grade 60, deformed billet steel bars conforming to ASTM A-615, latest edition. Size of bars shall be as shown on Drawings.

G. Welded wire fabric shall conform to ASTM A-185 except that welded intersections shall be spaced not farther than 12 inches in the direction of the principal reinforcement.

H. Vapor-Barrier: 4 mil polyethylene to be placed under septic/pump tank slab.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Air Content and Consistency: Unless otherwise specified, the concrete slump shall be 2 to 4 inches.

1. Air content by volume shall be 6%, +/-1, of the volume of the concrete. When specified or when directed by the Engineer, a water-reducing, set-retarding, admixture approved by the Engineer shall be used.

3.2 MIXERS AND MIXING

A. Concrete shall be uniform and thoroughly mixed when delivered to the Work. Variations in slump of more than 1 inch within a batch will be considered evidence of inadequate mixing and shall be corrected by either increasing mixing time or by other means.

B. For ready mix concrete the elapsed time from time of departure from plant until concrete is placed in forms shall not exceed 45 minutes. Delivery tickets shall show time of departure from plant, time concrete is placed, proportions of cement, aggregate and water, any additives introduced and any water added at job. A copy of each delivery ticket shall be sent to the Engineer.

C. For stationary mixers, the mixing time after all cement and aggregates are in the mixer drum shall be less than 1-1/2 minutes. When concrete is mixed in a truck mixer, the number of revolutions of the drum or blades at mixing speed shall be not less than 70 nor more than 100.

D. No mixing water in excess of the amount called for by the job mix shall be added to the concrete during mixing or hauling or after arrival at the delivery point.

3.3 STEEL REINFORCEMENT

A. Before reinforcement is placed, the surfaces of the bars and fabric and any metal supports

shall be cleaned to remove any loose, flaky rust, mill scale, oil, grease or other coatings or foreign substances. After placement, the reinforcement shall be maintained in a clean condition until it is completely embedded in the concrete.

B. Reinforcement shall be cut and bent in compliance with the requirements of the American Concrete Institute Standard 315. Bars shall not be bent or straightened in a manner that will injure the material. Bars with kinks, cracks or improper bends will be rejected.

C. Unless otherwise specified on the Drawings, splices of reinforcing bars shall provide an overlap equal to a least 30 times the diameter of the smaller bar in the splice but not less than 12 inches.

D. Reinforcement shall be accurately placed and secured in position in a manner that will prevent its displacement during the placement of concrete. Tack welding of bars will not be permitted. Metal chairs, metal hangers, metal spacers and concrete chairs may be used to support the reinforcement. Metal hangers, spacers and ties shall be placed in such a manner that they will not be exposed in the finished concrete surface. The legs of metal chairs that may be exposed at the lower face of slabs or beams shall be galvanized. Precast concrete chairs shall be manufactured of the same class concrete as that specified for the structure and shall have tie wires securely anchored in the chair or a V-shaped groove at least 3/4-inch in depth molded into the upper surface to receive the steel bar at the point of support. Precast concrete chairs shall be moist at the time concrete is placed.

E. Reinforcement shall not be placed until the prepared site has been inspected and approved by the Engineer. After placement of the reinforcement, concrete shall not be placed until the reinforcement has been inspected and approved by the Engineer.

F. Reinforcement shall be placed in accordance with the drawings.

3.4 FORMS

A. Forms shall be of wood, plywood, steel or other approved material and shall be mortar tight. The forms and associated false work shall be substantial and unyielding and shall be constructed so that the finished concrete will conform to the specified dimensions and contours. Forms surfaces shall be smooth and free from holes, dents, sags or other irregularities.

B. Forms may be omitted for unexposed concrete footings if concrete is poured in clean-cut trenches, of exact dimensions, without cave-ins.

C. Unexposed concrete may be formed against structural tongue and groove, No. 2 Common Southern Pine Lumber.

D. Coating on all form linings for exposed concrete shall be an approved form oil and shall be applied in accordance with manufacturer's directions.

E. Metal reinforcement shall be accurately placed according to Drawings and adequately secured in position by concrete, metal, other approved chairs, spacers or ties.

F. Securely fasten to forms all required anchor bolts, etc., which may be required to be embedded in concrete.

G. Metal ties or anchorages within the forms shall be equipped with cones, she-bolts or other devices that permit their removal to a depth of at least one inch without injury to the concrete.

3.5 PREPARATION OF FORMS AND SUBGRADE

A. Prior to placement of concrete, the forms and subgrade shall be free of chips, sawdust, debris, water, ice, snow, extraneous oil, mortar, or other harmful substances or coatings. Any oil on surfaces required to be bonded to the concrete shall be removed. Earth surfaces shall be firm and damp. Placement of concrete on mud, dried earth or uncompacted fill or frozen subgrade will not be permitted.

B. Items to be embedded in the concrete shall be rechecked and positioned accurately and anchored firmly.

C. For slabs on grade, subgrade shall be well compacted. Over subgrade place a minimum of 6 inches of compacted gravel fill.

3.6 CONVEYING

A. Concrete shall be delivered to the site and discharged into the forms within 1-1/2 hours after the introduction of the cement to the aggregates. In hot weather or under conditions contributing to quick stiffening of the concrete, the time between the introduction of the cement to the aggregates and discharge shall not exceed 45 minutes. The Engineer may allow a longer time, provided the setting of the concrete is increased a corresponding amount by the addition of an approved set-retarding admixture. In any case, concrete shall be conveyed from the mixer to the forms as rapidly as practicable by methods that will prevent segregation of the aggregates or loss of paste. Concrete shall not be dropped more than five feet vertically unless suitable equipment is used to prevent segregation.

