ROY COOPER
Governor
MARY PENNY KELLEY
Secretary
WILLIAM F. LANE
General Counsel

NORTH CAROLINA
Environmental Quality

TO: The Coastal Resources Commission

FROM: Christine A. Goebel, DEQ Assistant General Counsel

DATE: November 5, 2024 (for the November 13-14, 2024 CRC Meeting)

RE: **Variance Request by Town of Nags Head (CRC-VR-24-12)**

Petitioner Town of Nags Head owns the streets and rights-of-way at Juncos Street and Old Oregon Inlet Road in Nag Head, Dare County. The Site is currently developed with a 20-space beach access parking lot, a pedestrian beach access and vehicle access. Petitioner proposes to develop the Site with a underground stormwater infiltration system. On October 2, 2024, DCM denied the Town's CAMA Major Permit application as the proposed project did not meet the applicable 60' setback measured from the PPVL as required by 7H.0306. The Town now seeks a variance to waive most of the 60' oceanfront setback in order to develop the project as shown in their application.

The following additional information is attached to this memorandum:

Attachment A: Relevant Rules
Attachment B: Stipulated Facts
Attachment C: Petitioner's Positions and Staff's Responses to Variance Criteria
Attachment D: Petitioner's Variance Request Materials
Attachment E: Stipulated Exhibits including powerpoint

cc(w/enc.): John Leidy, Esq., Petitioners' Attorney, electronically
Mary Lucasse, Special Deputy AG and CRC Counsel, electronically

ATTACHMENT A **RELEVANT RULES**

SECTION .0300 - OCEAN HAZARD AREAS

15A NCAC 07H .0301 OCEAN HAZARD CATEGORIES

The Ocean Hazard categories of AECs encompass the natural hazard areas along the Atlantic Ocean shoreline where, because of their vulnerability to erosion or other adverse effects of sand, wind, and water, uncontrolled or incompatible development could endanger life or property. Ocean hazard areas include beaches, frontal dunes, inlet lands, and other areas in which geologic, vegetative and soil conditions may subject the area to erosion or flood damage.

15A NCAC 07H .0302 SIGNIFICANCE OF THE OCEAN HAZARD CATEGORY

(a) Hazards associated with ocean shorelines are due to the constant forces exerted by waves, winds, and currents upon the unstable sands that form the shore. During storms, these forces are intensified and can cause changes in the bordering landforms and to structures located on them. Ocean hazard area property is in the ownership of a large number of private individuals as well as several public agencies and is used by a vast number of visitors to the coast. Ocean hazard areas are critical due to both the severity of the hazards and the intensity of interest in these areas.

(b) The location and form of the various hazard area landforms, in particular the beaches, dunes, and inlets, are in a permanent state of flux, responding to meteorologically induced changes in the wave climate. For this reason, the siting of development on and near these landforms shall be subject to the provisions in this Section in order to avoid their loss or damage. The flexible nature of these landforms presents hazards to development situated immediately on them and offers protection to the land, water, and structures located landward of them. The value of each landform lies in the particular role it plays in affording protection to life and property. Development shall not diminish the energy dissipation and sand storage capacities of the landforms essential to the maintenance of the landforms' protective function.

15A NCAC 07H .0303 MANAGEMENT OBJECTIVE OF OCEAN HAZARD AREAS

(a) The CRC recognizes that absolute safety from the destructive forces of the Atlantic Ocean shoreline is an impossibility for development located adjacent to the coast. The loss of life and property to these forces, however, can be greatly reduced by the proper location and design of structures and by care taken in prevention of damage to natural protective features particularly primary and frontal dunes. Therefore, it is the CRC's objective that development in ocean hazard areas shall be sited to minimize danger to life and property and achieve a balance between the financial, safety, and social factors that are involved in hazard area development.

(b) The rules set forth in this Section shall further the goals set out in G.S. 113A-102(b), to minimize losses to life and property resulting from storms and long-term erosion, prevent encroachment of permanent structures on public beach areas, preserve the natural ecological conditions of the barrier dune and beach systems, and reduce the public costs of development within ocean hazard areas, and protect common-law and statutory public rights of access to and use of the lands and waters of the coastal area.

15A NCAC 07H .0306 GENERAL USE STANDARDS FOR OCEAN HAZARD AREAS

(a) In order to protect life and property, all development not otherwise specifically exempted or allowed by law or elsewhere in the Coastal Resources Commission's rules shall be located according to whichever of the following is applicable:

(1) The ocean hazard setback for development shall be measured in a landward direction from the vegetation line, the pre-project vegetation line, or the measurement line, whichever is applicable.

(2) The ocean hazard setback shall be determined by both the size of development and the shoreline long term erosion rate as defined in Rule .0304 of this Section. "Development size" is defined by total floor area for structures and buildings or total area of footprint for development other than structures and buildings. Total floor area includes the following:

(A) The total square footage of heated or air-conditioned living space;

(B) The total square footage of parking elevated above ground level; and

(C) The total square footage of non-heated or non-air-conditioned areas elevated above ground level, excluding attic space that is not designed to be load-bearing.

Decks, roof-covered porches, and walkways shall not be included in the total floor area unless they are enclosed with material other than screen mesh or are being converted into an enclosed space with material other than screen mesh.

(3) With the exception of those types of development defined in 15A NCAC 07H .0309(a), no development, including any portion of a building or structure, shall extend oceanward of the ocean hazard setback. This includes roof overhangs and elevated structural components that are cantilevered, knee braced, or otherwise extended beyond the support of pilings or footings. The ocean hazard setback shall be established based on the following criteria:

(A) A building or other structure less than 5,000 square feet requires a minimum setback of 60 feet or 30 times the shoreline erosion rate, whichever is greater;

***

(I)Infrastructure that is linear in nature, such as roads, bridges, pedestrian access such as boardwalks and sidewalks, and utilities providing for the transmission of electricity, water, telephone, cable television, data, storm water, and sewer requires a minimum setback of 60 feet or 30 times the shoreline erosion rate, whichever is greater;

1) The Petitioner is the Town of Nags Head ("Town" or "Petitioner"). It is located in Dare County and has eleven miles of oceanfront coastline.

2) David Ryan, Town Engineer and licensed P.E. signed a sworn affidavit with attachments on October 30, 2024, a copy of which is attached. While Staff acknowledge these are sworn statements, Staff cannot stipulate to the truth of them or not.

3) As of the 2022 Census, The Town of Nags Head is home to 3,163 year-round residents and can see a summer population of around 40,000.

4) The Town's amenities include 44 Public Ocean Beach Accesses (largely located at street-ends) and six Public Sound Accesses to the Roanoke Sound.

5) The Town owns the 50' wide public beach access located at the intersection of Juncos Street and Old Oregon Inlet Road in Nags Head, NC (the "Site"). The Site is shown on ground and aerial photographs attached as the powerpoint. The Site is shown on a 1952 plat map, a copy of which is attached as a stipulated exhibit as is the Dare County tax listing for the Site. Also attached as a stipulated exhibit is a title opinion about the Town's ownership from attorney Robert Hobbs, Jr.

6) The Site was constructed in 1987 with funding provided by (what is now known as) the North Carolina Land and Water Conservation Fund. The dune walkover at this location was replaced in 2000 following damages sustained from Hurricane Dennis, and again in 2004 following damages sustained from Hurricane Isabel.

7) The Site offers a public beach access facility for nearby residents and tourists, being one of seven of the 44 beach accesses with the Town limits that that is both accessible to wheelchairs/strollers and contains a lifeguard stand on site. The Site also allows for public beach driving access during limited times of the year and is a town access for emergency access, maintenance and construction projects along the beach. This Site is the primary vehicle access for the southern beach area along S. Old Oregon Inlet Rd. A map from the Town's website showing driving access locations is attached as a stipulated exhibit.

8) Based on environmental survey data, the project site (the "Site") falls within flood zones AE (elevation 4), AO (elevation 2), AO (elevation 1), and VE (elevation 10). See Sheet C1.1 of Nags Head Dune Infiltration Permit Drawing Set 1- June 2024 which was submitted as part of the original CAMA Major Development Permit application and Affidavit of David Ryan, paragraph 4.

9) Flooding from smaller rainfall events (as little as 2") has been known to remain for significant periods of time along South Old Oregon Inlet Road, Juncos Street, and the surrounding area, impacting the Town's primary vehicle access for the beach. Flooding also affects vehicle access to the beach and restricts use of the multi-use path, while also

limiting vehicle movements on South Old Oregon Inlet Road (SR 1243). See Affidavit of David Ryan, paragraph 5.

10) Due to its elevation and location in a flood zone, as well as its importance to the Town for pedestrian and vehicular traffic, there exists a need for flood mitigation and minimization on and around South Old Oregon Inlet Road and Juncos Street. See Affidavit of David Ryan, paragraph 6.

11) To address flooding at and near the Site, the Town applied for a CAMA Major Permit for authorization to reconstruct a new parking area and beach access on top of and after installing a dune infiltration system located at the Site (the "Project").

12) The Site is located in the Ocean Erodible Area ("OEA") of Environmental Concern ("AEC")=defined at 7H.0304. At the Site, the average annual erosion rate applicable for determining setbacks is 4' per year, making the setback from the PPVL 120' landward. The setback factor, the historical shorelines, erosion transects, and the pre-project vegetation line are shown on an image from the DCM Map Viewer, attached as a stipulated exhibit.

13) The setback requirements for Ocean erodible AECs generally state that that development must be set back a distance of 30 times the long-term annual erosion rate from the first line of stable natural vegetation or pre-project line, whichever is applicable.

14) In accordance with 15A NCAC 07H.0305(6), which requires that a pre-project vegetation line be established prior to the initiation of a for "large-scale beach nourishment project", a pre-project line was established in this area in 2010 prior to the Town's initial large-scale nourishment event. This line is used as the reference point for measuring setbacks unless the vegetation line is more restrictive.

15) At this location, the waters of the Atlantic Ocean are classified as SB waters by the EMC and are closed to the harvest of shellfish.

16) Per G.S. 113A-118, any "development" within an AEC requires CAMA permit authorization.

17) The intent of the Project is to minimize flooding for small, regularly occurring storm events and quicken the floodwater recession from roads after major storms by pumping floodwaters to an underground infiltration system elevated within the existing sand dune. See Affidavit of Dave Ryan, paragraph 7.

18) This Project is part of and adjacent to a previously authorized drainage infrastructure improvement project. The goal is to supplement the existing roadside swale on the east side of South Old Oregon Inlet Road with a new drainage pipe, connected to a pump station that would convey the flood waters to the dune system at the Juncos Street beach access to

infiltrate through the dune and be released to the Atlantic Ocean. The part of the drainage improvement project previously authorized is located outside of the Ocean Erodible Area of Environmental Concern. Regulatory permits were acquired, and the project advertised for bids in conjunction with a companion project. However, adequate funds were not available at that time to proceed with construction. See Affidavit of David Ryan, paragraph 8.

19) Currently the existing roadside conveyance system is mostly reliant upon evapotranspiration since the overland flow cannot reach the surface water outfalls within the South Old Oregon Inlet Road right of way. During storm events the low-lying areas intersect with the existing high groundwater table and existing soils are highly compacted due to urban development preventing any substantial infiltration. Pumping runoff into the dune will decrease the flooding time of South Old Oregon Inlet Road as well as reduce the peak floodwater elevations, which will minimize hindrances to vehicular access or pedestrian access to an important public beach access area.

20) The Project Site overlaps with an existing 20-space parking lot at the Juncos Street Public Beach Access and is located westward (landward) of existing primary dune system, which is frontal dunes at the driving access portion and have enough elevation on either side of the driving access to be primary dunes. The collection system will be located between the existing edge of the roadway and the multi-use path, entirely within the existing road right of way. The dune infiltration system is located entirely within the Juncos Street right of way. The Town of Nags Head has existing sand fencing along the seaward edge of the dune to stabilize the dune and vegetation. Rutting from vehicular traffic on the beach has occurred along the edge of sand fencing. Existing conditions depict a steeper gradient between the road and first line of stable vegetation.

21) A set of temporary piezometers were installed in 2022 to monitor the groundwater and to gather information regarding the groundwater gradient within the project area. Survey and groundwater monitoring data indicate that the parking lot on site is lower in elevation with limited infiltration capacity due to groundwater levels just under the parking lot. See Affidavit of David Ryan, paragraph 9.

22) As detailed in the permit application f, the proposed underground infiltration system will be constructed using modular buried stormwater storage units. Locating the units within the dune system will provide the minimum 2’ separation from the groundwater table and allow for greater infiltration into the groundwater. The stormwater storage units will allow for a modular installation method, will have a low profile, and possess structural capacity for handling the vehicular loading at Juncos Street.

23) The proposed dune infiltration system would start approximately 10’ landward of the first line of vegetation and extend approximately 84’ landward. The protective polyethylene geotextile will extend an additional 80’ landward to accommodate the vehicular traffic.

Following a storm event, it is anticipated that approximately 500 gallons of stormwater per minute will be pumped by this system. The infiltration basin will be centered at the apex of the dune.

24) The entirety of the proposed infiltration system will be constructed landward of the first line of stable, natural vegetation (as confirmed by DCM staff on May 17, 2024) as shown on the attached site plans.

25) If this variance is granted, the planned construction schedule for the Project will fall between November 16th and April 30th, avoiding potential impacts to nesting sea turtles, as well as to avoid economic impacts during tourist season. The construction laydown area will be within the existing footprint of the parking lot on Site. The overall disturbance limit is 0.53 acres and is for the dune infiltration system only.

26) The Project will not result in additional built upon or impervious surface from what is existing.

27) The Town of Nags Head is committed to maintaining its ocean beaches through a series of beach nourishment, dune planting, and sand fencing projects. The Town has implemented three large-scale beach nourishment projects since 2010. To further ensure the Town maintains healthy beaches, the Town formally adopted a Multi-Decadal Beach Nourishment Master Plan on July 3, 2024. This multi-decadal master plan identifies the Town's nourishment needs, sand resources, and funding mechanisms sufficient to provide for a beach nourishment program for the next 50 years. See David Ryan Affidavit, paragraph 10.

28) Petitioner, through its authorized agent Moffatt and Nichol, applied for a CAMA Major Permit on May 2, 2024. Additional information was submitted on June 27, 2024. The application package was accepted as complete on August 1, 2024). A copy of the permit application materials is attached as a stipulated exhibit.

29) On August 9, 2024, DCM Field Representative Yvonne Carver completed the Field Investigation Report for the Project, a copy of which is attached as a stipulated exhibit.

30) The Project will not require a Section 404 Permit from the U.S. Army Corps of Engineers.

31) The representative of the US Fish and Wildlife Service provided comments emailed to DCM on September 12, 2024 and September 16, 2024 including concerns about sea turtle habitat. Copies of these emails are attached as a stipulated exhibit.

32) The NC Wildlife Resources Commission's representative commented on the project on September 20, 2024 and a copy is attached as a stipulated exhibit.

33) The Project will not require a Water Quality Certification from the N.C. Division of Water Resources. While DWR first objected to the project, they are working with the Town to satisfy the DWR add-information request. This process may change the design from what was denied and is now the subject of this variance, as communicated in the attached email.

34) Notice of the proposed project was posted on Site and was published on August 18, 2024 in the Coastland Times.

35) Notice of the proposed project was given to the adjacent riparian owners. The owner to north is Boat Rides 001, LLC and it received notice of the permit application on May 3, 2024. The owner to the south is Bluffs Of South Nags Head and it received notice of the permit application on April 30, 2024. Copies of the notice letters and signed green cards are attached.

36) DCM received the following public comments:
- September 23, 2024 telephone conversation with Doug Davis and David Ryan, P.E. (See David Ryan Affidavit Paragraph 12.)
- October 4, 2024 email from Karen Johnson (attached as a stipulated exhibit)

37) On October 2, 2024, the Division of Coastal Management denied the Major Permit Application request because the proposed development does not meet the development setback requirements of 15A NCAC 07H.0306(3)(A). DCM believes that this system is a linear system that must meet the 60'setback. A copy of the denial letter is attached as a stipulated exhibit.

38) The Town stipulates that the Project is not consistent with the strict application of 15A NCAC 07H.0306(3)(A).

39) The Town filed this variance request on October 2, 2024, seeking relief from strict application of the Ocean Hazard AEC erosion setback requirements set forth in 15A NCAC 07H.0306(3)(A) in order to develop the project as proposed in its permit application.

40) As required by 15A NCAC 07J.0701(c)(7) notices of the proposed variance were provided to the adjacent property owners on by certified mail-return receipt requested on October 2, 2024. Notice to Boat Rides 001, LLC was delivered on October 15, 2024 and notice to Bluffs of South Nags Head was delivered on October 18, 2024. Copies of the notice letters, certified receipts and tracking information are attached as a stipulated exhibit.

Stipulated Exhibits:

1. David Ryan, P.E., Affidavit
2. 1952 Plat of the Site
3. Title Opinion- Town ownership of Site
4. Map of Nags Head Driving Accesses
5. DCM Map Viewer image of the Site
6. CAMA Major Permit application materials
7. 8-9-24 DCM Field Investigation Report
8. USFWS email comments x2
9. NC WRC comment
10. Changes in the plan related to DWR add-info email
11. Notice documents to adjacent owners during permit review
12. Public Comments x2
13. 10-2-24 DCM Denial Letter
14. Notice documents to adjacent owners about variance
15. Powerpoint Presentation with ground/aerial photos

ATTACHMENT C PETITIONER'S and STAFF'S POSITIONS

I. Will strict application of the applicable development rules, standards, or orders issued by the Commission cause the petitioner unnecessary hardships? If so, the petitioner must identify the hardships.

Petitioners' Position: Yes.

This area has long been subject to flooding from rain events. Flooding from smaller rainfall events (as little as 2") has been known to remain for significant periods of time along South Old Oregon Inlet Road, Juncos Street, and the surrounding area, impacting the Town's primary vehicle access for the beach. Flooding also affects vehicle access to the beach and restricts use of the multi-use path, while also limiting limits vehicle movements on South Old Oregon Inlet Road.

The strict application of the applicable development standard would prevent the construction of the desired and properly engineered dune infiltration system, which is being proposed to help alleviate the flooding at this location. Therefore, the strict application of 15A NCAC 07H.0306(3)(A) would present an unnecessary hardship on the Town of Nags Head, as well as users of this section of South Old Oregon Inlet Road, Juncos Street, and the surrounding areas.

Staff's Position: Yes.

The Town seeks a variance from the Commission's oceanfront setback rules which require development to be landward of the 60' setback as measured from the applicable PPVL. The Commission's Ocean Hazard rules are intended to protect oceanfront dunes by keeping significant development landward of these important features, and also to minimize losses to property from storms and long-term erosion. In this case, the dune infiltration project is designed to be buried under the dunes near the location of the floodwater collection point and to filter stormwater underneath the dunes. While Staff are particularly concerned about the 10' distance of the project to the vegetation line, and the future success of the planned dune reconstruction and revegetation project after the underground systems are installed, Staff agree that strict application of the Commission's setback rules and rules protecting dunes causes the Town an unnecessary hardship where the development will be placed under the dune.

II. Do such hardships result from conditions peculiar to the petitioner's property, such as location, size, or topography of the property? Explain.

Petitioner's Position: Yes.

The flooding at this location is due to the elevation of the property, the proximity of the Atlantic Ocean, and the existing high groundwater table. Based on environmental survey data, the proposed project site falls within flood zones AE (elevation 4), AO (elevation 2), AO (elevation 1), and VE (elevation 10). Due to its elevation and location in these flood zones, flooding from smaller rainfall events (up to 4") has been known to remain for significant periods of time along South Old Oregon Inlet Road, Juncos Street, and the surrounding area, as well as impacting the Town's primary

vehicle access for the beach. During storm events the low-lying areas intersect with the existing high groundwater table preventing any substantial infiltration of floodwaters. Additionally, the Juncos Street Beach Access is utilized by the Town as a main emergency access site for emergency vehicles needing to access the beach.

Staff's Position: Yes.

Staff agree that the Town's hardships result from conditions peculiar to the Town's property, where there do not appear to be properties that are large enough to accommodate the project but are also wide enough to locate them more than 60' from the static line and which have the proper elevation, and are also near this area of flooding. When combined, these requirements for the system narrow the site selection.

III. Do the hardships result from the actions taken by the Petitioner? Explain.

Petitioners' Position: No.

The Town of Nags Head has not taken any action that has resulted in the flooding at this location. The proximity of the adjacent ocean and beach, the resulting highwater table, and the proximity State-maintained roadway (SR 1243) are all circumstances outside of the Town's control. In fact, the Town has actually taken past measures to attempt to alleviate the flooding issues in this area, including various drainage infrastructure such as roadside swales, but these efforts have largely been ineffective.

Staff's Position: No.

Staff agree that the Town's hardships do not result from their actions. There are limited location options for addressing flooding along South Old Oregon Inlet Road in this portion of Town. This project would work to reduce or eliminate flooding on SR 1243, and would have limited long-term impacts on the existing dune within the setback.

IV. Will the variance requested by the petitioner (1) be consistent with the spirit, purpose, and intent of the rules, standards, or orders issued by the Commission; (2) secure the public safety and welfare; and (3) preserve substantial justice? Explain.

Petitioners' Position: Yes.

Spirit, Purpose, and Intent: § 113A-102(b)(4)(d) states that one of the goals of the Coastal Area Management Act (CAMA) is to establish policies, guidelines and standards for transportation systems, indicating that maintenance of such systems are considered critical coastal resources to be managed and protected under the CAMA. The implementation of the proposed project will be consistent with the intent of § 113A-102(b)(4)(d) by quickly removing excess flood water from the adjacent roadway, allowing for safe usage of this road.

The proposed project will also allow for continued and enhanced access to the dry-sand beach and waters of the Atlantic Ocean following rainfall events, while also keeping structures off of the dry-sand beach, which would be consistent with the spirit and intent of numerous components of the CAMA (for example, § 113A-134.1.(b)), as well as numerous rules of the Coastal Resources Commission.

Public Safety: Public safety and welfare will be maintained and enhanced due to reduction of periods of flooding, allowing improved usage of the public transportation system in the area. Additionally, the Juncos Street Beach Access is utilized by emergency vehicles for access to the beach when needed. Reductions in periods and durations of flooding will improve emergency vehicle access, maintaining public safety of the beach-going public. Additionally, the Town's commitment to maintaining healthy beaches should ensure that the structural components of the dune infiltration system will not encroach on the dry-sand beach.

Preserve Substantial Justice: A main goal of the Coastal Area Management Act is to insure the orderly and balanced use and preservation of North Carolina's coastal resources on behalf of the people of North Carolina and the nation (§ 113A-134.1.(b)(3)). Granting of the requested variance will be consistent with this goal and will preserve substantial justice by reducing flood-related impediments to the transportation system and recreational and emergency access to the ocean beach in this location in manner that represents minimal potential impact to coastal resources.

Staff's Position: Yes.

Staff contends that granting a variance in order to vary the Commission's oceanfront erosion setback rules to allow the development of the project is consistent with the spirit, purpose, and intent of the Commission's rules where the spirit of the oceanfront erosion setback rules is to protect oceanfront dune systems and to locate development more landward to reduce storm impacts. In this case, the impacts to the dune system will hopefully be short-term as the existing dune will be rebuilt and revegetated after installation of the project. Also, the risk of impacts to the project will be reduced because it will be buried under the dune, despite it's close 10' distance from the vegetation line. The fact that the Town has a long-term beach plan and this area is likely to receive renourishment in the future that will also help protect the reconstructed dunes and project underneath them. The proposed project will address public safety and welfare by both limiting the need to close Old Oregon Inlet Road due to stormwater flooding,. Locating the project within the existing dune in the setback area will cause only short-term impacts to the protective nature of the oceanfront dune. Staff agree that granting a variance would preserve substantial justice where the CAMA statute makes exceptions for buried utilities, but which do not include this project's technology, despite the similarities in purpose.

ATTACHMENT D

Petitioner's Petition Materials

(without initial proposed facts or duplicative exhibits)

CAMA VARIANCE REQUEST FORM

DCM FORM 11
DCM FILE No.:_____

PETITIONER'S NAME TOWN OF NAGS HEAD

COUNTY WHERE THE DEVELOPMENT IS PROPOSED DARE COUNTY

Pursuant to N.C.G.S. § 113A-120.1 and 15A N.C.A.C. 07J .0700 *et seq.*, the above named Petitioner hereby applies to the Coastal Resources Commission (CRC) for a variance.

VARIANCE HEARING PROCEDURES

A variance petition will be considered by the CRC at a regularly scheduled meeting, heard in chronological order based upon the date of receipt of a complete petition. 15A N.C.A.C. 07J .0701(e). A complete variance petition, as described below, must be *received* by the Division of Coastal Management (DCM) a minimum of six (6) weeks in advance of the first day of a regularly scheduled CRC meeting to be eligible for consideration by the CRC at that meeting. 15A N.C.A.C. 07J .0701(e). The final set of stipulated facts must be agreed to at least four (4) weeks prior to the first day of a regularly scheduled meeting. 15A N.C.A.C. 07J .0701(e). The dates of CRC meetings can be found at DCM's website: **www.nccoastalmanagement.net**

If there are controverted facts that are significant in determining the propriety of a variance, or if the Commission determines that more facts are necessary, the facts will be determined in an administrative hearing. 15A N.C.A.C. 07J .0701(b).

VARIANCE CRITERIA

The petitioner has the burden of convincing the CRC that it meets the following criteria:

[See Attached DISCUSSION OF FOUR VARIANCE FINDINGS.]

(a) Will strict application of the applicable development rules, standards, or orders issued by the Commission cause the petitioner unnecessary hardships? Explain the hardships.

(b) Do such hardships result from conditions peculiar to the petitioner's property such as the location, size, or topography of the property? Explain.

(c) Do the hardships result from actions taken by the petitioner? Explain.

(d) Will the variance requested by the petitioner (1) be consistent with the spirit, purpose, and intent of the rules, standards or orders issued by the Commission; (2) secure the public safety and welfare; and (3) preserve substantial justice? Explain.

Please make your written arguments that Petitioner meets these criteria on a separate piece of paper. *The Commission notes that there are some opinions of the State Bar which indicate that non-attorneys may not represent others at quasi-judicial proceedings such as a variance hearing before the Commission. These opinions note that the practice of professionals, such as engineers, surveyors or contractors, representing others in quasi-judicial proceedings through written or oral argument, may be considered the practice of law. Before you proceed with this variance request, you may wish to seek the advice of counsel before having a non-lawyer represent your interests through preparation of this Petition.*

For this variance request to be complete, the petitioner must provide the information listed below. The undersigned petitioner verifies that this variance request is complete and includes:

_x__ The name and location of the development as identified on the permit application;

_x__ A copy of the permit decision for the development in question;

_x__ A copy of the deed to the property on which the proposed development would be located;

_x__ A complete description of the proposed development including a site plan;

_x__ A stipulation that the proposed development is inconsistent with the rule at issue;

_x__ Proof that notice was sent to adjacent owners and objectors*, as required by 15A N.C.A.C. 07J .0701(c)(7);

_n/a_ Proof that a variance was sought from the local government per 15A N.C.A.C. 07J .0701(a), if applicable;

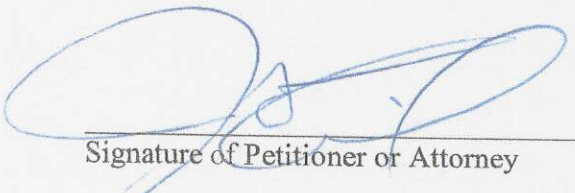
_x__ Petitioner's written reasons and arguments about why the Petitioner meets the four variance criteria, listed above;

_x__ A draft set of proposed stipulated facts and stipulated exhibits. Please make these verifiable facts free from argument. Arguments or characterizations about the facts should be included in the written responses to the four variance criteria instead of being included in the facts.

_x__ This form completed, dated, and signed by the Petitioner or Petitioner's Attorney.

**Please contact DCM or the local permit officer for a full list of comments received on your permit application. Please note, for CAMA Major Permits, the complete permit file is kept in the DCM Morehead City Office.*

Due to the above information and pursuant to statute, the undersigned hereby requests a variance.



Signature of Petitioner or Attorney

Oct. 1, 2024
Date

John D. Leidy
Printed Name of Petitioner or Attorney

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DELIVERY OF THIS HEARING REQUEST

This variance petition must be **received by** the Division of Coastal Management at least six (6) weeks before the first day of the regularly scheduled Commission meeting at which it is heard. A copy of this request must also be sent to the Attorney General's Office, Environmental Division. 15A N.C.A.C. 07J .0701(e).

Contact Information for DCM:

By mail, express mail or hand delivery:
Director
Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557

By Fax:
(252) 247-3330

By Email:
Check DCM website for the email address of the current DCM Director
www.nccoastalmanagement.net

Contact Information for Attorney General's Office:

By mail:
Environmental Division
9001 Mail Service Center
Raleigh, NC 27699-9001

By express mail:
Environmental Division
114 W. Edenton Street
Raleigh, NC 27603

By Fax:
(919) 716-6767

Revised: July 2014

ATTACHMENT E

Stipulated Exhibits

AFFIDAVIT OF DAVID RYAN

David Ryan, being first duly sworn, says:

1. My name is David Ryan. I am the Town Engineer for the Town of Nags Head. I am licensed professional engineer by the State of North Carolina and have been since 2004. I have personal knowledge of and am competent to testify to the matters stated herein.

2. In my capacity as Town Engineer, I am familiar with and have been involved with the Town's application for a CAMA Major Permit, DCM Project No PA-1386 for "authorization to install a dune infiltration system located at the Town-owned 50' wide public beach access (the "Project") at the intersection of Juncos Street and South Old Oregon Inlet Rd. in Nags Head (the "Site") . The Project would also involve a pumps station with connecting drainage infrastructure along S. Old Oregon Inlet Rs. and reconstructing the disturbed parking areas, dune walkover structure and existing beach access improvements.

3. As of the 2023 census estimates, and as reported and published n by the North Carolina Office of State and Budget Management/State Demographer's Office at https://demography.osbm.nc.gov/explore/?sort=modified, the Town of Nags Head is home to 3,233 year-round residents and can see a summer population of around 40,000.

4. I hereby attest that the Flood zone data for the Project Site is described on Sheet C1.1 of Nags Head Dune Infiltration Permit Drawing Set 1- June 2024 which was submitted as part of the original CAMA Major Development Permit application. Plan Sheet C1.1 is provided as a supplement to this stipulated fact

5. Having conducted post-rainfall monitoring and field visits for a period of 11 years and having observed flooding from smaller rainfall events (as little as 2"), which has been known to remain for significant periods of time along South Old Oregon Inlet Road, Juncos Street, and the surrounding area, I can attest that these circumstances negatively impact the Town's primary vehicle access for the beach. Flooding also limits vehicle movements along South Old Oregon Inlet Road, (SR 1243), and restricts pedestrian use of the multi-use path.

6. Due to its elevations and location in a flood zone, as well as its importance to the Town for pedestrian and vehicular traffic, I can attest there exists a need for flood

mitigation and minimization on and around South Old Oregon Inlet Road and Juncos Street

7. The intent of the Project is to minimize flooding for small, regularly occurring storm events and quicken the floodwater recession from roads after major storms by pumping floodwaters to an underground infiltration system elevated within the existing sand dune. Reference- Phase 4 Drainage Infrastructure Improvements, Conceptual Design Final Report, Nags Head, North Carolina, 2019Conceptual Design Alternative # 2, as prepared by WithersRavenel, dated August 2019 attached hereto as Attachment 1.

8. The Project is part of, and adjacent to a previously authorized infrastructure improvement project. The goal is to supplement the existing roadside swale on the east side of South Old Oregon Inlet Road with a new drainage pipe, connected to a pump station that would convey the flood waters to the dune system at the Juncos Street beach access to infiltrate through the dune and be released to the Atlantic Ocean. The part of the drainage improvement project previously authorized is outside of the Ocean Erodible Area of Environmental Concern. Regulatory permits were acquired, and the project advertised for bid in conjunction with a companion project. However, adequate funds were not available at that time to proceed forward with construction.

9. A set of temporary piezometers were installed in 2022 to monitor the groundwater and to gather information regarding the groundwater gradient within the project area. Survey and groundwater monitoring data indicate that the parking lot on site is lower in elevation with limited infiltration capacity due to groundwater levels just under the parking lot. Reference- Stormwater Management Report for Nags Head Dune Infiltration System at Juncos Street, as prepared by Moffat & Nichol, dated February 9, 2023 attached hereto as Attachment 2.

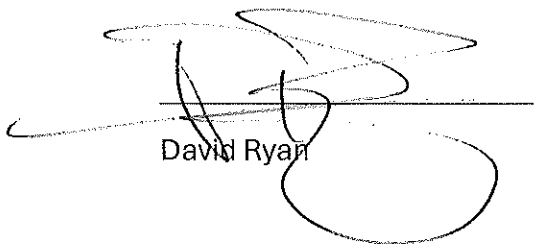
10. I can attest that the Town of Nags Head is committed to maintaining its ocean beaches through a series of beach nourishment, dune planting and sand fencing projects. The Town has implemented three large-scale beach nourishment projects since 2010. To further ensure the Town maintains healthy beaches, the Town formally adopted a Multi-Decadal Beach Nourishment Master Plan on July 3, 2024. This multi-decadal master plan identifies the Town's nourishment needs, sand resources, and funding mechanisms sufficient to provide for a beach nourishment program for the next 50 years. Reference- Town of Nags Head Muti-Decadal Beach

Nourishment Master Plan as prepared by Moffat & Nichol, dated June 2024 and the Town of Nags Head Strategic Plan, Action Item 1.3, adopted February 7, 2024 attached hereto as Attachment 3.

11. Following various communications between the Town, it's consultants, and Robert Tankard of the N.C. Division of Water Resources, Mr. Tankard submitted an email on October 24, 2024 asking for additional information and clarification on several items that had previously been submitted by the Town. On October 28, 2024, the Town provided Mr. Tankard (via email) a project specific "Flood Reduction System Management Plan" that will serve as a guide for system operation and maintenance of the proposed facility. On October 30, 2024, Mr. Tankard replied via email that after discussing this with Mr. Ryan, this office has a plan to permitting this project. A copy of this Flood Reduction System Management Plan, as well as a copy of Mr. Tankards October 30, 2024 email, are included as a proposed stipulated exhibits , attached hereto as Attachment 4.

12. On September 23, 2024, I discussed with Mr. Doug Davis, 9531 S. Old Oregon Inlet Rd., representing Boat Rides 001, LLC the Project description, function, and maintenance. The only outstanding concern expressed by the property owner was the operation of the dune infiltration overflow system and minimizing impacts to surface flow runoff onto the adjoining property. Existing topography currently restricts this from occurring with additional measures to be investigated. I further attest that this communication was the only communication received by the Town as a result of the permit application process.

Further the affiant saieth not.



David Ryan

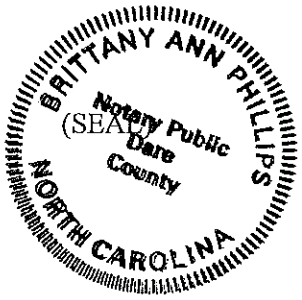
STATE OF NORTH CAROLINA

COUNTY OF DARE

Sworn to and subscribed before me this 30th day of October, 2024.

Brittany Ann Phillips
Notary Public

My Commission expires: 5/4/26



ATTACHMENT 1

WithersRavenel
Our People. Your Success.

PHASE 4
DRAINAGE INFRASTRUCTURE IMPROVEMENTS
CONCEPTUAL DESIGN FINAL REPORT
Sites 4, 5, 6, 7, 8, 9, 10, 12 and 13
Nags Head, NC

Prepared For:
Town of Nags Head
Town Hall, P.O. Box 99
Nags Head, NC 27959
252.441.5508
ATTN: David Ryan

Prepared By:
WithersRavenel
115 MacKenan Drive
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919.469.3340
License No. C-0832

August 2019
WR No. 02160539.30

Hunter C. Freeman, PE
Brandon J. Miller, EI

EXECUTIVE SUMMARY

The Town of Nags Head selected WithersRavenel as their consultant for further analysis and implementation of the Town's 2006 Stormwater Management Plan – Capital Improvement Plan. This memorandum summarizes the additional analyses and conceptual designs completed for project areas 4, 5, 6, 7, 8, 9, 10, 12 and 13.

Project Area 4 – Wrightsville Avenue
The Town requested additional hydrologic modeling of a groundwater pumping system to reduce flooding along Wrightsville Avenue. This work was completed by Moffat & Nichol, a sub-consultant to WithersRavenel on this project.

Project Area 5 – North Ridge
WithersRavenel completed cost-benefit analyses of potential design alternatives at the request of the Town Board.

Project Area 6 – Old Nags Head Place
Project Area 7 – Southridge
Project Area 8 – Soundside Road
Project Area 9 – Carolinian Circle / Nags Head Pond
Project Area 10 – Kipper Court
Project Area 12 – Old Oregon Inlet Road (Juncos St)
Project Area 13 – Old Oregon Inlet Road (E. Hardgrove St. to Fire Station)
WithersRavenel developed design alternatives and cost benefit analyses for each of these sites.

After discussing each project area with Town staff, WithersRavenel presented our findings to the Board of Commissioners. The Board used the results of this phase of work to determine next steps for implementation and construction projects intended to commence in the winter of 2019/2020.

No construction work was completed as part of this phase of the project.

PROJECT APPROACH

For project area 4, Moffat & Nichol completed detailed hydrologic and groundwater modeling to evaluate the benefits of various groundwater pumping and discharge scenarios. The overall intent was to more accurately predict the flood reduction benefits of proposed pipe systems, and also to determine the maximum rate and volume of pumped groundwater that the soils under the Bonnet Street beach access parking lot could accept without exacerbating existing flooding concerns on S. Virginia Dare Trail (NC-12).

The project report from Moffat & Nichol includes more detailed information on their approach, methods, and results. The report is included in the appendices of this report.

For Site 5, WithersRavenel expanded on previous preliminary design work in an effort to find alternatives which might reduce flooding along Lookout Road and Buccaneer Drive. This work focused on additional coordination with NCDOT and work within their right of way, including potential improvements NCDOT drainage infrastructure.

For the additional sites, WithersRavenel's approach was to develop simple models to represent complex and unique hydrologic challenges. Each conceptual design is intended to improve the quality of life of Nags Head residents by reducing the detrimental impacts of persistent standing water present after moderate rainfall events.

The study of all sites relies on the development of hydrologic models. The models were developed to help understand the hydrologic components existing in the present conditions, and also understand how the physical site conditions were affected by rainfall events. Once the existing conditions models were

calibrated to more closely match field observations from Town staff and citizens, we began developing proposed conditions models and retrofit options.

WithersRavenel modeled the six new project areas (6, 7, 8, 9, 10, 12, and 13) using PondPack software. Both physical (i.e., upgrade infrastructure) and mechanical (i.e., lowering groundwater through pumping) options were considered. Metrics presented for each project area include the depth of roadway flooding and time for floodwaters to recede. Projected performance of the proposed design alternatives was compared to existing conditions using these metrics to gauge their effectiveness in addressing the concerns noted by the stakeholders.

For the proposed groundwater lowering scenarios, WithersRavenel looked at the net result of the pumping to assess the effect on floodwater levels during small storm events. This approach removed the need to design and model specific pumping options for the time being. This level of detail will be added in the final design if the Board of Commissioners earmarks the project area for construction. The hydrologic models simulate the change in soil properties due to elevated and lowered water tables within each drainage area. Existing conditions (e.g., no groundwater pumping operation) were considered to be saturated, resulting in the loss of infiltration capacity as a starting boundary condition. To simulate the effect of the groundwater lowering operation, the soil type within the project area was revised to reflect the available absorptive capacity of the dewatered soil to infiltrate a portion of rainfall. This reflects WithersRavenel's assumption that prior to a rainfall event the soil would be functioning sandy, high infiltration-capacity soils that exist in most portions of the Town.

This approach was intended to address the primary impacts to quality of life voiced during community meetings. It should be noted that we are not attempting to quantify the results using traditional engineering metrics (peak flow, inches of runoff, level of service based on XX-year storm), but rather evaluating these scenarios within a framework that quantifies how each option will improve day-to-day quality of life. This approach is similar to the method in which previous project areas were evaluated.

PRELIMINARY RESULTS & COST ESTIMATES

*Note: the cost estimates below do not include potential costs of easements or land acquisition.

Project Area #4 – Wrightsville Avenue – Additional Study

Problem Statement

Insufficient drainage infrastructure, along with low-lying properties and elevated groundwater, are causing flooding along Wrightsville Avenue from Bonnett Street to Bainbridge Street.

Existing Constraints and Design Considerations

The detailed modeling is aimed at determining the ability for the pumped groundwater to infiltrate through the dune system and reach the Atlantic Ocean. There is no available open space where pumped groundwater could be discharged and expected to infiltrate (other than environmentally sensitive areas), therefore the area under the parking lot at the Bonnett Street beach access was the most viable location.

Project Area 4 Conceptual Design

Previous studies of the project area investigated the potential benefits of installing a french drain as well as potentially improving the culvert upstream of the Curlew St outfall. Both alternatives showed limited cost/benefit returns, therefore this pumping alternative was investigated.

Project Area #12 – Old Oregon Inlet Road @ Juncos St

Problem Statement

The area between Olympic St and Juncos St remains flooded for prolonged periods of time after rainfall events. S Old Oregon Road is often restricted to one lane of travel due to standing water. Saturated soils and damage to driveways was noted during the site visit.

Existing Constraints and Design Considerations

This southern portion of the Town has little relief and high groundwater elevation are evident by the water elevation in the existing swale west of Old Oregon Road. The volume of groundwater, ocean influence, and the proximity of this flooding to the existing ditch results in the assumption that localized groundwater lowering is not a feasible option.

Project Area 12 Conceptual Designs

Conceptual Design Alternative #1 – Install french drains and perforated pipe system.

Goal: Improve effective storage below the existing ground level and provide a high infiltration area to relieve standing water concerns as quickly as possible.

Assumptions: Effective depth of the french drain is limited to 1' – 2' below the existing edge of pavement, any depth below that elevation is expected to be continually saturated with groundwater.

Design: Add 2,100 lf of shallow french drain (5' wide, 1'-2' deep) and perforated pipe along east side of Old Oregon Inlet Rd. Repair and elevate driveways where possible, adding driveway culverts.

Preliminary Engineer's Cost Opinion: **$100,000 – $125,000**

Conceptual Design Alternative #2 – Add pump system to Alt 1.

Goal: Pump water from the french drain to a new infiltration area to be incorporated into the design of new beach access parking north of Juncos St.

Assumptions: Higher elevations in the parking area, especially closer to the ocean, provide separation from the groundwater table and suitable soils for infiltration.

Design: Install Alternative 1, and include submersible pumps and a force main to the discharge location. The system could be designed as a continuous low flow pump operation or an emergency pump connection.

Preliminary Engineer's Cost Opinion: Groundwater lowering option - **$250,000 – $300,000**
Emergency pump option - **$200,000 - $250,000**

Project Area 12 Preliminary Results

Under existing conditions, roadway flooding through the project area is expected multiple times per year. The proposed alternatives eliminate flooding for small storm events expected to occur 3 times per year (+/- 2" of rainfall). There is insufficient storage area and volume to prevent flooding from any larger storms. Flood ponding times are expected to be improved for very small storms.

In Alternative 2, the frequency of roadway flooding is expected to be slightly better than Alternative 1, however it is difficult to quantify this improvement as the effect of low flow pumping (2 cfs average flow rate) is insignificant compared to the rate of inflow from rain events. Both low flow and emergency pumping could reduce the long-term flood durations to less than 1 day after larger rainfall events.

Table 11. Projected depth of roadway flooding and time to recede for Project Area 12

Event	Existing WSEL	Alt-1 WSEL	Alt-2 WSEL
4-MONTH	1.53	1.35	0.89

Discussion and Next Steps

The Town directed WithersRavenel to proceed with field survey and design documents for installation of Alternate #1 (french drain). All design drawings will need to be reviewed by NCDOT prior to bidding.

ATTACHMENT 2

Stormwater Management Report
for

Nags Head Dune Infiltration System at Juncos Street

Presented to:

Town of Nags Head

Version:	***Date:***	***Comment:***
Draft v.1	*Feb 09, 2023*	*Submitted draft for Town Review*

Prepared by:

Table of Contents

Appendices

1. Stormwater Design

1.1. Stormwater Design Methodology

Bentley SewerGEMS software was used to calculate the hydrology and hydraulics for the upstream gravity conveyance system, pressure system and infiltration capacity for the system. The Implicit SewerGEMS Dynamic Wave Calculation method uses the full St. Venant equation and simultaneously solves for both flow and hydraulic grade using the same equations for gravity and pressure portions of the system. However, this method does not include the affects of recirculating water back into the gravity system after infiltrating from the ADS SC-740 Chamber System. The results in this report are based on the ideal scenario where once infiltrated, the stormwater outfalls directly to the Atlantic Ocean. However, based on the preliminary continuous groundwater monitoring results, the groundwater gradient during a storm event is in the inland direction, it then reverses direction 8-12 hours after a storm back to the Atlantic Ocean. It is expected that the results reported here will lag an additional 8-12 hours after the storm event due to recirculation of infiltrated water back into the gravity stormwater conveyance system and will need to be pumped more than once.

1.2. Hydrology and Hydraulic Assumptions

The following summary tables describe the assumed hydrologic and hydraulic assumptions associated with the gravity, pressure, and infiltration elements. The total contributing drainage area was assumed to be limited to the east portion of Old Oregon Inlet Rd for this calculation, with the assumption that the west side of the road will drain to the ditch within the divided median.

Table 1. Hydrology Summary

Total Contributing Drainage Area	19.58 acres
Impervious CN	98
HSG A Sand CN	5
HSG D Sand CN	38
Composite CN	49
Time of Concentration	30 min
Rainfall Distribution	SCS Type III
NOAA Atlas 14 1-yr 24 Hour Rainfall, in	3.7
NOAA Atlas 14 1-yr 24 Hour Rainfall, in	6.9

Table 3. Hydraulic Assumptions	
Minor losses, k values	
90 Elbow	0.25
45 Bend	0.18
Gate Valve	0.3
Check Valve	1.7
In-line Tee	0.30
22.5 Bend	0.1
Hazen Williams Friction Coefficient, (HDPE)	130
Entrance and Exit Loss Coefficients (submerged), k	1
Wett Well Diameter, ft	8
Manning's Roughness (HDPE pipe)	0.012

Table 4. Geotechnical Assumptions	
Permeability (Web Soil Survey) in/hr	19-32
Geotechnical Recommendation in/hr	15

1.3. Time of Concentration Methodology

Manning's Kinematic Solution will be used for determining the flow time for the first 300 feet of sheet flow. Based on the existing conditions consisting of Sand with brush, the Manning's Roughness Coefficient was considered as light underbrush (0.41). Based on the uniform flow path between the sub catchment areas the Time of Concentration for each was considered uniform at 30 min.

1.4. Continuous Groundwater Monitoring and Baseflow

Continuous groundwater monitoring occurred between December 19, 2022 and January 31, 2023 utilizing Onset HOBO 30-foot Water Level data loggers installed at each monitoring well location. A boring location map with the corresponding data logger locations is included in the appendix and includes a time series of the continuous groundwater data reported at 15 min intervals. Table 5 provides a summary of the groundwater elevation recorded during the collection period.

Table 5 Groundwater Elevations Summary
Dec. 19, 2022 - Jan. 31, 2023

Boring Location (HOBO S/N)	B1 (21382266)	B2 (21382264)	B3 (21382265)
Existing Ground Elevation (NAVD88)	3.85	15.00	9.53
Maximum Water Elevation (NAVD88)	3.07	3.16	4.49
Minimum Water Elevation (NAVD88)	1.87	1.29	0.86
Average Elevation (NAVD88)	2.22	2.15	2.11
Median Elevation (NAVD88)	2.21	2.09	2.00
95th Percentile Elevation	2.75	2.99	3.48
5th Percentile Elevation (NAVD88)	1.91	1.43	1.15

Based on the high groundwater elevations in the surrounding area of the proposed pump station and stormwater conveyance system it was assumed that groundwater intrusion will occur in the system and cause the pump to cycle even during non-storm events. 0.2 cfs was assumed and was applied as a base flow to the furthest upstream inlet from the pump station CB-12-1 and was applied continuously during the simulations to capture the intrusion during the peak rainfall event. To minimize the pumping of groundwater, the "Pump on" float switch will be set above the average groundwater elevation of 2.22 at monitoring well location B1 to an elevation of 2.50. The source of the baseflow assumption for groundwater intrusion were taken from the City of Virginia Beach Public Works Design Standards Manual Table VIII-4.

Table VIII-4 Groundwater Baseflows According To Drainage Area	
Drainage Area within Development or Project to Each Outfall (Acres)*	**Seasonal High Baseflow (c.f.s.)**
<50	0.2
≥ 50 and < 100	0.5
≥ 100 and < 250	1.2
≥ 250 and < 500	2.3
≥ 500 and < 1000	4.7
≥ 1000	**Consult with Public Works Stormwater Engineering Center**

* Exclude drainage areas upstream of the project.

2. Pump Selection

A conceptual Total Dynamic Head hand calculation resulted with a TDH of 59-feet based on 500 gpm through a 6-inch pipe. Based on that result the Barmesa Submersible Non-Clog Pump was selected based on its performance curve listed below. The pump was then entered into the SewerGEMS H&H model and it was determined that the required TDH calculated from the model was 48-feet and based on a 6" pipe and produced over 1000 gpm and had an operating efficiency around 60%. By reducing the forcemain pipe size to 4" to match the pump connection size the operating efficiency increased to roughly 70% and reduced the discharge down to 462 gpm. An enlarged view of the performance curve is provided in the appendix.

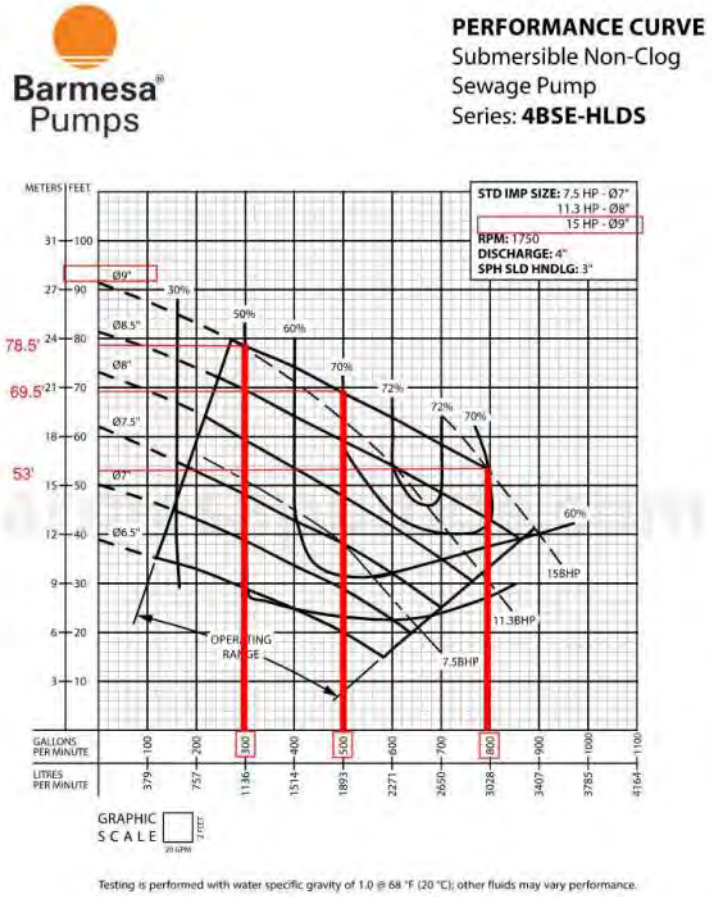


Table 6 - Hydraulic Results		
Storm Event	1-yr 24 hour	10-yr 24 hour
Flow, gpm	463	463
Longest Pumping Duration, hrs	8-hour 50 min	14 hours 14 min
Total Volume of Runoff, cu. ft.	15,307	107,657
Maximum HGL in Underground Chamber, (NAVD88)	6.47	7.01
Time to Max HGL in Underground Chamber, hours,hr	14.20	22.68
Maximum HGL in gravity system (NAVD88)	3.06	6.48

2.1. Infiltration Sizing

The resulting pump rate of 463 gpm allowed the underground infiltration system ADS Stormtech SC-740 Chamber to have a minimal footprint of 5 rows of chambers, 11 chambers long without having an overflow event. The invert of the chambers is set at 5.5 with over 2.3 ft of groundwater separation within the dune during a storm event and will meet the North Carolina minimum design criteria for infiltration basins.

ATTACHMENT 3

FINAL REPORT
Produced for the Town of Nags Head, NC
June 2024

moffatt & nichol

MULTI-DECADAL BEACH NOURISHMENT MASTER PLAN

Town of Nags Head, NC

10979/11

MULTI-DECADAL BEACH NOURISHMENT MASTER PLAN

Prepared for:

TOWN OF NAGS HEAD

Rev No	A	B	C	D	E	F
Issue Purpose	Draft	Revised Draft	Revised Draft	Revised Draft	Revised Draft	Final Report
Date	July 2023	August 2023	January 2024	April 2024	June 2024	June 2024
By	AK/TH/YC /ES	AK/TH/YC /ES	AK/TH/YC /ES	AK/TH/YC /ES/NV	AK/TH/YC /ES/NV	AK/TH/YC /ES/NV
Checked	NV/MB/PS	NV/PS	NV/PS	BPJ	BPJ	BPJ
Approved	BPJ	BPJ	BPJ	BPJ	BPJ	BPJ

Prepared by:

moffatt & nichol

MULTI-DECADAL BEACH NOURISHMENT MASTER PLAN

moffatt & nichol

EXECUTIVE SUMMARY

The Town of Nags Head has demonstrated its commitment to maintaining a healthy beach environment for storm protection, habitat preservation, and recreational use. Ongoing beach monitoring has informed the Town of the state of the beach, and beach nourishment projects have been completed as needed to enhance and protect the shoreline. This Multi-Decadal Beach Nourishment Master Plan has been completed to assist the Town in establishing a long-term strategy to permit, schedule, and finance ongoing beach nourishment efforts. The framework developed here allows for proactive planning and execution of sustainable beach management over the 50-year planning horizon.

The key aspects of this plan include statistical analysis of historical data to establish rates of volumetric sand loss due to long-term erosion as well as storm impacts, numerical modeling of storm impacts to determine equivalent Levels of Protection (LoP) for each area of the town's shoreline, and evaluation of alternatives to meet the town's beach management needs. In addition, a complete analysis of the offshore borrow area to be used as a long-term sediment source has been completed. Regulatory pathways and project timelines for both ongoing beach maintenance projects and post-storm emergency restoration projects have been completed to assist the Town in implementing the master plan. Figure ES-1 shows the Nags Head vicinity along with the reach designations that have been developed to facilitate the long-term monitoring and beach nourishment design process.

