STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL (DNREC)
DIVISION OF WATERSHED STE WARDSHIP

CONTRACT #NAT201910/MASSEYS

SPECIFICATIONS
FOR

MASSEY'S DITCH
CHANNEL MAINTENANCE DREDGING PROJECT

IN

SUSSEX COUNTY, DE

PREPARED
BY

MOFFATT & NICHOL

ISSUED FOR BID
MAY 1, 2019

BIDS WILL BE RECEIVED AT THE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL **UNTIL 2:00 P.M. MAY 31, 2019** AND WILL BE PUBLICLY OPENED AND READ ALOUD AT THAT TIME. PROPOSALS RECEIVED AFTER THAT DATE AND TIME SET FOR THE OPENING WILL BE RETURNED UNOPENED.

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INVITATION TO BID

Sealed bids for Contract No. NAT201910/MASSEYS, will be received by the State of Delaware, Department of Natural Resources and Environmental Control, Division of Watershed Stewardship, Richardson & Robbins Building, 89 Kings Highway, Dover, Delaware 19901, until 2:00 p.m. local time on May 31, 2019, at which time they will be publicly opened and read aloud in the DNREC Auditorium. Bidder bears the risk of late delivery. Any bids received after the stated time will be returned unopened.

Project involves maintenance dredging of Massey's Ditch federal navigation channel by hydraulic dredge method and placement of the sand material into the surf zone along the Atlantic Ocean beach north of Indian River Inlet for beach nourishment.

A **MANDATORY** Pre-Bid Meeting will be held on May 8, 2019, at 1:00 pm in the conference room of the Indian River Marina at Delaware Seashore State Park, 39415 Inlet Road, Rehoboth Beach, Delaware 19971 followed by a visit to the project site(s) for the purpose of establishing the listing of subcontractors and to answer questions. Representatives of each party to any Joint Venture must attend this meeting. **ATTENDANCE OF THIS MEETING IS A PREREQUISITE FOR BIDDING ON THIS CONTRACT.**

Sealed bids shall be addressed to the Department of Natural Resources and Environmental Control, Division of Watershed Stewardship, 89 Kings Highway, Dover, DE 19901, attn.: Mr. Charles Williams. The outer envelope should clearly indicate: **"CONTRACT NO. NAT201910/MASSEYS** - **SEALED BID - DO NOT OPEN."**

Contract documents may be obtained at the office of the Department of Natural Resources and Environmental Control, Division of Watershed Stewardship, 89 Kings Highway, Dover, DE 19901.

Construction documents will be available for review at the following locations: Delaware Contractors Association; Associated Builders and Contractors.

Bidders will not be subject to discrimination on the basis of race, creed, color, sex, sexual orientation, gender identity or national origin in consideration of this award, and Minority Business Enterprises, Disadvantaged Business Enterprises, Women-Owned Business Enterprises and Veteran-Owned Business Enterprises will be afforded full opportunity to submit bids on this contract. Each bid must be accompanied by a bid security equivalent to ten percent of the bid amount and all additive alternates. The successful bidder must post a performance bond and payment bond in a sum equal to 100 percent of the contract price upon execution of the contract. The Owner reserves the right to reject any or all bids and to waive any informalities therein. The Owner may extend the time and place for the opening of the bids from that described in the advertisement, with not less than two calendar days notice by certified delivery, facsimile machine or other electronic means to those bidders receiving plans.

END OF ADVERTISEMENT FOR BIDS

INSTRUCTIONS TO BIDDERS

TABLE OF ARTICLES

ARTICLE 1: GENERAL

1.1 DEFINITIONS

1.1.1 Whenever the following terms are used, their intent and meaning shall be interpreted as follows:

1.2 STATE: The State of Delaware.

1.3 AGENCY: Contracting State Agency as noted on cover sheet.

1.4 DESIGNATED OFFICIAL: The agent authorized to act for the Agency.

1.5 BIDDING DOCUMENTS: Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement for Bid, Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders (if any), General Conditions, Supplementary General Conditions, General Requirements, Special Provisions (if any), the Bid Form (including the Non-collusion Statement), and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, as well as the Drawings, Specifications (Project Manual) and all Addenda issued prior to execution of the Contract.

1.6 CONTRACT DOCUMENTS: The Contract Documents consist of the, Instructions to Bidders, Supplementary Instructions to Bidders (if any), General Conditions, Supplementary General Conditions, General Requirements, Special Provisions (if any), the form of agreement between the Owner and the Contractor, Drawings (if any), Specifications (Project Manual), and all addenda.

1.7 AGREEMENT: The Agreement shall be the DNREC Contract Document contained in these specifications.

1.8 GENERAL REQUIREMENTS (or CONDITIONS): General Requirements (or conditions) are instructions pertaining to the Bidding Documents and to contracts in general. They contain, in summary, requirements of laws of the State; policies of the Agency and instructions to bidders.

1.9 SPECIAL PROVISIONS: Special Provisions are specific conditions or requirements peculiar to the bidding documents and to the contract under consideration and are supplemental to the General Requirements. Should the Special Provisions conflict with the General Requirements, the Special Provisions shall prevail.

1.10 ADDENDA: Written or graphic instruments issued by the Owner/Architect prior to the execution of the contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

1.11 BIDDER OR VENDOR: A person or entity who formally submits a Bid for the material or Work contemplated, acting directly or through a duly authorized representative who meets the requirements set forth in the Bidding Documents.

1.12 SUB-BIDDER: A person or entity who submits a Bid to a Bidder for materials or labor, or both for a portion of the Work.

1.13 BID: A complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

1.14 BASE BID: The sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids (if any are required to be stated in the bid).

1.15 ALTERNATE BID (or ALTERNATE): An amount stated in the Bid, where applicable, to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents is accepted.

1.16 UNIT PRICE: An amount stated in the Bid, where applicable, as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

1.17 SURETY: The corporate body which is bound with and for the Contract, or which is liable, and which engages to be responsible for the Contractor's payments of all debts pertaining to and for his acceptable performance of the Work for which he has contracted.

1.18 BIDDER'S DEPOSIT: The security designated in the Bid to be furnished by the Bidder as a guaranty of good faith to enter into a contract with the Agency if the Work to be performed or the material or equipment to be furnished is awarded to him.

1.19 CONTRACT: The written agreement covering the furnishing and delivery of material or work to be performed.

1.20 CONTRACTOR: Any individual, firm, or corporation with whom a contract is made by the Agency.

1.21 SUBCONTRACTOR: An individual, partnership, or corporation which has a direct contract with a contractor to furnish labor and materials at the job site, or to perform construction labor and furnish material in connection with such labor at the job site.

1.22 CONTRACT BOND: The approved form of security furnished by the contractor and his surety as a guaranty of good faith on the part of the contractor to execute the work in accordance with the terms of the contract.

ARTICLE 2: BIDDER'S REPRESENTATIONS

2.1 PRE-BID MEETING

2.1.1 A pre-bid meeting for this project will be held at the time and place designated. Attendance at this meeting is a pre-requisite for submitting a Bid, unless this requirement is specifically waived elsewhere in the Bid Documents.

2.2 By submitting a Bid, the Bidder represents that:

2.2.1 The Bidder has read and understands the Bidding Documents and that the Bid is made in accordance therewith.

2.2.2 The Bidder has visited the site, become familiar with existing conditions under which the Work is to be performed, and has correlated the Bidder’s his personal observations with the requirements of the proposed Contract Documents.

2.2.3 The Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception.

2.3 JOINT VENTURE REQUIREMENTS

2.3.1 For Public Works Contracts, each Joint Venturer shall be qualified and capable to complete the Work with their own forces.

2.3.2 Included with the Bid submission, and as a requirement to bid, a copy of the executed Joint Venture Agreement shall be submitted and signed by all Joint Venturers involved.

2.3.3 All required Bid Bonds, Performance Bonds, Material and Labor Payment Bonds must be executed by both Joint Venturers and be placed in both of their names.

2.3.4 All required insurance certificates shall name both Joint Venturers.

2.3.5 Both Joint Venturers shall sign the Bid Form and shall submit a copy of a valid Delaware Business License with their Bid.

2.3.6 Both Joint Venturers shall include their Federal E.I. Number with the Bid.

2.3.7 In the event of a mandatory Pre-bid Meeting, each Joint Venturer shall have a representative in attendance.

2.3.8 Due to exceptional circumstances and for good cause shown, one or more of these provisions may be waived at the discretion of the State.

2.4 ASSIGNMENT OF ANTITRUST CLAIMS

2.4.1 As consideration for the award and execution by the Owner of this contract, the Contractor hereby grants, conveys, sells, assigns and transfers to the State of Delaware all of its right, title and interests in and to all known or unknown causes of action it presently has or may now or hereafter acquire under the antitrust laws of the United States and the State of Delaware, relating to the particular goods or services purchased or acquired by the Owner pursuant to this contract.

ARTICLE 3: BIDDING DOCUMENTS

3.1 COPIES OF BID DOCUMENTS

3.1.1 Bidders may obtain complete sets of the Bidding Documents from the Architectural/Engineering firm designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein.

3.1.2 Bidders shall use complete sets of Bidding Documents for preparation of Bids. The issuing Agency nor the Architect assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

3.1.3 Any errors, inconsistencies or omissions discovered shall be reported to the Architect immediately.

3.1.4 The Agency and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it

relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall report any errors, inconsistencies, or ambiguities discovered to the Architect.

3.2.2 Bidders or Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request to the Architect at least seven days prior to the date for receipt of Bids. Interpretations, corrections, and changes to the Bidding Documents will be made by written Addendum. Interpretations, corrections, or changes to the Bidding Documents made in any other manner shall not be binding.

3.2.3 The apparent silence of the specifications as to any detail, or the apparent omission from it of detailed description concerning any point, shall be regarded as meaning that only the best commercial practice is to prevail and only material and workmanship of the first quality are to be used. Proof of specification compliance will be the responsibility of the Bidder.

3.2.4 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all permits, labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work.

3.2.5 The Owner will bear the costs for all impact and user fees associated with the project.

3.3 SUBSTITUTIONS

3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of quality, required function, dimension, and appearance to be met by any proposed substitution. The specification of a particular manufacturer or model number is not intended to be proprietary in any way. Substitutions of products for those named will be considered, providing that the Vendor certifies that the function, quality, and performance characteristics of the material offered is equal or superior to that specified. It shall be the Bidder's responsibility to assure that the proposed substitution will not affect the intent of the design, and to make any installation modifications required to accommodate the substitution.

3.3.2 Requests for substitutions shall be made in writing to the Architect at least ten days prior to the date of the Bid Opening. Such requests shall include a complete description of the proposed substitution, drawings, performance and test data, explanation of required installation modifications due the substitution, and any other information necessary for an evaluation. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect’s decision of approval or disapproval shall be final. The Architect is to notify Owner prior to any approvals.

3.3.3 If the Architect approves a substitution prior to the receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding.