3.7 PLACING

A. Concrete shall not be placed until the subgrade, forms and steel reinforcement have been inspected and approved. No concrete shall be placed except in the presence of the Engineer or his representative. The Contractor shall give reasonable notice to the Engineer each time he intends to place concrete.

B. The concrete shall be deposited as closely as possible to its final position in the forms and shall be worked into the corners and angles of the forms and embedded items in a manner to prevent segregation of aggregates or honeycombing.

C. Immediately after the concrete is placed in the forms, it shall be consolidated by spading, hand-tamping or vibration as necessary to insure smooth surfaces and dense concrete. Each layer shall be consolidated to insure monolithic bond with the preceding layer.

3.8 REMOVAL OF FORMS

A. Forms shall be removed within 24 hours after the placement of the concrete. Forms shall be removed in such a way as to prevent damage to the concrete. Supports shall be removed in a manner that will permit the concrete to take the stresses due to its own weight uniformly and gradually. Generally, forms are to remain in place for three days. Forms for self-supporting slabs and beams shall remain in place seven days.

3.9 FINISHING

A. Base slabs shall be screeded and well tamped with straight edge, bringing base slab to level with no holes or pockets.

3.10 CURING

A. Concrete shall be prevented from drying for a curing period of at least 7 days after it is placed. Exposed surfaces shall be kept continuously moist for the entire period, or until curing compound is applied as specified below. Moisture shall be maintained by sprinkling, flooding or fog spraying or by covering with continuously-moistened canvas, cloth mats, straw, sand or other approved materials. Wood forms (except plywood) left in place during the curing period shall be kept wet. Formed surfaces shall be thoroughly wetted immediately after forms are removed and shall be wet until patching and repairs are completed. Water or covering shall be applied in such a way that the concrete surface is not eroded or otherwise damaged.

B. Concrete may be coated with an approved curing compound in lieu of continued application of moisture. The compound shall be sprayed on the moist concrete surfaces as soon as free water has disappeared, but shall not be applied to any surface until patching, repairs and finishing of that surface are completed.

3.11 REMOVAL AND REPAIR

A. When concrete is honeycombed, damaged or otherwise defective, the Contractor shall correct or repair the defective areas. The Engineer will determine the required extent of removal, replacement or repair. The Contractor shall perform all repair Work in the presence of the Engineer.

3.12 CONCRETING IN COLD WEATHER

A. Concrete shall neither be mixed nor placed when the daily minimum atmospheric temperature is less than 40 degrees Fahrenheit unless facilities are provided to prevent the concrete from freezing. The use of accelerators or antifreeze compounds will not be allowed.

3.13 CONCRETING IN HOT WEATHER

A. The Contractor shall apply effective means to maintain the temperature of the concrete below 90 degrees Fahrenheit during mixing, conveying and placing.

3.14 EMBEDDED ITEMS AND OPENINGS

A. Before placing concrete, the Contractor shall ascertain that every item to be embedded is properly placed and that openings required in the concrete are properly formed. Permanent embedding of wood in concrete is to be avoided whenever possible. Wood that must be embedded shall be thoroughly wet when concrete is placed. Items to be embedded shall be clean and free from rust, scale, oil and other foreign matter.

3.15 EQUIPMENT BASES AND FOUNDATIONS

A. Foundation base dimensions and locations shall be verified with equipment manufacturer's approved shop Drawings. Built-in items to be set such as anchor bolts, conduits, pipes, drains and receptacles shall be set in accordance with the equipment manufacturer's directions.

PART 4 - QUALITY CONTROL TESTING DURING CONSTRUCTION:

4.1 The Owner will employ a testing laboratory to perform tests and to submit test reports.

4.2 Sampling and testing for quality control during placement of concrete may include the following, as directed by Engineer.

A. Sampling Fresh Concrete: ASTM C172, except modified for slump to comply with ASTM C 94.

B. Slump: ASTM C143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.

C. Air Content: ASTM C173, volumetric method for lightweight or normal weight concrete; ASTM C231 pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.

D. Concrete Temperature: Test hourly when air temperature is 40 deg. F (4 deg. C) and below, and when 80 deg. F (27 Deg. C) and above; and each time a set of compression test specimens made.

E. Compressive Strength Tests: ASTM C29; one set for each day's pour exceeding 5 cu. yds. plus additional sets for each 50 cu. yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

1. When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.

F. Test results will be reported in writing to Engineer and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.

G. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

H. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not bee attained in the structure, as directed by Engineer. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.

END OF SECTION 03310

SECTION 03600 - GROUT

PART ONE - GENERAL

1.01 WORK INCLUDED:

A. The Contractor shall furnish all labor, materials, tools and equipment necessary to install grout at all locations specified or shown on Drawings.

1.02 STANDARDS:

A. Comply with standards specified in ASTM C-157.

1.03 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver and store product in original unopened containers.

B. Store in weather-tight enclosures and protect against dampness and warehouse set.

C. Each Contractor shall bear the trade name of the material and the name of the manufacturer.

PART 2 - PRODUCTS

2.01 Use specially-prepared, ready-to-use, waterproof non-shrinking grout. Grout may or may not contain metallic aggregate.

PART 3 - EXECUTION

3.01 Grouting shall be done in strict accordance with the recommendations of the American Concrete Institute and the manufacturer's specifications for mixing and placing. All surface areas requiring grout shall have full contact with the grout, free of any voids.