Figure ES-1: Nags Head Vicinity Map with Reaches

All of the long-term monitoring beach profile data was used to perform a statistical analysis of the sediment volume needs for each reach. Volume changes measured since 2011 were used along with the Crystal Ball software package to perform a Monte Carlo simulation and determine volume needs for long-term annual background erosion, as well as additional potential storm impacts, as presented in Table ES-1. Results showed an overall background volume loss along the Nags Head shoreline of approximately 450,000 cy/year at the 50% non-exceedance probability (i.e., there is a 50% likelihood that this volume will be exceeded). In order to estimate sediment need over the 50-year planning timeframe, potential impacts of additional storms were considered at the 75% non-exceedance probability (i.e., there is a 25% likelihood that this volume will be exceeded, as a conservative approach). An annualized total need of approximately 430,000 cy/year was estimated, considering 16 storms impacting the Town over the 50 years. These annual needs were summed and multiplied by 50 to estimate the 50-year need presented in Table ES-1.

Table ES-1: Nags Head Long-Term Nourishment Need from Background Erosion and Additional Storms

Category	Volume Above -19 ft, NAVD88 (cy)
Annual Background Volume Change (50% non-exceedance probability)	-451,218
Annualized* Storm Volume Change (75% non-exceedance probability)	-431,893
Annual Total Volume Change	-833,111
50-yr Material Need	44,155,550

**16 storms in 50-years*

Numerical modeling was performed to develop a preferred beach and dune profile design to achieve adequate LoP for habitable structures and infrastructure, along with appropriate trigger conditions for renourishment actions. Representative profiles were established along the Nags Head shoreline, based on the May 2018 profile survey data. These profiles are considered to demonstrate a quasi-natural state of the beach, being surveyed immediately prior to the 2019 beach nourishment project. The 25-year storm was selected as the most appropriate target for adequate LoP. Simulations were performed with the CSHORE 1D profile evolution model using the representative profiles and the 25-year storm conditions to evaluate the quasi-natural LoP of the beach state. Figure ES-1 shows the results of this analysis. In summary, the May 2018 pre-nourishment existing conditions of the beach and dune system are considered to provide a sufficient LoP along the northern and middle portions of Nags Head for up to a 25-year return period design storm event. Before the nourishment event, the representative profiles at Reaches 3 South and 4 do not have sufficient material available to protect the structures.

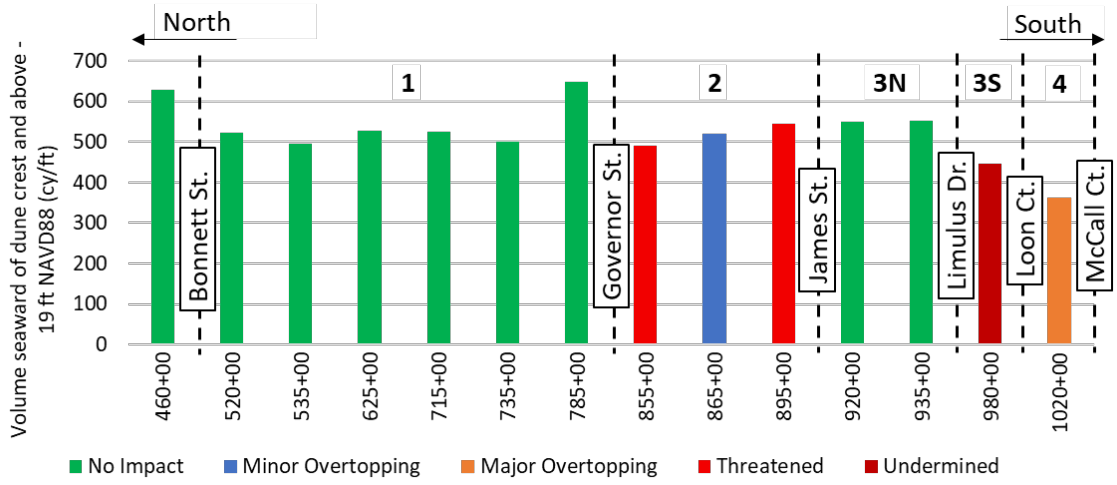


Figure ES-1: Pre-Nourishment Condition CSHORE Pre-Storm Profile Volumes Coded for 25-year Return Period LoP

The CSHORE model was then used along with the representative profiles to adjust the beach profile design to achieve an acceptable LoP along the Town's oceanfront in the design storm event. For cases where the profiles already provided adequate LoP, (e.g., Nags Head North, Reach 1, Reach 3N) dune and berm volume was removed to determine the threshold volume to meet the minimum LoP. The profiles at Reaches 2, 3 South, and 4 indicated severe impacts, so those were modified by adding dune and berm volumes to provide adequate protection. The volumes required to provide a 25-year LoP at each representative profile and within each reach are presented in Table ES-2. The May 2018 condition at each representative profile is also presented. It is noted that due to the condition of the profiles in Reaches 2, 3 South, and 4 at the time of the May 2018 survey, an estimated 0.6 Mcy would be required to be added to provide the minimum LoP. These triggers provide a basis for comparison with the annual beach monitoring profile surveys. When conditions arise such that the profile volumes are nearing the LoP triggers, the Town can begin planning the next maintenance project.

Table ES-2: Trigger Volumes Above -19 ft NAVD88 for 25-yr Event

Reach	Length (ft)	Rep. Profile	25-yr Trigger Volume (cy/ ft)	Reach Trigger for 25-yr event (cy/ft) (Weighted)	May 2018 Volume Above -19 ft (cy/ ft)
North	6,250	460+00	355	355	578
Reach 1	4,500	520+00	503	470	509
	5,500	535+00	451		472
	7,000	625+00	478		506
	5,500	715+00	479		501
	6,000	735+00	443		490
	2,500	785+00	604		610
Reach 2	5,500	855+00	491	502	446
	2,500	865+00	471		499
	2,500	895+00	526		485
	2,500	920+00	463		504
Reach 3 - North	4,500	935+00	464	446	464
Reach 3 - South	2,000	980+00	461		407
Reach 4	2,750	1020+00	401		373
TOTAL	59,500			464	

The implications of relative sea level change should also be considered when determining future beach nourishment needs. The dune crest and berm elevations would need to rise by approximately the same amount as relative sea level to maintain an equivalent LoP. An evaluation of the amount of sand volume that would be required to accommodate this required increase in dune crest and berm height and maintain the shoreline position has been performed using the Bruun Rule. Three sea level rise scenarios developed by NOAA for the Duck, NC tide gauge location were used to obtain a range of volume estimates, from 2.6 Mcy to 4.7 Mcy, to meet these needs.

The sea level rise volume need estimates were combined with the background erosion rate need, the additional storm erosion need, and the initial Level of Protection placement need analysis to develop a long-term sediment volume need, presented in Table ES-3. A relatively high estimate of potential volumetric losses during dredging was also computed. This volume estimate is considered to be conservative and can be compared with sand volumes available from identified borrow sources to provide assurance that the beach nourishment master plan can be executed successfully.

Table ES-3: Long-Term (50-Year) Sediment Volume Need

Crystal Ball	**Background Erosion 50 years (50%)**	22.5 Mcy		
	Additional Storms (16 storms) (75%)	21.5 Mcy		
LoP (25 year) Design		0.6 Mcy		
Relative Sea Level Rise (NOAA, 2022)		**Intermediate Low**	**Intermediate**	**Intermediate High**
		2.6 Mcy	3.4 Mcy	4.7 Mcy
TOTAL		**46.7 Mcy**	**47.5 Mcy**	**48.8 Mcy**
Assumed 20% losses during dredging		*56.0 Mcy*	*57.0 Mcy*	*58.6 Mcy*

A shoreline change model (GenCade) was calibrated and validated using historical data to enable assessment of longshore transport and long-term shoreline evolution along the Nags Head shoreline. The model shows that there is a reversal of sediment transport within the town where the net sediment transport is to the north along the northern reaches of the town, but the overall net sediment transport is towards the south. The exact location of the reversal varies according to the wave climate but is generally within Reach 1 or Reach 2. This reversal may be one of the reasons for the relative stability of Nags Head – North and Reach 1.

A series of engineering alternatives were evaluated to provide options for the Town to meet their goals to maintain a healthy beach over the next 50 years. These alternatives included discontinuing beach nourishment, varying cycles of beach nourishment, phased beach nourishment, and beach nourishment with structures.

To evaluate implications of discontinuing beach nourishment, a shoreline position forecast was made with the GenCade model, considering past wave conditions repeated consecutively to reach the 50-year timeframe. The resulting modeled shoreline was compared with structure footprints and parcels in a GIS framework. Structures, and their associated parcels, were considered impacted if the modeled 50-year shoreline came within 20 ft of the main structure footprint. Based on this analysis, approximately 1330 parcels were impacted, containing a total value of $805 million (2023 dollars). In addition to the potential property losses, potential losses to annual property tax could reach $3.9 million (2023 dollars). There are also significant potential economic implications for tourism if the beach is not maintained.

Varying cycles of beach nourishment along Reaches 1 to 4 were evaluated using estimated volume requirements and costs. An 8-year nourishment cycle had the lowest costs over the 50-year timeframe, because it minimized the number of projects and therefore lower mobilization and demobilization costs and lower costs per cubic yard for sand placement. However, a 6-year planning cycle allows for less expensive individual projects and more frequent ability to adapt to changes in the volumetric erosion rate. The nourishment interval is also flexible in that if volumetric triggers are not reached, the time period between projects can be extended, or the spatial limits of the project can be customized. Some general advantages of nourishing all of the reaches in each project are that this practice

reduces the number of projects required over the 50-year planning horizon, minimizing mobilization/demobilization costs as well as the number of times the permitting process is required. Additionally, it may be perceived as equitable by residents and property owners as all of the reaches are nourished each time. However, in this case all of the reaches are affected by the disruptions and potential environmental impacts associated with the nourishment project every time.

A phased approach was also considered where the interval between placement events would differ between Reach 1 and Reaches 2 to 4. Because the volumetric erosion rate in Reach 1 is less than that of the other reaches, direct placement of sand in Reach 1 can have a longer nourishment interval than Reaches 2 to 4. The phased approach provides nourishment volumes that would allow for Reach 1 to be nourished every other time that Reaches 2 to 4 are nourished. For example, the nourishment interval for Reaches 2 to 4 could be 4 years, while Reach 1 can be nourished every 8 years (a 4/8 year cycle). Intervals of 4/8 year cycles and 5/10 year cycles were evaluated. The 5/10 year cycles are the less expensive option over the 50-year master plan timeframe. The phased approach results in lower costs per cubic yard for Reach 1, because there is higher fill density for each project. In addition, the Reach 1 portion of the Town's shoreline is not subject to the disturbances and environmental impacts associated with project construction as often. Phasing also alternates between a lower-cost and a higher-cost project, which may have financing advantages for the Town. However, because there are more frequent projects in the phased approach than in the 6-year cycle or 8-year cycle where all of the reaches are nourished, overall mobilization and demobilization costs for the 50-year master plan timeframe are higher. Additionally, more frequent projects increase the number of times the environmental permitting process is required.

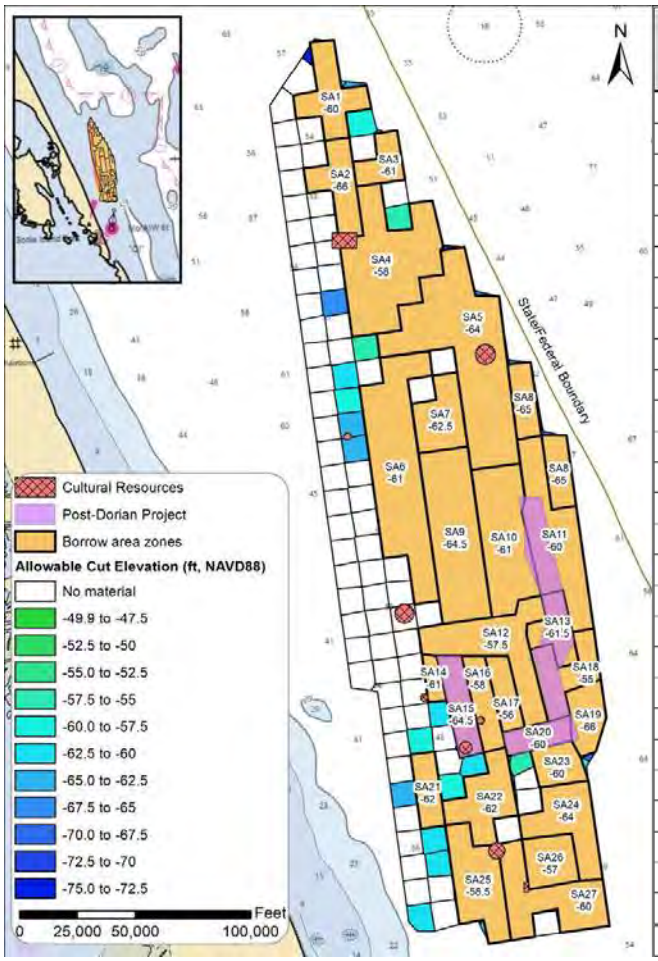
Structural alternatives to reduce erosion rates in South Nags Head (Reach 3S and Reach 4) were also considered in the alternatives analysis. Nearshore breakwaters added significant costs because the reduction in erosion provided by the breakwaters is not enough to substantially reduce the nourishment requirements. A groin alternative is shown to significantly reduce the erosion rates in Reaches 3S and 4, however, adverse downdrift effects are modeled within the Cape Hatteras National Seashore. These downdrift effects would likely add costs for required mitigation/downdrift sand placement. It is noted that oceanfront erosion control structures are currently not allowed under North Carolina G.S. § 113A-115.1, with the exception of terminal groins constructed at the terminus of an island or on the side of an inlet. Because the town is not immediately adjacent to Oregon Inlet, the groin approach would not fall within this exception.

Additional considerations for beach nourishment project design were reviewed, including project funding sources, feasibility of construction, and tourism and recreation. These factors can influence design and construction and can be evaluated on a project-by-project basis. Funding considerations may constrain a beach nourishment project in terms of the volume that is able to be placed with the available funds, as well as the timing of projects if funding sources take time to secure or favorable bids are not received from contractors. For beach nourishment project construction, there is generally a minimum fill volume density that is economically feasible for a contractor to construct. This volume density may vary depending upon the borrow source characteristics, dredging and placement

methodology, and desired template. The engineering design and permitting of each nourishment event should include analysis to determine whether higher volumes with lower unit costs or lower volumes with higher unit costs will be more advantageous for the Town in terms of overall project cost. Finally, in addition to beach nourishment providing protection for the Town's infrastructure, there are also recreational benefits to consider. The Town may choose to increase the volume of a planned beach nourishment to provide additional recreational beach width.

Maintenance of established dunes through best management practices is an important part of preserving and growing a healthy dune system. Dune planting along with installation of sand fencing is a proven method of stabilizing dunes and capturing sand, contributing towards dune growth. In order to create a robust vegetation system, it is recommended to participate in seasonal inspections and planting so as to allow for planting of multiple species of dune vegetation throughout the year.

A comprehensive evaluation of the previously identified borrow area S1 located offshore of Nags Head was performed, including collection of detailed geophysical and geological data to characterize and quantify the beach-compatible sand available. Sub-zones were delineated as shown in Figure ES-2, with allowable dredge cut elevation and available beach-compatible sand also presented. Based on this analysis of borrow area S1, approximately 67.9 Mcy of beach compatible material is made available. This quantity is considered sufficient to accommodate the estimated placement requirement of approximately 49 Mcy for the town's beach management efforts over the next 50 years.



Zone	Allowable Cut Elevation (ft, NAVD88)	Available Sand to Cut Elevation (cy)
SA1	-60	236,947
SA2	-66	1,476,340
SA3	-61	423,663
SA4	-58	2,306,244
SA5	-64	10,013,758
SA6	-61	5,949,522
SA7	-62.5	2,308,713
SA8	-65	2,902,471
SA9	-64.5	8,501,582
SA10	-61	5,796,575
SA11	-60	3,917,228
SA12	-57.5	4,195,481
SA13	-61.5	420,665
SA14	-61	329,510
SA15	-64.5	111,967
SA16	-58	692,023
SA17	-56	473,870
SA18	-55	1,272,303
SA19	-66	1,320,016
SA20	-60	USED
SA21	-62	626,489
SA22	-62	2,474,583
SA23	-60	1,374,315
SA24	-64	3,308,557
SA25	-58.5	2,160,860
SA26	-57	1,867,713
SA27	-60	3,424,295
SUM		67,885,691

Figure ES-2: Borrow Area Sub-Zones and Corresponding Maximum Dredge Cut Elevations

The master plan approach is designed to make the regulatory process more streamlined and efficient by developing volumetric requirements and evaluating borrow sources in advance of an imminent project. The required permitting process for a beach nourishment project includes both CAMA and USACE permits and coordination with multiple state and federal agencies. Construction moratoriums and avoidance measures are required to minimize environmental impacts of each project. Because of the coordination required as well as the time needed for project engineering design, bidding, and financing the project, it generally takes on the order of two years to complete a project from initiation to construction start. The annual beach monitoring surveys along with the volumetric LoP triggers provide the tools for the Town to initiate this process well in advance of a needed maintenance project. If an emergency post-storm project is required, an application for FEMA post-disaster assistance is initiated along with the other project tasks. FEMA review can take on the order of six months, and depending on the storm occurrence timeline, it may be up to three years before a post-storm recovery project is constructed to replace the losses incurred during the storm event.

TOWN OF

NAGS HEAD, NC

Strategic Plan 2024

Adopted February 7, 2024

Board of Commissioners

Nags Head's Board of Commissioners, comprised of a mayor and four commissioners, makes policy decisions, and adopts ordinances in accordance with procedures and responsibilities set out in North Carolina law. The town manager then carries out these policies and directives.

Mayor
Ben Cahoon

Mayor Pro Tem
Mike Siers

Commissioner
Kevin Brinkley

Commissioner
Megan Lambert

Commissioner
Bob Sanders

2024 Town of Nags Head Strategic Plan

Introduction

Welcome to the 2024 Town of Nags Head Strategic Plan. This document serves as a comprehensive guide to our town's strategic direction and was developed collaboratively with the input from our community members and through a joint effort of our dedicated Board of Commissioners and staff. The starting point for this plan was the mission, vision, and goals from the 2021 Strategic Plan. A big thank you to everyone involved in the creation of our prior strategic planning documents.

Strategic Plan Process

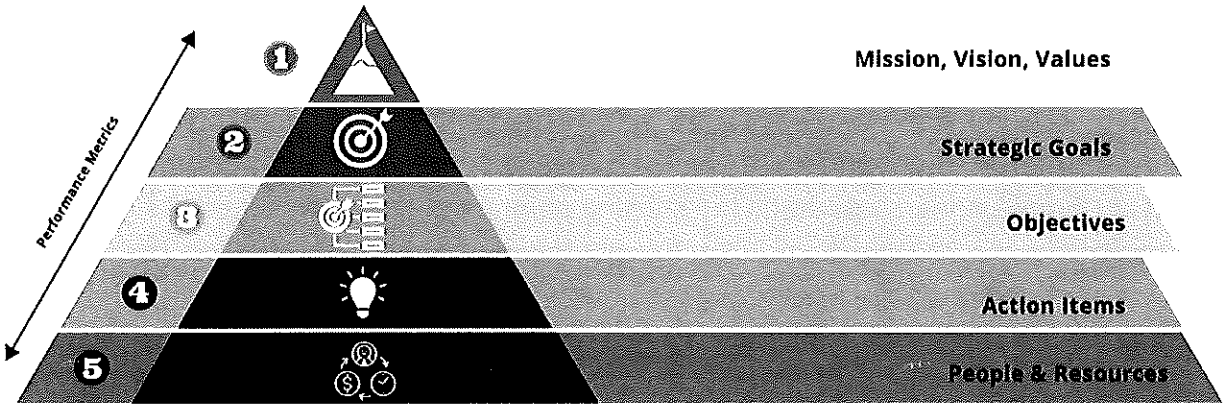
Community Involvement

The foundation of this plan lies in the collective wisdom of Nags Head's residents and property owners. In addition to reviewing strategic guidance from prior plans, we actively sought the input of our community to understand their needs, concerns, and aspirations for the town's future in the 2023 Community Survey. The insights gathered in the survey played a pivotal role in shaping the strategic priorities outlined in this plan.

Joint Board and Staff Retreat

To ensure alignment between community expectations and administrative resources, we held a retreat with the Board of Commissioners and Town staff November 16 – 17, 2023. The retreat allowed the Board and staff to align around the Community Survey results and other data, while sharing ideas and working collaboratively. The result is a strategic plan that reflects a shared vision of, and a commitment to, the town's future.

Included in the Plan



Goals, Objectives, and Strategic Action Items

The strategic plan goes beyond routine operations and defines a set of goals, objectives, and action items that guide the Town's direction. These items are forward-thinking, innovative, and designed to address both current challenges and future opportunities. They represent a commitment to proactive, intentional efforts to enhance the well-being of all residents and visitors.

Beyond Business as Usual

The strategic plan intentionally outlines action items that are outside the scope of "business as usual," so that we can channel resources efficiently and make a lasting impact on Nags Head's future. However, the daily operations of Town staff should be acknowledged as an integral part of our mission and vision.

Conclusion

The Town of Nags Head Strategic Plan is a dynamic roadmap that reflects the shared aspirations of our community, the dedication of our Board and staff, and a commitment to strategic action items that will shape our town's future. As we embark on this journey together, we invite all residents and property owners to actively participate and contribute to the realization of our collective vision.

Mission, Vision, and Goals

As part of the strategic planning process, the Board of Commissioners reviewed the Town's mission and vision statements. The statements below reflect the revisions from this process. The mission statement describes our purpose, or the reason we exist. The vision statement describes the future we would like to create and/or what success looks like for our community. The goals on the following page further articulate what we must accomplish to achieve our vision.

Mission

To support the well-being of our citizens, property owners, and visitors by delivering municipal services in an open, respectful, and responsive manner.

Vision

To thoughtfully preserve our unique coastal environment, heritage, and lifestyle now and for the future.

This vision is articulated as follows:

The Town of Nags Head is a unique coastal community built upon a legacy rooted in shared values, including our most recognized common bond - a love for the Outer Banks. We recognize that the town must be a good place to live before it can be a good place to visit. We strive to preserve and protect the Nags Head character, environment, tourism-based economy, and sense of place to ensure a high quality of life for residents and a memorable family vacation experience for present and future generations.

Legacy

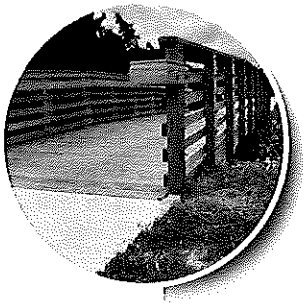
We uphold our legacy by protecting and promoting our small-town character that includes a sustainable local economy based on family vacation tourism, a high-quality beach experience, and small, locally owned businesses. Fundamental to our legacy and quality of life are preserving the historic architecture and culture that distinguishes our town; providing residents and visitors with excellent public services and well-maintained recreational amenities; and ensuring access to a well-protected natural coastal environment. Our legacy will be strengthened and preserved by a focused, transparent decision-making process that is comprehensive and consistent with the community's vision.

Goals

ENVIRONMENT

To safeguard our critical natural resources and coastal ecosystem.

DEVELOPMENT

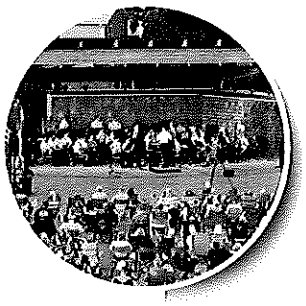


To achieve responsible, adaptive development that aligns with our community vision.

ECONOMY

To promote a sustainable economy that supports residents and visitors.

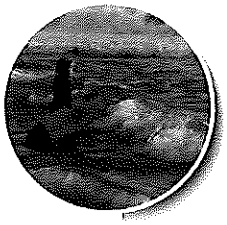
COMMUNITY SERVICES



To maintain an efficient government that provides high quality and cost-effective services.

Goals, Objectives, and Action Items

Environment



Goal: To safeguard our critical natural resources and coastal ecosystem.

Objective #1:	**Objective #2:**	**Objective #3:**	**Objective #4:**
Maintain the natural resources that we have	Mitigate the risk of natural disasters	Educate the public about their natural environment	Have a comprehensive strategy for clean water

Action Items:

#	Action	Related Objective(s)
1.1	Create water rates that incentivize water stewardship	#1
1.2	Develop implementation priorities/strategies for the Estuarine Shoreline Management Plan	#1, #2, #4
1.3	Complete/implement Beach Nourishment Master Plan to include: a. Engineering plan b. Financial plan to include recommended tax rates/revenues c. Include sprigging in all future plans	#1, #2, #4, Action #3.3
1.4	Complete Stormwater Management Plan/develop implementation plan w/ list of projects (for annual CIP)	#1, #2, #4
1.5	Complete Water System Master Plan/Develop implementation plan w/ list of projects (for annual CIP)	#1, #2, #4
1.6	Implement Decentralized Wastewater Management Plan w/ guidance from the Septic Health Advisory Committee	#1, #2, #4
1.7	Develop creative strategies to increase participation in the Septic Health Initiative	#3, #4
1.8	Create an education program to include a video series on the major threats to water quality in Nags Head (i.e. stormwater/ wastewater)	#3
1.9	Consider the impacts of sea level rise and climate change in policies/ordinances/planning studies	#1, #2, #3

ATTACHMENT 4

From: Tankard, Robert <robert.tankard@deq.nc.gov>
Sent: Wednesday, October 30, 2024 8:08 AM
To: Stewart, Glenn A; Bodnar, Gregg
Cc: David Ryan
Subject: FW: [External] JUNCOS STREET DUNE INFILTRATION PROJECT; DWR PROJECT NO. 20241126; DCM PROJECT NO. PA-1386
Attachments: 2024-28-10 DWR Robert Tankard Ltr.pdf

Please see the ad-info that was submitted to us. I have not had an opportunity to review, but after discussing with Mr. Ryan, this office has a plan forward to permitting this project. Any questions, please let me know.

Thanks!
Robert

Robert Tankard
Assistant Regional Supervisor
Division of Water Resources
North Carolina Department of Environmental Quality
Office: (252) 948-3921 | Cell: (252) 402-5694
Robert.tankard@deq.nc.gov

From: David Ryan <David.Ryan@nagsheadnc.gov>
Sent: Monday, October 28, 2024 4:43 PM
To: Tankard, Robert <robert.tankard@deq.nc.gov>; Vinson, Scott <scott.vinson@deq.nc.gov>
Cc: Freeman, Hunter <freeman@mcadamsco.com>; dhuggett <dhuggett@moffattnichol.com>; Zdeb, Kevin <kzdeb@moffattnichol.com>
Subject: [External] JUNCOS STREET DUNE INFILTRATION PROJECT; DWR PROJECT NO. 20241126; DCM PROJECT NO. PA-1386

Good afternoon Robert,
Thank you for taking the time out to speak discuss the Juncos St. Dune Infiltration Project. To assist with the feedback received, we have prepared a letter outlining the system intent, material construction, system function and maintenance, please see attached. For your reference, the permit plans sets are provided in two parts; Permit Plan Set 1-drainage collection system and Permit Plan Set 1A- infiltration gallery. Also included for your reference is a project specific Flood Reduction System Management Plan that will serve as a guide for system operation and maintenance.

Due to the plan file size, we are providing a link to a folder containing the plan sets and Flood Reduction System Management Plan. The files can be accessed here 2024-28-10 Project Area #12

If there is any additional information you require or have any additional questions pertaining to this project, please feel free to contact us.

Thank you.

David Ryan, P.E.
Town Engineer
Public Services Department
P: 252.441.6221
david.ryan@nagsheadnc.gov

Town of Nags Head
Post Office Box 99
Nags Head, NC 27959
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Fax 252-441-0776
www.nagsheadnc.gov

October 28, 2024

Robert Tankard
Assistant Regional Supervisor
Water Resources Water Quality Regional Operations Section
Department of Environmental Quality
943 Washington Sq. Mall, Washington, North Carolina, 27889
james.baltzer@deq.nc.gov

Re: Juncos St. Dune Infiltration Project; DWR Project No. 20241126; **DCM Project No. PA-1386**

Dear Mr. Tankard:

We are writing to provide clarifications for the proposed S. Old Oregon Inlet Rd. stormwater infrastructure improvements project located in Nags Head, North Carolina. A Division of Coastal Management CAMA Major Development Permit application was recently submitted for this project and a subsequent denial received.

We would like to respond to some of the questions you have raised during the review process.

The project intent is to reduce the frequency and depth of floodwaters resulting from rainfall surface runoff along S. Old Oregon Inlet Rd. in the proximity of Juncos St. Conventional drainage solutions are limited by elevated groundwater conditions, minimal hydraulic gradient, and potential water quality impacts via connections to the Atlantic Ocean or Roanoke Sound.

The drainage system proposal is comprised of three major system components, a discreet pipe collection system, a pump station for conveyance, and a subsurface infiltration gallery. The system is planned to be operated only with the occurrence of a significant rainfall event. Based upon site specific observations and resultant rainfall accumulation, a significant rainfall event is approximated to be 1.5 inches or greater. A review of recent rainfall totals for this area is anticipated to result in system operation in the range between six to twelve times annually following a significant rainfall event.

The discrete pipe collection is proposed to span along S. Old Oregon Inlet Rd between James St. and Juncos St. The project plans indicate a high-density polyethylene (HDPE) solid wall conveyance pipe connection between drainage inlets for the base bid option and an HDPE perforated conveyance pipe connection between inlets for an alternate bid option. The project is planned to be constructed with a solid wall conveyance pipe connection to mitigate the potential for on-site septic system effluent from propagating into the proposed drainage network.

There are several different management measures that are incorporated into the system design. The pump station can be operated via water level float activation, manually or remotely. In addition to the pumping system, management controls have been added to the infiltration gallery. An overflow pipe is connected to the infiltration chamber network to serve as a visual indicator for the system storage approaching capacity. Routing of the overflow pipe will be directed away from the ocean and towards the parking lot for localized infiltration or recirculate into the wet well. This information is noted on Sheet C2.5 from Nags Head Dune Infiltration Permit Set 1A, *(please note the drawing sets are divided between Permit Drawing Set 1 which describes the drainage collection part and Permit Drawing Set 1A which describes the wet well and dune infiltration gallery part).* Additional redundancy will be achieved via visual inspections during system operation and remote monitoring of an existing groundwater well downgradient of the infiltration gallery to monitor groundwater mounding conditions. A water level data logger is located within this well with remote monitoring capability and is currently operating as part of the Towns water quality monitoring program.

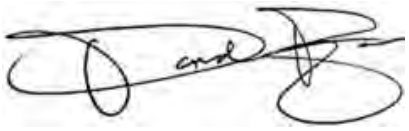
Experience with similar system operations has taught us the key to management of pumping systems is via on-site observations and continual monitoring. The approach to the proposed system operation will be no different. To aid with this, a specific operation and maintenance guide has been developed specifically for management of this system, (see attached Flood Reduction System Management Plan).

The project's purpose is to improve quality of life in Nags Head through the reduction of risks associated with flash flooding and standing water in a responsible manner.

Attached for your reference is a copy of the design plan set that was included with the CAMA Major Development Permit application. The plan set is divided into two parts; Permit Plan Set 1 which is the discrete pipe collection system along S. Old Oregon Inlet Rd. and Permit Plan Set 1A which is comprised of the connecting pump station and dune infiltration gallery system.

We appreciate your assistance with these matters. Should you have any questions or comments regarding the submitted information, please do not hesitate to contact me at (252) 441-6221. Thank you for your assistance in this matter.

Sincerely,



David M. Ryan, P.E. | **Town of Nags Head**
Town Engineer | Department of Public Services
P.O. Box 99
Nags Head, NC 27959
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REV
2024

FLOOD REDUCTION SYSTEM MANAGEMENT PLAN

OPERATIONS AND MAINTENANCE

PREPARED FOR: TOWN OF NAGS HEAD

PREPARED BY: MCADAMS

TABLE OF CONTENTS

BACKGROUND OF FLOODWATER MANAGEMENT OBJECTIVES

The Town of Nags Head is one of the many Coastal cities witnessing the effects of climate change firsthand. The National Oceanic and Atmospheric Administration's (NOAA) '2022 Sea Level Rise Technical Report' predicts that "by 2050, damaging flooding is expected to occur, on average, more than 10 times as often as it does today." This is driven in part by the sea level rise and by the more frequent and intense storm events expected to hit the coast. Hurricane driven storm surges driving up the water levels have historically posed significant threat to existing infrastructure, but smaller, more frequent storm events have caused more immediate safety and accessibility concerns for Nags Head residents. Standing water along heavily travelled road rights-of-ways create perilous driving conditions for Nags Head residents and often blocks pedestrian and bicycle paths. In an effort to alleviate the immediate effects of dangerous flooding and to be better prepared for the coming climate change induced impacts, the Town has implemented mechanical floodwater reduction systems subsequently described as part of their Master Plan.

The objective of floodwater reduction systems is to give Town staff and emergency first responders the infrastructure and equipment to pump floodwaters to suitable locations, away from high traffic areas or critical transportation route, where they can be stored, infiltrated, or retained using nature based strategies.

Mechanical floodwater reduction systems have alternative purposes and uses as well. In advance of large predicted storms, they can be used to temporarily restore the natural infiltration capabilities of the predominantly sandy soils in Nags Head. For decades, a lower water table allowed rainwater and stormwater runoff to infiltrate into the pervious soil areas without completely saturating the soil layer. More recently, rising groundwaters have reduced the total storage volume available and slowed the infiltration rate in many locations.

However, benefits do come with risks. If not properly managed, floodwater reduction systems can lead to subsidence, pumping of polluted water, or other unintended consequences.

This management manual aims to set a framework for proper management of the Town's existing and proposed systems, however the guidance contained herein is likely to be modified based on experience and lessons learned as more systems are installed and the volume of observational data grows.

OVERVIEW AND DESCRIPTION OF FLOOD REDUCTION SYSTEMS

Flood Reduction consist of four main design elements - a collection system, a pump (or multiple pumps), a force main or distribution system, and a receiving area.

These systems should not be directly connected to existing stormwater outfalls until additional research yields a higher level of confidence that direct discharge would not pose an environmental risk. (Permitting would likely be required). For the time being, the existing and proposed systems essentially create a closed loop where floodwater is pumped to a permissible area where it can infiltrate. The flood reduction benefits are, in theory, temporary, however some volume reduction is accomplished through evaporation and plant uptake.

At the time of this report, there are two existing systems in Nags Head Acres (mainly along Bridge Ln) and a pilot project location near Lost Colony Drive. Two additional systems are planned for construction in 2025 along South Old Oregon Inlet Road.

The existing systems use multiple smaller submersible pumps which pump into shared force mains that discharge into an infiltration basin near Health Center Drive.

The proposed systems each use a storm drainage collection network of which collect floodwater and direct it to a wet well. The concrete wet well houses a submersible pump which discharges to an infiltration area. The plans include one infiltration basin on the west side of S. Old Oregon Inlet Road, just north of the Town First Station at Ida St. The second system will discharge to a proposed dune infiltration system at the Junco St. Beach access (permit pending).

All systems include quick connects so the forcemains can be used in conjunction with emergency pumps that the Town maintains for use after large storms.

GENERAL COMPONENTS OF COLLECTION AND DISTRIBUTION SYSTEM

- Collection System
    - Existing systems use multiple low HP submersible pumps directly connected to the force main.
    - Proposed systems use a storm drainage system connected by gravity to a wet well. The proposed systems also have grate inlets to collect stormwater runoff directly from the ground surface.
- Debris Control
    - The existing systems use well screens to prevent large debris from damaging the pumps.
    - The proposed systems use grated inlets to limit the size of debris that can enter the wet well. The pumps have additional debris protection in the wet well.
- Pumps
    - The existing system uses 3 BHP submersible pumps designed to operate at between 75 and 80 gallons per minute.
    - The proposed systems include one 15 BHP pump in each wet well capable of operating at 500 gallons per minute.
- Force Main
    - Force mains are comparable to water lines, constructed using pressure rated PVC pipe or ductile iron water lines.
- Pump control
    - All pumps are currently manually operated from control panels located near the wet wells or along the project corridor.
    - The systems are designed to allow for future installation of remote operation to allow for more effective and adaptable response form Town staff.
    - Float switches ensure that pump systems shut off when water in the wells reach historical observed pre-project groundwater elevations.
- Infiltration Basins
    - The existing systems discharge to an above ground infiltration basin
    - One of the proposed systems will discharge to an underground chamber system within the oceanfront dune system.

- Each infiltration area has overflow protection to prevent surcharging, downstream erosion, or damage to the surrounding ecosystem.

INSPECTION AND MAINTENANCE CONSIDERATIONS

AREA OF INFLUENCE INSPECTIONS

The area of influence is the land area within 50 ft of the collection system. This is the area most likely to show signs of subsidence that may be indicative of unintended groundwater lowering or excessive unintended infiltration and inflow in the collection system. Inspections are recommended to aid in detecting any issues with the collection system or the soils in the area of influence.

ACTION ITEMS: Visual inspections are to take place every 30 calendar days and within 24 hours of a rain event exceeding 1.0 inch in 24 hours (if the pumps were operated) within the area of influence. Items to be especially aware of are listed and defined below:

Subsidence: Sinking of the ground near or around the pumping area because of underground material movement. This might be present in the form of either gradual settling or sudden sinking with little to no horizontal movement. Watch for cracking along roads or driveways, potholes directly above the collection system, or uneven settlement of soils.

Picture: An example of roadway damage.

Liquefaction: Occurs when a cohesionless saturated or partially saturated soil (i.e. sand) substantially loses strength and stiffness in response to an applied stress, therefore a material that is ordinarily a solid behaves like a liquid. This can happen as a result of storm wave loading or rapid changes in groundwater elevation and can cause pipes to float upward potentially breaching pavement.

Picture: Manhole breaches pavement as a result of liquefaction

PUMP OPERATIONS

The pumps shall operate at a minimum of 75 gpm @ 45 feet TDH within their intended design parameters. The motor shall not be loaded in excess of 110% of its nameplate rating within the normal operation range of the pump. Special baffling if required shall be set by the manufacturer – refer to manufacturer recommendations

The pumps are currently designed to be manually or remotely operated with a timer for automatic shut off. This is intended to prevent excessive pumping or pump burnout.

Inspect and test float switches to ensure that pumps are operating within the design floodwater elevation ranges.

Do not run the pumps unless flooding is present. If flooding does not decrease soon after starting the pumps, turn off the pumps and ensure that the collection system has sufficient inflow to provide a constant flow of water to the wet well and pumps.

PUMP INSPECTIONS

MAINTENANCE PRECAUTIONS

Pump maintenance presents a risk of serious personal injury. Maintenance of the pumps shall only be performed by trained and qualified personnel or contractors. Pumps contain moving mechanical parts and electrical connections in a wet environment.

Confined space entry certification may be required. All maintenance personnel and contractors shall have appropriate OSHA training and certifications to perform the intended work.

Applying heat to impellers, propellers, or their retaining devices may cause trapped liquid to rapidly expand and result in damage or injury. This manual clearly identifies accepted methods for disassembling units. These methods must be adhered to. Never apply heat to aid in their removal unless explicitly stated in this manual.

- Failure to disconnect and lock out the pump's power supply may result in serious physical injury or death. Always disconnect and lock out power to the pump before performing any installation or maintenance tasks.
- Electrical connections must be made by certified electricians in compliance with all international, national, state, and local rules.
- Refer to driver/coupling/gear manufacturer's installation and operation manuals (IOM) for specific instructions and recommendations.
- Lifting and handling heavy equipment poses a crush hazard. Use caution during lifting and handling and wear appropriate Personal Protective Equipment (PPE, such as steel toed shoes, gloves, etc.) at all times. Seek assistance if necessary.
- Precautions must be taken to prevent physical injury. Proper personal protective equipment should be worn. Pumpage must be handled and disposed of in conformance with applicable environmental regulations.

FREQUENCY OF MAINTENANCE/ TYPES OF INSPECTIONS

1. Routine inspections
2. Three-month inspections
3. Annual inspections
    - *Shorten the inspection intervals appropriately if the pumped fluid is abrasive or corrosive or if the excessive salt water enters the system.*

1. Routine Inspections

Perform these tasks whenever you check pumps during routine inspections:

- Check for unusual noise vibration and bearing temperatures.
- Check the pump and piping for leaks.
- Check the seal chamber and stuffing box for leaks.
- Ensure that there are no leaks from the mechanical seal.
- Adjust or replace the packing in the stuffing box if you notice excessive leaking.

Check the project area (collection system and force main) for:

- Trash and other debris,
- Settlement, potholes, or other unnatural soil surface conditions.
- Any seepage or unusually wet area should be further investigated and may require repairs to restore the infiltration capabilities of the soil or repair of the distribution system.
- Any damaged or eroded areas should be noted, repaired, and monitored. Repeated damage may be a sign that there is damage to an underground collection of distribution systems.

2. Three-month inspections

Perform these tasks every three months:

- Check that the wet wells and associated concrete foundation are in good condition.
- Check that pump connections and hold-down bolts are tight.
- Check the shaft alignment and realign as required.
- Repair any damaged plumbing within the wet well.
- Check amp draw on the pumps.

3. Annual inspections

Perform these inspections one time each year:

- Check the pump capacity and pressure and power.
- Operate and test quick connects and other emergency connection hardware.
- Thoroughly inspect all components (inlets, pipes, drains etc) of the collection system.
- Inspect roadways, sidewalks, and other infrastructure within the area of influence for signs of cracking, pavement damage, or other potential failures.

If the pump performance does not satisfy the original design parameters, and the process requirements have not changed, then perform these steps:

- Disassemble the pump, inspect all working components, replace worn parts per manufacturers specifications and retest. If repairs cannot address the issues, replace the pump.

Report all other inspection notes to the Town Engineer for further investigation. Repair or maintain all components of the system to ensure that they remain in proper working condition.

STORMWATER DISCHARGE OUTFALL INSPECTIONS

Frequency: Shall occur at least once per 7 calendar days and within 24 hours of a rain event exceeding 1.0 inch in 24 hours or pumping of stormwater.

Action Items:

- Outfalls shall be cleared of any debris.
- Should there be indication of upstream pollutants such as oil sheen, floating or suspended solids or discoloration, inspector to document description of pollutant, evidence, and date of corrective actions taken.
- Cease pumping if infiltration areas do not show signs of infiltration.
- If standing water is present for more than 24 hours, perform soils testing to ensure that soil infiltration rate has not been compromised.
- If infiltration is slow during dry periods, rake the surface of the infiltration area and remove and poor soils.
- Removed soils should be replaced with clean sand to maintain the surface elevations of the original design.
- Cease pumping operations if there are signs of downstream erosion
- Check overflow measures to ensure proper operation. If system is overflowing frequently during normal pump operations check infiltration area for adequate infiltration.

Corrective Action Items:

- Maintenance to correct deficiencies of the infiltration areas and outfalls will vary
- Common maintenance items may include:
    - Vegetation maintenance (pruning, leaf blowing)
    - Debris removal
    - Removal of fines and silts from the top layer (+/- 2”) in clogged areas of the infiltration system
    - Raking and tilling of clean sand into the top layer of the infiltration system
- Contact the Town engineer or a qualified stormwater engineer or soil scientist before conducting major maintenance activity.

COORDINATON WITH WATER LEVEL MONITORING

The Town operates series of water level and water quality data loggers. It is important to keep a log of when the floodwater reduction systems are in operation so that this data can be synced with the water level data. The Town should keep a log tracking when pumps were turned on and turned off, the reason for the pump operation (pre-storm, standing water, flooded conditions etc.) and notes about the result of the pumping operation. Where standing water or floodwaters are presents prior to pump operation, estimating the total drawdown depth based on visual operation is helpful in correlating the pumping data to the water level data.

APPENDIX

Flood Reduction System Maintenance Checklist

Town of Nags Head, North Carolina

Facility ID: **Date:**

Address: **Three-month Inspection ☐ Annual Inspection ☐**

Note: It shall be noted that the items included in this inspection checklist are not an exhaustive list of inspection items for any facility. As each facility is different, the Town looks to the professional inspecting the facility to perform a comprehensive inspection of the facility and list all items found during the inspection on the inspection checklist. The miscellaneous portion of this checklist can be used for these purposes. Any additional relevant documents may also be attached to the end of this checklist.

Checklist Status Codes

Fully Functional (No problems Found) = Pass for Inspection

Minor Function Issues = to be corrected during routine maintenance

Partially Functional (Repairs Needed) = Fail the Inspection

Not Functional (Repairs Needed) = Fail the Inspection

Not Applicable

***To be checked during three-month inspection**

****To be checked during annual inspections – consult approved pump specifications**

Assessment	Status	Comments
PUMP		
Unusual noise or vibration		
Bearing temperatures		
Pump and piping leakage		
Seal chamber leakage		
Mechanical seal leakage		
Packing in stuffing box		
***Foundation and hold-down Bolts**		
***Shaft alignment**		
***Amp Draw (check Manufacturer specs)**		
****Pump capacity**		
****Pump pressure**		

Flood Reduction System Maintenance Checklist

Town of Nags Head, North Carolina

Facility ID: **Date:**

Address: **Three-month Inspection ☐ Annual Inspection ☐**

Assessment	Status	Comments
PUMP		
**Pump power		
AREA OF INFLUENCE		
Note: Any deficiencies found in the zone of influence shall be immediately reported to the Town for further investigation.		
Water Ponding (exceeding 24 hours after storm)		
Subsidence		
Pavement Cracking		
INFILTRATION AREA / STORMWATER DISCHARGE OUTFALL		
Upstream pollutants (trash, debris, oil sheen, etc.)		
Downstream Area		
Seepage, water flow?		
Standing water?		
SPACE FOR ADDITIONAL OBSERVATIONS BELOW		

ATLANTIC OCEAN

Formerly First St.
now **Juncos St.**

PROPERTY

SOUTH ST.

FOURTH ST.

THIRD ST

SECOND ST N74°45'E

FIRST ST

IRON STAKE

FRED LEWIS

IRON STAKE

BODIE ISLAND LIGHT HOUSE S 5°-30'E

IRON STAKE

TO NAGS HEAD & MANTEO ← N 15°-15'W N.C. STATE HIGHWAY → TO OREGON INLET

N. MILLER

GOOSE WING CLUB
N. MILLER

WATER TANK, MANTEO
N 60°-00'W

SOUTH PROPERTY LINE S 66°-30'W 649.90'
TO U.S.G.S. CONC. MON.

PLAT OF SECTION ONE HOLLYWOOD BEACH

DARE COUNTY
N.C.

Scale - 1 in. = 200
AUG. 9th 1951
D.H. Lawrence - REGISTERED SURVEYOR

I, D.H. LAWRENCE, HEREBY CERTIFY THAT I MADE THIS PLAT OF HOLLYWOOD BEACH SUBDIVISION, THAT I MADE THE ACTUAL SURVEY OF THE SUBDIVISION & THAT IT IS CORRECT TO THE BEST OF MY KNOWLEDGE & BELIEF.

D.H. Lawrence

SUBSCRIBED TO & SWORN TO BEFORE ME THIS 13th DAY OF AUG. 1951.

MY COMM. EXPIRES:
Dec 8-1952

NOTARY PUBLIC
Elbre C. Twiford

North Carolina
Dare County.

The foregoing certificate of Elbre C. Twiford, Notary Public of Dare County, North Carolina, duly attested by his notarial seal, is adjudged to be correct. Let the plat, and certificates, be registered.

Witness my hand this August 16, 1951.

C. W. Meekins

LAUREN ARIZAGA-WOMBLE
M. H. HOOD ELLIS
MARSHALL H. ELLIS *
LOUIS J. HALLOW, III
ROBERT B. HOBBS, JR.**
L. PHILLIP HORNTHAL, III
ANDREW W. HOWLE
JOHN D. LEIDY
W. BROCK MITCHELL
DONALD C. PRENTISS
ZACHARY M. ROBESON

* BOARD CERTIFIED SPECIALIST IN FEDERAL AND STATE CRIMINAL LAW

** BOARD CERTIFIED SPECIALIST IN REAL PROPERTY LAW

HORNTHAL, RILEY, ELLIS & MALAND, L.L.P.
ATTORNEYS AT LAW
2502 S. CROATAN HIGHWAY
NAGS HEAD, NORTH CAROLINA 27959

TELEPHONE (252) 441-0871
TELEFAX (252) 441-8822
INTERNET: www.hrem.com

RETIRED
L. P. HORNTHAL, JR.
MARK M. MALAND
CHARLES W. OGLETREE
J. FRED RILEY
THOMAS L. WHITE, JR.

OTHER OFFICE
ELIZABETH CITY, NC

TITLE OPINION

RE: Juncos Street Public Beach Access, Town of Nags Head, North Carolina

I hereby certify that I am a member in good standing of the North Carolina State Bar and have been requested to determine record ownership for the parcel of property on which the above referenced project will be constructed, Juncos Street (formerly known as First Street), as shown on a map or plat of Hollywood Beach Section One, recorded in Map Book 1, Page 93, Dare County Registry (see attached copy).

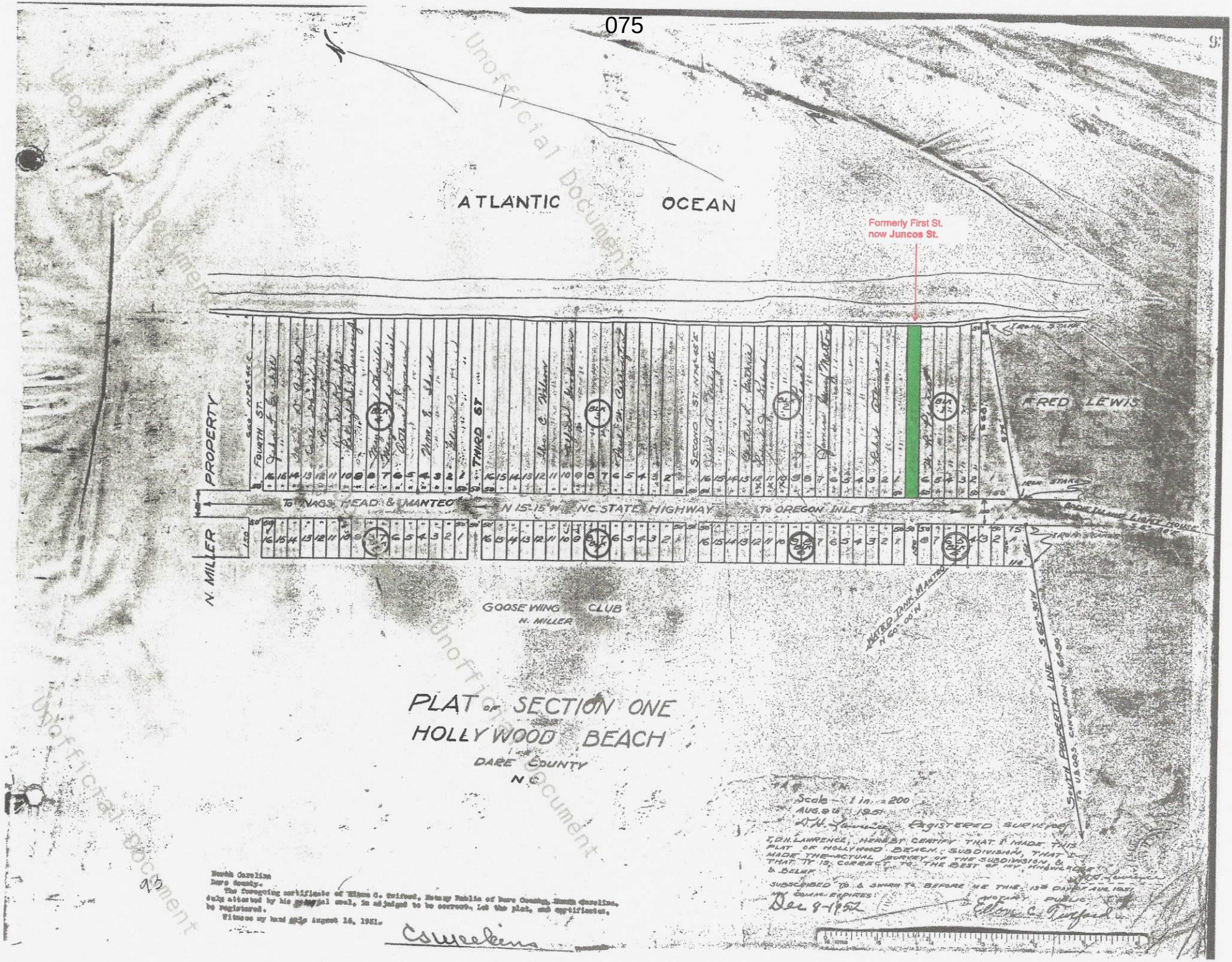
After examining appropriate public records in accordance with the laws of the State of North Carolina, and as of the date stated above, I hereby certify that title to the parcel is held by the Town of Nags Head as a dedicated street easement in perpetuity accepted by the Town of Nags Head by ordinance entitled "An Ordinance Accepting Certain Streets and Public Ways In The Town Of Nags Head As Public City Streets," adopted February 12, 1975 and recorded in Minute Book XII of the Nags Head Board of Commissioners (see attached copy). I have further determined that there are no easements or other encumbrances of record encumbering the street right-of-way except for an implied easement for public access within said street right-of-way by virtue of the said recorded plat. The Town has site control of the street right-of-way.

Period of search: February 12, 1975 to July 30, 2024 at 7:30AM.

HORNTHAL, RILEY, ELLIS & MALAND, LLP

BY: _____

Robert B. Hobbs, Jr.
N.C. State Bar No. 13543
2502 South Croatan Highway
Nags Head, NC 27959
Telephone: (252) 441-0871
Facsimile: (252) 441-8822
Email: rhobbs@hrem.com


ATLANTIC OCEAN
Formerly First St.
now Juncos St.
PROPERTY
FOURTH ST.
THIRD ST.
SECOND ST.
FRED LEWIS
N. MILLER
To NAGS HEAD & MANTEO
N 15° 15' W NC. STATE HIGHWAY
To OREGON INLET
GOOSE WING CLUB
N. MILLER
WATER TANK, MANTEO
N 60° 00' W
PLAT OF SECTION ONE
HOLLYWOOD BEACH
DARE COUNTY
N C
Scale — 1 in. = 200
AUG. 8 '51
Registered Surveyor
I, R.H. LAWRENCE, HEREBY CERTIFY THAT I MADE THIS PLAT OF HOLLYWOOD BEACH, SUBDIVISION, THAT I MADE THE ACTUAL SURVEY OF THE SUBDIVISION & THAT IT IS CORRECT TO THE BEST OF MY KNOWLEDGE & BELIEF.
SUBSCRIBED TO & SWORN TO BEFORE ME THIS 13th DAY OF AUG 1951
COMM. EXPIRES
Dec. 9-1952
NOTARY PUBLIC
Ellen C. Twiford
North Carolina
Dare County.
The foregoing certificate of Ellen C. Twiford, Notary Public of Dare County, North Carolina, duly attested by his notarial seal, is adjudged to be correct. Let the plat, and certificates, be registered.
Witness my hand this August 14, 1951.
C.S. Wheeless

AN ORDINANCE ACCEPTING CERTAIN STREETS AND PUBLIC WAYS IN

THE TOWN OF NAGS HEAD AS PUBLIC CITY STREETS AND WAYS

Be it ordained by the Board of Commissioners as follows:

WHEREAS there are numerous plats of subdivisions located in the Town of Nags Head which plats are recorded in the office of the Register of Deeds of Dare County, North Carolina, which plats offer for dedication streets and ways therein named or designated;

AND WHEREAS the Board of Commissioners of the Town of Nags Head deems it necessary that certain of the streets and ways be preserved for access to and from lands located in the Town of Nags Head, paved streets, throughways, roads and highways and the beaches bordering on the Atlantic Ocean and Roanoke Sound;

NOW, THEREFORE, be it ordained as follows:

1. That the streets, roads and ways hereinafter designated, shall be and the same are hereby designated public streets, roads and ways, the dedication of which is hereby accepted by the Town of Nags Head as municipal streets, roads and ways.

