STAFF REPORT
Town of Nags Head
Planning & Development Department

To: Planning Board

From: Kelly Wyatt, Planning Director

Date: January 14, 2022

Subject: Site Plan Review for Blue Moon Restaurant located at 4329 S. Croatan Highway.

GENERAL INFORMATION

Applicant: Michael Robinson, P.E., P.L.S. on behalf of Blue Moon Five, LLC.

Application Type: Site Plan Review.

Purpose/Request: Construction of an approximately 8,676 square feet, two-story, 100 seat restaurant and all associated site improvements.

Property Location: 4329 S. Croatan Highway, Nags Head.

Existing Land Use: Vacant.

Zoning Classification of Property: C-2, General Commercial Zoning District.

Zoning Classification of Surrounding Properties: Property to the north is zoned C-2, General Commercial (Cavalier Surf Shop, Residential). Property to the south, directly across Dove Street, is zoned C-2, General Commercial (Haven on the Banks Event Center and Cottage Court). Property to the west, directly across US Highway 158 is zoned R-2, Medium Density Residential (vacant). Property to the east is zoned C-2, General Commercial (residential and vacant).

Flood Hazard Zone of Property: Property is located in an X Flood Zone, per the Town of Nags Head local ordinance, the property is subject to an RFPE/LES of 9 ft. The proposed first floor elevation of the restaurant is 11.7 and is therefore compliant.

Land Use Plan Map/Policies: The 2017 Comprehensive Plan Future Land Use Map classifies this property as Neighborhood Commercial. This proposal is consistent with this land use classification and stated Land Use Policies.

SPECIFIC INFORMATION

Applicable Zoning Regulations:

- Use Regulations: Section 6.6, Table of Uses and Activities lists "Restaurant – Sit Down" as a Permitted Use within the C-2, General Commercial District, with supplemental regulations set forth in Section 7.31. This section requires that the restaurant have a food preparation area that is at least 20 percent of the gross building square footage of the principal building, that at least 75 percent of all customer seats are designated for full-service, full menu dining and that no more than fifteen percent of the total building square footage is devoted to accessory entertainment uses. As proposed, the restaurant is compliant with these supplemental regulations.

- Lot Coverage: Total allowable lot coverage for this site is 55%. Proposed lot coverage is 54% and is therefore compliant.

- Height: The maximum allowable building height within the Town is 35 feet; however, pursuant to Section 8.2.1, Dimensional requirements, total height may be increased to 42 feet with the use of an 8:12 roof pitch or greater. The applicant has proposed a structure with an overall height of 33.5 feet with the use of an 8:12 roof pitch therefore height is compliant.

- Architecture Design Standards: Section 10.82 of the UDO, Applicability, states that Commercial Design Standards shall apply to all building construction or remodeling projects requiring a conditional use permit or site plan review. This project must adhere to the Commercial Design Standards set forth within Part VI of the UDO. Section 10.83, Design Standards, of the UDO, states that projects adding a total habitable building area of 10,000 square feet or less may elect to comply with the building design requirements by achieving 150 points based on the criteria outlined in the Town of Nags Head Residential Design Guidelines. Projects that elect to comply in this manner shall, in addition to the required 150 architectural design points, incorporate specific building standards into the design. The proposed architectural design satisfies the minimum standards required by Section 10.83 and additionally achieves 159 architectural design points with the use of a first-floor porch, dormers, 8:12 pitched roof, simulated wood shingles and other miscellaneous architectural details.

- Parking: Pursuant to Article 10, Table 10-2, Required Parking by Use, Sit Down Restaurant shall provide parking at one (1) parking space for every 55 square feet of indoor customer service area. The proposed structure contains 2,513 square feet of customer service area, requiring 46 parking spaces. A total of 54 spaces have been provided therefore parking is compliant.

  In addition, Section 10.92.14.4 of the UDO, Surface Materials, requires that a minimum of twenty (20) percent of the surface area of the parking area and drive aisles shall be constructed of permeable surface materials. Upwards of 40% of the parking area has been proposed in permeable surface materials therefore the proposal is compliant.

- Buffering/Landscaping: Several sections of the Unified Development Ordinance speak to Buffering and Landscaping as it applies throughout this proposed site:

- Section 10.92.6.2 of the UDO, Parking and Drive Aisle Setbacks, requires that where off-street parking is provided between the building and the street right-of-way line, a parking lot buffer of at least ten (10) feet in width shall be provided between the parking lot and the street right-of-way. A compliant buffer has been proposed along the western property boundary, adjacent to US Highway 158, and along the southern property boundary adjacent to East Dove Street.

- Section 10.93.3.2 of the UDO, Commercial Transitional Protective Yards, requires increased landscaping to be provided and maintained when non-residential land uses are adjacent to a residential use or residential zoning district. This protective landscape buffer is required to be ten (10) feet in width with two rows of acceptable plant material. Properties to the east are developed residentially and this protective yard will be required along the eastern boundary line. A retaining wall is being proposed in this area; however, the applicant has indicated that two compliant rows of plant material will be provided. Property north of this site is developed both residentially and commercially, a compliant protective buffer has been proposed in this area.

- Section 10.93.3.7 of the UDO, Interior Parking Lot Landscaping, requires parking lot landscaping be provided at a minimum rate equal to ten percent of the total area of the parking spaces. The minimum area necessary for compliance is 1,080 square feet of vegetation. The applicant has proposed 1,386 square feet of vegetation therefore interior parking lot landscaping is compliant.

- Section 10.93.3.8 of the UDO, Vegetation Preservation/Planting Requirements, requires that new development projects either preserve a minimum of ten (10) percent of the lot's total area with existing natural vegetation and/or dune elevations or plant new vegetation in lieu of preservation. When existing vegetation cannot be preserved, the planting of a minimum of fifteen (15) percent of the lot's total area shall be required. Existing vegetation on this site is sparse and cannot be preserved to meet the intent of this section therefore, the applicant has proposed to plant 15% of the lots total area in new vegetation. The applicant has provided the required calculations and notation on the landscape plan demonstrating that the vegetation planting requirements will be met.

- Lighting: A lighting plan compliant with the requirements of Article 10, Part IV of the Unified Development Ordinance will be required prior to the issuance any development permits. In addition, a light audit will be required prior to issuance to occupancy permits.

- Signage: No additional signage is being proposed at this time.

Water and Sewage Disposal: The Dare County Health Department has reviewed and approved the proposal as presented (DCHD Approval Attached).

Traffic Circulation: Traffic circulation has been reviewed and approved by the Town Engineer as presented.

Stormwater Management: Stormwater management has been reviewed and approved by the Town Engineer as presented. An NCDEQ state stormwater management permit will be required to be submitted and approved.

Fire: The project will be required to comply with all applicable NC Fire Prevention Code requirements as part of building permit application review and issuance.

Public Works: The Public Works Director has reviewed and approved the proposed site plan as presented.

ANALYSIS

Staff finds that the proposal is consistent with the applicable use and development standards, as well as relevant land use policies.

STAFF RECOMMENDATION

Staff recommends approval of the Site Plan request as presented.

Attachments: *Site Plan Application & Checklist, Site Plan, Architectural Elevations, Grading and Wastewater plan set, DCHD Approval, Supplemental data.*

TOTAL PROPOSED SQUARE FOOTAGE _____ x .50 = $_____ +

(Optional) VESTED RIGHT ☐ ($200.00)

= TOTAL FEE DUE _____

TOWN OF NAGS HEAD

DATE RECEIVED _____

SITE PLAN REVIEW APPLICATION & CHECKLIST

1. **LOCATION AND ZONING INFORMATION**
   - A. PROJECT TITLE BLUE MOON FIVE, LLC
   - B. STREET ADDRESS 4329 S. CROATAN HWY
   - C. SUBDIVISION RESUBDIVISION OF ROANOKE SOUND SHORES
     LOT(S) 11-15 BLOCK B-1 SECTION 3
   - D. PRESENT ZONING C-2
   - E. PRESENT USE VACANT
   - F. EXISTING NONCONFORMITIES NONE KNOWN
   - G. ABUTTING PROPERTY ZONING C-2
   - H. ABUTTING PROPERTY USE NORTH - COMMERCIAL RETAIL
     EAST - RESIDENTIAL / VACANT

2. **CERTIFICATION AND STANDING**
   - A. As applicant of standing of the above named project, I certify that the information on this checklist and the site plan is complete and accurate.

     OWNER ☐ AGENT ☒ CONTRACT PURCHASER ☐
   - B. APPLICANT/DEVELOPER: NAME BLUE MOON FIVE 2, LLC
     ADDRESS 326 W. VILLA DUNE DR. NAGS HEAD
     TELEPHONE _____
   - C. CONTACT PERSON: NAME MIKE ROBINSON
     ADDRESS P.O. BOX 2852, KILL DEVIL HILLS
     TELEPHONE 252-255-8026

3. **ADJACENT OWNERSHIP INFORMATION (TO BE SHOWN ON SITE PLAN)**
   NAME/ADDRESS (N) KENNETH and MARGARET SLAYTON, P.O. BOX 513, NAGS HEAD
   NAME/ADDRESS (S) EAST DOVE STREET
   LOT 7 LOT 8 NAME/ADDRESS (E) CHUCK BRADSHAW, 135 BEECHWOOD DR., FANKLIN VA 23851
   NAME/ADDRESS (W) SOUTH CROATAN HIGHWAY
   (If additional space is needed, please attach separate sheets.)

   LOT 9 (E) SARA MIDLER, 1360 CLEARVIEW DR, DENVER, PA 17517

   LOT 10 (E) GANDT DEVELOPMENT LLC P.O. BOX 97, NAGS HEAD

4. **SITE PLAN AND SITE PLAN ATTACHMENT DATA**

A. Site plan preparer MICHAEL W. ROBINSON P.E., P.L.S. Phone # 252-255-8026

NC Registered ☒ Engineer ☐ Architect ☒ Surveyor. License # P.E. - 18994 P.L.S. - L-3154

B. The design for the attached Stormwater Management Plan includes:

☒ 1.5", 2-hour rainfall: retained on-site.

☒ 4.3", 2-hour rainfall: no important access or health-related impacts.

STORMWATER PLAN AND CALCULATIONS BY DEEL ENGINEERING, PLLC

☐ 5.0", 2-hour rainfall: no unapproved impacts.

Drainage calculations have been prepared ☒ YES ☐ NO ATTACHED ☒ YES ☐ NO

Note: Stormwater Managment Plan MUST be approved by the Town Engineer prior to Planning Board review for all listed permitted uses in the zoning ordinance.

C. Sewage disposal approval is being submitted in the form of:

☐ Attached tentative approval letter dated _____

☒ Attached final permit dated 11-01-2021

☐ State ☐ County WASTEWATER BY ~~DEEL~~ ANLAUF ENGINEERING, PLLC

D. Project involves condominium ownership.

☒ NO ☐ YES, Three copies of condominium documents attached.

E. Amount of land-disturbing activity proposed 57,000 ft² square feet.

A Soil Erosion and Sedimentation Control Plan has been prepared.

☒ NO ☐ YES; (1) Copy attached, PARTIAL PLAN W/ DETAILS PREPARED

(2) Copy submitted to Dare County Soil Conservation Service, Manteo NC 27954.

F. Coastal Area Management Act (CAMA) permit. ☐ YES ☒ NO

5. **INFORMATION TO BE SHOWN ON SITE PLAN**

Twelve (12) copies for Planning Board review

A. **Property and ownership**	YES	COMMENTS
1. Present recorded owner and map book/cabinet reference of the site property.	X	
2. Current PIN Number.	X	
3. Current site address.	X	
4. Owners' names, lot numbers or map book and page reference of all adjacent property owners.	X	
5. Boundary of the entire parcel by course and distance.	X	
6. Widths of the existing rights-of-way that abut the site.	X	
7. Nature or purpose, location and size of existing easements.	X	
8. At all lot corners, points of tangents and any angle point along a given course of the site, iron pins minimum 3/8-inch diameter or 4x4-inch concrete monuments.	X	
9. Plan to at least 1"=50' scale, showing north arrow and whether true or magnetic.	X	
10. Signature and seal of preparer.	X	
B. **Existing features**		
1. Streets, curbs, and sidewalks with type and width of pavement.	X	
2. Topographic features of site and existing grades for any streets, storm drainage system including existing grades at four corners of all structures.	X	
	YES	**COMMENT**

3. Flood zone(s) as determined by latest FEMA Flood Insurance Rate Map, with notation, "flood zone subject to change by FEMA."	X	
4. All underground utilities and facilities including gasoline tanks and existing septic facilities (including tanks and fields).	X	
5. The location of any marsh areas, estuarine waters, or US Army Corps of Engineers 404 wetlands protection within or abutting the lot.	N/A	
6. If the lot is within an ocean hazard Area of Environmental Concern, the location of the first line of stable natural vegetation, the CAMA setback line, and contour lines at 2-foot intervals depicting any dunes located within an oceanfront AEC that are to be disturbed by construction.	N/A	
7. If the lot is within the small surface water supply watershed AEC (within 1,200 feet from the Fresh Water Pond), the distance between the pond and proposed septic or sewage treatment system.	N/A	
8. Percentage of site to be undisturbed and included in calculation for compliance with vegetation preservation ordinance Section 48-371.	X	ENTIRE SITE WILL BE DISTURBED

C. **Site improvements** in accordance with regulations of state of North Carolina, Dare County, and Town of Nags Head

1. Proposed building type (e.g., concrete or frame), number of floors and dimensions.	X	
2. Proposed building elevations for all sides of building labeled in accordance with proposed architectural design criteria of Section 48-370.	X	WOOD FRAME 2 STORY
3. Total height and number of stories of proposed structure(s). If increased height is being proposed in conjunction with increased setbacks, show increase allowed in tabular form on plan. Note definition of height in Section 48-7 of Town Code of Ordinances.	X	
4. Existing and proposed ground elevations at the corners of proposed structure(s).	X	
5. Sanitary sewer facilities with connection to sewer system or septic tank.	X	
6. Approximate locations of proposed underground utilities and any necessary easements.	X	
7. Screened dumpster pad(s) accessible to left-side loaders and sized in accordance with the Town Code of Ordinances.	X	
8. Proposed fire hydrants and extensions of water distribution lines in accordance with size and density requirements found in Section 48-363 of the Town Code of Ordinances.	N/A	
9. Location and height of proposed free-standing signs. See requirements of Chapter 48 Article VIII of the Town Code of Ordinances.	X	
10. Location of all sidewalks, curbs, drives, and parking within the site and proposed finished elevations.	X	
11. Handicapped parking spaces, walks, ramps, and entrances shown in accordance with the NC State Building Code. Include a Handicapped sign detail.	X	
12. The Vegetative Buffer Yard areas have been identified and the proper buffer yard provision(s) have been identified (i.e. Buffer Yard A, B,C,D,E as outlined in Chapter 48 Article XIII of the Town of Nags Head Code of Ordinances).	X	
13. Layout of numbered stalls/loading zones in accordance with Chapter 48 Article V of the Town Code of Ordinances.	X	

Commercial	☒	46	Parking Spaces Required	55	Parking Spaces Shown	1	Loading Spaces
Residential	☐						

2 STORIES BUILDING SQUARE FOOTAGE: PRINCIPAL 8,676 ACCESSORY # 96 TOTAL 8,772			
# EMPLOYEES 10			
# DWELLING/LODGING UNITS N/A			

D. **EXPLANATORY NOTES**

1. Vicinity map. ✓
2. Total square feet of land area to undergo land-disturbing activity. ✓
3. The total required parking spaces versus the total parking spaces provided. Parking spaces to be numbered. ✓
4. Cross-sectional details of all streets, roads, ditches, and parking lot improvements. ✓
5. The number of dwelling/commercial units. If more than one use is proposed (e.g., large hotel with shops, etc.), show breakdown of units or square footage by building. ✓
6. If additional height above 35 feet is being proposed, the additional height and increased setbacks shall be laid out in tabular form. N/A
7. Total site coverage calculations. (Refer to Zoning Ordinance to calculate lot coverage for lots abutting ocean or sound.) ✓
8. Components of the lighting plan (pole location, pole height, type of fixture, wattage, source of illumination, etc.). See Chapter 48 Article IX of the Town Code of Ordinances. PENDING - FIXTURES NOTED ON PLAN and DETAIL SHEET
9. A completed architectural points worksheet for commercial structures subject to residential design criteria. N/A

6. **PLAN AND ATTACHMENT PREPARER CERTIFICATION**

A. I certify that all information for which I am responsible is complete and accurate.

11-12-21
DATE

SIGNATURE OF ENGINEER ☒ ARCHITECT ☐ SURVEYOR ☐

B. The following individuals have contributed information or attachments to the plan:

Name	Phone #	Information provided
ANLAUF ENGINEERING PLLC	252-489-7143	WASTEWATER SYSTEM
DEEL ENGINEERING PLLC	252-202-3803	STORMWATER | GRADING
CAHOON + KASTEN ARCHITECTS	252-441-0271	ARCHITECTURAL

Site Specific Development Plan Option - Vested Right for Site Plans

Please be advised that as the owner, or agent for the owner, you have the opportunity to apply for and receive a Site Specific Development Plan that will establish a Vested Right for this project for a period of time not to exceed two (2) years from the date the Board of Commissioners approves the plan. You must secure a building permit for this project within two (2) years of the approval date or your Site Specific Development Plan will expire. If you elect not to apply for a Site Specific Development Plan, you must secure a building permit within six (6) months or else your site plan will expire.

If you choose the Site Specific Development Plan option, please keep in mind the following concerns:

1. Although your project may be classified as a permitted use, by requesting a Site Specific Development Plan your project will be processed as a Conditional Use for which a public hearing will be held, and an additional fee of $200.00 will be charged to process your application.
2. Once your Site Specific Development Plan has been approved with vested rights status no modifications can be made to the plan.

If you wish to take advantage of the Vested Right process please check off the Vested Right box on page one. If you do not then leave the box blank.

Improvement Permit
County of Dare
PO Box 669
Manteo NC 27954

S4-6881

System A

Phone: (252) 475-5080

DARE COUNTY DEPARTMENT OF PUBLIC HEALTH

An Improvement Permit (IP) issued pursuant to this application is not affected by change in ownership provided the site and wastewater characteristics remain unchanged. An IP issued with a plat is valid without expiration. An IP issued with a site plan is valid for 60 months from the date of issuance.

Parcel: 012411000	LOT:12-15 BLK: B1 SEC: 3	Permit: S4-6881	
Location:	4329 S CROATAN HWY – NAGS HEAD		
Subdivision:	ROANOKE SOUND SHORES RESUB S 3		
Owner Name:	GANDT DEVELOPMENT LLC	Permit Date:	11/01/2021
Owner Address:	P O BOX 97	Permit Type:	WW COMMERCIAL NEW RESTAURANT
	NAGS HEAD, NC 27959		Seats 100

Number of bedrooms:	0	Gallons per day:	2250
Occupancy:	0	Tank type:	PRECAST
Water Supply:	PUBLIC	Tank size:	3000
Nitrific field size sqft:	375	Pump tank size:	3000
Number of lines:	5	Grease trap size:	4000
Trench length (feet):	75	Septic type:	Type V-D Pre-treatment system
Trench width (inches):	18	Septic code:	COMMERCIAL
Trench depth (inches):	18	Distribution:	LOW PRESSURE PIPE
Gravel depth (inches):	12	Distance from building:	5
Rock Under (inches):	6	Distance from water supply:	10
Rock Above (inches):	2	Distance from property line:	25
Bed system dimensions:	N/A	Distance from open water:	50

Design Specifications:

-- INSTALL SYSTEM AS DESIGNED BY ANLAUF ENGINEERING. SYSTEM FOR NEW RESTAURANT WITH 100 SEATS AND 25 BAR SEATS. SYSTEM A HANDLES 50% OF FLOW OR 2250 GPD. 100% REPAIR AREA SHOWN. PERIODIC INSPECTIONS REQUIRED WITH ENGINEER AND EH UNIT.

Note: This Permit is subject to all provisions of the 15A NCAC .1900 rules governing the installation of septic systems. The person making the installation must notify the Health Department when the septic tank system is ready for inspection. If any septic tank system or part thereof is covered before being inspected and approved, it shall be uncovered at the direction of the Health Officer at the expense of the one responsible for making the installation.

Issued 11/01/2021

Permit Fee: $ 600.00

Environmental Health Specialist

Applicant Signature: ANLAUF ENGINEERING PLLC

Application Reference# 5095

County of Dare
PO Box 669
Manteo NC 27954

S8-6882

Phone: (252) 475-5080

DARE COUNTY DEPARTMENT OF PUBLIC HEALTH
Authorization for Wastewater System Construction

Parcel: 012411000 PIN: 080109061969 Permit: S8-6882

Owner Name:	GANDT DEVELOPMENT LLC	Permit Date:	11/01/2021
Owner Address:	P O BOX 97 NAGS HEAD, NC 27959		
Location:	4329 S CROATAN HWY – NAGS HEAD		
Subdivision:	ROANOKE SOUND SHORES RESUB S 3		LOT:12-15 BLK: B1 SEC: 3

1. Issued by _____ JDC
2. Any alteration in soil conditions (including location of structures and appurtenances) or modification in use, design wastewater flow or wastewater characteristics as specified in the associated improvement permit and application, may subject this authorization and associated permit(s) to revocation.
3. Comments:
   INSTALL SYSTEM AS DESIGNED. SYSTEM REQUIRES PERPETUAL CONTRACT WITH CERTIFIED OPERATOR FOR MAINTENANCE AND REPORTING. ANNUAL INSPECTION REQUIRED BY EH UNIT WITH FEE ASSOCIATED.

This CA is valid for 60 months from the date of issuance.
Disclaimer: This permit does not relieve you of the responsibility to obtain any other necessary Federal, State or Local permit(s).

Owner Certification

X _____
Applicant or Owner Signature Date
Applicant: ANLAUF ENGINEERING PLLC

Application Reference# 5095

Improvement Permit
County of Dare
PO Box 669
Manteo NC 27954

S4-6883

System B

Phone: (252) 475-5080

DARE COUNTY DEPARTMENT OF PUBLIC HEALTH

An Improvement Permit (IP) issued pursuant to this application is not affected by change in ownership provided the site and wastewater characteristics remain unchanged. An IP issued with a plat is valid without expiration. An IP issued with a site plan is valid for 60 months from the date of issuance.

Parcel: 012411000	LOT:12-15 BLK: B1 SEC: 3	Permit: S4-6883	
Location:	4329 S CROATAN HWY – NAGS HEAD		
Subdivision:	ROANOKE SOUND SHORES RESUB S 3		
Owner Name:	GANDT DEVELOPMENT LLC	Permit Date:	11/01/2021
Owner Address:	P O BOX 97	Permit Type:	WW COMMERCIAL NEW RESTAURANT
	NAGS HEAD, NC 27959		Seats 100

Number of bedrooms:	0	Gallons per day:	2250
Occupancy:	0	Tank type:	PRECAST
Water Supply:	PUBLIC	Tank size:	3000
Nitrific field size sqft:	375	Pump tank size:	3000
Number of lines:	5	Grease trap size:	4000
Trench length (feet):	75	Septic type:	Type V-D Pre-treatment system
Trench width (inches):	18	Septic code:	COMMERCIAL
Trench depth (inches):	18	Distribution:	LOW PRESSURE PIPE
Gravel depth (inches):	12	Distance from building:	5
Rock Under (inches):	6	Distance from water supply:	10
Rock Above (inches):	2	Distance from property line:	25
Bed system dimensions:	N/A	Distance from open water:	50

Design Specifications:

-- INSTALL SYSTEM AS DESIGNED BY ANLAUF ENGINEERING. SYSTEM FOR NEW RESTAURANT WITH 100 SEATS AND 25 BAR SEATS. SYSTEM B HANDLES 50% OF FLOW OR 2250 GPD. 100% REPAIR AREA SHOWN. PERIODIC INSPECTIONS REQUIRED WITH ENGINEER AND EH UNIT.