3.3.4 The Architect shall have no obligation to consider any substitutions after the Contract award.

3.4 ADDENDA

3.4.1 Addenda will be mailed or delivered to all who are known by the Architect to have received a complete set of the Bidding Documents.

3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

3.4.3 No Addenda will be issued later than 4 days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which extends the time or changes the location for the opening of bids.

3.4.4 Each bidder shall ascertain prior to submitting his Bid that they have received all Addenda issued, and shall acknowledge their receipt in their Bid in the appropriate space. Not acknowledging an issued Addenda could be grounds for determining a bid to be non-responsive.

ARTICLE 4: BIDDING PROCEDURES

4.1 PREPARATION OF BIDS

4.1.1 Submit the bids on the Bid Forms included with the Bidding Documents.

4.1.2 Submit the original Bid Form for each bid. Bid Forms may be removed from the project manual for this purpose.

4.1.3 Execute all blanks on the Bid Form in a non-erasable medium (typewriter or manually in ink).

4.1.4 Where so indicated by the makeup on the Bid Form, express sums in both words and figures, in case of discrepancy between the two, the written amount shall govern.

4.1.5 Interlineations, alterations or erasures must be initialed by the signer of the Bid.

4.1.6 BID ALL REQUESTED ALTERNATES AND UNIT PRICES, IF ANY. If there is no change in the Base Bid for an Alternate, enter “No Change”. The Contractor is responsible for verifying that they have received all addenda issued during the bidding period. Work required by Addenda shall automatically become part of the Contract.

4.1.7 Make no additional stipulations on the Bid Form and do not qualify the Bid in any other manner.

4.1.8 Each copy of the Bid shall include the legal name of the Bidder and a statement whether the Bidder is a sole proprietor, a partnership, a corporation, or any legal entity, and each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current Power of Attorney attached, certifying agent's authority to bind the Bidder.

4.1.9 Bidder shall complete the Non-Collusion Statement form included with the Bid Forms and include it with their Bid.

4.1.10 In the construction of all Public Works projects for the State of Delaware or any agency thereof, preference in employment of laborers, workers or mechanics shall be given to bona fide legal citizens of the State who have established citizenship by residence of at least 90 days in the State.

4.1.11 Each bidder shall include in their bid a copy of a valid Delaware Business License.’

4.1.12 Each bidder shall include signed Affidavit(s) for the Bidder and each listed Subcontractor certifying compliance with OMB Regulation 4104- “Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on “Large Public Works Projects.” “Large Public Works” is based upon the current threshold required for bidding Public Works as set by the Purchasing and Contracting Advisory Council.

4.2 BID SECURITY

4.2.1 All bids shall be accompanied by a deposit of either a good and sufficient bond to the agency for the benefit of the agency, with corporate surety authorized to do business in this State, the form of the bond and the surety to be approved by the agency, or a security of the bidder assigned to the agency, for a sum equal to at least 10% of the bid plus all add alternates, or

in lieu of the bid bond a security deposit in the form of a certified check, bank treasurer's check, cashier's check, money order, or other prior approved secured deposit assigned to the State. The bid bond need not be for a specific sum, but may be stated to be for a sum equal to 10% of the bid plus all add alternates to which it relates and not to exceed a certain stated sum, if said sum is equal to at least 10% of the bid. The Bid Bond form used shall be the standard OMB form (attached).

4.2.2 The Agency has the right to retain the bid security of Bidders to whom an award is being considered until either a formal contract has been executed and bonds have been furnished or the specified time has elapsed so the Bids may be withdrawn or all Bids have been rejected.

4.2.3 In the event of any successful Bidder refusing or neglecting to execute a formal contract and bond within 20 days of the awarding of the contract, the bid bond or security deposited by the successful bidder shall be forfeited.

4.3 SUBCONTRACTOR LIST

4.3.1 As required by Delaware Code, Title 29, section 6962(d)(10)b, each Bidder shall submit with their Bid a completed List of Sub-Contractors included with the Bid Form. NAME ONLY ONE SUBCONTRACTOR FOR EACH TRADE. A Bid will be considered non-responsive unless the completed list is included.

4.3.2 Provide the Name and Address for each listed subcontractor. Addresses by City, Town or Locality, plus State, will be acceptable.

4.3.3 It is the responsibility of the Contractor to ensure that their Subcontractors are in compliance with the provisions of this law. Also, if a Contractor elects to list themselves as a Subcontractor for any category, they must specifically name themselves on the Bid Form and be able to document their capability to act as Subcontractor in that category in accordance with this law.

4.4 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

4.4.1 During the performance of this contract, the contractor agrees as follows:

A. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, sex, color, sexual orientation, gender identity or national origin. The Contractor will take affirmative action to ensure the applicants are employed, and that employees are treated during employment, without regard to their race, creed, sex, color, sexual orientation, gender identity or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.

B. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, sex, color, sexual orientation, gender identity or national origin."

4.5 PREVAILING WAGE REQUIREMENT

4.5.1 Wage Provisions: For renovation and new construction projects whose costs exceed the thresholds contained in Delaware Code, Title 29, Section 6960, the minimum wage rates for various classes of laborers and mechanics shall be as determined by the Department of Labor, Division of Industrial Affairs of the State of Delaware.

4.5.2 The employer shall pay all mechanics and labors employed directly upon the site of work, unconditionally and not less often than once a week and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the specifications, regardless of any contractual relationship which may be alleged to exist between the employer and such laborers and mechanics.

4.5.3 The scale of the wages to be paid shall be posted by the employer in a prominent and easily accessible place at the site of the work.

4.5.4 Every contract based upon these specifications shall contain a stipulation that sworn payroll information, as required by the Department of Labor, be furnished weekly. The Department of Labor shall keep and maintain the sworn payroll information for a period of 6 months from the last day of the work week covered by the payroll.

4.6 SUBMISSION OF BIDS

4.6.1 Enclose the Bid, the Bid Security, and any other documents required to be submitted with the Bid in a sealed opaque envelope. Address the envelope to the party receiving the Bids. Identify with the project name, project number, and the Bidder's name and address. If the Bid is sent by mail, enclose the sealed envelope in a separate mailing envelope with the notation "BID ENCLOSED" on the face thereof. The State is not responsible for the opening of bids prior to bid opening date and time that are not properly marked.

4.6.2 Deposit Bids at the designated location prior to the time and date for receipt of bids indicated in the Advertisement for Bids. Bids received after the time and date for receipt of bids will be marked “LATE BID” and returned.

4.6.3 Bidder assumes full responsibility for timely delivery at location designated for receipt of bids.

4.6.4 Oral, telephonic or telegraphic bids are invalid and will not receive consideration.

4.6.5 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids, provided that they are then fully in compliance with these Instructions to Bidders.

4.7 MODIFICATION OR WITHDRAW OF BIDS

4.7.1 Prior to the closing date for receipt of Bids, a Bidder may withdraw a Bid by personal request and by showing proper identification to the Architect. A request for withdraw by letter or fax, if the Architect is notified in writing prior to receipt of fax, is acceptable. A fax directing a modification in the bid price will render the Bid informal, causing it to be ineligible for consideration of award. Telephone directives for modification of the bid price shall not be permitted and will have no bearing on the submitted proposal in any manner.

4.7.2 Bidders submitting Bids that are late shall be notified as soon as practicable and the bid shall be returned.

4.7.3 A Bid may not be modified, withdrawn or canceled by the Bidder during a thirty (30) day period following the time and date designated for the receipt and opening of Bids, and Bidder so agrees in submitting their Bid. Bids shall be binding for 30 days after the date of the Bid opening.

ARTICLE 5: CONSIDERATION OF BIDS

5.1 OPENING/REJECTION OF BIDS

5.1.1 Unless otherwise stated, Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids will be made available to Bidders.

5.1.2 The Agency shall have the right to reject any and all Bids. A Bid not accompanied by a required Bid Security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

5.1.3 If the Bids are rejected, it will be done within thirty (30) calendar day of the Bid opening.

5.2 COMPARISON OF BIDS

5.2.1 After the Bids have been opened and read, the bid prices will be compared and the result of such comparisons will be made available to the public. Comparisons of the Bids may be based on the Base Bid plus desired Alternates. The Agency shall have the right to accept Alternates in any order or combination.

5.2.2 The Agency reserves the right to waive technicalities, to reject any or all Bids, or any portion thereof, to advertise for new Bids, to proceed to do the Work otherwise, or to abandon the Work, if in the judgment of the Agency or its agent(s), it is in the best interest of the State.

5.2.3 An increase or decrease in the quantity for any item is not sufficient grounds for an increase or decrease in the Unit Price.

5.2.4 The prices quoted are to be those for which the material will be furnished F.O.B. Job Site and include all charges that may be imposed during the period of the Contract.

5.2.5 No qualifying letter or statements in or attached to the Bid, or separate discounts will be considered in determining the low Bid except as may be otherwise herein noted. Cash or separate discounts should be computed and incorporated into Unit Bid Price(s).

5.3 DISQUALIFICATION OF BIDDERS

5.3.1 An agency shall determine that each Bidder on any Public Works Contract is responsible before awarding the Contract. Factors to be considered in determining the responsibility of a Bidder include:

A. The Bidder's financial, physical, personnel or other resources including Subcontracts;

B. The Bidder's record of performance on past public or private construction projects, including, but not limited to, defaults and/or final adjudication or admission of violations of the Prevailing Wage Laws in Delaware or any other state;

C. The Bidder's written safety plan;

D. Whether the Bidder is qualified legally to contract with the State;

E. Whether the Bidder supplied all necessary information concerning its responsibility; and,

F. Any other specific criteria for a particular procurement, which an agency may establish; provided however, that, the criteria be set forth in the Invitation to Bid and is otherwise in conformity with State and/or Federal law.

5.3.2 If an agency determines that a Bidder is nonresponsive and/or nonresponsible, the determination shall be in writing and set forth the basis for the determination. A copy of

the determination shall be sent to the affected Bidder within five (5) working days of said determination.

5.3.3 In addition, any one or more of the following causes may be considered as sufficient for the disqualification of a Bidder and the rejection of their Bid or Bids.

5.3.3.1 More than one Bid for the same Contract from an individual, firm or corporation under the same or different names.

5.3.3.2 Evidence of collusion among Bidders.

5.3.3.3 Unsatisfactory performance record as evidenced by past experience.

5.3.3.4 If the Unit Prices are obviously unbalanced either in excess or below reasonable cost analysis values.

5.3.3.5 If there are any unauthorized additions, interlineation, conditional, or alternate bids or irregularities of any kind which may tend to make the Bid incomplete, indefinite, or ambiguous as to its meaning.

5.3.3.6 If the Bid is not accompanied by the required Bid Security and other data required by the Bidding Documents.

5.3.3.7 If any exceptions or qualifications of the Bid are noted on the Bid Form.

5.4 ACCEPTANCE OF BID AND AWARD OF CONTRACT

5.4.1 A formal Contract shall be executed with the successful Bidder within twenty (20) calendar days after the award of the Contract.