END OF SECTION 03600

Pump Data Sheet - Myers

Company: PHASE 8A CURRITUCK CLUB
Name: PUMPSTATION #21
Date: 1/14/2011

Myers® Pentair

Pump:

Size: 3RH/3RHX

Type: Non-clog
Synch speed: 3600 rpm

Speed: 3450 rpm
Dia: 4.625 in

Curve:

Impeller:

Specific Speeds:

Ns: ---
Nss: ---

Dimensions:

Suction: ---
Discharge: 3 in

Pump Limits:

Temperature: ---
Pressure: ---
Sphere size: 2 in

Power: ---
Eye area: ---

Search Criteria:

Flow: 150 US gpm

Head: 47 ft

Fluid:

Water
SG: 1
Viscosity: 1.105 cP

Temperature: 60 °F
Vapor pressure: 0.2563 psi a
Atm pressure: 14.7 psi a

NPSHa: ---

Motor:

Standard: NEMA
Enclosure: TEFC

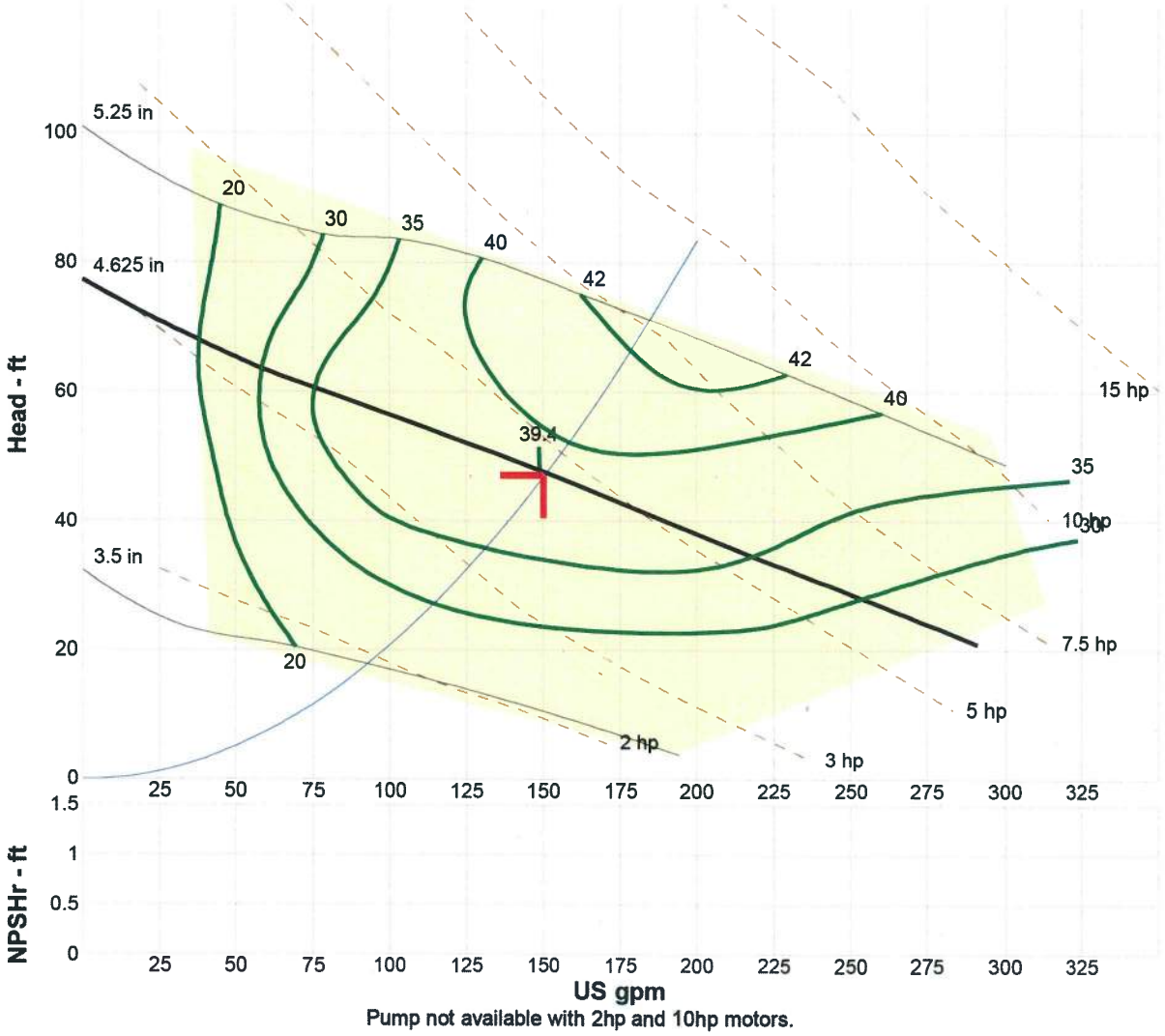
Size: 7.5 hp
Speed: 3600
Frame: 213T

Sizing criteria: Max Power on Design Curve

---- Data Point ----	
Flow:	150 US gpm
Head:	47.6 ft
Eff:	39.3%
Power:	4.58 hp
NPSHr:	---

---- Design Curve ----	
Shutoff head:	77.3 ft
Shutoff dP:	33.4 psi
Min flow:	---
BEP:	39.4% @ 149 US gpm
NOL power:	6.56 hp @ 291 US gpm

-- Max Curve --	
Max power:	10.1 hp @ 300 US gpm



Pump not available with 2hp and 10hp motors.

Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
180	3450	41.9	37.4	4.96	---
150	3450	47.6	39.3	4.58	---
120	3450	52.9	37.7	4.07	---
90	3450	58.1	35.9	3.55	---
60	3450	63.3	30.5	3.14	---

Selected from catalog: Myers.60 Vers: 12-10

NCDENR
North Carolina Department of Environment and Natural Resources
Division of Water Quality

Beverly Eaves Perdue
Governor

Coleen H. Sullins
Director

Dee Freeman
Secretary

May 5, 2011

Rolf Blizzard, Manager
Pine Island – Currituck, LLC
615 Hillsborough St., Suite 201
Raleigh, NC 27604

Subject: Permit No. WQ0018170 Modification
Pine Island – Currituck, LLC
Pine Island – Currituck, LLC (Wastewater Collection System Extension to serve The Currituck Club, Phase 8A and Lot 430) Sewer - Modification
Wastewater Collection System Extension
Currituck County

Dear Mr. Blizzard:

In accordance with your permit modification application received April 19, 2011 and additional information received May 3, 2011, we are forwarding herewith Permit No. WQ0018170, dated May 5, 2011, to Pine Island – Currituck, LLC for the continued construction and operation of the subject wastewater collection system extension. This permit shall be effective from the date of issuance until rescinded, shall void Permit No. WQ0018170 dated October 4, 2006, and shall be subject to the conditions and limitations as specified therein. This cover letter shall be considered a part of this permit and is therefore incorporated therein by reference.

1) This modification clarifies the names of the owner and the facility, as well as increases the design flow of the Phase 8A section (previously named Cottages) by 480 gallons per day (GPD). The section was previously designed as 16 7-bedroom Lots, but due to larger homes not selling, the section has been redesigned as 29 4-bedroom Lots. The Phase 8A modification reduces pump station (PS) number (#) 21, from duplex 151 gallon per min (GPM) pumps to 150 GPM pumps. (**Note**: PS # 21 serves only the 13,920 GPD design flow for Phase 8A.) The total design flow for the Phase 8A/Inn Site/Historic Lots section therefore increases by 480 GPD, previously permitted with a total section design flow of 49,560 GPD, to the increased total section design flow of 50,040 GPD. The line length was previously permitted for 1,408 linear feet (LF) of 4-inch force main (FM). The redesigned smaller lot sizes for the Phase 8A section reduces the design length to 1,176 LF of 4-inch FM.

2) This modification adds Lot # 430 to the Phase 1 section. The Lot is located at the end of Herring Gull Court and increases the section's design flow by 480 GPD. The Currituck Club PUD Phase 1 and Phase 2 and Magnolia Bay – Phase 1 total section design flow was previously permitted as 98,400 GPD. Lot # 430 increases the section's total flow to 98,880 GPD. **Note**: The flow of Lot # 430 is made

North Carolina Division of Water Quality
943 Washington Square Mall
Washington, NC 27889

Internet: www.ncwaterquality.org
Phone: (252) 946-6481
Fax: (252) 948-9215

tributary via a deemed service connection (Additional sewer length permitting is not included for the connection).

3) Therefore, this modification increases the total design flow by 960 GPD as accounted above. Although, the Engineer has requested for the entire Pine Island – Currituck, LLC system flow allocation be reduced from the previously permitted 543,160 GPD to the total development allocation of 541,628 GPD. The Aquifer Protection Section of the Washington Regional Office has agreed to allow the revised total.

Please pay particular attention to Permit Condition 3 which requires that the wastewater collection facilities be properly operated and maintained in accordance with 15A NCAC 2T .0403 or any individual system-wide collection system permit issued to the Permittee.

Permitting of this project does not constitute an acceptance of any part of the project that does not meet 15A NCAC 2T; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; and the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable, unless specifically mentioned herein. Division approval is based on acceptance of the certification provided by a North Carolina-licensed Professional Engineer in the application. It shall be the Permittee's responsibility to ensure that the as-constructed project meets the appropriate design criteria and rules. Failure to comply may result in penalties in accordance with North Carolina General Statute §143-215.6A through §143-215.6C, construction of additional or replacement wastewater collection facilities, and/or referral of the North Carolina-licensed Professional Engineer to the licensing board.

In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations, permission is hereby granted to Pine Island – Currituck, LLC for the continued construction and operation of approximately 3,058 linear feet of 8-inch gravity sewer and 859 linear feet of 6-inch gravity sewer; a 125–gallon per minute pump station (PS #20) with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; a 150–gallon per minute pump station (PS #21) with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 1,176 linear feet of 4-inch force main to serve 29 4-bedroom units, 23 units at the Inn site, 27, 7-bedroom units and one retail building as part of the **Phase 8A/Inn Site/Historic Lots** project, and the discharge of **50,040** gallons per day of collected or wastewater into the Pine Island – Currituck, LLC's existing sewerage system, pursuant to the application received April 19, 2011, and in conformity with 15A NCAC 2T; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered a part of this permit, and;

The continued operation of the certified facilities or continued construction and operation of the not yet certified facilities as follows:

Approximately 2,762 linear feet of 8-inch gravity sewer; 190 linear feet of 6-inch gravity sewer; a 150–gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; a 180–gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry, as well as approximately 1,034 linear feet of 4-inch force main to serve 54 three-bedroom residences as part of **Phase 7**, and the discharge of **25,920** gallons per day of collected domestic wastewater into Pine Island – Currituck, LLC's existing sewerage system;

Approximately 100 linear feet of 6-inch gravity sewer and 316 linear feet of 8-inch gravity sewer to serve a 180 seat restaurant and pool as part of **Flyway Grill at Pine Island**, and the discharge of approximately **8,700** gallons per day of wastewater to the Pine Island – Currituck, LLC's existing sewerage system;

Approximately 2,216 linear feet of 8-inch gravity sewer; a 110–gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 1,223 linear feet of 4-inch force main to serve 24 four-bedroom residences as part of Currituck Club PUD, **Phase 6**, with the discharge of **11,520** gallons per day of wastewater to the Pine Island – Currituck, LLC's existing sewerage system;