Note: This Permit is subject to all provisions of the 15A NCAC .1900 rules governing the installation of septic systems. The person making the installation must notify the Health Department when the septic tank system is ready for inspection. If any septic tank system or part thereof is covered before being inspected and approved, it shall be uncovered at the direction of the Health Officer at the expense of the one responsible for making the installation.

Issued 11/01/2021

Permit Fee: $ 600.00

Environmental Health Specialist

Applicant Signature: ANLAUF ENGINEERING PLLC

Application Reference# 5096

County of Dare
PO Box 669
Manteo NC 27954

S8-6884

Phone: (252) 475-5080

DARE COUNTY DEPARTMENT OF PUBLIC HEALTH
Authorization for Wastewater System Construction

Parcel: 012411000 PIN: 080109061969 Permit: S8-6884

Owner Name: GANDT DEVELOPMENT LLC Permit Date: 11/01/2021
Owner Address: P O BOX 97
NAGS HEAD, NC 27959

Location: 4329 S CROATAN HWY – NAGS HEAD
Subdivision: ROANOKE SOUND SHORES RESUB S 3 LOT:12-15 BLK: B1 SEC: 3

1. Issued by _____ JDC
2. Any alteration in soil conditions (including location of structures and appurtenances) or modification in use, design wastewater flow or wastewater characteristics as specified in the associated improvement permit and application, may subject this authorization and associated permit(s) to revocation.
3. Comments:
INSTALL SYSTEM AS DESIGNED. SYSTEM REQUIRES PERPETUAL CONTRACT WITH CERTIFIED OPERATOR FOR MAINTENANCE AND REPORTING. ANNUAL INSPECTION REQUIRED BY EH UNIT WITH FEE ASSOCIATED.

This CA is valid for 60 months from the date of issuance.
Disclaimer: This permit does not relieve you of the responsibility to obtain any other necessary Federal, State or Local permit(s).

Owner Certification

X _____
Applicant or Owner Signature Date
Applicant: ANLAUF ENGINEERING PLLC

Application Reference# 5096

Stormwater Management Plan Narrative

Blue Moon Five, LLC
Town of Nags Head Submission
November 12, 2021

General

The Blue Moon Five, LLC project is a proposed 100 seat restaurant to be placed on a vacant site at 4329 South Croatan Highway in the Town of Nags Head.

Pursuant to Town of Nags Head requirements, a stormwater management treatment and disposal system has been designed to address the runoff generated by a 4.3" rainfall (depth) event. The following narrative will detail the proposed stormwater management plan for capture and treatment of runoff from the proposed facility.

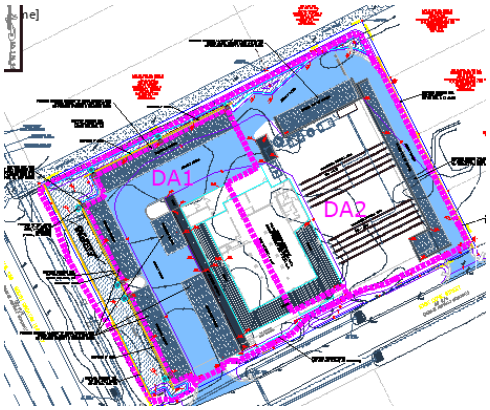
Summary of Existing Conditions

The subject parcel is located on the east side of US 158 (South Croatan Highway) in the northeast quadrant of the intersection of US 158 and East Dove Street. The site is currently undeveloped and there are no discernable on-site drainage improvements. The right-of-ways of US 158 and East Dove Street contain swale and storm sewer drainage infrastructure.

Summary of Proposed Conditions

This project proposes the addition of a new 100 seat restaurant with associated parking, utility, and stormwater management infrastructure.

Stormwater will be managed via two "nested" infiltration systems; a permeable paver system with gravel bed storage and infiltration, and a dry infiltration basin. They are referred to as "nested" because the permeable paver system is actually located within the drainage area of the infiltration basin. The permeable paver system will collect runoff from upstream areas until its capacity is exceeded. Once its capacity is exceeded, any additional flows will be conveyed to the adjoining infiltration basin for storage and infiltration. For simplicity of calculations, the contributing drainage area for the permeable paver system has been identified as "Drainage Area #1" (DA1) and the rest of the drainage area for the infiltration basin as "Drainage Area #2" (DA2). It is important to remember that DA1 overflows into DA2:



Calculations

Using the "Simple Method" for determining runoff (as outlined in the NCDEQ SCM Manual), the runoff generated by a 4.3 inch rainfall event within each drainage area is as follows:

Storage Required:

Drainage Area 1:	6,684 cf
Drainage Area 2:	4,527 cf

The storage available in the Permeable Pavement system is 5,062 cf. Therefore, an excess of 1,622 cf of runoff will "overflow" the permeable pavement system and flow into the infiltration basin. Therefore, the actual required storage volume for the infiltration basin will be 4,527 cf + 1,622 cf = **6,149 cf.** The storage available in the proposed infiltration basin is 6,255 cf.

Therefore, there is adequate capacity in the two combined systems to capture, treat, and dispose of the runoff from a 4.3 inch rainfall event. Runoff and storage calculations can be found in the appendix to this narrative.

Permeable Pavement systems not included in the storage calculations for Drainage Area 1: It is important to note that there are two areas of permeable pavement located to the east of the proposed building that are not included in the stormwater storage calculations presented above and are not included in Drainage Area 1. These systems will not be permitted as SCM's due to their proximity to the proposed drainfield. Runoff contributed from these areas is included in the runoff calculations for Drainage Area 2 and rely entirely on storage, treatment, and disposal provided by the dry infiltration basin.

Soils

Protocol Sampling Service, Inc. performed on-site soil borings to verify soil type and determine elevation of mean high groundwater.

Information collected on site indicates that the soils found in the subject area on the site are composed primarily of medium to fine sands. These soil types will have a rapid permeability and water capacity. These findings generally correlate with the description mapped and discussed in the United States Department of Agriculture, Soil Conservation Service, Soil Survey of Dare County, North Carolina, which map the soil for this site as follows:

NeC - Newhan fine sand, Permeability is rapid
CoB – Corolla fine sand, Permeability is rapid

Infiltration rates typical for these sands generally range from 6.0 in/hr to 20 in/hr. Protocol Sampling Service testing indicates the in-situ soils have a Saturated Hydraulic Conductivity of 9-13 inches per hour.

A more detailed description of the method of determining the subsurface storage volume available as a function of the soils is discussed in this section. The following determination of the volume available in the subsurface is based on the definition of Porosity: The ratio of volume of void spaces in a rock or sediment to the total volume of the rock or sediment[1].

Table 10.3. Typical Total Porosities.[2]

Material	**Total Porosity (%)**
Unaltered granite and gneiss	0-2
Quartzites	0-1
Shales, slates, mica-schists	0-10
Chalk	5-40
Sandstones	5-40
Volcanic tuff	30-40
Gravels	25-40
Sands	15-48
Silt	35-50
Clays	40-70
Fractured basalt	5-50
Karst limestone	5-50
Limestone, dolomite	0-20

Table 5.1 Porosities for Common Consolidated and Unconsolidated Materials[3]

Unconsolidated Sediments	**η** (%)	Consolidated Rocks	**η** (%)
Clay	45-55	Sandstone	5-30
Silt	35-50	Limestone/dolomite	1-20
Sand	25-40	Shale	0-10
Gravel	25-40	Fractured crystalline rock	0-10
Sand & gravel mixes	10-35	Vesicular basalt	10-50
Glacial till	10-35	Dense, solid rock	<1

Based on the information in the proceeding tables a value of 20% void space can be assigned to the sandy soils located on the subject parcel. This value should be considered conservative.

Seasonal High Water Table

Per the Protocol Sampling Service, Inc. Report, the Seasonal High Water Table (SHWT) was encountered at a depth of 30-33 inches in the three borings performed. This averages out to a SHWT elevation of 4.5', which was utilized to set grades for the infiltration systems and as a basis for storage calculations.

APPENDIX A

Soils Map & Field Investigation Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Dare County, North Carolina

November 12, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:670 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 30 60 120 180

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Dare County, North Carolina
Survey Area Data: Version 21, Sep 3, 2021

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

Date(s) aerial images were photographed: Dec 31, 2009—Oct 19, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CrB	Corolla-Duckston complex, 0 to 6 percent slopes, rarely flooded	0.4	44.6%
NeC	Newhan fine sand, 0 to 10 percent slopes	0.5	55.4%
Totals for Area of Interest		**0.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the

development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Dare County, North Carolina

CrB—Corolla-Duckston complex, 0 to 6 percent slopes, rarely flooded

Map Unit Setting

National map unit symbol: 3qgt
Elevation: 0 to 10 feet
Mean annual precipitation: 42 to 58 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 190 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

Corolla and similar soils: 50 percent
Duckston and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Corolla

Setting

Landform: Troughs on barrier islands
Landform position (two-dimensional): Backslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Eolian sands and/or beach sand

Typical profile

A - 0 to 3 inches: fine sand
C - 3 to 26 inches: fine sand
Ab - 26 to 32 inches: sand
Cg - 32 to 60 inches: sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 39.96 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Duckston

Setting

Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Eolian sands and/or beach sand

Typical profile

A - 0 to 8 inches: fine sand
Cg - 8 to 13 inches: sand
Ab - 13 to 17 inches: sand
C'g - 17 to 80 inches: sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 39.96 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Moderately saline to strongly saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

NeC—Newhan fine sand, 0 to 10 percent slopes

Map Unit Setting

National map unit symbol: 3qh5
Elevation: 0 to 20 feet
Mean annual precipitation: 42 to 58 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 190 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

Newhan and similar soils: 80 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Newhan

Setting

Landform: Dunes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Eolian sands and/or beach sand

Typical profile

A - 0 to 2 inches: fine sand
C1 - 2 to 50 inches: fine sand
C2 - 50 to 80 inches: sand

Properties and qualities

Slope: 0 to 10 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 to 39.96 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 20.0
Available water supply, 0 to 60 inches: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Duckston

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Beaches

Percent of map unit: 5 percent
Landform: Barrier beaches, barrier flats
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

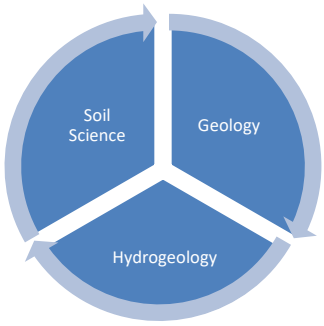
United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf



Protocol Sampling Service, Inc.
"Experts in Environmental Compliance"

4114 Laurel Ridge Drive
Raleigh, North Carolina 27612

Protocolsampling@yahoo.com
Environmentalservicesnc.com

(919) 210-6547

June 14, 2021

Mr. Andy Deel, P.E.
Post Office Box 3901
Kill Devil Hills, North Carolina 27948
Via email; dadeeleng@gmail.com

Re: **Storm Water Management Soil Investigation**
Hydraulic Conductivity (Ksat) Testing
Blue Moon Restaurant
Dove Street
Nags Head, Dare County, North Carolina
Protocol Project #21-97

Dear Mr. Deel:

The following Soil Investigation is submitted to assist in a site assessment for the proposed storm water management improvements associated with the proposed Blue Moon Brewery and Restaurant. The study area which is being considered for one (1) dry infiltration basin and two (2) parking lot sites where permeable turf stones will be used. The site is located on the north side of East Dove Street and east of NC 158 Bypass in Nags Head, Dare County, North Carolina.

SITE HISTORY AND PHYSICAL CHARACTERISTICS

The study area is currently undeveloped. Residential development surrounds the study area. Protocol Sampling Service, Inc. of Raleigh, North Carolina was hired to perform an investigation to identify the depth to seasonal high-water table, if any restrictive layers are present in the proposed location of the basins and determine subsurface permeabilities at or slightly above the expected basin bottom and turf stone elevations.

SOIL INVESTIGATION

The field survey was conducted on June 9, 2021. Three (3) soil borings were advanced to 60 inches below land surface (bls) with a hand auger in predetermined boring locations as shown on the attached exhibit. Soil color was determined with a Munsell Soil Color Chart. The presence of fill or other disturbances, the depth to the seasonal high-water table, soil structure and consistence were noted. The borings were also checked for reduced colors, an anaerobic smell or obvious soil wetness. Surface elevations range from 7 feet msl to 8 feet msl from west to east across the study area.

FINDINGS - Soil

- The subject property contains soil belonging to the Corolla series with some disturbance. The Corolla series belongs to the Quartzipsamment subgroup that has in one or more horizons within 100 cm of the surface, redox depletions with a chroma of 2 or less and also Aquic conditions for some time in normal years.

- The soil was found to have an apparent depth to seasonal high-water table ranging from 30, 33 and 32-inches bls in soil boring No.1, 2 and 3, respectively. Static water levels were found from 48-inches bls in soil boring No.1, 55-inches bls in soil boring No.2 to 62-inches and at 52-inches bls in boring No.3.

- No major restrictive horizons were encountered to a depth of 60-inches in any of the soil borings.

HYDRAUILIC CONDUCTIVITY TESTING

Saturated hydraulic conductivity tests were performed to determine the permeability at or slightly above the expected infiltration depth of each basins. Saturated hydraulic conductivity is a quantitative measure of a saturated soil's ability to transmit water. It can be thought of as the ease with which pores of a saturated soil permit water movement. A common method to measure saturated hydraulic conductivity (K_{SAT}) of the unsaturated zone is by a constant-head well permeameter method (Amoozegar and Mecklenburg, 1999). These K_{SAT} tests take into account soil morphologic factors other than texture, because soil structure and clay mineralogy have been found to have a significant impact on the rate of water movement through soils (Bouma et al., 1983; Schoeneberger et al, 1995, Vepraskas et al, 1996). The Compact Constant Head Permeameter (Amoozemeter) is an example of a constant head permeameter which allows measurements of K_{SAT} in the vadose zone and is widely used in North Carolina and other parts of the country (Amoozegar, 2004; Amoozegar and Mecklenburg, 1999).

Since the expected finished depth of the infiltration basin ranges at 12-inches below existing grade, the Ksats were run at expected basin bottom elevations. The Ksats were run approximately 18-inches above the current seasonal high water table elevation and above the capillary fringe. The saturated hydraulic conductivity tests (Ksats) all reached steady state readings within two minutes and three consecutive readings revealed an average conductivity of 10.86 inches/hour or 22 feet/day with final calculated values ranging from 9 to 13 inches/hour.

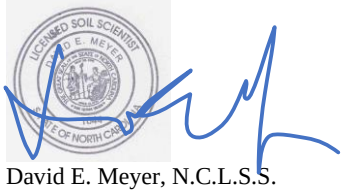
FINDINGS - Conductivity

- In-situ testing has revealed an infiltration and percolation rate through the subsurface sand of greater than 8-inches/hour. The well-sorted fine to medium beach sand is estimated to have a porosity of 22 to 25%.

The findings presented herein are based on the site conditions observed during performance of the field survey on June 9, 2021.

Please call me at (919) 210-6547 if you have any questions or need further assistance.

Sincerely,
Protocol Sampling Service, Inc.



David E. Meyer, N.C.L.S.S.
President

Soil Profile Description
Blue Moon Restaurant

Ap 0 – 30 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose.

C1 30 – 36 inches; yellowish brown (10YR 5/4) fine sand with strong brown (7.5YR 5/6) concentrations; single grained; loose.

C2 36 – 54 inches; grayish brown (10YR 5/2) fine sand; single grained; loose.

C3 54 – 60 inches; gray (10YR 6/1) fine sand; single grained; loose.

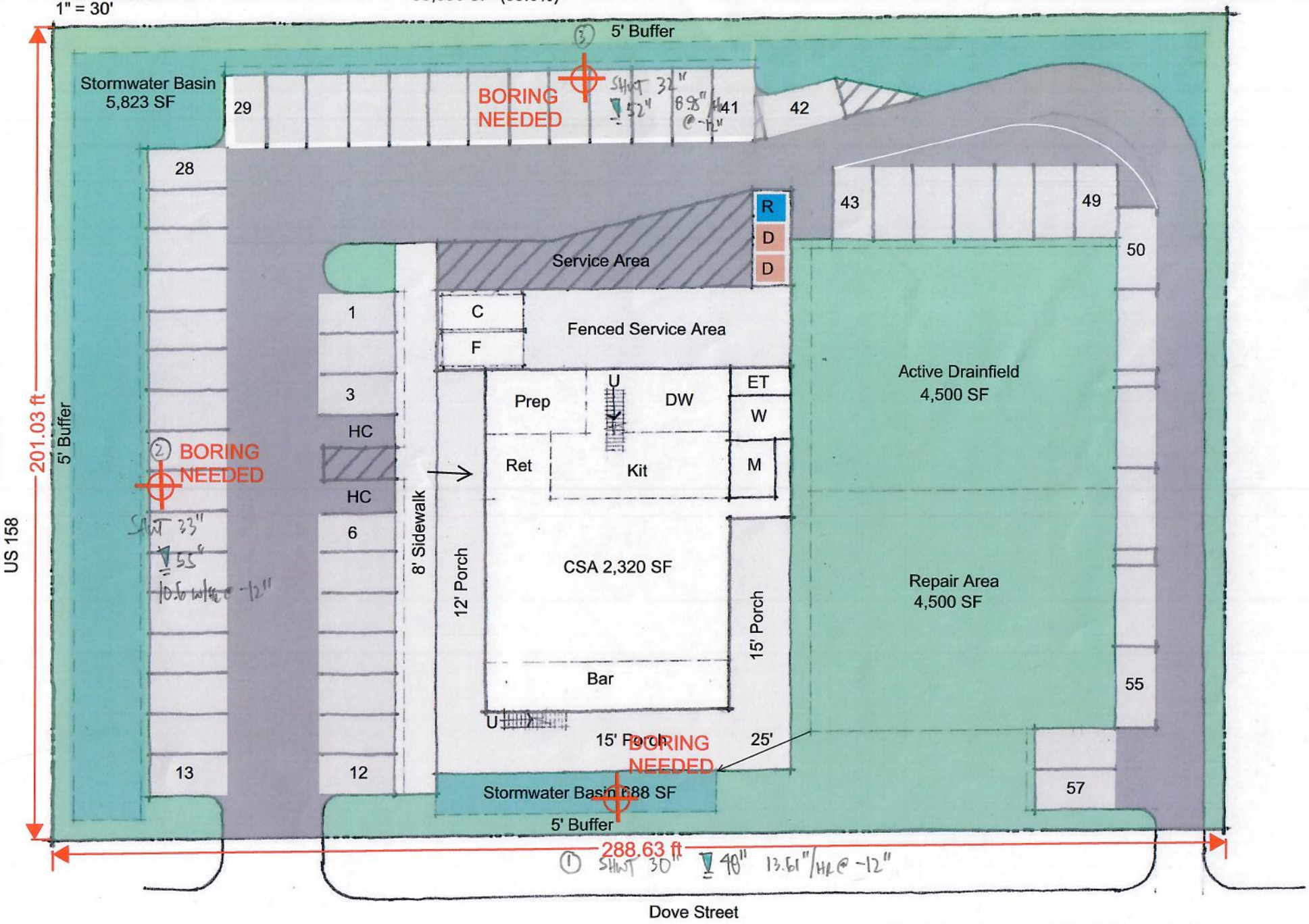
Soil Series: Corolla
Landscape: Coastal Plain
Landform: dune
Parent Material: Marine sediments
Drainage Class: moderately well drained
Particle Size Class: sandy
Temperature Regime: thermic
Subgroup Classification: Typic Quartzipsamments
Examination Method: auger boring
Date: June 9, 2021
Weather: Sunny, 80°
Investigators: David Meyer
Shwt: 30-33”
Measured water table depth: 48-55”

LOT COVERAGE
(100%) 23,767 SF
(66%) 10,287 SF x 0.66 = 6,789 SF
30,556 SF (53.6%)

PARKING
2,320 SF CSA @ 1 SP/55 SF = 42 SP

STORMWATER
30,556 SF x 0.36' = 11,000 CF / 6,511 SF = 1.7' D

ALTERNATIVE "A"
1" = 30'



HYDRAULIC CONDUCTIVITY STUDY
Blue Moon Restaurant

Date: 6/9/2021
Location: Ksat 1 @ SB-1

SET UP

		cm	inches
Hole Depth (cm):		30.5	12.0
Reference (cm):	+	10.2	4.0
Head (cm):	-	15.2	6.0
CHT Tube(s) setting:	=	25.4	

Valve Setting: x
2-ON

	cm	inches
Target Water Level:	15.2	6.0
Beginning Water Level:	12.7	5.0
Ending Water Level:	12.7	5.0

Hole diameter (cm): 5.2
Hole radius (r): 2.6
coefficient A: 0.000884

NOTE: Readings based on Ending Water Level

Coversion Factor (C.F. 105.0

Water Reading	change in water level	Chamber C.F.	clock time (min)	Elapsed Time (min)	(hr)	Q (cm3/hr)	K (cm/hr)	K (in/hr)	K gpd/sq foot
43	0.0	105.0	0.0						
35	8.0	105.0	1.0	1.00	0.017	50400.0	44.5720	17.5480	262.547
29	6.0	105.0	2.0	1.00	0.017	37800.0	33.4290	13.1610	196.910
23	6.0	105.0	3.0	1.00	0.017	37800.0	33.4290	13.1610	196.910
17	6.0	105.0	4.0	1.00	0.017	37800.0	33.4290	13.1610	196.910
11	6.0	105.0	5.0	1.00	0.017	37800.0	33.4290	13.1610	196.910
						Final Ksat	**33.429**	**13.161**	**196.910**

)

HYDRAULIC CONDUCTIVITY STUDY
Blue Moon Restaurant

Date: 6/9/2021
Location: Ksat 2 @ SB-2

SET UP

		cm	inches
Hole Depth (cm):		30.5	12.0
Reference (cm):	+	10.2	4.0
Head (cm):	-	15.2	6.0
CHT Tube(s) setting:	=	25.4	

Valve Setting: x
2-ON

	cm	inches
Target Water Level:	15.2	6.0
eginning Water Level:	7.6	3.0
Ending Water Level:	7.6	3.0

Hole diameter (cm): 5.2
Hole radius (r): 2.6
coefficient A: 0.000602

NOTE: Readings based on Ending Water Level

Coversion Factor (C.F 105.0

Water Reading	change in water level	Chamber C.F.	clock time (min)	Elapsed Time (min)	(hr)	Q (cm3/hr)	K (cm/hr)	K (in/hr)	K gpd/sq foot)
41	0.0	105.0	0.0						
32	9.0	105.0	1.0	1.00	0.017	56700.0	34.1487	13.4444	201.149
25	7.0	105.0	2.0	1.00	0.017	44100.0	26.5601	10.4567	156.449
18	7.0	105.0	3.0	1.00	0.017	44100.0	26.5601	10.4567	156.449
11	7.0	105.0	4.0	1.00	0.017	44100.0	26.5601	10.4567	156.449
4	7.0	105.0	5.0	1.00	0.017	44100.0	26.5601	10.4567	156.449
						Final Ksat	**26.560**	**10.457**	**156.449**

HYDRAULIC CONDUCTIVITY STUDY
Blue Moon Restaurant

Date: 6/29/2012
Location: Ksat 3 @ SB-3

SET UP

		cm	inches
Hole Depth (cm):		30.5	12.0
Reference (cm):	+	10.2	4.0
Head (cm):	-	15.2	6.0
CHT Tube(s) setting:	=	25.4	

Valve Setting: x
2-ON

	cm	inches
Target Water Level:	15.2	6.0
eginning Water Level:	10.2	4.0
Ending Water Level:	10.2	4.0

Hole diameter (cm): 5.2
Hole radius (r): 2.6
coefficient A: 0.000722

NOTE: Readings based on Ending Water Level

Coversion Factor (C.F 105.0

Water Reading	change in water level	Chamber C.F.	clock time (min)	Elapsed Time (min)	(hr)	Q (cm3/hr)	K (cm/hr)	K (in/hr)	K gpd/sq foot)
41	0.0	105.0	0.0						
34	7.0	105.0	1.0	1.00	0.017	44100.0	31.8401	12.5355	187.551
29	5.0	105.0	2.0	1.00	0.017	31500.0	22.7429	8.9539	133.965
19	10.0	105.0	4.0	2.00	0.033	31500.0	22.7429	8.9539	133.965
9	10.0	105.0	6.0	2.00	0.033	31500.0	22.7429	8.9539	133.965
4	5.0	105.0	7.0	1.00	0.017	31500.0	22.7429	8.9539	133.965
						Final Ksat	**22.743**	**8.954**	**133.965**

APPENDIX B

Stormwater Calculations

Storage Reqd:

Drainage Area 1: (Permeable Paver System)

Drainage Area: 21,090 sf (0.48 Ac.)