5.4.2 Per Section 6962(d)(13) a., Title 29, Delaware Code, “The contracting agency shall award any public works contract within thirty (30) days of the bid opening to the lowest responsive and responsible Bidder, unless the Agency elects to award on the basis of best value, in which case the election to award on the basis of best value shall be stated in the Invitation To Bid.”

5.4.3 Each Bid on any Public Works Contract must be deemed responsive by the Agency to be considered for award. A responsive Bid shall conform in all material respects to the requirements and criteria set forth in the Contract Documents and specifications.

5.4.4 The Agency shall have the right to accept Alternates in any order or combination, and to determine the low Bidder on the basis of the sum of the Base Bid, plus accepted Alternates.

5.4.5 The successful Bidder shall execute a formal contract, submit the required Insurance Certificate, and furnish good and sufficient bonds, unless specifically waived in the General Requirements, in accordance with the General Requirement, within twenty (20) days of official notice of contract award. The successful Bidder shall provide two business days prior to contract execution, copies of the Employee Drug Testing Program for the Bidder and all listed Subcontractors. Bonds shall be for the benefit of the Agency with surety in the amount of 100% of the total contract award. Said Bonds shall be conditioned upon the faithful performance of the contract. Bonds shall remain in affect for period of one year after the date of substantial completion.

5.4.6 If the successful Bidder fails to execute the required Contract, Bond and all required information, as aforesaid, within twenty (20) calendar days after the date of official Notice of the Award of the Contract, their Bid guaranty shall immediately be taken and become the property of the State for the benefit of the Agency as liquidated damages, and not as a

forfeiture or as a penalty. Award will then be made to the next lowest qualified Bidder of the Work or readvertised, as the Agency may decide.

5.4.7 Each bidder shall supply with its bid its taxpayer identification number (i.e., federal employer identification number or social security number) and a copy of its Delaware business license, and should the vendor be awarded a contract, such vendor shall provide to the agency the taxpayer identification license numbers of such subcontractors. Such numbers shall be provided on the later of the date on which such subcontractor is required to be identified or the time the contract is executed. The successful Bidder shall provide to the agency to which it is contracting, within 30 days of entering into such public works contract, copies of all Delaware Business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the Bidder entered the public works contract the Delaware Business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

5.4.8 The Bid Security shall be returned to the successful Bidder upon the execution of the formal contract. The Bid Securities of unsuccessful bidders shall be returned within thirty (30) calendar days after the opening of the Bids.

ARTICLE 6: POST-BID INFORMATION

6.1 CONTRACTOR'S QUALIFICATION STATEMENT

6.1.1 Bidders to whom award of a Contract is under consideration shall, if requested by the Agency, submit a properly executed Contractor's Qualification Statement, unless such a statement has been previously required and submitted.

6.2 BUSINESS DESIGNATION FORM

6.2.1 Successful bidder shall be required to accurately complete an Office of Management and Budget Business Designation Form for Subcontractors.

ARTICLE 7: PERFORMANCE BOND AND PAYMENT BOND

7.1 BOND REQUIREMENTS

7.1.1 The cost of furnishing the required Bonds that are stipulated in the Bidding Documents, shall be included in the Bid.

7.1.2 If the Bidder is required by the Agency to secure a bond from other than the Bidder's usual sources, changes in cost will be adjusted as provide in the Contract Documents.

7.1.3 The Performance and Payment Bond forms used shall be the standard OMB forms (attached).

7.2 TIME OF DELIVERY AND FORM OF BONDS

7.2.1 The bonds shall be dated on or after the date of the Contract.

7.2.2 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix a certified and current copy of the power of attorney.

ARTICLE 8: FORM OF AGREEMENT BETWEEN AGENCY AND CONTRACTOR

8.1 The Agreement for the Work will be written the DNREC Contract Document contained in these specifications.

END OF INSTRUCTIONS TO BIDDERS

BID FORM

For Bids Due: _____ **To:** DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL (DNREC)
DIVISION OF WATERSHED STEWARDSHIP
89 KINGS HIGHWAY
DOVER, DE 19901

Name of Bidder: _____

Delaware Business License No.: _____ **Taxpayer ID No.:** _____
(A copy of Bidder's Delaware Business License must be attached to this form.)

(Other License Nos.): _____

Phone No.: (_____) _____ - _____ **Fax No.: (_____) _____ - _____**

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

$_____
($)

BID FORM

BID QUANTITIES

Bid quantities to be used for the lump sum bid above are as follows:

BID ITEM No. 1 – Mobilization & Demobilization (1 Lump Sum)

BID ITEM No. 2 – Hydraulic Dredging and Placement (100,000 cubic yards)

BID FORM

UNIT PRICES

Unit prices conform to applicable project specification section. Refer to the specifications for a complete description of the following Unit Prices:

	ADD	DEDUCT
UNIT PRICE BID ITEM No. 1 – Hydraulic Dredging per cubic yard	$ _____	$ _____

BID FORM

I / We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for thirty (30) days from the date of opening of bids (60 days for School Districts and Department of Education), and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid.

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work within _____ calendar days of the Notice to Proceed.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

_____
(State of Corporation)

Business Address: _____
_____
_____
_____

Witness: _____ **By:** _____
(Authorized Signature)

(SEAL)

_____
(Title)

Date: _____

ATTACHMENTS

Sub-Contractor List
Non-Collusion Statement
Affidavit(s) of Employee Drug Testing Program
Bid Security
(Others as Required by Project Manuals)

BID FORM

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor **must be listed for each category** where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the Delaware Department of Natural Resources and Environmental Control (DNREC), **it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.** This form must be filled out completely with no additions or deletions. **Note that all subcontractors listed below must have a signed Affidavit of Employee Drug Testing Program included with this bid.**

Subcontractor Category	Subcontractor	Address (City & State)	Subcontractors tax payer ID # or Delaware Business license #
1. Surveying			
2. Hydraulic Dredging			
3. Earthwork/Sand Placement			

BID FORM

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date to the Division of Facilities Management.

All the terms and conditions of Contract No. NAT201910/MASSEYS have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE (TYPED): _____

AUTHORIZED REPRESENTATIVE (SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

_____

_____

E-MAIL: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____day of _____ 20____.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL (DNREC)
DIVISION OF WATERSHED STEWARDSHIP

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____ _____of _____ in the County of _____ _____and State of _____as **Principal**, and _____ _____ of _____ in the County of _____ and State of _____ as **Surety**, legally authorized to do business in the State of Delaware ("**State**"), are held and firmly unto the **State** in the sum of _____ _____ Dollars ($_____), or _____ percent not to exceed _____ _____ Dollars ($_____) of amount of bid on Contract No. NAT201910/MASSEYS, to be paid to the **State** for the use and benefit of **Department of Natural Resources and Environmental Control, Division of Watershed Stewardship** for which payment well and truly to be made, we do bind ourselves, our and each of our heirs, executors, administrators, and successors, jointly and severally for and in the whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bonded **Principal** who has submitted to the **Department of Natural Resources and Environmental Control, Division of Watershed Stewardship** a certain proposal to enter into this contract for the furnishing of certain material and/or services within the **State**, shall be awarded this Contract, and if said **Principal** shall well and truly enter into and execute this Contract as may be required by the terms of this Contract and approved by the **Department of Natural Resources and Environmental Control, Division of Watershed Stewardship** this Contract to be entered into within twenty days after the date of official notice of the award thereof in accordance with the terms of said proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this _____day of _____ in the year of our Lord two thousand and _____ (20___).

SEALED, AND DELIVERED IN THE
Presence of

_____
Name of Bidder (Organization)

Corporate Seal

By: _____
Authorized Signature

Attest _____

_____
Title

_____
Name of Surety

Witness:_____ By: _____

_____
Title

DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL

89 KINGS HIGHWAY

DOVER, DE 19901

CONTRACT DOCUMENT

FOR

MASSEY'S DITCH CHANNEL MAINTENANCE DREDGING PROJECT CONTRACT NO. NAT201910/MASSEYS

THIS AGREEMENT, made and executed this _____day of _____, 2019, by and between_____(Hereinafter designated as Contractor) party of the first part, and the Department of Natural Resources and Environmental Control, a Department created under the laws of the State of Delaware (hereinafter designated as Department) party of the second part.

WITNESSETH that the Contractor, in consideration of the covenants and agreements herein contained and made by the Department, agrees to the following:

ARTICLE ONE. The Contractor shall provide and furnish all the material, supplies, machinery, implements, appliances, tools and labor required to complete this contract in Sussex County, State of Delaware, as shown and specified in the specifications, proposals, drawings or plans as indicated in the project manual issued for the Department, with specifications, proposals, drawings or plans entitled **MASSEY'S DITCH CHANNEL MAINTENANCE DREDGING PROJECT CONTRACT NO. NAT201910/MASSEYS** is hereby incorporated by reference as part of this contract. This contract will be binding on both parties upon receipt by the Contractor of an approved State of Delaware Purchase Order. The Contractor must prosecute the work in such order as to complete the hydraulic dredging and sand fill placement no later than March 1, 2020.

ARTICLE TWO. General Indemnification: By submitting a proposal, the proposing vendor agrees that in the event it is awarded a contract, it will indemnify and otherwise hold harmless the U.S. Government, the U.S. Army Corps of Engineers, and the State of Delaware, its agents and employees from any and all liability, suits, actions, or claims, together with all costs, expenses for attorney's fees, arising out of the vendor's agents and employees' performance work or services in connection with the contract, regardless of whether such suits, actions, claims or liabilities are based upon acts or failures to act attributable, in whole or part, to the State, its employees or agents. Vendor further agrees that in the event it is awarded a contract, it will be responsible for all damages to the federal project and be required to repair such damage in a timely manner to the satisfaction of the U.S.A.C.E.

IN WITNESS WHEREOF, the said parties have duly executed this agreement in triplicate the day and year first above written.

IN WITNESS WHEREOF, the parties below have hereunto set their hands on the _____ day of _____, 2019.

_____
Contractor

_____ By: _____
Witness Title: _____

State of _____
County of _____

Sworn and subscribed before me this _____ day of _____, 2019.

_____
Notary Public

IN WITNESS WHEREOF, the parties below have hereunto set their hands on the _____ day of _____, 2019.

_____ _____
Witness Project Manager
Division of Watershed Stewardship

State of _____
County of _____

Sworn and subscribed before me this _____ day of _____, 2019.

_____
Notary Public

IN WITNESS WHEREOF, the parties below have hereunto set their hands on the _____ day of _____, 2019.

_____ _____

Witness _____ Director, Division of Watershed Stewardship

State of _____
County of _____

Sworn and subscribed before me this _____ day of _____, 2019.

_____
Notary Public

_____ _____

Witness Secretary, Department of Natural Resources & Environmental Control

State of _____
County of _____

Sworn and subscribed before me this _____ day of _____, 2019.