Approximately 3,849 linear feet of 8-inch gravity sewer; a 95–gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 802 linear feet of 4-inch force main to serve 15 four-bedroom single family lots and 72 three-bedroom patio homes as part of the **Hammocks at the Currituck Club** project, and the discharge of **33,120** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage system;

Approximately 396 linear feet of 8-inch gravity sewer; a 194–gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 57 linear feet of 4-inch force main to serve 121 rooms and a 100-person conference room as part of the **Pine Island Hotel** project, and the discharge of **15,020** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage system;

Approximately 36 linear feet of 6-inch gravity sewer; a 40–gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 30 linear feet of 2-inch force main to serve 60 seats as part of the **Soundside Restaurant/Sanderling Inn Resort** project, and the discharge of **2,400** gallons per day of domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage system;

A 32-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 365 linear feet of 2-inch force main to serve **The Currituck Club (Restaurant & Clubhouse)**, and the discharge of **3,985** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage system;

Approximately 1,362 linear feet of eight-inch gravity sewer; approximately 41 linear feet of 10-inch gravity sewer; a 158-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 703 linear feet of 4-inch force main to serve **The Currituck Club PUD - Phase 4**, (47 four-bedroom houses and the Hole #15 Comfort Station) and the discharge of **23,060** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage collection system.

From Permit No. WQ0004823

Approximately 13,144 linear feet of 8-inch gravity sewer, approximately 8,409 linear feet of 6-inch force main which will be a common force main for the following pump stations; a 455-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 37 linear feet of 6-inch force main; a 85-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 768 linear feet of 6-inch force main; a 490-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 84 linear feet of 6-inch force main; and a 530-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 47 linear feet of 6-inch force main, to serve **The Currituck Club PUD Phase 1 and Phase 2 and Magnolia Bay - Phase 1** (173 four-bedroom homes and 44 three-bedroom patio homes) and the discharge of **98,880** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage system (flow reduced from 102,720 gallon per minute due to multiple counting of contributory facilities);

An additional wastewater collection system consisting of a 315-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry, a 30,338 gallon storage tank, and approximately 700 linear feet of 4-inch force main to the irrigation pond; 200 linear feet of 4-inch force main to the existing high rate disposal system (Permit No. WQ0004823); a 620-gallon per minute brine pump station with duplex pumps, audible and visual high water alarms with telemetry and approximately 708 linear feet of 6-inch force main to the five-day holding pond; and a 23.5-gallon per minute pump station with duplex pumps, audible and visual high water alarms and approximately 571 linear feet of 2-inch force main to the existing wastewater treatment facility (Permit No. WQ0004823), to serve the domestic wastewater at the **water treatment plant**;

From Permit No. WQ0006778

Approximately 3,460 linear feet of 8-inch gravity sewer; approximately 27 linear feet of 10-inch gravity sewer; a 325 gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 3,200 linear feet of 6-inch force main, to serve **Pine Island PUD – Phase 1** (56 single family homes and a public beach access restroom) and the discharge of **29,000** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage system (flow reduced from 113,000 gallons per day due to contributing facilities not being constructed.)

From Permit No. WQ0007150

a 190-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 24,200 linear feet of 6-inch force main to serve **Pine Island (Sanderling Inn and Restaurant)** and the discharge of **27,885** gallons per day of collected commercial wastewater into the Pine Island – Currituck, LLC's existing sewerage system;

From Permit No. WQ007984

Approximately 4,562 linear feet of 8-inch gravity sewer; a 105-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 1,900 linear feet of 4-inch force main, to serve **Pine Island PUD – Phases 2 & 3,** (99 single family lots) and the discharge of **49,500** gallons per day of domestic waste into the Pine Island – Currituck, LLC's existing sewerage system;

From Permit No. WQ0009088

Approximately 3,754 linear feet of 8-inch gravity sewer and a 75-gallon per minute pump station with duplex pumps, audible and visual high water alarms, and portable generator with telemetry system to serve of the **Pine Island PUD - Phase 4** [four (4) four-bedroom homes] and the discharge of **1,920** gallons per day of domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage system;

Approximately 2,718 linear feet of 8-inch gravity sewer; a 78-gallon per minute pump station with duplex pumps, audible and visual high water alarms, portable generator with telemetry system; as well as approximately 3,348 linear feet of 4-inch force main, to serve **Pine Island PUD – Phase 8** (44 four-bedroom homes) and the discharge of **21,120** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage system;

From Permit No. WQ009947

Approximately 2,301 linear feet of 8-inch gravity sewer; approximately 656 linear feet of 10-inch gravity sewer; a 260-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 90 linear feet of 4-inch force main, to serve **Pine Island PUD – Phases 1A & 6** (46 four-bedroom homes) and the discharge of **22,080** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage system;

From Permit No. WQ0011377

Approximately 2,045 linear feet of 8-inch gravity sewer; a 260-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 90 linear feet of 4-inch force main, to serve **Pine Island PUD – Phase 7** (28 four-bedroom homes) and the discharge of **13,440** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage system;

From permit WQ0011740

a 105-gallon per minute pump station and two (2) 25-gallon per minute pump stations each with duplex pumps, each with on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 695 linear feet of 2-inch force main; approximately 360 linear feet of 3-inch force main; and approximately 412 linear feet of 4-inch force main to serve **Sanderling Inn Health Club and Station Bay Cove** (two lots) and the discharge of **3,460** gallons per day of collected domestic and commercial wastewater into the Pine Island – Currituck, LLC's existing sewerage system;