2. That the acceptance of these streets, roads and ways does not obligate the Town of Nags Head to open, pave or maintain the said streets, roads or ways until such time as, in the opinion of the Board of Commissioners, sufficient funds are available and when in their opinion said opening, paving or maintaining is required for the continued orderly development of the Town of Nags Head.

3. The listing of streets, roads and ways hereinafter designated does not constitute an inclusive listing of all streets, roads and ways accepted for dedication and maintained by the Town as it is recognized that there are other streets, roads and ways which have either been dedicated and accepted by the Town or have been deeded to the Town of Nags Head or which have been opened and maintained by the Town.

4. Those streets, roads and ways, the dedication of which is accepted by the Town of Nags Head in accordance with this ordinance are as follows:

(a) 1st Street through 8th Street inclusive, Vero, Ray, Warren, Huron, Memorial, and Wrightville Avenues or streets all as shown on a map or plat of Nags Head Shores Subdivision recorded in Map Book 1, Page 179; Map Book 1, Page 189; and Map Book 1, Page 191; Dare County Registry, as said streets are thereon named or as said names have been changed or shall be changed in the future.

(b) 1st through 4th Streets inclusive as shown on a map or plat of Bodie Island Beach Subdivision recorded in Map Book 1, Page 158, Dare County Registry, as said streets are thereon named or as said names have been changed or shall be changed in the future.

(c) Egret Avenue, Turnstone Avenue, Vincent Avenue, Charlew Street, Douglas Street, Evans Street, Plover Street, Tern Street, Curlew Street, and Osprey Street, as shown on Maps or Plats of Whalebone Beaches and Nags Head Beach as shown in Map Book 1, Page 148; Map Book 1, Page 153; Map Book 1, Page 154; Map Book 1, Page 167; Map Book 1, Page 185 and Map Book 1, Page 186 and as may be amended by map or plat entitled " Revised Plat of Whalebone Beach", recorded in Map Book 2, Page 203, all in the Dare County Registry, as said streets are thereon named or as said names have been changed or shall be changed in the future.

KELLOGG, WHALEY AND WHITE
ATTORNEYS-AT-LAW
MANTEO, N. C. 27954

(d) Pond Avenue, Fourth Avenue, Third Avenue, Second Avenue, and First Avenue as shown on a map or plat of Fresh Pond Beaches recorded in Map Book 1, Page 51 and Map Book 2, Page 68, Dare County Registry, as said streets are thereon named or as said names have been changed or shall be changed in the future.

(e) First through Ninth Streets inclusive as shown on maps or plats of Hollywood Beach Subdivision recorded in Map Book 1, Page 26; Map Book 1, Page 42; Map Book 1, Page 78; Map Book 1, Page 93; and Map Book 2, Page 26 as amended in Map Book 2, Page 194, Dare County Registry, as said streets are thereon named or as said names have been changed or shall be changed in the future.

(f) Benedict Avenue, Carolyn Avenue, Danube Avenue, Explorer, Glory Street, Moone Street, Dune Street, Hill Street, Ri[illegible]e Street, and also four twenty foot unnamed lanes and one fifty foot unnamed street North of Benedict Avenue, and one fifty foot unnamed street between Virginia Dare Trail and the Atlantic Ocean situated between Benedict Avenue and Carolyn Avenue as extended, all as shown on the following maps or plats of Nags Head Beach and Roanoke Sound Shores recorded in Map Book 2, Page 114; Map Book 2, Page 143; Map Book 2, Page 90; Map Book 1, Page 184 and Map Book 1, Page 192 all in the Dare County Registry, as said streets are thereon named or as said names have been changed or shall be changed in the future.

(g) Old Road, Lakeside Avenue, 1st through 5th Streets inclusive and a twenty foot unnamed right of way Sound to Ocean and also 11.5 foot drive all as shown on a map or plat of Roanoke Shore recorded in Map Book 1, Page 81, Dare County Registry, as said streets are thereon named or as said names have been changed or shall be changed in the future.

(h) Sound Road also known as Soundside Road as shown on a map or plat of the Gertrude Sucro Lots recorded in Map Book 1, Page 162, Dare County Registry, as said streets are thereon named or as said names have been changed or shall be changed in the future.

(i) Outlaw Avenue, Winston Avenue, Hollowell Avenue, Wood Avenue, and Reed Avenue, as shown on a map or plat of the George T. Stronach, Trustee Lots, recorded in Map Book 1, Page 196, Dare County Registry, excepting that portion of Outlaw Avenue which has been withdrawn from dedication and which has been relocated as a result of a Judgment in the suit of Foreman vs The Town of Nags Head, Judgment of which is recorded in the Office of the Clerk of the Superior Court of Dare County, North Carolina, as said streets are thereon named or as said names have been changed or shall be changed in the future.

(j) Colony Court, Second Street and Third Street, Sunset Terrace and Morning View Place, as shown on Maps or Plats of Vista Colony and Vista Colony Section II, recorded in Map Book 3, Page 38 and Map Book 3, Page 108, Dare County Registry, as said streets are thereon named or as said names have been changed or shall be changed in the future.

(k) Roanoke Avenue and Cedar Avenue as shown on a map or plat of Roanoke Beaches recorded in Map Book 1, Page 197, Dare County Registry, as said streets are thereon named or as said names have been changed or shall be changed in the future.

(l) Driftwood Street and Sea Oat Street as shown on a map or plat recorded in Map Book 2, Page 63, Dare County Registry, as said streets are thereon named or as said names have been changed or shall be changed in the future.

KELLOGG, WHEELESS AND WHITE
ATTORNEYS-AT-LAW
MANTEO, N. C. 27954

5. This Ordinance shall be in effect from and after the 12th day of February, 1975.

Mayor

ATTEST:

Town Clerk

TOWN ATTORNEY:

Adopted 2/12/75

Recorded in Minute Book XII

KELLOGG, WHELESS AND WHITE
ATTORNEYS-AT-LAW
RALEIGH, N. C. 27604

ORDINANCE AMENDING THE ORDINANCE ACCEPTING CERTAIN STREETS AND PUBLIC WAYS IN THE TOWN OF NAGS HEAD AS PUBLIC CITY STREETS AND WAYS ADOPTED ON FEBRUARY 12, 1975

BE IT ORDAINED by the Board of Commissioners as follows:

1. That the ordinance accepting certain streets and public ways in the Town of Nags Head as public city streets and ways adopted by the Board of Commissioners on the 12th day of February, 1975 is hereby amended by adding a paragraph (m) to paragraph 4 thereof as follows:

(m) Roanoke Avenue as shown on a map or plat entitled "Plan of Nags Head Hotel Property" recorded in Book U, Page 378, Dare County Registry and on the map or plat entitled "Map of Old Hotel Lots" recorded in Book 15, Page 219, Dare County Registry, as said streets are thereon named or as said names have been changed or shall be changed in the future.

2. This ordinance shall be in effect from and after the 3rd day of March, 1975.

MAYOR

ATTEST:

TOWN CLERK

TOWN ATTORNEY:

Adopted 3/3/75

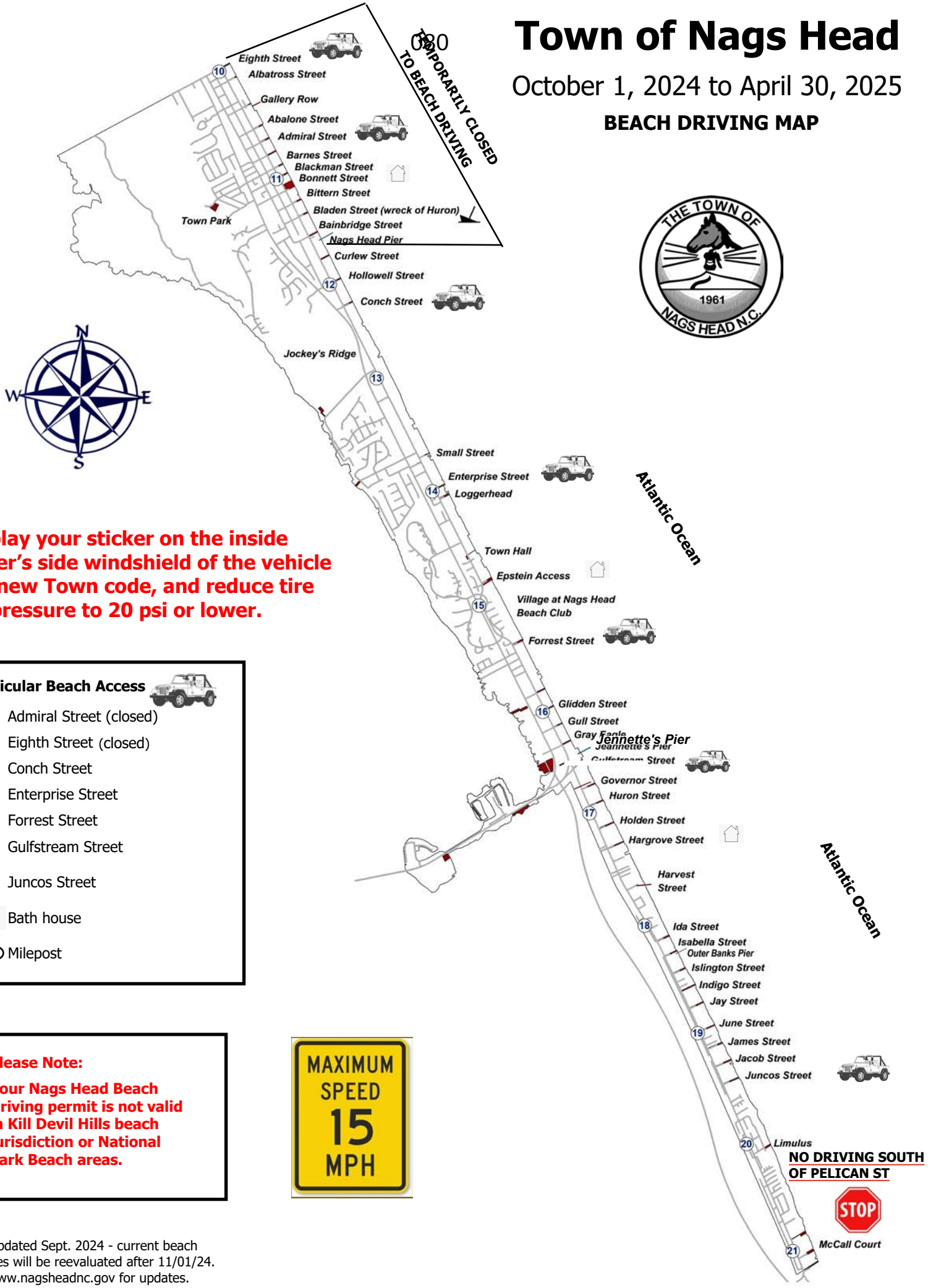
Recorded in Minute Book XIII

KELLOGG, WHELESS AND WHITE
ATTORNEYS-AT-LAW
MANTEO, N. C. 27954

Town of Nags Head

October 1, 2024 to April 30, 2025

BEACH DRIVING MAP



Display your sticker on the inside driver's side windshield of the vehicle per new Town code, and reduce tire air pressure to 20 psi or lower.

Vehicular Beach Access

- Admiral Street (closed)
- Eighth Street (closed)
- Conch Street
- Enterprise Street
- Forrest Street
- Gulfstream Street
- Juncos Street

Bath house

Milepost

Please Note:

Your Nags Head Beach Driving permit is not valid in Kill Devil Hills beach jurisdiction or National Park Beach areas.

MAXIMUM SPEED 15 MPH

Last updated Sept. 2024 - current beach closures will be reevaluated after 11/01/24. See www.nagsheadnc.gov for updates.

TOWN OF NAGS HEAD
REGULATIONS GOVERNING OFF-ROAD VEHICLES

The general rules of operation on Beach Driving are listed below for quick reference along with a summary of the Town of Nags Head ordinance (the complete Town of Nags Head ordinance can be found on our web site at **www.nagsheadnc.gov/173/beach-driving**.
Please familiarize yourself with these rules. Please understand that driving an off-road vehicle on the beaches of Nags Head is a privilege. **The Town of Nags Head Manager shall have the authority to close any vehicle access point and portion of the beach at any time for any reason.** Due to beach populations and weather, busier areas of the beach may be closed to beach driving at the beginning and end of the season and will be re-evaluated and opened as conditions warrant. The Town of Nags Head has made every effort to accommodate four-wheel drive vehicles on the beach. At the same time, in order to ensure your safety, the safety of pedestrians, and the protection of the beaches, the Town of Nags Head must enforce certain regulations with respect to beach driving privileges. These rules are as follows:

- Beach Driving Permits are authorized to be used on the designated ocean beach areas within the Town of Nags Head jurisdiction only, and only during the beach driving season from one-half hour prior to sunrise on October 1 until one-half hour past sunset on April 30 of the following year. **This permit is not valid in the Kill Devil Hills beach jurisdiction or National Park Beach areas**.
- Stay off the dunes and private property. The Nags Head dune system is very fragile and can be destroyed by vehicles running over the vegetation. Please stay to the east or ocean side of any sand fence or dune vegetation. Under no circumstances does a beach driving permit allow you to drive your vehicle on private property without the express permission of the owner.
- Enter and exit the beach at designated and marked access points only.
- The speed limit on the beach is now **15 mph**. **The Town of Nags Head strongly encourages all beach drivers to reduce tire air pressure to 20 psi.**
- **Display your sticker on the inside driver's side windshield of the vehicle.** In the case of a bona fide fishing tournament, a temporary permit signed and sealed by the Town of Nags Head clerk may substitute for a device or insignia which must be displayed in front dash of the vehicle when being operated on the beach.
- Only four-wheel drive vehicles that are properly registered in the state in which the vehicle is licensed are eligible to receive beach driving permits. ATVs, UTVs, and other similar off-road vehicles are not permitted on the beach. Vehicles must also have current inspections as required by the state in which they are licensed within. Modified utility vehicles ("MUTV") as described in N.C.G.S. 20-4.01(27) shall not be considered an "eligible" vehicle regardless of whether the MUTV is registered or licensed in any state.
- Applications for beach driving permits will be taken from 8:30 a.m. until 5:00 p.m. daily, Monday through Friday in the Municipal Complex at 5401 S. Croatan Highway. Additionally, Town of Nags Head designated tackle shops will also distribute applications and permits during their normal business hours. When applying for the permit, please have a valid driver's license, current vehicle registration and license plate number. **The fee is currently $100 per season or $50 per season for those applicants with proof of Town of Nags Head property ownership or residency (driver's license with Nags Head address, tax bill or utility bill of property with name of owner or resident). The $50 permit is only available for purchase at the Town of Nags Head Municipal Complex (the $50 permit cannot be purchased online or at designated tackle shops).** The fee is subject to change by the Board of Commissioners. Beach drivers must comply with all local regulations having to do with licensing, registration, inspection/insurance before a permit will be issued.
- **Permits may also be obtained online at www.nagsheadnc.gov/173/beach-driving for the $100 fee only.**
- Short term permits up to 14 days duration may be issued for a bona fide fishing tournament. Such permits may be issued after application by an organization meeting the requirements of this division sponsoring a bona fide fishing tournament. Such application shall be made three weeks in advance of the tournament and shall include the inclusive dates, not exceeding 14 days, and the number of permits required. Applications shall be forwarded to the Board of Commissioners for approval.
- Pedestrians, swimmers and bathers shall have the right-of-way over all vehicles being operated on the beach.
- All other state motor vehicle regulations as provided by G.S. §§ 160A-205, 160A-175, and Chapter 20 shall be enforced on the beach.
- Should you have any additional questions concerning beach driving, please call the Nags Head Town Hall (252-441-5508) during regular business hours (M-F 8:30 am to 5:00 pm).

Suggested equipment to carry while driving on the beach: shovel, jack, tow rope or chain, board or similar jack support, low pressure tire gauge, approved tires, and a spare tire. If your vehicle gets stuck in the sand and you need assistance, you will need to call a tow company. For all other emergencies (police, fire, ambulance, and ocean rescue) **DIAL 911.**

OTHER IMPORTANT TOWN OF NAGS HEAD REGULATIONS

PIT FIRES - A permit must be obtained from the Nags Head Fire Department (252-441-5909) prior to setting or lighting a pit fire. Permits for any type of fire can only be issued by the Nags Head office of the Fire Marshal (**www.nagsheadfirerescue.com**).

CAMPING REGULATIONS – Camping on the beaches of the Town of Nags Head is prohibited.

DOGS MUST BE ON A LEASH –See chapter 4, Article I, Animal Control of the Nags Head town Code of Ordinances. Animals on the beach shall be restrained by a leash, cord, or chain not exceeding ten (10) feet in length, held by a person who is physically able to control the animal. A collar or harness with attached current vaccination and identification tags must be worn at all times except when the dog is contained to the owner's premises. All feces shall be removed immediately. Burying feces in the sand or depositing in the ocean is prohibited and constitutes a violation of the Town of Nags Head Ordinance.

Division of Coastal Management

11/5/2024, 2:24:26 PM

Setback Factors (2020)

Pre-Project Vegetation Lines

Shorelines - Oceanfront & Inlet (1849-2020)

> 1,960 – 1,980

> 1,980 – 2,000

> 2,000 – 2,020

Erosion Rates (2020)

Erosion

Parcels

2020 Imagery

Red: Band_1

Green: Band_2

Blue: Band_3

1:1,128

0 0.01 0.01 0.03 mi

0 0.01 0.02 0.04 km

Permit Application Report

Application ID	Application Type	Submitted	App Complete	Deadline	Decision	Expiration
PA-1386	DCM Major Permit	06-27-2024	08-01-2024	10-21-2024		

Primary Applicant Information

Applicant Type	Title	Business Name	Name	Email	Business Phone	Mobile Phone
Business/Company		Town of Nags Head	Town of Nags Head	david.ryan@nagsheadnc.gov	2524416221	2524416221

Physical Address				Mailing Address			
Street 1	City	State	Zip	Street 1	City	State	Zip
5401 S. Croatan Hwy	Nags Head	North Carolina	27959	5401 S. Croatan Hwy	Nags Head	North Carolina	27959

Registered Agent Information

Agent Type	Title	Business Name	Name	Email	Business Phone	Mobile Phone
Business/Company		Moffatt and Nichol	Moffatt and Nichol	dhuggett@moffattnichol.com	19192181490	19192181490

Physical Address				Mailing Address			
Street 1	City	State	Zip	Street 1	City	State	Zip
305 COMMERCE AVE	Morehead City	North Carolina	28557	305 COMMERCE AVE	Morehead City	North Carolina	28557

Project Information

Project Name	Project Type	Disturbed Land Area (Sq Ft/Acres)
Juncos Street Dune Infiltration Project	Public/Government	23087 Sq. Ft. / 0.53 Acres

Is proposed project located in national registered historic district or national register listed/eligible: False

List of previous state or federal permits for work on project tract: N/A

Project Location Information

Address	County	River Basin	Subdivision	County Parcel ID	Latitude	Longitude
Juncos Street beach Access Town of Nags Head, NC 27959	Dare	Pasquotank	N/A	000108555	35.86937	-75.57519

Project Discharges to State Waters

Discharge Type	Surface Runoff	Sanitary Wastewater	Industry/Commercial Effluent	Vessel Wash Down	Residential	Other
New Discharges to State Waters						Dune Infiltration - subsurface discharge to ocean waters.

Wastewater/Stormwater Discharged Into Wetland?	Discharge Same Salinity as Receiving Waters	Is There Any Mitigation Proposed
False	False	False

Detailed Description of the Existing Development Located on the Property

Existing Man-Made Features:

Beach access facility (including parking lot,, gazebo, and above-ground shower), local roads and associated infrastructure.

Existing Land Uses:

Public parking for recreational access to the beach. Public transportation on adjacent public roads.

Existing Wastewater Treatment/Disposal:

None

Solid Waste/Fish Offal/Trash Disposal:

Trash receptacle on site.

Use and Daily Operations of the Project When Complete

Proposed Development Purpose:

Due to its elevation and location in a flood zone, as well as its relevance to the Town for pedestrian and vehicular traffic, there exists a need for flood mitigation and minimization on and around South Old Oregon Inlet Road and Juncos Street. The intent of the proposed project is to minimize flooding for small, regularly occurring storm events and quicken the floodwater recession from roads for major storms by pumping floodwaters to an underground infiltration system elevated within the existing sand dune. Flooding also affects vehicle access to the beach and restricts use of the multi-use path, while also limiting limits vehicle movements on South Old Oregon Inlet Road. This project is adjacent to a previously authorized drainage infrastructure improvement project (Project Area 12). The goal would be to supplement the existing roadside swale on the east side of South Old Oregon Inlet Road with a new drainage pipe, connected to a pump station that would convey the flood waters to the dune system at the Juncos Street beach access to infiltrate through the dune and be released to the Atlantic Ocean.

Currently the existing roadside conveyance system is mostly reliant upon evapotranspiration since the overland flow cannot reach the surface water outfalls within the South Old Oregon Inlet Road right of way. During storm events the low-lying areas intersect with the existing high groundwater table and existing soils are highly compacted due to urban development preventing any substantial infiltration. By pumping the runoff into the dune, it will decrease the flooding time of South Old Oregon Inlet Road as well as reduce the peak floodwater elevations, which will minimize any hindrances to vehicular access or pedestrian access to an important public beach access area.

Buildings/Facilities/Units/Structures:

Parking Lot will be re-established following instillation of the dune infiltration system.

Use & Daily Operations:

Once completed, the dune infiltration system will not impact existing parking and beach access capabilities at the project site.

Construction Methodology & Equipment:

Portion of existing parking lot will be removed and the dune infiltration system will be constructed using ADS Stormtech SC-740 chambers. The chambers are constructed of impact modified polypropylene copolymers and ship in 7.1-foot-long sections. Each section is 30-inches tall by 45-inches wide and overlap one another to create a continuous underground chamber.

Impacted parking lot will be restored following instillation of the dune infiltration system.

Development Activities Narrative Specifics:

System will provide the minimum 2’ separation from the groundwater table and allow for greater infiltration into the groundwater. The proposed dune infiltration system would start approximately 10’ landward of the first line of vegetation and extend approximately 84’ landward. The protective polyethylene geotextile will extend an additional 80’ landward to accommodate the vehicular traffic. Following a storm event, this project is anticipated to pump approximately 500 gallons of stormwater per minute. The infiltration basin will be centered at the apex of the dune.

Application Narrative:

Due to size limitations, detailed project narrative cannot be presented. A detailed Project Narrative is attached to this permit application package.

Boat Ramp Development Activity Included: False

Boat Ramp Dimensions				
Length	**Width**	**Avg Existing Depth**	**Final Project Depth**	**Distance Waterward of NHW/NWL**

Will Fill Material Be Placed In Any Of The Following Areas		
Area	**Sq. Ft. Affected**	**Purpose of Fill in This Area**
Coastal Wetland/Marsh (CW)		
Submerged Aquatic Vegetation (SAV)		
Shell Bottom (SB)		
Other Non-Coastal Wetlands (WL)		

Shoreline Stabilization Development Activity Included: False

Living Shoreline Development Activity Included: False

Piers & Docking Facilities Development Activity Included: False

Excavation Development Activity Included: False

Bridges & Culverts Development Activity Included: False

Oceanfront Erosion Control Development Activity Included: False

Temporary Structures Development Activity Included: False

Utility Crossings Development Activity Included: False

Freestanding Moorings, Buoys & Bird Nesting Poles Development Activity Included: False

Log Removal/Marine Debris Development Activity Included: Yes/No

Navigational Aids Development Activity Included: False

Other Fill Below Water Level Development Activity Included: False

Stormwater Structures Development Activity Included: True

Stormwater Structures - General
Does Stormwater Structure Have an Oceanfront Component: True

Navigational Aids Details			
Number of Buoys	**Number of Day Markers**	**Min Distance Each Aid Placed Beyond Shoreline**	**Max Distance Each Aid Placed Beyond Shoreline**

Upland Development For Stormwater Structures					
# of Lots/Parcels Created	**Lots Platted & Recorded Date**	**# Residential Units**	**Units per Acre**	**Area Size to be Disturbed (sq ft)**	**Tract Has State or Local Approval**

0		0		23087	False

Date Site Development Plan Submitted	Date Sedimentation & Erosion Control Plan Submitted	Impervious Coverage (% Within AEC)	Impervious Coverage (% of Entire Tract)	Project Includes Innovative Stormwate Design
			13.00	True

"Upland Development" Development Activity Included: True

Upland Development Details					
# of Lots/Parcels Created	Lots Platted & Recorded Date	# Residential Units	Units per Acre	Area Size to be Disturbed (sq ft)	Tract Has State or Local Approval
0	12/8/1952	0		23087	False

Date Site Development Plan Submitted	Date Sedimentation & Erosion Control Plan Submitted	Impervious Coverage (% Within AEC)	Impervious Coverage (% of Entire Tract)	Project Includes Innovative Stormwate Design
		0.00	13.00	True

Energy Facilities Development Activity Included: False

Aquaculture Development Activity Included: False

Submerged Lands Mining Development Activity Included: False

General Development Activity Details Required

Marina Development Activity Details Required

Acknowledgements

☒ I understand that any permit issued in response to this application will allow only the development described in the application. The project will be subject to the conditions and restrictions contained in the permit

☒ I certify that I am authorized to grant, and do in fact grant permission to representatives of state and federal review agencies to enter on the aforementioned lands in connection with evaluating information related to this permit application and follow-up monitoring of the project

☒ I further certify that the information provided in this application is truthful to the best of my knowledge

☒ I certify that by clicking the submit button on this NC Division of Coastal Management application I acknowledge that I am signing and dating the application submitted therein

PERMIT APPLICATION NARRATIVE

FOR

Town of Nags Head

Juncos Street Dune Infiltration System

April 26, 2024

Prepared by:
Moffatt & Nichol
305 Commerce Ave
Suite 201
Morehead City, NC 28557

1. Introduction

The Town of Nags Head, located in Dare County to the south of Kitty Hawk and Kill Devil Hills, is the largest village in the North Carolina Outer Banks by land area. With eleven miles of coastline and the largest natural sand dunes on the U.S. eastern shore, Nags Head has been known as a resort community since 1830. As of the 2022 Census, The Town of Nags Head is home to 3,163 year-round residents and can see a summer population of around 40,000. The Town's amenities include 44 Public Beach Accesses and 6 Public Sound Accesses to the Roanoke Sound.

This permit application involves stormwater improvements on a site located within the right of way of Juncos Street in the Town of Nags Head, North Carolina (see Figure 1). The project will also include work within the right of way of South Old Oregon Inlet Road, from James Street to approximately 200' south of Juncos Street. The project site is bounded to the east and west by the Atlantic Ocean and S. Old Oregon Inlet Rd, with residential properties to the north and south (see Figure 2). This street offers an important public beach access facility for nearby residents and tourists, being one of only 7 of the 44 beach accesses with the Town limits that that is both accessible to wheelchairs or strollers and contains a lifeguard stand on site. Furthermore, Juncos Street allows for public beach driving access during limited times of the year and is the town access for emergency access, maintenance and construction projects along the beach. This street is the primary vehicle access for the southern beach area along S. Old Oregon Inlet Rd.

Based on environmental survey data, the proposed project area falls within flood zones AE (elevation 4), AO (elevation 2), AO (elevation 1), and VE (elevation 10). Flooding from smaller rainfall events (up to 4") has been known to remain for significant periods of time along South Old Oregon Inlet Road, Juncos Street, and the surrounding area, impacting the Town's primary vehicle access for the beach. The proposed dune infiltration vault system would minimize flooding from these small, regularly occurring storm events and quicken the floodwater recession from roads for major storms, clearing the roadway for both vehicular and pedestrian traffic.

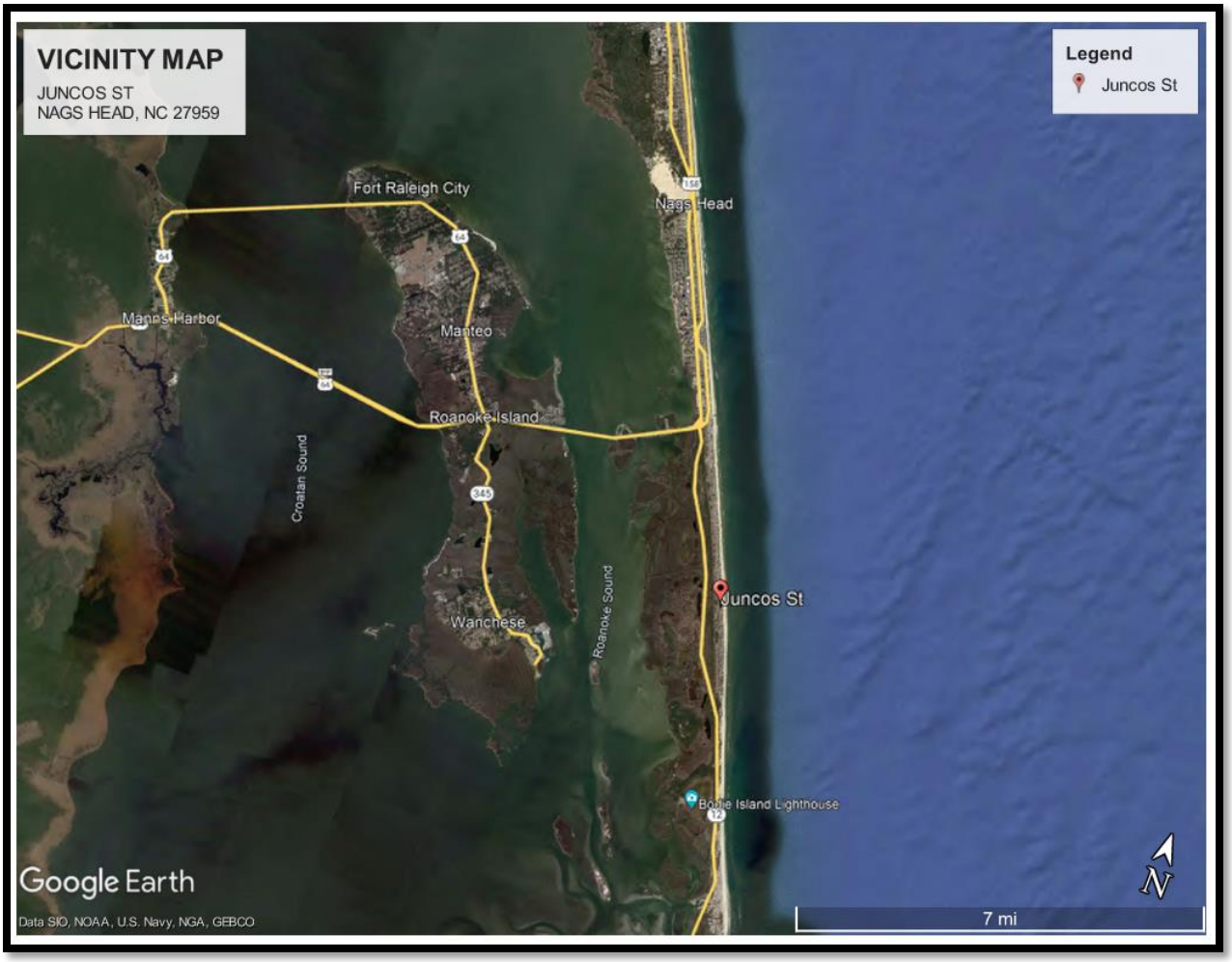


Figure 1. Vicinity map of the area surrounding the proposed Juncos Street Dune Infiltration System in the Town of Nags Head, Dare County, NC

Figure 2. Location map displaying the proposed site location for the Juncos Street Dune Infiltration System

2. Purpose and Need

Due to its elevation and location in a flood zone, as well as its relevance to the Town for pedestrian and vehicular traffic, there exists a need for flood mitigation and minimization on and around South Old Oregon Inlet Road and Juncos Street. The intent of the proposed project is to minimize flooding for small, regularly occurring storm events and quicken the floodwater recession from roads for major storms by pumping floodwaters to an underground infiltration system elevated within the existing sand dune. Flooding also affects vehicle access to the beach and restricts use of the multi-use path, while also limiting limits vehicle movements on South Old Oregon Inlet Road. This project is adjacent to a previously authorized drainage infrastructure improvement project (Project Area 12). The goal would be to supplement the existing roadside swale on the east side of South Old Oregon Inlet Road with a new drainage pipe, connected to a pump station that would convey the flood waters to the dune system at the Juncos Street beach access to infiltrate through the dune and be released to the Atlantic Ocean.

Currently the existing roadside conveyance system is mostly reliant upon evapotranspiration since the overland flow cannot reach the surface water outfalls within the South Old Oregon Inlet Road right of way. During storm events the low-lying areas intersect with the existing high groundwater table and existing soils are highly compacted due to urban development preventing any substantial infiltration. By pumping the runoff into the dune, it will decrease the flooding time of South Old Oregon Inlet Road as well as reduce the peak floodwater elevations, which will minimize any hindrances to vehicular access or pedestrian access to an important public beach access area.

3. Existing Conditions

The project site overlaps with an existing parking lot at the Juncos Street Public Beach Access and is located westward (landward) of an existing dune system. The project will be located between the existing edge of the roadway and the multi-use path, entirely within the existing road right of way. The Town of Nags Head has existing sand fencing along the seaward edge of the dune to stabilize the dune and vegetation. Rutting from vehicular traffic on the beach has occurred along the edge of sand fencing. Existing conditions depict a steeper gradient between the road and first line of stable vegetation. A set of temporary piezometers were installed in 2022 to monitor the groundwater and to gather information regarding the groundwater gradient within the project area. Survey and groundwater monitoring data indicate that the parking lot on site is lower in elevation with limited infiltration capacity due to groundwater levels just under the parking lot.

4. Proposed Action

The proposed underground infiltration system will be constructed using ADS Stormtech SC-740 chambers. The chambers are constructed of impact modified polypropylene copolymers and ship in 7.1-foot-long sections. Each section is 30-inches tall by 45-inches wide and overlap one another to create a continuous underground chamber. By locating the SC-740 chambers within the Dune system it will provide the minimum 2’ separation from the groundwater table and allow for greater infiltration into the groundwater. The ADS Stormtech SC-740 underground chambers were selected as the appropriate underground system based on their modular installation method, low profile, and structural capacity for handling the vehicular loading at Juncos Street.

Based on the erosive nature of the sand cover, a buried polyester geotextile (Mobi-Mat Medium Grade A2x) will be placed between the SC-740 chambers and finished grade. The Mobi-Mat will serve as an indicator for the town that the minimum cover has been reached and maintenance is required. The Mobi-Mat will be buried under the sand and have a 36” separation from the Stormtech SC-740 Chambers. The Stormtech Chambers can support dump truck loading provided the 36” minimum cover and the Mobi-Mat system is designed to support construction access and prevent extensive rutting. Based on the proximity to the adjacent properties, it is anticipated that temporary shoring or trench boxes be used for trenching and excavation safety. It may be necessary to have additional sand stockpiling seaward of the first line of vegetation during construction; however, a 100’ buffer from the mean high-water line will be established to prevent sediment transfer to the ocean.

The proposed dune infiltration system would start approximately 10’ landward of the first line of vegetation and extend approximately 84’ landward. The protective polyethylene geotextile will extend an additional 80’ landward to accommodate the vehicular traffic. Following a storm event, this project is

anticipated to pump approximately 500 gallons of stormwater per minute. The infiltration basin will be centered at the apex of the dune.

The construction schedule will fall between November 16th and April 30th, avoiding potential impacts to nesting sea turtles, as well as to avoid economic impacts during tourist season. The construction laydown area will take place within the existing footprint of the parking lot. The overall disturbance limit is 0.53 acres and is for the dune infiltration system only. The project does not include additional built upon or impervious surface. However, gravel pavers could be modified to avoid any potential additional impervious surface footprint.

It should also be pointed out that additional grant funding has been applied for that would add more stormwater improvements to the parking lot, including permeable pavement. Should these grant funds be awarded to the Town in the future, additional coordination shall take place with the Division of Coastal Management to determine any necessary additional regulatory approvals.

5. Supplemental Information for Endangered Species Act (ESA) Section 7

This section identifies ESA-listed species with the potential to occur in the Project vicinity and potential project related impacts to these species. Information regarding the presence of federally listed species within the Project vicinity was obtained from the US Fish and Wildlife Service (USFWS) Information for Planning and Consulting (IPaC) (USFWS, 2024). The following species are ESA-listed with potential to occur in the action area.

Table 1. Species listed under the ESA with potential to occur in the action area

Species Name		ESA Listing Status	Critical Habitat	Determination
Common Name	**Scientific Name**			
Northern Long-eared Bat	*Myotis septentrionalis*	Endangered	Not designated	NLAA
Red Wolf	*rufus*	Endangered	Not designated	NLAA
Tricolored Bat	*Perimyotis subflavus*	Endangered	Not designated	NLAA
West Indian Manatee	*Trichechus manatus*	Threatened	Not in project area	NLAA
Eastern Black Rail	*Laterallus jamaicensis ssp. jamaicensis*	Threatened	Not designated	NLAA
Piping Plover	*Charadrius melodus*	Threatened	Not in project area	NLAA
Red Knot	*Calidris canutus rufa*	Threatened	Not designated	NLAA
Red-cockaded Woodpecker	*Picoides borealis*	Endangered	Not designated	NLAA
American Alligator	*Alligator mississippiensis*	Similarity of Appearance (Threatened)	Not designated	NLAA
Green Sea Turtle	*Chelonia mydas*	Threatened	Not in project area	NLAA
Hawksbill Sea Turtle	*Eretmochelys imbricata*	Endangered	Not in project area	NLAA

Species Name		ESA Listing Status	Critical Habitat	Determination
Common Name	**Scientific Name**			
Kemp's Ridley Sea Turtle	*Lepidocheyls kempii*	Endangered	Proposed, not designated	NLAA
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered	Not in project area	NLAA
Loggerhead Sea Turtle	*Caretta Caretta*	Threatened	Not in project area	NLAA

According to the USFWS species lists, the species listed below may occur in the vicinity of the action area. Site investigations and literature review, however, indicated that these species are not likely to be present within the action area, and, therefore, it is determined that they are not likely to be adversely affected (NLAA) by the proposed action. Rationale for the determination of these species is provided below.

- Northern Long-eared Bat *(Myotis septentrionalis)* – Endangered
    - The northern long-eared bat is a wide-ranging species found in 37 states and eight provinces in North America. The species typically overwinters in caves or mines and spends the remainder of the year in forested habitats. During the summer and portions of the fall and spring, northern long-eared bats may be found roosting singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags, or dead trees. Males and non-reproductive females may also roost in cooler places, like caves and mines. **Suitable habitat for the Northern long-eared bat does not exist within the project area.**

- Red Wolf
    - Once found from Texas to New York, today the red wolf is only found in eastern North Carolina. Specifically, the red wolf can be found in five counties of North Carolina: Dare, Hyde, Tyrrell, Washington, and Beaufort. Red wolves inhabit upland and bottomland forests, coastal prairies, swamps and marshes. They require dense vegetation to protect denning sites and resting areas. This species hunts mostly small mammals such as rabbits and raccoons and will occasionally prey on small deer. The red wolf is secretive and mostly nocturnal with much of its activity concentrated around dawn, dusk and early evening. During the winter, however, it frequently becomes more diurnal. Hunting is usually centered around a promising area within its larger home range. The study area for this proposed project lacks the coastal wetland habitat and dense vegetation required for this species. **Suitable habitat for the red wolf does not exist within the project area.**
- Tricolored Bat
    - The tricolored bat is native to North America and can be found across the eastern and central United States. Tricolored bats appear to inhabit landscapes that are partly open, with large trees and plentiful woodland edges. They are found in a variety of terrestrial habitats, including grasslands, old fields, suburban areas, orchards, urban areas and woodlands, especially hardwood woodlands. The tricolored bat forages along forest

edges and over ponds and waterways for small insects, such as leafhoppers, ground beetles, flies, small moths, and flying ants. They typically will hibernate on cave walls or ceilings. These bats are loyal to their hibernation sites and may return to the same cave or mine every winter of their lives. **Suitable habitat for the tricolored bat does not exist within the project area.**

- West Indian Manatee
    - West Indian manatees have been observed in all the North Carolina coastal counties. West Indian manatees are found in canals, sluggish rivers, estuarine habitats, and salt water bays, and as far off shore as 3.7 miles. They utilize freshwater and marine habitats at shallow depths of 5 to 20 ft. In the winter, between October and April, manatees concentrate in areas with warm water. During the other time of the year habitats for the manatee are those with sufficient water depth, an adequate food supply, and in proximity to freshwater. West Indian manatees require a source of freshwater to drink. West Indian manatees are primarily herbivorous, feeding on any aquatic vegetation present, but they may occasionally feed on fish. The study area is too far inland and lacks large aquatic habitats associated with this species. **Suitable habitat for the West Indian manatee does not exist within the project area.**

- Eastern Black Rail
    - Eastern black rails occupy the upper zone of tidal marshes (high marsh) along the Atlantic Coast. High marsh areas are only inundated during extreme high tide events and are dominated by plants such as salt meadow hay, saltgrass, and interspersed with shrubs such as marsh elder or groundsel tree. Additional habitat features include higher saline patches dominated by Salicornia spp. And patches of needlerushes (Juncus spp.). The study area, although located in a county along the Atlantic Coast, is only made up of disturbed and maintained land and lacks tidal marshes. **Suitable habitat for the Eastern black rail does not exist within the project area.**

- Piping Plover
    - The piping plover occurs along the entire eastern coast of the United States. North Carolina is uniquely positioned in the species' range, being the only State where the piping plover's breeding and wintering ranges overlap and the birds are present year-round. They nest most commonly where there is little or no vegetation, but some may nest in stands of beach grass. The nest is a shallow depression in the sand that is usually lined with shell fragments and light- colored pebbles. The study area for this project contains beach/habitat areas associated with this species, however, is not located in critical habitat in Onslow County. **The proposed action is determined not likely to adversely affect this species.**

- Red Knot
    - The rufa red knot's unique and impressive life history depends on suitable habitat, food, and weather conditions across its long-distance migratory sites spanning the Western Hemisphere. Coastal habitats used by rufa red knots in migration and wintering areas are similar in character: generally coastal marine and estuarine habitats with large areas

of exposed intertidal sediments. Migration and wintering habitats include both high-energy ocean- or bay-front areas, as well as tidal flats in more sheltered bays and lagoons. Preferred wintering and migration habitats are muddy or sandy coastal areas, specifically, bays and estuaries, tidal flats, and unimproved tidal inlets. **Suitable habitat for the red knot does not exist within the project area.**

- Red-cockaded Woodpecker
    - Red-cockaded woodpeckers are found throughout the southeastern United States. These woodpeckers make their homes in mature pine forests. While other woodpeckers bore out cavities in dead trees where the wood is rotten and soft, the red-cockaded woodpecker is the only one which excavates cavities that are exclusively in living pine trees. This species requires a dense growth of trees and underbrush covering a large tract. **Suitable habitat for Red-cockaded woodpecker is not present within the project area.**
- American Alligator
    - In North Carolina, alligators have been recorded in nearly every coastal county, and many inland counties to the fall line. The alligator is found in rivers, streams, canals, lakes, swamps, and coastal marshes. Adult animals are highly tolerant of salt water, but the young are apparently more sensitive, with salinities greater than 5 parts per thousand considered harmful. The American alligator remains on the protected species list due to its similarity in appearance to the Endangered American crocodile. This species listed as threatened due to similarity of appearance and therefore does not require Section 7 consultation with the USFWS. **Suitable habitat for American alligator is not present within the project area**.
- Green Sea Turtle
    - The green sea turtle is found in temperate and tropical oceans and seas. Nesting in North America is mostly limited to small communities on the east coast of Florida requiring beaches with minimal disturbances and a sloping platform for nesting. The green sea turtle can be found in shallow waters. They are attracted to lagoons, reefs, bays, mangrove swamps and inlets where an abundance of marine grasses can be found, as this is the principal food source for the green sea turtle. The study area for this project contains beach/habitat areas associated with this species, however, the proposed action will take place outside of the nesting season, and landward of the existing first line of stable natural vegetation. **The proposed action is determined not likely to adversely affect this species.**
- Hawksbill Sea Turtle
    - The hawksbill sea turtle is found in temperate and subtropical oceans and seas. Nesting primarily occurs from June to August in Florida. Females come on shore and develop nests on sandy beaches mainly during daytime hours. This species prefers developing nests near or under vegetation; however, they may develop nests in any zone along the beach. The diet of the hawksbill sea turtle primarily consists of sponges. Hawksbill turtles use a variety of habitats during different stages of their life cycle, but largely

inhabit nearshore foraging grounds, especially healthy coral reef habitats. The study area for this project contains beach/habitat areas associated with this species, however, the proposed action will take place outside of the nesting season, and landward of the existing first line of stable natural vegetation. **The proposed action is determined not likely to adversely affect this species.**

- Kemp's Ridley Sea Turtle
    - The Kemp's ridley sea turtle is the smallest of the sea turtles that visit North Carolina's coast and has been sighted in most coastal counties. While the majority of this sea turtle's nesting occurs in Mexico, the species is known to nest on North Carolina's beaches infrequently. Sightings of the species exist for most coastal counties. Kemp's ridley sea turtle can lay eggs as many as three times during the April to June breeding season. Kemp's ridley sea turtles prefer beach sections that are backed up by extensive swamps or large bodies of open water having seasonal narrow ocean connections and a well-defined elevated dune area. The species prefers neritic areas with sandy or muddy bottoms. The study area for this project contains beach/habitat areas associated with this species, however, the proposed action will take place outside of the nesting season, and landward of the existing first line of stable natural vegetation. **The proposed action is determined not likely to adversely affect this species.**
- Leatherback Sea Turtle
    - The leatherback sea turtle is distributed world-wide in tropical waters of the Atlantic, Pacific, and Indian oceans. They are generally open ocean species and may be common off the North Carolina coast during certain times of the year. However, in northern waters leatherback sea turtles are reported to enter into bays, estuaries, and other inland bodies of water. Major nesting areas occur mainly in tropical regions. In the United States, primary nesting areas are in Florida, however, nests are known from Georgia, South Carolina, and North Carolina as well. Nesting occurs from April to August. Leatherback sea turtles need sandy beaches backed with vegetation in the proximity of deep water and generally with rough seas. Beaches with a relatively steep slope are usually preferred. The study area for this project contains beach/habitat areas associated with this species, however, the proposed action will take place outside of the nesting season, and landward of the existing first line of stable natural vegetation. **The proposed action is determined not likely to adversely affect this species.**
- Loggerhead Sea Turtle
    - The loggerhead sea turtle is widely distributed within its range and is found in three distinct habitats during their lives. These turtles may be found hundreds of miles out in the open ocean, in neritic areas, or on coastal beaches. In North Carolina, this species has been observed in every coastal county. Loggerhead sea turtles occasionally nest on North Carolina beaches and are the most common of all sea turtles that visit the North Carolina coast. They nest nocturnally, at two-to-three-year intervals, between May and September, on isolated beaches that are characterized by fine-grained sediments. In near shore areas, loggerhead sea turtles have been observed in bays, lagoons, salt

marshes, creeks, ship channels, and the mouths of large rivers. Coral reefs, rocky places, and shipwrecks are often used as foraging areas. The study area for this project contains beach/habitat areas associated with this species, however, the proposed action will take place outside of the nesting season, and landward of the existing first line of stable natural vegetation. **The proposed action is determined not likely to adversely affect this species.**

Based on lack of suitable habitat for these species and/or their extremely unlikely occurrence in the action area during the construction window, it is determined that the proposed project will have no adverse effect on them, and these species are not addressed further in this supplemental document.

6. Impacts

The proposed project will not result in any impacts to wetlands or any open-water areas. Due to the configuration of the parking lot, location of the existing pedestrian ramp, the location of the dunes, and the need for sufficient vertical separation of the ADS Stormtech SC-740 underground chambers from the ground water elevation, it is not possible to design the system so that the project meets appropriate oceanfront setbacks as set forth in the rules of the Coastal Resources Commission. Accordingly, the ADS Stormtech SC-740 underground chamber system will be centered within the 50ft R/W of Juncos Street just beyond the limits of the existing pedestrian wood ramp and under the crest of the dune with the majority of the chamber system located waterward of the existing Static Vegetation Line, but landward of the existing first line of stable natural vegetation. More than one half of the chamber system will be under the existing beach access travel way for motor vehicles. The limits of disturbance for construction extend onto the beach maintaining a minimum 100 ft setback from the Mean High Water elevation. The limits of disturbance extend onto the adjacent parcel to the south of the Juncos Street R/W in a 75 ft square on the beach side to serve as a materials staging area and a construction vehicle movement area.

7. Scoping Meeting

An agency scoping meeting was held for this project on November 28, 2022. A copy of the meeting summary is attached as Attachment A.

8. Adjacent Riparian Property Owners

Based upon the Dare County GIS, the following properties are listed as adjacent riparian property owners and were therefore notified of the proposed project.

Property to North (9531 S. Old Oregon Inlet Rd.)
Boat Rides 001 LLC TTEE
3225 McLeod Dr. - STE 777
Las Vegas, NV 89121

Property to South (9601 S. Old Oregon Inlet Rd.)
Bluffs Of South Nags Head
11 Venetian Dr.
Rehoboth Beach, DE 19971

Copies of the certified mail receipts for the notifications for these two properties are included as Attachment B.

9. AEC Ocean Hazard Notice

In accordance with NCAC 07H.0306(e), a copy of an AEC Hazard Notice signed by the Town of Nags Head is provided as Attachment C.

10. Compliance with N.C. State Environmental Policy Act (SEPA)

§ 113A-12(6) states that the preparation of an environmental document shall not be required for projects that require a Coastal Area Management Act major permit. Therefore, no SEPA document will be prepared for the proposed project modification.

11. Fee

A permit processing fee of $400 will be provided to the Division of Coastal Management shortly.

12. List of Attachments

Attachment A: Scoping Meeting Minutes

Attachment B: Adjacent Riparian Property Owner Notification Certified Mail Receipts

Attachment C: AEC Ocean Hazard Notice

RECEIVED
By Yvonne B. Carver at 3:38 pm, May 16, 2024

OCEAN HAZARD AEC NOTICE

Project is in an: _X_ **Ocean Erodible Area** _____ **Inlet Hazard Area**

Property Owner: **Town of Nags Head**

Property Address: **Juncos Street Beach Access; 0 S Va Dare Trl. (Parcel 000108555), Nags Head**

Date Lot Was Platted: N/A

This notice is intended to make you, the applicant, aware of the special risks and conditions associated with development in this area, which is subject to natural hazards such as storms, erosion and currents. The rules of the Coastal Resources Commission require that you receive an AEC Hazard Notice and acknowledge that notice in writing before a permit for development can be issued.

The Commission's rules on building standards, oceanfront setbacks and dune alterations are designed to minimize, but not eliminate, property loss from hazards. By granting permits, the Coastal Resources Commission does not guarantee the safety of the development and assumes no liability for future damage to the development. Permits issued in the Ocean Hazard Area of Environmental Concern include the condition that structures be relocated or dismantled if they become imminently threatened by changes in shoreline configuration. The structure(s) must be relocated or dismantled within two (2) years of becoming imminently threatened, and in any case upon its collapse or subsidence.

The best available information, as accepted by the Coastal Resources Commission, indicates that the annual long-term average ocean erosion rate for the area where your property is located is 4 feet per year.

The rate was established by careful analysis of aerial photographs of the coastline taken over the past 50 years.

The flood waters in a major storm are predicted to be about **10** feet deep in this area.

Preferred oceanfront protection measures are beach nourishment and relocation of threatened structures. Hard erosion control structures such as bulkheads, seawalls, revetments, groins, jetties and breakwaters are prohibited. Temporary sand bags may be authorized under certain conditions.

The applicant must acknowledge this information and requirements by signing this notice in the space below. Without the proper signature, the application will not be complete.

DocuSigned by:
Andy Garman
D5CD944068184C3...

4/22/2024

Property Owner's Signature *Date*

SPECIAL NOTE: This hazard notice is required for development in areas subject to sudden and massive storms and erosion. Permits issued for development in this area expire on December 31 of the third year following the year in which the permit was issued. Shortly before work begins on the project site, the Local Permit Officer must be contacted to determine the vegetation line and setback distance at your site. If the property has seen little change since the time of permit issuance, and the proposed development can still meet the setback requirement, the LPO will inform you that you may begin work. Substantial progress on the project must be made within 60 days of this setback determination, or the setback must be re-measured. Also, the occurrence of a major shoreline change as the result of a storm within the 60-day period will necessitate re-measurement of the setback. It is important that you check with the LPO before the permit expires for official approval to continue the work after the permit has expired. Generally, if foundation pilings have been placed and substantial progress is continuing, permit renewal can be authorized. It is unlawful to continue work after permit expiration.

For more information, contact:

Yvonne B. Carver

Local Permit Officer/Environmental Specialist II

NC Division of Coastal Management
401 S. Griffin St., Suite 300
Elizabeth City, NC 27909

Address

Northeastern District Office

Locality

252-621-6453

Phone Number

BEFORE YOU BUILD

Setting Back for Safety: A Guide to Wise Development Along the Oceanfront

When you build along the oceanfront, you take a calculated risk. Natural forces of water and wind collide with tons of force, even on calm days.

Man-made structures cannot be guaranteed to survive the force of a hurricane. Long-term erosion (or barrier island migration) may take from two to ten feet of the beach each year, and, sooner or later, will threaten oceanfront structures. These are the facts of life for oceanfront property owners.

The Coastal Resources Commission (CRC) has adopted rules for building along the oceanfront. The rules are intended to avoid an unreasonable risk to life and property, and to limit public and private losses from storm and long-term erosion. These rules lessen but do not eliminate the element of risk in oceanfront development.

As you consider building along the oceanfront, the CRC wants you to understand the rules and the risks. With this knowledge, you can make a more informed decision about where and how to build in the coastal area.

The Rules

When you build along the oceanfront, coastal management rules require that the structure be sited to fit safely into the beach environment.

Structures along the oceanfront, less than 5,000 square feet in size, must be behind the frontal dune, landward of the crest of the primary dune, and set back from the first line of stable natural vegetation a distance equal to 30 times the annual erosion rate (a minimum of 60 feet). The setback calculation increases as the size of the structure increases [15A NCAC 7H.0306(a)(2)]. For example: A structure between 5,000 and 10,000 square feet would require a setback from the first line of stable, natural vegetation to a distance equal to 60 times the annual erosion rate (a minimum of 120 feet). The graduated setback continues to increase through structure sizes greater than 100,000 square feet.