_____
Notary Public

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL (DNREC)
DIVISION OF WATERSHED STEWARDSHIP

PERFORMANCE BOND

Bond Number: _____

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____, as principal ("**Principal**"), and _____, a _____ corporation, legally authorized to do business in the State of Delaware, as surety ("**Surety**"), are held and firmly bound unto the _____ **Department of Natural Resources and Environmental Control, Division of Watershed Stewardship** ("**Owner**"), in the amount of _____ ($_____), to be paid to **Owner**, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrations, successors and assigns, jointly and severally, for and in the whole, firmly by these presents.

Sealed with our seals and dated this_____ day of _____, 2019.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH, that if **Principal**, who has been awarded by **Owner** that certain contract known as Contract No. NAT201910/MASSEYS dated the _____ day of _____, 2019 (the "Contract"), which Contract is incorporated herein by reference, shall well and truly provide and furnish all materials, appliances and tools and perform all the work required under and pursuant to the terms and conditions of the Contract and the Contract Documents (as defined in the Contract) or any changes or modifications thereto made as therein provided, shall make good and reimburse **Owner** sufficient funds to pay the costs of completing the Contract that **Owner** may sustain by reason of any failure or default on the part of **Principal**, and shall also indemnify and save harmless **Owner** from all costs, damages and expenses arising out of or by reason of the performance of the Contract and for as long as provided by the Contract; then this obligation shall be void, otherwise to be and remain in full force and effect.

Surety, for value received, hereby stipulates and agrees, if requested to do so by **Owner**, to fully perform and complete the work to be performed under the Contract pursuant to the terms, conditions and covenants thereof, if for any cause **Principal** fails or neglects to so fully perform and complete such work.

Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of **Surety** and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition or change in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and **Surety** hereby waives notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other

transferees shall have the same effect as to **Surety** as though done or omitted to be done by or in relation to **Principal**.

Surety hereby stipulates and agrees that no modifications, omissions or additions in or to the terms of the Contract shall in any way whatsoever affect the obligation of **Surety** and its bond.

Any proceeding, legal or equitable, under this Bond may be brought in any court of competent jurisdiction in the State of Delaware. Notices to **Surety** or Contractor may be mailed or delivered to them at their respective addresses shown below.

IN WITNESS WHEREOF, **Principal** and **Surety** have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seal to be hereto affixed and these presents to be signed by their duly authorized officers, the day and year first above written.

PRINCIPAL

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name: _____
Title: _____

(Corporate Seal)

SURETY

Name: _____

Witness or Attest: Address: _____

_____ By: _____ (SEAL)
Name: Name: _____
Title: _____

(Corporate Seal)

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL (DNREC)
DIVISION OF WATERSHED STEWARDSHIP

PAYMENT BOND

Bond Number: _____

KNOW ALL PERSONS BY THESE PRESENTS, that we, _____, as principal ("**Principal**"), and _____, a _____ corporation, legally authorized to do business in the State of Delaware, as surety ("**Surety**"), are held and firmly bound unto the **State** ("**Owner**") **Department of Natural Resources and Environmental Control, Division of Watershed Stewardship**, in the amount of _____($_____), to be paid to **Owner**, for which payment well and truly to be made, we do bind ourselves, our and each and every of our heirs, executors, administrations, successors and assigns, jointly and severally, for and in the whole firmly by these presents.

Sealed with our seals and dated this _____ day of_____, 2019.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH, that if **Principal**, who has been awarded by **Owner** that certain contract known as Contract No. NAT201910/MASSEYS dated the _____ day of _____, 2019 (the "Contract"), which Contract is incorporated herein by reference, shall well and truly pay all and every person furnishing materials or performing labor or service in and about the performance of the work under the Contract, all and every sums of money due him, her, them or any of them, for all such materials, labor and service for which **Principal** is liable, shall make good and reimburse **Owner** sufficient funds to pay such costs in the completion of the Contract as **Owner** may sustain by reason of any failure or default on the part of **Principal**, and shall also indemnify and save harmless **Owner** from all costs, damages and expenses arising out of or by reason of the performance of the Contract and for as long as provided by the Contract; then this obligation shall be void, otherwise to be and remain in full force and effect.

Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligation of **Surety** and its bond shall be in no way impaired or affected by any extension of time, modification, omission, addition or change in or to the Contract or the work to be performed thereunder, or by any payment thereunder before the time required therein, or by any waiver of any provisions thereof, or by any assignment, subletting or other transfer thereof or of any work to be performed or any monies due or to become due thereunder; and **Surety** hereby waives notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers and hereby expressly stipulates and agrees that any and all things done and omitted to be done by and in relation to assignees, subcontractors, and other transferees shall have the same effect as to **Surety** as though done or omitted to be done by or in relation to **Principal**.

Surety hereby stipulates and agrees that no modifications, omission or additions in or to the terms of the Contract shall in any way whatsoever affect the obligation of **Surety** and its bond.

Any proceeding, legal or equitable, under this Bond may be brought in any court of competent jurisdiction in the State of Delaware. Notices to **Surety** or Contractor may be mailed or delivered to them at their respective addresses shown below.

IN WITNESS WHEREOF, **Principal** and **Surety** have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seal to be hereto affixed and these presents to be signed by their duly authorized officers, the day and year first above written.

PRINCIPAL

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name: _____
Title: _____

(Corporate Seal)

SURETY

Name: _____

Witness or Attest: Address: _____

_____ By: _____(SEAL)
Name: Name: _____
Title: _____

(Corporate Seal)

00 73 46 PREVAILING WAGE RATE DETERMINATION

STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
4425 NORTH MARKET STREET
WILMINGTON, DELAWARE 19802

TELEPHONE (302) 761-8200
FAX (302) 761-6601

Via Electronic and Regular Mail

April 2, 2019

Mr. Peter Kotulak
Associate
Moffatt & Nichol
2700 Lighthouse Point East, Suite 501
Baltimore, MD 21224

Re: NAT201910/MASSEYs Massey Ditch Channel Maintenance Dredging, Sussex County, DE

Dear Mr. Kotulak:

I am responding to your request for a category determination for the NAT201910/MASSEYs Massey Ditch Channel Maintenance Dredging, which is a state funded construction project located in Sussex County, DE. The work consists of hydraulically maintenance dredge 50,000 +/- cubic yards to -6.5 feet in Masseys Ditch from Rehoboth Bay to Indian River Bay and hydraulically dredge 50,000 +/- cubic yards of new material to 6.5 feet MLW north of Middle Island and north of Lynch Thicket Island. You estimate the total cost of construction for this project to be $4,000,000.00.

Based upon the information you provided the Department of Labor has determined that this project is a Heavy Construction project.

Delaware's Prevailing Wage Regulations provide that the rates applicable to a project are the rates in effect on the date of publication of the specifications for that project. I have enclosed a certified copy of the March 15, 2019, prevailing wage rates for Heavy Construction to be included in your bid specification. However, please be advised that, in the event that a contract for a project is not executed within one hundred and twenty (120) days from the earliest date the specifications were published, the rates in effect at the time of the execution of the contract shall be the applicable rates for the project.

This determination is directed solely to the parties identified herein. It is based on the unique facts relevant to this matter. It does not constitute precedent and should not be cited as such by future parties.

Lastly, please see the enclosed debarment list. Entities/individuals listed shall not be permitted to bid on, be awarded or work on Delaware State funded construction projects, in the timeframe specified, as provided for under 29 Del.C. §6960 or other applicable State statutes.

If you have any questions or I can provide any additional assistance, please do not hesitate to contact me at 302-761-8325.

Sincerely,

Curtis Washington
Labor Law Enforcement Officer
curtisl.washington@delaware.gov

Enclosures

STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
OFFICE OF LABOR LAW ENFORCEMENT
PHONE: (302) 761-8200

Mailing Address:
4425 North Market Street
3rd Floor
Wilmington, DE 19802

Located at:
4425 North Market Street
3rd Floor
Wilmington, DE 19802

PREVAILING WAGES FOR **HEAVY CONSTRUCTION** EFFECTIVE MARCH 15, 2019

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	23.12	20.33	44.22
BOILERMAKERS	79.62	33.60	61.64
BRICKLAYERS	69.61	24.27	26.06
CARPENTERS	55.63	55.63	44.22
CEMENT FINISHERS	45.61	25.48	18.98
ELECTRICAL LINE WORKERS	77.06	76.66	67.64
ELECTRICIANS	70.49	70.49	70.49
GLAZIERS	21.36	18.55	12.56
INSULATORS	57.88	57.88	57.88
IRON WORKERS	64.26	63.77	61.00
LABORERS	47.70	47.70	47.70
MILLWRIGHTS	74.23	74.23	59.84
PAINTERS	83.91	83.91	83.91
PILEDRIVERS	78.02	41.17	32.04
PLASTERERS	20.12	17.48	11.81
PLUMBERS/PIPEFITTERS/STEAMFITTERS	89.13	81.44	18.72
POWER EQUIPMENT OPERATORS	71.29	71.29	71.29
SHEET METAL WORKERS	32.15	19.95	18.73
SPRINKLER FITTERS	34.65	13.12	10.86
TRUCK DRIVERS	33.44	21.57	23.30

CERTIFIED 04/02/2019 BY: on behalf of Elie Reshoff
ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

NOTE: THESE RATES ARE PROMULGATED AND ENFORCED PURSUANT TO THE PREVAILING WAGE REGULATIONS ADOPTED BY THE DEPARTMENT OF LABOR ON APRIL 3, 1992.

CLASSIFICATIONS OF WORKERS ARE DETERMINED BY THE DEPARTMENT OF LABOR. FOR ASSISTANCE IN CLASSIFYING WORKERS, OR FOR A COPY OF THE REGULATIONS OR CLASSIFICATIONS, PHONE 302-761-8200

NON-REGISTERED APPRENTICES MUST BE PAID THE MECHANIC'S RATE.

PROJECT: NAT201910/MASSEYs Massey Ditch Channel Maintenance Dredging, Sussex County

PREVAILING WAGE DEBARMENT LIST

The following contractors have been debarred for violations of the prevailing wage law 29Del.C. §6960 or other applicable State statutes.

Therefore, no public construction contract in this State shall be bid on, awarded to, or received by contractors and individuals on this list for a period of (3) three years from the date of the judgment or as deemed by a court of competent jurisdiction.