Impervious: 19,735 sf ← Incl. Perm Parking since storage is calculated for gravel storage layer. as BMP.
Pervious: 1,355 sf

$I_a = 19,735/21,090 = 0.936$
$R_v = 0.05 + (0.9 \times I_a) = 0.892$
$R_d = 4.3$ in.

Design Volume = $3630 \times R_d \times R_v \times A$ = 6,684 cf

Drainage Area 2: (Infil. Basin)

Drainage Area: 32,314 sf (0.74 Ac)

Pavers Coverage: 2,644 sf (60% - 40% split:)
Pavers Imp: 1,586 sf
Pavers Perv: 1,058 sf

Impervious: 10,691 sf + 1,586 sf = 12,277 sf
Pervious: 18,979 sf + 1,058 sf = 20,037 sf

$I_a = 12,277/32,314 = 0.38$
$R_v = 0.392$
$R_d = 4.3$ in.

Design Volume = 4,527 cf

Storage Provided:

Drainage Area 1: Permeable Pavers system

SHWT @ +/- 4.5'
Top Pavers @ 7.6' - 8.0'
Top Gravel Storage @ 7.3 - 7.7'
Bottom Gravel Storage @ 6.3'

gravel pore space = 40%
sand pore space = 20%

Permeable Pavers Area = 6,660 sf

Storage in gravel layer = 6,660 x 1.0 x 0.4 = 2,664 cf
storage in sand layer = 6,660 x (6.3-4.5) x 0.2 = 2,398 cf

Total Storage Available = 5,062 cf

Storage Reqd for DA 1 = 6,684 cf

∴ 1,622 cf overflows to infil. basin

Storage Provided:

7934

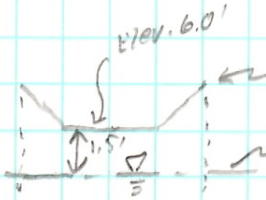
Drainage Area 2: Infiltration Basin

SHWT @ +/- 4.5'
Bottom Basin @ 6.0'
Top Storage @ 7.2'
Top Berm @ 7.5'

sand porosity = 20%
Infiltration rate = 8 in/hr
} Per Protocol Sampling report dated 7/14/21

Elev.	Area	Avg Area	Vol.	Σ Vol.
6.0	3344			0
		3831	3831	
7.0	4317			3831
		4452	891	
7.2	4587			4722 ← Above Grade Storage

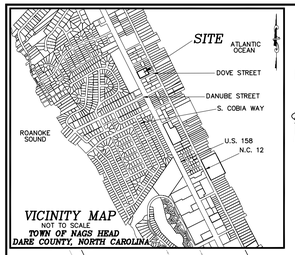
Below Grade Storage:



20% Void Space

Vol. = [(4,587 x (7.2-4.5)) - 4,722] x 0.2 = 1,533 cf ← Below Grade Storage

Total Storage Available = 6,255 cf



VICINITY MAP
NOT TO SCALE
TOWN OF NAGS HEAD
DARE COUNTY, NORTH CAROLINA

SURVEY DATA BY SEABOARD SURVEYING AND PLANNING, INC. C-1536. 252-480-9998. THE PLAT IS ENTITLED " TOPOGRAPHIC SURVEY FOR BLUE MOON FIVE, LLC" THE PLAT IS DATED JUNE 03, 2021 WITH FILE NUMBER 2109821.

NOTES FROM SURVEY:
1. THIS SURVEY IS SUBJECT TO ANY FACTS THAT MAY BE DISCLOSED BY A FULL AND ACCURATE TITLE SEARCH.
2. AREA BY COORDINATE COMPUTATION: TOTAL = 57,000 S.F.
3. F.I.R.M. ZONE: "X" PER F.I.R.M. 3730080100K EFFECTIVE JUNE 19, 2020 (SUBJECT TO CHANGE BY F.E.M.A.)
   (R.F.P.E.: 9.0')
4. RECORDED REFERENCE: D.B. 2413, PG. 178; M.B. 2, PG. 114
5. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES.
6. DARE COUNTY P.I.N.: LOT 11: 14 080109 07 2079
   LOTS 12-15: 14 080109 06 1969
7. ELEVATIONS (NAVD 1988): AS SHOWN
8. MINIMUM BUILDING LINES (MBL), IF SHOWN HEREON, ARE PER THE CURRENT LOCAL ZONING REGULATIONS. OTHER SETBACKS AND/OR RESTRICTIONS MAY APPLY AND MUST BE VERIFIED PRIOR TO CONSTRUCTION.

M.B. 2 PG. 114

LOT 6, BLK. B1, SECT. 3 ROANOKE SOUND SHORES (PC 2, SL 114) (D.B. 463, PG. 109) NOW OR FORMERLY KENNETH R. SLAYTON & MARGARET L. SLAYTON P.O. BOX 513 NAGS HEAD, NC 27959 ZONING: C-2 USE: RETAIL/RESIDENTIAL

LOT 7, BLK. B1, SECT. 3 ROANOKE SOUND SHORES (PC 2, SL 114) NOW OR FORMERLY BRADSHAW, CHARLIE D JR TTEE TRE C/O CHUCK BRADSHAW TRE 135 BEECHWOOD DR FRANKLIN VA 23851 ZONING: C-2 USE: VACANT

LOT 8, BLK. B1, SECT. 3 ROANOKE SOUND SHORES (PC 2, SL 114) NOW OR FORMERLY BRADSHAW, CHARLIE D JR TTEE TRE C/O CHUCK BRADSHAW TRE 135 BEECHWOOD DR FRANKLIN VA 23851 ZONING: C-2 USE: RESIDENTIAL

LOT 9, BLK. B1, SECT. 3 ROANOKE SOUND SHORES (PC 2, SL 114) NOW OR FORMERLY MIDER, SARA SHNCOVICH EVR MIDER, MICHAEL PETER EVR 1360 CLEARVIEW DR DENVER PA 17517 ZONING: C-2 USE: RESIDENTIAL

LOT 10, BLK. B1, SECT. 3 ROANOKE SOUND SHORES (PC 2, SL 114) NOW OR FORMERLY GANDT DEVELOPMENT LLC P.O. BOX 97 NAGS HEAD, NC 27959 ZONING: C-2 USE: VACANT

LOT 16, BLK. B1, SECT. 3 ROANOKE SOUND SHORES (PC 2, SL 114) (D.B. 463, PG. 109) NOW OR FORMERLY KENNETH R. SLAYTON & MARGARET L. SLAYTON P.O. BOX 513 NAGS HEAD, NC 27959 ZONING: C-2 USE: RETAIL/RESIDENTIAL

N.C. 12 SOUTH VIRGINIA DARE TRAIL
(PUBLIC ASPHALT ROADWAY)
50' R/W

U.S. 158 SOUTH CROATAN HIGHWAY
(PUBLIC ASPHALT ROADWAY)
150' R/W

EAST DOVE STREET
50' R/W
(PUBLIC ASPHALT ROADWAY)

PROPOSED 100 SEAT RESTAURANT
25 BAR SEATS
BUILDING FOOTPRINT AREA = 2,513 sq.ft.
SECOND STORY FRAME ON CMU SPACE = 6,918 sq.ft.
FIRST FLOOR ELEVATION = 11.3'
COMMERCIAL SPRINKLER SYSTEM TO BE INCLUDED

PROPOSED RETAINING WALL
TOP WALL @ 8.5'
BOTTOM WALL @ EX. GRADE

PROPOSED DROP INLET WITH DISCHARGE THROUGH RETAINING WALL (TYP.)

LIGHT TYPE A
LITHONIA LIGHTING
KED LED AREA LUMINAIRE
OPTIONAL HOUSE SIDE SHIELD
DIMMABLE WITH AMBIENT SENSOR
M.H. = 20' ABOVE PARKING
TYPICAL FOR 4

LIGHT TYPE C
LITHONIA LIGHTING
WST LED WALL MOUNT LUMINAIRE
P1=27K-VF HVOLT WITH
MOTION/AMBIENT LIGHT SENSOR
M.H. = 10' AG
TYPICAL FOR 2

WASTEWATER TREATMENT SYSTEM
WASTEWATER DISPOSAL AREA
F.G. = 8.75'

FENCED SERVICE AREA
SERVICE AREA AND LOADING ZONE
ASPHALT OR CONCRETE PAVING
PAVERS WITH 6" CURB
PAVERS WITH 18" BORDER
NO PARKING
FIRE LANE - NO PARKING
PORCH
CONCRETE SIDEWALK
PROPOSED RETAINING WALL
15' FRONT SETBACK
5' SIDE SETBACK
30' REAR SETBACK
20' CORNER SIDE SETBACK
CONCRETE DUMPSTER PAD W/ SCREEN
GREASE TRAP
BLOWER UNIT UNDERGROUND
FLUME
CONCRETE DRIVEWAY
ONE WAY EXIT ONLY
STOP SIGN
DO NOT ENTER ONE WAY
SIGN
FIRE HYDRANT
FIRE LINE SIZE TO BE DETERMINED
RPZ IN HEATED ENCLOSURE SEE DETAIL SHEET 2 SIZE TO BE DETERMINED
PROPOSED WATER SERVICE LINE SIZE TO BE DETERMINED
POWER TRANSMISSION TOWER
OVERHEAD UTILITY LINE(S) (TYP.) (APPROXIMATE LOCATION)
UNDERGROUND GAS (APPROXIMATE LOCATION)
UNDERGROUND WATER LINE (APPROXIMATE LOCATION)
EDGE OF ASPHALT
DROP INLET
VALVE
MH
EX. 5/8" REBAR FLUSH
EX. 5/8" REBAR 0.3' BG
EX. 5/8" REBAR 0.7' AG
EX. 4" X 4" CONC. MON. (DISTURBED)
EXIST. WATER METERS
R(FOC)=15'
R(FOC)=10'
24" CURB/GUTTER
18" HDPE
DRIVEWAY APRON SHALL BE MINIMUM 4" THICK, 3,000 PSI CONCRETE EOP TO RIGHT OF WAY OR 6" ABC WITH 2" SURFACE COURSE
PROPOSED 18" CULVERT WITH FES 40 L.F., DOUBLE WALL HDPE WITH CLASS B EROSION CONTROL STONE

PRELIMINARY PLAN
GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

NOTES and DEVELOPMENT DATA:

1. Developer/Owner: Blue Moon Five 2, LLC
   326 West Villa Dune Drive, Nags Head, NC 27959
2. Contact: Michael W. Robinson P.E., P.L.S.
   P.O. Box 2852, Kill Devil Hills, NC 27948
   252-255-8026 mrobinson@obxengineering.com
3. Subject Parcel:
   Lots 11-15, Block B-1, Section 3, Resub. of Roanoke Sound Shores Street Address: 4329 S. Croatan Highway, Nags Head 27959
   Reference: P.C. 2 Sl. 114, D. B. 2546 Pg. 00234
   Lot 12-15: PIN 0801 09 06 1969 Parcel 012411000
   Lot 11: PIN 0801 09 07 2079 Parcel 008618000

Lot Recombination or similar legal document required prior to issuance of building permit to combine properties for development purposes.

4. Parcel Area = 57,000 sq.ft.
5. FEMA Data:
   Map Number: 3730080100K, Effective Date: 6/19/2020
   Flood Zone X – Base Flood Elevation – n/a
   Flood Zones subject to change by FEMA.

   Regulatory flood protection elevation: Properties west of NC 12 and SR 1243 – The RFPE for properties located west of NC 12 and SR 1243 and in flood zones Shaded X, X, or AE, is 9 feet NAVD 1988. Reference Level – The reference level is the bottom of the lowest floor or the bottom of the lowest attendant utility including ductwork, whichever is lower, with only flood resistant materials located below the reference level west of NC 12 and SR 1243.
6. Zoning: C-2 General Commercial District
7. District Development Standards:
   Minimum Front Yard (Croatan Highway) – 15'
   Minimum Side Yard (East Dove Street) – 15'
   Minimum Side Yard (North Property Line) – 5'
   Minimum Rear Yard (East Property Line) – 30'
   Maximum Building Height: 35 feet, 42 feet with 8/12 roof pitch
   Maximum Lot Coverage: 55%
8. Proposed Use: Restaurant (Sit-Down) with 100 restaurant seats and 25 bar seats in a one story frame commercial structure on a concrete slab foundation. This use is a Permitted with Supplemental Regulations in the C-2 Zoning district.
9. Minimum Parking Requirements:
   Use Category/Class- Food Service, Restaurant Sit-Down
   Required Parking: One parking space for every 55 square feet of indoor customer service area.
   Indoor Customer Service Area = 2,513 sq.ft.
   Required Parking Spaces = 46
   Parking Spaces Provided = 54
10. Lot Coverage calculations:
    Parcel Area = 57,000 sq.ft.
    Building Footprint including Service Area = 9,986 sq.ft.
    Pavement, Curbing and Paver Border = 13,543 sq.ft.
    Permeable Pavers (adjusted area) = 6,028 sq.ft.
    (Actual area = 8,997 sq. ft. x 0.67 = 6,028 sq.ft.)
    Concrete Walk = 915 sq.ft.
    Concrete Dumpster Pad = 200 sq.ft.
    Wastewater building = 96 sq.ft.
    Total Lot Coverage = 30,768 sq.ft.
    % Lot Coverage = 54.0
11. Wastewater Treatment and Disposal System plans prepared by Anlauf Engineering, PLLC entitled "Wastewater system Site Plan, Blue Moon Restaurant". The plans have been approved by the Dare County Health Department with the Permit S4-6881 and S4-6881 issued 11/01/2021.
12. Grading, Stormwater management and Sedimentation/Erosion Control Plans prepared by Deel Engineering PLLC, entitled Grading and Drainage Plan, Blue Moon Five, LLC.
13. A lighting plan consistent with Section 10.37.1 of the UDO will be required prior to issuance of building permits for the proposed use.

NORTH CAROLINA PROFESSIONAL SEAL 18994 ENGINEER MICHAEL W. ROBINSON 01-10-22

MICHAEL W. ROBINSON, P.E., P.L.S.
ENGINEERING AND SURVEYING
KILL DEVIL HILLS, NC
P.O. BOX 2852 27948
PHONE: 252-255-8026
EMAIL: mrobinson@obxengineering.com

SITE PLAN
PRELIMINARY

NORTH CAROLINA PROFESSIONAL SEAL 18994 ENGINEER MICHAEL W. ROBINSON

REVISIONS

NO.	DATE	DESCRIPTION	BY

PROJECT:
BLUE MOON FIVE, LLC
NAGS HEAD DARE COUNTY NORTH CAROLINA
COMMERCIAL DEVELOPMENT PLAN

DATE:	SCALE:
01-10-22	1"=20'
DESIGNED: MWR	DRAWN: MWR

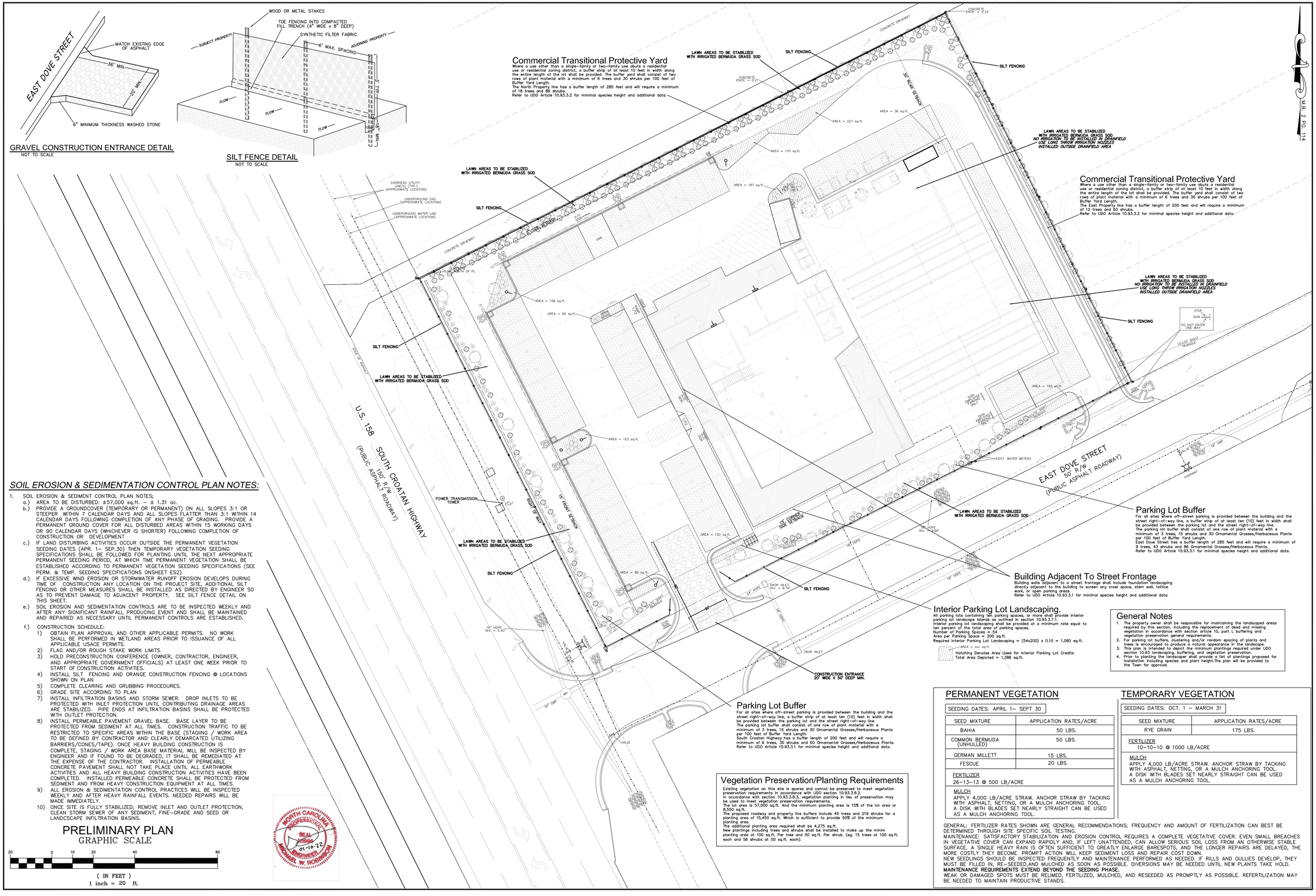
SHEET: 1 OF 6

CAD FILE:

PROJECT NO: 080221

GRAVEL CONSTRUCTION ENTRANCE DETAIL
NOT TO SCALE

SILT FENCE DETAIL
NOT TO SCALE



SOIL EROSION & SEDIMENTATION CONTROL PLAN NOTES:

1. SOIL EROSION & SEDIMENT CONTROL PLAN NOTES;
   a.) AREA TO BE DISTURBED: ±57,000 sq.ft. – ± 1.31 ac.
   b.) PROVIDE A GROUNDCOVER (TEMPORARY OR PERMANENT) ON ALL SLOPES 3:1 OR STEEPER WITHIN 7 CALENDAR DAYS AND ALL SLOPES FLATTER THAN 3:1 WITHIN 14 CALENDAR DAYS FOLLOWING COMPLETION OF ANY PHASE OF GRADING. PROVIDE A PERMANENT GROUND COVER FOR ALL DISTURBED AREAS WITHIN 15 WORKING DAYS OR 90 CALENDAR DAYS (WHICHEVER IS SHORTER) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT
   c.) IF LAND DISTURBING ACTIVITIES OCCUR OUTSIDE THE PERMANENT VEGETATION SEEDING DATES (APR. 1– SEP.30) THEN TEMPORARY VEGETATION SEEDING SPECIFICATIONS SHALL BE FOLLOWED FOR PLANTING UNTIL THE NEXT APPROPRIATE PERMANENT SEEDING PERIOD, AT WHICH TIME PERMANENT VEGETATION SHALL BE ESTABLISHED ACCORDING TO PERMANENT VEGETATION SEEDING SPECIFICATIONS (SEE PERM. & TEMP. SEEDING SPECIFICATIONS ONSHEET ES2).
   d.) IF EXCESSIVE WIND EROSION OR STORMWATER RUNOFF EROSION DEVELOPS DURING TIME OF CONSTRUCTION ANY LOCATION ON THE PROJECT SITE, ADDITIONAL SILT FENCING OR OTHER MEASURES SHALL BE INSTALLED AS DIRECTED BY ENGINEER SO AS TO PREVENT DAMAGE TO ADJACENT PROPERTY. SEE SILT FENCE DETAIL ON THIS SHEET.
   e.) SOIL EROSION AND SEDIMENTATION CONTROLS ARE TO BE INSPECTED WEEKLY AND AFTER ANY SIGNIFICANT RAINFALL PRODUCING EVENT AND SHALL BE MAINTAINED AND REPAIRED AS NECESSARY UNTIL PERMANENT CONTROLS ARE ESTABLISHED.
   f.) CONSTRUCTION SCHEDULE:
      1) OBTAIN PLAN APPROVAL AND OTHER APPLICABLE PERMITS. NO WORK SHALL BE PERFORMED IN WETLAND AREAS PRIOR TO ISSUANCE OF ALL APPLICABLE USACE PERMITS.
      2) FLAG AND/OR ROUGH STAKE WORK LIMITS.
      3) HOLD PRECONSTRUCTION CONFERENCE (OWNER, CONTRACTOR, ENGINEER, AND APPROPRIATE GOVERNMENT OFFICIALS) AT LEAST ONE WEEK PRIOR TO START OF CONSTRUCTION ACTIVITIES.
      4) INSTALL SILT FENCING AND ORANGE CONSTRUCTION FENCING @ LOCATIONS SHOWN ON PLAN
      5) COMPLETE CLEARING AND GRUBBING PROCEDURES.
      6) GRADE SITE ACCORDING TO PLAN
      7) INSTALL INFILTRATION BASINS AND STORM SEWER. DROP INLETS TO BE PROTECTED WITH INLET PROTECTION UNTIL CONTRIBUTING DRAINAGE AREAS ARE STABILIZED. PIPE ENDS AT INFILTRATION BASINS SHALL BE PROTECTED WITH OUTLET PROTECTION.
      8) INSTALL PERMEABLE PAVEMENT GRAVEL BASE. BASE LAYER TO BE PROTECTED FROM SEDIMENT AT ALL TIMES. CONSTRUCTION TRAFFIC TO BE RESTRICTED TO SPECIFIC AREAS WITHIN THE BASE (STAGING / WORK AREA TO BE DEFINED BY CONTRACTOR AND CLEARLY DEMARCATED UTILIZING BARRIERS/CONES/TAPE). ONCE HEAVY BUILDING CONSTRUCTION IS COMPLETE, STAGING / WORK AREA BASE MATERIAL WILL BE INSPECTED BY ENGINEER AND IF FOUND TO BE DEGRADED, IT SHALL BE REMEDIATED AT THE EXPENSE OF THE CONTRACTOR. INSTALLATION OF PERMEABLE CONCRETE PAVEMENT SHALL NOT TAKE PLACE UNTIL ALL EARTHWORK ACTIVITIES AND ALL HEAVY BUILDING CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED. INSTALLED PERMEABLE CONCRETE SHALL BE PROTECTED FROM SEDIMENT AND FROM HEAVY CONSTRUCTION EQUIPMENT AT ALL TIMES.
      9) ALL EROSION & SEDIMENTATION CONTROL PRACTICES WILL BE INSPECTED WEEKLY AND AFTER HEAVY RAINFALL EVENTS. NEEDED REPAIRS WILL BE MADE IMMEDIATELY.
      10) ONCE SITE IS FULLY STABILIZED; REMOVE INLET AND OUTLET PROTECTION, CLEAN STORM SEWER OF ANY SEDIMENT, FINE-GRADE AND SEED OR LANDSCSAPE INFILTRATION BASINS.