The beachfront is an ever-changing landform. The beach and the dunes are natural "shock absorbers," taking the beating of the wind and waves and protecting the inland areas. By incorporating building setbacks into the regulations, you have a good chance of enjoying the full life of the structure. At first, it seems very inviting to build your dream house as close to the beach as possible, but in five years you could find the dream has become a nightmare as high tides and storm tides threaten your investment.

The Exception

The Coastal Resources Commission recognized that these rules, initially passed in June 1979, might prove a hardship for some property owners. Therefore, they established an exception for lots that cannot meet the setback requirement. The exception allows buildings in front of the current setback, if the following conditions apply:

1) the lot must have been platted as of June 1, 1979, and is not capable of being enlarged by combining with adjoining land under the same ownership;
2) development must be constructed as far back on the property as possible and in no case less than 60 feet landward of the vegetation line;
3) no development can take place on the frontal dune;
4) special construction standards on piling depth and square footage must be met; and
5) all other CAMA, state and local regulations must be met.

The exception is not available in the Inlet Hazard Area.

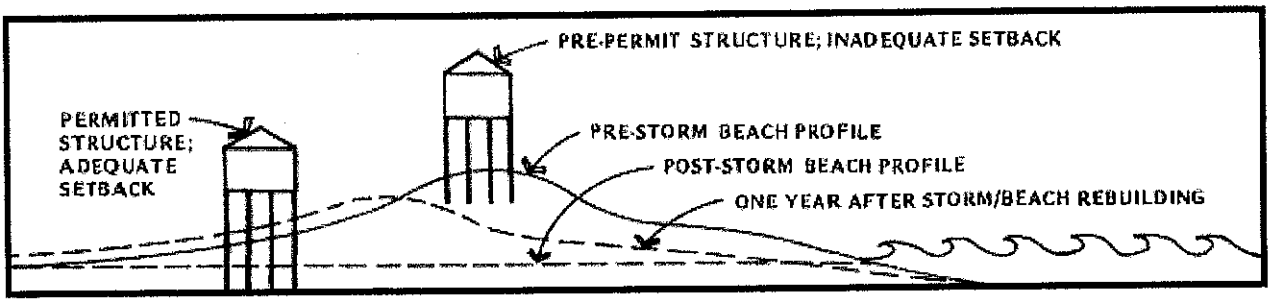
To determine eligibility for the exception the Local Permit Officer will make these measurements and observations:

_____ required setback from vegetation line

_____ exception setback (maximum feasible)

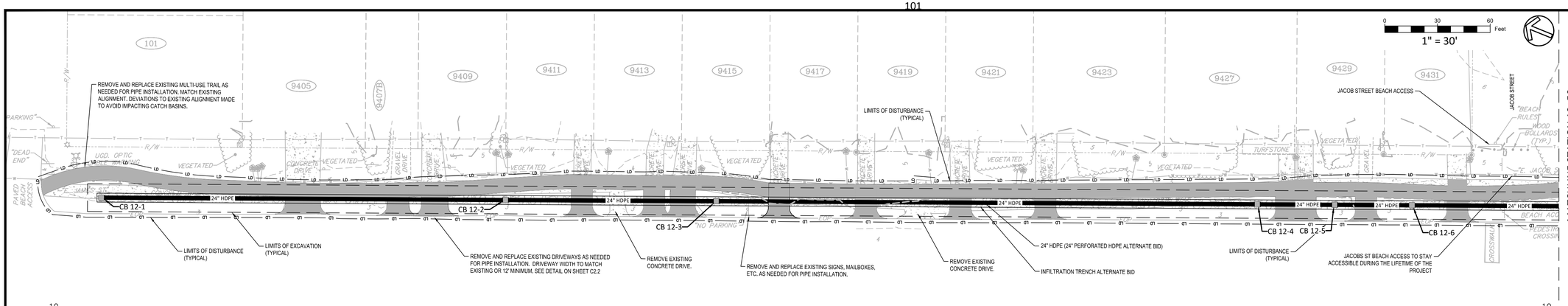
_____ rear property line setback

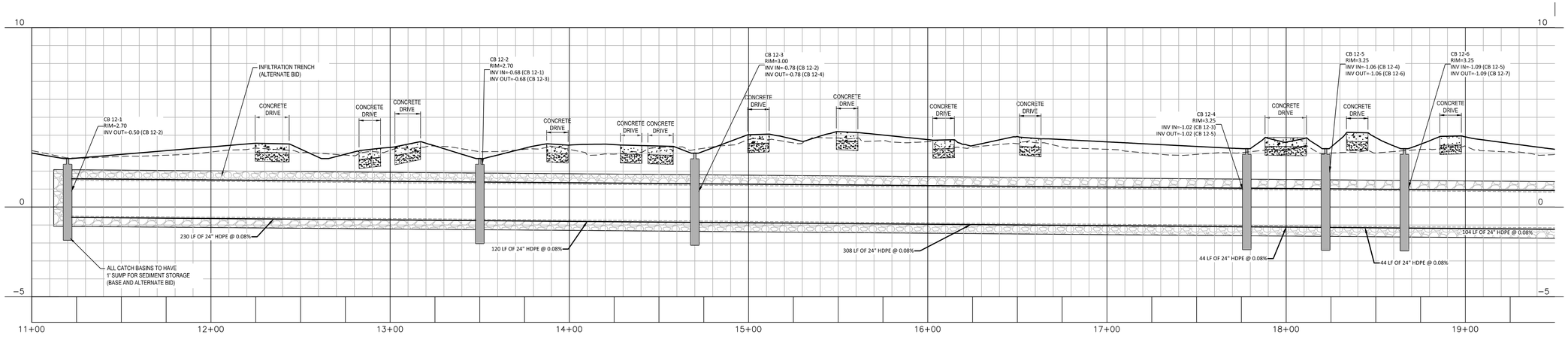
_____ max. allowable square footage on lowest floor

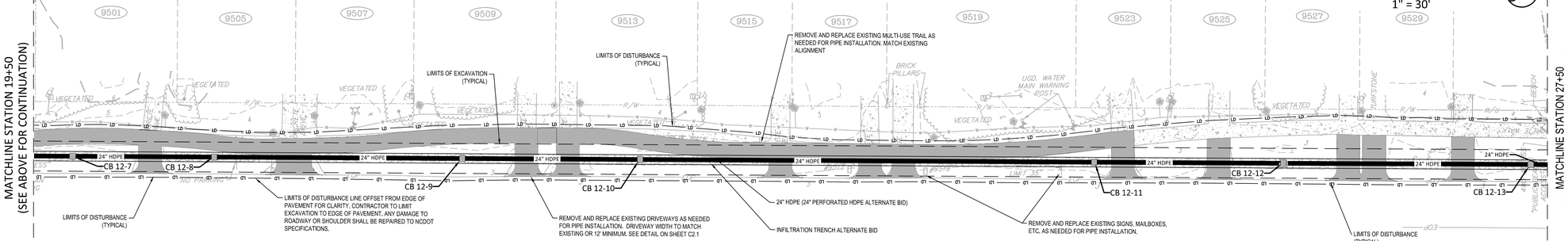


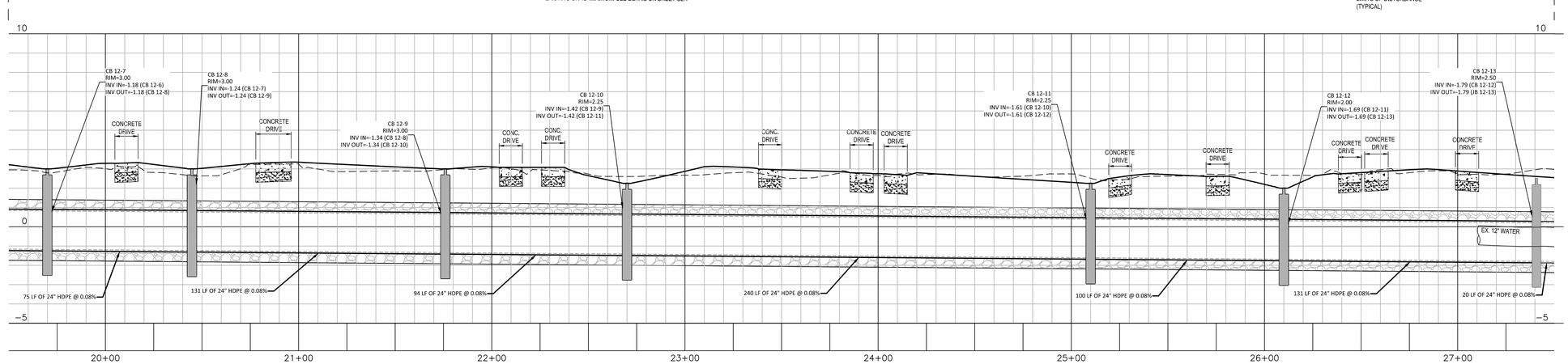
The Reasons

After the storm, the house on the dune will be gone. The other house has a much better chance of survival.









NOTES:
UTILITY LOCATIONS SHOWN ARE BASED ON BEST AVAILABLE INFORMATION AND SHALL BE CONSIDERED APPROXIMATE AND POSSIBLY INCOMPLETE. CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO EXCAVATION.

FIELD CONDITIONS MAY REQUIRE DEVIATION FROM PLAN LOCATION AND TYPICAL SECTION. CONTRACTOR SHALL COORDINATE ALL DEVIATIONS WITH THE TOWN AND THE ENGINEER.

24" PERFORATED HDPE WITH INFILTRATION TRENCH FOR ENTIRE NETWORK ARE TO BE BID AS AN ALTERNATE.

ALL STONE BACKFILL USED IN INFILTRATION TRENCHES SHALL BE CLEAN #57 WASHED STONE. THE CONTRACTOR SHALL PROVIDE SAMPLES OF THE MATERIAL FOR THE OWNER'S INSPECTION PRIOR TO INSTALLATION. LUMP SUM BID PRICE TO INCLUDE SUFFICIENT QUANTITY OF WASHED STONE BACKFILL FOR INSTALLATION AT THE FOLLOWING ESTIMATED RATE:

TRENCH WITH SOLID WALL PIPE 1.9 CF PER LF OF TRENCH
TRENCH WITH 24" PERFORATED PIPE 22.2 CF PER LF OF TRENCH

ALTERNATE BID: MESH SCREEN USED IN INFILTRATION TRENCHES SHALL BE HIGH TENSILE STRENGTH ANTI-CORROSIVE PLAIN WOVEN SCREEN WITH A TOTAL OPEN AREA OF AT LEAST 50%. LUMP SUM BID PRICE TO INCLUDE SUFFICIENT QUANTITY OF MESH SCREEN FOR INSTALLATION AT THE FOLLOWING ESTIMATED RATE:

TRENCH WITH 24" PERFORATED PIPE 20.0 SF PER LF OF TRENCH

THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL.

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY - NOT RELEASED FOR CONSTRUCTION

McAdams
The John R. McAdams Company, Inc.
621 Hillsborough Street
Suite 500
Raleigh, NC 27603
phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187
www.mcadamsco.com

CLIENT

TOWN OF NAGS HEAD
POST OFFICE BOX 99
NAGS HEAD, NC 27959
PHONE: 252.441.5580

SOOIR STORMWATER INFRASTRUCTURE IMPROVEMENTS
CONSTRUCTION DRAWINGS
PROJECT AREA 12
NAGS HEAD, NC, 27959

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026842 JEREMY WILLIAM SMITHHEART
FOR REVIEW PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION
5.30.24

REVISIONS

NO.	DATE	
1	06.14.2024	ADDENDUM #1

PLAN INFORMATION

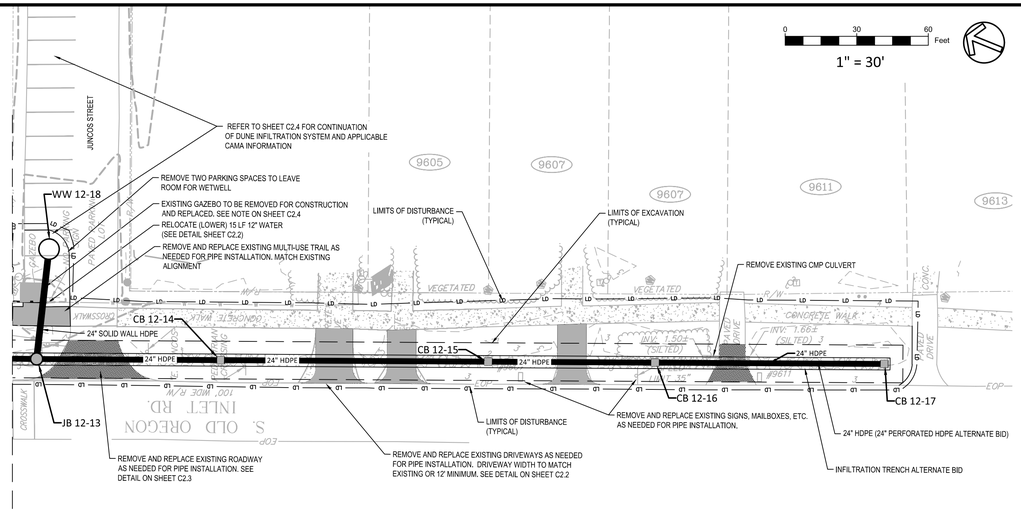
PROJECT NO.	SRP-SW-ARP-0019.2
FILENAME	TNH22001_17-P1
CHECKED BY	HCF
DRAWN BY	JWS
SCALE	AS NOTED
DATE	6/26/2024

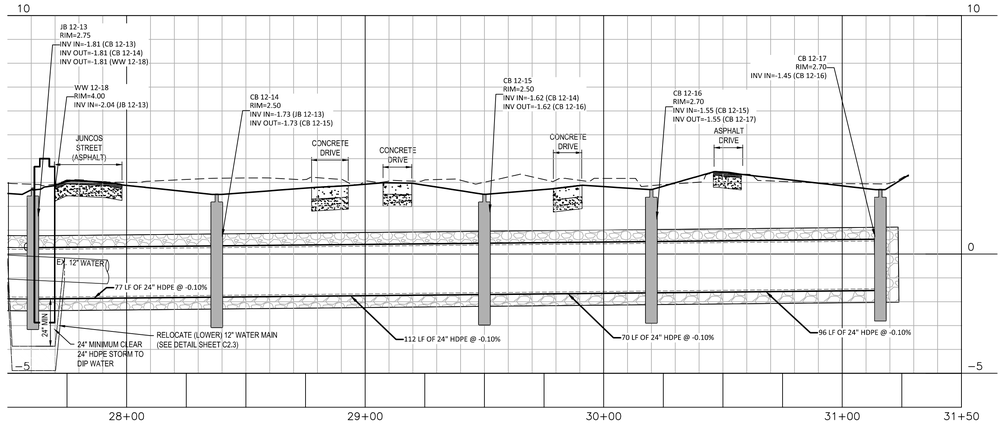
SHEET

STORM PLAN & PROFILE

C2.0

M:\Projects\TNH\TNH22001_17\04-Production\Water Resources\CD_ReSpermit\Construction Drawings\TNH22001_17-P1.dwg, 6/26/2024 10:06:49 AM, Jeremy Smithheart





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TRENCH WITH SOLID WALL PIPE	1.9 CF PER LF OF TRENCH
TRENCH WITH 24" PERFORATED PIPE	22.2 CF PER LF OF TRENCH

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TRENCH WITH 24" PERFORATED PIPE	20.0 SF PER LF OF TRENCH

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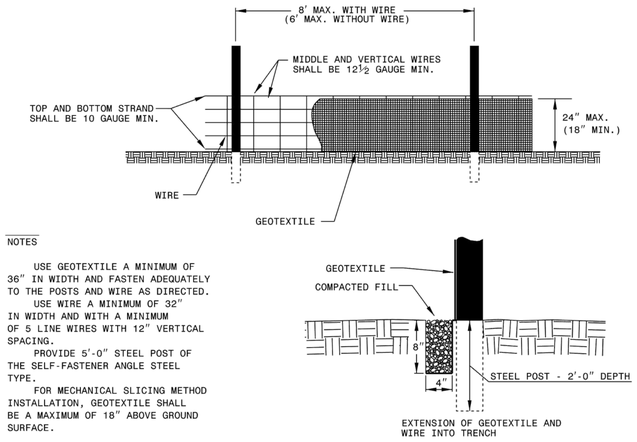
SHEET

STORM PLAN & PROFILE

C2.1



NOTES

USE GEOTEXTILE A MINIMUM OF 36" IN WIDTH AND FASTEN ADEQUATELY TO THE POSTS AND WIRE AS DIRECTED.

USE WIRE A MINIMUM OF 32" IN WIDTH AND WITH A MINIMUM OF 5 LINE WIRES WITH 12" VERTICAL SPACING.

PROVIDE 5'-0" STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.

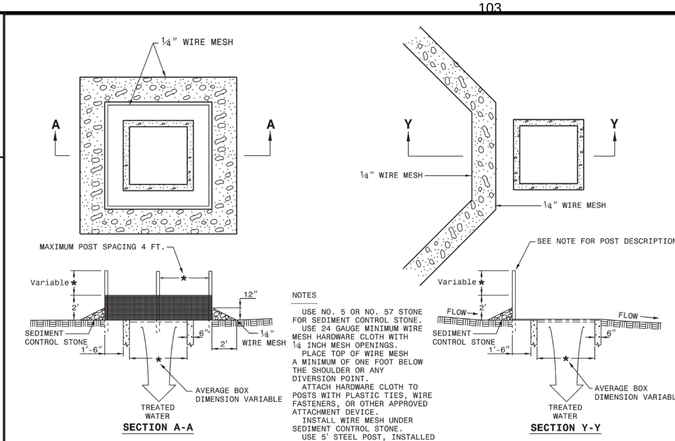
FOR MECHANICAL SLICING METHOD INSTALLATION, GEOTEXTILE SHALL BE A MAXIMUM OF 18" ABOVE GROUND SURFACE.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-23

ROADWAY STANDARD DRAWING FOR
TEMPORARY SILT FENCE

SHEET 1 OF 1
1605.01



NOTES

USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

USE 24 GAUGE MINIMUM WIRE MESH HARDWARE CLOTH WITH ¼ INCH MESH OPENINGS.

PLACE TOP OF WIRE MESH A MINIMUM OF ONE FOOT BELOW THE SHOULDER OR ANY DIVERSION POINT.

ATTACH HARDWARE CLOTH TO POSTS WITH PLASTIC TIES, WIRE FASTENERS, OR OTHER APPROVED ATTACHMENT DEVICE.

INSTALL WIRE MESH UNDER SEDIMENT CONTROL STONE.

USE 5' STEEL POST, INSTALLED 2' DEEP MINIMUM, AND OF THE SELF-FASTENER ANGLE STEEL TYPE.

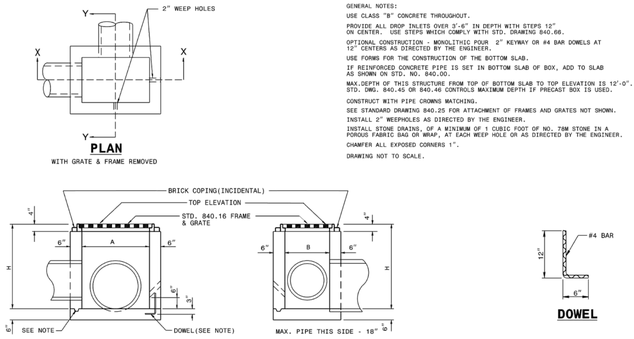
SPACE POST A MAXIMUM OF 4'.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR
ROCK INLET SEDIMENT TRAP TYPE C

SHEET 1 OF 1
1632.03



GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL DROP INLETS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR. 2" KEYWAY OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

MAX. DEPTH OF THIS STRUCTURE FROM TOP OF BOTTOM SLAB TO TOP ELEVATION IS 12'-0". STD. DWG. 840.45 OR 840.46 CONTROLS MAXIMUM DEPTH IF PRECAST BOX IS USED.

CONSTRUCT WITH PIPE CHORDS WATCHING.

SEE STANDARD DRAWING 840.25 FOR ATTACHMENT OF FRAMES AND GRATES NOT SHOWN.

INSTALL 2" WEEPHOLES AS DIRECTED BY THE ENGINEER.

INSTALL STONE DRAINS, OF A MINIMUM OF 1 CUBIC FOOT OF NO. 78M STONE IN A POROUS FABRIC BAG OR WRAP, AT EACH WEEP HOLE OR AS DIRECTED BY THE ENGINEER.

CHAMFER ALL EXPOSED CORNERS 1".

DRAWING NOT TO SCALE.

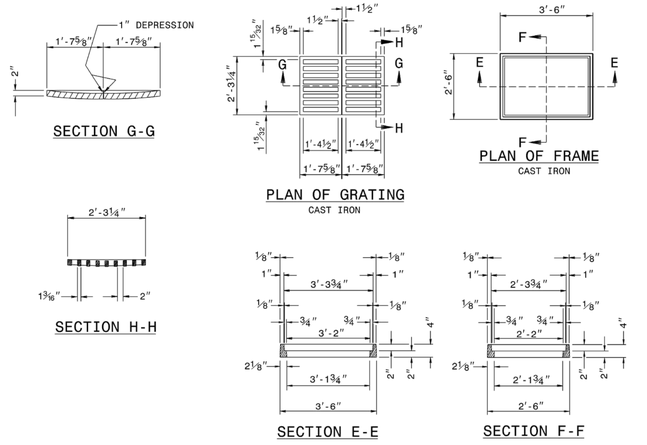
DIMENSIONS AND QUANTITIES FOR DROP INLET(BASED ON MIN. HEIGHT, H)								
DIMENSIONS OF BOX & PIPE				CUBIC YARDS CONC. IN BOX			DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	MIN. HEIGHT	BOTTOM SLAB	WALL PER FT. HT.	TOTAL CONCRETE FOR MINIMUM HEIGHT	C.W.	H.C.
D	A	B	H					
12"	3'-0"	2'-0"	2'-0"	0.222	0.222	0.592	0.015	0.026
15"	/	/	2'-3"	/	/	0.648	0.023	0.036
18"	/	/	2'-6"	/	/	0.703	0.033	0.049
24"	/	/	3'-0"	/	/	0.814	0.059	0.085
30"	3'-0"	2'-0"	3'-6"	0.222	0.222	0.925	0.092	0.127

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-24

ROADWAY STANDARD DRAWING FOR
CONCRETE DROP INLET
12" THRU 30" PIPE

SHEET 1 OF 1
840.14

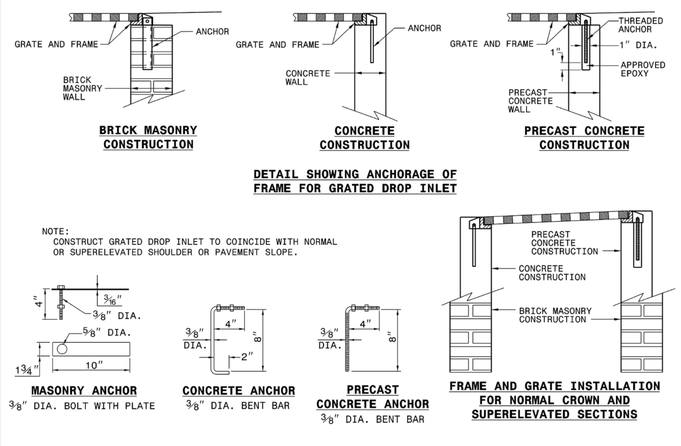


STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-24

ROADWAY STANDARD DRAWING FOR
DROP INLET FRAME AND GRATES
FOR USE WITH STD. DWG.S 840.14 AND 840.15

SHEET 1 OF 1
840.16



STATE OF NORTH CAROLINA
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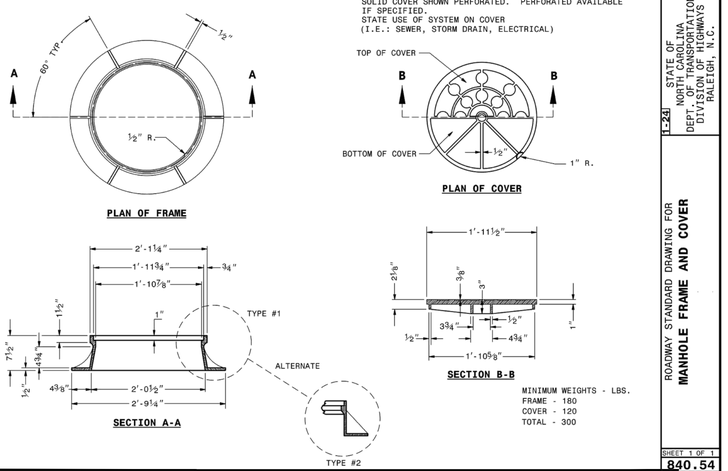
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-24

ROADWAY STANDARD DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE

SHEET 1 OF 1
840.25



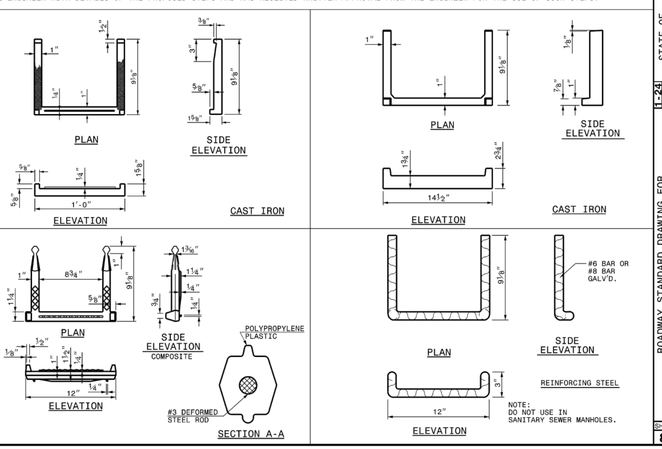
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-24

ROADWAY STANDARD DRAWING FOR
MANHOLE FRAME AND COVER

SHEET 1 OF 1
840.54

NOTES:
INSTALL ALL STEPS PROTRUDING 4" FROM INSIDE FACE OF STRUCTURE WALL.
STEPS DIFFERING IN DIMENSIONS, CONFIGURATION, OR MATERIALS FROM THOSE SHOWN MAY ALSO BE USED PROVIDED THE CONTRACTOR HAS FURNISHED THE ENGINEER WITH DETAILS OF THE PROPOSED STEPS AND HAS RECEIVED WRITTEN APPROVAL FROM THE ENGINEER FOR THE USE OF SUCH STEPS.

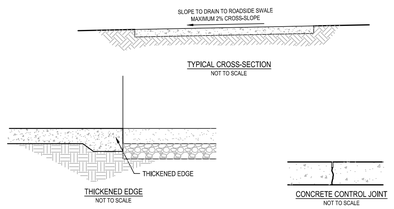


STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-23

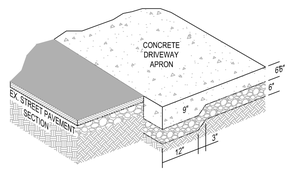
ROADWAY STANDARD DRAWING FOR
DRAINAGE STRUCTURE STEPS

SHEET 1 OF 1
840.66



NOTES:
1. Multiuse trail shall be constructed of a minimum of 4" thick, air-entrained, 3000 PSI concrete (NCDOT Class A).
2. Construction or control joint shall be placed with a maximum spacing of 8', and at all intersections.
3. A thickened edge is required at all road, street and driveway intersections.

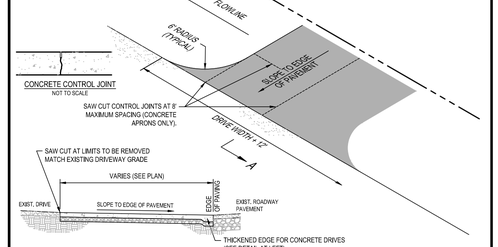
CONCRETE MULTIUSE TRAIL DETAILS
NOT TO SCALE



NOTES:
1. Contractor shall sawcut existng pavement straight and true prior to driveway apron installation.
2. Contractor shall contact the Department of Public Works prior to concrete installation to confirm compliance.
3. Special conditions may warrant exceptions to this detail. Subject to prior approval by Town Engineer or Public Works Director.
4. If the street pavement section is damaged during construction activity, the contractor shall patch the pavement section to teh same pavement cross section that existed prior to the commencement of construction.
5. Concrete driveway aprons for this project shall be constructed of a minimum of 6" thick, air-entrained, 3000 PSI concrete (NCDOT Class A).
6. Driveway subgrade shall be compacted to 95% (minimum) of Modified Proctor (ASTM D1557) prior to placement of base.

RESIDENTIAL DRIVEWAY APRON THICKENED EDGE
(THIS DETAIL APPLIES TO CONCRETE DRIVEWAY INSTALLATION FOR THIS PROJECT ONLY)
NOT TO SCALE

ADAPTED FROM NCDOT STANDARD DETAIL NO. 521



NOTES:
1. All driveways must meet current Town requirements and NCDOT requirements for spacing, sight distance, and offsets from property lines and intersections.
2. Driveway aprons shall be constructed of a minimum of 6" thick, air-entrained, 3000 PSI concrete (NCDOT Class A) with 6" ABC base course, or 6" ABC base course with a 2" asphalt surface course (S9.5 C). (Material to match existing driveway.)
6. Driveway subgrade shall be compacted to 95% (minimum) of Modified Proctor (ASTM D1557) prior to placement of base.

RESIDENTIAL DRIVEWAY APRON REPLACEMENT
NOT TO SCALE

McADAMS
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TOWN OF NAGS HEAD

SOOIR STORMWATER INFRASTRUCTURE IMPROVEMENTS
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REVISIONS

NO.	DATE

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FILENAME	TNH22001_17_D
CHECKED BY	HCF
DRAWN BY	JWS
SCALE	AS NOTED
DATE	6/26/2024

SHEET

DETAILS (1 OF 2)

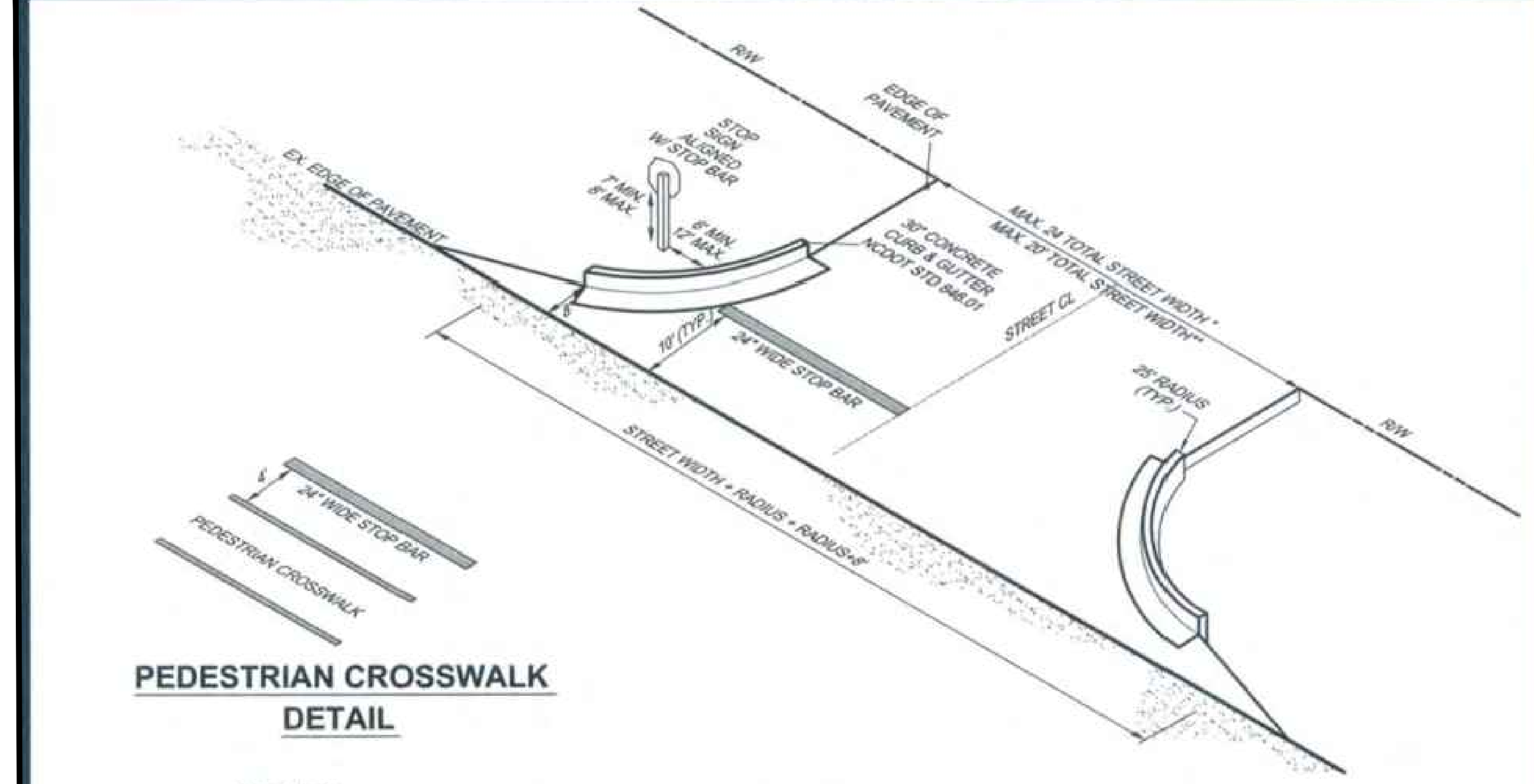
C2.2

M:\Projects\TNH\TNH22001_17\04 Production\Water Resources\CD_Rev\epermit\Construction Drawing\TNH22001_17_D.dwg, 6/26/2024 10:07:14 AM, Jeremy Smitheart

REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS

(AREAS IN SQUARE FEET)

SIZE and DEGREE OF BEND	STATIC THRUST (LBS.)	MODERATELY DRY CLAY 4,000 LBS./SF	SOFT CLAY 2,000 LBS./SF	GRAVEL/ COARSE SAND 1,600 LBS./SF	DRY CLAY (ALWAYS DRY) 8,000 LBS./SF	SAND (COMPACTED FIRM) 8,000 LBS./SF	SAND (CLEAN, DRY) 4,000 LBS./SF	"QUICKSAND" (VERY POOR SOIL) 1,000 LBS./SF	ROCK (POOR) 10,000 LBS./SF
		SOIL DESCRIPTION AND ASSUMED BEARING CAPACITY (LBS./SF)							
6"									
11 1/4°	1,108	1	1	1	1	1	1	2	1
22 1/2°	2,207	1	2	2	1	1	1	3	1
45°	4,328	2	3	3	1	1	2	5	1
90°	7,996	2	4	5	1	1	2	8	1
PLUG	5,655	2	3	4	1	1	2	6	1
8"									
11 1/4°	1,970	1	1	2	1	1	1	2	1
22 1/2°	3,922	1	2	3	1	1	1	4	1
45°	7,694	2	4	5	1	1	2	8	1
90°	14,215	4	8	9	2	2	4	15	2
PLUG	10,053	3	5	6	2	2	3	10	1
12"									
11 1/4°	4,433	2	3	3	1	1	2	5	1
22 1/2°	8,826	3	5	6	2	2	3	9	1
45°	17,312	5	9	11	3	3	5	18	2
90°	31,983	8	16	19	4	4	8	32	4
PLUG	22,619	6	12	14	3	3	6	23	3
16"									
11 1/4°	7,881	2	4	5	1	1	2	8	1
22 1/2°	15,691	4	8	10	2	2	4	16	2
45°	30,779	8	16	19	4	4	8	31	4
90°	56,861	15	29	35	8	8	15	57	6
PLUG	40,213	10	21	25	5	5	10	41	5
24"									
11 1/4°	17,734	5	9	11	3	3	5	18	2
22 1/2°	35,305	9	18	22	5	5	9	36	4
45°	69,252	18	35	42	9	9	18	70	7
90°	127,936	32	64	77	16	16	32	128	13
PLUG	90,478	23	46	55	12	12	23	91	10



PEDESTRIAN CROSSWALK DETAIL

NOTES:

1. Stop Bar shall span across the approach lane and shall installed parallel to the intersecting roadway.
2. Special conditions may warrant exceptions to this detail. The stop bar shall not be placed less than 4 ft. or greater than 30' from the nearest edge of the intersecting roadway.
3. The placement of the stop bar shall be placed so that vehicles have the optimum sight distance along intersecting roadways.
4. The stop sign shall not be blocked by other signs or vegetation and shall be positioned so to face approaching vehicular traffic.
5. The stop bar shall be installed a minimum of 4' offset from a pedestrian crosswalk if one exists.

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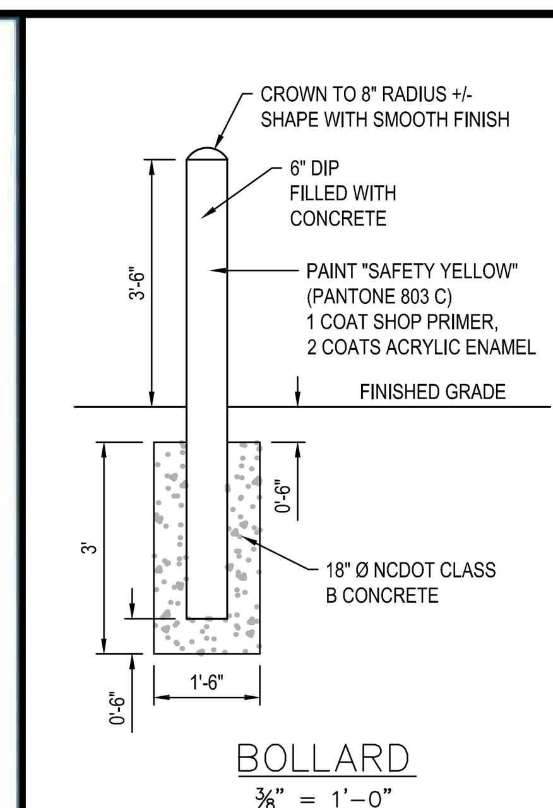
TYPICAL STREET STOP SIGN AND AND STOP BAR PLACEMENT

* WIDTH FOR COLLECTOR AND LOCAL ACCESS STREETS
** WIDTH FOR SUBCOLLECTOR AND ENVIRONMENTAL STREETS

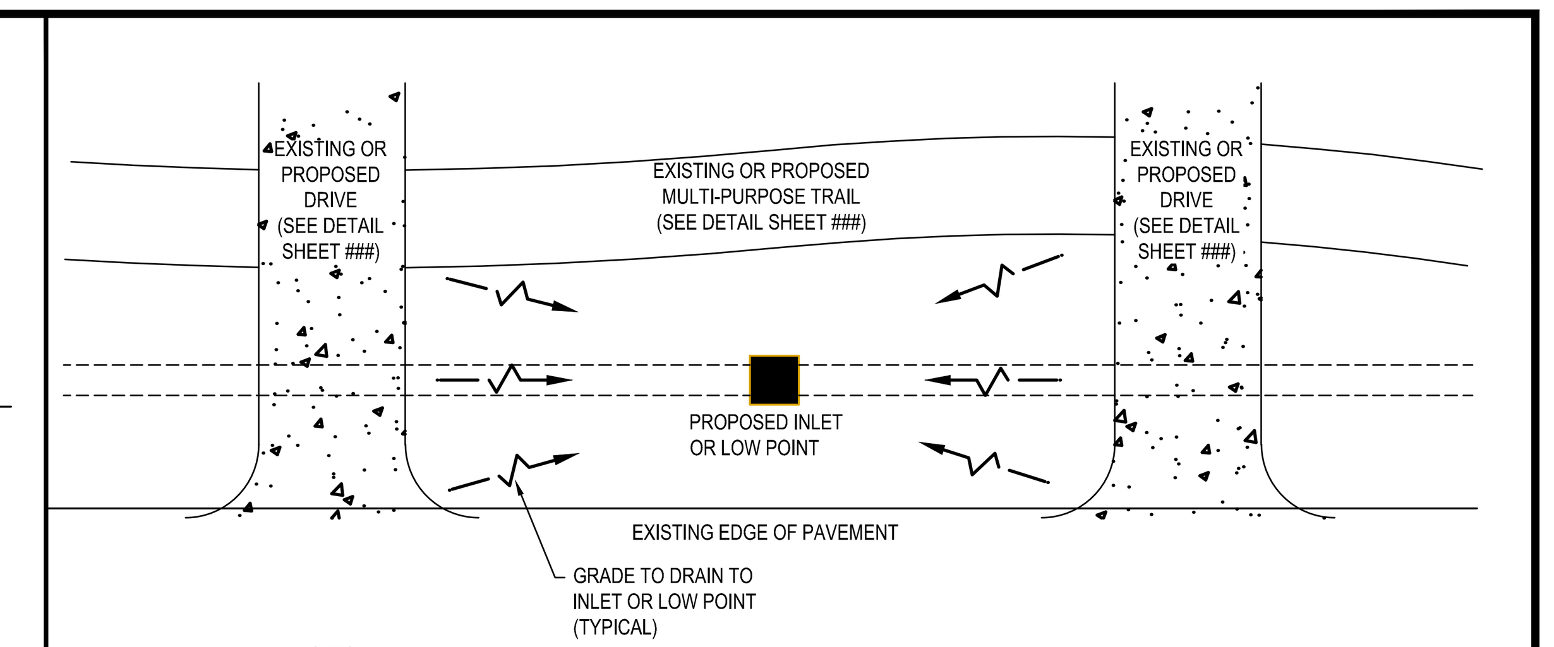
SCALE: NONE
ISSUE DATE: 8-13-2015
REVISION DATE: 1-3-2019
SHEET NO: 1 OF 1
DRAWN BY: DMR

DETAIL NO.: 300

17



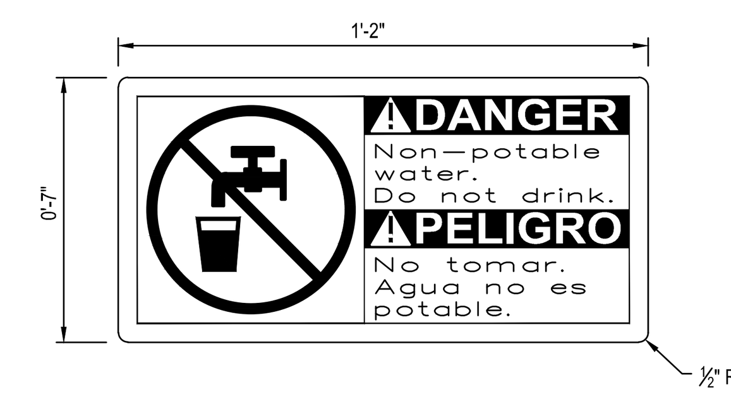
BOLLARD
3/8" = 1'-0"



NOTES:
INLET OR LOW POINT ELEVATION IS TYPICALLY SET APPROXIMATELY 6 INCHES BELOW THE LOWEST EDGE OF PAVEMENT ELEVATION FOR EACH AREA.

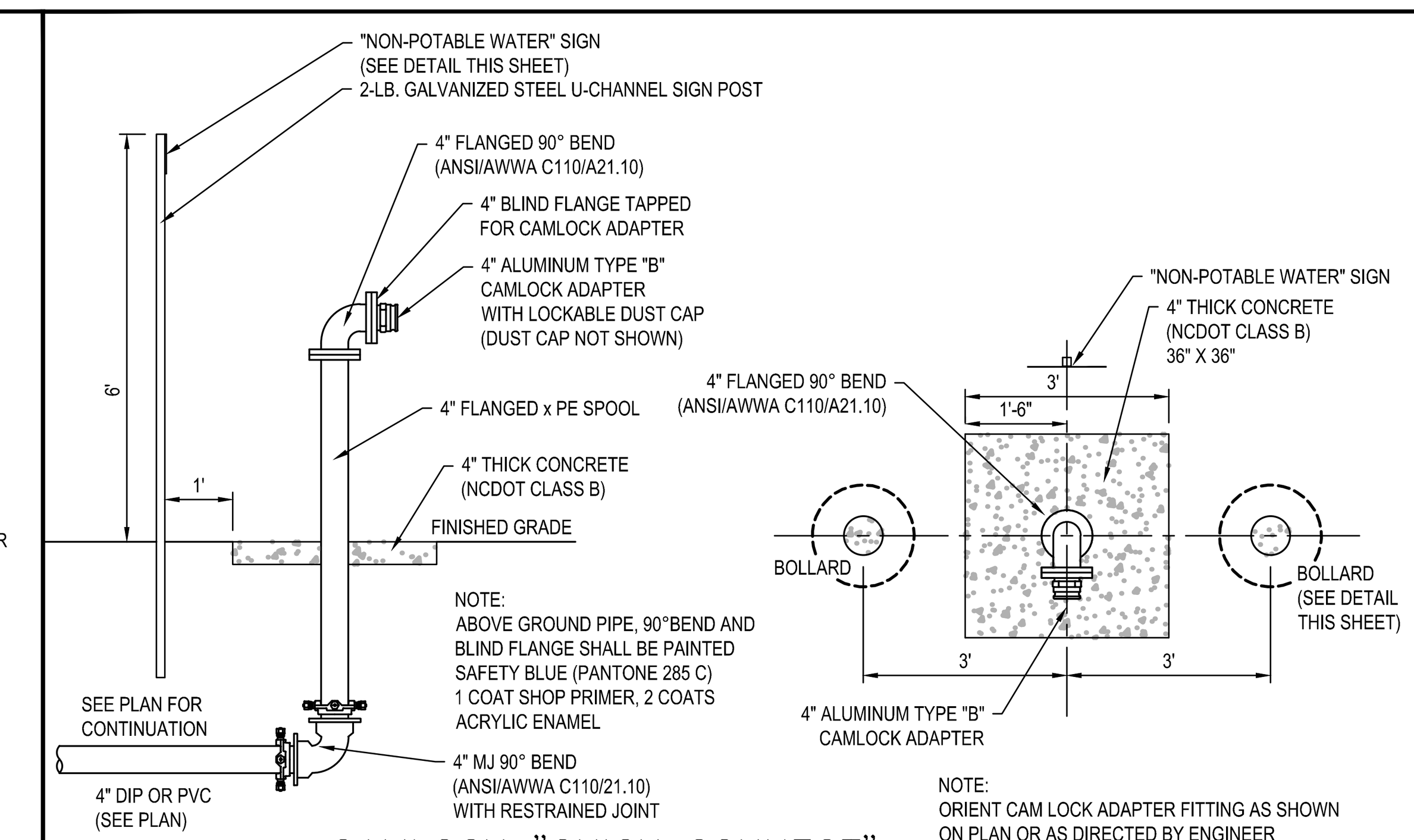
FIELD CONDITIONS MAY REQUIRE DEVIATION FROM PLAN LOCATION AND TYPICAL SECTION. CONTRACTOR SHALL COORDINATE ALL DEVIATIONS WITH THE TOWN AND THE ENGINEER.

TYPICAL SHOULDER GRADING
OLD OREGON INLET ROAD
STA. 10+85± TO STA. 31+30± (LEFT)
NOT TO SCALE



NOTE:
- SIGN TO BE BILINGUAL (ENGLISH AND SPANISH).
- SIGN TO COMPLY WITH ANSI Z535 FORMAT.
- SIGN SHOWN IS AN EXAMPLE. ENGINEER MAY APPROVE ALTERNATE DESIGNS.
- SIGN BACKING TO BE 1 mm (0.039") (MIN).
- SIGN TO BE MOUNTED ON 2-LB. GALVANIZED U-CHANNEL.
- ATTACH TO POST IN ACCORDANCE WITH NCDOT STD. 904.50.

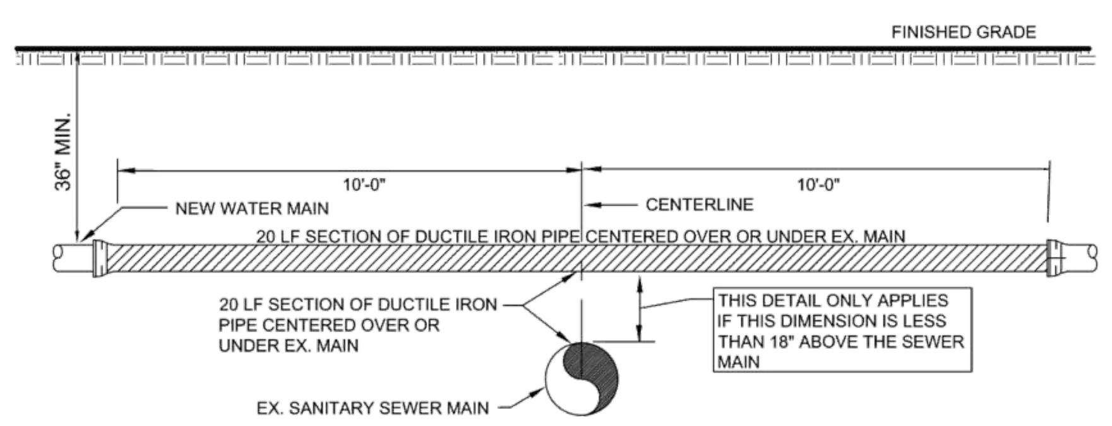
NON-POTABLE WATER WARNING SIGN
NOT TO SCALE



NOTE:
ABOVE GROUND PIPE, 90°BEND AND BLIND FLANGE SHALL BE PAINTED SAFETY BLUE (PANTONE 285 C) 1 COAT SHOP PRIMER, 2 COATS ACRYLIC ENAMEL

NOTE:
ORIENT CAM LOCK ADAPTER FITTING AS SHOWN ON PLAN OR AS DIRECTED BY ENGINEER

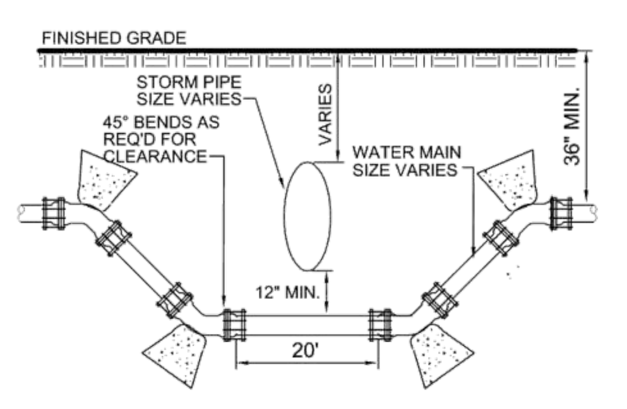
CAMLOCK "QUICK CONNECT" FOR EMERGENCY PUMP
3/8" = 1'-0"



NOTES:

1. DUCTILE IRON PIPE IS ONLY REQUIRED IF LOCAL CONDITIONS PREVENT AN 18 INCH VERTICAL SEPARATION. IF THE VERTICAL SEPARATION IS LESS THAN 18 INCHES, A SINGLE LENGTH OF DUCTILE IRON PIPE SHALL BE CENTERED OVER THE POINT OF CROSSING.
2. NOTE 1 SHALL APPLY TO A WATER MAIN CROSSING OVER A SANITARY SEWER MAIN OR A SEWER MAIN CROSSING OVER A WATER MAIN.
3. DUCTILE IRON PIPE SHALL BE REQUIRED FOR BOTH WATER MAIN AND SANITARY SEWER MAIN IF THE VERTICAL SEPARATION IS LESS THAN 18 INCHES.

WATER MAIN-SANITARY SEWER CROSSING *



NOTES:

1. TO THE MAXIMUM EXTENT PRACTICABLE, CENTER PIPE SECTIONS OVER THE POINT OF CROSSING.
2. IF LOCAL CONDITIONS PREVENT THE MINIMUM 12 INCH VERTICAL SEPARATION FROM BEING OBTAINED, CONSULT WITH THE TOWN OF NAGS HEAD WATER DEPARTMENT FOR POTENTIAL ALTERNATIVES.*
3. IT IS RECOMMENDED (2) 60# BAGS OF PREMIX CONCRETE ON EITHER SIDE OF PIPE CROSSING FOR STORM PIPE SUPPORT.
4. CONCRETE THRUST BLOCKS SHALL BE INSTALLED PER THRUST BLOCK DETAIL.

WATER MAIN-STORM SEWER CROSSING *

* Exceptions to separation distances may be permitted if authorized in accordance with 15A NCAC 18C .0904 Rules Governing Public Water Systems - Distribution Systems Pipe Laying

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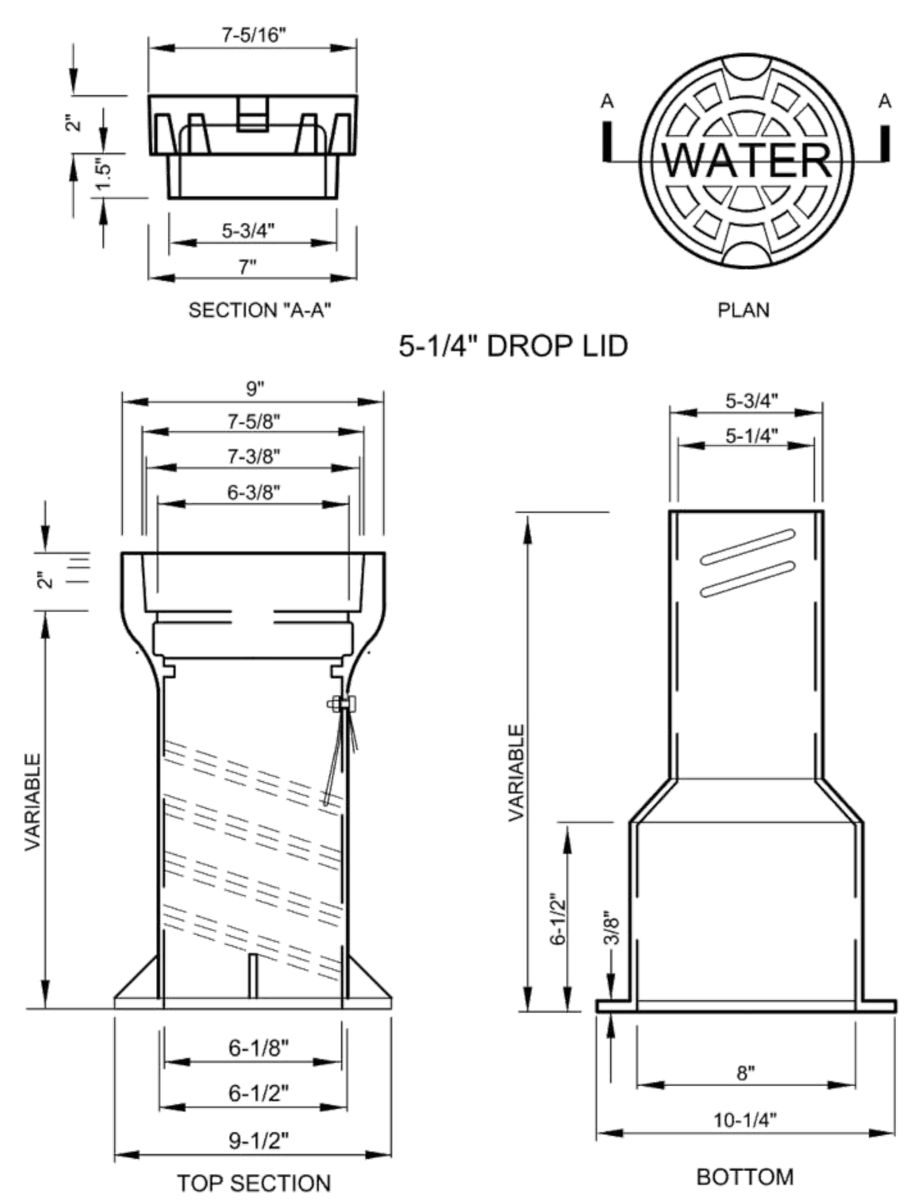
WATER MAIN CROSSING (UTILITY) DETAILS

SCALE: NONE
ISSUE DATE: 6-7-2021
REVISION DATE:
SHEET NO: 1 OF 1
DRAWN BY: DMR

DETAIL NO.: W-15



NOTES

1. VALVE BOX SHALL BE 3 PART SCREW-TYPE, CLOSE-GRAINED GRAY CAST IRON MANUFACTURED BY CHAMPION METALS OR APPROVED EQUAL.
2. VALVE BOX SHALL HAVE RAISED LETTERS "WATER" CAST INTO COVER.
3. VALVE BOX ACCOMMODATES 4" THRU 12" VALVES.
4. VALVE BOX SHALL HAVE (1) COAT OF PROTECTIVE ASPHALTUM PAINT.
5. DIMENSIONS SHOWN ARE FOR INFORMATION ONLY AND VARY BASED UPON THE MANUFACTURER.
6. WHERE A VALVE BOX WILL BE PLACED IN THE PAVEMENT THE LID SHALL BE A BINGHAM AND TAYLOW ROAD LOCK SCREW TYPE IRON LID #CUL5LWL OR APPROVED EQUAL.
7. EACH VALVE BOX SHALL BE PROTECTED WITH A PRECAST CONCRETE VALVE PROTECTOR.