Contractor	Address	Date of Debarment
Mullen Brothers, Inc. and Daniel Mullen, individually	3375 Garnett Road, Boothwyn, PA 19060	Indefinite/ Civil Contempt
State Contractors Corporation, and Jose Oscar Rivera, individually	13004 Hathaway Drive Silver Spring, MD 20906	Indefinite/ 19 Del.C. 2374(f)
Green Granite and Jason Green, individually	604 Heatherbrooke Court Avondale, PA 19311	Indefinite/ Civil Contempt
Pro Image Landscaping, Inc. and Owner(s) individually	23 Commerce Street Wilmington, DE 19801 and/or 2 Cameo Road Claymont, DE 19703	Indefinite/19 Del.C. §108 & 10 Del.C. 542(c)
Liberty Mechanical, LLC and Owner(s), individually	2032 Duncan Road Wilmington, DE 19801	Indefinite/ 19 Del.C. 2374(f)
Integrated Mechanical and Fire Systems Inc. and Allison Sheldon, individually	4601 Governor Printz Boulevard Wilmington, DE 19809	Indefinite/19 Del.C. §108 & 10 Del.C. 542(c)

Updated: January 22, 2019

GENERAL REQUIREMENTS

TABLE OF ARTICLES

ARTICLE 1: GENERAL

1.1 CONTRACT DOCUMENTS

1.1.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary and what is required by one shall be as binding as if required by all. Performance by the Contractor shall be required to an extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results.

1.1.2 Work including material purchases shall not begin until the Contractor is in receipt of a bonafide State of Delaware Purchase Order. Any work performed or material purchases prior to the issuance of the Purchase Order is done at the Contractor's own risk and cost.

1.2 EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS

1.2.1 For Public Works Projects financed in whole or in part by state appropriation the Contractor agrees that during the performance of this contract:

1. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, sex, color, sexual orientation, gender identity or national origin. The Contractor will take positive steps to ensure that applicants are employed and that employees are treated during employment without regard to their race, creed, sex, color, sexual orientation, gender identity or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.

2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, sex, color, sexual orientation, gender identity or national origin."

ARTICLE 2: OWNER

2.1 INFORMATION AND SERVICES REQUIRED OF THE OWNER

The Owner shall furnish surveys describing physical characteristics of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work. The Contractor, at their expense shall bear the costs to accurately identify the location of all underground utilities in the area of their excavation and shall bear all cost for any repairs required, out of failure to accurately identify said utilities."

The Contractor shall be furnished free of charge up to five (5) sets of the Drawings and Project Manuals. Additional sets will be furnished at the cost of reproduction, postage and handling.

ARTICLE 3: CONTRACTOR

3.1 Schedule of Values: The successful Bidder shall within twenty (20) days after receiving notice to proceed with the work, furnish to the Owner a complete schedule of values on the various items comprising the work.

3.2 Subcontracts: Upon approval of Subcontractors, the Contractor shall award their Subcontracts as soon as possible after the signing of their own contract and see that all material, their own and those of their Subcontractors, are promptly ordered so that the work will not be delayed by failure of materials to arrive on time.

3.3 Before commencing any work or construction, the General Contractor is to consult with the Owner as to matters in connection with access to the site and the allocation of Ground Areas for the various features of hauling, storage, etc.

3.4 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions.

3.5 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

3.6 The Contractor warrants to the Owner that materials and equipment furnished will be new and of good quality, unless otherwise permitted, and that the work will be free from defects and in conformance with the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved, may be considered defective. If required by the Owner, the Contractor shall furnish evidence as to the kind and quality of materials and equipment provided.

3.7 Unless otherwise provided, the Contractor shall pay all sales, consumer, use and other similar taxes, and shall secure and pay for required permits, fees, licenses, and inspections necessary for proper execution of the Work.

3.8 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on performance of the Work. The Contractor shall promptly notify the Owner if the Drawings and Specifications are observed to be at variance therewith.

3.9 The Contractor shall be responsible to the Owner for the acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons performing portions of the Work under contract with the Contractor.

3.10 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work the Contractor shall remove from and about the Project all waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials. The Contractor shall be responsible for returning all damaged areas to their original conditions.

3.11 STATE LICENSE AND TAX REQUIREMENTS

3.11.1 Each Contractor and Subcontractor shall be licensed to do business in the State of Delaware and shall pay all fees and taxes due under State laws. In conformance with Section 2503, Chapter 25, Title 30, Delaware Code, "the Contractor shall furnish the Delaware Department of Finance within ten (10) days after entering into any contract with a contractor or subcontractor not a resident of this State, a statement of total value of such contract or contracts together with the names and addresses of the contracting parties."

3.12 The Contractor shall comply with all requirements set forth in Section 6962, Chapter 69, Title 29 of the Delaware Code.

3.13 During the contract Work, the Contractor and each listed Subcontractor, shall implement an Employee Drug Testing Program in accordance with OMB Regulation 4104- "Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on "Large Public Works Projects". "Large Public Works" is based upon the current threshold required for bidding Public Works as set by the Purchasing and Contracting Advisory Council.

ARTICLE 4: ADMINISTRATION OF THE CONTRACT

4.1 CONTRACT SURETY

4.1.1 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

4.1.2 All bonds will be required as follows unless specifically waived elsewhere in the Bidding Documents.

4.1.3 Contents of Performance Bonds – The bond shall be in the form approved by the Office of Management and Budget. The bond shall be conditioned upon the faithful compliance and performance by the successful bidder of each and every term and condition of the contract and the proposal, plans, specifications, and bid documents thereof. Each term and condition shall be met at the time and in the manner prescribed by the Contract, Bid documents and the specifications, including the payment in full to every person furnishing materiel or performing labor in the performance of the Contract, of all sums of money due the person for such labor and materiel. (The bond shall also contain the successful bidder's guarantee to indemnify and save harmless the State and the agency from all costs, damages and expenses growing out of or by reason of the Contract in accordance with the Contract.)

4.1.4 Invoking a Performance Bond – The agency may, when it considers that the interest of the State so require, cause judgement to be confessed upon the bond.

4.1.5 Within twenty (20) days after the date of notice of award of contract, the Bidder to whom the award is made shall furnish a Performance Bond and Labor and Material Payment Bond, each equal to the full amount of the Contract price to guarantee the faithful performance of all terms, covenants and conditions of the same. The bonds are to be issued by an acceptable Bonding Company licensed to do business in the State of Delaware and shall be issued in duplicate.

4.1.6 Performance and Payment Bonds shall be maintained in full force (warranty bond) for a period of two (2) years after the date of the Certificate for Final Payment. The Performance Bond shall guarantee the satisfactory completion of the Project and that the Contractor will make good any faults or defects in his work which may develop during the period of said guarantees as a result of improper or defective workmanship, material or apparatus, whether furnished by themselves or their Sub-Contractors. The Payment Bond shall guarantee that the Contractor shall pay in full all persons, firms or corporations who furnish labor or material or both labor and material for, or on account of, the work included herein. The bonds shall be paid for by this Contractor. The Owner shall have the right to demand that the proof parties signing the bonds are duly authorized to do so.

4.2 FAILURE TO COMPLY WITH CONTRACT

4.2.1 If any firm entering into a contract with the State, or Agency that neglects or refuses to perform or fails to comply with the terms thereof, the Agency which signed the Contract may terminate the Contract and proceed to award a new contract in accordance with this Chapter 69, Title 29 of the Delaware Code or may require the Surety on the Performance Bond to complete the Contract in accordance with the terms of the Performance Bond. Nothing herein shall preclude the Agency from pursing additional remedies as otherwise provided by law.

4.3 CONTRACT INSURANCE AND CONTRACT LIABILITY

4.3.1 In addition to the bond requirements stated in the Bid Documents, each successful Bidder shall purchase adequate insurance for the performance of the Contract and, by submission of a Bid, agrees to indemnify and save harmless and to defend all legal or equitable actions brought against the State, any Agency, officer and/or employee of the State, for and from all claims of liability which is or may be the result of the successful Bidder's actions during the performance of the Contract.

4.3.2 The purchase or nonpurchase of such insurance or the involvement of the successful Bidder in any legal or equitable defense of any action brought against the successful Bidder based upon work performed pursuant to the Contract will not waive any defense which the State, its agencies and their respective officers, employees and agents might otherwise have against such claims, specifically including the defense of sovereign immunity, where applicable, and by the terms of this section, the State and all agencies, officers and employees thereof shall not be financially responsible for the consequences of work performed, pursuant to said contract.

4.4 RIGHT TO AUDIT RECORDS

4.4.1 The Owner shall have the right to audit the books and records of a Contractor or any Subcontractor under any Contract or Subcontract to the extent that the books and records relate to the performance of the Contract or Subcontract.

4.4.2 Said books and records shall be maintained by the Contractor for a period of seven (7) years from the date of final payment under the Prime Contract and by the Subcontractor for a period of seven (7) years from the date of final payment under the Subcontract.

ARTICLE 5: SUBCONTRACTORS

5.1 SUBCONTRACTING REQUIREMENTS

5.1.1 All contracts shall be subject to the following provisions:

A. A contract shall be awarded only to a Bidder whose Bid is accompanied by a statement containing, for each Subcontractor category, the name and address (city or town and State only – street number and P.O. Box addresses not required) of the subcontractor whose services the Bidder intends to use in performing the Work and providing the material for such Subcontractor category.

B. A Bid will not be accepted nor will an award of any Contract be made to any Bidder which, as the Prime Contractor, has listed itself as the Subcontractor for any Subcontractor unless:

1. It has been established to the satisfaction of the awarding Agency that the Bidder has customarily performed the specialty work of such Subcontractor category by artisans regularly employed by the Bidder's firm;

2. That the Bidder is duly licensed by the State to engage in such specialty work, if the State requires licenses; and

3. That the Bidder is recognized in the industry as a bona fide Subcontractor or Contractor in such specialty work and Subcontractor category.

5.1.2 The decision of the awarding Agency as to whether a Bidder who list itself as the Subcontractor for a Subcontractor category shall be final and binding upon all Bidders, and

no action of any nature shall lie against any awarding agency or its employees or officers because of its decision in this regard.

5.1.3 After such a Contract has been awarded, the successful Bidder shall not substitute another Subcontractor for any Subcontractor whose name was set forth in the statement which accompanied the Bid without the written consent of the awarding Agency.

5.1.4 No Agency shall consent to any substitution of Subcontractors unless the Agency is satisfied that the Subcontractor whose name is on the Bidders accompanying statement:

A. Is unqualified to perform the work required;

B. Has failed to execute a timely reasonable Subcontract;

C. Has defaulted in the performance on the portion of the work covered by the Subcontract; or

D. Is no longer engaged in such business.

5.1.5 Should a Bidder be awarded a contract, such successful Bidder shall provide to the agency the taxpayer identification license numbers of such subcontractors. Such numbers shall be provided on the later of the date on which such subcontractor is required to be identified or the time the contract is executed. The successful Bidder shall provide to the agency to which it is contracting, within 30 days of entering into such public works contract, copies of all Delaware Business licenses of subcontractors and/or independent contractors that will perform work for such public works contract. However, if a subcontractor or independent contractor is hired or contracted more than 20 days after the Bidder entered the public works contract the Delaware Business license of such subcontractor or independent contractor shall be provided to the agency within 10 days of being contracted or hired.