PRELIMINARY PLAN
GRAPHIC SCALE

20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

NORTH CAROLINA PROFESSIONAL SEAL 18994 ENGINEER MICHAEL W. ROBINSON 01-10-22

PERMANENT VEGETATION

SEEDING DATES: APRIL 1– SEPT 30

SEED MIXTURE	APPLICATION RATES/ACRE
BAHIA	50 LBS.
COMMON BERMUDA (UNHULLED)	50 LBS.
GERMAN MILLETT	15 LBS.
FESCUE	20 LBS.
FERTILIZER 26–13–13 @ 500 LB/ACRE	
MULCH APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.	

TEMPORARY VEGETATION

SEEDING DATES: OCT. 1 – MARCH 31

SEED MIXTURE	APPLICATION RATES/ACRE
RYE GRAIN	175 LBS.
FERTILIZER 10–10–10 @ 1000 LB/ACRE	
MULCH APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.	

GENERAL: FERTILIZER RATES SHOWN ARE GENERAL RECOMMENDATIONS; FREQUENCY AND AMOUNT OF FERTILIZATION CAN BEST BE DETERMINED THROUGH SITE SPECIFIC SOIL TESTING.
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 BARESPOTS, 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.

MICHAEL W. ROBINSON, P.E., P.L.S.
ENGINEERING AND SURVEYING
P.O. BOX 2852 27948
KILL DEVIL HILLS
PHONE: 252-255-8026
EMAIL: mrobinson@obxengineering.com

LANDSCAPE PLAN
SEDIMENTATION/EROSION CONTROL PLAN

REVISIONS

NO.	DATE	DESCRIPTION	BY

PROJECT:
BLUE MOON FIVE, LLC
NAGS HEAD DARE COUNTY NORTH CAROLINA
COMMERCIAL DEVELOPMENT PLAN

DATE: 01–10–22
SCALE: 1"=20'
DESIGNED: MWR
DRAWN: MWR
SHEET: 2 OF 6
CAD FILE:
PROJECT NO: 080221

GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes

Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed
(d) Slopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

Temporary Stabilization	Permanent Stabilization
• Temporary grass seed covered with straw or other mulches and tackifiers • Hydroseeding • Rolled erosion control products with or without temporary grass seed • Appropriately applied straw or other mulch • Plastic sheeting	• Permanent grass seed covered with straw or other mulches and tackifiers • Geotextile fabrics such as permanent soil reinforcement matting • Hydroseeding • Shrubs or other permanent plantings covered with mulch • Uniform and evenly distributed ground cover sufficient to restrain erosion • Structural methods such as concrete, asphalt or retaining walls • Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

1. Select flocculants that are appropriate for the soils being exposed during construction, selecting from the *NC DWR List of Approved PAMS/Flocculants*.
2. Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
3. Apply flocculants at the concentrations specified in the *NC DWR List of Approved PAMS/Flocculants* and in accordance with the manufacturer's instructions.
4. Provide ponding area for containment of treated Stormwater before discharging offsite.
5. Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

EQUIPMENT AND VEHICLE MAINTENANCE

1. Maintain vehicles and equipment to prevent discharge of fluids.
2. Provide drip pans under any stored equipment.
3. Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
4. Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
5. Remove leaking vehicles and construction equipment from service until the problem has been corrected.
6. Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

1. Never bury or burn waste. Place litter and debris in approved waste containers.
2. Provide a sufficient number and size of waste containers (e.g dumpster, trash receptacle) on site to contain construction and domestic wastes.
3. Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
4. Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
5. Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
6. Anchor all lightweight items in waste containers during times of high winds.
7. Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
8. Dispose waste off-site at an approved disposal facility.
9. On business days, clean up and dispose of waste in designated waste containers.

PAINT AND OTHER LIQUID WASTE

1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
3. Contain liquid wastes in a controlled area.
4. Containment must be labeled, sized and placed appropriately for the needs of site.
5. Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

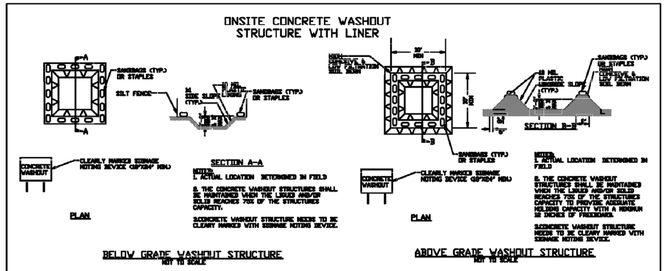
PORTABLE TOILETS

1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
2. Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
3. Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

EARTHEN STOCKPILE MANAGEMENT

1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
2. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
3. Provide stable stone access point when feasible.
4. Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.

NORTH CAROLINA *Environmental Quality*



CONCRETE WASHOUTS

1. Do not discharge concrete or cement slurry from the site.
2. Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
3. Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
4. Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
5. Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
6. Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
7. Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority.
8. Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
9. Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
10. At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

HERBICIDES, PESTICIDES AND RODENTICIDES

1. Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
2. Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
3. Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
4. Do not stockpile these materials onsite.

HAZARDOUS AND TOXIC WASTE

1. Create designated hazardous waste collection areas on-site.
2. Place hazardous waste containers under cover or in secondary containment.
3. Do not store hazardous chemicals, drums or bagged materials directly on the ground.

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

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ENGINEERING AND SURVEYING
P.O. BOX 2852
KILL DEVIL HILLS, NC 27948
PHONE: 252-255-8026
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NCG01-SHEET 1
PRELIMINARY

NORTH CAROLINA PROFESSIONAL SEAL 18994 ENGINEER MICHAEL W. ROBINSON

REVISIONS

NO.	DATE	DESCRIPTION	BY

PROJECT: BLUE MOON FIVE, LLC
NAGS HEAD DARE COUNTY NORTH CAROLINA
COMMERCIAL DEVELOPMENT PLAN

DATE: 01-10-22
SCALE: 1"=20'
DESIGNED: MWR
DRAWN: MWR
SHEET: 3 OF 6
CAD FILE:
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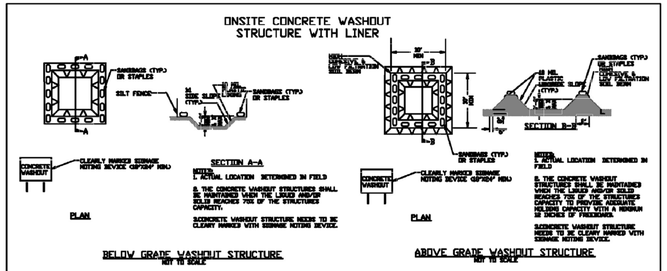
NORTH CAROLINA *Environmental Quality*



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NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

MICHAEL W. ROBINSON, P.E., P.L.S.
ENGINEERING AND SURVEYING
P.O. BOX 2852
KILL DEVIL HILLS, NC 27948
PHONE: 252-255-8026
EMAIL: mrobinson@obxengineering.com

NCG01-SHEET 2
PRELIMINARY

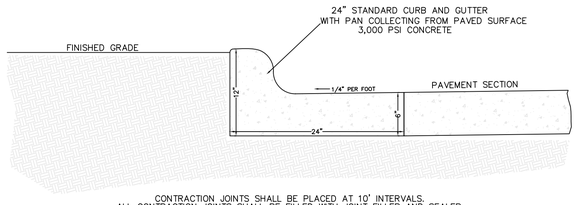
NORTH CAROLINA PROFESSIONAL SEAL 18994 ENGINEER MICHAEL W. ROBINSON

REVISIONS

NO.	DATE	DESCRIPTION	BY

PROJECT: BLUE MOON FIVE, LLC
NAGS HEAD DARE COUNTY NORTH CAROLINA
COMMERCIAL DEVELOPMENT PLAN

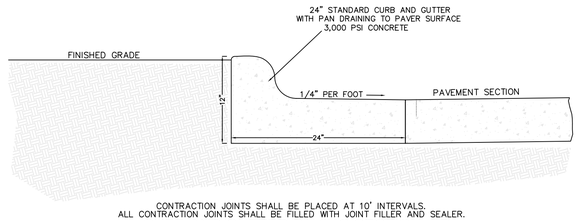
DATE: 01-10-22
SCALE: 1"=20'
DESIGNED: MWR
DRAWN: MWR
SHEET: 4 OF 6
CAD FILE:
PROJECT NO: 080221



CONTRACTION JOINTS SHALL BE PLACED AT 10' INTERVALS.
ALL CONTRACTION JOINTS SHALL BE FILLED WITH JOINT FILLER AND SEALER.

CURB AND GUTTER PAVING SECTION AA

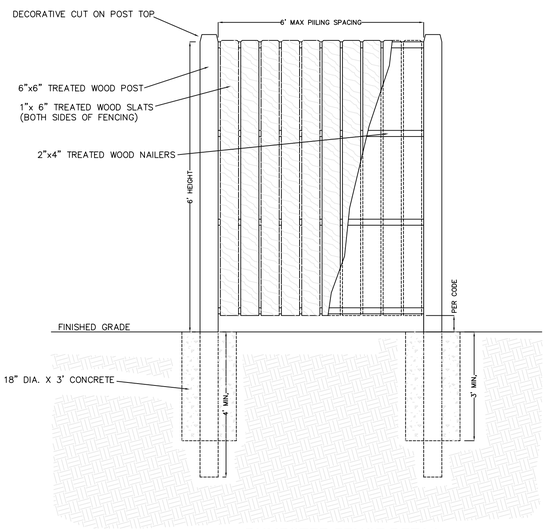
NOT TO SCALE



CONTRACTION JOINTS SHALL BE PLACED AT 10' INTERVALS.
ALL CONTRACTION JOINTS SHALL BE FILLED WITH JOINT FILLER AND SEALER.

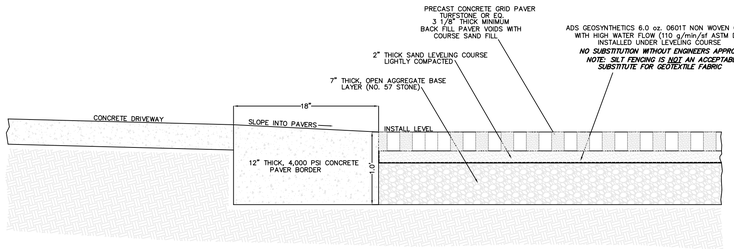
CURB AND GUTTER PAVING SECTION BB

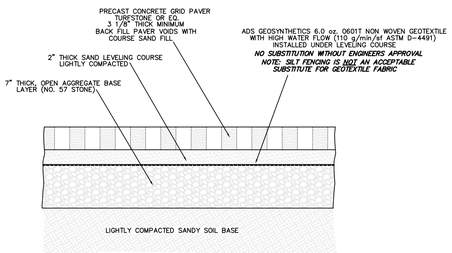
NOT TO SCALE



DUMPSTER FENCE DETAIL

NOT TO SCALE

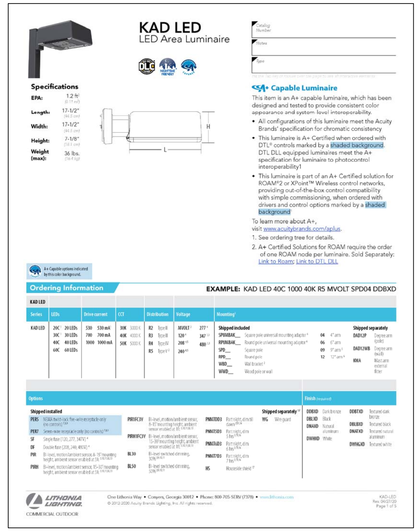




TURFSTONE/PICP PAVING DETAIL

NOT TO SCALE

SIGN-ONE WAY-DO NOT ENTER



LIGHT TYPE A

LITHONIA LIGHTING - KED LED AREA LUMINAIRE

OPTIONAL HOUSE SIDE SHIELD AND DIMMER WITH AMBIENT SENSOR

COLOR AND FINISH BY OWNER
M.H. = 20' ABOVE PARKING

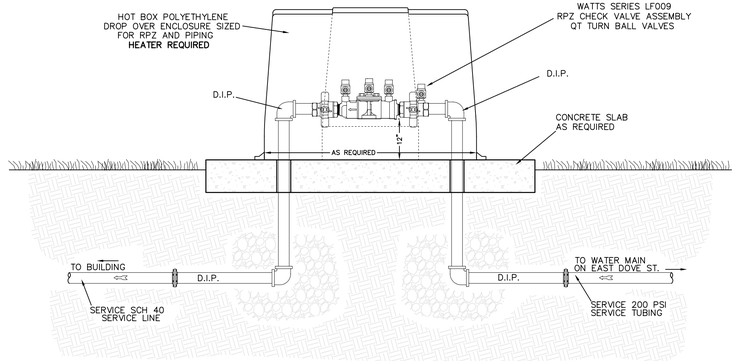
LIGHT TYPE B

LITHONIA LIGHTING - WST LED WALL MOUNT LUMINAIRE

P1-27K-VF HVOLT WITH MOTION/AMBIENT LIGHT SENSOR

COLOR AND FINISH BY OWNER

Parking Lot Lighting Standards:
Activity Level – Low
Maximum Maintained Footcandles (Cutoff Fixture) – 3.0 fc
Minimum Maintained Footcandles (Cutoff Fixture) – 0.2 fc



FIRE LINE BACK FLOW PREVENTION

NOT TO SCALE

Relation of Water Mains to Sewers

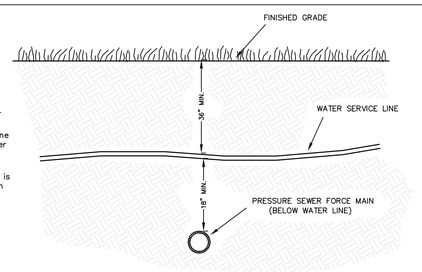
(a) Lateral Separation of Sewers and Water Mains. Water mains shall be laid at least 10 feet laterally from existing or proposed sewers, unless local conditions or barriers prevent a 10-foot lateral separation---in which case:

(1) The water main is laid in a separate trench, with the elevation of the bottom of the water main at least 18 inches above the top of the sewer; or

(2) The water main is laid in the same trench as 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.

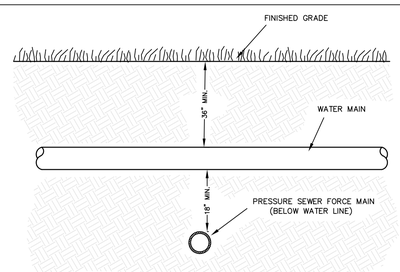
(b) Crossing a Water Main Over a Sewer. Whenever it is necessary for a water main to cross over a sewer, the water main shall be laid at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer, unless local conditions or barriers prevent an 18 inch vertical 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.

(c) 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 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.



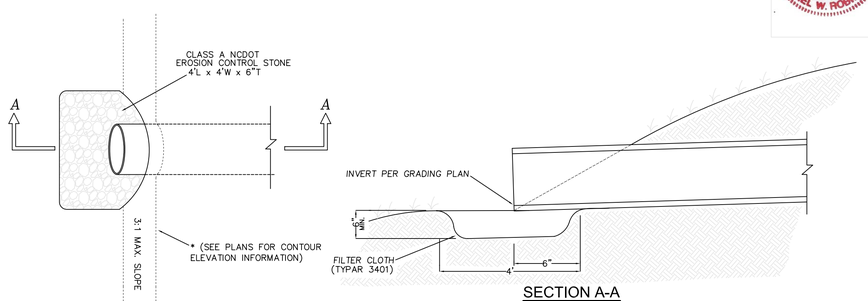
WATER SERVICE / SEWER FORCE MAIN CROSSING DETAIL

NOT TO SCALE



WATER MAIN / SEWER FORCE MAIN CROSSING DETAIL

NOT TO SCALE



PLAN VIEW

STORM PIPE OUTLET DETAIL

(APPLIES TO ALL PROPOSED STORM PIPE OUTLETS)
NOT TO SCALE

SECTION A-A

MICHAEL W. ROBINSON, P.E., P.L.S.
ENGINEERING AND SURVEYING
P.O. BOX 2852
KILL DEVIL HILL, NC 27948
PHONE: 252-255-8026
EMAIL: mrobinson@obxengineering.com

DETAIL SHEET 1
PRELIMINARY

NORTH CAROLINA PROFESSIONAL SEAL 18994 ENGINEER MICHAEL W. ROBINSON

NO.	DATE	REVISIONS DESCRIPTION	BY

PROJECT:
BLUE MOON FIVE, LLC
NAGS HEAD DARE COUNTY NORTH CAROLINA
COMMERCIAL DEVELOPMENT PLAN

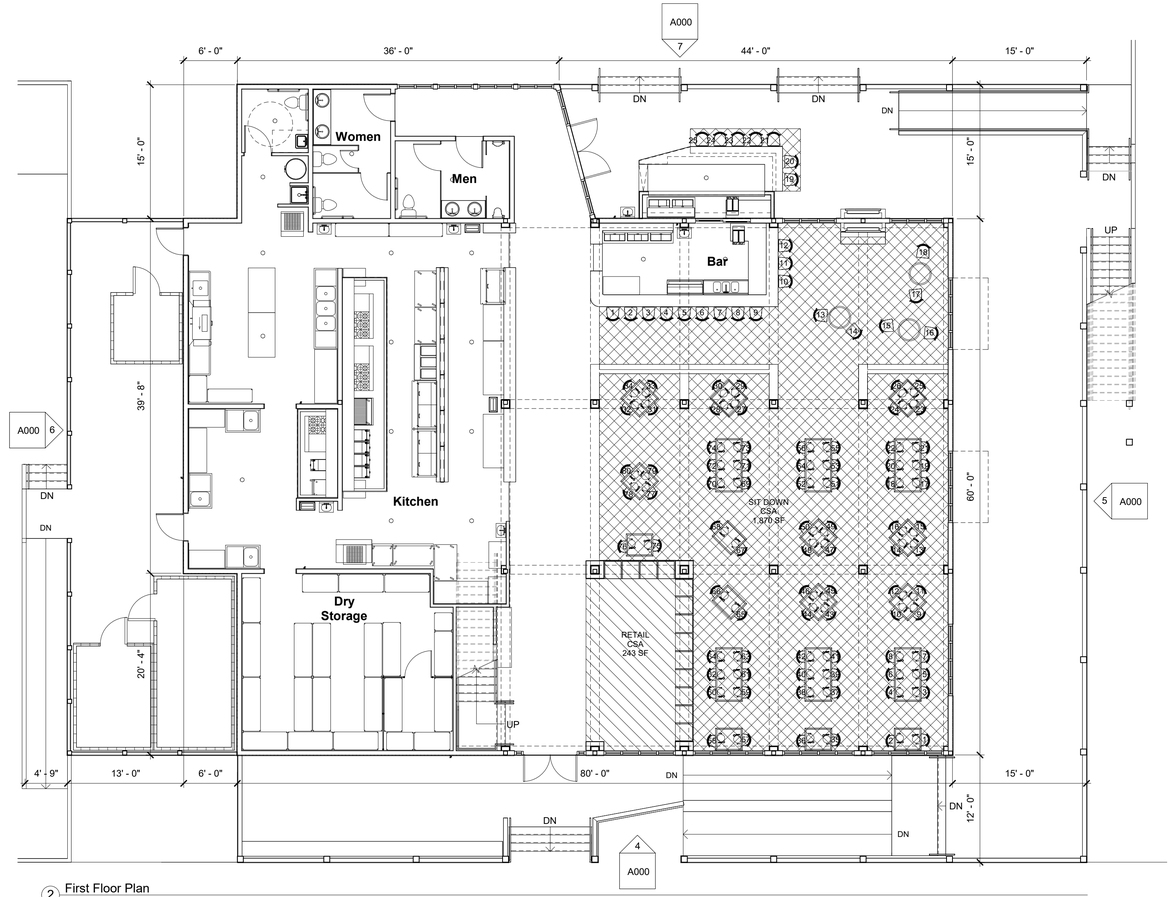
DATE:	SCALE:
01-10-22	1"=20'
DESIGNED:	DRAWN:
MWR	MWR

SHEET: 5 OF 6

CAD FILE:

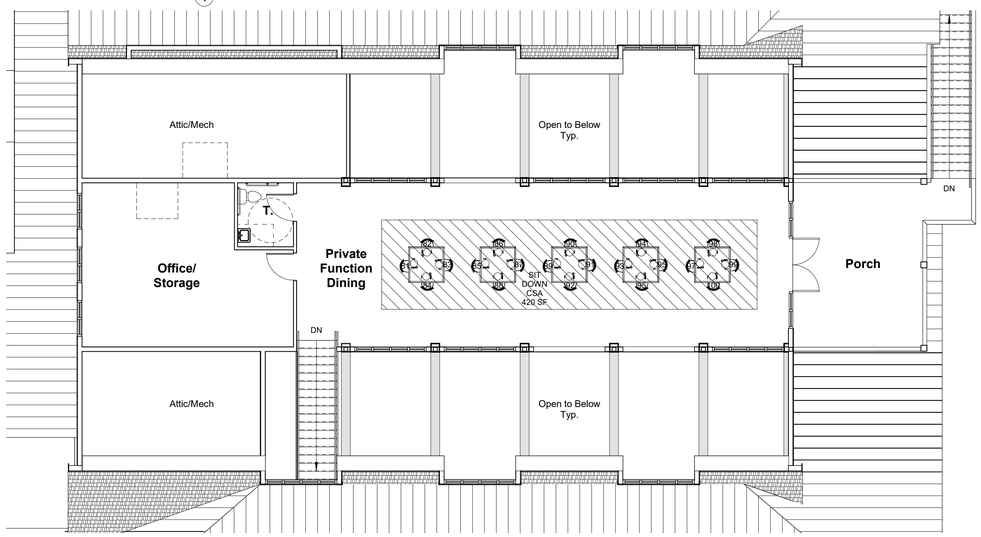
PROJECT NO: 080221

NORTH CAROLINA PROFESSIONAL SEAL 01-10-22 ENGINEER MICHAEL W. ROBINSON



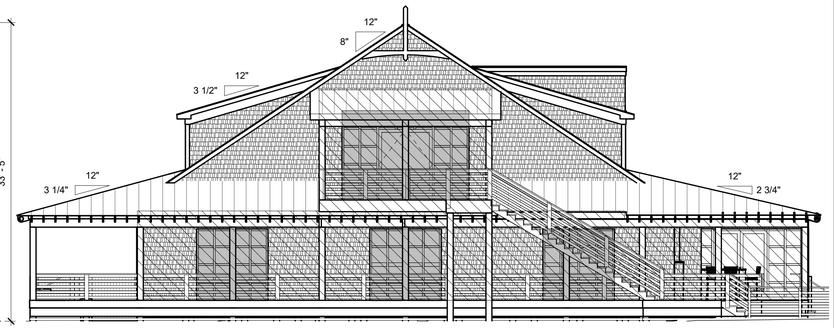
2 First Floor Plan
1/8" = 1'-0"