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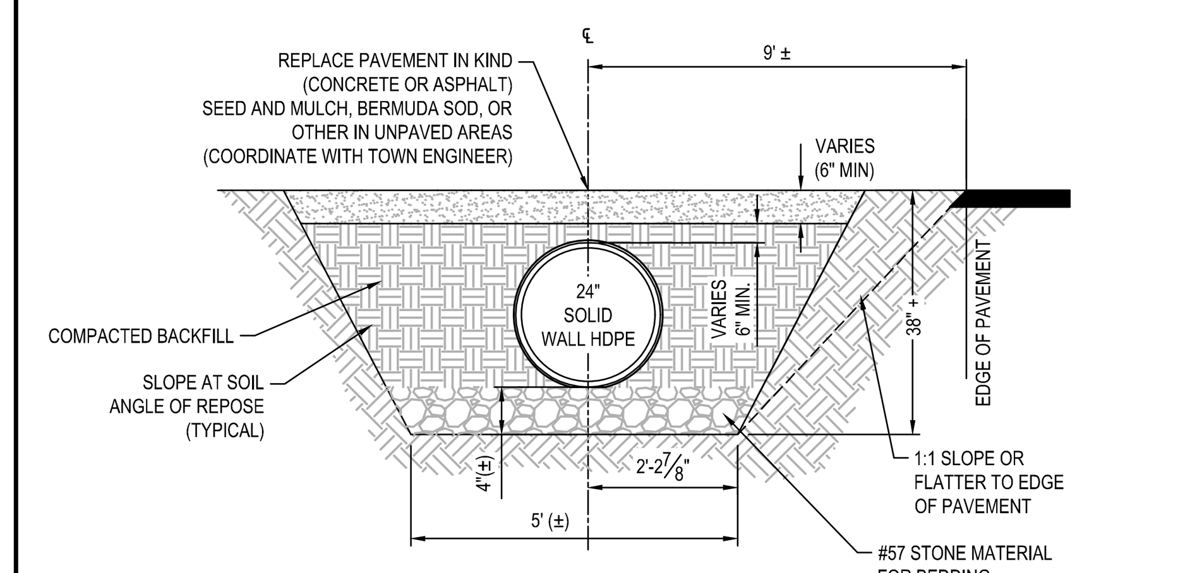
VALVE BOX DETAIL

SCALE: NONE
ISSUE DATE: 6-7-2021
REVISION DATE:
SHEET NO: 1 OF 1
DRAWN BY: DMR

DETAIL NO.: W-9

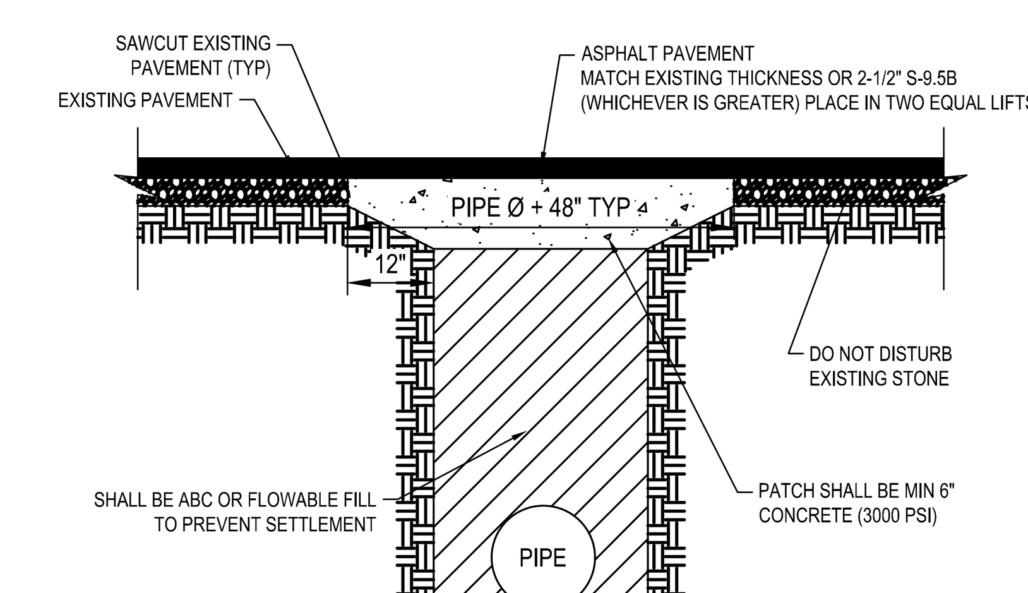


NOTES:
FIELD CONDITIONS MAY REQUIRE DEVIATION FROM PLAN LOCATION AND TYPICAL SECTION. CONTRACTOR SHALL COORDINATE ALL DEVIATIONS WITH THE TOWN AND THE ENGINEER.

THE MATERIAL EXCAVATED FROM THE TRENCH MAY BE USED FOR BACKFILL, IF SUITABLE (SEE SPECIFICATIONS). ANY UNSUITABLE MATERIAL SHALL BE REMOVED FROM THE SITE AT NO EXTRA CHARGE.

SOLID WALL HDPE TRENCH DETAIL
NOT TO SCALE

BASE BID

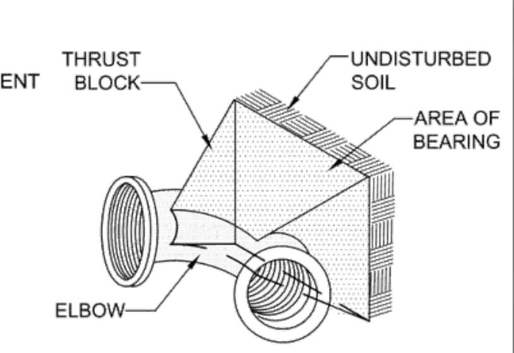


NOTE:
ALL PAVEMENT CUTS SHALL BE REPAIRED WITHIN A MAXIMUM OF 2 DAYS FROM THE DATE THE CUT IS MADE. IF CONDITIONS DO NOT PERMIT A PERMANENT REPAIR WITHIN THE GIVEN TIME LIMIT, PERMISSION TO MAKE A TEMPORARY REPAIR MUST BE OBTAINED FROM ENGINEER.

NON-NCDOT ROAD OPEN CUT INSTALLATION
NOT TO SCALE

NOTES:

1.) THRUST BLOCKS SHALL BE INSTALLED ON WATER DISTRIBUTION LINES 6" THRU 12" DIA. IN THE MANNER SHOWN.
2.) COMPACT FITTINGS ARE NOT ACCEPTABLE. STANDARD FITTINGS SHALL BE USED WITH CONCRETE THRUST BLOCKING.
3.) THRUST BLOCKS SHALL BE INSTALLED ON WATER MAIN IN THE MANNER SHOWN.
4.) IF SAC-CRETE IS USED, MIXING MUST BE ON SITE UTILIZING A MECHANICAL MIXER.
5.) NO CONCRETE SHALL BE PLACED ON BOLTS. WRAP JOINT FITTINGS WITH PLASTIC.
6.) CONCRETE SHALL BE A MINIMUM OF 3/4 C.Y. @ 3,000 psi.
7.) ALL BEARING SURFACES SHALL BE AGAINST UNDISTURBED SOIL AND SHALL BE APPROVED BY TOWN REPRESENTATIVE PRIOR TO PLACEMENT OF CONCRETE.
8.) USE OF RESTRAINED JOINT DUCTILE IRON WILL BE REQ'D IF SOIL CONDITIONS DO NOT ALLOW THE USE OF THRUST BLOCKS
9.) ALL VERTICAL BENDS SHALL BE RESTRAINED USING RESTRAINED JOINT DUCTILE IRON PIPE.

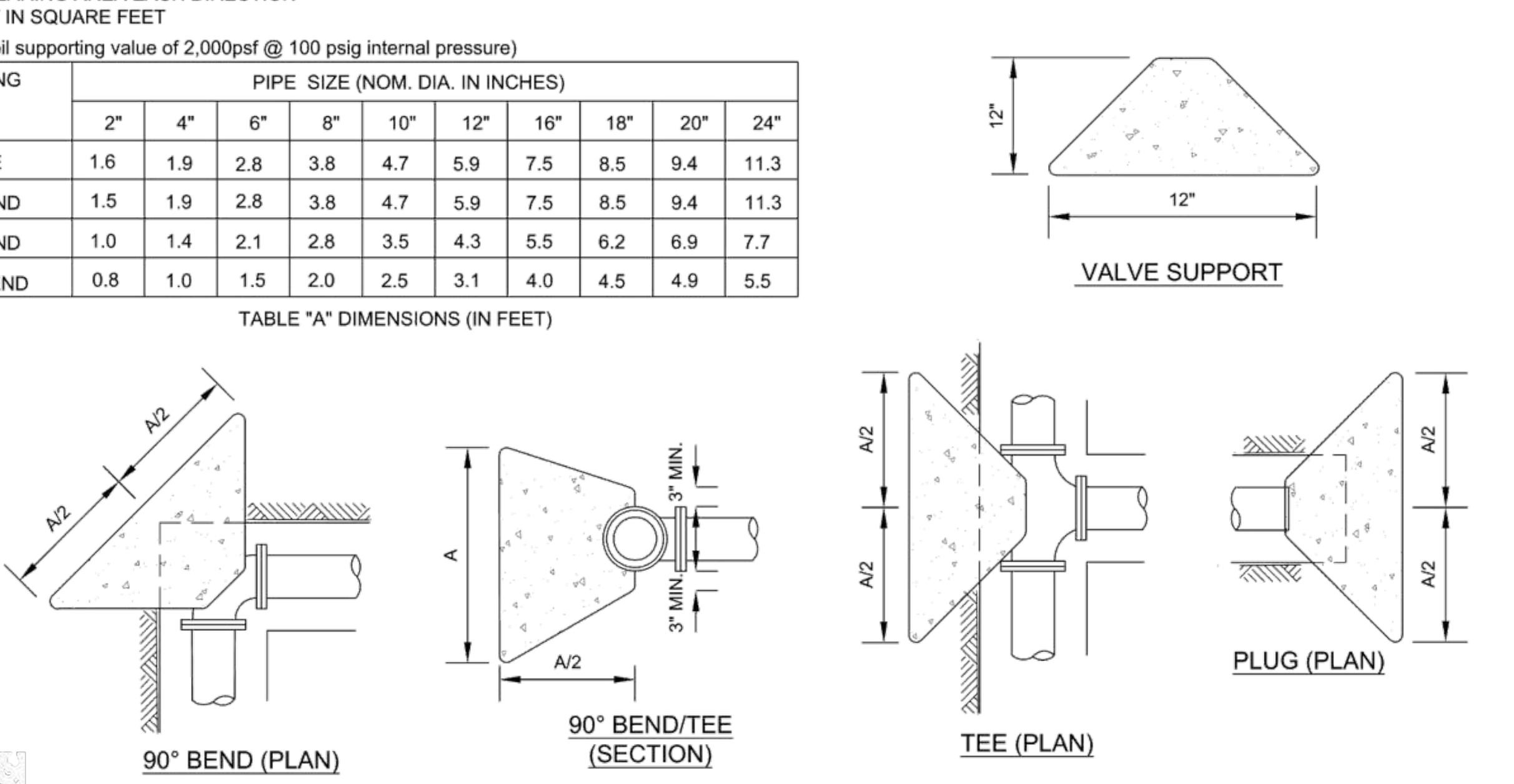


MINIMUM BEARING AREA EACH DIRECTION OF THRUST IN SQUARE FEET

(based on soil supporting value of 2,000psf @ 100 psig internal pressure)

FITTING	2"	4"	6"	8"	10"	12"	16"	18"	20"	24"
	PIPE SIZE (NOM. DIA. IN INCHES)									
TEE	1.6	1.9	2.8	3.8	4.7	5.9	7.5	8.5	9.4	11.3
90° BEND	1.5	1.9	2.8	3.8	4.7	5.9	7.5	8.5	9.4	11.3
45° BEND	1.0	1.4	2.1	2.8	3.5	4.3	5.5	6.2	6.9	7.7
22.5° BEND	0.8	1.0	1.5	2.0	2.5	3.1	4.0	4.5	4.9	5.5

TABLE "A" DIMENSIONS (IN FEET)



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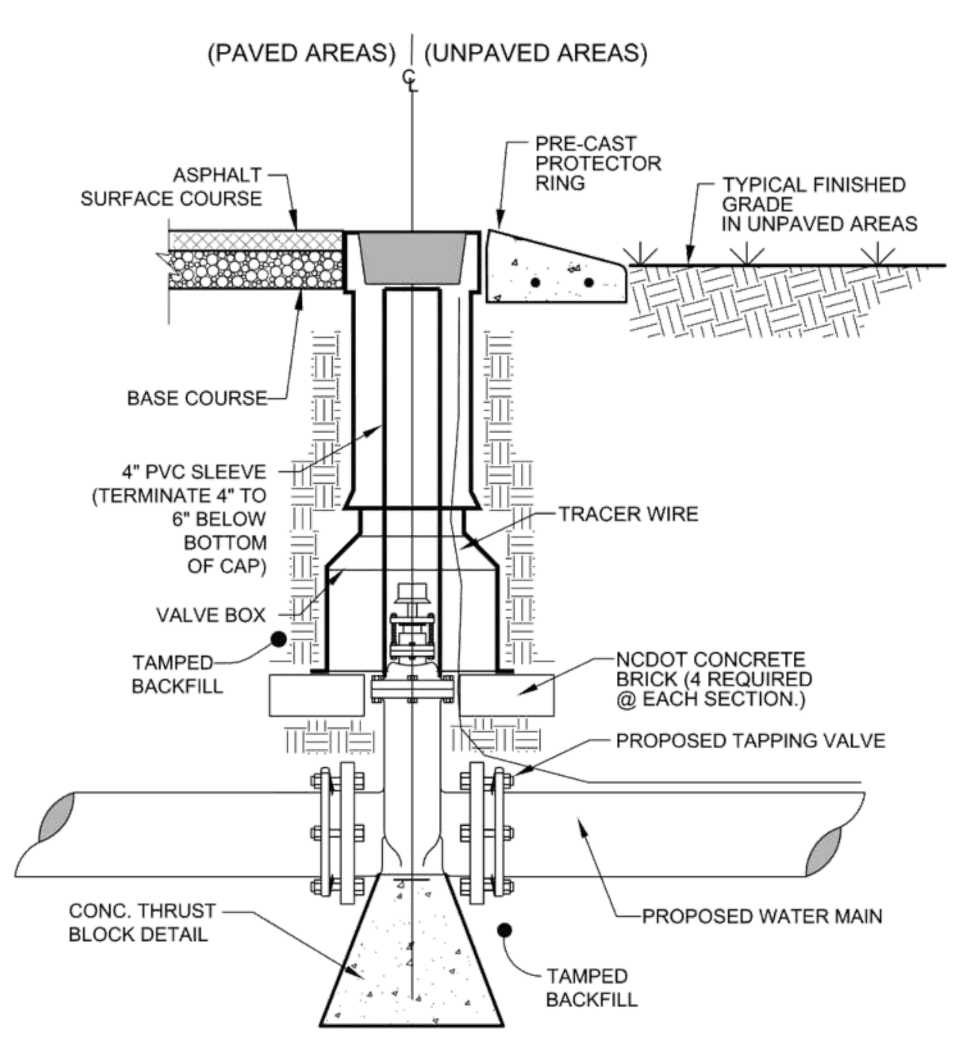
THRUST BLOCK DETAIL

SCALE: NONE
ISSUE DATE: 6-7-2021
REVISION DATE:
SHEET NO: 1 OF 1
DRAWN BY: DMR

DETAIL NO.: W-5

NOTES:

1. ALL MATERIALS SHALL BE IN ACCORDANCE WITH AWWA STANDARDS.
2. RESILIENT WEDGE GATE VALVE SHALL BE AS MANUFACTURED BY WATEROUS RESILIENT WEDGE TYPE OR APPROVED EQUAL.
3. ALL VALVES SHALL HAVE 2" SQUARE OPERATING NUT AND SHALL OPEN COUNTERCLOCKWISE.
4. VALVE BODY, BONNET AND GATE SHALL BE IN ACCORDANCE WITH AWWA C-509/C-515 AND NSF61.
5. VALVE BODY AND BONNET SHALL BE COATED ON ALL INTERIOR AND EXTERIOR SURFACES WITH A FUSION BONDED EPOXY IN ACCORDANCE WITH AWWA C-550-90.
6. ALL VALVES 24" AND SMALLER SHALL HAVE A SAFE WORKING PRESSURE OF 200 PSI. MIN.
7. ALL MAINLINE VALVES SMALLER THAN 4 INCHES SHALL BE A FORD BALL VALVE OR MUELLER.
8. SEE VALVE BOX DETAIL FOR ADDITIONAL INFORMATION.
9. SEE VALVE BOX PROTECTOR RING DETAIL FOR ADDITIONAL INFORMATION.
10. VALVE BOX SECTIONS ARE REQUIRED. THE USE OF PIPE IN LIEU OF VALVE BOX SECTIONS SHALL NOT BE PERMITTED.



PROFILE

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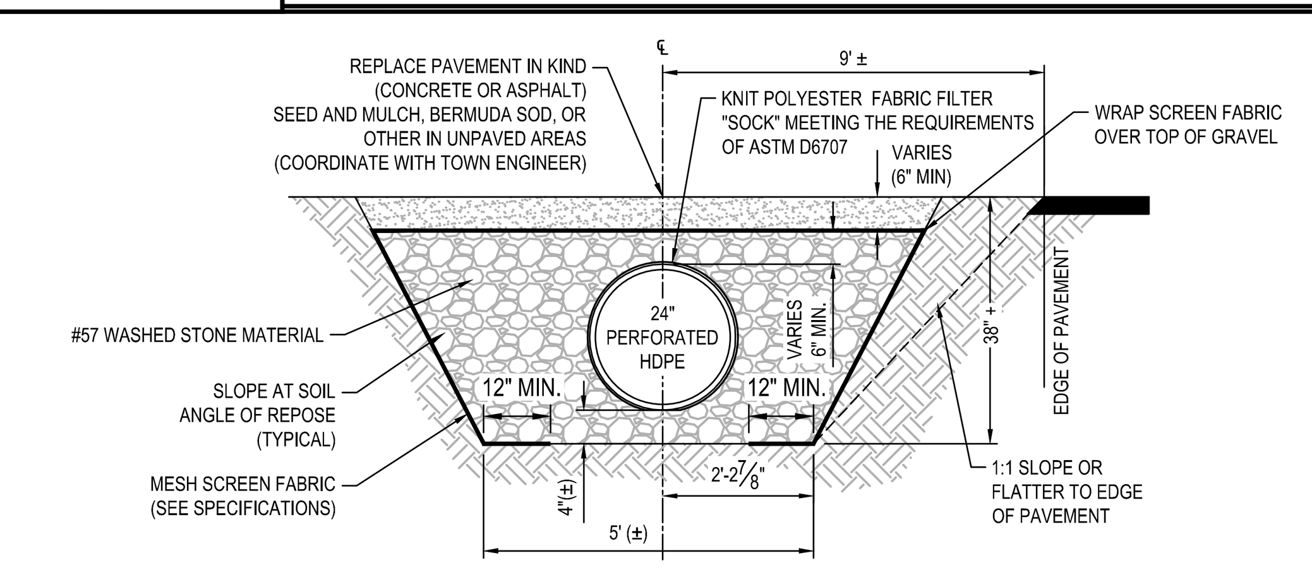
STANDARD GATE VALVE INSTALLATION DETAIL

SCALE: NONE
ISSUE DATE: 6-7-2021
REVISION DATE:
SHEET NO: 1 OF 1
DRAWN BY: DMR

DETAIL NO.: W-8



NOTES:
FIELD CONDITIONS MAY REQUIRE DEVIATION FROM PLAN LOCATION AND TYPICAL SECTION. CONTRACTOR SHALL COORDINATE ALL DEVIATIONS WITH THE TOWN AND THE ENGINEER.

ALL STONE BACKFILL USED IN INFILTRATION TRENCHES SHALL BE CLEAN, WASHED #57 STONE. THE CONTRACTOR SHALL PROVIDE SAMPLES OF THE MATERIAL FOR THE OWNER'S INSPECTION PRIOR TO INSTALLATION. ANY CONTAMINATED STONE SHALL BE REMOVED FROM THE SITE AT NO EXTRA CHARGE.

MESH SCREEN SHALL BE HIGH TENSILE STRENGTH ANTI-CORROSIVE PLAIN WOVEN SCREEN WITH UNIFORM OPENINGS OF AT LEAST 1/16" BUT NOT MORE THAN 1/8" AND A TOTAL OPEN AREA RETAION OF AT LEAST 50%. CONTRACTOR MAY SUBMIT ALTERNATE MATERIAL TO TOWN OF NAGS HEAD FOR APPROVAL.

OVERLAP EDGES OF MESH SCREEN IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION, OR A MINIMUM OF 18 INCHES, WHICHEVER IS GREATER.

PERFORATED HDPE INFILTRATION TRENCH DETAIL
NOT TO SCALE

ALTERNATE BID

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY - NOT RELEASED FOR CONSTRUCTION

McADAMS
The John R. McAdams Company, Inc.
621 Hillsborough Street
Suite 500
Raleigh, NC 27603

phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187

www.mcadamsco.com

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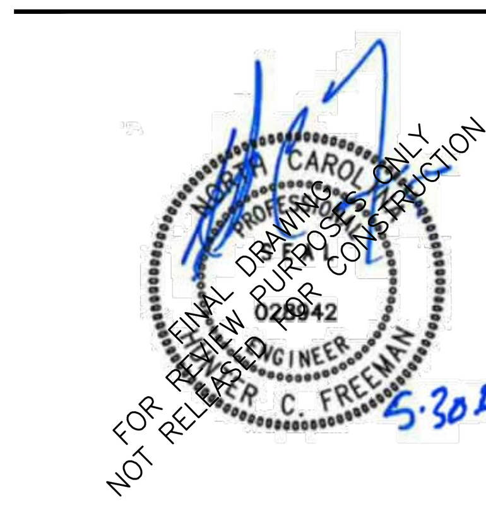
NAGS HEAD, NC 27959
PHONE: 252.441.5580

SOOIR STORMWATER INFRASTRUCTURE IMPROVEMENTS

CONSTRUCTION DRAWINGS
PROJECT AREA 12
NAGS HEAD, NC, 27959



REVISIONS

NO. DATE

PLAN INFORMATION

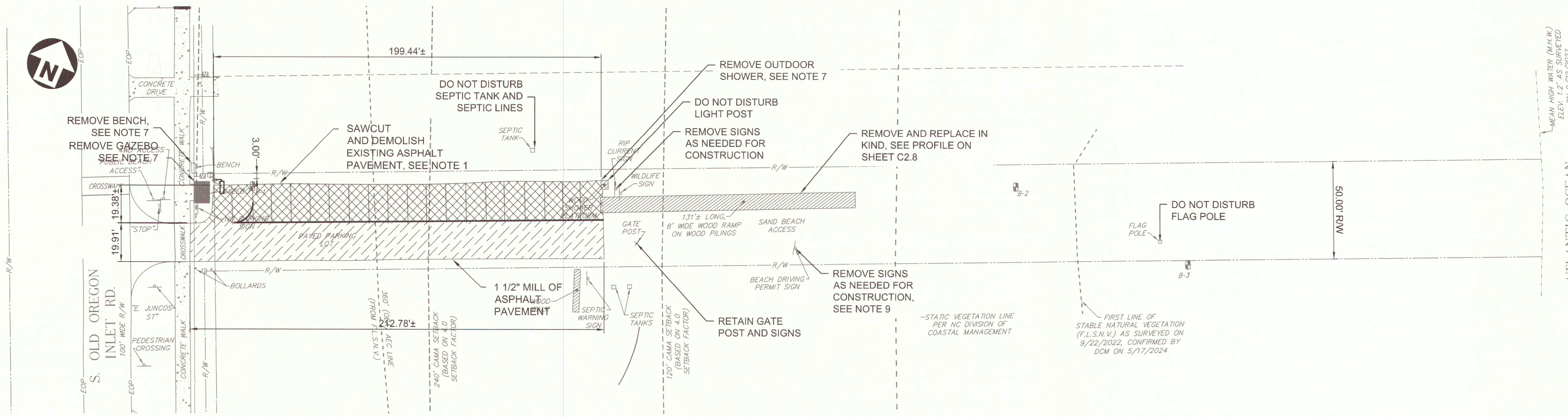
PROJECT NO.	SRP-SW-ARP-0019.2
FILENAME	TNH22001_17_D
CHECKED BY	HCF
DRAWN BY	JWS
SCALE	AS NOTED
DATE	6/26/2024

SHEET

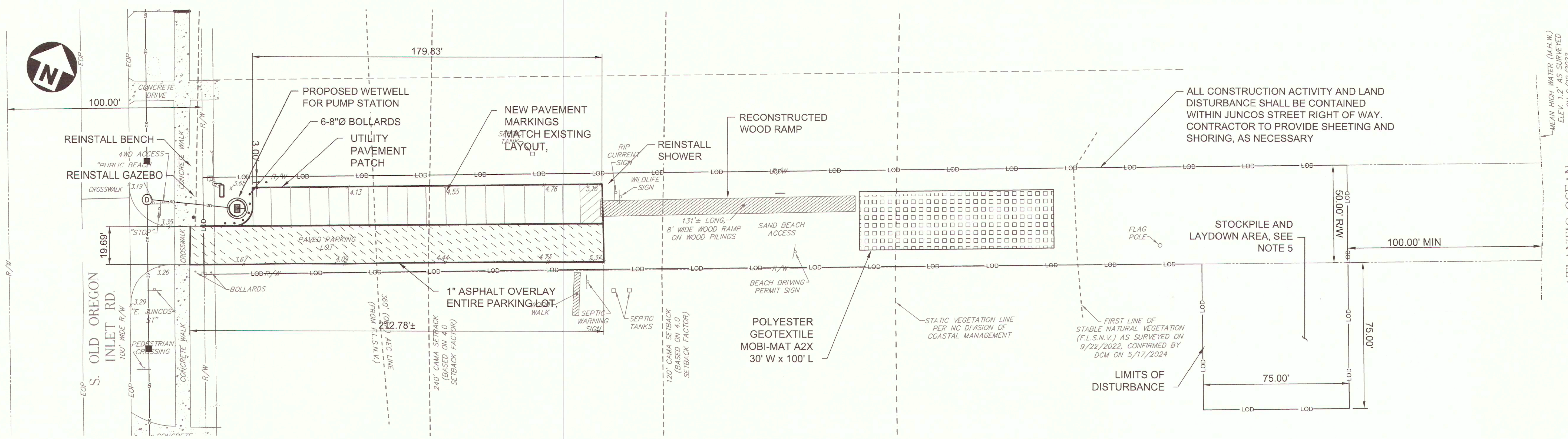
DETAILS (2 OF 2)

C2.3

moffatt & nichol
4700 FALLS OF NEUSE RD. SUITE 300
RALEIGH, NC 27609
919-781-4626
N.C. FIRM NO. F-0105



EXISTING CONDITIONS / DEMOLITION PLAN



SITE PLAN

NOTES:

1. CONTRACTOR SHALL VERIFY PAVEMENT THICKNESS. DURING REMOVAL AND REPLACE PAVEMENT IN KIND AFTER INSTALLATION OF WET WELL AND FORCE MAIN. FINAL GRADE OF ASPHALT REPLACEMENT AND OVERLAY SHALL MATCH EXISTING GRADES.
2. OVERALL ADS STORM TECH STRUCTURE AREA IS 2,150 SF UNDER MOBI-MAT.
3. MOBI-MAT POLYETHYLENE GEOTEXTILE OVERALL AREA 3,000 SF
4. STORM DRAIN IMPROVEMENTS UP TO WETWELL PROVIDED BY MCADAMS.
5. STOCKPILING AND LAYDOWN WITHIN PAVED PARKING AREA ALONG JUNCOS STREET AND WITHIN BEACH AREA SETBACK SHALL BE 100 FT FROM MEAN HIGH WATER AND CONFORM WITH SCHEDULE AND ACCESSIBILITY REQUIREMENTS DESCRIBED ON SHEET C0.1.
6. MEAN HIGH WATER AND LOW WATER ELEVATIONS BASED UPON NOAA STATION 8651370, DUCK, NC.
7. GAZEBO, BENCH AND OUTDOOR SHOWER SHALL BE RE-INSTALLED IN THEIR ORIGINAL LOCATION ONCE CONSTRUCTION OF DRAINAGE SYSTEM AND WETWELL IS COMPLETED.
8. DO NOT DISTURB EXISTING SIGNS AT THE INTERSECTION OF S. OREGON INLET ROAD AND JUNCOS STREET.
9. ALL SIGNS REMOVED DURING CONSTRUCTION SHALL BE STORED APPROPRIATELY AND REPLACED IN KIND ONCE CONSTRUCTION ACTIVITY IS COMPLETED.

SCALE: 1"=30'

FINAL DRAWING
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621 Hillsborough Street
Suite 500
Raleigh, NC 27603
phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187
www.mcadamsco.com

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SOOIR STORMWATER INFRASTRUCTURE IMPROVEMENTS

CONSTRUCTION DRAWINGS
PROJECT AREA 12
NAGS HEAD, NC, 27959

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REVISIONS

NO. DATE

PLAN INFORMATION

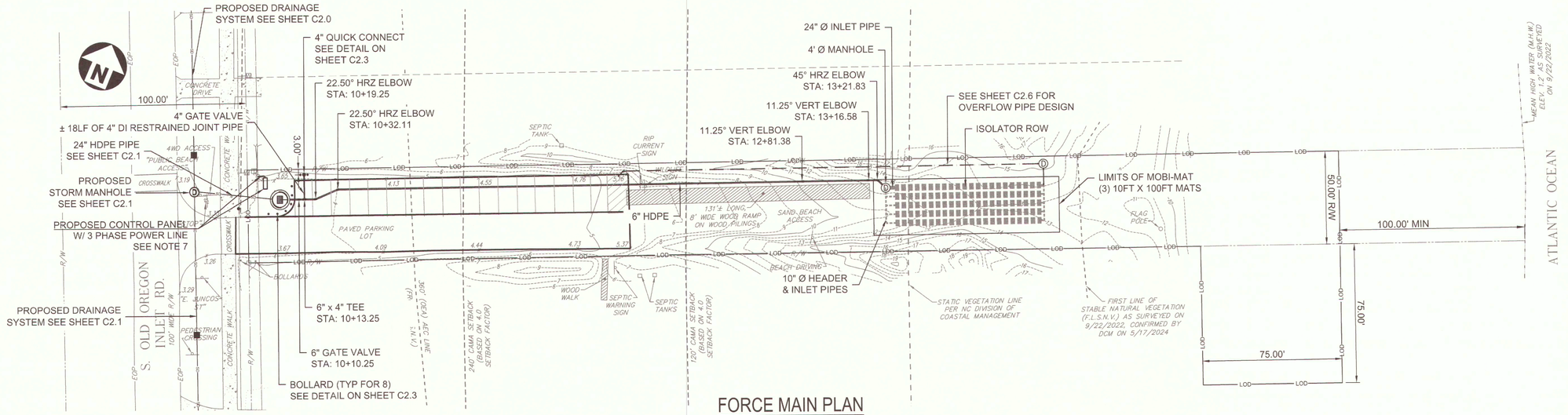
PROJECT NO.	220494-03
FILENAME	
CHECKED BY	KCZ
DRAWN BY	YIS
SCALE	AS NOTED
DATE	06/26/2024

SHEET

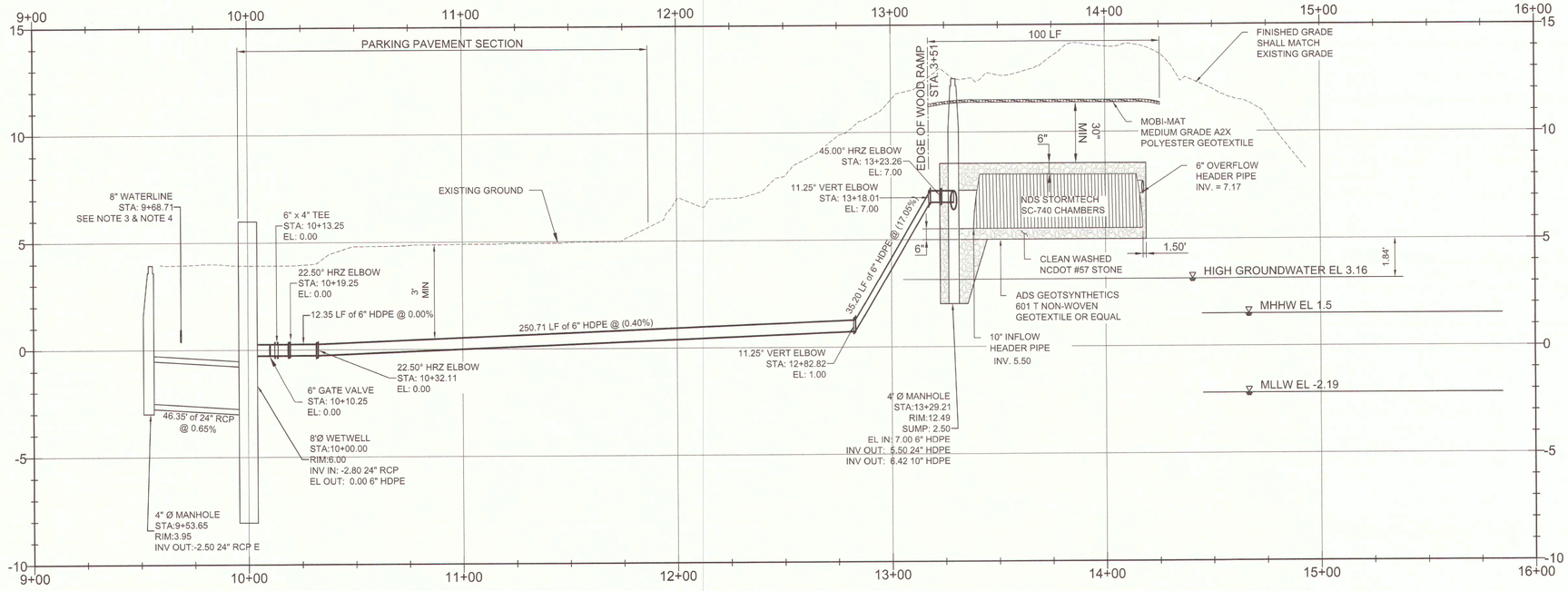
DUNE INFILTRATION UTILITY PLAN & PROFILE (1 OF 3)

C2.4

moffatt & nichol
4700 FALLS OF NEUSE RD, SUITE 300
RALEIGH, NC 27609
919-781-4626
N.C. FIRM NO. F-0105



FORCE MAIN PLAN



FORCE MAIN PROFILE VIEW

NOTES:

1. CONTRACTOR SHALL NOT DISTURB EXISTING OUTDOOR SHOWER OR EXISTING LIGHT POLE.
2. ELEVATION (EL) OF FORCE MAIN IS NOTED AT CENTER OF LINE OF PIPE, UNLESS NOTE AS AN INVERT (INV).
3. EXISTING WATERLINE ASSUMED TO HAVE 3 FT OF COVER. CONTRACTOR SHALL VERIFY LOCATION OF EXISTING WATERLINE BEFORE STARTING WORK.
4. CURRENT STORMWATER DESIGN BY MCADAMS ASSUMES THAT THE EXISTING WATERLINE IS IN CONFLICT WITH PROPOSED 24" HDPE PIPE AND REQUIRES RELOCATION.
5. MOBI-MAT SHALL HAVE A MINIMUM OF 12" OF SAND OVER THE TOP OF THE MAT.
6. MOBI-MAT SHALL COVER THE EXTENTS OF THE GRAVEL AREA OF THE INFILTRATION SYSTEM.
7. CONTRACTOR SHALL COORDINATE WITH POWER COMPANY TO PROVIDE POWER SERVICE TO PROPOSED LOCATION OF CONTROL PANEL.
8. PIPING FROM THE WETWELL TO THE 6 x 4 TEE SHALL BE DUCTILE IRON.
9. PIPING FROM THE 6 x 4 TEE TO THE MANHOLE SHALL BE HDPE SDR-9 WITH BUTT FUSION JOINTS. ALL 6" BEND FITTINGS SHALL BE HDPE AND OF SAME MANUFACTURER AS THE PIPE.
10. 6 x 4 TEE SHALL BE MJ FITTING.
11. HDPE PIPE SHALL HAVE AN MJ ADAPTER FUSED ON THE END THAT CONNECTS TO THE 6 x 4 TEE.
12. JOINTS ON THE 6 x 4 TEE SHALL BE RESTRAINED USING MEGALUGS, OR APPROVED EQUAL.

VERT: 3' 0' 3' 6'
SCALE: 1"=3'

HORZ: 30' 0' 30' 60'
SCALE: 1"=30'

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TOWN OF NAGS HEAD

SOUTH OF THE INLET STORMWATER INFRASTRUCTURE IMPROVEMENTS
CONSTRUCTION DRAWINGS
PROJECT AREA 12
NAGS HEAD, NC, 27959

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NORTH CAROLINA PROFESSIONAL SEAL 027661 ENGINEER KEVIN C. ZELEB

REVISIONS

NO.	DATE

PLAN INFORMATION

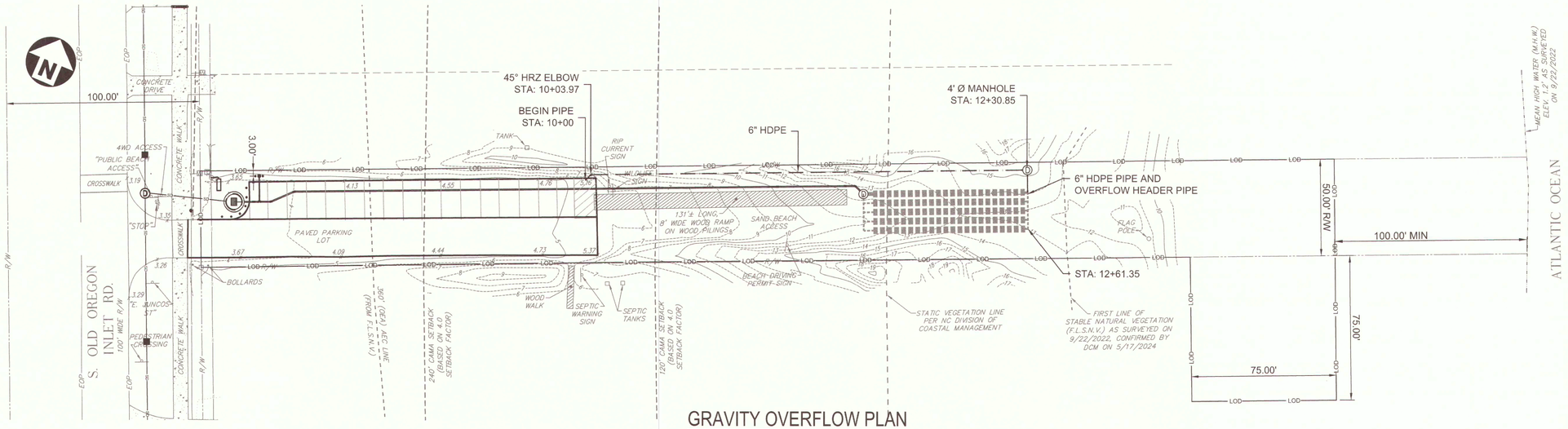
PROJECT NO.	220494-03
FILENAME	
CHECKED BY	KCZ
DRAWN BY	YIS
SCALE	AS NOTED
DATE	06/26/2024

SHEET

DUNE INFILTRATION UTILITY PLAN & PROFILE (2 OF 3)

C2.5

moffatt & nichol
4700 FALLS OF NEUSE RD, SUITE 300
RALEIGH, NC 27609
919-781-4626
N.C. FIRM NO. F-0105



GRAVITY OVERFLOW PLAN

GRAVITY OVERFLOW PROFILE VIEW

NOTES:

1. PIPE INVERT IS MEASURED AT CENTER OF MH.
2. PIPE LENGTH IS MEASURED TO CENTER OF MH
3. OVERFLOW PIPE OUTLETS TO THE PARKING LOT SURFACE

VERT: 3' 0' 3' 6'
SCALE: 1"=3'

HORZ: 30' 0' 30' 60'
SCALE: 1"=30'

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TOWN OF NAGS HEAD
POST OFFICE BOX 99
NAGS HEAD, NC 27959
PHONE: 252.441.5580

SOOIR STORMWATER INFRASTRUCTURE IMPROVEMENTS

CONSTRUCTION DRAWINGS
PROJECT AREA 12
NAGS HEAD, NC, 27959

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027661 ENGINEER K. V. I. N. C. Z. D. E. B.

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DUNE INFILTRATION UTILITY PLAN & PROFILE (3 OF 3)

C2.6

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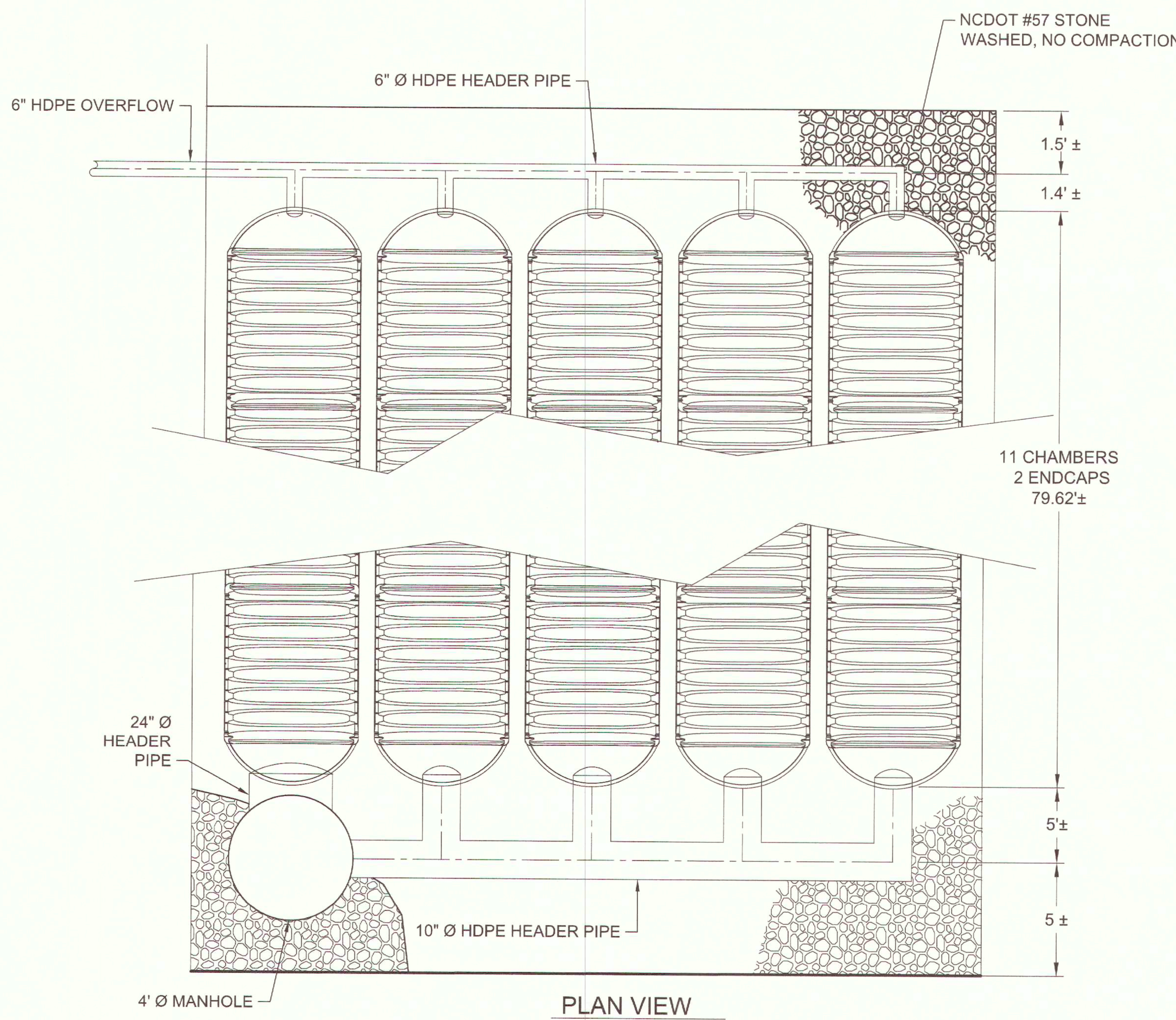
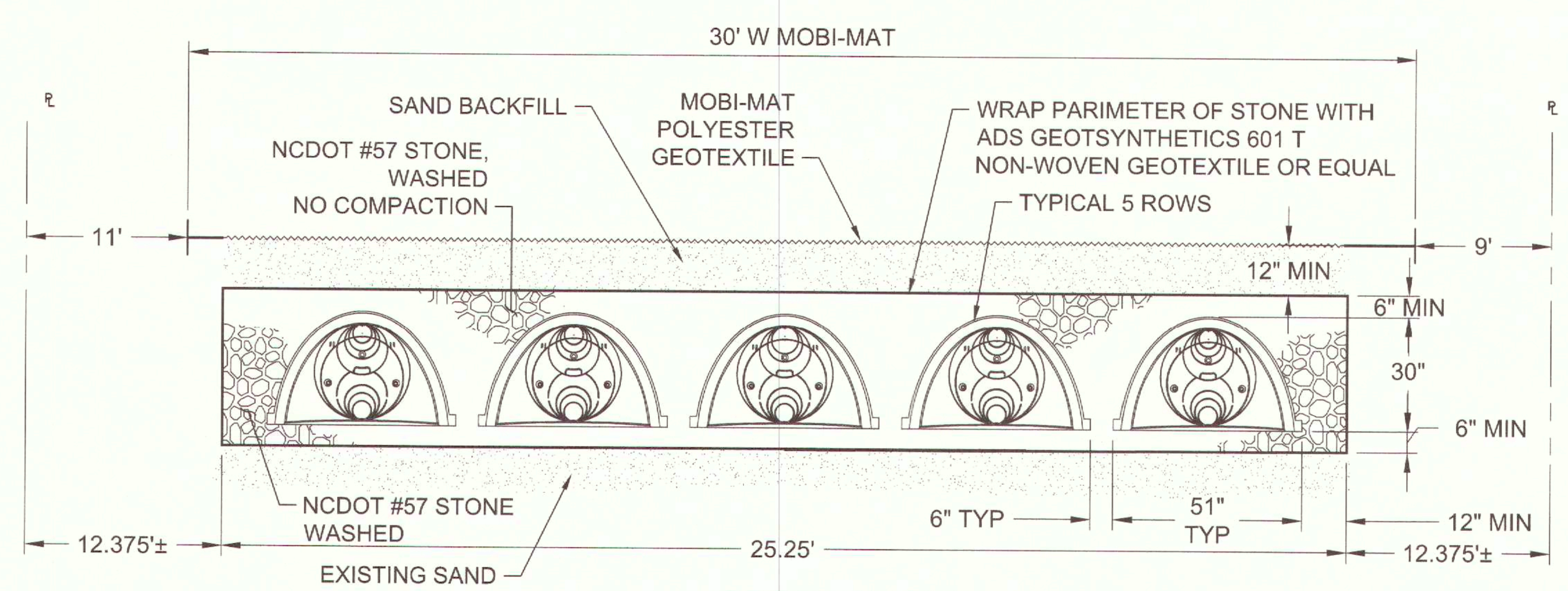
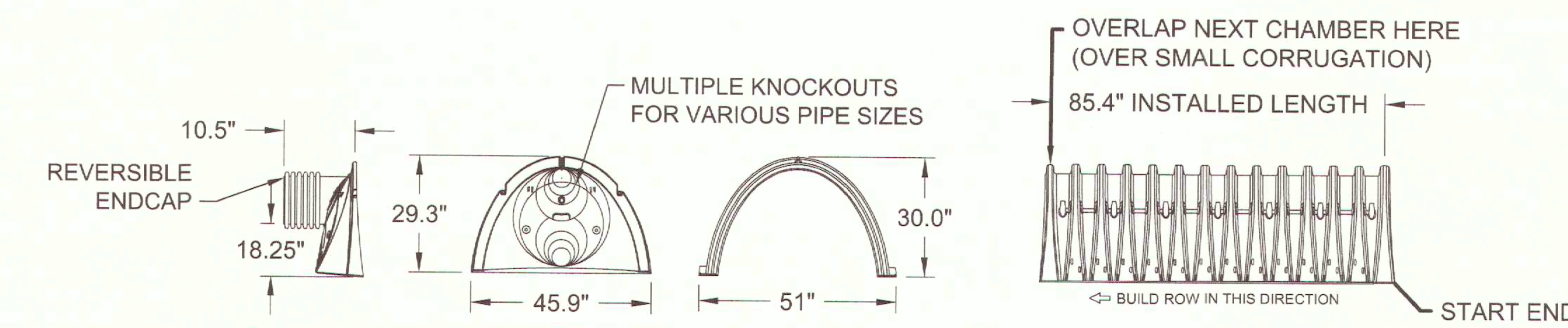


PLAN VIEW



PROFILE VIEW

NDS STORMTECH SC-740 CHAMBERS
NOT TO SCALE



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"
CHAMBER STORAGE	45.9 CUBIC FEET
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET
WEIGHT	75.0 lbs.

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS

NDS STORMTECH SC-740 CHAMBERS SPECIFICATIONS
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TOWN OF NAGS HEAD

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DUNE INFILTRATION
DETAILS 1 OF 2

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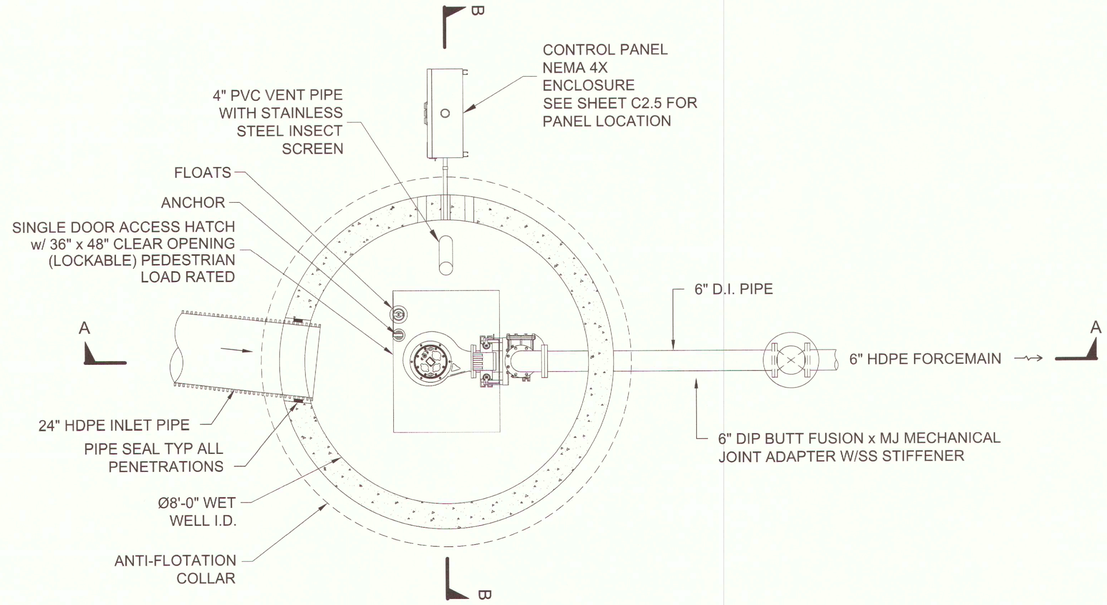
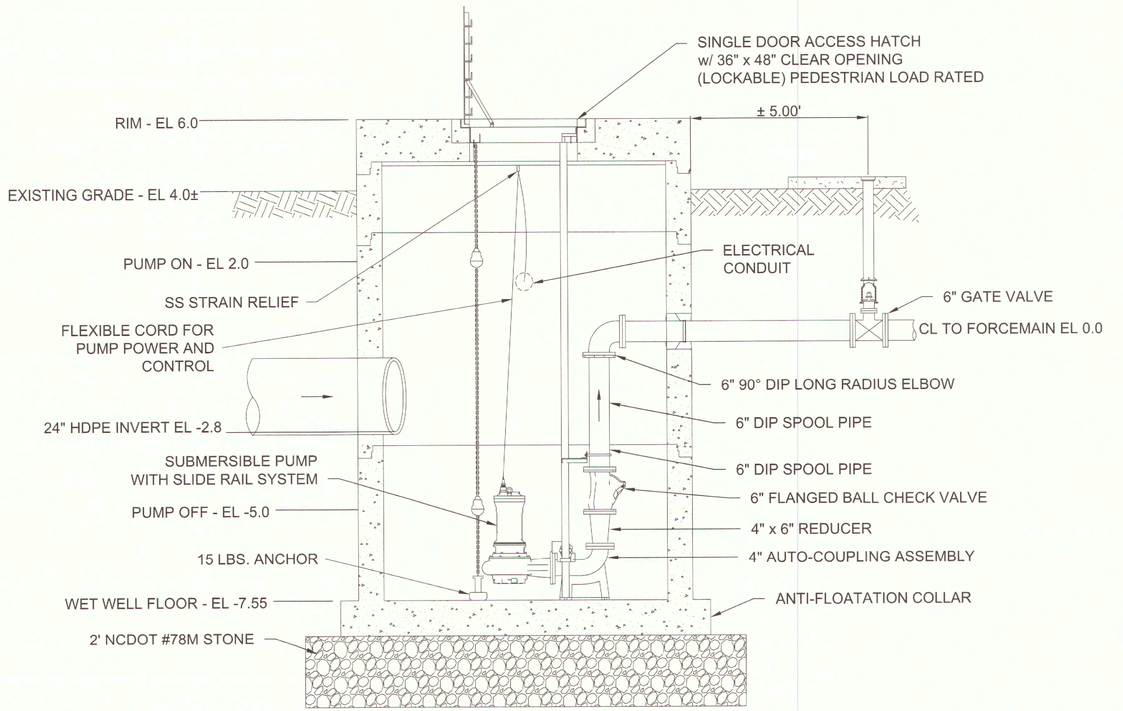


PLAN VIEW
SCALE: 1" = 2'

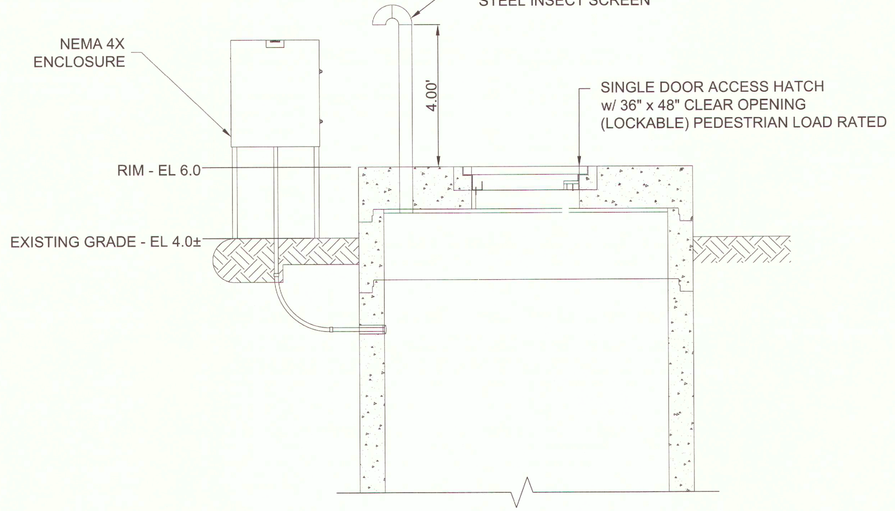
SYSTEM CHARACTERISTICS	
APPLICATION	PUMP
DESIGN FLOW (gpm)	500 GPM
TOTAL DYNAMIC HEAD (Ft.)	32
STATIC HEAD (Ft.)	12.0

NOTES:

1. DESIGN BASED UPON 4" SIMPLEX BARMESA SUBMERSIBLE NON CLOG SERIES 4BSE-HLDS, 11.3 HP 1750 RPM, Ø8" IMPELLER, 6" DISCHARGE PIPE.
2. PROVIDE WATER TIGHT SLEEVE SEALS FOR ALL PENETRATIONS.
3. PROVIDE ANTI-FLOATATION COLLAR AND BUOYANCY CALCULATIONS. SEALED AND SIGNED BY A LICENSED PROFESSIONAL ENGINEER.
4. ALL SLIDE RAIL SYSTEM AND INTERIOR HARDWARE SHALL BE 304 STAINLESS STEEL.