From Permit No. WQ0011886

Approximately 943 linear feet of 8-inch gravity sewer; a pressure sewer collection system consisting of one (1) 35-gallon per minute pump station; one (1) 38-gallon per minute pump station; and one (1) 41-gallon per minute pump station; each with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 1,034 linear feet of 2-inch pressure sewer; a 340-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 1,153 linear feet of 6-inch force main to serve **The Currituck Club PUD – Phase 2** (16 four-bedroom homes) and the discharge of **7,680** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage system;

From Permit No. WQ0012566 (this description modified in 8/22/06 modification to reflect as-built)

Approximately 246 linear feet of 8-inch gravity sewer to serve **Windswept Ridge Golf Villas** (6 two-bedroom villas; 18 three-bedroom villas; 6 four-bedroom villas; and a 50 person pool/bathhouse) and the discharge of **11,300** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage system;

From Permit No. WQ0012893

Approximately 564 linear feet of 8-inch gravity sewer; a 210-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 854 linear feet of 4-inch force main, to serve **The Currituck Club PUD** with **no** discharge of domestic and commercial wastewater into the Pine Island – Currituck, LLC's existing sewerage collection system (Flow reduced from 37,522 gallons per day due to contributory facilities not being constructed);

From Permit No. WQ0013006

a 340-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as, (no backwash during power outage); approximately 609 linear feet of 4-inch force main; and approximately 1,790 linear feet of 6-inch force main to serve **The Currituck Club, PUD filter backwash**, with **no** discharge of collected industrial wastewater into the Pine Island – Currituck, LLC's existing sewerage collection system [flow reduced from 24,750 gallons per day (the collected 24,750 gallons per day is routed directly to the high rate infiltration pond and does not directly impact the wastewater treatment facility)];

From Permit No. WQ0013141

a pressure sewer collection system consisting of one (1) 35-gallon per minute pump station; one (1) 38-gallon per minute pump station; and one (1) 43.5-gallon per minute pump station; each with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 906 linear feet of 2-inch pressure sewer, to serve **The Currituck Club PUD – Oceans Subdivision** (eight three-bedroom houses) and the discharge of **2,880** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage collection system;

From Permit No. WQ0013307

Approximately 231 linear feet of 8-inch gravity sewer to serve **The Currituck Club PUD – Amenities Area** (pool with a maximum of 137 users) and the discharge of **1,370** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage collection system;

From Permit No. WQ0013388

Approximately 5,408 linear feet of 8-inch gravity sewer; approximately 21 linear feet of 10-inch gravity sewer; a pressure sewer collection system consisting of six (6) 32-39 gallon per minute pump stations with simplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 100 linear feet of 1.25-inch pressure sewer; approximately 761 linear feet of 2-inch pressure sewer; a 75-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 202 linear feet of 3-inch force main; a 150-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 1,748 linear feet of 4-inch force main; and a 140-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 1,111 linear feet of 4-inch force main to serve The **Currituck Club PUD – Phase 3** (74 four-bedroom homes), and the discharge of **35,520** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage system;

From Permit No. WQ0014523

Approximately 1,439 linear feet of 8-inch gravity sewer; a 210-gallon per minute pump station with duplex pumps, audible and visual high water alarms, portable generator with telemetry system; and approximately 340 linear feet of 4-inch force main, to serve **Magnolia Bay – Phase 2** (26 three-bedroom houses and a pool with a maximum of 50 users) and the discharge of **9,860** gallons per day of collected domestic wastewater into the Pine Island – Currituck, LLC's existing sewerage system; and

From Permit No. WQ0017772

Approximately 687 linear feet of 8-inch gravity sewer; a 310-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 56 linear feet of 4-inch force main; a 160-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 400 linear feet of 4-inch force main; and a 250-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, and portable generator receptacle with telemetry; as well as approximately 24 linear feet of 4-inch force main to serve **Ocean Club Centre Buildings 1-6** (Lots 1-4), and the discharge of **17,200** gallons per day of collected domestic and commercial wastewater into the Pine Island – Currituck, LLC's existing sewerage system.

The total flow allocated to the **Pine Island – Currituck, LLC** wastewater treatment facility (Permit No. **WQ0004823**) at the issuance of this permit to be **541,628** gallons per day pursuant to the application received January 28, 2003 and the request to modify the allocation dated April 19, 2011, as well as in conformity with 15A NCAC 2T; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting data subsequently

Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered a part of this permit.

The sewage and wastewater collected by this system shall be treated in the Pine Island – Currituck, LLC Wastewater Treatment Facility (Non-Discharge Permit No. WQ0004823) prior to being land applied by spray irrigation.

A stormwater management plan shall be submitted to and approved by the Washington Regional Office in accordance with 15A NCAC 2H .1000.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within 30 days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made, this permit shall be final and binding.

If you need additional information concerning this matter, please contact Thom Edgerton at (252) 948-3963 or via E-mail at thom.edgerton@ncdenr.gov.

Sincerely,

For Coleen H. Sullins

cc: Currituck County Health Department
Washington Regional Office, Water Quality Section (WWTF Permit No. WQ0004823)
Joseph J. Antauf, PE, Quible & Associates, PC, PO Drawer 870, Kitty Hawk, NC 27949
PERCS (formerly NDPU) Files

NORTH CAROLINA

ENVIRONMENTAL MANAGEMENT COMMISSION

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

RALEIGH

WASTEWATER COLLECTION SYSTEM EXTENSION PERMIT

This permit shall be effective from the date of issuance until rescinded, shall void Permit No. WQ0018170 issued October 4, 2006, and shall be subject to the following specified conditions and limitations:

1. This permit shall become voidable unless the wastewater collection facilities are constructed in accordance with the conditions of this permit; 15A NCAC 2T; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials unless specifically mentioned herein.