1 Perspective

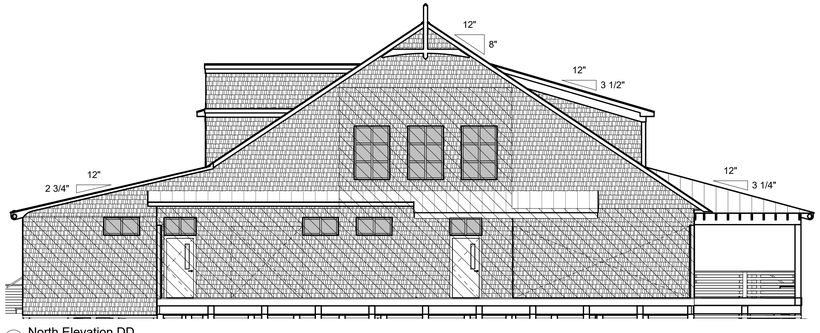


3 Mezzanine Floor Plan
1/8" = 1'-0"

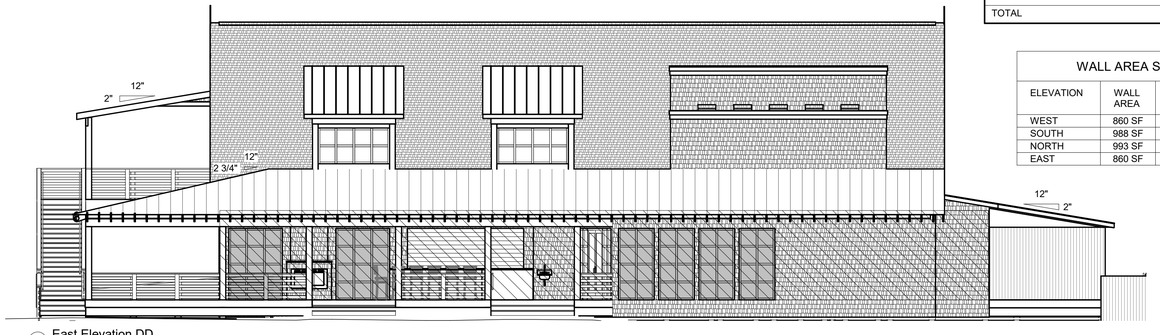
4 West Elevation DD
1/8" = 1'-0"



5 South Elevation DD
1/8" = 1'-0"



6 North Elevation DD
1/8" = 1'-0"



7 East Elevation DD
1/8" = 1'-0"

Nags Head Design Points Tabulation

DESIGN ELEMENT	FORMULA/NO. OF POINTS POSSIBLE	POINTS
PORCHES	FIRST FLOOR PORCHES - p1/b1 x 150 = p1 = PERIMETER OF FIRST FLOOR WITH PORCH b1 = PERIMETER OF FIRST FLOOR	180/310x150=87
	SECOND FLOOR PORCHES - p2/b2 x 75= p2 = PERIMETER OF SECOND FLOOR WITH PORCH b2 = PERIMETER OF SECOND FLOOR	0x75=0
DORMERS (25 POINTS MAX.)	HIP OR GABLE - n x 5	0
	SHED - n(10) + L = n = NO. OF DORMERS L = LINEAR FT. PAST 12'	50
COASTAL WATCH TOWER (10 POINTS MAX.)	10	0
ROOFS	25	25
BUILDING FORM (40 POINTS MAX.)	BUMP OUTS - f x 10 f= FACADE WITH REQUIRED BUMP OUTS	0
	COMBINATION BASE FORM	0
SIDING MATERIALS	WOOD SHINGLES = 25	0
	SIMULATED WOOD SHINGLES = 12	12
MISC. DETAILS	WINDOWS = 20	0
	WORKABLE SHUTTERS = 15	0
	EXPOSED RAFTER TAILS = 5	5
	BEAUTY BANDS = 5	0
	COLUMN TRIM = 5	0
	GABLE BRACKET = 5	5
MINIMUM REQUIRED POINT TOTAL 0.025 x S.F. 125 POINTS REQUIRED IN C2 FOR COMMERCIAL BUILDINGS		150
TOTAL		184

WALL AREA SCHEDULE

ELEVATION	WALL AREA	GLAZING AREA	GLAZING PERCENTAGE
WEST	860 SF	272 SF	31.6 %
SOUTH	988 SF	334 SF	33.8 %
NORTH	993 SF	110 SF	11.1 %
EAST	860 SF	224 SF	26.0 %

cahoon+kasten
ARCHITECTS
118 West Woodhill Drive
Nags Head, North Carolina 27959
P.252.441.0271 F.252.441.8724
E.office@obxarchitects.com

Area Schedule

Name	Area	Heated	Porches	Exterior Decks
1st Heated	5608 SF	5608 SF		
Covered Porch	2895 SF		2895 SF	
Service Yard	902 SF			902 SF
Mezz Heated	1547 SF	1547 SF		
2nd Porch	290 SF		290 SF	
		7155 SF	3185 SF	902 SF

Project: **Blue Moon Beach Grill**

Project No: **21028RT**

Location: **4329 S Croatan Hwy Nags Head, NC 27959**

Title: **Town Submittal**

Date: **January 7, 2021**

Scale: **As indicated**

BENJAMIN B. CAHOON REGISTERED ARCHITECT NORTH CAROLINA NAGS HEAD, NC
CAHOON & KASTEN ARCHITECTS, P.C. REGISTERED ARCHITECTURAL CORPORATION 51211 NORTH CAROLINA NAGS HEAD, NC
1/7/22

Revisions:

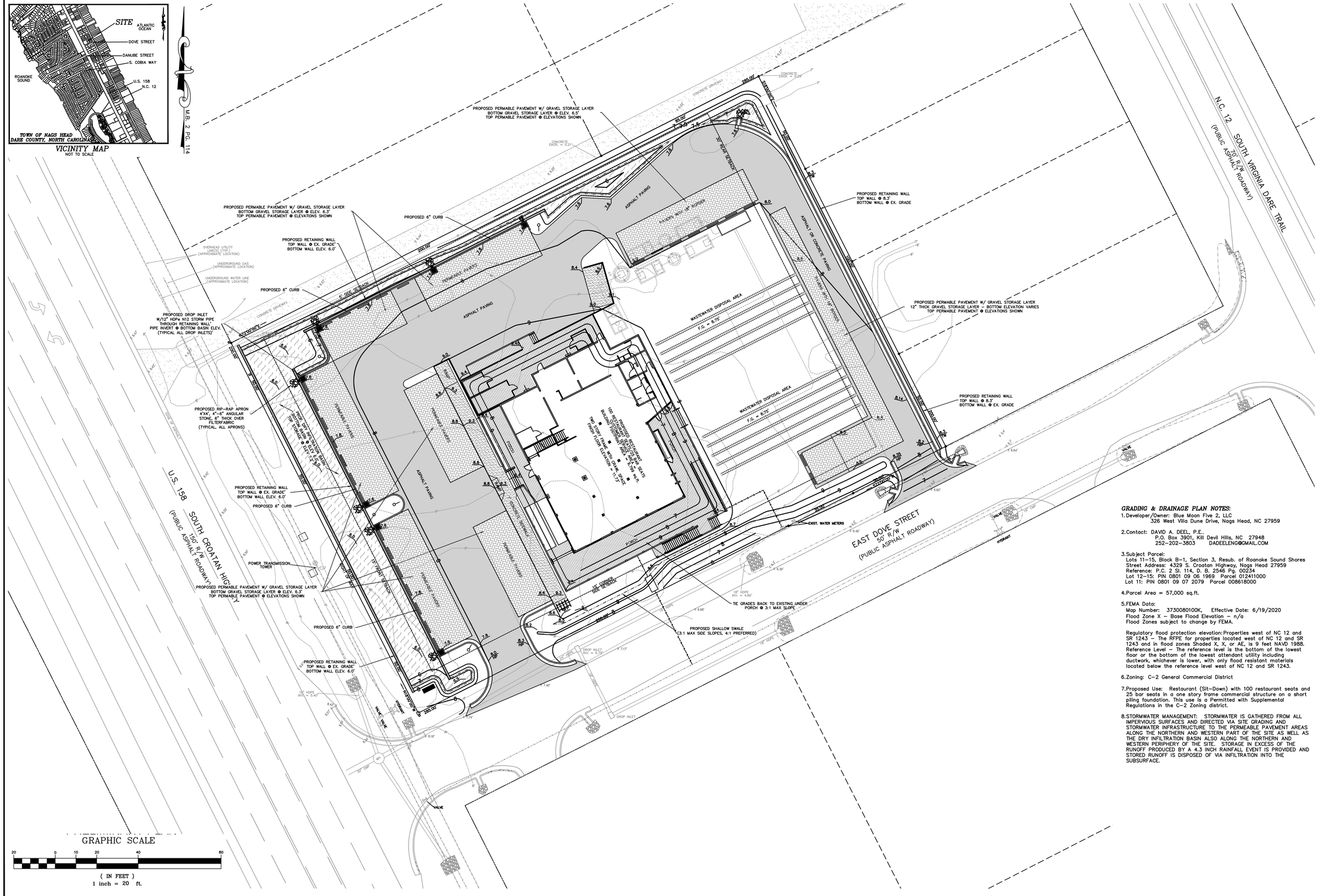
No.	Description	Date

Designed: BBC
Drawn: JPB
Reviewed:
Cad File:

A000

VICINITY MAP
NOT TO SCALE

M.B. 2 PG. 114



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

GRADING & DRAINAGE PLAN NOTES:

1. Developer/Owner: Blue Moon Five 2, LLC
   326 West Villa Dune Drive, Nags Head, NC 27959

2. Contact: DAVID A. DEEL, P.E..
   P.O. Box 3901, Kill Devil Hills, NC 27948
   252-202-3803 DADEELENG@GMAIL.COM

3. Subject Parcel:
   Lots 11-15, Block B-1, Section 3, Resub. of Roanoke Sound Shores
   Street Address: 4329 S. Croatan Highway, Nags Head 27959
   Reference: P.C. 2 Sl. 114, D. B. 2546 Pg. 00234
   Lot 12-15: PIN 0801 09 06 1969 Parcel 012411000
   Lot 11: PIN 0801 09 07 2079 Parcel 008618000

4. Parcel Area = 57,000 sq.ft.

5. FEMA Data:
   Map Number: 3730080100K, Effective Date: 6/19/2020
   Flood Zone X – Base Flood Elevation – n/a
   Flood Zones subject to change by FEMA.

   Regulatory flood protection elevation: Properties west of NC 12 and SR 1243 – The RFPE for properties located west of NC 12 and SR 1243 and in flood zones Shaded X, X, or AE, is 9 feet NAVD 1988. Reference Level – The reference level is the bottom of the lowest floor or the bottom of the lowest attendant utility including ductwork, whichever is lower, with only flood resistant materials located below the reference level west of NC 12 and SR 1243.

6. Zoning: C-2 General Commercial District

7. Proposed Use: Restaurant (Sit-Down) with 100 restaurant seats and 25 bar seats in a one story frame commercial structure on a short piling foundation. This use is a Permitted with Supplemental Regulations in the C-2 Zoning district.

8. STORMWATER MANAGEMENT: STORMWATER IS GATHERED FROM ALL IMPERVIOUS SURFACES AND DIRECTED VIA SITE GRADING AND STORMWATER INFRASTRUCTURE TO THE PERMEABLE PAVEMENT AREAS ALONG THE NORTHERN AND WESTERN PART OF THE SITE AS WELL AS THE DRY INFILTRATION BASIN ALSO ALONG THE NORTHERN AND WESTERN PERIPHERY OF THE SITE. STORAGE IN EXCESS OF THE RUNOFF PRODUCED BY A 4.3 INCH RAINFALL EVENT IS PROVIDED AND STORED RUNOFF IS DISPOSED OF VIA INFILTRATION INTO THE SUBSURFACE.

DEEL ENGINEERING, PLLC
CIVIL ENGINEERING SERVICES
FIRM LICENSE P-1045
322 WEST WILKINSON STREET
KILL DEVIL HILLS, NC 27948
Phone: (252) 202-3803 E-Mail: dadeeleng@gmail.com

NO.	DATE	REVISIONS

PLANNING BOARD SUBMISSION
CERTIFICATION

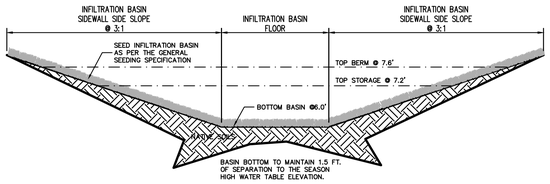
GRADING & DRAINAGE PLAN

BLUE MOON FIVE, LLC
4329 SOUTH CROATAN HIGHWAY
NAGS HEAD DARE NORTH CAROLINA

COMMISSION NO.	2021-11
DESIGNED BY	DAD
DRAWN BY	DAD
CHECKED BY	DAD
ISSUE DATE	1/11/2022
SHEET NO.	G1

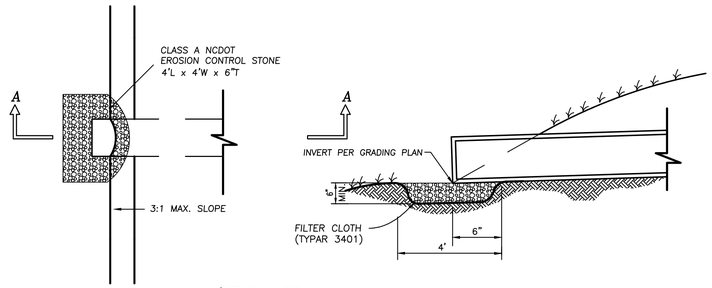
OF 2 SHEETS

GRADING & DRAINAGE PLANS – BLUE MOON.DWG 11/12/2021



INFILTRATION BASIN TYPICAL CROSS SECTION

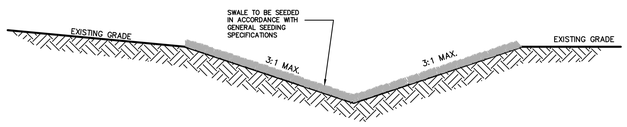
N.T.S.



STORM PIPE OUTLET DETAIL

(APPLIES TO ALL PROPOSED STORM PIPE OUTLETS)

N.T.S.



TYPICAL SHALLOW SWALE

N.T.S.

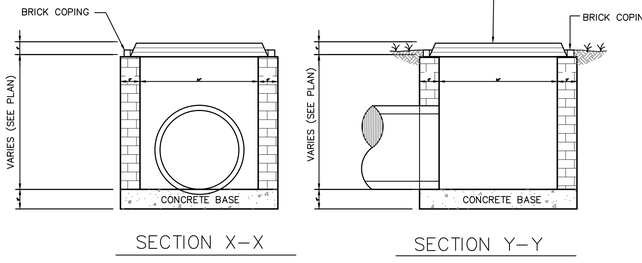
PLAN

WITH COPING REMOVED

MINIMUM DIMENSIONS AND QUANTITIES FOR BRICK CATCH BASIN					
DIMENSIONS OF BOX AND PIPE					
PIPE	SPAN	WIDTH	WIDTH	SPAN	HEIGHT
D	A	B	C	G	MIN HT
12"	3'–0"	2'–2"			2'–3"
15"	3'–0"	2'–2"			2'–6"
18"	3'–0"	2'–2"			2'–10"
24"	3'–0"	2'–2"			3'–2"

HEIGHT OF BOXES VARY
SEE DRAWING SHEET C3

FRAME & GRATE:
IN CURB: NCDOT STD 840.03B
ALL OTHERS: CAPITOL FOUNDRY CB2424*PED
(SUBSTITUTE PEDESTRIAN / BIKE SAFE GRATE IN ALL CASES)



STORM INLET DETAIL

HEIGHT OF BOXES VARY SEE SHEET C3
NC DOT 840.15

PERMANENT VEGETATION

SEEDING DATES: APRIL 1– SEPT 30

SEED MIXTURE	APPLICATION RATES/ACRE
BAHIA	50 LBS.
COMMON BERMUDA (UNHULLED)	50 LBS.
GERMAN MILLETT	15 LBS.
FESCUE	20 LBS.

FERTILIZER

26–13–13 @ 500 LB/ACRE

MULCH

APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

TEMPORARY VEGETATION

SEEDING DATES: OCT. 1 – MARCH 31

SEED MIXTURE	APPLICATION RATES/ACRE
RYE GRAIN	175 LBS.

FERTILIZER

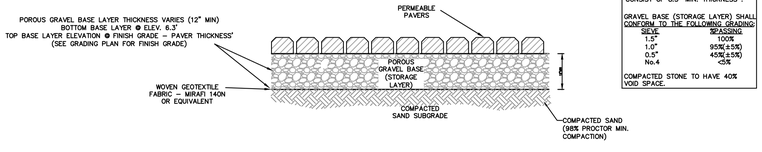
10–10–10 @ 1000 LB/ACRE

MULCH

APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

GENERAL:
– FERTILIZER RATES SHOWN ARE GENERAL RECOMMENDATIONS; FREQUENCY AND AMOUNT OF FERTILIZATION CAN BEST BE DETERMINED THROUGH SITE SPECIFIC SOIL TESTING.
– MAINTENANCE:
INTERMPORARY STABILIZATION AND EROSION CONTROL REQUIRES A COMPLETE VEGETATIVE COVER. EVEN SMALL BREACHES IN VEGETATIVE COVER CAN EXPAND RAPIDLY AND, IF LEFT UNATTENDED, CAN ALLOW SERIOUS SOIL LOSS FROM AN OTHERWISE STABLE SURFACE. A SINGLE HEAVY RAIN IS OFTEN SUFFICIENT TO GREATLY ENLARGE BARE SPOTS, AND THE LONGER REPAIRS ARE DELAYED, THE MORE COSTLY THEY BECOME. PROMPT ACTION WILL KEEP SEDIMENT LOSS AND REPAIR COST DOWN. NEW 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. (UNTIL FINAL COMPLETION IS AWARDED) WEAK OR DAMAGED SPOTS MUST BE RELIMED, FERTILIZED, MULCHED, AND RESEEDED AS PROMPTLY AS POSSIBLE. REFERTILIZATION MAY BE NEEDED TO MAINTAIN PRODUCTIVE STANDS.

SEEDING SPECIFICATIONS



GRAVEL BASE (STORAGE LAYER) TO CONSIST OF 8.5" MIN. THICKNESS .

GRAVEL BASE (STORAGE LAYER) SHALL CONFORM TO THE FOLLOWING GRADING:

SIEVE	%PASSING
1.5"	100%
1.0"	95%(±5%)
0.5"	45%(±5%)
No.4	<5%

COMPACTED STONE TO HAVE 40% VOID SPACE.

TYPICAL PERMEABLE PAVER INSTALLATION DETAIL

N.T.S.

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

DEEL ENGINEERING, PLLC
CIVIL ENGINEERING SERVICES
FIRM LICENSE P-1045
322 WEST WILKINSON STREET
KILL DEVIL HILLS, NC 27948
Phone: (252) 202–3803 E-Mail: dodeeleng@gmail.com

NO.	DATE	REVISIONS

PLANNING BOARD SUBMISSION

CERTIFICATION

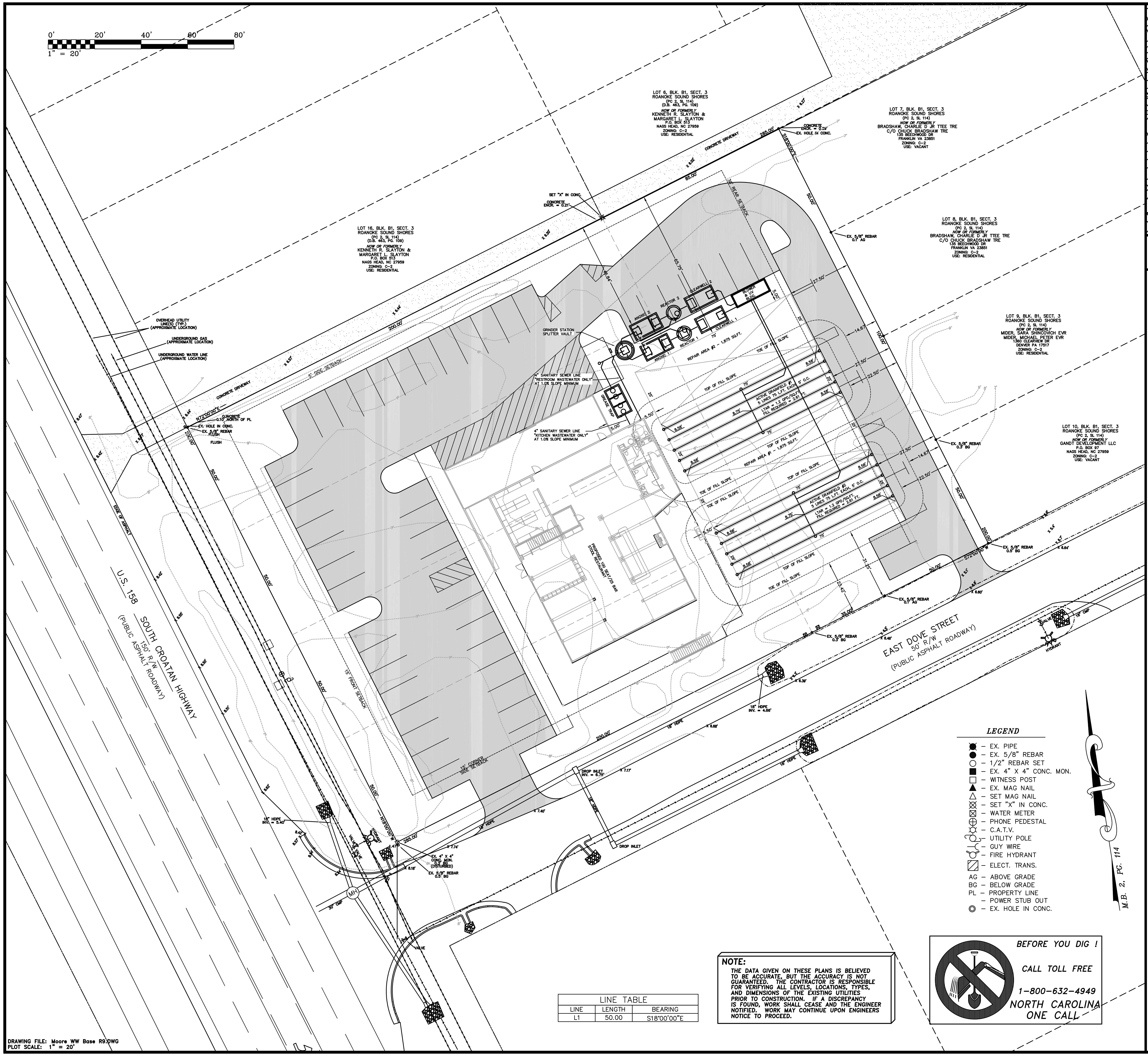
STORMWATER DETAILS

BLUE MOON FIVE, LLC
4329 SOUTH CROATAN HIGHWAY

NORTH CAROLINA
DARE
NAGS HEAD

COMMISSION NO.	2021-11
DESIGNED BY	DAD
DRAWN BY	DAD
CHECKED BY	DAD
ISSUE DATE	1/11/22
SHEET NO.	G2
OF	2 SHEETS

GRADING & DRAINAGE PLANS – BLUE MOON.DWG 11/12/2021



LEGEND

⊗	– EX. PIPE
●	– EX. 5/8" REBAR
○	– 1/2" REBAR SET
■	– EX. 4" X 4" CONC. MON.
□	– WITNESS POST
▲	– EX. MAG NAIL
△	– SET MAG NAIL
⊗	– SET "X" IN CONC.
☒	– WATER METER
⊕	– PHONE PEDESTAL
☼	– C.A.T.V.
○	– UTILITY POLE
—(	– GUY WIRE
○	– FIRE HYDRANT
▨	– ELECT. TRANS.
AG	– ABOVE GRADE
BG	– BELOW GRADE
PL	– PROPERTY LINE
	– POWER STUB OUT
◎	– EX. HOLE IN CONC.

LINE TABLE

LINE	LENGTH	BEARING
L1	50.00	S18°00'00"E

NOTE:
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BEFORE YOU DIG !