SECTION A-A
SCALE: 1" = 2'



SECTION B-B
SCALE: 1" = 2'

WETWELL NON-CLOG PUMP STATION
SCALE: 1" = 2'

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027661 KEVIN C ZIDEL

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DUNE INFILTRATION
DETAILS 2 OF 2

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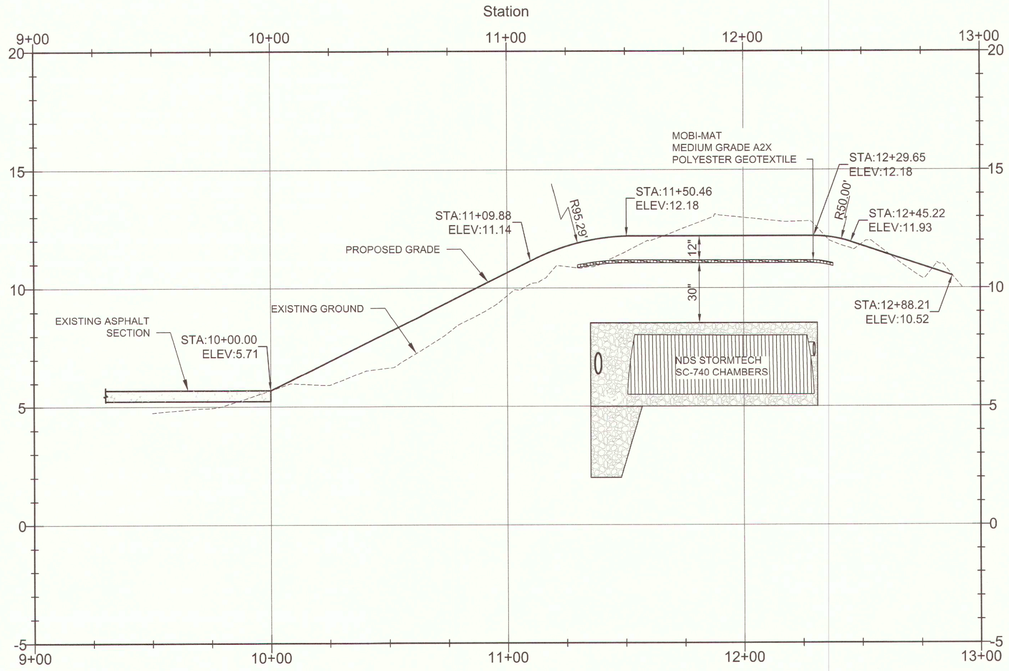
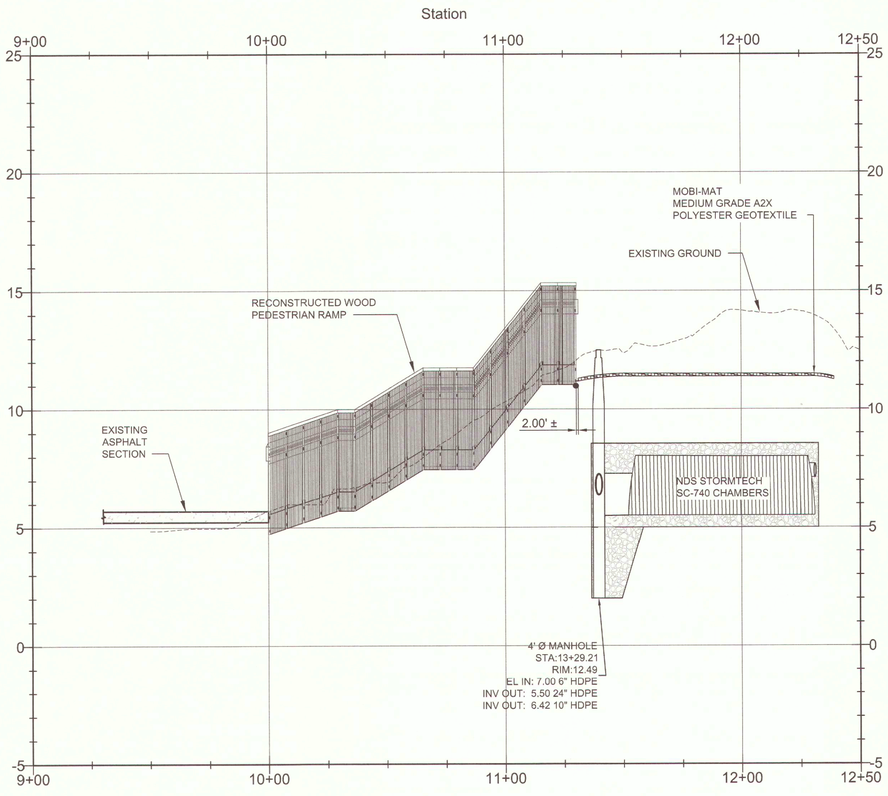


VEHICLE ACCESS PROFILE VIEW



WALKOVER RAMP PROFILE VIEW

VERT: 3' 0' 3' 6'
SCALE: 1"=3'

HORZ: 30' 0' 30' 60'
SCALE: 1"=30'

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DUNE WALKOVER AND VEHICLE ACCESS PROFILES

C2.9

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual day rainfall information is available, record the cumulative rain measurement for those un attended days (and this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the measures inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Indication of whether the measures were operating properly, 5. Description of maintenance needs for the measure, 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDOs)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the discharge outfalls inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5. Indication of visible sediment leaving the site, 6. Description, evidence, and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If visible sedimentation is found outside site limits, then a record of the following shall be made: 1. Actions taken to clean up or stabilize the sediment that has left the site limits, 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases.
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream has visible increased turbidity from the construction activity, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office per Part III, Section C, Item (2)(a) of this permit.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&SC measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be kept on site and available for inspection at all times during normal business hours.

Item to Document	Documentation Requirements
(a) Each E&SC measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&SC plan.	Initial and date each E&SC measure on a copy of the approved E&SC plan or complete, date and sign an inspection report that lists each E&SC measure shown on the approved E&SC plan. This documentation is required upon the initial installation of the E&SC measures or if the E&SC measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&SC plan.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&SC measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&SC measures.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

2. Additional Documentation to be Kept on Site

In addition to the E&SC plan documents above, the following items shall be kept on the site and available for inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

(a) This General Permit as well as the Certificate of Coverage, after it is received.

(b) Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years

All data used to complete the e-NOI and all inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that Must be Reported

Permittees shall report the following occurrences:

(a) Visible sediment deposition in a stream or wetland.

(b) Oil spills if:
- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).

(c) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.

(d) Anticipated bypasses and unanticipated bypasses.

(e) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Department's Environmental Emergency Center personnel at (800) 858-0368.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	• ***Within 24 hours***, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible.*** The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment[40 CFR 122.41(l)(7)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

PART II, SECTION G, ITEM (4)
DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT

Sediment basins and traps that receive runoff from drainage areas of one acre or more shall use outlet structures that withdraw water from the surface when these devices need to be drawn down for maintenance or close out unless this is infeasible. The circumstances in which it is not feasible to withdraw water from the surface shall be rare (for example, times with extended cold weather). Non-surface withdrawals from sediment basins shall be allowed only when all of the following criteria have been met:

(a) The E&SC plan authority has been provided with documentation of the non-surface withdrawal and the specific time periods or conditions in which it will occur. The non-surface withdrawal shall not commence until the E&SC plan authority has approved these items,
(b) The non-surface withdrawal has been reported as an anticipated bypass in accordance with Part III, Section C, Item (2)(c) and (d) of this permit,
(c) Dewatering discharges are treated with controls to minimize discharges of pollutants from stormwater that is removed from the sediment basin. Examples of appropriate controls include properly sited, designed and maintained dewatering tanks, weir tanks, and filtration systems,
(d) Vegetated, upland areas of the sites or a properly designed stone pad is used to the extent feasible at the outlet of the dewatering treatment devices described in Item (c) above,
(e) Velocity dissipation devices such as check dams, sediment traps, and riprap are provided at the discharge points of all dewatering devices, and
(f) Sediment removed from the dewatering treatment devices described in Item (c) above is disposed of in a manner that does not cause deposition of sediment into waters of the United States.

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING | EFFECTIVE: 04/01/19

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.

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.

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.
11. See detail this sheet.

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING | EFFECTIVE: 04/01/19

STABILIZATION REQUIREMENTS:

Stabilization for this project shall comply with the time frame guidelines as specified by the NCG-010000 general construction permit effective April 1, 2019 issued by the North Carolina Department of Environmental Quality Division of Water Resources. Temporary or permanent ground cover stabilization shall occur within 7 calendar days from the last land-disturbing activity, with the following exceptions in which temporary or permanent ground cover shall be provided in 14 calendar days from the last land-disturbing activity:
- Slopes between 2:1 and 3:1, with a slope length of 10 ft. or less
- Slopes 3:1 or flatter, with a slope of length of 50 ft. or less
- Slopes 4:1 or flatter

The stabilization timeframe for High Quality Water (HQW) Zones shall be 7 calendar days with no exceptions for slope grades or lengths. High Quality Water Zones (HQW) Zones are defined by North Carolina Administrative Code 15A NCAC 04A.0105 (25). Temporary and permanent ground cover stabilization shall be achieved in accordance with the provisions in this contract and as directed.

SEEDING AND MULCHING: (East)
The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

All Roadway Areas

March 1 - August 31		September 1 - February 28	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

March 1 – August 31		September 1 - February 28	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

Approved Tall Fescue Cultivars

06 Dust	Escalade	Justice	Serengeti	2nd Millennium
Essential	Kalahari	Shelby	3rd Millennium	Evergreen 2
Kitty Hawk 2000	Sheridan	Apache III	Falcon IV	Legitimate
Signia	Avenger	Falcon NG	Lexington	Silver Hawk
Barlexas	Falcon V	LSD	Sliverstar	
Barlexas II	Faith	Magellan	Shenandoah Elite	Bar Fa
Fat Cat	Matador	Sidewinder	Barrera	Festnova
Millennium SRP	Skyline	Barrington	Fidelity	Monet
Solara	Barrobusto	Finelawn Elite	Mustang 4	Southern Choice II
Barvado	Finelawn Xpress	Ninja 2	Speedway	Biltmore
Finesse II	Ol' Glory	Spyder LS	Bingo	Firebird
Olympic Gold	Sunset Gold	Bizem	Firecracker LS	Padre
Taccoa	Blackwatch	Firenza	Patagonia	Tanzania
Blade Runner II	Five Point	Pedigree	Trio	Bonsai
Focus	Picasso	Tahoe II	Braveheart	Forte
Piedmont	Talladega	Bravo	Garrison	Plantation
Tarheel	Bullseye	Gazelle II	Proseeds 5301	Terrano
Cannavaro	Gold Medallion	Prospect	Titan ltd	Catalyst
Grande 3	Pure Gold	Titanium LS	Cayenne	Greenbrooks
Quest	Tracer	Cessane Rz	Greenkeeper	Raptor II
Traverse SRP	Chipper	Gremlin	Rebel Exeda	Tulsa Time
Cochise IV	Greystone	Rebel Sentry	Turbo	Constitution
Guardian 21	Rebel IV	Turbo RZ	Corgi	Guardian 41
Regiment II	Tuxedo RZ	Corona	Hemi	Regenerate
Ultimate	Coyote	Honky Tonk	Rendition	Venture
Darlington	Hot Rod	Rhambler 2 SRP	Umbrella	Davinci
Hunter	Rembrandt	Van Gogh	Desire	Inferno
Reunion	Watchdog	Dominion	Innovator	Riverside
Wolfpack II	Dynamic	Integrity	RNP	Xtremegreen
Dynasty	Jaguar 3	Rocket	Endeavor	Jamboree
Scorpion				

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. A different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis and as directed.

TEMPORARY SEEDING:

Fertilizer shall be the same analysis as specified for Seeding and Mulching and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. Sweet Sudan Grass, German Millet or Browntop Millet shall be used in summer months and Rye Grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

FERTILIZER TOPDRESSING:

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20 grade and shall be applied at the rate of 500 pounds per acre. A different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis and as directed.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. A different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis and as directed.

SUPPLEMENTAL SEEDING:

The kinds of seed and proportions shall be the same as specified for Seeding and Mulching, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

MULCHING:
Mulch and tack shall be in accordance with NCDOT Specification Section 1060-5. mulch shall be applied in accordance with NCDOT Specification 1615. An approved rolled erosion control product (RECP), May be used in lieu of straw mulch.

MOWING:

The minimum mowing height on this project shall be 4 inches.

EROSION CONTROL NOTES:

1. See Plan & Profile sheets (Sheets C3.1 through C3.2), for erosion control plan and area specific notes.
2. All disturbed areas shall be prepped and seeded in accordance with Section 1660 of the NCDOT Standard Specifications. Limited areas of the project may require sod installation, at the direction of the Town Engineer. Sodding shall be completed in accordance with Section 1664 of the NCDOT Standard Specifications.
3. See sheet C2.2 for Erosion Control Details.
4. Any area disturbances by contractor not shown on the construction drawings are to be permitted through the appropriate permitting agency.
5. Pursuant to GS 113a-57(2), the angle for graded slopes and fills shall be no greater than the angle that can be retained by vegetative cover or other adequate erosion control device or structure.
6. Provide a rolled erosion control product (RECP) to stabilize disturbed ditches if any signs of scouring are evident even if no RECP has been shown on the construction drawings.
7. No stock or waste piles are allowed within 50' of streams or drainage structures.
8. Where dewatering of trenches, pits, and other excavations becomes necessary the discharge must be diverted to a sediment filter bag before being discharged to the ground.
9. Adequate erosion control measures must be installed, maintained, and adjusted as needed during the demolition or clearing and grubbing phases as well as throughout the life of the project and until permanent vegetation is established.

Self Inspection:
Notification of the Division of Energy, Mining and Land Resources (DEMLR) Sediment and Erosion Control Self-Inspection Program:

The Sedimentation Pollution Control Act was amended in 2006 to require that persons responsible for land-disturbing activities inspect a project after each phase of the project to make sure that the approved erosion and sedimentation control plan is being followed. Rules detailing the documentation of these inspections took effect October 1, 2010. The self-inspection program is separate from the weekly self-monitoring program of the NPDES Stormwater Permit for Construction Activities. The focus of the self-inspection report is the installation and maintenance of erosion and sedimentation control measures according to the approved plan. The inspections must be conducted after each phase of the project, and continued until permanent ground cover is established in accordance with NCGS 113a-54.1 and 15a NCAC 4B.0131.

The self-inspection report form is available from: *https://deq.nc.gov/about/divisions/energy-mineral-land-resources/erosion-sediment-control/forms*.

If you have questions or cannot access the form, please contact DEMLR Washington Regional Office at (252)946-6481.

CONSTRUCTION SEQUENCE

1. Obtain plan approval and Land Disturbing Permit.
2. Schedule and hold preconstruction conference at least one week prior to beginning construction.
3. See Plan & Profile Sheets C3.1 through C3.2 for Erosion Control Plan and Sheet C2.2 for Erosion Control Details.
4. Install Temporary Silt Fence along right of way adjacent to existing multi-use trail to remain or proposed multi-use trail to be replaced (See Plan & Profile Sheets C3.1 through C3.2).
5. The contractor is responsible for the design and execution of a dewatering plan. **All discharge from any dewatering activities shall made through approved sediment filter bags, in a manner to prevent damage to property or discharge onto or across streets or roads.**
6. Working in a linear manner, excavate, install, and backfill infiltration trench and install inlets as shown on the plan.
7. As work progresses, remove and replace driveways as indicated on the plan.
8. Install sod, or seed and mulch areas as they are brought to finished grade in accordance with schedule on this sheet.
9. Install and maintain Inlet Protection Devices at all inlets.
10. As infiltration trench and driveway construction progresses, install Temporary Silt Fence along the edge of pavement.
11. Inspect all erosion and sediment control devices weekly and after each rainfall event. Remove accumulated sediment when devices reach capacity and repair any damaged immediately.
12. When all areas have been brought to finished grade and stabilized, call for inspection.
13. When site is approved, remove all temporary sediment and erosion control devices and stabilize any resulting disturbed areas.

Disturbed Area:

Area 12 | 79,440 SF | 1.8 Acres

DANGER
Overhead Electrical Power Lines

811
Know what's below. Call before you dig.

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY - NOT RELEASED FOR CONSTRUCTION

MCADAMS
The John R. McAdams Company, Inc.
621 Hillsborough Street
Suite 500
Raleigh, NC 27603
phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187
www.mcadamsco.com

CLIENT
TOWN OF NAGS HEAD
POST OFFICE BOX 99
NAGS HEAD, NC 27959
PHONE: 252.441.5580

TOWN OF NAGS HEAD

SOOIR STORMWATER INFRASTRUCTURE IMPROVEMENTS
CONSTRUCTION DRAWINGS
PROJECT AREA 12
NAGS HEAD, NC, 27959

NORTH CAROLINA PROFESSIONAL ENGINEER 028942 C. FREEMAN
FINAL DRAWING - FOR REVIEW PURPOSES ONLY - NOT RELEASED FOR CONSTRUCTION
5.30.24

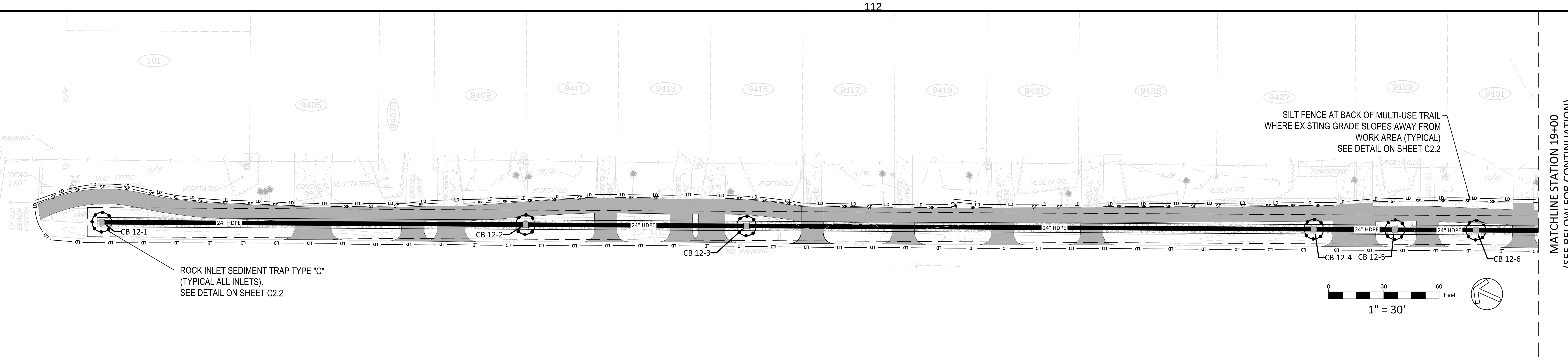
REVIEWS

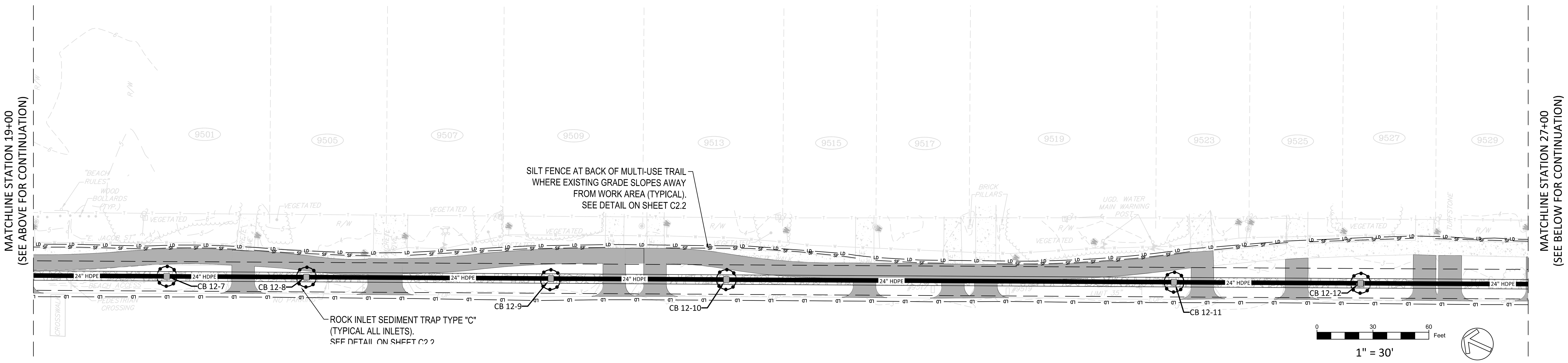
NO.	DATE	
1	06.14.2024	ADDENDUM #1

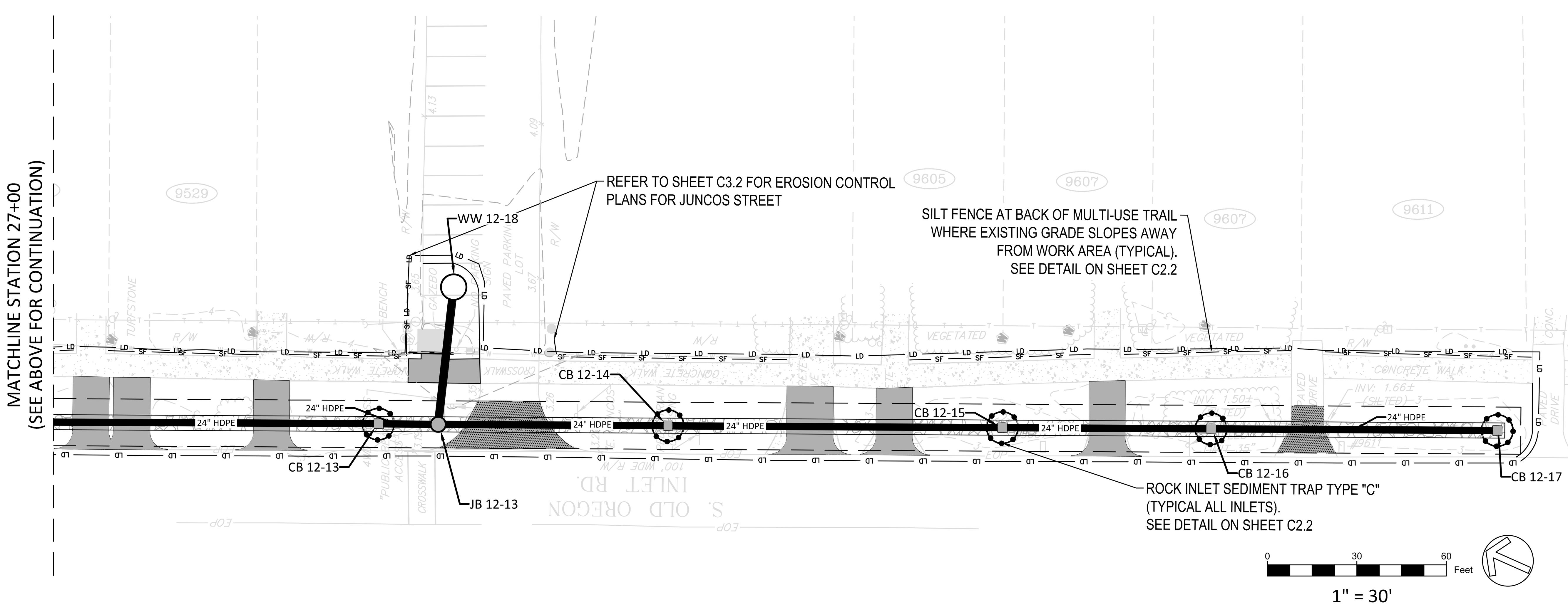
PLAN INFORMATION

PROJECT NO.	SRP-SW-ARP-0019.2
FILENAME	TNH22001_17-EC
CHECKED BY	HCF
DRAWN BY	JWS
SCALE	AS NOTED
DATE	6/26/2024

SHEET
EROSION CONTROL NOTES
C3.0







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SOOIR STORMWATER INFRASTRUCTURE IMPROVEMENTS
CONSTRUCTION DRAWINGS
PROJECT AREA 12
NAGS HEAD, NC, 27959

FOR REVIEW ONLY NOT RELEASED FOR CONSTRUCTION
ENGINEER
C. FREEMAN
5-30-24

REVISIONS

NO.	DATE	
1	06.14.2024	ADDENDUM #1

PLAN INFORMATION

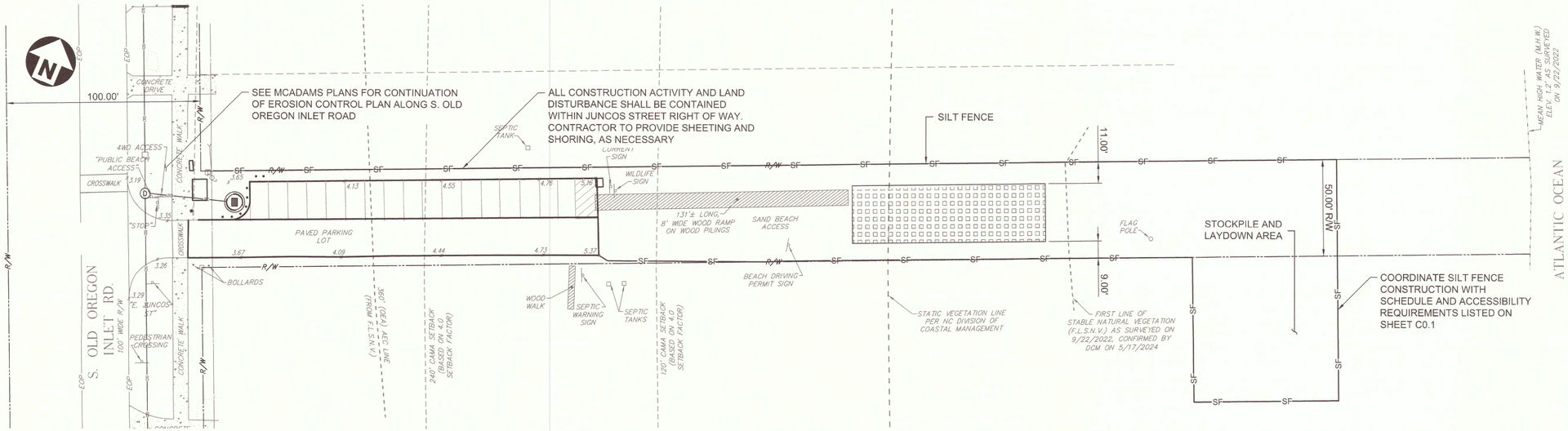
PROJECT NO.	SRP-SW-ARP-0019.2
FILENAME	TNH22001_17-EC
CHECKED BY	HCF
DRAWN BY	JWS
SCALE	AS NOTED
DATE	6/26/2024

SHEET

EROSION CONTROL (SOOIR)

C3.1

moffatt & nichol
4700 FALLS OF NEUSE RD, SUITE 300
RALEIGH, NC 27609
919-781-4626
N.C. FIRM NO. F-0105



EROSION CONTROL PLAN

NOTE:

SILT FENCE SHALL DELINEATE THE LIMITS OF DISTURBANCE AND CONTRACTOR USE AREA ON THE OCEAN SIDE OF THE DUNE.

30' 0' 30' 60'

SCALE: 1"=30'

FINAL DRAWING
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SOOIR STORMWATER INFRASTRUCTURE IMPROVEMENTS

CONSTRUCTION DRAWINGS
PROJECT AREA 12
NAGS HEAD, NC, 27959

FINAL DRAWING
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027661 KEVIN C. ZOLLER

Kevin C. Zoller, PE

REVISIONS

NO. DATE

PLAN INFORMATION

PROJECT NO.	220494-03
FILENAME	
CHECKED BY	KCZ
DRAWN BY	YIS
SCALE	AS NOTED
DATE	06/26/2024

SHEET

JUNCOS STREET EROSION CONTROL

C3.2

SOUTH OLD OREGON INLET ROAD STORMWATER INFRASTRUCTURE IMPROVEMENTS

PROJECT AREA 12
NAGS HEAD, NC 27959

CONSTRUCTION DRAWINGS

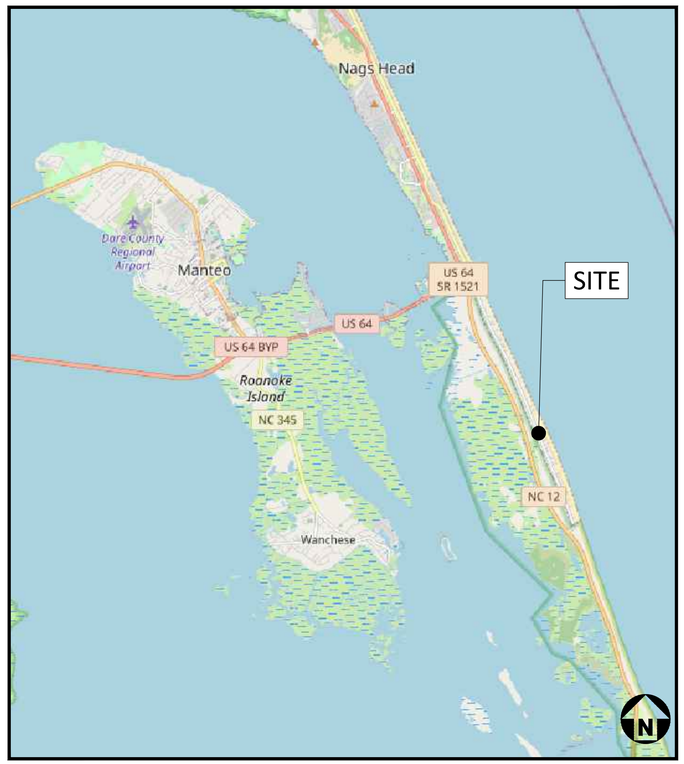
PROJECT NUMBER: SRP-SW-ARP-0019.2
DATE: JUNE 14, 2024
UPDATED: JULY 29, 2024

VICINITY MAP
N.T.S.

SHEET INDEX

PROJECT DESCRIPTION:
PROJECT AREA 12 IS LOCATED ON THE EAST SIDE OF OLD OREGON INLET ROAD, FROM JAMES STREET TO A POINT APPROXIMATELY 200' SOUTH OF JUNCOS STREET. THE SCOPE OF WORK INCLUDES INSTALLATION OF A FRENCH DRAIN GENERALLY ON THE EAST SIDE OF SOUTH OLD OREGON INLET ROAD FROM JAMES ST TO APPROXIMATELY 200' SOUTH OF JUNCOS ST. ASSOCIATED IMPROVEMENTS AT JUNCOS ST INCLUDE REPAVING, A WET WELL, PUMP INSTALLATION, FORCE MAIN TO THE OCEANFRONT DUNE, AND AN INFILTRATION GALLERY UNDER THE VEHICULAR BEACH ACCESS PATH. INCIDENTAL WORK INCLUDES THE REMOVAL AND REPLACEMENT OF A PORTION OF THE EXISTING MULTI USE PATH, REPLACEMENT OF NUMEROUS DRIVEWAYS, REPLACEMENT OF THE DUNE WALKOVER, AND REGRADING AND REVEGETATION OF THE EXISTING SWALE.

THIS CONTRACT IS BEING COMPLETED FOR THE BENEFIT OF THE TOWN OF NAGS HEAD AND ITS CITIZENS.



LOCATION MAP
N.T.S.

FINAL DRAWING - FOR REVIEW PURPOSES ONLY - NOT RELEASED FOR CONSTRUCTION

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CONTACT
HUNTER FREEMAN, PE, LEED AP
FREEMAN@MCADAMSCO.COM
PHONE: 919. 361. 5000

CLIENT
TOWN OF NAGS HEAD
PO BOX 99
NAGS HEAD, NC 27959
PHONE: 252. 441. 5580

PROJECT DIRECTORY

MOFFATT & NICHOL
4700 FALLS OF NEUSE RD, SUITE 3000
RALEIGH, NC 27609
PHONE: 919. 781. 4626

COASTAL ENGINEERING & SURVEYING, INC.
PO BOX 1129
4425 N CROATAN HIGHWAY
KITTY HAWK, NC 27949
PHONE: 252. 261. 4151

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026942 HUNTER C. FREEMAN
FOR PRELIMINARY REVIEW PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION
5.30.24

REVISIONS

NO.	DATE	
1	06.14.2024	ADDENDUM #1
2	07.29.2024	SHEET C1.1 SCALE CORRECTED

CONSTRUCTION DRAWINGS FOR:
SOOIR STORMWATER
INFRASTRUCTURE IMPROVEMENTS
PROJECT AREA 12
NAGS HEAD, NC 27959
PROJECT NUMBER: SRP-SW-ARP-0019.2

GENERAL NOTES:

1. CONTRACTOR TO HAVE A COMPLETE SET OF CONTRACT DOCUMENTS AS WELL AS ALL PERMIT APPROVALS AND EASEMENTS ON JOB SITE AT ALL TIMES.
2. CONSTRUCTION AND MATERIAL SPECIFICATIONS TO CONFORM TO CURRENT NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, DEPARTMENT OF ENVIRONMENTAL QUALITY, OR TOWN OF NAGS HEAD STANDARDS, AND CONTRACT DOCUMENTS.
3. ALL SHOP DRAWINGS MUST BE REVIEWED AND APPROVED BY ENGINEER BEFORE EQUIPMENT OR MATERIAL IS ORDERED.
4. ALL KNOWN EXISTING UTILITIES HAVE BEEN LOCATED BASED ON BEST AVAILABLE INFORMATION. CONTRACTOR IS RESPONSIBLE TO ACCURATELY LOCATE BOTH HORIZONTALLY AND VERTICALLY ALL EXISTING UTILITIES PRIOR TO START OF CONSTRUCTION (ONE CALL CENTER 1-800-632-4949). ALL COSTS ASSOCIATED WITH ANY DAMAGE TO KNOWN OR UNKNOWN EXISTING UTILITIES RESULTING FROM CONTRACTOR'S FAILURE TO ADEQUATELY PROTECT EXISTING UTILITIES DURING CONSTRUCTION TO BE BORNE SOLELY BY CONTRACTOR.
5. THE CONTRACTOR SHALL CONTACT NC811 AND THE FOLLOWING PRIOR TO MOBILIZATION FOR LOCATION OF THE FOLLOWING KNOWN UNDERGROUND UTILITIES IN THE PROJECT AREA:

- POWER
- PHONE
- GAS
- WATER
- SEWER
- CABLE
- OTHER

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SHALL ADHERE TO THE PROVISIONS OF THE MUTCD (MOST CURRENT EDITION).
7. CONTRACTOR TO SAVE PROPERTY IRONS, MONUMENTS, OTHER PERMANENT POINTS AND LINES OF REFERENCE AND CONSTRUCTION STAKES. A REGISTERED LAND SURVEYOR AT CONTRACTOR'S EXPENSE TO REPLACE PROPERTY IRONS, MONUMENTS, AND OTHER PERMANENT POINTS OF REFERENCE DESTROYED BY CONTRACTOR.
8. CONTRACTOR TO FURNISH, INSTALL, AND MAINTAIN ALL NECESSARY EROSION CONTROL MEASURES WHETHER OR NOT SHOWN ON PLANS TO PROTECT ADJACENT DITCHES, CANALS, ROADWAYS, ETC. FROM SILT AND EROSION.
9. ALL WORK TO BE COMPLETED ON PUBLIC PROPERTY. NO EASEMENTS HAVE BEEN OBTAINED. CONTRACTOR TO PROVIDE SHEETING AND SHORING AS NEEDED TO RESTRICT ALL LAND DISTURBANCE TO DEFINED LIMITS OF DISTURBANCE
10. CONTRACTOR TO RELOCATE EXISTING UTILITIES AS REQUIRED FOR INSTALLATION OF NEW WORK. THERE WILL BE NO ADDITIONAL OR SEPARATE PAY ITEM FOR THIS WORK UNLESS SPECIFICALLY CALLED OUT IN BID FORM. RELOCATIONS OF EXISTING UTILITIES MUST BE COORDINATED WITH AFFECTED UTILITY COMPANY.
11. CONTRACTOR TO SUPPORT ALL UTILITY POLES AS NECESSARY. CONTRACTOR TO COORDINATE UTILITY POLE SUPPORT WITH APPROPRIATE UTILITY COMPANIES.
12. CONTRACTOR TO RESTORE/REPLACE ALL SIGNS, MAILBOXES, ETC. ENCOUNTERED DURING CONSTRUCTION TO ORIGINAL CONDITION.
13. CONTRACTOR TO RESTORE ALL DISTURBED DRIVE STORM PIPES TO ORIGINAL OR BETTER CONDITION.
14. CONTRACTOR SHALL MAINTAIN ACCESS TO PROPERTY AT ALL TIMES.
15. CONTRACTOR TO RESTORE EXISTING DUNE WALKOVER AND GAZEBO TO ORIGINAL OR BETTER CONDITION
16. CONTRACTOR TO RESTORE ALL DISTURBED AREAS TO EXISTING GRADE UNLESS OTHERWISE NOTED ON DRAWINGS.
17. ROADWAY DITCHES DISTURBED DURING CONSTRUCTION TO BE RESTORED TO PRE-CONSTRUCTION CONDITION OR BETTER AND CONFORM TO NCDOT REQUIREMENTS.
18. ALL DISTURBED AREAS SHALL BE PREPPED AND RESEEDED IN ACCORDANCE WITH SECTION 1660 OF THE NCDOT STANDARD SPECIFICATIONS. LIMITED AREAS OF THE PROJECT MAY REQUIRE SOD INSTALLATION, AT THE DIRECTION OF THE TOWN ENGINEER. SODDING SHALL BE COMPLETED IN ACCORDANCE WITH SECTION 1664 OF THE NCDOT STANDARD SPECIFICATIONS.
19. EXCAVATED MATERIAL TO BE PLACED WITHIN LIMITS OF DISTURBANCE DURING UTILITY INSTALLATION. CONTRACTOR TO PROVIDE NECESSARY SEDIMENT AND EROSION CONTROL MEASURES TO CONTROL RUN-OFF. EXCESS EXCAVATED MATERIAL TO BE REMOVED FROM CONSTRUCTION SITE AND DISPOSED OF IN A LEGAL MANNER.
20. EASEMENTS ACROSS SLOPED AREAS TO BE GRADED UNIFORMLY ACROSS SLOPE AT NO STEEPER THAN 5:1 HORIZONTAL TO VERTICAL RATIO.
21. POSITIVE DRAINAGE TO BE PROVIDED FOR ALL AREAS THROUGHOUT CONSTRUCTION.
22. NO WORK OR DISTURBANCE PERMITTED OUTSIDE DEFINED WORK LIMITS. CONTRACTOR RESPONSIBLE FOR ALL DAMAGE TO PRIVATE PROPERTY.
23. MOBILIZATION AND MATERIAL STORAGE: EQUIPMENT AND MATERIALS MAY BE STAGED IN AREAS APPROVED FOR SUCH USE BY THE TOWN, IN WRITING, BEGINNING ON AUGUST 15, 2025.

   23.1. MATERIAL STORAGE AND STAGING AREAS SHALL NOT IMPEDE OR DISRUPT PUBLIC PARKING, BEACH ACCESS, MULTI-USE PATHS, SIDEWALKS, OR ROADWAYS ON OR BEFORE TO SEPTEMBER 15, 2025 WITHOUT THE WRITTEN APPROVAL OF THE TOWN.

   23.2. THE CONTRACTOR SHALL NOTIFY THE TOWN AT LEAST 14 CALENDAR DAYS PRIOR TO RESTRICTING ACCESS OR CLOSING ANY PUBLIC PARKING, BEACH ACCESS, MULTI-USE PATHS, SIDEWALKS, OR ROADWAYS AT ANY TIME DURING THIS CONTRACT.

   23.3. ALL EQUIPMENT, UNUSED CONSTRUCTION MATERIALS, AND DEBRIS SHALL BE REMOVED FROM THE CONSTRUCTION SITES ALONG SOUTH OLD OREGON INLET ROAD (SOOIR) AND JUNCOS STREET ON OR BEFORE MAY 15, 2026. MATERIALS AND EQUIPMENT MAY BE STORED IN OTHER SUITABLE AREAS NEAR THE PROJECT SITE, AFTER THIS DATE AND AT THE CONTRACTOR'S OWN RISK, DURING OTHER TIMES WITH THE WRITTEN APPROVAL OF THE TOWN. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMISSIONS, AGREEMENTS, AND PERMITS RELATED TO MATERIAL AND EQUIPMENT STORAGE.

23. IMPROVEMENTS WITHIN THE SOUTH OLD OREGON INLET ROAD (SOOIR) RIGHT OF WAY: WORK ALONG SOOIR INCLUDING BUT NOT LIMITED TO TRAFFIC CONTROL, DEMOLITION, EROSION CONTROL, UTILITY RELOCATION, HDPE PIPE INSTALLATION, INLET INSTALLATION, GRADING, AND STABILIZATION MAY BE PERFORMED STARTING ON OR AFTER SEPTEMBER 15, 2025, AND IS EXPECTED TO BE COMPLETED ON OR BEFORE MAY 15, 2026.
24. IMPROVEMENTS AT JUNCOS STREET INCLUDING BUT NOT LIMITED TO TRAFFIC CONTROL, DEMOLITION, EROSION CONTROL, UTILITY RELOCATION, GAZEBO REMOVAL (AND STORAGE), WET WELL INSTALLATION, DUNE INFILTRATION CONSTRUCTION, WALKWAY RECONSTRUCTION, AND STABILIZATION MAY BE PERFORMED STARTING ON OR AFTER DECEMBER 15, 2025 AND IS EXPECTED TO BE SUBSTANTIALLY COMPLETED ON OR BEFORE MAY 15, 2026. DURING THIS TIME THE CONTRACTOR SHALL MAINTAIN VEHICULAR BEACH ACCESS TO THE OCEANFRONT AS NOTED BELOW.
25. THE JUNCOS STREET BEACH ACCESS SHALL REMAIN ACCESSIBLE BY ALL PERMITTED VEHICLES FROM SEPTEMBER 15, 2025 THROUGH JANUARY 4, 2026. PARKING MAY BE REDUCED IF APPROVED IN WRITING BY THE TOWN. ADDITIONALLY, THE CONTRACTOR SHALL NOT DISRUPT EMERGENCY VEHICULAR ACCESS TO THE OCEANFRONT VIA THE VEHICULAR BEACH ACCESS FOR MORE THAN 14 TOTAL CALENDAR DAYS OR MORE THAN 10 CONSECUTIVE CALENDAR DAYS DURING THE DURATION OF THIS CONTRACT. THE CONTRACTOR SHALL NOTIFY THE TOWN, IN WRITING, AT LEAST 14 CALENDAR DAYS PRIOR TO ANY CLOSURE OF THE VEHICULAR BEACH ACCESS THAT WOULD PREVENT EMERGENCY VEHICLES FROM ACCESSING THE OCEANFRONT VIA JUNCOS STREET.
26. THE JUNCOS STREET BEACH ACCESS SHALL REMAIN ACCESSIBLE BY ALL PERMITTED VEHICLES FROM SEPTEMBER 15, 2025 THROUGH DECEMBER 15, 2025. FROM DECEMBER 15, 2025 TO MAY 15, 2026, THE CONTRACTOR MAY PROHIBIT PARKING IN THE JUNCOS STREET LOT AND PEDESTRIAN BEACH ACCESS, BUT SHALL NOT DISRUPT EMERGENCY VEHICULAR ACCESS TO THE OCEANFRONT VIA THE VEHICULAR BEACH ACCESS FOR MORE THAN 14 TOTAL CALENDAR DAYS OR MORE THAN 10 CONSECUTIVE CALENDAR DAYS.

   26.1. PARKING, PEDESTRIAN ACCESS, AND VEHICULAR BEACH ACCESS SHALL BE FULLY RESTORED AND OPEN TO THE PUBLIC ON OR BEFORE MAY 15, 2026.

   26.2. THE CONTRACTOR SHALL NOTIFY THE TOWN, IN WRITING, AT LEAST 14 CALENDAR DAYS PRIOR TO ANY CLOSURE OF THE VEHICULAR BEACH ACCESS THAT WOULD PREVENT EMERGENCY VEHICLES FROM ACCESSING THE OCEANFRONT VIA JUNCOS STREET.

27. EXCEPT AS NOTED ABOVE, CONSTRUCTION ACTIVITY AT JUNCOS STREET THAT WILL NOT OCCUPY MORE THAN 2 PARKING SPACES OR DISRUPT VEHICULAR BEACH ACCESS TO THE OCEANFRONT MAY BE PERMISSIBLE AT ALL TIMES DURING THIS CONTRACT WITH WRITTEN TOWN APPROVAL. THE CONTRACTOR IS REQUIRED TO REQUEST THIS ALLOWANCE FROM THE TOWN, IN WRITING, AT LEAST 14 CALENDAR DAYS IN ADVANCE OF COMMENCING ANY SUCH ACTIVITY.
28. THE FINAL PAYMENT REQUEST SHALL BE SUBMITTED TO THE TOWN NO LATER THAN OCTOBER 31, 2026.

LEGEND

NAIL
CAP & TACK
COTTON SPINDLE
BENCHMARK
CROSS ON PAVEMENT
PK/MAG NAIL SET
ANGLE IRON
AXLE
CONCRETE MONUMENT
EXISTING IRON PIPE
IRON PIPE SET
CALCULATED POINT
MASONRY NAIL
NC GEODETIC SURVEY MON.
REBAR
RAILROAD SPIKE
RIGHT-OF-WAY MONUMENT
WITNESS POST
FIRE HYDRANT
WATER METER
BACKFLOW PREVENTER
WATER MANHOLE
WATER VALVE
BLOW OFF VALVE
HOSEBIB
FIRE DEPT. CONNECTION
SPRINKLER HEAD
DRAINAGE INLET/YARD INLET
CL CATCH BASIN AT BC
STORM DRAIN MANHOLE
JUNCTION BOX
FES
ELECTRIC MANHOLE
ELECTRIC METER
ELECTRIC TRANSFORMER
ELECTRIC PEDESTAL
ELECTRIC HANDHOLE
ELECTRIC BOX
GUY WIRE
LIGHT POLE
TOWER
POWER/UTILITY POLE
GREASE TRAP MANHOLE
CLEAN OUT
SEWER MANHOLE
IRRIGATION CONRTOL VALVE
RECLAIMED WATER METER
GAS SERVICE METER
GAS MARKER
GUY POLE
GAS REGULATOR
GAS TEST STATION
GAS VALVE
CABLE TV BOX
CATV HANDHOLE
TELEPHONE HANDHOLE
TELEPHONE BOX
TELEPHONE MANHOLE
TELEPHONE PEDESTAL
FIBER OPTIC MARKER
FIBER OPTIC HANDHOLE
UNKNOWN MANHOLE
UNKNOWN UTILITY PEDESTAL
BURIED CABLE WARNING POST
TRAFFIC SIGNAL BOX
SIGNAL POLE
TRAFFIC HANDHOLE
RAILROAD CROSSING GATE
BOLLARD
AIR CONDITIONER
SIGN
MAILBOX
WATER WELL
CAMERA
SOLAR PANEL
FLOOD LIGHT
WETLAND FLAGS
ROOF DRAIN
SATELLITE DISH
BORE HOLE
FLAG POLE
MONITORING/OBSERVATION WELL
ARTWORK/STATUE
OUTDOOR AMENITY
BOLLARD LIGHT
CONTROLLED ACCESS R/W
18/6 REGULAR SPACES / ACCESSIBLE SPACES
BIKE RACK

Symbol	Description
SZ AP	APPLE
SZ A	ASH
SZ BE	BEECH
	HARDWOOD TREE
SZ B	BIRCH
SZ W	BLACK WALNUT
SZ C	CEDAR
SZ CH	CHERRY
SZ CM	CRAPE MYRTLE
SZ DG	DOGWOOD
SZ RO	RED OAK
SZ E	ELM
	SHRUB
	STUMP
SZ G	SWEET GUM
SZ H	HICKORY
	HEDGEROW
SZ HO	HOLLY
SZ HW	HARDWOOD
SZ JM	JAPANESE MAPLE
	LANDSCAPED AREA
SZ MG	MAGNOLIA
SZ M	MAPLE
SZ MI	MIMOSA
SZ O	OAK
SZ ORN	ORNAMENTAL
SZ PCN	PECAN
SZ RBD	REDBUD
SZ PER	PEAR
SZ PEC	PEACH
SZ PRS	PERSIMMON
SZ SF	SASSAFRAS
SZ WL	WILLOW
SZ P	PINE
SZ SB	SUGARBERRY
SZ PO	POPLAR
SZ SO	SOURWOOD
SZ SY	SYCAMORE
SZ WO	WHITE OAK
SZ SP	SPRUCE

Line label	Description
	BOUNDARY LINE
	ADJOINER LINE
	RIGHT OF WAY LINE
G	GAS LINE
W	WATER LINE
SS	SEWER LINE
SD	STORM LINE
(W)	WATER LINE PER RECORD/GIS
(SS)	SEWER LINE PER RECORD/GIS
(SD)	STORM LINE PER RECORD/GIS
X	FENCE
	HANDRAIL
	CANOPY/BUILDING OVERHANG
	GUARD RAIL
CATV	UNDERGROUND TV CABLE
UE	UNDERGROUND ELECTRIC LINE
FO	UNDERGROUND FIBER OPTIC CABLE
UNK	UNKNOWN UTILITY
UT	UNDERGROUND TELEPHONE CABLE
ST	UNDERGROUND STEAM LINE
AIR	UNDERGROUND AIR LINE
RCW	RECLAIMED WATERLINE
T	OVERHEAD TELEPHONE LINE
FM	FORCEMAIN LINE
OU	OVERHEAD ELECTRIC LINE
	WOOD LINE/LANDSCAPING
	RAILROAD TRACKS
	RIP RAP

MCADAMS
The John R. McAdams Company, Inc.
621 Hillsborough Street
Suite 500
Raleigh, NC 27603
phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187
www.mcadamsco.com

CLIENT

TOWN OF NAGS HEAD
POST OFFICE BOX 99
NAGS HEAD, NC 27959
PHONE: 252.441.5580

TOWN OF NAGS HEAD

SOOIR STORMWATER INFRASTRUCTURE IMPROVEMENTS

CONSTRUCTION DRAWINGS
PROJECT AREA 12
NAGS HEAD, NC, 27959

FOR REVIEW ONLY – NOT RELEASED FOR CONSTRUCTION
5.30.24

REVISIONS

NO.	DATE	
1	06.14.2024	ADDENDUM #1

PLAN INFORMATION

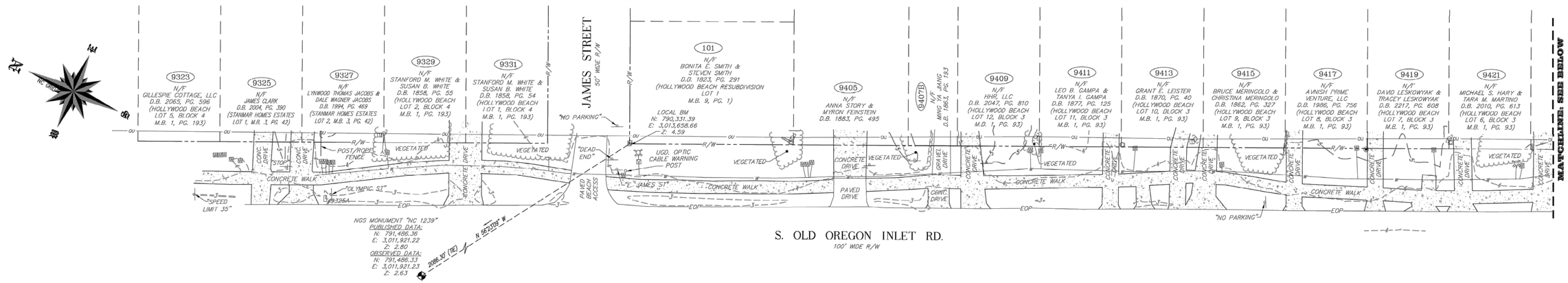
PROJECT NO.	SRP-SW-ARP-0019.2
FILENAME	TNH22001_17-CS2
CHECKED BY	HCF
DRAWN BY	JWS
SCALE	AS NOTED
DATE	6/26/2024

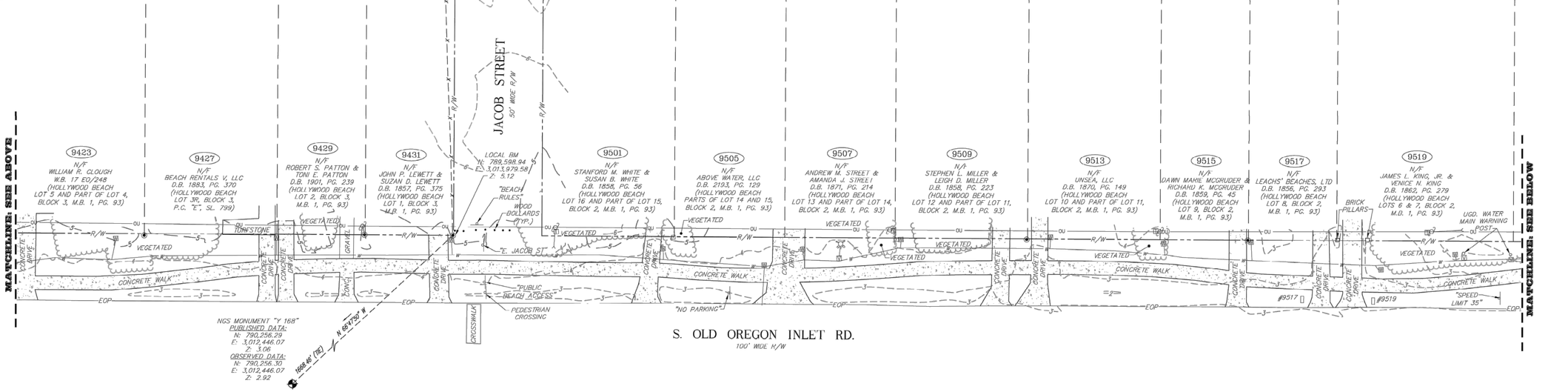
SHEET

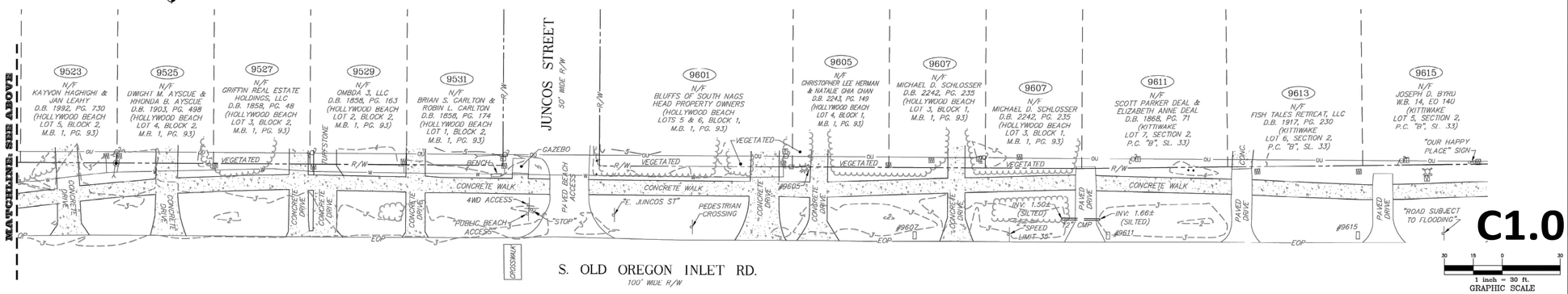
GENERAL NOTES

C0.1

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY - NOT RELEASED FOR CONSTRUCTION







LEGEND:
- ⊡ – EXISTING CONCRETE MONUMENT
- ◉ – EXISTING IRON ROD
- ○ – EXISTING IRON PIPE
- CATV – CABLE TV PEDESTAL
- E – ELECTRIC PEDESTAL
- TV – TV PEDESTAL
- ☼ – LIGHT POLE
- ▷ – SIGN
- P – POWER POLE
- WM – WATER METER
- WV – WATER VALVE
- IV – IRRIGATION VALVE
- FH – FIRE HYDRANT
- PROPERTY LINE – PROPERTY LINE
- R/W LINE – R/W LINE
- EOP – EDGE OF PAVEMENT
- R/W – RIGHT OF WAY
- 9423 – HOUSE NUMBER

NOTES:
1. TOPOGRAPHIC CONDITIONS SHOWN HEREON ARE BASED ON A SURVEY PERFORMED BY COASTAL ENGINEERING AND SURVEYING, INC. IN JULY, 2019.
2. HORIZONTAL DATUM SHOWN HEREON BASED ON NAD83 (2011) DATUM (NC STATE PLANE GRID PROJECTION).
3. VERTICAL DATUM SHOWN HEREON BASED ON NAVD 88 DATUM.
4. BOUNDARY LINES SHOWN HEREON ARE BASED ON DEEDS AND PLANS OF RECORD AND FOUND BOUNDARY EVIDENCE. THIS PLAN IS NOT INTENDED TO PORTRAY A BOUNDARY SURVEY.
5. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE COMMITMENT.
6. THESE PARCELS MAY BE SUBJECT TO EASEMENTS NOT SHOWN HEREON.