5.2 PENALTY FOR SUBSTITUTION OF SUBCONTRACTORS

5.2.1 Should the Contractor fail to utilize any or all of the Subcontractors in the Contractor's Bid statement in the performance of the Work on the public bidding, the Contractor shall be penalized in the amount of (project specific amount*). The Agency may determine to deduct payments of the penalty from the Contractor or have the amount paid directly to the Agency. Any penalty amount assessed against the Contractor may be remitted or refunded, in whole or in part, by the Agency awarding the Contract, only if it is established to the satisfaction of the Agency that the Subcontractor in question has defaulted or is no longer engaged in such business. No claim for the remission or refund of any penalty shall be granted unless an application is filed within one year after the liability of the successful Bidder accrues. All penalty amounts assessed and not refunded or remitted to the contractor shall be reverted to the State.

*one (1) percent of contract amount not to exceed $10,000

5.3 ASBESTOS ABATEMENT

5.3.1 The selection of any Contractor to perform asbestos abatement for State-funded projects shall be approved by the Office of Management and Budget, Division of Facilities Management pursuant to Chapter 78 of Title 16.

5.4 STANDARDS OF CONSTRUCTION FOR THE PROTECTION OF THE PHYSICALLY HANDICAPPED

5.4.1 All Contracts shall conform with the standard established by the Delaware Architectural Accessibility Board unless otherwise exempted by the Board.

5.5 CONTRACT PERFORMANCE

5.5.1 Any firm entering into a Public Works Contract that neglects or refuses to perform or fails to comply with its terms, the Agency may terminate the Contract and proceed to award a new Contract or may require the Surety on the Performance Bond to complete the Contract in accordance with the terms of the Performance Bond.

ARTICLE 6: CONSTRUCTION BY OWNER OR SEPARATE CONTRACTORS

6.1 The Owner reserves the right to simultaneously perform other construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other Projects at the same site.

6.2 The Contractor shall afford the Owner and other Contractors reasonable opportunity for access and storage of materials and equipment, and for the performance of their activities, and shall connect and coordinate their activities with other forces as required by the Contract Documents.

ARTICLE 7: CHANGES IN THE WORK

7.1 The Owner, without invalidating the Contract, may order changes in the Work consisting of Additions, Deletions, Modifications or Substitutions, with the Contract Sum and Contract completion date being adjusted accordingly. Such changes in the Work shall be authorized by written Change Order signed by the Professional, as the duly authorized agent, the Contractor and the Owner.

7.2 The Contract Sum and Contract Completion Date shall be adjusted only by a fully executed Change Order.

7.3 The additional cost, or credit to the Owner resulting from a change in the Work shall be by mutual agreement of the Owner, Contractor and the Architect. In all cases, this cost or credit shall be based on the ‘DPE’ wages required and the “invoice price” of the materials/equipment needed.

7.3.1 “DPE” shall be defined to mean “direct personnel expense”. Direct payroll expense includes direct salary plus customary fringe benefits (prevailing wage rates) and documented statutory costs such as workman’s compensation insurance, Social Security/Medicare, and unemployment insurance (a maximum multiplier of 1.35 times DPE).

7.3.2 “Invoice price” of materials/equipment shall be defined to mean the actual cost of materials and/or equipment that is paid by the Contractor, (or subcontractor), to a material distributor, direct factory vendor, store, material provider, or equipment leasing entity. Rates for equipment that is leased and/or owned by the Contractor or subcontractor(s) shall not exceed those listed in the latest version of the “Means Building Construction Cost Data” publication.

7.3.3 In addition to the above, the General Contractor is allowed a fifteen percent (15%) markup for overhead and profit for additional work performed by the General Contractor’s own forces. For additional subcontractor work, the Subcontractor is allowed a fifteen (15) percent overhead and profit on change order work above and beyond the direct costs stated previously. To this amount, the General Contractor will be allowed a mark-up not exceeding seven and one half percent (7.5%) on the subcontractors work. These mark-ups shall include all costs including, but not limited to: overhead, profit, bonds, insurance, supervision, etc. No markup is permitted on the work of the subcontractors subcontractor. No additional costs shall be allowed for changes related to the Contractor’s onsite superintendent/staff, or project manager, unless a change in the work changes the project

duration and is identified by the CPM schedule. There will be no other costs associated with the change order.

ARTICLE 8: TIME

8.1 Time limits, if any, are as stated in the Project Manual. By executing the Agreement, the Contractor confirms that the stipulated limits are reasonable, and that the Work will be completed within the anticipated time frame.

8.2 If progress of the Work is delayed at any time by changes ordered by the Owner, by labor disputes, fire, unusual delay in deliveries, abnormal adverse weather conditions, unavoidable casualties or other causes beyond the Contractor's control, the Contract Time shall be extended for such reasonable time as the Owner may determine.

8.3 Any extension of time beyond the date fixed for completion of the construction and acceptance of any part of the Work called for by the Contract, in whole or in part, previous to the completion shall not be deemed a waiver by the Owner of his right to annul or terminate the Contract for abandonment or delay in the matter provided for, nor relieve the Contractor of full responsibility.

8.4 SUSPENSION AND DEBARMENT

8.4.1 Per Section 6962(d)(14), Title 29, Delaware Code, “Any Contractor who fails to perform a public works contract or complete a public works project within the time schedule established by the Agency in the Invitation To Bid, may be subject to Suspension or Debarment for one or more of the following reasons: a) failure to supply the adequate labor supply ratio for the project; b) inadequate financial resources; or, c) poor performance on the Project.”

8.4.2 “Upon such failure for any of the above stated reasons, the Agency that contracted for the public works project may petition the Director of the Office of Management and Budget for Suspension or Debarment of the Contractor. The Agency shall send a copy of the petition to the Contractor within three (3) working days of filing with the Director. If the Director concludes that the petition has merit, the Director shall schedule and hold a hearing to determine whether to suspend the Contractor, debar the Contractor or deny the petition. The Agency shall have the burden of proving, by a preponderance of the evidence, that the Contractor failed to perform or complete the public works project within the time schedule established by the Agency and failed to do so for one or more of the following reasons: a) failure to supply the adequate labor supply ratio for the project; b) inadequate financial resources; or, c) poor performance on the project. Upon a finding in favor of the Agency, the Director may suspend a Contractor from Bidding on any project funded, in whole or in part, with public funds for up to 1 year for a first offense, up to 3 years for a second offense and permanently debar the Contractor for a third offense. The Director shall issue a written decision and shall send a copy to the Contractor and the Agency. Such decision may be appealed to the Superior Court within thirty (30) days for a review on the record.”

8.5 RETAINAGE

8.5.1 Per Section 6962(d)(5) a.3, Title 29, Delaware Code: The Agency may at the beginning of each public works project establish a time schedule for the completion of the project. If the project is delayed beyond the completion date due to the Contractor’s failure to meet their responsibilities, the Agency may forfeit, at its discretion, all or part of the Contractor’s retainage.

8.5.2 This forfeiture of retainage also applies to the timely completion of the punchlist. A punchlist will only be prepared upon the mutual agreement of the Owner, Architect and Contractor. Once the punchlist is prepared, all three parties will by mutual agreement,

establish a schedule for its completion. Should completion of the punchlist be delayed beyond the established date due to the Contractor's failure to meet their responsibilities, the Agency may hold permanently, at its discretion, all or part of the Contractor's retainage.

ARTICLE 9: PAYMENTS AND COMPLETION

9.1 APPLICATION FOR PAYMENT

9.1.1 Applications for payment shall be made to Department of Natural Resources and Environmental Control Division of Watershed Stewardship, at Room B172, Richardson & Robbins Building, 89 Kings Highway, Dover, DE 19901 and marked Contract No. NAT201910/MASSEYS; Attention: Charles Williams. There will be a five percent (5%) retainage on all Contractor's monthly invoices until completion of the project. This retainage may become payable upon receipt of all required closeout documentation, provided all other requirements of the Contract Documents have been met.

9.1.2 A date will be fixed for the taking of the monthly account of work done. Upon receipt of Contractor's itemized application for payment, such application will be audited, modified, if found necessary, and approved for the amount. Statement shall be submitted to the Owner.

9.1.3 Section 6516, Title 29 of the Delaware Code annualized interest is not to exceed 12% per annum beginning thirty (30) days after the "presentment" (as opposed to the date) of the invoice.

9.2 PARTIAL PAYMENTS

9.2.1 Any public works Contract executed by any Agency may provide for partial payments at the option of the Owner with respect to materials placed along or upon the sites or stored at secured locations, which are suitable for use in the performance of the contract.

9.2.2 When approved by the agency, partial payment may include the values of tested and acceptable materials of a nonperishable or noncontaminative nature which have been produced or furnished for incorporation as a permanent part of the work yet to be completed, provided acceptable provisions have been made for storage.

9.2.2.1 Any allowance made for materials on hand will not exceed the delivered cost of the materials as verified by invoices furnished by the Contractor, nor will it exceed the contract bid price for the material complete in place.

9.2.3 If requested by the Agency, receipted bills from all Contractors, Subcontractors, and material, men, etc., for the previous payment must accompany each application for payment. Following such a request, no payment will be made until these receipted bills have been received by the Owner.

9.3 SUBSTANTIAL COMPLETION

9.3.1 When the Work has been completed, but still requires small items of miscellaneous work, the Owner will determine the date when the project has been substantially completed.

9.3.2 If, after the Work has been substantially completed, full completion thereof is materially delayed through no fault of the Contractor, and without terminating the Contract, the Owner may make payment of the balance due for the portion of the Work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment that it shall not constitute a waiver of claims.

9.3.3 On projects where commissioning is included, the commissioning work as defined in the specifications must be complete prior to the issuance of substantial completion.

9.4 FINAL PAYMENT

9.4.1 Final payment, including the five percent (5%) retainage if determined appropriate, shall be made within thirty (30) days after the Work is fully completed and the Contract fully performed and provided that the Contractor has submitted the following closeout documentation (in addition to any other documentation required elsewhere in the Contract Documents):

9.4.1.1 Evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the work have been paid,

9.4.1.2 An acceptable RELEASE OF LIENS,

9.4.1.3 Copies of all applicable warranties,

9.4.1.4 As-built drawings,

9.4.1.5 Operations and Maintenance Manuals,

9.4.1.6 Instruction Manuals,

9.4.1.7 Consent of Surety to final payment.

9.4.1.8 The Owner reserves the right to retain payments, or parts thereof, for its protection until the foregoing conditions have been complied with, defective work corrected and all unsatisfactory conditions remedied.

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall take all reasonable precautions to prevent damage, injury or loss to: workers, persons nearby who may be affected, the Work, materials and equipment to be incorporated, and existing property at the site or adjacent thereto. The Contractor shall give notices and comply with applicable laws ordinances, rules regulations, and lawful orders of public authorities bearing on the safety of persons and property and their protection from injury, damage, or loss. The Contractor shall promptly remedy damage and loss to property at the site caused in whole or in part by the Contractor, a Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable.