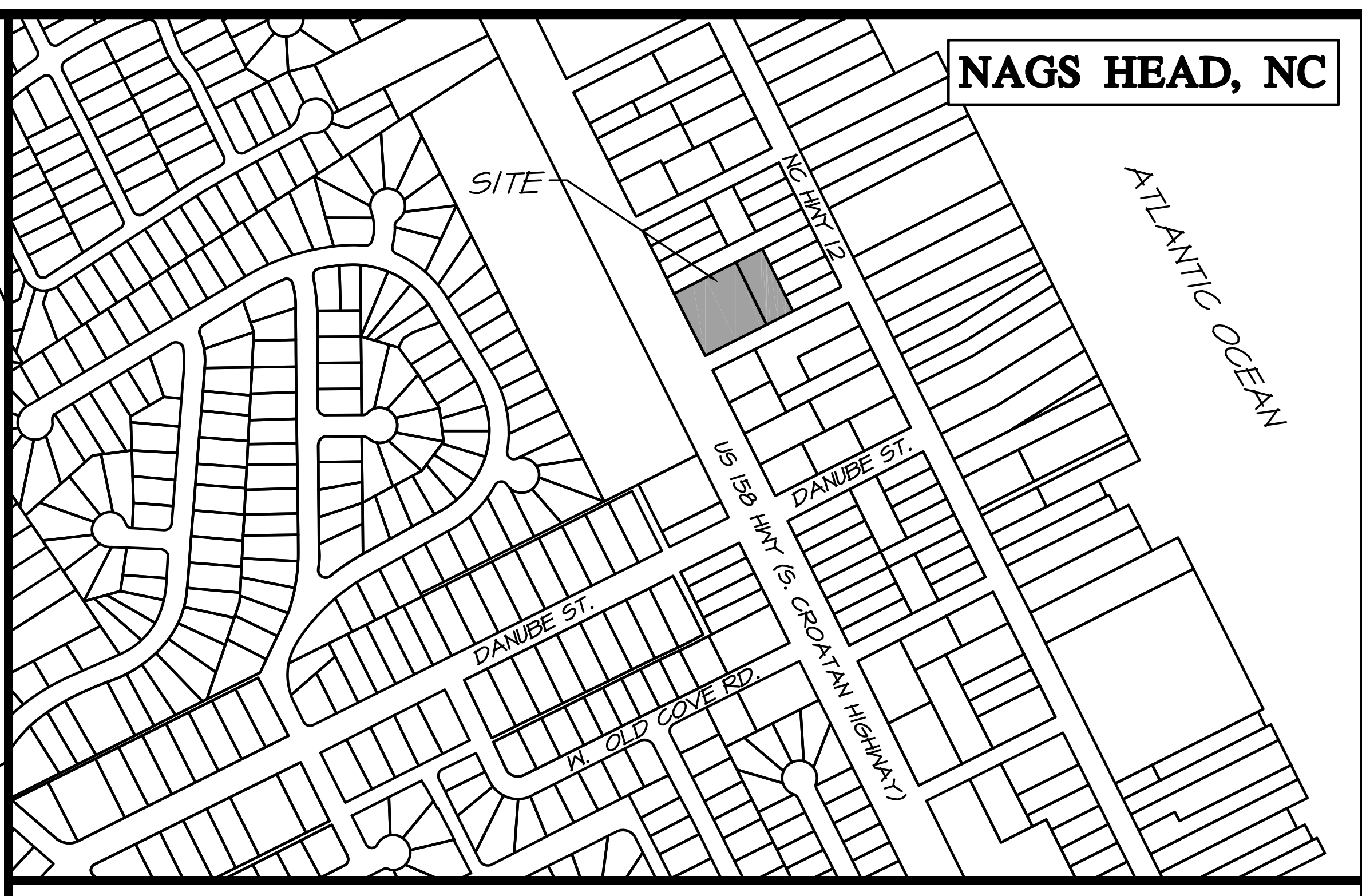
CALL TOLL FREE

1-800-632-4949

NORTH CAROLINA
ONE CALL

DRAWING FILE: Moore WW Base R9.DWG
PLOT SCALE: 1" = 20'

NAGS HEAD, NC



VICINITY MAP
N.T.S.

NOTES:

1. OWNER/APPLICANT: BLUE MOON FIVE 2, LLC
325 W. VILLA DUNES DR.
NAG HEAD, NC 27959

2. ENGINEER: ANLAUF ENGINEERING, PLLC
4721 W. ECKNER ST.
KITTY HAWK, NC 27949
TEL.:(252)489-7143
EMAIL: jjanlauf@gmail.com

3. PROPERTY: LOTS 11-15, BLOCK B1, SECTION 3, ROANOKE SOUND SHORES

4. PIN NUMBERS : (LOT 11) 080109072079
(LOTS 12-15)0801009061969

5. PARCEL NUMBER: (LOT 11) 008618000
(LOT 12-15) 012411000

6. ADDRESS: 4329 S. CROATAN HWY, NAGS HEAD,NC 27959

7. LAND PARCEL AREA: LOT 11 = 17,000 SQ.FT. (0.39 AC.)
LOT 12 = 10,000 SQ.FT. (0.23 AC.)
LOT 13 = 10.000 SQ.FT. (0.23 AC.)
LOT 14 = 10,000 SQ.FT. (0.23 AC.)
LOT 15 = 10.000 SQ.FT. (0.23 AC.)

8. RECORDED REFERENCE: D.B. 2546, PG. 234, P.C. "2", SL. 114

9. PROPERTY IS CURRENTLY LOCATED IN F.I.R.M. ZONE X
MAP NUMBER: 3730080100K, EFFECTIVE DATE 6/19/20
(SUBJECT TO CHANGE BY F.E.M.A.)

10. SITE ZONING: C-2, GENERAL COMMERCIAL DISTRICT

11. SEPTIC SYSTEM:

PROPOSED ACTIVE & REPAIR SYSTEMS (2 TOTAL):
DESIGN FLOW: 2,250 GPD PER SYSTEM
LONG TERM APPLICATION RATE (LTAR) = 1.2 GPD/SF
FILL REQUIRED IN DRAINFIELDS = 2.13' TO 2.58'
CONTRACTOR TO REMOVE SPODIC LAYER AND BACKFILL WITH GROUP I SOILS
ACTIVE DISPOSAL AREA REQUIRED = 1875 SQ.FT. PER SYSTEM
AMPHIDROME SUBMERGED ATTACHED GROWTH BIOREACTORS
COMMON ELEMENTS TO SYSTEMS:
(1) 4,000 GALLON GREASE TRAP
(1) 6'ø GRINDER STATION SPLITTER VAULT
(1) 50 GPM UV UNIT
(1) KAESAR BLOWER MODEL BB 52C
EACH SYSTEM IS COMPRISED OF THE FOLLOWING ITEMS:
(1) 3,000 GALLON ANOXIC TANK
(1) 5'ø REACTOR WITH 6' MEDIA DEPTH
(1) 3,000 GALLON CLEARWELL TANK
DISPOSAL CONFIGURATION (2 LPP FIELDS): 5 LINES 75 L.FT. EACH, 5' O.C.

12. SURVEY DATA TAKEN FROM DOCUMENT ENTITLED "TOPOGRAPHIC SURVEY FOR BLUE MOON FIVE, LLC, LOTS 11-15, BLOCK B-1, SECTION 3, RESUBD. OF ROANOKE SOUND SHORES, NAGS HEAD, NAGS HEAD TOWNSHIP, DARE COUNTY, NORTH CAROLINA" AS PREPARED BY SEABOARD SURVEYING & PLANNING, INC., DATED 06/03/21. ALSO PROVIDED IN ELECTRONIC FORM IN FILE "2109821-EMAIL.DWG".

13. WASTEWATAER DISPOSAL AREAS TO BE CONSTRUCTED IN ACCORDANCE TO THE REPORT ENTITLED "SOIL/SITE AND LIMITED HYDROGEOLOGICSL FIELD EVALUATION, BLUE MOON RESTAURANT WASTEWATER MANAGEMENT SYSTEMS, DARE COUNTY, NORTH CAROLINA" AS PREPARED BY S&EC CONSULTANTS AND DATED OCTOBER 2021

14. PLANS TO BE USED FOR THE PERMITTING AND CONSTRUCTION OF THE WASTEWATER SYSTEM ONLY, PLANS SHALL NOT BE USED FOR ANY OTHER PURPOSE.

15. SITE PLAN IS NOT VALID UNTIL ALL APPLICABLE GOVERNMENT APPROVALS HAVE BEEN OBTAINED, INCLUDING BUT NOT LIMITED TO, TOWN OF NAGS HEAD, DCHD, NCDEQ, ETC.

WASTEWATER SYSTEM NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR LOCATING EXISTING UNDERGROUND UTILITIES IN AREAS OF WORK PRIOR TO ANY WORK. PROVIDE ADEQUATE MEANS OF SUPPORT AND PROTECTION IF UTILITIES ARE TO REMAIN IN PLACE.

2. REMOVE TREES, GRASSES, SHRUBS AND OTHER VEGETATION, IMPROVEMENTS OR OBSTRUCTIONS INTERFERING WITH INSTALLATION OF NEW CONSTRUCTION UNLESS NOTED OTHERWISE.

3. ACTIVE WASTEWATER SYSTEM:
DESIGN FLOW: 100 SEATS @ 40 GALLONS PER DAY (GPD) PER SEAT = 4,000 GPD
25 BAR STOOLS @ 20 GPD PER STOOL = 500 GPD
LONG TERM APPLICATION RATE (LTAR): 1.2 GPD/SQ.FT. FOR AN LPP SYSTEM WITH TS-II ADVANCED TREATMENT.

4. UNLESS OTHERWISE INDICATED ON THE PLAN, CONSTRUCTION OF SEWAGE COLLECTION, TREATMENT AND DISPOSAL SYSTEM IS TO CONFORM WITH SECTION .1900 "LAWS AND RULES FOR SEWAGE TREATMENT AND DISPOSAL SYSTEMS" OF NORTH CAROLINA ADMINISTRATIVE CODE, DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, DIVISION OF ENVIRONMENTAL HEALTH, ON-SITE WASTEWATER SECTION (15 NCAC 18A.1900).

5. CONSTRUCTION OF SEWAGE COLLECTION SYSTEM, TREATMENT AND DISPOSAL SYSTEM IS TO CONFORM WITH ANY CONDITIONS IMPOSED BY THE LOCAL HEALTH DEPARTMENT.

6. MATERIAL USED FOR COLLECTION AND DISPOSAL SYSTEM SHALL CONFORM WITH SAME REQUIREMENTS AS #4 ABOVE.

7. FILL MATERIAL SHALL HAVE SUCH SOIL TEXTURE TO BE CLASSIFIED AS SAND OR LOAMY SAND (SOIL GROUP I) UP TO THE TOP OF THE NITRIFICATION TRENCHES. THE FINAL SIX INCHES OF FILL USED TO COVER THE SYSTEM SHALL HAVE A FINER TEXTURE (SUCH AS GROUP II, III) FOR THE ESTABLISHMENT OF A VEGETATIVE COVER. THE FILL MATERIAL AND THE EXISTING SOIL SHALL BE MIXED TO A DEPTH OF SIX INCHES BELOW THE INTERFACE. HEAVY VEGETATIVE COVER OR ORGANIC LITTER SHALL BE REMOVED BEFORE THE FILL MATERIAL IS INCORPORATED.

8. WELL POINTS AND PUMPS SHALL BE SUFFICIENT IN SIZE AND SPACING TO DRAW DOWN WATER TABLE TWO TO THREE FEET BELOW REQUIRED EXCAVATION FOR SEPTIC AND PUMP TANKS.

9. GRADES SHALL BE ESTABLISHED TO DIVERT RUNOFF AWAY FROM TANKAGE. FINAL GROUND ELEVATION ABOVE TANK SHALL BE AS INDICATED ON THE DETAIL SHEETS.

10. ALL SURFACE RUNOFF SHALL BE DIVERTED AROUND AND AWAY FROM THE DRAINFIELD AREA. FINISH GRADE SHALL BE LANDSCAPED TO PREVENT PONDING OF SURFACE WATER. VEGETATE DRAINFIELD AREA AS SPECIFIED IN LANDSCAPE PLAN (BY OTHERS).

Anlauf Engineering, PLLC
CIVIL ENGINEERING SERVICES
FIRM LICENSE NO.: P-0929
JANLAUF2645@CHARTER.NET - 4721 W. ECKNER ST., KITTY HAWK, NC - (252) 489-7143

SEAL 26980
JOSEPH J. ANLAUF
Joseph J. Anlauf P.E.
CERTIFICATION

NO.	DATE	REVISIONS
1	10/13/21	REV. PER MANUFACTURER'S REVIEW COMMENTS

WASTEWATER SYSTEM SITE PLAN

BLUE MOON RESTAURANT

Roanoke Sound Shores

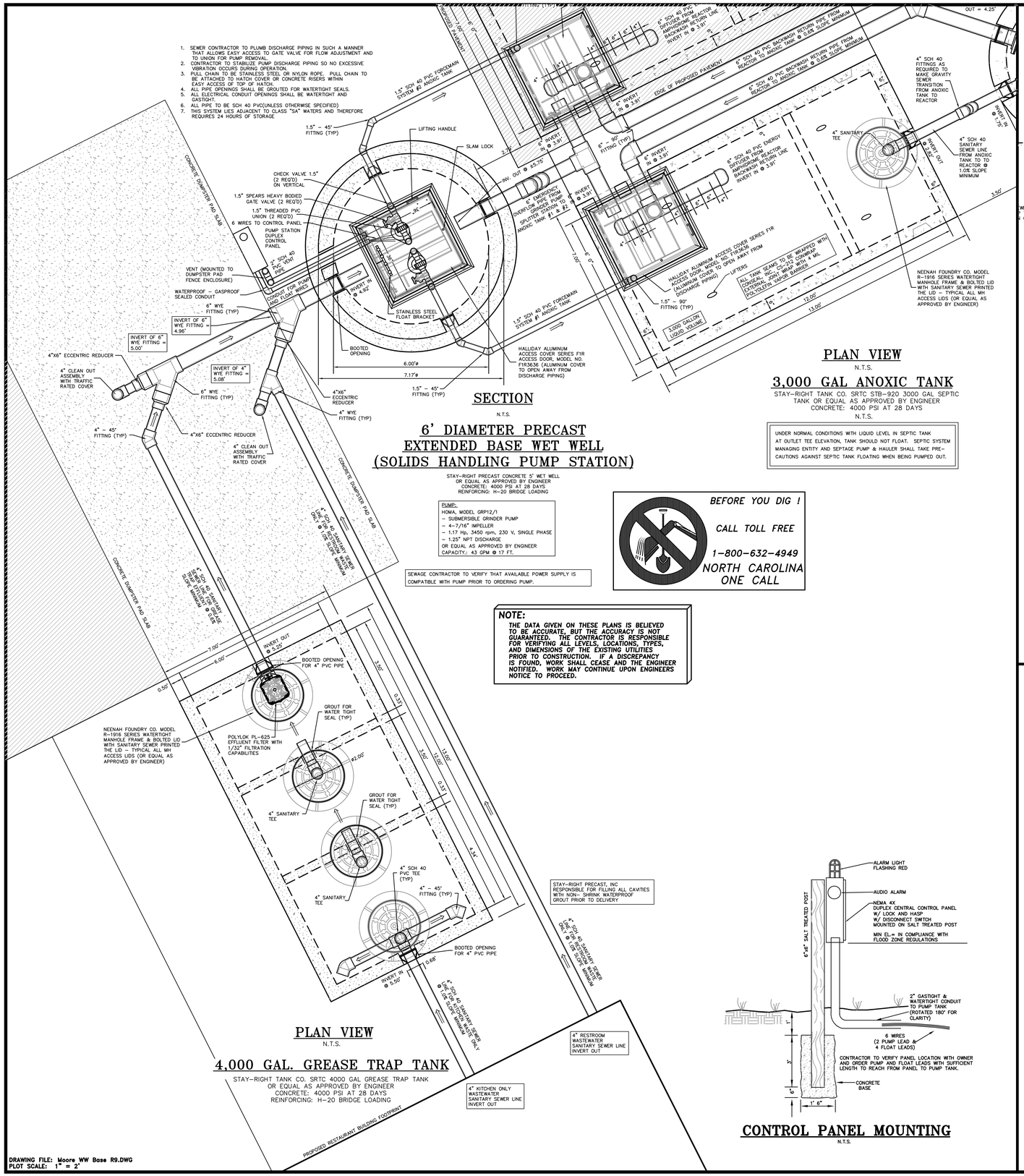
NAGS HEAD DARE COUNTY NORTH CAROLINA

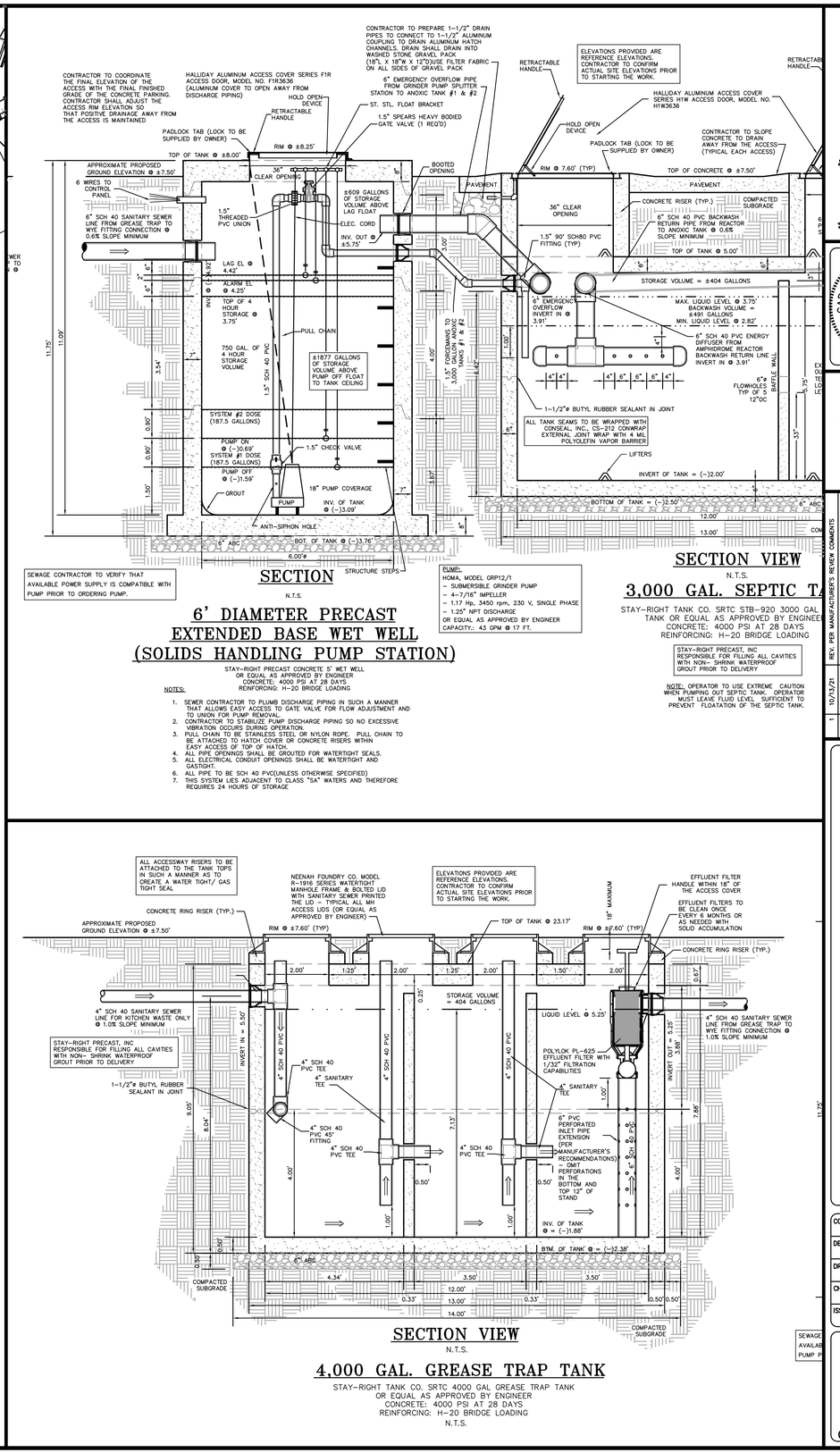
COMMISSION NO.	P2133
DESIGNED BY	JJA
DRAWN BY	JJA
CHECKED BY	JJA
ISSUE DATE	10/5/21

SHEET NO.

WW1

OF 6 SHEETS





Anlauf Engineering, PLLC
CIVIL ENGINEERING SERVICES
PO BOX 1000 • KITTY HAWK, NC • (252) 489–1345
JAMES J. ANLAUF, P.E.
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26980 JOSEPH J. ANLAUF
CERTIFICATION

NO.	DATE	REVISIONS
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WASTEWATER SYSTEM DETAILS

BLUE MOON RESTAURANT
Roanoke Sound Shores
NAGS HEAD — DARE COUNTY — NORTH CAROLINA

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SHEET NO.
WW2
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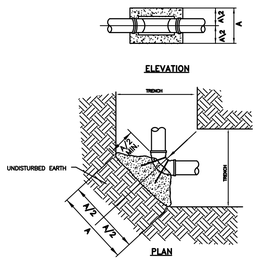


TABLE "A" DIMENSIONS (IN FEET)

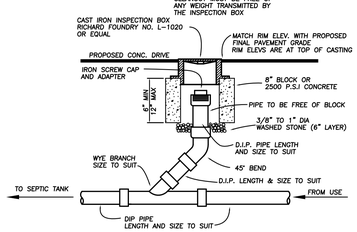
BEND	PIPE SIZE (NOM. DIA. IN INCHES)									
	2	4	6	8	10	12	16	18	20	24
90	1.5	1.9	2.8	3.8	4.7	5.9	7.5	8.5	9.4	11.2
45	1.0	1.4	2.1	2.8	3.5	4.3	5.5	6.2	6.9	8.3
22 1/2	0.8	1.0	1.5	2.0	2.5	3.1	4.0	4.5	4.9	5.7
11 1/4	0.8	1.0	1.1	1.5	1.8	2.2	2.2	3.2	3.6	4.4

NOTE: THRUST BLOCKS SHALL BE CONSTRUCTED OF 2000 P.S.I. CONCRETE.

THRUST BLOCK DETAIL FOR WATER MAIN BENDS

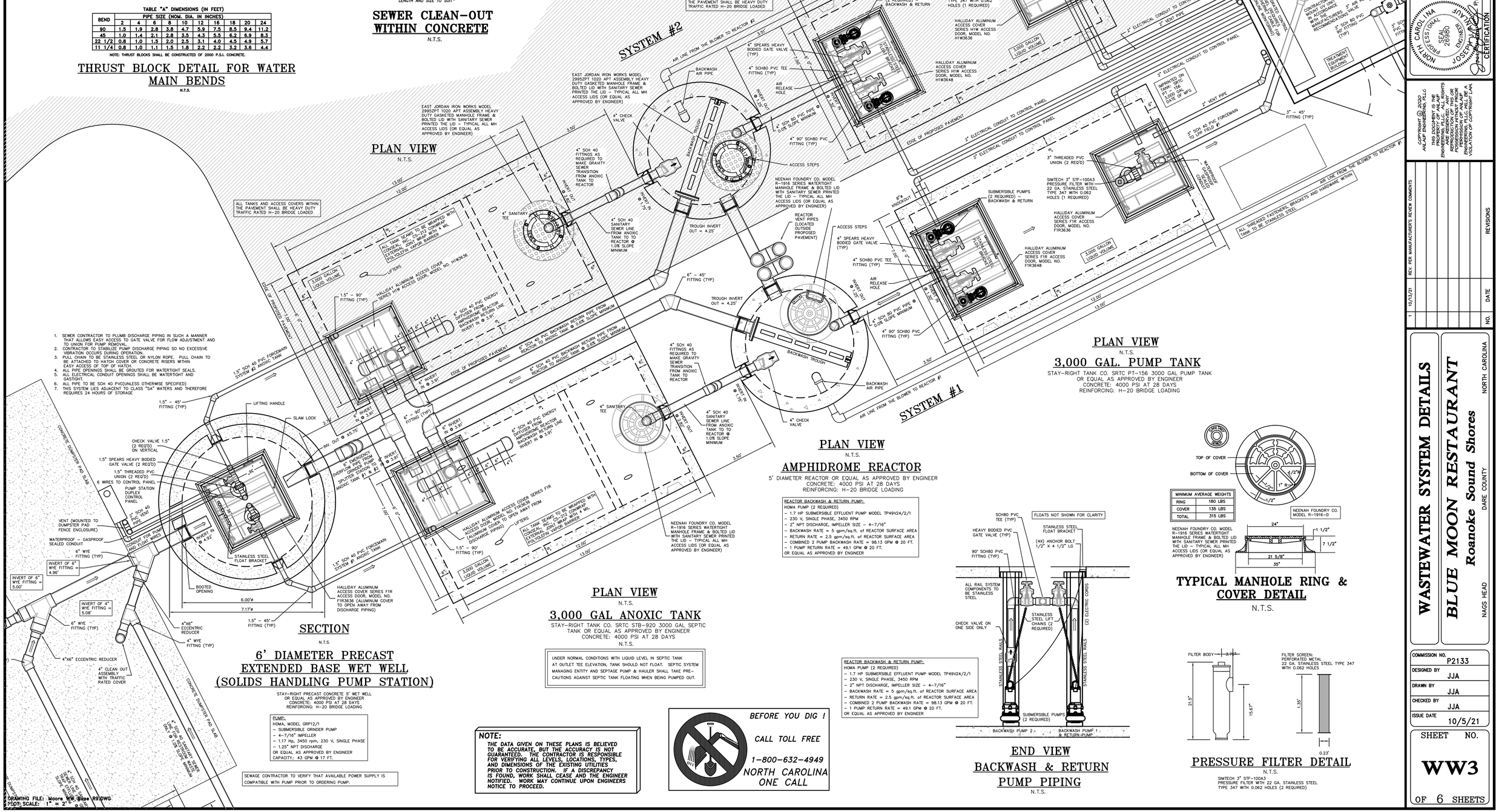
N.T.S.