P.O. Box 1129
4425 N. Croatan Hwy.
Kitty Hawk, NC 27949
(252) 261-4153
(252) 261-1333
Civil - Structural
Site Development

Coastal
ENGINEERING & SURVEYING, INC.
C-0836

REVISIONS

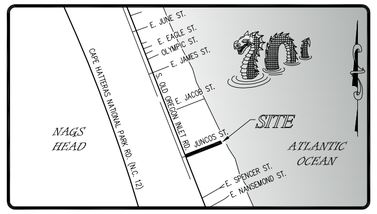
NO.	DATE	DESCRIPTION	BY

TOPOGRAPHIC SURVEY FOR:
WITTERSRAVENEL
NAGS HEAD TWSP. DARE COUNTY NORTH CAROLINA
TOWN OF NAGS HEAD DRAINAGE PROJECT #12

DATE: 7/10/19	SCALE: 1" = 30'
CHECKED: CFG	DRAWN: JCB
PROJECT NO: P705.18	
CAD FILE: P705 AREA 12	
SHEET: 1 OF 1	

C1.0

30 15 0 30
1 inch = 30 ft.
GRAPHIC SCALE



VICINITY MAP
N.T.S.

TOPOGRAPHIC SURVEY FOR:

TOWN OF NAGS HEAD
JUNCOS STREET BEACH ACCESS

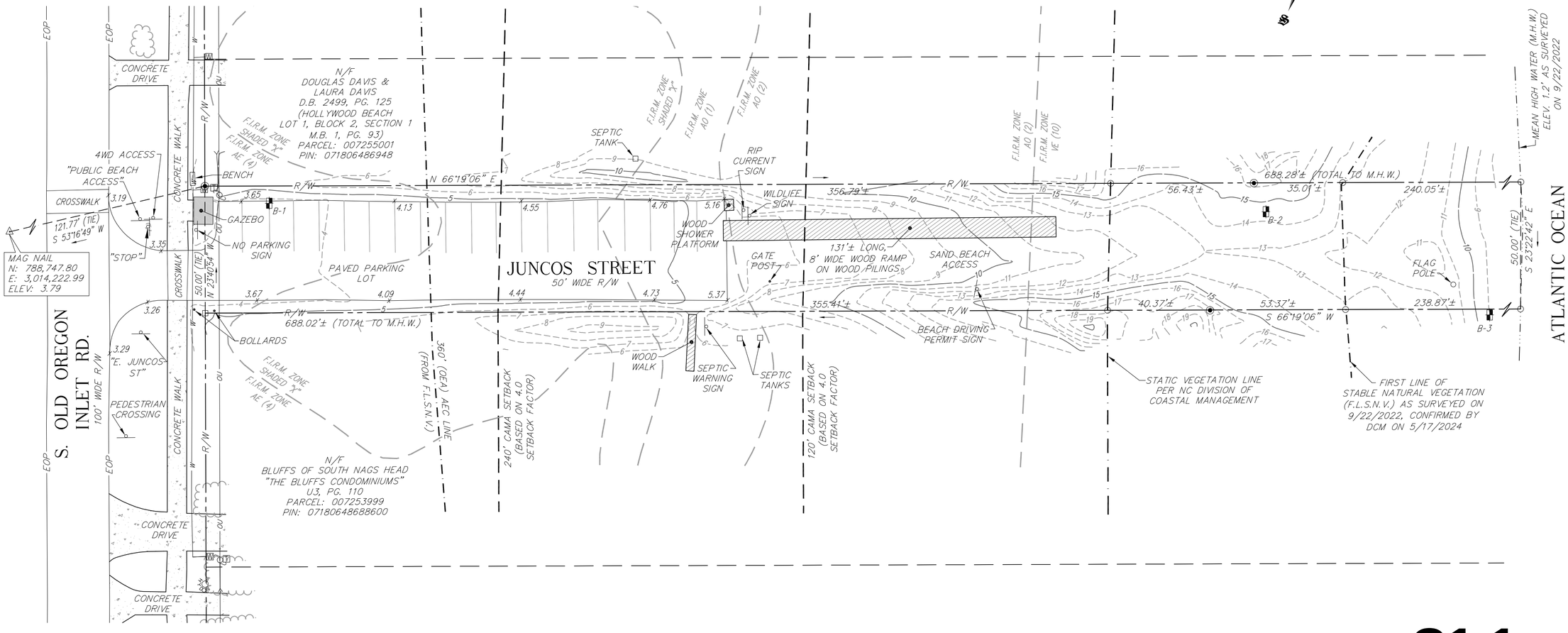
NOTES:

1. PARCEL: 000108555, PIN: 071806484897
2. TOPOGRAPHIC CONDITIONS SHOWN HEREON ARE BASED ON A SURVEY PERFORMED BY COASTAL ENGINEERING & SURVEYING, INC. ON SEPTEMBER 22, 2022
3. HORIZONTAL DATUM SHOWN HEREON BASED ON NAD83 (2011) DATUM (NC STATE PLANE GRID PROJECTION).
4. VERTICAL DATUM SHOWN HEREON BASED ON NAVD 88 DATUM.
5. BOUNDARY LINES SHOWN HEREON ARE BASED ON DEEDS AND PLANS OF RECORD AND FOUND BOUNDARY EVIDENCE. THIS PLAN IS NOT INTENDED TO PORTRAY A BOUNDARY SURVEY.
6. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE COMMITMENT.
7. THIS PARCEL MAY BE SUBJECT TO EASEMENTS NOT SHOWN HEREON.
8. PROPERTY IS LOCATED IN F.I.R.M. ZONES AS SHOWN, MAP NO. 3730071800K, DATED JUNE 19, 2020. USE OF LAND WITHIN THE FLOODWAY OR FLOODPLAIN AND FLOOD ZONES SUBJECT TO CHANGE BY FEMA.

LEGEND:

- ⊡ – EXISTING CONCRETE MONUMENT
- ◉ – EXISTING IRON ROD
- △ – EXISTING MAG NAIL
- ⊡ – WOODEN STAKE ON PROPERTY LINE
- ⊡ – TELEPHONE PEDESTAL
- —⚲— – SIGN
- —<— – GUY WIRE
- ⚲ – UTILITY POLE
- Ⓦ – WATER METER
- *EOP* – EDGE OF PAVEMENT
- *R/W* – RIGHT OF WAY
- *x4.13* – GROUND ELEVATION (NAVD 88)
- — — — — — – PROPERTY LINE
- ——— - - ——— – RIGHT OF WAY LINE
- *B-1* – BORING/MONITORING WELL LOCATION & NUMBER

NC GRID NAD 83 (2011)



I, CARLOS F. GONZALEZ, CERTIFY THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM RECORDED INSTRUMENTS REFERENCED HEREON, THAT THE BOUNDARIES NOT ACTUALLY SURVEYED ARE SHOWN AS BROKEN LINES PLOTTED FROM INFORMATION FOUND IN EXISTING RECORDS AND THAT THIS MAP WAS NOT PREPARED TO BE RECORDED. THE RATIO OF CLOSURE WAS 1:10,000+ BY LAT. & DEP. WITNESS MY HAND AND SEAL THIS 4TH DAY OF OCTOBER, 2022.

P.L.S. L-3241

C1.1

30 15 0 30
1 inch = 30 ft.
GRAPHIC SCALE

REVISIONS			
NO.	DATE	DESCRIPTION	BY
1	11/7/22	REVISED BORING LOCATIONS	JCB
2	5/17/24	REVISED PER TOWN COMMENTS	JCB
3	6/18/24	REVISED PER TOWN COMMENTS	JCB

Coastal ENGINEERING & SURVEYING, INC.
P.O. Box 1129
4425 N. CROATAN HWY.
Kitty Hawk, N.C. 27949
(252)-261-4151
(252)-261-1333
C-0836 Civil - Structural Site Development

TOPOGRAPHIC SURVEY FOR:

TOWN OF NAGS HEAD

NAGS HEAD TWSP. DARE COUNTY NORTH CAROLINA

JUNCOS STREET BEACH ACCESS

DATE: 10/4/2022	SCALE: 1"=30'
CHECKED: CFG	DRAWN: JCB
PROJECT NO: P798.22	
CAD FILE: P798.22 BASE	
SHEET: 1 OF 1	


DOGIPOT
PLEASE CLEAN UP AFTER YOUR DOG!
NOTICE
CAMA PERMIT APPLIED FOR

DIVISION OF COASTAL MANAGEMENT
FIELD INVESTIGATION REPORT: PA-1386

1. **APPLICANT'S NAME**: Town of Nags Head

2. **LOCATION OF PROJECT SITE**: Juncos Street Beach Access off S. Old Oregon Inlet Road (SR 1243) in the Town of Nags Head; adjacent the Atlantic Ocean
   Longitude: -75.57519 **Latitude:** 35.86937

3. **INVESTIGATION TYPE**: CAMA

4. **INVESTIGATIVE PROCEDURE**:

Date of Visit	Purpose of Visit	Applicant Present?
5/17/2024	Meet consultants to review preliminary site plans and site conditions for major permit application	No

5. **PROCESSING PROCEDURE**:

Application Received	Application Complete	Regional Office
6/27/2024	8/1/2024	DCM - Elizabeth City Regional Office

6. **SITE DESCRIPTION**:
   - **(A) Local Land Use Plan:** Town of Nags Head
     Land Classification from LUP: R2
   - **(B) AEC(s) Involved:** Ocean Erodible Area
   - **(C) Water Dependent:** Yes and No
   - **(D) Intended Use:** Public/Government
   - **(E) Wastewater Treatment:**
     Existing: N/A
     Planned: N/A
   - **(F) Type of Structures:**
     Existing: Elevated accessway(ocean), Parking lot, Pavilion
     Planned: Stormwater Dune Infiltration System, Replace Elevated accessway(ocean) and section of parking lot
   - **(G) Estimated Annual Rate of Erosion:** N/A
     Erosion Information Source: N/A

7. **HABITAT DESCRIPTION**:

	DREDGED (ft^2)	FILLED (ft^2)	OTHER (ft^2)
(A) Open Water			
(B) CW's above NHW			
(C) CW's below NHW			
(D) Shallow Bottom			
(E) High Ground			23087
(F) Non-Coastal WL			

   - **(E) Total Area Disturbed:** 23087 ft^2 (.53 acres)
   - **(F) Primary Nursery Area:** No
   - **(G) Water Classification:** SB: Primary Contact Recreation, Tidal Salt Water
     Open to Shellfishing: Yes

8. PROJECT SUMMARY:

Construct an underground infiltration system with ADS Stormtech SC-740 chambers within the dune system, reconstruction of the wooden beach access and renovation of the parking area.

9. NARRATIVE DESCRIPTION:

The Town of Nags Head's Juncus Street Beach Access is located off of S. Old Oregon Inlet Road (between 9531 and 9601 S. Old Oregon Inlet Road) and adjacent to the Atlantic Ocean. Parcel #000108555 was platted on 12/08/1952, has a shoreline length of 50 feet, and is within the Ocean Erodible Area (OEA) Area of Environmental Concern. The flood zones for this property transition from VE 10 oceanward of the accessway, to AO in the area of the ramp, to Shaded X west of the ramp to AE 4 outside of the OEA AEC. The existing development at this parcel includes asphalt parking, an elevated 8-foot wide pedestrian beach accessway ramp, a vehicular access to the south, and a gazebo/pavilion adjacent the concrete walkway outside of the 360' OEA AEC. Vegetation on the property consists of beach grass. The First Line of Stable Natural Vegetation (FLSNV) was staked and confirmed by Division staff on 05/17/2024. The Static Vegetation Line (aka the Pre-Project Line) is located landward of the FLSNV. The OEA for this property is 360 feet, measured landward of the Static Vegetation line, and the setback factor is 4', which equates to a minimum setback of 120' measured landward from the Static line. The elevations of the dune(s) vary from 6' to 12' in the area of the existing wooden accessway, increase from 13' to 14' oceanward of the accessway, and would be considered a frontal dune. Primary dunes with elevations of 16'+ exist to the north and south of the project area.

Dare County parcel records indicate that the parking area was built in 1990, and the access ramp and pavilion were built in 2004. No CAMA permit history was established for this specific beach accessway ramp; however, it was confirmed by the Town Permitting Coordinator that a 2004 building permit was on file for 4 beach accessway ramps which included Juncos Street. This correlates to an entry in the Division's Minor permit database that on 04/20/2004 Minor permit 042004A was issued to the Town authorizing them to rebuild several existing beach access sites.

A scoping meeting was held on November 28, 2022, and representatives of DWR and DEMLR were in attendance.

The riparian property to the north is developed with a single-family residence, pool, gazebo, and elevated beach accessway. The riparian property to the south is developed with three, 2-story townhouses.

The adjacent waters of the Atlantic Ocean are within the Pasquotank River Basin and are classified as Coastal Waters by the NC Marine Fisheries Commission. The DWR water classification is SB: Primary Contact Recreation, Tidal Salt Water. The area is not classified as a PNA and is open to the harvesting of shellfish.

10. PROJECT DESCRIPTION:

The applicant is proposing the installation of an underground infiltration system using Stormtech SC-740 chambers for stormwater infrastructure improvements to minimize flooding from storm events through the pumping of flood waters to the elevated system within the existing sand dune. The goal is to enhance the existing roadside swale off S. Old Oregon Inlet Road with a new drainage pipe, connect to a pump station that would transport flood waters to the dune system at the Juncos beach access and infiltrate through the dune and to the Atlantic Ocean.

The demolition plan includes the removal of the 131'x8' wooden access ramp, ±3,900 sf of asphalt pavement, and the pavilion/gazebo.

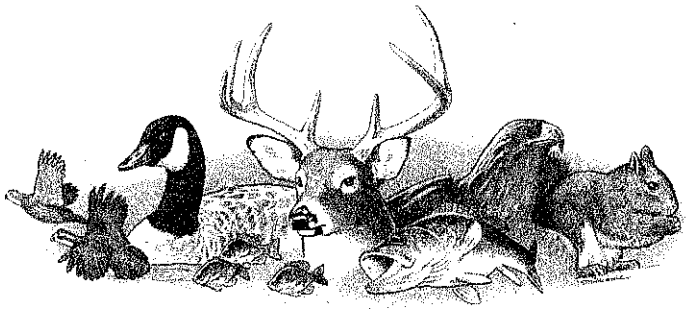
The infiltration system is proposed to start ~10' landward of the FLSNV and extend ~84' landward. The Stormtech chambers are constructed of modified polypropylene copolymers, and each section is 30-inches tall by 45-inches wide and overlap one another to create a continuous underground ±1,900 sf chamber. A 100'x30' (3,000 sf) buried polyester Geotextile Mobi-Mat will be placed between the SC-740 chambers and have a 36" separation from the chambers. A total of 298.26 linear feet (lft) of 6" HDPE force main will extend from a 10" inflow header pipe attached to the Stormtech chambers and extend landward to connect to a proposed ±90 sf wetwell for the pump station. It is noted that the Mobi-mat and Stormtech chambers are proposed seaward of the 120' CAMA Setback and do not meet the Exceptions under 15A NCAC 07H.0309 Use Standards for the Ocean Hazard Areas. A 75'x75' (5,625 sf) stockpile and laydown area is also proposed seaward of the FLSNV.

The 1,048-sf access ramp, ±3,500 sf of asphalt pavement/parking, and the 48-sf pavilion/gazebo will be restored following the completion of the dune infiltration system.

11. ANTICIPATED IMPACTS:

The proposed infiltration system will disturb a total of 23,087 of High Ground Habitat.

Name: Yvonne Carver **Date: 08-09-2024** **Office: DCM - Elizabeth City Regional Office**



North Carolina Wildlife Resources Commission

Cameron Ingram, Executive Director

MEMORANDUM

TO: Division of Coastal Management
North Carolina Department of Environmental Quality

FROM: Maria T. Dunn, Coastal Coordinator
Habitat Conservation Division

DATE: September 20, 2024

SUBJECT: CAMA Dredge/Fill Permit Application for Town of Nags Head, Dune Infiltration Proposals, PA-1386, Dare County, North Carolina.

Biologists with the North Carolina Wildlife Resources Commission (NCWRC) reviewed the permit application with regard to impacts on fish and wildlife resources. The project site includes the access area of Juncos Street to the associated dune system of ocean shoreline. Our comments are provided in accordance with provisions of the Coastal Area Management Act (G.S. 113A-100 through 113A-128), as amended, Sections 401 and 404 of the Clean Water Act, as amended, the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Magnuson-Stevens Fishery Conservation and Management Act (FCMA), as amended (16 U.S.C. 1801 et seq.), & the Migratory Bird Treaty Act (16 U.S.C. 703-712 et seq.).

The Town of Nags Head proposes to conduct stormwater improvements on a site located within the ROW of Juncos Street by collecting stormwater from South Old Oregon Inlet Road to James Street and then extending approximately 200' south of Juncos Street. Water collected would be distributed through an underground dune infiltration system starting approximately 10' landward of the first line of vegetation and extending approximately 84' landward. Stormtech chambers will overlay each other to make a continuous 1,900 ft^2 underground chamber. A buried geotextile mat will create 36" of separation from the chambers. Approximately 300' of 6" HDPE force main will extend from a 10" inflow header pipe attached to the Stormtech chambers and extend landward to connect to a proposed 90 ft^2 wetwell pump station. Polyethylene geotextile will extend an additional 80' landward to accommodate vehicular traffic using the access area. The infiltration basin will be centered at the apex of the dune. The geotextile and Stormtech chambers are proposed seaward the 120' CAMA Setback. A 75' by 75' stockpile and laydown area are proposed waterward the FLSNV. It is anticipated 500 gallons of stormwater per minute may be pumped to the system after a storm event. A scoping meeting was conducted in November 2022. The Atlantic Beach is classified SB by the Environmental Management Commission.

The NCWRC has reviewed the project proposal and believes there is insufficient information to determine the affects the engineered stormwater system will have on environmental resources. It does not appear

Mailing Address: Habitat Conservation • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

questions presented during the scoping meeting have been addressed. Therefore, we request the following be considered and information provided prior to consideration of permit issuance:

- The dune system and ocean shoreline of Nags Head provide habitat opporotunites to numerous state and federally recognized species including coastal waterbirds, sea turtles, and beach invertebrates. Federally protected species that utilize the area include piping plover (*Charadrius melodus melodus*), red knot (*Calidris canutus rufa*), roseate tern (*Sterna dougallii dougallii*) and Kemp's Ridley (*Lepidochelys kempi*), hawksbill (*Eretmochelys imbricata*), leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*), and green (*Chelonia mydas*) sea turtles. Impacts the project may have on these species and their habitats should be considered as several species nest within the dune and ocean shoreline habitats in Nags Head.

- Installation of the engineered stormwater system will add hardened structures to the dune and ocean shoreline systems. Erosion and general sediment transport may cause the system to be frequently exposed. Information regarding maintenance and continued disturbance of the area to repair the system should be presented. The placement of the structure within the NCDCM setback escalates these concerns.

- Stormwater collected for this proposal will be removed from lower elevation areas and pumped to the engineered system. This will not only collect rainwater but will also collect contaminants from highway runoff and potentially septic contaminated water during elevated water events. Statements should be made acknowledging potential contaminants and their impact to the dune and ocean shore environments.

- The engineered stormwater system affects more than just the physical footprint of the system. The area of influence, or area outside the physical footprint of the system, should be delineated and considered as the impact area for the proposal.

- The engineered stormwater system will introduce increased water to the dune system and ocean shoreline. The dunes and ocean shoreline of Nags Head provides nesting habitat for several sea turtle species. Sea turtle nests are influenced by temperature, water and gas exchanges from the adjacent sands to the nest cavities. The introduction of increased water volumes would influence temperature, inundation, gas exchange, and contaminants, affecting gender determination and overall nest success and viability. The area of influence and affect the discharge will have on habitats has not been provided. Suitable nesting habitat may be permanently affected.

- Due to the engineered design of the system, including pumping of water from lower elevations, introduction of contaminants, water storage, and discharge pipes, the project may be considered a point discharge. Therefore, the proposal should be reviewed and permitted accordingly by the appropriate state and federal agencies.

- The NCWRC encourages the Town of Nags Head to investigate a multitude of management measures to help address stormwater. Such measures would include the reduction of impervious surfaces for new or redeveloped projects and implementation of engineered systems outside environmentally sensitive areas.

We appreciate the opportunity to review and comment on this permit application and look forward to additional information as it becomes available. If you need further assistance or additional information, please contact me at maria.dunn@ncwildlife.org or (252) 495-5554.

From: Hall, Wayne P
To: Matthews, Kathryn (Kathy)
Subject: RE: [External] Crowell Street Infiltration project - CAMA Follow-up
Date: Monday, September 16, 2024 2:04:26 PM
Attachments: image002.png
image003.png
image004.png

Thanks! I'll consolidate the comments in our denial letter to the applicant and for our commission to review in their consideration when a variance is requested.

Thanks!

Wayne Hall

Assistant Major Permits Coordinator
Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557
(252)515-5423
Wayne.Hall@deq.nc.gov
www.deq.nc.gov

Find a Field Rep (arcgis.com)

From: Matthews, Kathryn (Kathy) <kathryn_matthews@fws.gov>
Sent: Monday, September 16, 2024 1:29 PM
To: Hall, Wayne P <Wayne.Hall@deq.nc.gov>
Subject: Fw: [External] Crowell Street Infiltration project - CAMA Follow-up

Hi Wayne,

I found these comments today - I hope they are helpful for the Nags Head Project. The Nags Head project is not as large, but the concerns are similar.

From: Matthews, Kathryn (Kathy) <kathryn_matthews@fws.gov>
Sent: Wednesday, February 21, 2024 8:32 AM
To: MacPherson, Tara <tara.macpherson@deq.nc.gov>; Dunn, Maria T. <maria.dunn@ncwildlife.org>
Cc: Amico, Patrick J <Patrick.Amico@deq.nc.gov>
Subject: Re: [External] Crowell Street Infiltration project - CAMA Follow-up

Hi Tara,

Below are my comments. Thanks for the opportunity to comment!

- The Service is concerned that installation of the system would effectively remove over 1,600 sf of sea turtle nesting habitat, in and adjacent to designated breeding critical habitat for loggerhead sea turtle. Any other hardened structures associated with the facility, if located in what is now suitable habitat for nesting sea turtles, would also result in a loss of habitat. Storm water often carries oils and greases, animal feces, bacteria, and other pollutants. Adverse changes to sand quality or sand temperature as a result of effluent from the device would also be considered an impact to sea turtle habitat. We would recommend formal consultation under ESA Section 7 (if there is a federal nexus) or Section 10 (if there is no federal nexus) for the installation of one or more of these devices.

- In order to minimize impacts to most nesting sea turtle species, the top of the system must be maintained at a depth greater than 24 inches or so. It should be maintained at more than 36 inches deep to avoid potential impacts to nesting leatherback sea turtles. It does not appear that this depth is proposed, nor is it clear how such a depth would be maintained.

- There is currently no dune in the area where the system is proposed, and the area appears to be a public access. The Service is concerned that it may be difficult to maintain the depth of the system while also providing public access.

- The Service is concerned that these structures adds to those requiring protection from storms and erosion, resulting in increased sand placement or other shoreline protection measures.

- The Service is concerned that large rain or tidal events may overwhelm the device. Is there the potential for erosion or a blow-out associated with flow from the device? Where would water flow if there was a rapid or uncontrolled discharge, or if the pump continues to move water rapidly toward an overwhelmed device? How would that affect the beach shoreline?

- It will be very important to keep the device maintained clear of clogging materials, so that water may move through it as designed. The Service is concerned that over time, a clogged system may not perform as designed, potentially causing smaller rain events to overwhelm it.

- If the device becomes eroded during high tide or a storm, wave energy may be reflected off of device and cause increased erosion to adjacent properties.

Have a good week,

We are temporarily lacking a physical office. Electronic and phone correspondence is preferred. For snail mail, please use the P.O. Box listed below, rather than our former physical address. We will update our physical courier address when we move into the new space (expected by June 2024). Thanks!

Kathy Matthews
NC Renewable Energy Coordinator
U.S. Fish and Wildlife Service
P.O. Box 33726
Raleigh, NC 27636-3726
NEW Phone! 984-308-0852

From: MacPherson, Tara <tara.macpherson@deq.nc.gov>
Sent: Monday, February 19, 2024 12:35 PM
To: Dunn, Maria T. <maria.dunn@ncwildlife.org>; Matthews, Kathryn (Kathy) <kathryn_matthews@fws.gov>
Cc: Amico, Patrick J <Patrick.Amico@deq.nc.gov>

Subject: RE: [External] Crowell Street Infiltration project - CAMA Follow-up

That would be great.
Thanks Maria.

Tara MacPherson
Wilmington Region District Manager
North Carolina Division of Coastal Management
Department of Environmental Quality

910 796-7266 office
tara.macpherson@deq.nc.gov

127 Cardinal Drive Ext
Wilmington, NC 28405

As part of DEQ's phased email update, all Division of Coastal Management emails are now @deq.nc.gov. Our email addresses may look different, but email performance will not be impacted.

Find a Field Rep (arcgis.com)
Join the DCM Interested Parties List

From: Dunn, Maria T. <maria.dunn@ncwildlife.org>
Sent: Monday, February 19, 2024 11:37 AM
To: MacPherson, Tara <tara.macpherson@deq.nc.gov>; kathryn_matthews@fws.gov
Cc: Amico, Patrick J <Patrick.Amico@deq.nc.gov>
Subject: RE: [External] Crowell Street Infiltration project - CAMA Follow-up

Hi Tara.
I thought we had this week to get something to you. I imagine it will have be to be Wednesday for me – today is also a federal holiday.
Thank you.
Maria

Maria T. Dunn
Coastal Coordinator

NC Wildlife Resources Commission
943 Washington Sq. Mall
Washington, NC 27889
252-495-5554

www.ncwildlife.org

From: MacPherson, Tara <tara.macpherson@deq.nc.gov>
Sent: Monday, February 19, 2024 11:35 AM
To: kathryn_matthews@fws.gov; Dunn, Maria T. <maria.dunn@ncwildlife.org>
Cc: Amico, Patrick J <Patrick.Amico@deq.nc.gov>
Subject: RE: [External] Crowell Street Infiltration project - CAMA Follow-up

Hi Ladies, Just checking in on any comments related to Oak Islands Dune Infiltration Project.
Thanks!
Tara

Tara MacPherson
Wilmington Region District Manager
North Carolina Division of Coastal Management
Department of Environmental Quality

910 796-7266 office
tara.macpherson@deq.nc.gov

127 Cardinal Drive Ext
Wilmington, NC 28405

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Find a Field Rep (arcgis.com)
Join the DCM Interested Parties List

From: MacPherson, Tara
Sent: Tuesday, February 13, 2024 12:16 PM
To: Matthews, Kathryn (Kathy) <kathryn_matthews@fws.gov>; Dunn, Maria T. <maria.dunn@ncwildlife.org>
Subject: RE: [External] Crowell Street Infiltration project - CAMA Follow-up

Hi Kathy,

It is going to be denied by rule, but if they comments are part of the permit file for the Variance that would be good. Within the next week ok?
Thank you!

Tara MacPherson
Wilmington Region District Manager
North Carolina Division of Coastal Management
Department of Environmental Quality

910 796-7266 office
tara.macpherson@deq.nc.gov

127 Cardinal Drive Ext
Wilmington, NC 28405

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From: Matthews, Kathryn (Kathy) <kathryn_matthews@fws.gov>
Sent: Tuesday, February 13, 2024 11:16 AM
To: MacPherson, Tara <tara.macpherson@deq.nc.gov>; Dunn, Maria T. <maria.dunn@ncwildlife.org>
Subject: Re: [External] Crowell Street Infiltration project - CAMA Follow-up

Thank you! - when do you need comments?

We are temporarily lacking a physical office. Electronic and phone correspondence is preferred. For snail mail, please use the P.O. Box listed below, rather than our former physical address. We will update our physical courier address when we move into the new space (expected by June 2024). Thanks!

Kathy Matthews
NC Renewable Energy Coordinator
U.S. Fish and Wildlife Service
P.O. Box 33726
Raleigh, NC 27636-3726
NEW Phone! 984-308-0852

From: MacPherson, Tara <tara.macpherson@deq.nc.gov>
Sent: Tuesday, February 13, 2024 11:00 AM
To: Matthews, Kathryn (Kathy) <kathryn_matthews@fws.gov>
Subject: RE: [External] Crowell Street Infiltration project - CAMA Follow-up

Here is the application and narrative.
Thanks,
Tara

Tara MacPherson
Wilmington Region District Manager
North Carolina Division of Coastal Management
Department of Environmental Quality

910 796-7266 office
tara.macpherson@deq.nc.gov

127 Cardinal Drive Ext
Wilmington, NC 28405

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From: MacPherson, Tara
Sent: Tuesday, February 13, 2024 10:43 AM
To: kathryn_matthews@fws.gov
Cc: Amico, Patrick J <Patrick.Amico@deq.nc.gov>; Dunn, Maria T. <maria.dunn@ncwildlife.org>
Subject: FW: [External] Crowell Street Infiltration project - CAMA Follow-up

Resending- Sorry Kathy, state email has trumped me! Please see below and attached.

Tara MacPherson
Wilmington Region District Manager
North Carolina Division of Coastal Management
Department of Environmental Quality

910 796-7266 office
tara.macpherson@deq.nc.gov

127 Cardinal Drive Ext
Wilmington, NC 28405

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From: Amico, Patrick J <Patrick.Amico@deq.nc.gov>
Sent: Tuesday, February 13, 2024 10:05 AM
To: Dunn, Maria T. <maria.dunn@ncwildlife.org>; MacPherson, Tara <tara.macpherson@deq.nc.gov>; Matthews, Kathy <kathy.matthews@dac.nc.gov>
Subject: RE: [External] Crowell Street Infiltration project - CAMA Follow-up

And here are the revised, updated plans.
Thanks for your review.
Patrick

From: Dunn, Maria T. <maria.dunn@ncwildlife.org>
Sent: Tuesday, February 13, 2024 9:10 AM
To: MacPherson, Tara <tara.macpherson@deq.nc.gov>; Matthews, Kathy <kathy.matthews@dac.nc.gov>
Cc: Amico, Patrick J <Patrick.Amico@deq.nc.gov>
Subject: RE: [External] Crowell Street Infiltration project - CAMA Follow-up

Thank you Tara.

Maria T. Dunn
Coastal Coordinator

NC Wildlife Resources Commission
943 Washington Sq. Mall
Washington, NC 27889
252-495-5554

www.ncwildlife.org

From: MacPherson, Tara <tara.macpherson@deq.nc.gov>
Sent: Tuesday, February 13, 2024 9:08 AM
To: Dunn, Maria T. <maria.dunn@ncwildlife.org>; Matthews, Kathy <kathy.matthews@dac.nc.gov>
Cc: Amico, Patrick J <Patrick.Amico@deq.nc.gov>
Subject: FW: [External] Crowell Street Infiltration project - CAMA Follow-up

Good Morning, This is the proposed Oak Island dune infiltration project. It will be denied by rule due to structures that are proposed within the 60 ft. Ocean Hazard Setback. The Town intends to ask for a Variance Petition.

These are not the final plans, the final plans have a little more detail on the AEC and FLSNV, but I wanted to get this in your hands to circulate.

Thanks,
Tara

Tara MacPherson
Wilmington Region District Manager
North Carolina Division of Coastal Management
Department of Environmental Quality

910 796-7266 office
tara.macpherson@deq.nc.gov

127 Cardinal Drive Ext
Wilmington, NC 28405

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Join the DCM Interested Parties List

From: Marc Horstman <mhorstman@wkdickson.com>
Sent: Tuesday, February 13, 2024 8:00 AM
To: Amico, Patrick J <Patrick.Amico@deq.nc.gov>; Rick Patterson <rpatterson@oakislandnc.gov>
Cc: Alex McMillan <amcmillan@wkdickson.com>; MacPherson, Tara <tara.macpherson@deq.nc.gov>
Subject: RE: [External] Crowell Street Infiltration project - CAMA Follow-up

Hi Patrick,

Thank you for this information. Please let me know if the attached PDF is what you need related to the drawings. This was the permitting plan set that was sent out as part of the adjacent property owner notification package.

I appreciate the links to the CRC meeting. I'll work with the Town to submit a petition for a variance request as soon as we get your technical denial letter.

Thanks,
-Marc

Marc T. Horstman, PE, PH, BC.WRE
Senior Project Manager
WK Dickson & Co., Inc.
919-256-5642 (o) | 919-215-1198 (m)

From: Amico, Patrick J <Patrick.Amico@deq.nc.gov>
Sent: Monday, February 12, 2024 5:17 PM
To: Marc Horstman <mhorstman@wkdickson.com>; Rick Patterson <rpatterson@oakislandnc.gov>
Cc: Alex McMillan <amcmillan@wkdickson.com>; MacPherson, Tara <tara.macpherson@deq.nc.gov>

Subject: RE: [External] Crowell Street Infiltration project - CAMA Follow-up

Hi Marc-
We have one more step, to get comments from the resource agencies-

With that being said, can I ask you all to please send me an electronic pdf of the workplan drawings? I need to pass it on to a NCWRC/USFWS for comment, and I just have the oversize print version (that unfortunately I can't scan).

Afterwards, I will need to issue the technical denial letter, and after that permit decision is complete you will be able to submit the petition for the variance request.

March 14 is the variance request deadline to make the agenda for the April CRC meeting: https://www.deq.nc.gov/about/divisions/coastal-management/coastal-management-permits/variances-appealsPlease see link for information on variance process.

Please see the following link for the CRC Meeting Schedule and Locations: https://www.deq.nc.gov/about/divisions/coastal-management/coastal-resources-commission/crc-meetings-schedule

Patrick

From: Marc Horstman <mhorstman@wkdickson.com>
Sent: Monday, February 12, 2024 1:22 PM
To: Amico, Patrick J <Patrick.Amico@deq.nc.gov>; Rick Patterson <rpatterson@oakislandnc.gov>
Cc: Alex McMillan <amcmillan@wkdickson.com>
Subject: [External] Crowell Street Infiltration project - CAMA Follow-up

Good afternoon Patrick,

Happy Monday, and I hope you had a great weekend!

I wanted to quickly circle back with you to confirm the following items related to the Crowell Street Dune Infiltration Project:

- Hopefully, your office has received the $100 check that we sent two weeks ago. If you have not received this check, please let us know.
- The Town has posted the site card at a visible location on-site. We have had adjacent neighbors call and ask us about this project since they saw this site card.

Can you remind me of the next steps in this review process and the respective timeframes? We are

planning to meet with GoldenLeaf in a couple of weeks to discuss our pending grant application, and we thought it would be helpful to provide them with a permitting update.

Thanks,
-Marc

Marc T. Horstman, PE, PH, BC.WRE
Senior Project Manager
WK Dickson & Co., Inc.
720 Corporate Center Drive
Raleigh, NC 27607
Office: 919-782-0495
Direct: 919-256-5642
Email: mhorstman@wkdickson.com
www.wkdickson.com

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-----Original Message-----
From: Amico, Patrick J <Patrick.Amico@deq.nc.gov>
Sent: Monday, January 29, 2024 6:42 PM
To: Rick Patterson <rpatterson@oakislandnc.gov>
Cc: Alex McMillan <amcmillan@wkdickson.com>; Marc Horstman <mhorstman@wkdickson.com>
Subject: Site Card for Crowell Street Infiltration project

Hi Rick-
Can you or someone from your staff please post the attached site card at a visible location at the site of the proposed dune infiltration project?
With kind regards,
Patrick

From: Matthews, Kathryn (Kathy)
To: Hall, Wayne P
Cc: Dunn, Maria T.
Subject: Re: [EXTERNAL] RE: Town of Nags Head - Dune Infiltration CAMA Major Permit Application
Date: Thursday, September 12, 2024 4:27:16 PM
Attachments: image001.png
image002.png

Hi Wayne,

Thanks for the additional information. I didn't write down the scoping comments that I provided during the November 28, 2022 meeting, nor do I have notes from Lyn Hardison to remind me what I said, but the Service's main concerns for the proposed project include the placement of non-suitable material in what is currently suitable sea turtle nesting habitat.

I don't see a narrative description, but from the plan sheets, it appears that the Town is proposing to construct a collection system on Old Oregon Inlet Road that will pump stormwater to a dune infiltration system underneath the Juncos Street beach access. The dune infiltration system is approximately 100 feet long and consists of a StormTech(R) chamber system covered and surrounded by 6 inches of NCDOT #57 stone (around and between the chambers) and geotextile material. The chambers are proposed to be buried a minimum of 30 inches below grade. A 10' x 100' Mobi-Mat(R) is proposed to top the structure. The structure is proposed to extend past the NCDCM static vegetation line, but stops just short of the first line of stable natural vegetation.

Below are my comments and concerns:

1. The USFWS is concerned about the proposed installation of hardened structures underneath the dune. There is no information as to the potential for the site to be overtopped or washed out, but the proximity to the ocean makes it likely that the structure will be threatened by erosion on a regular basis. This becomes yet more infrastructure than must be maintained and managed in the face of increasing storms and erosion.
2. Both the Mobi-Mat on the surface and the proposed buried structure (if erosion results in it being closer than 30 inches of the surface) would obstruct sea turtle nesting. The average loggerhead sea turtle nest is approximately 18 inches below grade, but can be much deeper. Though not common, a leatherback nest is on average about 36 inches

below grade. We are concerned that wind and water may cause the structure to often be much closer to the surface than 30 inches. Because there is no federal nexus, if a nesting sea turtle is negatively affected by the structure, there is no relief from legal liability under the Endangered Species Act.

3. The Service is also concerned for the quality and volume of water that may be released from the structure. Have you discussed this project with the NPDES folks at DWR and/or EPA? I believe they have had some interest in these types of projects before. It is unclear if this would represent a point-source discharge and whether water quality standards would be met. It's also not clear whether the volume of water to be released may cause some erosion of the sand around the structure.

4. This is not the first (or probably the last) proposal we have seen to use dune infiltration to dispose of stormwater. However, it is unclear whether the town has investigated other alternatives to address the problem, such as replacement of impervious surfaces with more pervious materials, or requiring pervious materials to be incorporated into new lot development. We note that the Town proposes to demolish and repour the paved parking lot, and to repave the roadway and driveway sections that are affected. From the plans, it looks like they propose to use impervious pavement materials. Has the Town investigated using pervious materials for these activities and others in the area?

Thanks,

We are in the process of moving to our new office. Please see our new physical courier address, below. Mail may also still be sent to our P.O. Box. Thanks!

Kathy Matthews
NC Renewable Energy Coordinator
U.S. Fish and Wildlife Service
3916 Sunset Ridge Rd.
Raleigh, NC 27607
Phone 984-308-0852

Or

P.O. Box 33726
Raleigh, NC 27636-3726

From: Hall, Wayne P <Wayne.Hall@deq.nc.gov>
Sent: Wednesday, September 11, 2024 2:59 PM
To: Matthews, Kathryn (Kathy) <kathryn_matthews@fws.gov>
Subject: [EXTERNAL] RE: Town of Nags Head - Dune Infiltration CAMA Major Permit Application.

Said the file was too big, so may need to send in multiple parts.

Please see attached files for the Dune Infiltration Project.

I'll add that as a note to the letter we send out. Is the concern primarily with the mobi mats, underground infiltration system/tank, or the quality/volume of water that would be pumped out on the oceanside? Or all of the above? Just for my knowledge for this and future projects.

Thanks!

Wayne Hall

Assistant Major Permits Coordinator
Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557
(252)515-5423
Wayne.Hall@deq.nc.gov
www.deq.nc.gov

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From: Matthews, Kathryn (Kathy) <kathryn_matthews@fws.gov>
Sent: Wednesday, September 11, 2024 1:56 PM
To: Hall, Wayne P <Wayne.Hall@deq.nc.gov>
Cc: Dunn, Maria T. <maria.dunn@ncwildlife.org>
Subject: Re: [EXTERNAL] RE: Town of Nags Head - Dune Infiltration CAMA Major Permit Application.

I apologize - we have been having some issues with our server, and I have no record of having received the September 4 email. Could you send the attachments again? Just off the top of my head, our comments have not changed. We would have significant concerns for adverse affects to nesting sea turtles, and without a federal permit or other federal nexus, the Town would be on their own to ensure compliance with the ESA (Section 10).

We are in the process of moving to our new office. Please see our new physical courier address, below. Mail may also still be sent to our P.O. Box. Thanks!

Kathy Matthews
NC Renewable Energy Coordinator
U.S. Fish and Wildlife Service
3916 Sunset Ridge Rd.
Raleigh, NC 27607
Phone 984-308-0852

Or

P.O. Box 33726
Raleigh, NC 27636-3726

From: Hall, Wayne P <Wayne.Hall@deq.nc.gov>
Sent: Wednesday, September 11, 2024 1:30 PM
To: Matthews, Kathryn (Kathy) <kathryn_matthews@fws.gov>
Subject: [EXTERNAL] RE: Town of Nags Head - Dune Infiltration CAMA Major Permit Application.

Good Afternoon,

I wanted to follow up to see if comments on this proposed project. DCM would like to incorporate your comments when we issue our denial for this project.

Thanks!

Wayne Hall

Assistant Major Permits Coordinator
Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557
(252)515-5423
Wayne.Hall@deq.nc.gov
www.deq.nc.gov

Find a Field Rep (arcgis.com)

From: Hall, Wayne P
Sent: Wednesday, September 4, 2024 9:07 AM
To: Dunn, Maria T. <maria.dunn@ncwildlife.org>; kathryn_matthews@fws.gov
Subject: Town of Nags Head - Dune Infiltration CAMA Major Permit Application.

Hi,

Received a CAMA major permit application (PA-1386) regarding a dune infiltration project for the Town of Nags Head at Juncos Street Beach Access. Looking through the old scoping meetings, there were stated concerns about sea turtle nesting and other impacts due to the project. As far as I know, USACE does not have regulatory authority, so if there hasn't been already, I wanted to start the discussion and collaboration for this matter as review occurs and comments were submitted. DCM plans to issue a technical denial for the application so we want to incorporate your comments for possible design changes as the Town of Nags Head

will be going for a variance.

I've attached the primary documents for your reference. The scoping meeting was prior to my start date, so if please share any additional notes or comments if you have them.

Thanks!

Wayne Hall

Assistant Major Permits Coordinator
Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557
(252)515-5423
Wayne.Hall@deq.nc.gov
www.deq.nc.gov

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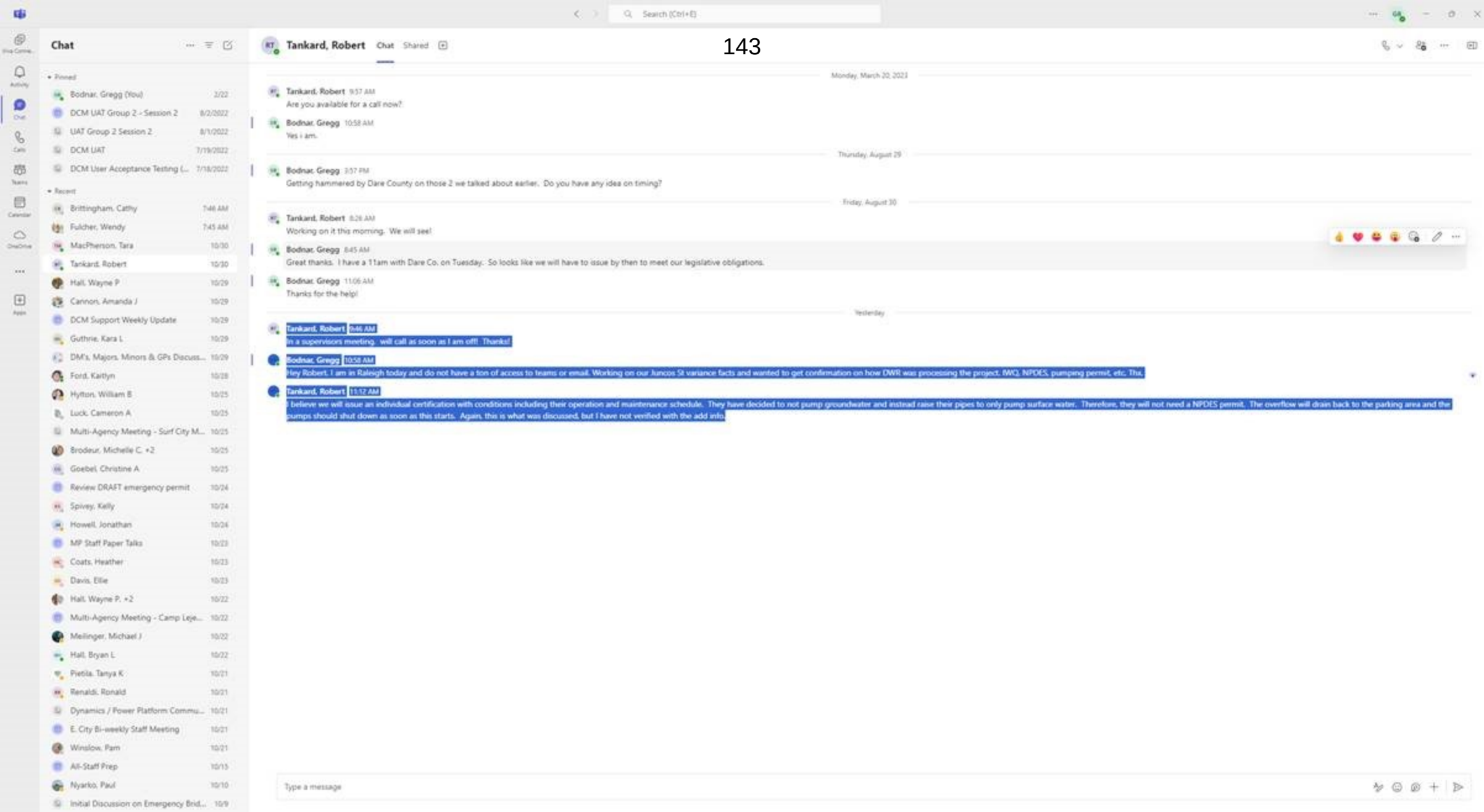
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Bodnar, Gregg (You) 2/22
DCM UAT Group 2 - Session 2 8/2/2022
UAT Group 2 Session 2 8/1/2022
DCM UAT 7/19/2022
DCM User Acceptance Testing (... 7/18/2022
Recent
Brittingham, Cathy 7:46 AM
Fulcher, Wendy 7:45 AM
MacPherson, Tara 10/30
Tankard, Robert 10/30
Hall, Wayne P 10/29
Cannon, Amanda J 10/29
DCM Support Weekly Update 10/29
Guthrie, Kara L 10/29
DM's, Majors, Minors & GPs Discuss... 10/29
Ford, Kaitlyn 10/28
Hylton, William B 10/25
Luck, Cameron A 10/25
Multi-Agency Meeting - Surf City M... 10/25
Brodeur, Michelle C, +2 10/25
Goebel, Christine A 10/25
Review DRAFT emergency permit 10/24
Spivey, Kelly 10/24
Howell, Jonathan 10/24
MP Staff Paper Talks 10/23
Coats, Heather 10/23
Davis, Ellie 10/23
Hall, Wayne P, +2 10/22
Multi-Agency Meeting - Camp Leje... 10/22
Meilinger, Michael J 10/22
Hall, Bryan L 10/22
Pietila, Tanya K 10/21
Renaldi, Ronald 10/21
Dynamics / Power Platform Commu... 10/21
E. City Bi-weekly Staff Meeting 10/21
Winslow, Pam 10/21
All-Staff Prep 10/15
Nyarko, Paul 10/10
Initial Discussion on Emergency Brid... 10/9
Tankard, Robert Chat Shared
Monday, March 20, 2023
Tankard, Robert 9:57 AM
Are you available for a call now?
Bodnar, Gregg 10:58 AM
Yes i am.
Thursday, August 29
Bodnar, Gregg 3:57 PM
Getting hammered by Dare County on those 2 we talked about earlier. Do you have any idea on timing?
Friday, August 30
Tankard, Robert 8:26 AM
Working on it this morning. We will see!
Bodnar, Gregg 8:45 AM
Great thanks. I have a 11am with Dare Co. on Tuesday. So looks like we will have to issue by then to meet our legislative obligations.
Bodnar, Gregg 11:06 AM
Thanks for the help!
Yesterday
Tankard, Robert 9:46 AM
In a supervisors meeting. will call as soon as I am off! Thanks!
Bodnar, Gregg 10:58 AM
Hey Robert, I am in Raleigh today and do not have a ton of access to teams or email. Working on our Juncos St variance facts and wanted to get confirmation on how DWR was processing the project. IWQ, NPDES, pumping permit, etc. Thx.
Tankard, Robert 11:12 AM
I believe we will issue an individual certification with conditions including their operation and maintenance schedule. They have decided to not pump groundwater and instead raise their pipes to only pump surface water. Therefore, they will not need a NPDES permit. The overflow will drain back to the parking area and the pumps should shut down as soon as this starts. Again, this is what was discussed, but I have not verified with the add info.
Type a message

Town of Nags Head
Post Office Box 99
Nags Head, NC 27959
Telephone 252-441-5508
Fax 252-441-0776
www.nagsheadnc.gov

October 28, 2024

Robert Tankard
Assistant Regional Supervisor
Water Resources Water Quality Regional Operations Section
Department of Environmental Quality
943 Washington Sq. Mall, Washington, North Carolina, 27889
james.baltzer@deq.nc.gov

Re: Juncos St. Dune Infiltration Project; DWR Project No. 20241126; **DCM Project No. PA-1386**

Dear Mr. Tankard:

We are writing to provide clarifications for the proposed S. Old Oregon Inlet Rd. stormwater infrastructure improvements project located in Nags Head, North Carolina. A Division of Coastal Management CAMA Major Development Permit application was recently submitted for this project and a subsequent denial received.

We would like to respond to some of the questions you have raised during the review process.

The project intent is to reduce the frequency and depth of floodwaters resulting from rainfall surface runoff along S. Old Oregon Inlet Rd. in the proximity of Juncos St. Conventional drainage solutions are limited by elevated groundwater conditions, minimal hydraulic gradient, and potential water quality impacts via connections to the Atlantic Ocean or Roanoke Sound.