10.2 The Contractor shall notify the Owner in the event any existing hazardous material such as lead, PCBs, asbestos, etc. is encountered on the project. The Owner will arrange with a qualified specialist for the identification, testing, removal, handling and protection against exposure or environmental pollution, to comply with applicable regulation laws and ordinances. The Contractor and Architect will not be required to participate in or to perform this operation. Upon completion of this work, the Owner will notify the Contractor and Architect in writing the area has been cleared and approved by the authorities in order for the work to proceed. The Contractor shall attach documentation from the authorities of said approval.

10.3 As required in the Hazardous Chemical Information Act of June 1984, all vendors supplying any materials that may be defined as hazardous, must provide Material Safety Data Sheets for those products. Any chemical product should be considered hazardous if it has a warning caution on the label relating to a potential physical or health hazard, if it is known to be present in the work place, and if employees may be exposed under normal conditions or in any foreseeable emergency situation. Material Safety Data Sheets must be provided directly to the Owner along with the shipping slips that include those products.

10.4 The Contractor shall certify to the Owner that materials incorporated into the Work are free of all asbestos. This certification may be in the form of Material Safety Data Sheet (MSDS) provided by the product manufacturer for the materials used in construction, as specified or as provided by the Contractor.

ARTICLE 11: INSURANCE AND BONDS

11.1 The Contractor shall carry all insurance required by law, such as Unemployment Insurance, etc. The Contractor shall carry such insurance coverage as they desire on their own property such as a field office, storage sheds or other structures erected upon the project site that belong to them and for their own use. The Subcontractors involved with this project shall carry whatever insurance protection they consider necessary to cover the loss of any of their personal property, etc.

11.2 Upon being awarded the Contract, the Contractor shall obtain a minimum of two (2) copies of all required insurance certificates called for herein, and submit one (1) copy of each certificate, to the Owner, within 20 days of contract award.

11.3 Bodily Injury Liability and Property Damage Liability Insurance shall, in addition to the coverage included herein, include coverage for injury to or destruction of any property arising out of the collapse of or structural injury to any building or structure due to demolition work and evidence of these coverages shall be filed with and approved by the Owner.

11.4 The Contractor's Property Damage Liability Insurance shall, in addition to the coverage noted herein, include coverage on all real and personal property in their care, custody and control damaged in any way by the Contractor or their Subcontractors during the entire construction period on this project.

11.5 Builders Risk (including Standard Extended Coverage Insurance) on an existing building during the entire construction period, shall not be provided by the Contractor under this contract. The Owner shall insure the existing building and all of its contents and all this new alteration work under this contract during entire construction period for the full insurable value of the entire work at the site. Note, however, that the Contractor and their Subcontractors shall be responsible for insuring building materials (installed and stored) and their tools and equipment whenever in use on the project, against fire damage, theft, vandalism, etc.

11.6 Certificates of the insurance company or companies stating the amount and type of coverage, terms of policies, etc., shall be furnished to the Owner, within 20 days of contract award.

11.7 The Contractor shall, at their own expense, (in addition to the above) carry the following forms of insurance:

11.7.1 <u>Contractor's Contractual Liability Insurance</u>

Minimum coverage to be:

Bodily Injury	$500,000	for each person
	$1,000,000	for each occurrence
	$1,000,000	aggregate
Property Damage	$500,000	for each occurrence
	$1,000,000	aggregate

11.7.2 Contractor's Protective Liability Insurance

Minimum coverage to be:

Bodily Injury	$500,000	for each person
	$1,000,000	for each occurrence
	$1,000,000	aggregate
Property Damage	$500,000	for each occurrence
	$500,000	aggregate

11.7.3 Automobile Liability Insurance

Minimum coverage to be:

Bodily Injury	$1,000,000	for each person
	$1,000,000	for each occurrence
Property Damage	$500,000	per accident

11.7.4 Prime Contractor's and Subcontractors' policies shall include contingent and contractual liability coverage in the same minimum amounts as 11.7.1 above.

11.7.5 Workmen's Compensation (including Employer's Liability):

11.7.5.1 Minimum Limit on employer's liability to be as required by law.

11.7.5.2 Minimum Limit for all employees working at one site.

11.7.6 Certificates of Insurance must be filed with the Owner guaranteeing fifteen (15) days prior notice of cancellation, non-renewal, or any change in coverages and limits of liability shown as included on certificates.

11.7.7 Social Security Liability

11.7.7.1 With respect to all persons at any time employed by or on the payroll of the Contractor or performing any work for or on their behalf, or in connection with or arising out of the Contractor's business, the Contractor shall accept full and exclusive liability for the payment of any and all contributions or taxes or unemployment insurance, or old age retirement benefits, pensions or annuities now or hereafter imposed by the Government of the United States and the State or political subdivision thereof, whether the same be measured by wages, salaries or other remuneration paid to such persons or otherwise.

11.7.7.2 Upon request, the Contractor shall furnish Owner such information on payrolls or employment records as may be necessary to enable it to fully comply with the law imposing the aforesaid contributions or taxes.

11.7.7.3 If the Owner is required by law to and does pay any and/or all of the aforesaid contributions or taxes, the Contractor shall forthwith reimburse the Owner for the entire amount so paid by the Owner.

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.1 The Contractor shall promptly correct Work rejected by the Owner or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed, and shall correct any Work found to be not in accordance with the requirements of the Contract Documents within a period of two years from the date of Substantial Completion, or by terms of an applicable special

warranty required by the Contract Documents. The provisions of this Article apply to work done by Subcontractors as well as to Work done by direct employees of the Contractor.

12.2 At any time during the progress of the work, or in any case where the nature of the defects shall be such that it is not expedient to have them corrected, the Owner, at their option, shall have the right to deduct such sum, or sums, of money from the amount of the contract as they consider justified to adjust the difference in value between the defective work and that required under contract including any damage to the structure.

ARTICLE 13: MISCELLANEOUS PROVISIONS

13.1 CUTTING AND PATCHING

13.1.1 The Contractor shall be responsible for all cutting and patching. The Contractor shall coordinate the work of the various trades involved.

13.2 DIMENSIONS

13.2.1 All dimensions shown shall be verified by the Contractor by actual measurements at the project site. Any discrepancies between the drawings and specifications and the existing conditions shall be referred to the Owner for adjustment before any work affected thereby has been performed.

13.3 LABORATORY TESTS

13.3.1 Any specified laboratory tests of material and finished articles to be incorporated in the work shall be made by bureaus, laboratories or agencies approved by the Owner and reports of such tests shall be submitted to the Owner. The cost of the testing shall be paid for by the Contractor.

13.3.2 The Contractor shall furnish all sample materials required for these tests and shall deliver same without charge to the testing laboratory or other designated agency when and where directed by the Owner.

13.4 ARCHAEOLOGICAL EVIDENCE

13.4.1 Whenever, in the course of construction, any archaeological evidence is encountered on the surface or below the surface of the ground, the Contractor shall notify the authorities of the Delaware Archaeological Board and suspend work in the immediate area for a reasonable time to permit those authorities, or persons designated by them, to examine the area and ensure the proper removal of the archaeological evidence for suitable preservation in the State Museum.

13.5 GLASS REPLACEMENT AND CLEANING

13.5.1 The General Contractor shall replace without expense to the Owner all glass broken during the construction of the project. If job conditions warrant, at completion of the job the General Contractor shall have all glass cleaned and polished.

13.6 WARRANTY

13.6.1 For a period of two (2) years from the date of substantial completion, as evidenced by the date of final acceptance of the work, the contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect of equipment, material or workmanship performed by the contractor or any of his subcontractors or suppliers. However, manufacturer's warranties and guarantees, if for a period longer than two (2) years, shall take precedence over the above warranties. The contractor shall remedy, at his own

expense, any such failure to conform or any such defect. The protection of this warranty shall be included in the Contractor's Performance Bond.

ARTICLE 14: TERMINATION OF CONTRACT

14.1 If the Contractor defaults or persistently fails or neglects to carry out the Work in accordance with the Contract Documents or fails to perform a provision of the Contract, the Owner, after seven days written notice to the Contractor, may make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor. Alternatively, at the Owner's option, and the Owner may terminate the Contract and take possession of the site and of all materials, equipment, tools, and machinery thereon owned by the Contractor and may finish the Work by whatever method the Owner may deem expedient. If the costs of finishing the Work exceed any unpaid compensation due the Contractor, the Contractor shall pay the difference to the Owner.

14.2 “If the continuation of this Agreement is contingent upon the appropriation of adequate state, or federal funds, this Agreement may be terminated on the date beginning on the first fiscal year for which funds are not appropriated or at the exhaustion of the appropriation. The Owner may terminate this Agreement by providing written notice to the parties of such non-appropriation. All payment obligations of the Owner will cease upon the date of termination. Notwithstanding the foregoing, the Owner agrees that it will use its best efforts to obtain approval of necessary funds to continue the Agreement by taking appropriate action to request adequate funds to continue the Agreement.”

END OF GENERAL REQUIREMENTS

EMPLOYEE DRUG TESTING REPORT FORM
Period Ending:_____

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds submit Testing Report Forms to the Owner no less than quarterly.

Project Number: _____

Project Name: _____

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Number of employees who worked on the jobsite during the report period:_____

Number of employees subject to random testing during the report period:_____

Number of Negative Results _____ Number of Positive Results _____

Action taken on employee(s) in response to a failed or positive random test:

_____

_____

_____

Authorized Representative of Contractor/Subcontractor: _____
(typed or printed)

Authorized Representative of Contractor/Subcontractor: _____
(signature)

Date: _____

EMPLOYEE DRUG TESTING
REPORT OF POSITIVE RESULTS

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors who work on Large Public Works Contracts funded all or in part with public funds to notify the Owner in writing of a positive random drug test.

Project Number: _____

Project Name: _____

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

_____

_____

Name of employee with positive test result: _____

Last 4 digits of employee SSN: _____

Date test results received: _____

Action taken on employee in response to a positive test result:

_____

_____

_____

Authorized Representative of Contractor/Subcontractor: _____
(typed or printed)

Authorized Representative of Contractor/Subcontractor: _____
(signature)

Date: _____

This form shall be sent by mail to the Owner within 24 hours of receipt of test results.

Enclose this test results form in a sealed envelope with the notation "Drug Testing Form – DO NOT OPEN" on the face thereof and place in a separate mailing envelope.

SECTION 01 71 13 – MOBILIZATION/DEMOBILIZATION

PART 1 - GENERAL

1.1 RELATED SECTIONS

A. Section 31 23 23 Sand Fill

B. Section 35 20 23.23 Hydraulic Dredging

1.2 GENERAL

A. This item shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various items on the project site.

B. DNREC will provide a staging area and material stockpile area at the Massey's Landing Parking Lot and the Indian River Inlet parking Lot; its limits shall be as shown on the drawings. All utilities for the Contractor's staging area shall be provided by the Contractor directly. No separate payment shall be made for any item required for the Contractor to enclose and set up his operational areas. Contractor shall restore the site to its original conditions, to the satisfaction of DNREC upon completion of the contract work; grassing is required as a part of the restoration. Prior to any work commencing, the Contractor and DNREC shall document the condition of existing area and roads with pictures and videos. No separate payment shall be made for any restoration work.