NOTE:
CLEANOUT MUST BE FREE OF ANY WEIGHT TRANSMITTED BY THE INSPECTION BOX



SEWER CLEAN-OUT WITHIN CONCRETE

N.T.S.



1. SEWER CONTRACTOR TO PLUMB DISCHARGE PIPING IN SUCH A MANNER THAT ALLOWS EASY ACCESS TO GATE VALVE FOR FLOW ADJUSTMENT AND TO UNION FOR PUMP REMOVAL.
2. CONTRACTOR TO STABILIZE PUMP DISCHARGE PIPING SO NO EXCESSIVE VIBRATION OCCURS DURING OPERATION.
3. PULL CHAIN TO BE STAINLESS STEEL OR NYLON ROPE. PULL CHAIN TO BE ATTACHED TO HATCH COVER OR CONCRETE RISERS WITHIN EASY ACCESS OF TOP OF HATCH.
4. ALL PIPE OPENINGS SHALL BE GROUTED FOR WATERTIGHT SEALS.
5. ALL ELECTRICAL CONDUIT OPENINGS SHALL BE WATERTIGHT AND GASTIGHT.
6. ALL PIPE TO BE SCH 40 PVC(UNLESS OTHERWISE SPECIFIED)
7. THIS SYSTEM LIES ADJACENT TO CLASS "SA" WATERS AND THEREFORE REQUIRES 24 HOURS OF STORAGE

PLAN VIEW

N.T.S.

3,000 GAL. PUMP TANK

STAY-RIGHT TANK CO. SRTC PT-156 3000 GAL PUMP TANK OR EQUAL AS APPROVED BY ENGINEER
CONCRETE: 4000 PSI AT 28 DAYS
REINFORCING: H-20 BRIDGE LOADING

PLAN VIEW

N.T.S.

AMPHIDROME REACTOR

5' DIAMETER REACTOR OR EQUAL AS APPROVED BY ENGINEER
CONCRETE: 4000 PSI AT 28 DAYS
REINFORCING: H-20 BRIDGE LOADING

REACTOR BACKWASH & RETURN PUMP:
HOMA PUMP (2 REQUIRED)
– 1.7 HP SUBMERSIBLE EFFLUENT PUMP MODEL TP49V24/2/1
– 230 V, SINGLE PHASE, 3450 RPM
– 2" NPT DISCHARGE, IMPELLER SIZE – 4–7/16"
– BACKWASH RATE = 5 gpm/sq.ft. of REACTOR SURFACE AREA
– RETURN RATE = 2.5 gpm/sq.ft. of REACTOR SURFACE AREA
– COMBINED 2 PUMP BACKWASH RATE = 98.13 GPM @ 20 FT.
– 1 PUMP RETURN RATE = 49.1 GPM @ 20 FT.
OR EQUAL AS APPROVED BY ENGINEER

END VIEW

BACKWASH & RETURN PUMP PIPING

N.T.S.

REACTOR BACKWASH & RETURN PUMP:
HOMA PUMP (2 REQUIRED)
– 1.7 HP SUBMERSIBLE EFFLUENT PUMP MODEL TP49V24/2/1
– 230 V, SINGLE PHASE, 3450 RPM
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– 1 PUMP RETURN RATE = 49.1 GPM @ 20 FT.
OR EQUAL AS APPROVED BY ENGINEER

PLAN VIEW

N.T.S.

3,000 GAL ANOXIC TANK

STAY-RIGHT TANK CO. SRTC STB-920 3000 GAL SEPTIC TANK OR EQUAL AS APPROVED BY ENGINEER
CONCRETE: 4000 PSI AT 28 DAYS
N.T.S.

UNDER NORMAL CONDITIONS WITH LIQUID LEVEL IN SEPTIC TANK AT OUTLET TEE ELEVATION, TANK SHOULD NOT FLOAT. SEPTIC SYSTEM MANAGING ENTITY AND SEPTAGE PUMP & HAULER SHALL TAKE PRE-CAUTIONS AGAINST SEPTIC TANK FLOATING WHEN BEING PUMPED OUT.

SECTION

N.T.S.

6' DIAMETER PRECAST EXTENDED BASE WET WELL (SOLIDS HANDLING PUMP STATION)

STAY-RIGHT PRECAST CONCRETE 5' WET WELL OR EQUAL AS APPROVED BY ENGINEER
CONCRETE: 4000 PSI AT 28 DAYS
REINFORCING: H-20 BRIDGE LOADING

PUMP:
HOMA, MODEL GRP12/1
– SUBMERSIBLE GRINDER PUMP
– 4–7/16" IMPELLER
– 1.17 Hp, 3450 rpm, 230 V, SINGLE PHASE
– 1.25" NPT DISCHARGE
OR EQUAL AS APPROVED BY ENGINEER
CAPACITY:: 43 GPM @ 17 FT.

SEWAGE CONTRACTOR TO VERIFY THAT AVAILABLE POWER SUPPLY IS COMPATIBLE WITH PUMP PRIOR TO ORDERING PUMP.

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

NEENAH FOUNDRY CO. MODEL R-1916 SERIES WATERTIGHT MANHOLE FRAME & BOLTED LID WITH SANITARY SEWER PRINTED THE LID – TYPICAL ALL MH ACCESS LIDS (OR EQUAL AS APPROVED BY ENGINEER)

TYPICAL MANHOLE RING & COVER DETAIL

N.T.S.

PRESSURE FILTER DETAIL

N.T.S.

SIMTECH 3" STF-100A3
PRESSURE FILTER WITH 22 GA. STAINLESS STEEL TYPE 347 WITH 0.062 HOLES (2 REQUIRED)

DRAWING FILE: Moore WW Base R9.DWG
PLOT SCALE: 1" = 2'

Anlauf Engineering, PLLC
CIVIL ENGINEERING SERVICES
PROFESSIONAL ENGINEER LICENSE NO. P-0959
JAN ANLAUF, P.E. – 417 W. DOANE ST. – CARY, NC – (252) 459-1345

NORTH CAROLINA PROFESSIONAL SEAL 26980 ENGINEER JOSEPH ANLAUF

I HEREBY CERTIFY THAT THE ENGINEERING FEATURES SHOWN ON THESE PLANS WERE DESIGNED UNDER MY DIRECT SUPERVISION AND CONTROL.
Joseph Anlauf, P.E. CERTIFICATION

NO.	DATE	REVISIONS
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WASTEWATER SYSTEM DETAILS

BLUE MOON RESTAURANT

Roanoke Sound Shores

NAGS HEAD — DARE COUNTY — NORTH CAROLINA

COMMISSION NO.	P2133
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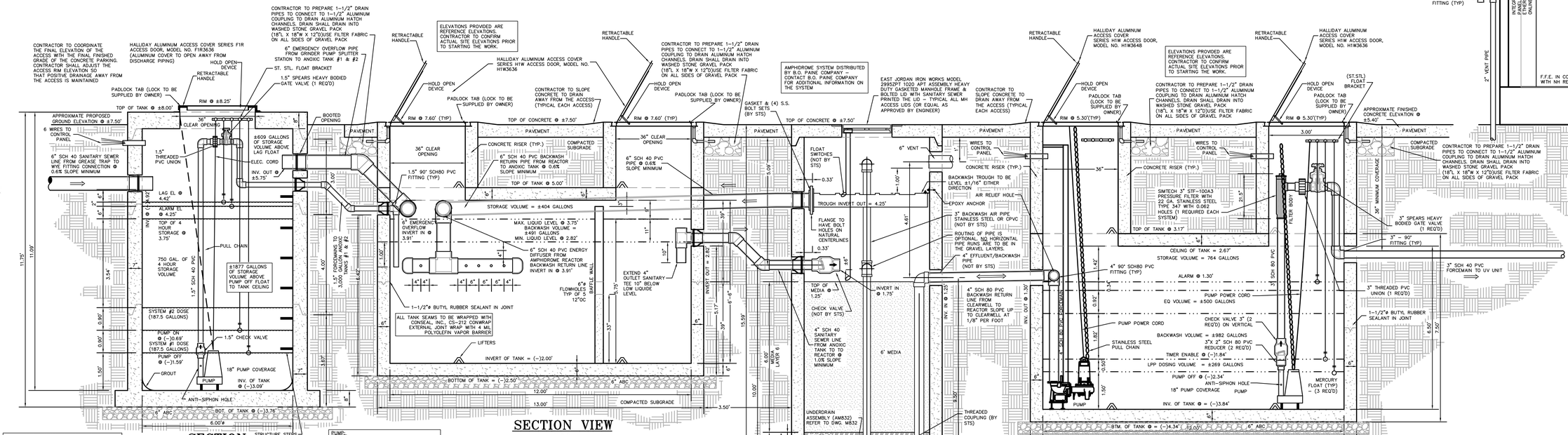
SHEET NO.

WW3

OF 6 SHEETS



SECTION

N.T.S.

6' DIAMETER PRECAST EXTENDED BASE WET WELL (SOLIDS HANDLING PUMP STATION)

STAY–RIGHT PRECAST CONCRETE 5' WET WELL OR EQUAL AS APPROVED BY ENGINEER
CONCRETE: 4000 PSI AT 28 DAYS
REINFORCING: H–20 BRIDGE LOADING

NOTES:

1. SEWER CONTRACTOR TO PLUMB DISCHARGE PIPING IN SUCH A MANNER THAT ALLOWS EASY ACCESS TO GATE VALVE FOR FLOW ADJUSTMENT AND TO UNION FOR PUMP REMOVAL.
2. CONTRACTOR TO STABILIZE PUMP DISCHARGE PIPING SO NO EXCESSIVE VIBRATION OCCURS DURING OPERATION.
3. PULL CHAIN TO BE STAINLESS STEEL OR NYLON ROPE. PULL CHAIN TO BE ATTACHED TO HATCH COVER OR CONCRETE RISERS WITHIN EASY ACCESS OF TOP OF HATCH.
4. ALL PIPE OPENINGS SHALL BE GROUTED FOR WATERTIGHT SEALS.
5. ALL ELECTRICAL CONDUIT OPENINGS SHALL BE WATERTIGHT AND GASTIGHT.
6. ALL PIPE TO BE SCH 40 PVC(UNLESS OTHERWISE SPECIFIED)
7. THIS SYSTEM LIES ADJACENT TO CLASS "SA" WATERS AND THEREFORE REQUIRES 24 HOURS OF STORAGE.

SEWAGE CONTRACTOR TO VERIFY THAT AVAILABLE POWER SUPPLY IS COMPATIBLE WITH PUMP PRIOR TO ORDERING PUMP.

PUMP:
HOMA, MODEL GRP12/1
– SUBMERSIBLE GRINDER PUMP
– 4–7/16" IMPELLER
– 1.17 Hp, 3450 rpm, 230 V, SINGLE PHASE
– 1.25" NPT DISCHARGE
OR EQUAL AS APPROVED BY ENGINEER
CAPACITY.: 43 GPM @ 17 FT.

SECTION VIEW

N.T.S.

3,000 GAL. SEPTIC TANK

STAY–RIGHT TANK CO. SRTC STB–920 3000 GAL SEPTIC TANK OR EQUAL AS APPROVED BY ENGINEER
CONCRETE: 4000 PSI AT 28 DAYS
REINFORCING: H–20 BRIDGE LOADING

STAY–RIGHT PRECAST, INC RESPONSIBLE FOR FILLING ALL CAVITIES WITH NON– SHRINK WATERPROOF GROUT PRIOR TO DELIVERY

NOTE: OPERATOR TO USE EXTREME CAUTION WHEN PUMPING OUT SEPTIC TANK. OPERATOR MUST LEAVE FLUID LEVEL SUFFICIENT TO PREVENT FLOATATION OF THE SEPTIC TANK.

SECTION VIEW

N.T.S.

3,000 GAL. PUMP TANK

STAY–RIGHT TANK CO. SRTC PT–156 3000 GAL PUMP TANK OR EQUAL AS APPROVED BY ENGINEER
CONCRETE: 4000 PSI AT 28 DAYS
REINFORCING: H–20 BRIDGE LOADING

REACTOR BACKWASH & RETURN PUMP:
HOMA PUMP (2 REQUIRED)
– 1.7 HP SUBMERSIBLE EFFLUENT PUMP MODEL TP49V24/2/1
– 230 V, SINGLE PHASE, 3450 RPM
– 2" NPT DISCHARGE, IMPELLER SIZE = 4–7/16"
– BACKWASH RATE = 5 gpm/sq.ft. of REACTOR SURFACE AREA
– RETURN RATE = 2.5 gpm/sq.ft. of REACTOR SURFACE AREA
– COMBINED 2 PUMP BACKWASH RATE = 98.13 GPM @ 20 FT.
– 1 PUMP RETURN RATE = 49.1 GPM @ 20 FT.
OR EQUAL AS APPROVED BY ENGINEER

ALL THREADED FASTENERS, BRACKETS AND HARDWARE WITHIN TANK TO BE STAINLESS STEEL

FINAL LPP DOSING PUMPS:
HOMA PUMP, MODEL TP50M24/2/1
– SUBMERSIBLE EFFLUENT PUMP
– 1.51 Hp, 230 V, SINGLE PHASE
– 2" NPT DISCHARGE, 3450 RPM
– 3–5/16" IMPELLER
OR EQUAL AS APPROVED BY ENGINEER
OPERATING POINT: 78 GPM AT 21.5 FT.

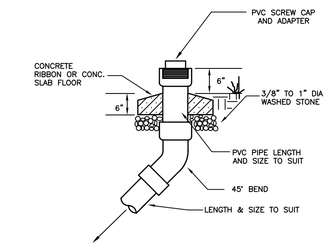
1. SEWER CONTRACTOR TO PLUMB DISCHARGE PIPING IN SUCH A MANNER THAT ALLOWS EASY ACCESS TO GATE VALVE FOR FLOW ADJUSTMENT AND TO UNION FOR PUMP REMOVAL.
2. CONTRACTOR TO STABILIZE PUMP DISCHARGE PIPING SO NO EXCESSIVE VIBRATION OCCURS DURING OPERATION.
3. PULL CHAIN TO BE STAINLESS STEEL. PULL CHAIN TO BE ATTACHED TO HATCH COVER OR CONCRETE RISERS WITHIN EASY ACCESS OF TOP OF HATCH.
4. ALL PIPE OPENINGS SHALL BE GROUTED FOR WATERTIGHT SEALS.
5. ALL ELECTRICAL CONDUIT OPENINGS SHALL BE WATERTIGHT AND GASTIGHT.
6. ALL PIPE TO BE SCH 40 PVC UNLESS SPECIFIED AS TO BE OTHER
7. THIS SYSTEM LIES ADJACENT TO CLASS "SA" WATERS AND THEREFORE REQUIRES 24 HOURS OF STORAGE
8. WASTEWATER SYSTEM SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS FOR WASTEWATER TREATMENT & DISPOSAL SYSTEM.

SECTION VIEW

N.T.S.

AMPHIDROME REACTOR

5' DIAMETER REACTOR OR EQUAL AS APPROVED BY ENGINEER
CONCRETE: 4000 PSI AT 28 DAYS
REINFORCING: H–20 BRIDGE LOADING



TYPICAL SEWER CLEAN–OUT

N.T.S.

LATERAL TURN–UP & TRENCH X–SECTION

N.T.S.

NOTES:
1. ACTIVE DRAINFIELD AREA SHALL BE GRADED SO THAT STORMWATER RUNOFF DOES NOT POND ON DRAINFIELD AREA.
2. VEGETATE DRAINFIELD AND REPAIR AREAS AS PER SEEDING SPECIFICATION SHOWN BELOW.
3. FILTER FABRIC SHALL BE TREVIRA SPUNBOND TYPE 1112 ENGINEERING FABRIC OR EQUAL AS APPROVED BY ENGINEER.
4. ALL TRENCHES, LATERALS, AND MANIFOLDS SHALL BE INSTALLED LEVEL.

LOW–PRESSURE PIPE DRAINFIELD CROSS SECTION

N.T.S.

MANIFOLD–LATERAL CONNECTION

N.T.S.

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BEFORE YOU DIG !
CALL TOLL FREE
1–800–632–4949
NORTH CAROLINA ONE CALL

DRAWING FILE: Moore WW Base R9.DWG
PLOT SCALE: 1" = 2'

Anlauf Engineering, PLLC
CIVIL ENGINEERING SERVICES
PO BOX 1000 • 402 W DUKES ST • TROY, NC • (910) 464–3145
JAN@ANLAUFENGINEERING.COM

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26980 JOSEPH ANLAUF
CERTIFICATION

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WASTEWATER SYSTEM SITE DETAILS

BLUE MOON RESTAURANT
Roanoke Sound Shores
NAGS HEAD
DARE COUNTY
NORTH CAROLINA

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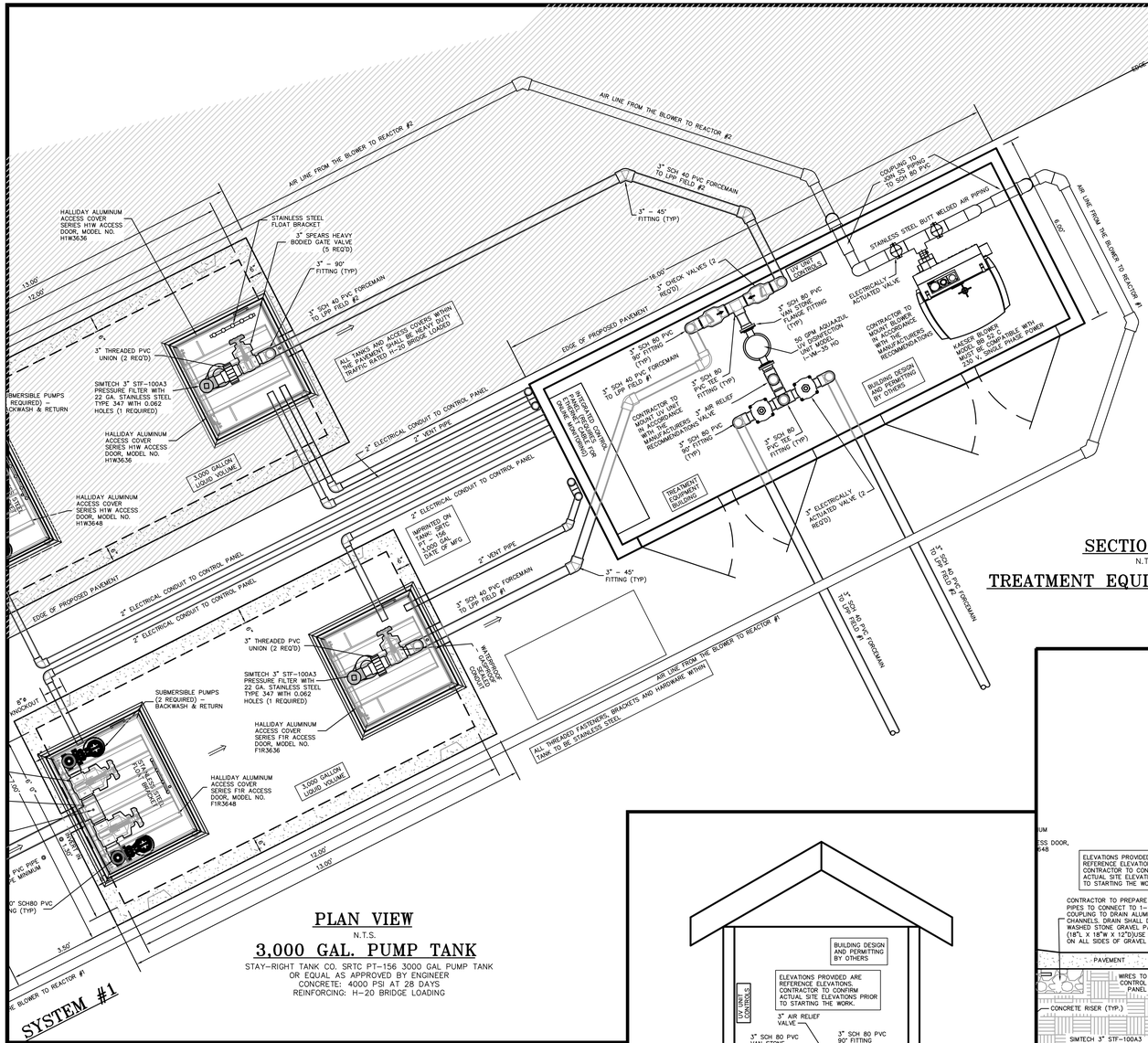
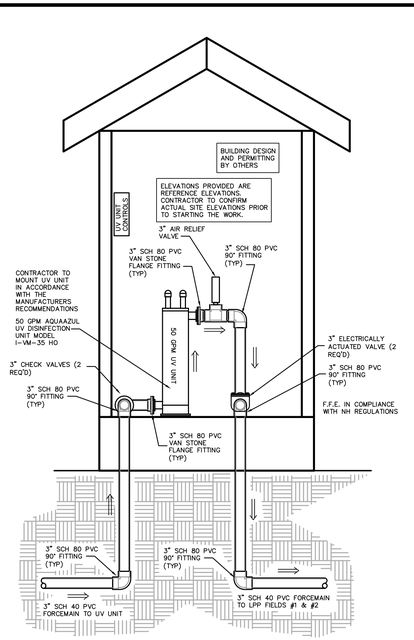


PLAN VIEW
N.T.S.

3,000 GAL. PUMP TANK
STAY-RIGHT TANK CO. SRTC PT-156 3000 GAL PUMP TANK
OR EQUAL AS APPROVED BY ENGINEER
CONCRETE: 4000 PSI AT 28 DAYS
REINFORCING: H-20 BRIDGE LOADING

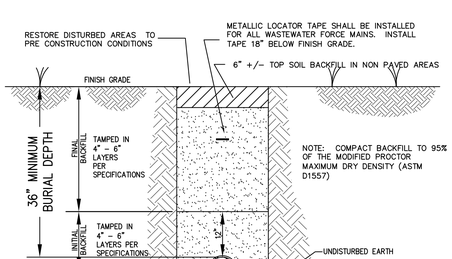
SECTION VIEW
N.T.S.

TREATMENT EQUIPMENT BUILDING



END VIEW
N.T.S.