2. This permit shall be effective only with respect to the nature and volume of wastes described in the application and other supporting data.

3. The wastewater collection facilities shall be properly maintained and operated at all times. The Permittee shall maintain compliance with an individual system-wide collection system permit for the operation and maintenance of these facilities as required by 15A NCAC 2T .0403. If an individual permit is not required, the following performance criteria shall be met as provided in 15A NCAC 2T .0403:

   a. The sewer system shall be effectively maintained and operated at all times to prevent discharge to land or surface waters, and any contravention of the groundwater standards in 15A NCAC 2L .0200 or the surface water standards in 15A NCAC 2B .0200.

   b. A map of the sewer system shall be developed and shall be actively maintained.

   c. An operation and maintenance plan shall be developed and implemented.

   d. Pump stations that are not connected to a telemetry system shall be inspected every day (i.e. 365 days per year). Pump stations that are connected to a telemetry system shall be inspected at least once per week.

   e. High-priority sewer lines shall be inspected at least once per every six-month period of time.

   f. A general observation of the entire sewer system shall be conducted at least once per year.

   g. Inspection and maintenance records shall be maintained for a period of at least three years.

   h. Overflows and bypasses shall be reported to the appropriate Division regional office in accordance with 15A NCAC 2B .0506(a), and public notice shall be provided as required by North Carolina General Statute §143-215.1C.

4. This permit shall not be transferable. In the event there is a desire for the wastewater collection facilities to change ownership, or there is a name change of the Permittee, a formal permit request shall be submitted to the Division accompanied by documentation from the parties involved, and other supporting materials as may be appropriate. The approval of this request shall be considered on its merits and may or may not be approved.

5. Construction of the gravity sewers, pump stations, and force mains shall be scheduled so as not to interrupt service by the existing utilities nor result in an overflow or bypass discharge of wastewater to the surface waters of the State.

6. Per 15A NCAC 2T .0116, upon completion of construction and **prior to operation** of these permitted facilities, the completed Engineering Certification form attached to this permit shall be submitted with the required supporting documents to the address provided on the form. A complete certification is one where the form is fully executed and the supporting documents are provided as applicable.

7. A copy of the construction record drawings shall be maintained on file by the Permittee for the life of the wastewater collection facilities.

8. Failure to abide by the conditions and limitations contained in this permit; 15A NCAC 2T; the Division's Gravity Sewer Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Station and Force Mains adopted June 1, 2000 as applicable; and other supporting materials may subject the Permittee to an enforcement action by the Division, in accordance with North Carolina General Statutes §143-215.6A through §143-215.6C.

9. In the event that the wastewater collection facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall take immediate corrective action, including those as may be required by this Division, such as the construction of additional or replacement facilities.

10. The issuance of this permit shall not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (local, state and federal) which have jurisdiction, including but not limited to applicable river buffer rules in 15A NCAC 2B .0200, erosion and sedimentation control requirements in 15A NCAC Ch. 4 and under the Division's General Permit NCG010000, and any requirements pertaining to wetlands under 15A NCAC 2B .0200 and 15A NCAC 2T.

11. **Noncompliance Notification:**

    The Permittee shall report by telephone to a water quality staff member at the Washington Regional Office, telephone number (252) 946-6481, as soon as possible, but in no case more than 24 hours or on the next working day, following the occurrence or first knowledge of the occurrence of either of the following:

    a. Any process unit failure, due to known or unknown reasons, that renders the facility incapable of adequate wastewater transport, such as mechanical or electrical failures of pumps, line blockage or breakage, etc.; or

    b. Any failure of a pumping station or sewer line resulting in a by-pass directly to receiving waters without treatment of all or any portion of the influent to such station or facility.

    Voice mail messages or faxed information is permissible but this shall not be considered as the initial verbal report. Overflows and spills occurring outside normal business hours may also be reported to the Division of Emergency Management at telephone number (800) 858-0368 or (919) 733-3300. Persons reporting any of the above occurrences shall file a spill report by completing and submitting Part I of Form CS-SSO (or the most current Division approved form) within five days following first knowledge of the occurrence. This report must outline the actions taken or proposed to be taken to ensure that the problem does not recur. Part II of Form CS-SSO (or the most current Division approved form) can also be completed to show that the SSO was beyond control.

12. Gravity sewers installed below the minimum required slope per the Division's Gravity Sewer Minimum Design Criteria shall not be acceptable and shall not be certified until corrected. If there is an unforeseen obstacle in the field where all viable solutions have been examined, a slope variance can be requested from the Division with firm supporting documentation. This shall be done through a permit modification with fee. Such variance requests will be evaluated on a case-by-case basis. Resolution of such request shall be evident prior to completing and submitting the construction certification.

Permit issued this the fifth day of May, 2011.

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

For Coleen H. Sullins, Director
Division of Water Quality
By Authority of the Environmental Management Commission

Permit Number WQ0018170 Modification

ENGINEER'S CERTIFICATION

Complete and submit this form to the permit issuing office (address below) with the following:

- One copy of the project record drawings (plan/profile views and detail drawings of sewer lines) of the wastewater collection system extension. Final record drawings should be clear on the plans. Record drawings should indicate the design and the marked up changes during construction.
- Supporting design calculations (selected pumps, system curve, operating point, available storage if portable generator(s) or storage greater than longest past three year outage reliability option selected) for any pump stations permitted as part of this project
- Changes to the project should be clearly identified on the record drawings or in written summary form. Permit modifications are required for any changes resulting in non-compliance with this permit, regulations or minimum design criteria. Modifications should be submitted prior to certification.