The drainage system proposal is comprised of three major system components, a discreet pipe collection system, a pump station for conveyance, and a subsurface infiltration gallery. The system is planned to be operated only with the occurrence of a significant rainfall event. Based upon site specific observations and resultant rainfall accumulation, a significant rainfall event is approximated to be 1.5 inches or greater. A review of recent rainfall totals for this area is anticipated to result in system operation in the range between six to twelve times annually following a significant rainfall event.

The discrete pipe collection is proposed to span along S. Old Oregon Inlet Rd between James St. and Juncos St. The project plans indicate a high-density polyethylene (HDPE) solid wall conveyance pipe connection between drainage inlets for the base bid option and an HDPE perforated conveyance pipe connection between inlets for an alternate bid option. The project is planned to be constructed with a solid wall conveyance pipe connection to mitigate the potential for on-site septic system effluent from propagating into the proposed drainage network.

There are several different management measures that are incorporated into the system design. The pump station can be operated via water level float activation, manually or remotely. In addition to the pumping system, management controls have been added to the infiltration gallery. An overflow pipe is connected to the infiltration chamber network to serve as a visual indicator for the system storage approaching capacity. Routing of the overflow pipe will be directed away from the ocean and towards the parking lot for localized infiltration or recirculate into the wet well. This information is noted on Sheet C2.5 from Nags Head Dune Infiltration Permit Set 1A, *(please note the drawing sets are divided between Permit Drawing Set 1 which describes the drainage collection part and Permit Drawing Set 1A which describes the wet well and dune infiltration gallery part).* Additional redundancy will be achieved via visual inspections during system operation and remote monitoring of an existing groundwater well downgradient of the infiltration gallery to monitor groundwater mounding conditions. A water level data logger is located within this well with remote monitoring capability and is currently operating as part of the Towns water quality monitoring program.

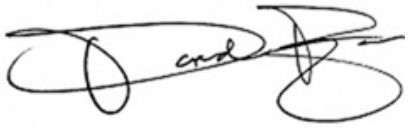
Experience with similar system operations has taught us the key to management of pumping systems is via on-site observations and continual monitoring. The approach to the proposed system operation will be no different. To aid with this, a specific operation and maintenance guide has been developed specifically for management of this system, (see attached Flood Reduction System Management Plan).

The project's purpose is to improve quality of life in Nags Head through the reduction of risks associated with flash flooding and standing water in a responsible manner.

Attached for your reference is a copy of the design plan set that was included with the CAMA Major Development Permit application. The plan set is divided into two parts; Permit Plan Set 1 which is the discrete pipe collection system along S. Old Oregon Inlet Rd. and Permit Plan Set 1A which is comprised of the connecting pump station and dune infiltration gallery system.

We appreciate your assistance with these matters. Should you have any questions or comments regarding the submitted information, please do not hesitate to contact me at (252) 441-6221. Thank you for your assistance in this matter.

Sincerely,



David M. Ryan, P.E. | **Town of Nags Head**
Town Engineer | Department of Public Services
P.O. Box 99
Nags Head, NC 27959
Tel: (252) 441-6221
Fax: (252) 441-3350
david.ryan@nagsheadnc.gov
www.nagsheadnc.gov

From:	Carver, Yvonne
To:	Renaldi, Ronald; Goebel, Christine A
Subject:	FW: [External] FW: JUNCOS STREET DUNE INFILTRATION PROJECT; DWR PROJECT NO. 20241126; DCM PROJECT NO. PA-1386
Date:	Tuesday, October 29, 2024 8:52:51 AM
Attachments:	image001.png 2024-28-10 DWR Robert Tankard Ltr.pdf

Keeping you both 'in the loop', as this project is going through a Variance hearing.

Yvonne

Yvonne B. Carver
Environmental Specialist II
Division of Coastal Management
NC Department of Environmental Quality
252-621-6453

401 S. Griffin St., Suite 300
Elizabeth City, NC 27909

From: Huggett, Douglas <dhuggett@moffattnichol.com>
Sent: Tuesday, October 29, 2024 8:40 AM
To: Bodnar, Gregg <gregg.bodnar@deq.nc.gov>; Hall, Wayne P <Wayne.Hall@deq.nc.gov>; Carver, Yvonne <yvonne.carver@deq.nc.gov>
Subject: [External] FW: JUNCOS STREET DUNE INFILTRATION PROJECT; DWR PROJECT NO. 20241126; DCM PROJECT NO. PA-1386

FYI – Keeping you all in the loop.

Thanks
Doug

Douglas Huggett
Senior Environmental Permit Specialist

Moffatt & Nichol
305 Commerce Avenue, Suite 201 | Morehead City, NC 28557
D +1 (919) 645-0649 | O +1 (919) 781-4626 | M +1 (919) 534-6834
E dhuggett@moffattnichol.com

From: David Ryan <David.Ryan@nagsheadnc.gov>
Sent: Monday, October 28, 2024 4:43 PM
To: robert.tankard@deq.nc.gov; Vinson, Scott <scott.vinson@deq.nc.gov>
Cc: Hunter Freeman <freeman@mcadamsco.com>; Huggett, Douglas <dhuggett@moffattnichol.com>; Zdeb, Kevin <kzdeb@moffattnichol.com>
Subject: JUNCOS STREET DUNE INFILTRATION PROJECT; DWR PROJECT NO. 20241126; DCM PROJECT NO. PA-1386

Good afternoon Robert,
Thank you for taking the time out to speak discuss the Juncos St. Dune Infiltration Project. To assist with the feedback received, we have prepared a letter outlining the system intent, material construction, system function and maintenance, please see attached. For your reference, the permit plans sets are provided in two parts; Permit Plan Set 1-drainage collection system and Permit Plan Set 1A- infiltration gallery. Also included for your reference is a project specific Flood Reduction System Management Plan that will serve as a guide for system operation and maintenance.

Due to the plan file size, we are providing a link to a folder containing the plan sets and Flood Reduction System Management Plan. The files can be accessed here 2024-28-10 Project Area #12

If there is any additional information you require or have any additional questions pertaining to this project, please feel free to contact us.

Thank you.

David Ryan, P.E.
Town Engineer
Public Services Department
P: 252.441.6221
david.ryan@nagsheadnc.gov

RECEIVED
By Yvonne B. Carver at 3:39 pm, May 16, 2024

moffatt & nichol

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

April 26, 2024

Boat Rides 001 LLC TTEE
3225 McLeod Dr. - STE 777
Las Vegas, NV 89121

Dear Sirs,

The Town of Nags Head is in the process of developing a dune infiltration system to address stormwater needs adjacent to your property. The project will be located at the Juncos Street Beach Access facility. The proposed project is described in detail in the attached project narrative and drawings.

A Coastal Area Management Act (CAMA) permit will be required for the project. The firm of Moffatt and Nichol, on behalf of the Town, is applying for a CAMA permit modification from the North Carolina Division of Coastal Management (NCDCM) for the above referenced activities. Given that you own riparian property immediately adjacent to the proposed project, CAMA rules require that you be provided notice of the permit application. Should you wish to comment on the permit application, you may do so within 30 days from the date you receive this correspondence. Your comments, which will be considered by NCDCM before reaching a final permit decision, may be provided to:

The North Carolina Division of Coastal Management
c/o Yvonne Carver
401 South Griffin Street, Suite 300
Elizabeth City, NC 27909

If you choose not to comment on the application, NCDCM will consider that you have no objection to the project. Should you have any questions about this issue, please feel free to contact me at dhuggett@moffattnichol.com.

Sincerely,

Doug Huggett

Doug Huggett

RECEIVED
By Yvonne B. Carver at 3:40 pm, May 16, 2024

moffatt & nichol

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

April 26, 2024

Bluffs Of South Nags Head
11 Venetian Dr.
Rehoboth Beach, DE 19971

Dear Sirs,

The Town of Nags Head is in the process of developing a dune infiltration system to address stormwater needs adjacent to your property. The project will be located at the Juncos Street Beach Access facility. The proposed project is described in detail in the attached project narrative and drawings.

A Coastal Area Management Act (CAMA) permit will be required for the project. The firm of Moffatt and Nichol, on behalf of the Town, is applying for a CAMA permit modification from the North Carolina Division of Coastal Management (NCDCM) for the above referenced activities. Given that you own riparian property immediately adjacent to the proposed project, CAMA rules require that you be provided notice of the permit application. Should you wish to comment on the permit application, you may do so within 30 days from the date you receive this correspondence. Your comments, which will be considered by NCDCM before reaching a final permit decision, may be provided to:

The North Carolina Division of Coastal Management
c/o Yvonne Carver
401 South Griffin Street, Suite 300
Elizabeth City, NC 27909

If you choose not to comment on the application, NCDCM will consider that you have no objection to the project. Should you have any questions about this issue, please feel free to contact me at dhuggett@moffattnichol.com.

Sincerely,

Doug Huggett

Doug Huggett

7021 0350 0001 4911 4792

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Postage	$2.35
Total Postage and Fees	$10.40

MOREHEAD CITY NC 28557
APR 27 2024
USPS
Postmark Here
04/27/2024

Sent To: Boat Rides 001 LLC
Street and Apt. No., or PO Box No.: 3225 mcleod Dr - STE 77
City, State, ZIP+4®: Las Vegas, NV 89121

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7022 1670 0003 0449 8634

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Rehoboth Beach, DE 19971

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☐ Certified Mail Restricted Delivery	$ $0.00
☐ Adult Signature Required	$ $0.00
☐ Adult Signature Restricted Delivery	$
Postage	$2.35
Total Postage and Fees	$10.40

MOREHEAD CITY NC 28557
APR 27 2024
USPS
Postmark Here
04/27/2024

Sent To: Bluffs of S. Nags Head
Street and Apt. No., or PO Box No.: 11 Venetian Dr.
City, State, ZIP+4®: Rehoboth Beach DE 19971

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Bluffs of South Nags Head
11 Venetian Dr.
Rehoboth Beach, DE 19971

9590 9402 6767 1074 2598 04

2. Article Number (Transfer from service label)

7022 1670 0003 0449 8634

PS Form 3811, July 2020 PSN 7530-02-000-9053

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A. Signature

X [signature] ☒ Agent ☐ Addressee

B. Received by (Printed Name) ANN SNYDER

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☒ No

3. Service Type

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- ☐ Collect on Delivery
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- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Boat Rides 001 LLC
3225 McLeod Dr., STE 77
Las Vegas, NV 89121

9590 9402 6767 1074 2597 98

2. Article Number (Transfer from service label)

7021 0350 0001 4911 4792

PS Form 3811, July 2020 PSN 7530-02-000-9053

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X C. Kuiken ☒ Agent ☐ Addressee

B. Received by (Printed Name) Cierra Kuiken

C. Date of Delivery 5/3/24

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

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- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

Domestic Return Receipt

From:	Hall, Wayne P
To:	Karen Johnson
Cc:	Renaldi, Ronald; Carver, Yvonne; Bodnar, Gregg
Subject:	RE: [External] Town of Nags Head, Juncos Street Dune Infiltration Project
Date:	Friday, October 4, 2024 11:34:00 AM
Attachments:	image001.png image002.png

Good Morning,

Thank you for submitting your comments for this project.

A denial has been issued for this project. The Town of Nags Head has requested a variance and will be heard at an upcoming Coastal Resource Commission (CRC) meeting – the date of the variance to be determined.

Thanks!

Wayne Hall

Assistant Major Permits Coordinator
Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557
(252)515-5423
Wayne.Hall@deq.nc.gov
www.deq.nc.gov

Find a Field Rep (arcgis.com)

From: Karen Johnson <karenjoyce1@verizon.net>

Sent: Friday, October 4, 2024 9:18 AM
To: Carver, Yvonne <yvonne.carver@deq.nc.gov>; Bodnar, Gregg <gregg.bodnar@deq.nc.gov>; Hall, Wayne P <Wayne.Hall@deq.nc.gov>
Cc: Renaldi, Ronald <ronald.renaldi@deq.nc.gov>
Subject: [External] Town of Nags Head, Juncos Street Dune Infiltration Project

Dear Ms. Carver, Mr. Bodnar, and Mr. Hall,

I am writing this email to address some comments and concerns regarding the installation of a dune infiltration system using underground ADS Stormtech SC-740 chambers to minimize flooding and to convey flood waters into the dune system at MP 19.5/Juncos beach access, to infiltrate the dune and be released to the Atlantic Ocean in South Nags Head. I appreciate that I have been allowed to submit my comments after the acceptance date.

I have been monitoring sea turtle nests in South Nags Head for over 10 years, and I have lived at MP 19.5 full time for the last 4+ years. I do not recall flooding issues being a consistent problem before 2016. 2016 was a major weather year on the barrier island, the year of Tropical Storm Hermine and Hurricane Matthew. T.S. Hermine washed out much of the beach, including many sea turtle nests in SNH. The effect to the dune system was severe, and it seems since that time, despite beach nourishment, the ocean continues to take back the beach. With sea level rising, high tides are higher, especially during King Tide/higher expected tide events. There has not been a successful emergence from a sea turtle nest between James Street and Juncos Street in over 4 years. These nests have, of course, been over washed, however, the saturation of the sand has been factor. The surface of the sand can be over washed several times, and the sand underneath remains dry.

This area has a water table that is consistently high, and what were smallish amounts of rainfall in the past are now causing flooding on the street and in neighboring yards and driveways. The water table is higher than in other areas where a dune infiltration system is being considered, i.e. in the Bonnett Street area.

I think another contributing factor to the water/flooding problem at MP 19.5 is that during the last 4 years, several beach front property owners have removed native plants, bushes and trees, plants that had deep roots, deep roots that absorbed a great deal of water. These native plants have been replaced with concrete, creating more runoff on the street and sidewalks and standing water in yards, and plantings of non-native plants and bushes with short root systems with the inability to handle the harsh beach environment. It makes no sense to remove native plants. Several yards have low-lying areas, where the native plants were removed, which now collect water and take days to soak into the ground.

I question how effective a dune infiltration system can be if the dune is saturated already; what the effect will be of flood waters pumped into the dune system, waters that may be contaminated with dog feces and bacteria, both of which are known to exist in the ditches beside the road; what will happen if the dune is unable to handle the water pumped into it; how the water quality will be effected if the pumped water contaminates the beach once released into the ocean.

Once again, thank you for the opportunity to give you my thoughts and observations.

Sincerely,

Karen Johnson
9500 S Old Oregon Inlet Rd.
Nags Head, NC 27959
(757) 642-0431

ROY COOPER
Governor
MARY PENNY KELLEY
Secretary
TANCRED MILLER
Director

NORTH CAROLINA
Environmental Quality

October 2, 2024

CERTIFIED MAIL 7019 0140 0001 0233 9798
RETURN RECEIPT REQUESTED

DEN24-03

Electronic Delivery to: david.ryan@nagsheadnc.gov

Town of Nags Head c/o David Ryan
501 S. Croatan Hwy
Nags Head, NC 27959

RE: DENIAL OF CAMA MAJOR DEVELOPMENT PERMIT
DEN 24-03

This letter is in response to your application for a Major Permit under the Coastal Area Management Act (CAMA), in which authorization was requested to reconstruct a parking area and beach access, and install a dune infiltration system, located in the Ocean Erodible Area (OEA) Area of Environmental Concern (AEC). The subject property is located at the Juncos Street Beach Access off S. Old Oregon Inlet Road (between 9531 and 9601 S. Old Oregon Inlet Road) and adjacent to the Atlantic Ocean in the Town of Nags Head, Dare County. Processing of the application, which was received by the Division of Coastal Management's Morehead City Office on June 27, 2024, is now complete. Based on the state's review, the Division of Coastal Management has made the following findings:

1) The proposed project would involve development within the Ocean Erodible Area AEC as designated by the N.C. Coastal Resources Commission. [15A NCAC 07H .0304(1)].

2) The setback is 120' based on an erosion rate of 4' per year and the setback is measured from the Pre-Project Vegetation Line.

3) The first line of stable natural vegetation (FLSNV) was surveyed on 9/22/2022 and verified by DCM on 5/17/2024. The FLSNV is approximately 90' oceanward of Pre-Project Vegetation Line.

4) There is an existing bench, gazebo, parking lot (~7800sf), shower, 8'x131' wooden pedestrian walkway, and unconsolidated sand beach access for vehicles at the site.

5) The applicant is proposing the installation of an underground dune infiltration system using Stormtech SC-740 chambers for stormwater infrastructure improvements. The proposal would add a new drainage pipe connected to a pump station to transport flood waters from the existing roadside swale off S. Old Oregon Inlet Road to the dune system at the Juncos Beach Access and infiltrate through the dune to the Atlantic Ocean. There is a 6" pipe for overflow connected to the infiltration chamber that would allow direct discharge within the dune system. A 30'x100' Mobi-Mat is proposed over the dune infiltration system located approximately 1 foot below the re-established dune. The Mobi-Mat is designed to identify erosion within the re-established dune. The infiltration system and Mobi-Mat would start ~10' landward of the first line of stable natural vegetation. Approximately 3500sf of existing parking lot and the wooden pedestrian walkway would be removed and replaced after the installation of the proposed stormwater infrastructure.

6) The proposed Stormtech SC-740 Chamber, Mobi-Mats, and associated excavation/grading are considered development within the ocean setback. A majority of the chamber and Mobi-Mat would be waterward of the pre-project vegetation line but landward of the first line of stable natural vegetation (FLSNV).

7) The US Fish and Wildlife Service (USFWS) commented they have concerns on the loss of sea turtle nesting habitat and potential negative impacts on sea turtle nesting habitat through stormwater carrying pollutants, bacteria, and other contaminants and adverse changes to sand quality or sand temperature as a result of effluent from the device.

8) In coordination with review agencies the following comments have been received:

   a) DWR provided the following comments on 9/16/24:

      1. The project design shows the dewatering pipe buried in the ground to a depth of at least 2.5ft this will likely be intercepting groundwater most of the time as groundwater level is approximately at the same depth in the area. Surrounding houses in the area are on septic systems and past studies have shown that dewatering projects of this nature inevitably pick up groundwater contamination from septic systems.

      2. This project is located in a high energy environment with relatively low dunes and little beach space from dune to the high tide line. DWR is concerned about erosion events uncovering your system and runoff coming out of the toe of the dune instead of reaching the ocean as groundwater.

      3. The construction plans appear to show an overflow outlet for the infiltration storage system shown on the cross section plans. Is this buried within the dune or will it be piped as an outfall towards the MHW line? Also, given potential for water sourced from the "pumping system" to contain a wastewater signature attributed to influence from nearby sub-surface waste disposal systems, any direct discharge (if present) has potential need to be covered through an NPDES permit.

b) WRC provided the following comments on 9/20/24

1. The dune system and ocean shoreline of Nags Head provide habitat opportunities to numerous state and federally recognized species including coastal waterbirds, sea turtles, and beach invertebrates. Federally protected species that utilize the area include piping plover (*Charadrius melodus melodus*), red knot (*Calidris canutus rufa*), roseate tern (*Sterna dougallii dougallii*) and Kemp's Ridley (*Lepidochelys kempi*), hawksbill (*Eretmochelys imbricata*), leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*), and green (*Chelonia mydas*) sea turtles. Impacts the project may have on these species and their habitats should be considered as several species nest within the dune and ocean shoreline habitats in Nags Head.

2. Installation of the engineered stormwater system will add hardened structures to the dune and ocean shoreline systems. Erosion and general sediment transport may cause the system to be frequently exposed. Information regarding maintenance and continued disturbance of the area to repair the system should be presented. The placement of the structure within the NCDCM setback escalates these concerns.

3. Stormwater collected for this proposal will be removed from lower elevation areas and pumped to the engineered system. This will not only collect rainwater but will also collect contaminants from highway runoff and potentially septic contaminated water during elevated water events. Statements should be made acknowledging potential contaminants and their impact to the dune and ocean shore environments.

4. The engineered stormwater system affects more than just the physical footprint of the system. The area of influence, or area outside the physical footprint of the system, should be delineated and considered as the impact area for the proposal.

5. The engineered stormwater system will introduce increased water to the dune system and ocean shoreline. The dunes and ocean shoreline of Nags Head provides nesting habitat for several sea turtle species. Sea turtle nests are influenced by temperature, water and gas exchanges from the adjacent sands to the nest cavities. The introduction of increased water volumes would influence temperature, inundation, gas exchange, and contaminants, affecting gender determination and overall nest success and viability. The area of influence and affect the discharge will have on habitats has not been provided. Suitable nesting habitat may be permanently affected.

6. Due to the engineered design of the system, including pumping of water from lower elevations, introduction of contaminants, water storage, and discharge pipes, the project may be considered a point discharge. Therefore,

the proposal should be reviewed and permitted accordingly by the appropriate state and federal agencies.

7. The NCWRC encourages the Town of Nags Head to investigate a multitude of management measures to help address stormwater. Such measures would include the reduction of impervious surfaces for new or redeveloped projects and implementation of engineered systems outside environmentally sensitive areas.

9) Based upon the above referenced findings, the Division has determined that the proposed project is inconsistent with the following Rules of the Coastal Resources Commission:

a) 15A NCAC 07H.0306(a)(3), which states, in part, "*With the exception of those types of development defined in 15A NCAC 07H .0309(a), no development, including any portion of a building or structure, shall extend oceanward of the ocean hazard setback.*"

b) 15A NCAC 07H .0306(a)(3)(I), which states, in part, "*Infrastructure that is linear in nature, such as roads, bridges, pedestrian access such as boardwalks and sidewalks, and utilities providing for the transmission of electricity, water, telephone, cable television, data, storm water, and sewer requires a minimum setback of 60 feet or 30 times the shoreline erosion rate, whichever is greater.*"

Given the preceding findings, it is necessary that your request for issuance of a CAMA Major Permit under the Coastal Area Management Act be denied. This denial is made pursuant to N.C.G.S. 113A-120(a)(8) which requires denial for projects inconsistent with the state guidelines for Areas of Environmental Concern or local land use plans.

If you wish to appeal this denial, you are entitled to a contested case hearing. The hearing will involve appearing before an Administrative Law Judge who listens to evidence and arguments of both parties before making a final decision on the appeal. Your request for a hearing must be in the form of a written petition, complying with the requirements of §150B of the General Statutes of North Carolina, and must be filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714, within twenty (20) days from the date of this denial letter. A copy of this petition should be filed with this office as well as with the Coastal Resources Commission's agent for service of process at the following address:

William F. Lane, General Counsel
Dept. of Environmental Quality
1601 Mail Service Center
Raleigh, NC 27699-1601

In the alternative, you may petition the N.C. Coastal Resources Commission for a variance to undertake development that is prohibited by the Commission's rules (Note- a Commission variance cannot be granted if your project was denied due to an inconsistency with a CAMA Land Use Plan or other statutory provisions of the CAMA or NC D&F Law). Applying for a variance requires that you first stipulate that the Division of Coastal Management applied the

Rules properly in issuing this denial. Applying for a variance means that you agree that the legal restrictions are valid but request an exception to the restrictions because of hardships resulting from unusual conditions of the property. In seeking a variance, you are requesting that the Commission vary the rules at issue, and you must state how you believe your request meets the four criteria found at N.C.G.S. § 113A-120.1. To apply for a variance, you must file a petition for a variance with the Director of the Division of Coastal Management and the State Attorney General's Office on a standard form, which must be accompanied by additional information on the nature of the project and the reasons for requesting a variance. The variance request may be filed at any time but must be filed a minimum of six weeks before a scheduled Commission meeting to be eligible to be heard at that meeting.

You may either appeal the permit decision or seek a variance. These are two separate paths and cannot be pursued simultaneously. If the appeal of the permit decision is denied, you may still seek a variance. However, you may not first seek a variance and if that is denied attempt to challenge the decision to deny the permit. Information about both a permit appeal in the Office of Administrative Hearings and the Variance process may be obtained at https://deq.nc.gov/about/divisions/coastal-management/coastal-management-permits/variances-appeals.

Members of my staff are available should you desire assistance in the future. If you have any questions concerning this matter, please contact Mr. Wayne Hall at (252) 515-5423 or Wayne.Hall@deq.nc.gov.

Sincerely,

Tancred Miller
Director, NC Division of Coastal Management

cc: Josh Pelletier, Project Manager, U.S. Army Corps of Engineers, Wilmington, NC
Richard Rogers, Director, NC Division of Water Resources, Raleigh, NC
Stephanie Goss, 401 & Buffer Permitting Branch Supervisor, NC Division of Water Resources, Raleigh, NC
Glenn Stewart, Environmental Specialist, NC Division of Water Resources, NC
Robert Tankard, Assistant Regional Supervisor, NC Division of Water Resources, NC

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Certified Mail Fee	$4.85
Extra Services & Fees (check box, add fee as appropriate)	$4.10
☐ Return Receipt (hardcopy)	$0.00
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☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$0.00
Postage	$1.50
Total Postage and Fees	$10.45

0557
09

Postmark Here

10/02/2024

Sent To: Boat Rides001 LLC
Street and Apt. No., or PO Box No.: 3225 McLeod Dr. Suite 777
City, State, ZIP+4®: Las Vegas, NV 89121

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

7022 0410 0001 1248 1029

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
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For delivery information, visit our website at www.usps.com®.

Rehoboth Beach, DE 19971

OFFICIAL USE

Certified Mail Fee	$4.85
Extra Services & Fees (check box, add fee as appropriate)	$4.10
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery	$0.00
Postage	$1.50
Total Postage and Fees	$10.45

0557
09

Postmark Here

10/02/2024

Sent To: Bluffs of South Nags Head
Street and Apt. No., or PO Box No.: 11 Venetian Dr.
City, State, ZIP+4®: Rehoboth Beach, DE 19971

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

moffatt & nichol

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

October 1, 2024

Boat Rides 001 LLC TTEE
3225 McLeod Dr. - STE 777
Las Vegas, NV 89121

Dear Sirs,

You had previously been notified that the Town of Nags Head was applying for a Coastal Area Management Act (CAMA) permit for the development of a dune infiltration system located at the Juncos Street Beach Access facility adjacent to your property. The N.C. Division of Coastal Management (NCDCM) correctly denied the permit application request due to inconsistencies with appropriate oceanfront setback requirements. Subsequently, the Town is in the process of petitioning the North Carolina Coastal Resources Commission (NCCRC)for a variance which would allow the proposed project to move forward.

The NCCRC's variance process requires that you be provided notice of the permit application. Should you wish to comment on the permit application, you may comment to NCDCM at the address below:

The North Carolina Division of Coastal Management
c/o Tancred Miller – Director
400 Commerce Avenue
Morehead City, NC 28557

Should you have any questions about this issue, please feel free to contact me at dhuggett@moffattnichol.com.

Sincerely,

Doug Huggett

Doug Huggett

moffatt & nichol

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

October 1, 2024

Bluffs Of South Nags Head
11 Venetian Dr.
Rehoboth Beach, DE 19971

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400 Commerce Avenue
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Should you have any questions about this issue, please feel free to contact me at dhuggett@moffattnichol.com.

Sincerely,

Doug Huggett

Doug Huggett

Division of Coastal Management

NC COASTAL RESOURCES COMMISSION MEETING

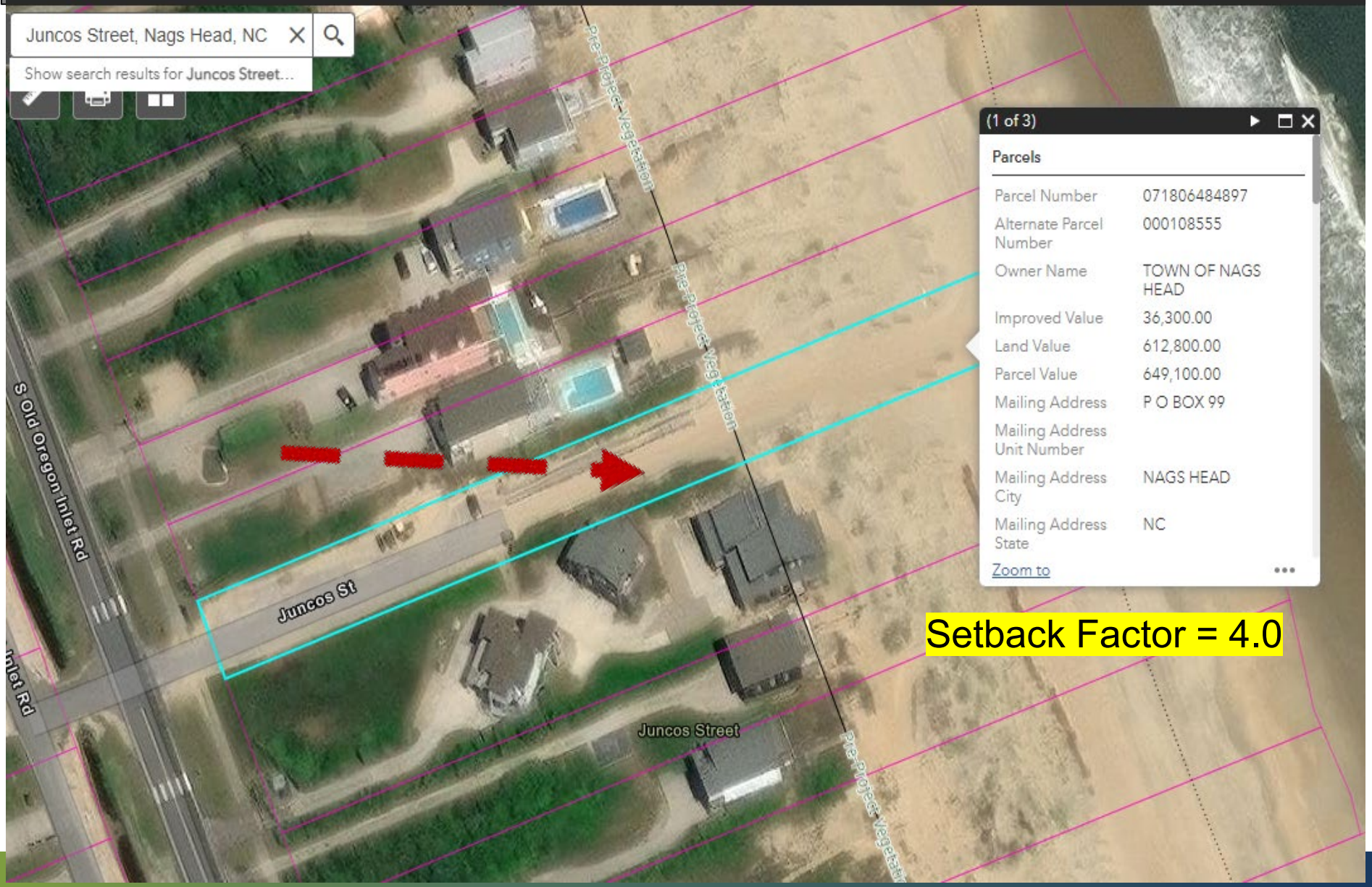
11/14/24

TOWN OF NAGS HEAD, DARE COUNTY
VARIANCE CRC-VR-24-12
OCEANFRONT SETBACK

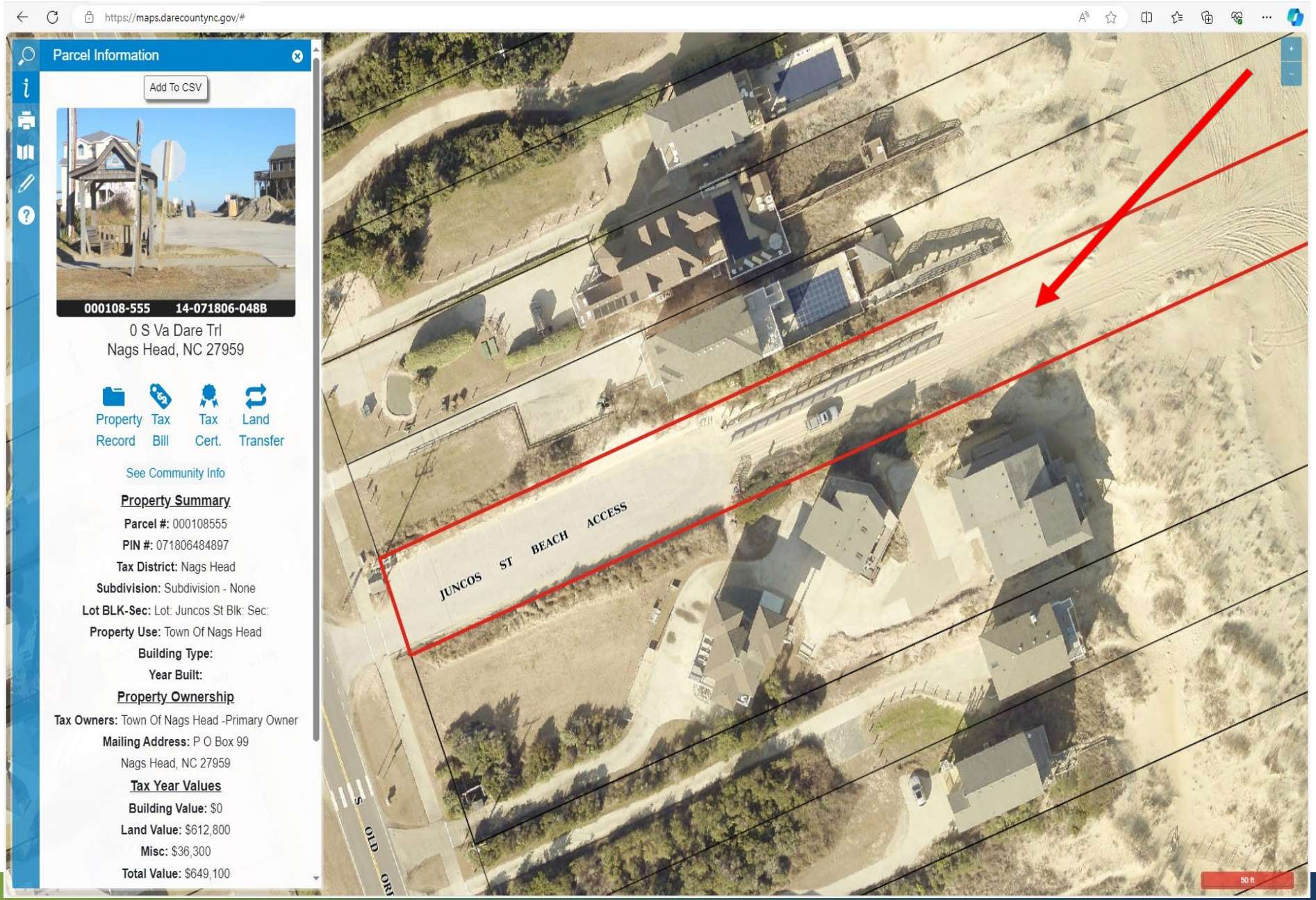
Ron Renaldi, District Manager
Yvonne Carver, Field Representative
Northeastern District Office
Elizabeth City, NC

Department of Environmental Quality

LOCATION MAP – DCM INTERACTIVE SITE; 11/07/2010 PRE-PROJECT VEGETATION LINE



DARE COUNTY GIS 2022 IMAGERY

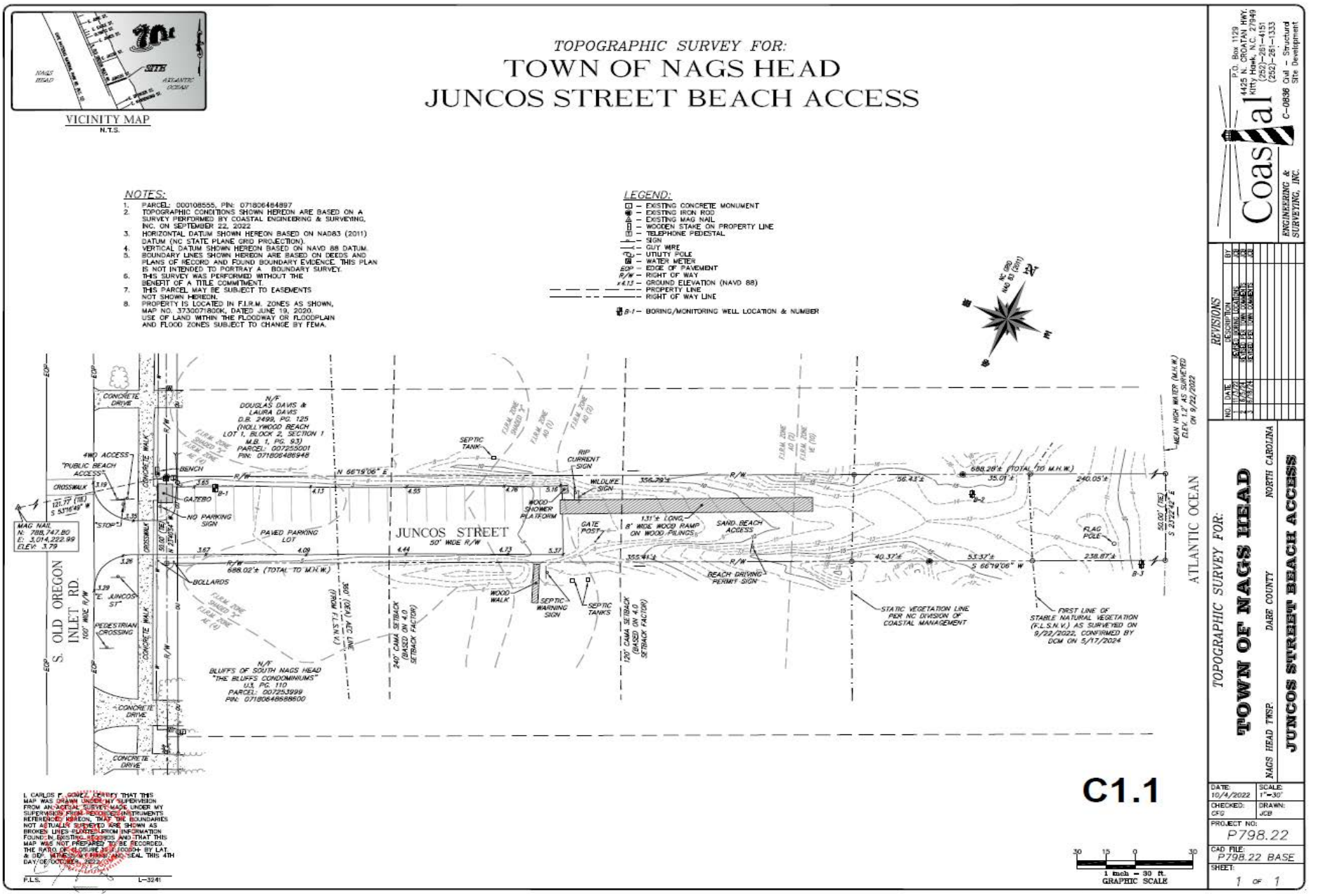


PHOTOS TAKEN BY YVONNE CARVER, FIELD REPRESENTATIVE, 10/04/24

LOOKING EAST

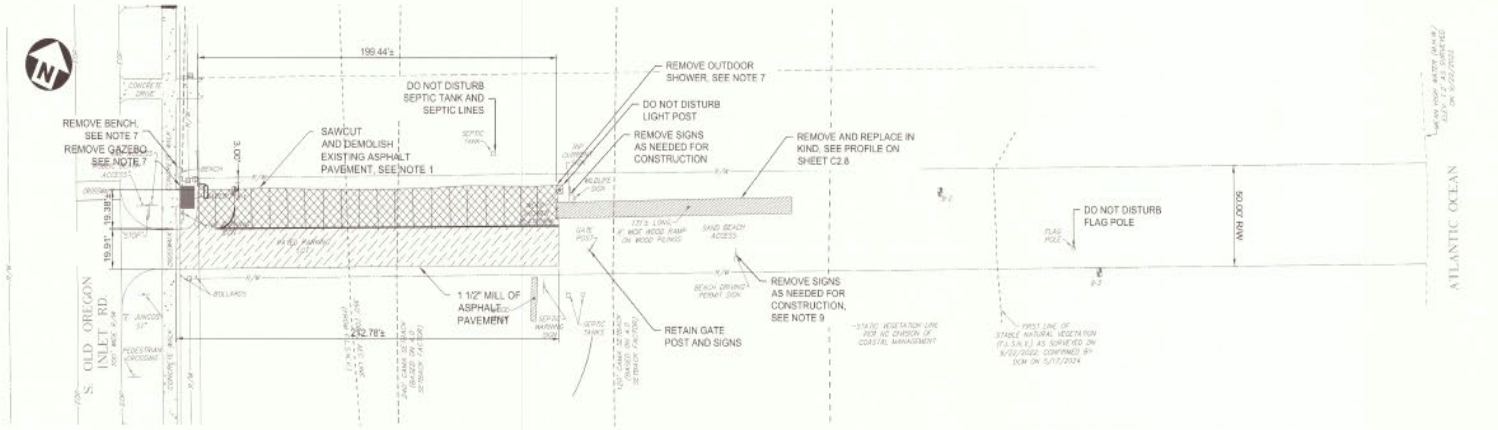
PHOTOS TAKEN BY YVONNE CARVER, FIELD REPRESENTATIVE
10/04/24 & 05/17/24

SURVEY OF EXISTING CONDITIONS, JUNCOS ST BEACH ACCESS

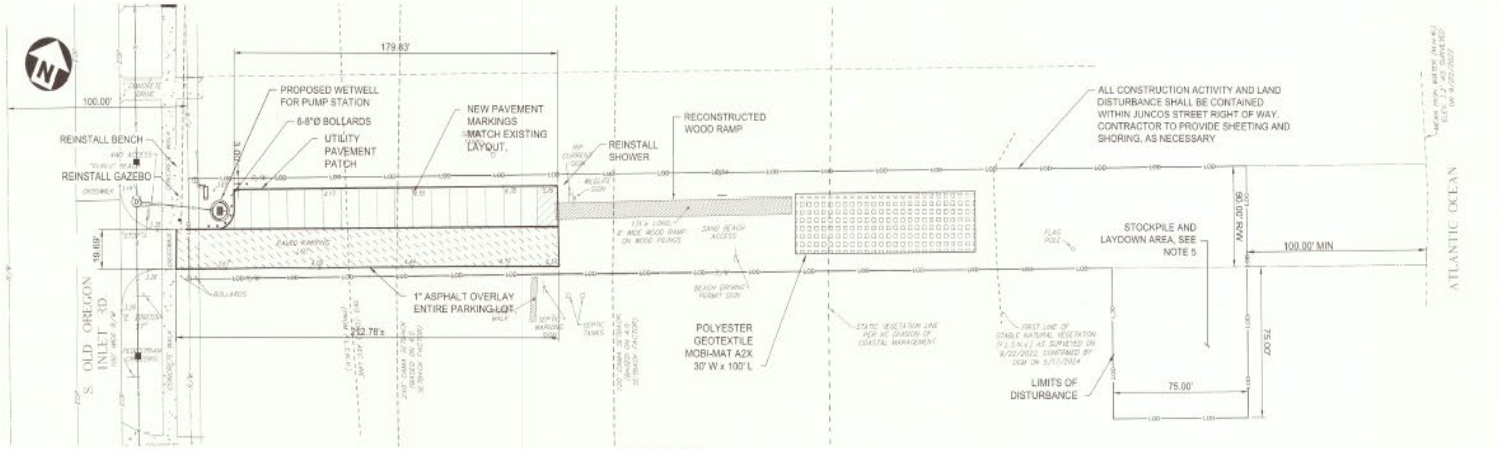


EX. CONDITIONS/DEMOLITION PLAN, PROPOSED SITE PLAN

moffatt & nichol
4700 FALLS OF NEUSE RD. SUITE 300
RALEIGH, NC 27609
919.781.4626
N.C. FIRM NO. P-0158



EXISTING CONDITIONS / DEMOLITION PLAN



SITE PLAN

NOTES:

1. CONTRACTOR SHALL VERIFY PAVEMENT THICKNESS DURING REMOVAL AND REPLACE PAVEMENT IN KIND AFTER INSTALLATION OF WET WELL AND FORCE MAIN. FINAL GRADE OF ASPHALT REPLACEMENT AND OVERLAY SHALL MATCH EXISTING GRADES.
2. OVERALL ADS STORM TECH STRUCTURE AREA IS 2,150 SF UNDER MOBI-MAT.
3. MOBI-MAT POLYETHYLENE GEOTEXTILE OVERALL AREA 3,000 SF
4. STORM DRAIN IMPROVEMENTS UP TO WETWELL PROVIDED BY MCADAMS.
5. STOCKPILING AND LAYDOWN WITHIN PAVED PARKING AREA ALONG JUNCOS STREET AND WITHIN BEACH AREA SETBACK SHALL BE 100 FT FROM MEAN HIGH WATER AND CONFORM WITH SCHEDULE AND ACCESSIBILITY REQUIREMENTS DESCRIBED ON SHEET C0.1.
6. MEAN HIGH WATER AND LOW WATER ELEVATIONS BASED UPON NOAA STATION 8651370, DUCK, NC.
7. GAZEBO, BENCH AND OUTDOOR SHOWER SHALL BE RE-INSTALLED IN THEIR ORIGINAL LOCATION ONCE CONSTRUCTION OF DRAINAGE SYSTEM AND WETWELL IS COMPLETED.
8. DO NOT DISTURB EXISTING SIGNS AT THE INTERSECTION OF S. OREGON INLET ROAD AND JUNCOS STREET.
9. ALL SIGNS REMOVED DURING CONSTRUCTION SHALL BE STORED APPROPRIATELY AND REPLACED IN KIND ONCE CONSTRUCTION ACTIVITY IS COMPLETED.

SCALE: 1"=30'

FINAL DRAWING FOR REVIEW PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION

MCADAMS
The John R. McAdams Company, Inc.
621 Hillsborough Street
Suite 500
Raleigh, NC 27603
phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187
www.mcadamsco.com

CLIENT
TOWN OF NAGS HEAD
POST OFFICE BOX 99
NAGS HEAD, NC 27959
PHONE: 252.441.5580

NAGS HEAD

SOOIR STORMWATER INFRASTRUCTURE IMPROVEMENTS
CONSTRUCTION DRAWINGS
PROJECT AREA 12
NAGS HEAD, NC, 27959

FINAL DRAWING FOR REVIEW PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION

NORTH CAROLINA PROFESSIONAL ENGINEER

REVISIONS

NO.	DATE

PLAN INFORMATION

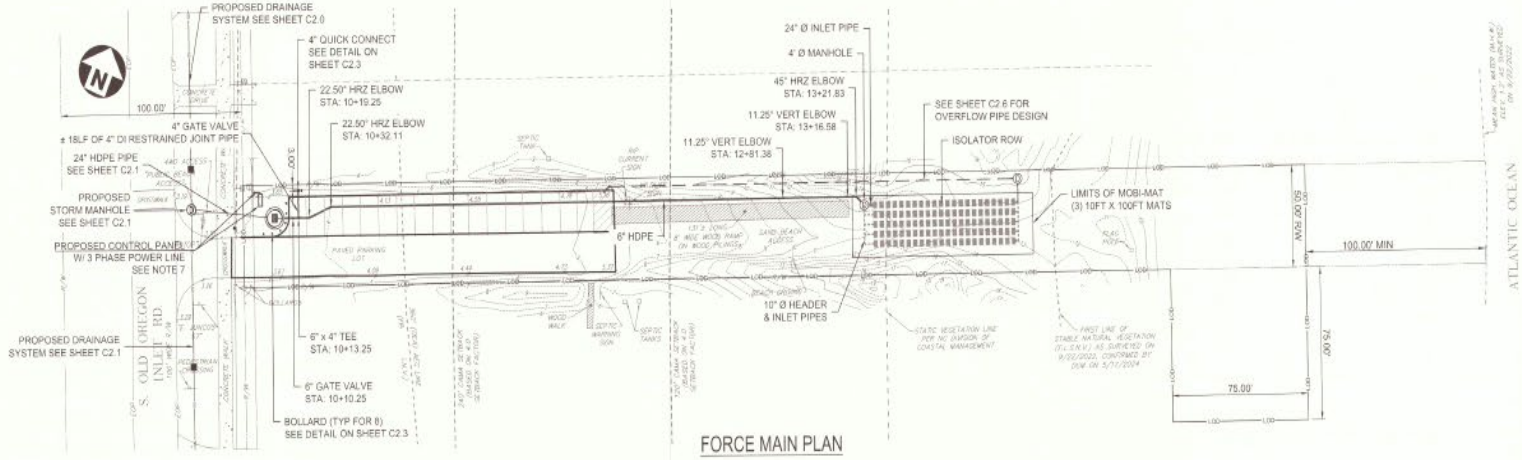
PROJECT NO.	220494-03
FILENAME	
CHECKED BY	KCZ
DRAWN BY	YES
SCALE	AS NOTED
DATE	06/26/2024

SHEET
DUNE INFILTRATION UTILITY PLAN & PROFILE (1 OF 3)

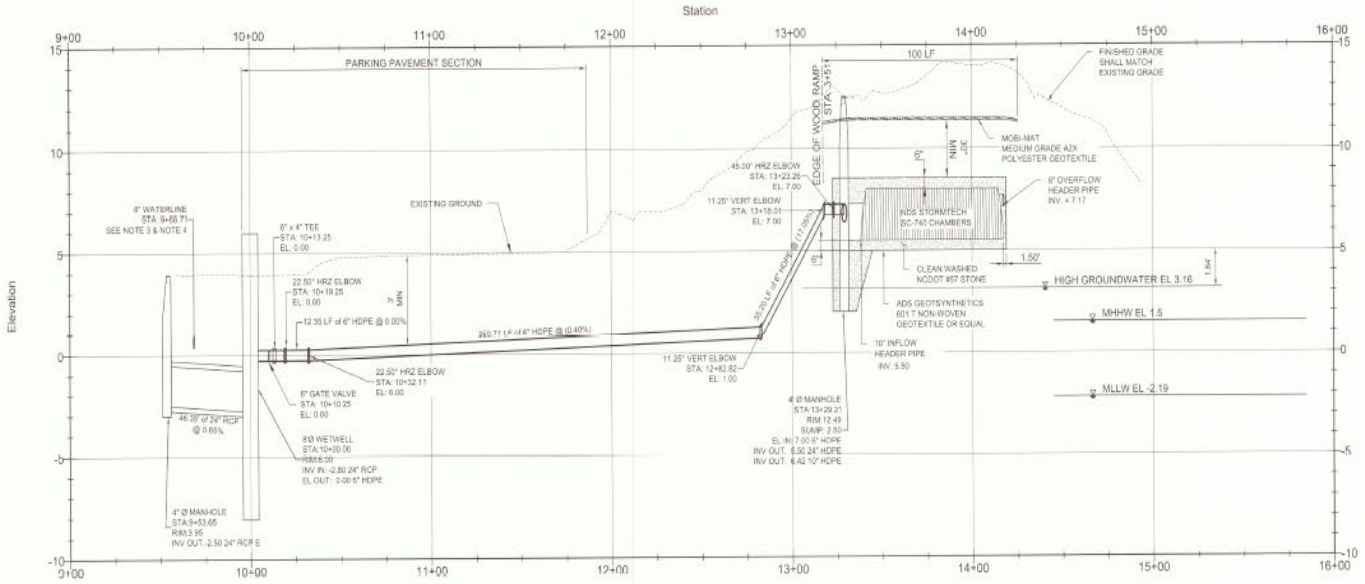
C2.4

FORCE MAIN PLAN & PROFILE VIEW

moffatt & nichol
4700 FALLS OF NEUSE RD., SUITE 300
RALEIGH, NC 27609
919-781-4626
N.C. FIRM NO. P-0105



FORCE MAIN PLAN



FORCE MAIN PROFILE VIEW

NOTES:

1. CONTRACTOR SHALL NOT DISTURB EXISTING OUTDOOR SHOWER OR EXISTING LIGHT POLE.
2. ELEVATION (EL) OF FORCE MAIN IS NOTED AT CENTER OF LINE OF PIPE, UNLESS NOTE AS AN INVERT (INV).
3. EXISTING WATERLINE ASSUMED TO HAVE 3 FT OF COVER. CONTRACTOR SHALL VERIFY LOCATION OF EXISTING WATERLINE BEFORE STARTING WORK.
4. CURRENT STORMWATER DESIGN BY MCADAMS ASSUMES THAT THE EXISTING WATERLINE IS IN CONFLICT WITH PROPOSED 24" HDPE PIPE AND REQUIRES RELOCATION.
5. MOBI-MAT SHALL HAVE A MINIMUM OF 12" OF SAND OVER THE TOP OF THE MAT.
6. MOBI-MAT SHALL COVER THE EXTENTS OF THE GRAVEL AREA OF THE INFILTRATION SYSTEM.
7. CONTRACTOR SHALL COORDINATE WITH POWER COMPANY TO PROVIDE POWER SERVICE TO PROPOSED LOCATION OF CONTROL PANEL.
8. PIPING FROM THE WETWELL TO THE 6 x 4 TEE SHALL BE DUCTILE IRON.
9. PIPING FROM THE 6 x 4 TEE TO THE MANHOLE SHALL BE HDPE SDR-9 WITH BUTT FUSION JOINTS. ALL 6" BEND FITTINGS SHALL BE HDPE AND OF SAME MANUFACTURER AS THE PIPE.
10. 6 x 4 TEE SHALL BE MJ FITTING.
11. HDPE PIPE SHALL HAVE AN MJ ADAPTER FUSED ON THE END THAT CONNECTS TO THE 6 x 4 TEE.
12. JOINTS ON THE 6 x 4 TEE SHALL BE RESTRAINED USING MEGALUGS, OR APPROVED EQUAL.

VERT: 0' 3' 7' 6'
SCALE: 1"=3'

HORZ: 30' 0' 30' 60'
SCALE: 1"=30'

FINAL DRAWING FOR REVIEW PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION

McADAMS
The John R. McAdams Company, Inc.
621 Hillsborough Street
Suite 500
Raleigh, NC 27603
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NAGS HEAD

SOOIR STORMWATER INFRASTRUCTURE IMPROVEMENTS
CONSTRUCTION DRAWINGS
PROJECT AREA 12
NAGS HEAD, NC, 27959

FINAL DRAWING FOR REVIEW PURPOSES ONLY NOT RELEASED FOR CONSTRUCTION

NORTH CAROLINA PROFESSIONAL SEAL 027681 ENGINEER K. V. I. N. C. ZOLP

REVISIONS
No. DATE

PLAN INFORMATION

PROJECT NO.	220494-03
FILENAME	
CHECKED BY	KCZ
DRAWN BY	YLS
SCALE	AS NOTED
DATE	06/26/2024

SHEET
DUNE INFILTRATION UTILITY PLAN & PROFILE (2 OF 3)

C2.5

§ 113A-120.1. Variances.

(a) Any person may petition the Commission for a variance granting permission to use the person's land in a manner otherwise prohibited by rules or standards prescribed by the Commission, or orders issued by the Commission, pursuant to this Article. To qualify for a variance, the petitioner must show all of the following:

(1) Unnecessary hardships would result from strict application of the rules, standards, or orders.
(2) The hardships result from conditions that are peculiar to the property, such as the location, size, or topography of the property.
(3) The hardships did not result from actions taken by the petitioner.
(4) The requested variance is consistent with the spirit, purpose, and intent of the rules, standards, or orders; will secure public safety and welfare; and will preserve substantial justice.

(b) The Commission may impose reasonable and appropriate conditions and safeguards upon any variance it grants.