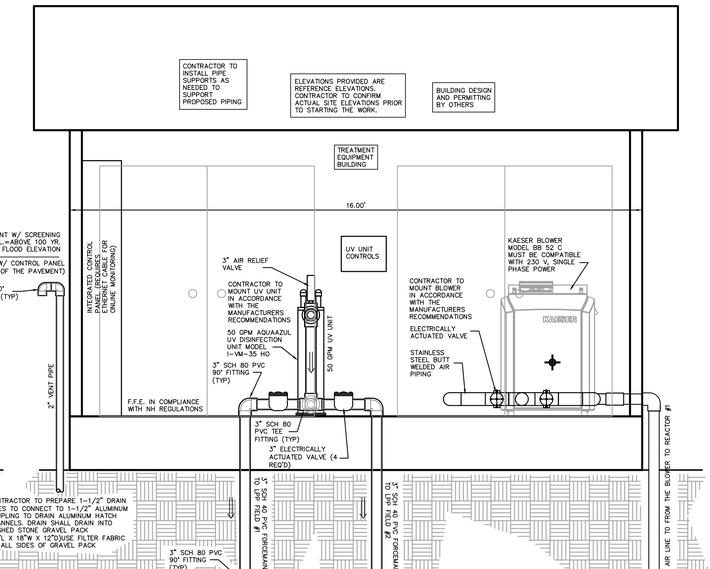
TREATMENT EQUIPMENT BUILDING



NOTES:

1. FOR TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING
2. NO ROCKS OR BOULDERS 4" AND LARGER SHALL BE USED IN INITIAL BACKFILL AREA.
3. ALL BACKFILL MATERIAL SHALL BE SATISFACTORY SOIL MATERIALS UNLESS OTHERWISE SPECIFIED BY THE ENGINEER. (SATISFACTORY SOIL FILL SHALL CONSIST OF SAND OR GRAVEL CONTAINING LESS THAN 20% BY WEIGHT OF FINES [SW, SP, SP-SM, SM] HAVING A LIQUID LIMIT LESS THAN 20 AND PLASTIC LIMIT LESS THAN 6, AND FREE OF RUBBLE, ORGANICS, CLAY, DEBRIS, AND OTHER UNSUITABLE MATERIAL.)

TYPICAL BACKFILLING REQUIREMENTS AND TRENCH BOTTOM DIMENSIONS
N.T.S.



SECTION VIEW
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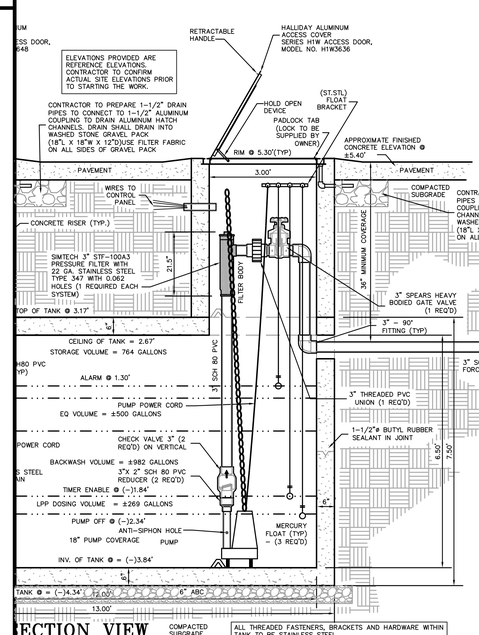
TREATMENT EQUIPMENT BUILDING



SECTION VIEW
N.T.S.

GAL. PUMP TANK
ANK CO. SRTC PT-156 3000 GAL PUMP TANK
EQUAL AS APPROVED BY ENGINEER
NCRETE: 4000 PSI AT 28 DAYS
NFORCING: H-20 BRIDGE LOADING

ALL THREADED FASTENERS, BRACKETS AND HARDWARE WITHIN TANK TO BE STAINLESS STEEL

FINAL LPP DOSING PUMPS:
HOMA PUMP, MODEL TP50M24/2/1
- SUBMERSIBLE EFFLUENT PUMP
- 1.51 Hp, 230 V, SINGLE PHASE
- 2" NPT DISCHARGE, 3450 RPM
- 3-5/16" IMPELLER

OR EQUAL AS APPROVED BY ENGINEER
OPERATING POINT: 78 GPM AT 21.5 FT.

N PUMP:

1. SEWER CONTRACTOR TO PLUMB DISCHARGE PIPING IN SUCH A MANNER THAT ALLOWS EASY ACCESS TO GATE VALVE FOR FLOW ADJUSTMENT AND

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26980 JOSEPH JOHN ANLAUF
CERTIFICATION

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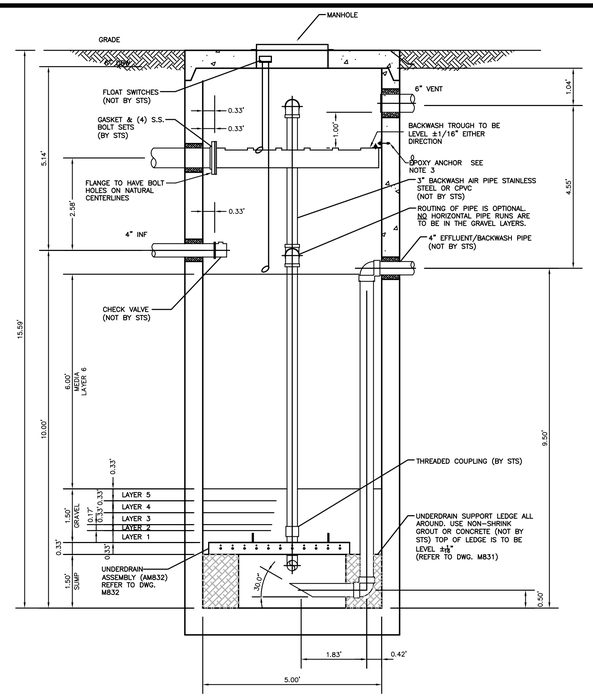
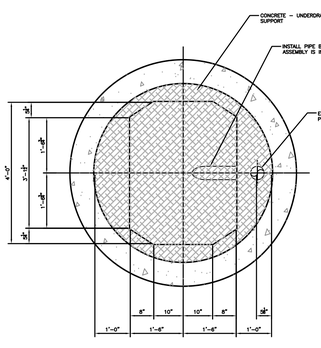
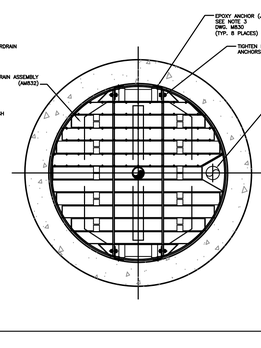
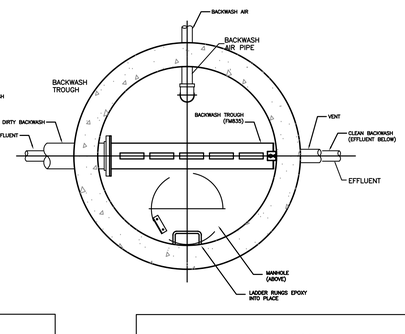


REACTOR BOTTOM PLAN
SCALE: 1" = 1'-0"







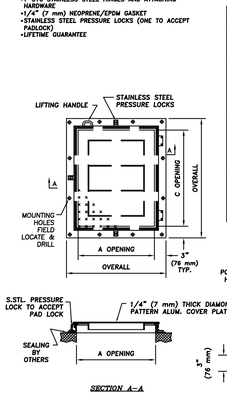
SERIES F1R ACCESS DOOR

HP HALLIDAY PRODUCTS www.HallidayProducts.com Phone: 800-298-1027 Fax: 407-298-6534 Sales@HallidayProducts.com

STANDARD FEATURES:

- 625 LBS. PER SQ. FT. LOAD RATING (3051 kg SQ. METER)
- EXTRUDED ALUMINUM FRAME
- SINGLE LEAF CONSTRUCTION
- SINGLE LEAF T-316 STAINLESS STEEL HOLD OPEN ARM WITH RELEASE HANDLE
- T-316 STAINLESS STEEL HINGES AND ATTACHING HARDWARE
- 1/4" (7 mm) NEOPRENE/EPDM GASKET
- STAINLESS STEEL PRESSURE LOCKS (ONE TO ACCEPT PADLOCK)
- LIFETIME GUARANTEE

STANDARD SIZES				
QTY.	MODEL NO.	A DIM. INCHES (mm)	C DIM. INCHES (mm)	UNIT WT. LBS. (kg.)
	F1R2424	24 (610)	24 (610)	46 (21)
	F1R2430	24 (610)	30 (762)	51 (23)
	F1R2436	24 (610)	36 (914)	61 (28)
	F1R2442	24 (610)	42 (1067)	77 (35)
	F1R2448	24 (610)	48 (1219)	85 (39)
	F1R3030	30 (762)	30 (762)	54 (24)
	F1R3036	30 (762)	36 (914)	69 (31)
	F1R3042	30 (762)	42 (1067)	77 (35)
	F1R3048	30 (762)	48 (1219)	85 (39)
	F1R3054	30 (762)	54 (1372)	99 (45)
	F1R3060	30 (762)	60 (1524)	106 (48)
	F1R3636	36 (914)	36 (914)	70 (32)
	F1R3642	36 (914)	42 (1067)	89 (40)
	F1R3648	36 (914)	48 (1219)	97 (44)
	F1R3654	36 (914)	54 (1372)	107 (48)
	F1R3660	36 (914)	60 (1524)	104 (47)
	F1R3666	36 (914)	66 (1676)	126 (57)
	F1R3672	36 (914)	72 (1828)	135 (61)



SECTION A-A DETAIL

SERIES H1W ACCESS DOOR

HP HALLIDAY PRODUCTS www.HallidayProducts.com Phone: 800-298-1027 Fax: 407-298-6534 Sales@HallidayProducts.com

STANDARD FEATURES:

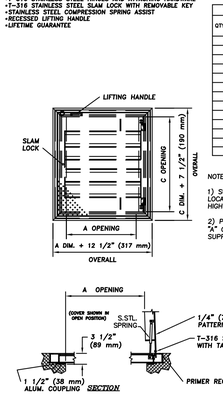
- H20 LOAD RATING (SEE NOTES)
- EXTRUDED ALUMINUM CHANNEL FRAME
- SINGLE LEAF CONSTRUCTION
- AUTO-LOCK T-316 STAINLESS STEEL HOLD-OPEN ARM WITH RELEASE HANDLE
- T-316 STAINLESS STEEL HINGES AND ATTACHING HARDWARE
- T-316 STAINLESS STEEL SLAM LOCK WITH REMOVABLE KEY
- STAINLESS STEEL COMPRESSION SPRING ASSIST
- RECESSED LIFTING HANDLE
- LIFETIME GUARANTEE

STANDARD SIZES				
QTY.	MODEL NO.	A DIM. INCHES (mm)	C DIM. INCHES (mm)	UNIT WT. LBS. (kg.)
	H1W2424	24 (610)	24 (610)	72 (33)
	H1W2430	24 (610)	30 (762)	90 (41)
	H1W2436	24 (610)	36 (914)	108 (49)
	H1W2442	24 (610)	42 (1067)	126 (57)
	H1W3030	30 (762)	30 (762)	113 (51)
	H1W3036	30 (762)	36 (914)	135 (61)
	H1W3042	30 (762)	42 (1067)	158 (72)
	H1W3048	30 (762)	48 (1219)	180 (82)
	H1W3636	36 (914)	36 (914)	162 (73)
	H1W3642	36 (914)	42 (1067)	189 (86)
	H1W3648	36 (914)	48 (1219)	216 (98)

NOTES:

1) SUITABLE FOR USE IN OFF STREET LOCATION WHERE NOT SUBJECTED TO HIGH DENSITY TRAFFIC.

2) PROVIDE A FULL BED OF CLASS "A" CONCRETE UNDER FRAME AND SUPPORT ANGLES.



SECTION

BEFORE YOU DIG !
CALL TOLL FREE
1-800-632-4949
NORTH CAROLINA ONE CALL

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

DRAWING FILE: Moore WW Base R9.DWG
PLOT SCALE: 1" = 20'

EQUIPMENT NOTES:

1. PIPE, PIPE SLEEVES, CONCRETE VESSEL, AND GROUT NOT BY STS.

2. ALL QUANTITES SHOWN ARE FOR ONE REACTOR ONLY.

3. CONCRETE ANCHORS (SHIPPING TAG JM800 & KM800) TO BE 1/2" x 4 3/4" TYPE 304 STAINLESS STEEL EPOXY ANCHOR WITH FLAT WASHER AND HEX NUT (BY STS). INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. USE 9/16" DRILL BIT TO MAKE A 3 1/2" DEEP HOLE.

4. MATERIALS OF CONSTRUCTION:

- UNDERDRAIN SUPPORT BEAMS – 3/16" TYPE 304 S. STL. PLATE
- UNDERDRAIN SUPPORT PIPE – SCH. 40S TYPE 304 S. STL. PIPE
- UNDERDRAIN MISC. PLATE – TYPE 304 S. STL.
- TROUGH – TYPE 304 S. STL. PLATE

INSTALLATION SEQUENCE NOTES:

A. PRE-INSTALLATION CHECK

1. THE UNDERDRAIN ASSEMBLY IS A SINGLE PIECE 57 1/2" DIAMETER, THEREFORE, MEASURE THE INSIDE OF THE VESSEL TO BE SURE THE UNDERDRAIN ASSEMBLY WILL FIT.

2. CHECK TO SEE THAT THE PIPE PENETRATIONS ARE LOCATED PROPERLY.

B. UNDERDRAIN INSTALLATION

1. THE INFLUENT AND DIRTY BACKWASH PIPING AND LADDER RUNGS (IF APPLICABLE) ARE NOT TO BE INSTALLED UNTIL THE UNDERDRAIN ASSEMBLY IS INSTALLED.

2. INSTALL THE UNDERDRAIN SUPPORT LEDGE TO THE DIMENSIONS SHOWN. THIS LEDGE MUST BE LEVEL TO PLUS OR MINUS 1/16" SO THE UNDERDRAIN WILL BE FULLY SUPPORTED AROUND THE PERIMETER. THE EFFLUENT PIPE IS TO BE CAST INTO THE LEDGE AS SHOWN.

3. INSTALL THE UNDERDRAIN ASSEMBLY. MAKE SURE THERE ARE NO GAPS BETWEEN THE LAST UNDERDRAIN CHANNEL AND THE UNDERDRAIN SUPPORT LEDGE. CENTER AND HOLD THE UNDERDRAIN ASSEMBLY IN PLACE WITH THE EPOXY ANCHORS.

C. AIR PATTERN TEST

1. WITH THE UNDERDRAIN ASSEMBLY AND AIR HEADER PIPING INSTALLED FILL THE REACTOR WITH WATER TO THE TOP OF THE UNDERDRAIN.

2. USE EITHER THE BACKWASH BLOWERS OR AN AIR COMPRESSOR TO PROVIDE A MINIMUM OF 50 CFM OF AIR.

3. IF THE AIR DISTRIBUTION IS VISUALLY EVEN ACROSS THE BOTTOM PROCEED TO THE NEXT STEP. IF NOT, REMOVE THE UNDERDRAIN AND INSPECT FOR PLUGGED HOLES. REPEAT THE TEST AFTER CLEARING THE PLUGGED HOLES.

D. PIPING

1. INSTALL THE INFLUENT, DIRTY BACKWASH, AND EFFLUENT PIPING AS SHOWN.

2. INSTALL THE INFLUENT CHECK VALVE.

3. INSTALL THE DIRTY BACKWASH TROUGH.

E. GRAVEL AND MEDIA INSTALLATION INSTRUCTIONS

1. SCRIBE LINES AROUND THE FULL CIRCUMFERENCE OF THE INTERIOR SURFACE LOCATING THE TOP OF EACH GRAVEL AND MEDIA LAYER.

2. USING THE ESTIMATED NUMBER OF BAGS LISTED IN THE TABLE, CAREFULLY PLACE THE UNOPENED BAGS OF GRAVEL OF THE PROPER SIZE, FOR THE LAYER TO BE INSTALLED, ON TOP OF THE MEDIA SUPPORTS, OR PREVIOUS GRAVEL LAYER. THE BAGS SHOULD BE EQUALLY SPACED AROUND TO MINIMIZE LATERAL SPREADING OF THE GRAVEL AFTER EACH BAG IS OPENED.

3. CUT EACH BAG AND ROLL THE GRAVEL OUT.

4. UTILIZING A STRAIGHT EDGE AND THE SCRIBED LINES ON THE WALLS, BUILD UP EACH GRAVEL LAYER TO THE REQUIRED THICKNESS. THE TOP OF EACH LAYER IS TO BE LEVEL ACROSS THE REACTOR.

5. PLACE REACTOR MEDIA ON TOP OF THE FINAL GRAVEL LAYER IN THE SAME WAY AS ABOVE UNTIL THERE IS AT LEAST A FOOT OF MEDIA. THIS IS TO MINIMIZE INTERMIXING WITH THE GRAVEL LAYER. THE REMAINING MEDIA MAY BE POURED IN.

6. 1 CUBIC FOOT OF SAND OR GRAVEL = 100 POUNDS.

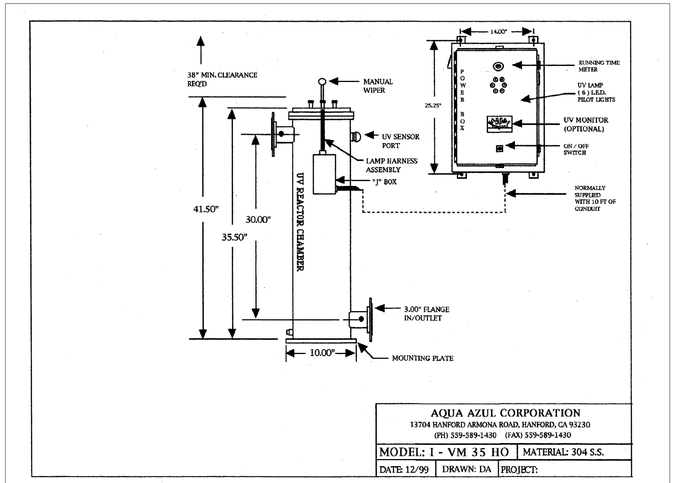
7. LAYER NO. 1 VOLUME INCLUDES 20% EXTRA TO ALLOW FOR VOIDS CREATED BY THE MEDIA SUPPORT PIPES AND CHANNELS.

GRAIN SIZE	VOLUME FOR 1 REACTOR CELL		No. 50# BAGS FOR 1 REACTOR CELL	No. 100# BAGS FOR 1 REACTOR CELL
1 1/2"x3/4" GRAVEL	7	CU. FT.	14	
3/4"x1/2" GRAVEL	4	CU. FT.	8	
1/2"x1/4" GRAVEL	6.5	CU. FT.	14	
1/4"x1/8" GRAVEL	6.5	CU. FT.	14	
1/2"x1/4" GRAVEL	6.5	CU. FT.	14	
TETRA #5 SAND	X	CU. FT.	---	

F. REACTOR MEDIA FLUSHING

1. AFTER INSTALLATION OF GRAVEL AND MEDIA THE REACTOR IS TO BE FLUSHED WITH CLEAN WATER AND AIR TO REMOVE DUST AND FINES. THE BACKWASH AIR BLOWERS AND PUMPS SHALL BE USED FOR THIS PURPOSE. THE CONTRACTOR SHALL PERFORM THIS WORK UNDER THE DIRECTION OF A STS REPRESENTATIVE. FLUSHING SHALL CONTINUE ON EACH REACTOR FOR A MINIMUM OF 15 MINUTES AND UNTIL THE BACKWASH WATER IS CLEAR OF FINES. REACTORS ARE TO BE FILLED WITH WATER BEFORE FLUSHING BEGINS.

2. AFTER COMPLETION OF FLUSHING, DRAIN THE REACTOR AS MUCH AS POSSIBLE AND COVER THE MEDIA WITH PLASTIC, OR CLOSE OVER THE TOP OF THE REACTOR, UNTIL THE REACTOR IS PLACED INTO SERVICE. THIS IS TO KEEP FOREIGN CONTAMINANTS OUT OF THE MEDIA.



AQUA AZUL CORPORATION 13704 HANFORD ARMONA ROAD, HANFORD, CA 93230 (PH) 559-589-1430 (FAX) 559-589-1430		
MODEL: I - VM 35 HO	MATERIAL: 304 S.S.	
DATE: 12/99	DRAWN: DA	PROJECT:

ALL DRAINFIELD AND REPAIR AREAS SHALL BE SEEDED AND MULCHED ACCORDING TO THE FOLLOWING SPECIFICATIONS:

PERMANENT VEGETATION

SEEDING DATES: APRIL 1– SEPT 30

SEED MIXTURE	APPLICATION RATES/ACRE
BAHIA	30 LBS.
COMMON BERMUDA (UNHULLED)	50 LBS.
GERMAN MILLETT	15 LBS.
FESCUE	20 LBS.

FERTILIZER

10–10–10 @ 500 LB/ACRE

MULCH

APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

TEMPORARY VEGETATION

SEEDING DATES: OCT. 1 – MARCH 31

SEED MIXTURE	APPLICATION RATES/ACRE
RYE GRAIN	175 LBS.

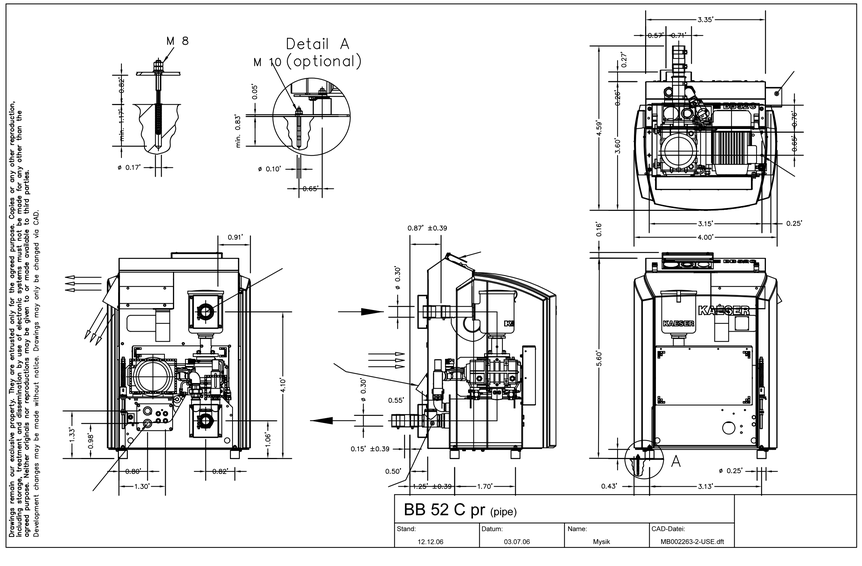
FERTILIZER

10–10–10 @ 750 LB/ACRE

MULCH

APPLY 4,000 LB. STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

GENERAL SEEDING SPECIFICATIONS



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BB 52 C pr (pipe)			
Stand: 12.12.06	Datum: 03.07.06	Name: Mysik	CAD-Datei: MB002263-2-USE.dft

Anlauf Engineering, PLLC
CIVIL ENGINEERING SERVICES
TRU LICENSE NO. P-0959
JILL ANLAUF, P.E. - 472 W. COLLEGE ST. - PITTSBORO, N.C. - (252) 459-7145

NORTH CAROLINA PROFESSIONAL SEAL 26980 ENGINEER JOSEPH BLAKE ANLAUF

Joseph Blake Anlauf, P.E. CERTIFICATION

NO.	DATE	REVISIONS
1	10/13/21	REV. PER MANUFACTURER'S REVIEW COMMENTS

WASTEWATER SYSTEM SITE PLAN

BLUE MOON RESTAURANT
Roanoke Sound Shores
NAGS HEAD — DARE COUNTY — NORTH CAROLINA

COMMISSION NO.	P2133
DESIGNED BY	JJA
DRAWN BY	JJA
CHECKED BY	JJA
ISSUE DATE	10/5/21

SHEET NO.
WW6
OF 6 SHEETS