This project shall not be considered complete nor allowed to operate until this Engineer's Certification and all required supporting documentation have been received by the Division. **Therefore, it is highly recommended that this certification be sent in a manner that provides proof of receipt by the Division.**

ENGINEER'S CERTIFICATION

☐ Partial ☐ Final

I, , as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe (☐ periodically, ☐ weekly, ☐ full time) the construction of the Phase 8A/Inn Site/Historic Lots, Currituck project, consisting of 3,058 LF of 8-inch gravity sewer, 859 LF of 6-inch gravity sewer, 1,176 LF of 4-inch force main, a 125 GPM pump station and a 150 GPM pump station, for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance of this permit; 15A NCAC 2T; the Division of Water Quality's (Division) Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials.

North Carolina Professional Engineer's
seal, signature, and date:

**SEND THIS FORM & SUPPORTING DOCUMENTATION
WITH REQUIRED ATTACHMENTS TO THE FOLLOWING ADDRESS**

NORTH CAROLINA DIVISION OF WATER QUALITY
Washington Regional Office – Surface Water Protection Section
Attn: Al Hodge, Regional Supervisor
943 Washington Square Mall
Washington, NC 27889

The Permittee is responsible for tracking all partial certifications up until a final certification is received. Any wastewater flow made tributary to the wastewater collection system extension prior to completion of this Engineer's Certification shall be considered a violation of the permit and shall subject the Permittee to appropriate enforcement actions.

Quible

Quible & Associates, P.C.

ENGINEERING • ENVIRONMENTAL SCIENCES • PLANNING • SURVEYING
SINCE 1959

P.O. Drawer 870
Kitty Hawk, NC 27949
Phone: 252-491-8147
Fax: 252-491-8146
web: quible.com

January 22, 2024
Mr. Carl Dunn
DEQ - Washington Regional Office
North Carolina Department of Environmental Quality
943 Washington Square Mall
Washington, NC 27889

Re: Stormwater Management Plan (Stormwater Certification)
Currituck Club Phase 8A, Section 2B
Currituck County, NC

Mr. Dunn,

Please find the enclosed Designer's Certification for the above referenced project. This project is under High Density Permit No. SW7110108MOD and includes a wet pond within drainage area 1. Drainage area 2, as permitted, provided a reduction in impervious coverage and did not require a stormwater control measure.

It should be noted that an additional portion of the subdivision and associated infrastructure has been built at this time and the included certification should be considered "partial" only. Section 2B of the subdivision as currently installed includes Lots 444-447 and 431-436 only and approximately 520 LF of roadway. Section 1 and 2A were previously certified under separate cover. Roadway installed under Section 2B includes an extension of Windswept Ridge Ln. The remaining lots have not yet been installed at this time. The stormwater wet pond has been installed and at the time of survey (01/31/2020) had approximately 121,018 cf of storage above permanent pool, well above the required 28,818 cf for full build out. A copy of the phased asbuilt has been included with this partial certification to help clarify the coverage that has been installed.

Please feel free to contact me by phone at (252) 491-8147 or by email at csaunders@quible.com should you have any questions or require any additional information.

Sincerely,
Quible & Associates, P.C.

Cathleen Saunders, P.E.
Encl: as stated
cc:

Designer's Certification

I, CATHLEEN M. SAUNDERS, as a duly registered PROFESSIONAL ENGINEER in the State of North Carolina, having been authorized to observe (periodically/weekly/full time) the construction of the project,

CURRITUCK CLUB PHASE 8A, SECTION 2B
(Project)

for CURRITUCK ASSOCIATION RESIDENTIAL LLC. (Project Owner) hereby state that, to the best of my abilities, due care and diligence was used in the observation of the project construction such that the construction was observed to be built within substantial compliance and intent of the approved plans and specifications.

The checklist of items on page 2 of this form is a part of this Certification.

Noted deviations from approved plans and specifications:

1) THIS IS A PARTIAL CERT. FOR LOTS 431-436 & 444-447 only. AND ROADWAY EXTENSION.
2) STABILIZATION IS ONGOING. THE SITE SHALL BE REGRADED, RE-SEEDED, AND MULCHED AS NECESSARY UNTIL PERMANENT STABILIZATION IS ESTABLISHED.

Signature _____

Registration Number 043652

Date 1/22/24

✓ 1. The drainage area to the system contains approximately the permitted acreage.

✓ 2. The drainage area to the system contains no more than the permitted amount of built-upon area. * ONLY A PORTION OF THE PROJECT HAS BEEN BUILT.

✓ 3. All the built-upon area associated with the project is graded such that the runoff drains to the system.

N/A 4. All roof drains are located such that the runoff is directed into the system. * HOUSES NOT YET BUILT

✓ 5. The outlet/bypass structure elevations are per the approved plan.

✓ 6. The outlet structure is located per the approved plans. * OVER TOPS AT ELEV. 113'

N/A 7. Trash rack is provided on the outlet/bypass structure.

* 8. All slopes are grassed with permanent vegetation. SEE NOTE 2.

✓ 9. Vegetated slopes are no steeper than 3:1.

✓ 10. The inlets are located per the approved plans and do not cause short-circuiting of the system.

✓ 11. The permitted amounts of surface area and/or volume have been provided.

N/A 12. Required drawdown devices are correctly sized per the approved plans.

✓ 13. All required design depths are provided.

✓ 14. All required parts of the system are provided, such as a vegetated shelf, a forebay, and the vegetated filter.

✓ 15. The required dimensions of the system are provided, per the approved plan.