1.3 CONSTRUCTION LAYOUT

A. Contractor to provide all survey layout of all work to be constructed in this project so that all work is located and sized in conformance with the plans and specifications provided.

1.4 TEMPORARY FACILITIES

A. Contractor shall furnish for the duration of the project:

1. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
2. Field Trailers: To be 10' x 40' to accommodate needs of the construction personnel office activities and to accommodate project meetings. Keep office clean and orderly. Furnish and equip offices as follows:

    a. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
    b. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power and data (internet) service and 120-V ac duplex receptacles, with not less than one receptacle on each wall. Furnish room with conference table, chairs, and 4' square marker boards.
    c. Drinking water and private toilets.
    d. Coffee machine and supplies.

e. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 degrees F.
f. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.
g. Mini refrigerator.
h. Fire extinguisher.

3. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

a. Store combustible materials apart from building.

PART 2 - METHOD OF MEASUREMENT

2.1 SUM

A. The sum of Mobilization/Demobilization shall be limited to a maximum of 10% of the total contract bid.

PART 3 - BASIS OF PAYMENT

3.1 PARTIAL PAYMENTS

A. Partial payments for the sum of Mobilization/Demobilization will be made as follows:

Stages of Work	Percent of the Price to be Paid
Mobilization	60%
Demobilization	40%

3.2 PAYMENTS

A. Payment for Mobilization/Demobilization, Construction Layout, and Temporary Facilities will be made at the contract lump sum price. The price shall be full compensation for furnishing all materials and for providing all of the required items, and for all labor, equipment, fees, tools and incidentals necessary to complete the work from Notice to Proceed through the completion of the work.

B. Payment will be made under:

Item 1 Mobilization and Demobilization Per Lump Sum

-- End of Section –

SECTION 31 23 23 – SAND FILL

PART 1 - GENERAL

1.1 SUMMARY

A. The work covered by this section includes the furnishing and placement of sand fill, obtained from hydraulic dredging, for beach nourishment as shown on the Contract Drawings.

1.2 RELATED SECTIONS

A. Section 35 20 23.23 Hydraulic Dredging

1.3 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

B. Unless otherwise indicated the most recent edition of the publication, including any revisions, shall be used.

C. Delaware Department of Transportation (DelDOT) Standard Specifications for Road and Bridge Construction

D. American Society For Testing And Materials (ASTM)

ASTM D 422	(2007e2) Particle-Size Analysis of Soils
ASTM D 2216	(2010) Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D 2487	(2017) Classification of Soils for Engineering Purposes (Unified Soil Classification System)

1.4 SUBMITTALS

A. Atlantic Ocean Beach Fill Placement Plan

1. Prior to any work associated with the dredging and placement work, the Contractor shall submit a fill placement plan to the Engineer for approval. The plan shall include the following:

    a. Method and equipment for transporting the sand fill from the channel dredging site to the nourishment area including details on booster pumps if proposed.
    b. Method and equipment for placing the sand fill within the surf zone nourishment placement area.
    c. Sequencing of fill placement detailing location of placement, discharge pipe movement, and progression of fill.

d. Fuel spill control plan.
e. Schedule.
f. Spill containment plan.

B. Quality Control Plan: Procedures to be implemented to assure that sand material to be placed as fill comply with requirement specified herein.

C. Fill certification: The State has tested the material and certify that all fill material is uncontaminated as defined under 40 CFR 230.3.

PART 2 - PRODUCTS

2.1 BEACH FILL MATERIAL

A. The beach fill material shall be obtained from hydraulic dredging of Massey's Ditch.

2.2 PLACEMENT

A. General: The beach fill material shall be placed by hydraulic methods. The Contractor shall place the fill to achieve mixing in the surf zone as shown on the Contract Drawings. Fill placement shall comply with the sequence of construction shown on the drawings. Onsite stockpiling of sand fill material on land shall not be performed.

B. Grading and compaction of the sand fill shall not be required.

2.3 QUALITY CONTROL

A. The Contractor shall monitor placement volumes and locations and provide daily reports on the progression of the fill.

B. The Contractor shall have personnel at the discharge placement site whenever material is being pumped into the surf zone along the beach.

2.4 TOLERANCES

A. No tolerances for the fill placement are specified.

PART 3 - EXECUTION

3.1 GENERAL

A. The State of Delaware is the owner-operator of the Delaware Seashore State Park.

B. Inspection of the project site prior to the Contractor's submission of bids should be coordinated with DNREC, telephone number (302) 739-9921.

C. The Contractor's attendance shall be required at biweekly and other scheduled status meetings held at the Indian River Inlet during dredging operations.

3.2 PLACEMENT OF DREDGED MATERIAL

A. Placement of dredged material into the surf zone of the Atlantic Ocean at the Delaware Seashore State Park beach north of Indian River Inlet shall conform to the requirements and procedures set forth in Appendices 2 and 3 of these specifications, except as modified herein.

B. Land access to the beach placement area shall be from the Inlet Road off of Coastal Highway Route 1 to the DNREC parking area on the west side of Route 1, north of Indian River Inlet.

C. A joint inspection of the beach placement area will be conducted by the Contractor, DNREC and the Engineer prior to commencing operations and upon completion of operations to ascertain any damages or deficiencies. Placement location shall be based on site condition surveys at the time of commencement of placement operations.

D. The Contractor is advised that other activities may occur at the beach placement area. The Contractor shall be responsible for coordinating his activities with DNREC to avoid interference with each other's operations.

E. The dredged material shall be placed into the surf zone within the area shown on the Contract Drawings. The material shall be placed in a manner to evenly distribute the material and allow waves and currents to naturally disperse the material to the north and south. The material shall not be mounded along the beach and the discharge pipe shall be moved as necessary to achieve the dispersion of the dredged material into the surf zone. The maximum vertical height to which the material shall be placed is +6.00 feet above MLLW.

F. DNREC will have the authority to make decisions for movement of the discharge end of the pipe by the Contractor to meet the goals of the placement.

G. There is no limit to the horizontal distance to which the material shall be placed or moved by the waves and currents.

3.3 PLACEMENT OPERATIONS CRITERIA

A. Storage Areas

1. All operations related to the storage of equipment and materials shall be confined to the areas approved by DNREC. The Contractor shall include his requirements for storage space in his plan of operation submitted for approval.

2. Use of storage areas other than those approved by DNREC must be submitted for approval and not interfere with traffic or other operations. The Contractor shall not store pipe or equipment on vegetated dune areas.

3. Temporary buildings (storage sheds, shops, offices, etc.) may be erected and utilities may be installed by the Contractor upon approval by DNREC, and shall be built with labor and materials furnished by the Contractor without expense to DNREC. Such temporary buildings and utilities shall remain the property of the Contractor and shall be removed by him at his expense upon the completion of the

work. Upon approval by DNREC, such buildings and utilities may be abandoned and need not be removed.

4. The Contractor shall use only established roadways or construct and use such temporary roadways as may be authorized by DNREC. Where materials are transported in the prosecution of the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross any roadways, curbs or utilities, protection against damage shall be provided by the Contractor and any damaged roadways, curbs or utilities shall be repaired promptly by, or at the expense of the Contractor.

5. The Contractor shall be responsible for any necessary maintenance or improvement, and periodic clean-up of the storage areas.

B. Speed Limit: Observe all posted speed limits. Employees shall be cautioned to watch out for traffic and pedestrians, and to slow down in the vicinity of pedestrian crosswalks and paths, parking areas, and for pipe crossings. Vehicles shall be operated in a careful manner and any employee found to be operating his vehicle in a reckless manner will be denied the privilege of driving for the project.

C. Safety and Fire Protection: The Contractor, his subcontractors, and employees shall comply with all regulations regarding safety and fire protection. The Contractor shall familiarize himself and all personnel engaged in work under his direction, with the location of a telephone for fire reporting. Bottles, cans and other trash shall be placed in trash receptacles to eliminate safety hazards. No burning will be allowed.

D. The Contractor shall be responsible for the maintenance and repair to roads, rights-of-way, and other access points throughout the Contractor's performance at the project site. This responsibility includes only those roads and areas that the Contractor actually uses in his operations. Maintenance of roadways shall include the control of dust that may occur as a result of the Contractor's activities. The Contractor may employ only those methods of dust control that have been approved by the Engineer.

E. Upon completion of the work and before final payment will be made, all areas occupied and used by the Contractor for the operation at the beach placement area shall be cleaned of all rubbish, temporary structures, and buildings that were placed thereon by the Contractor. All dredged materials that were spilled or misplaced by the Contractor shall be cleaned up as directed by the Engineer.

PART 4 - COMPENSATION

4.1 MEASUREMENT

A. Sand Fill shall not be measured.

4.2 PAYMENT

A. Payment for Sand Fill Placement, complete in place, shall be included in the Unit Price Bid per cubic yard under Item No. 2 Hydraulic Dredging, on the Bid Form. This price shall include all transporting and placing.

B. The above prices shall include all the work described in this Section and shown on the Contract Drawings including all labor, materials, services, and equipment necessary to complete the work in every respect to the satisfaction of the Engineer.

-- End of Section –

SECTION 35 20 23.23 – HYDRAULIC DREDGING

PART 1 – GENERAL

1.1 SCOPE

A. The work to be performed under this contract includes furnishing of all plant, labor, materials, and equipment and the performance of all work required to complete the dredging, transport and placement of the dredged material as shown on the Contract Drawings and as herein specified or directed by the Engineer. The work requires dredging Massey's Ditch from the Rehoboth Bay south to Indian River Bay, and includes the satisfactory placement of the dredged material into the surf zone of the Atlantic Ocean beach north of Indian River Inlet. Allowable overdepth dredging is included in this contract and will be paid for at the applicable required dredging rate.

B. The materials to be removed under this Contract primarily consist of sand. Other materials may be encountered including mud, silt, cobbles, debris, trash, and combinations thereof.

1.2 RELATED SECTIONS

A. Section 31 23 23 Sand Fill

1.3 REFERENCES

A. Appendix 1 – Geotechnical Reports and Chemistry Analytical Report

B. Appendix 2 – DNREC Subaqueous Permit & Coastal Management Consistency Review

C. Appendix 3 – U.S. Army Corps of Engineers (USACE) Permit

D. U.S. Army Corps of Engineers - Engineers Manual (EM)
EM 1110-2-1003 Engineering and Design – Hydrographic Surveying

1.4 PRE-BID ACTIVITIES

The Owner/Engineer has performed, prior to and as close as practical to the time of advertisement, hydrographic and soil condition surveys of the area to be dredged in sufficient detail to make a determination of the conditions of the area to be dredged and as a basis for the estimated quantities in the contract documents. Any additional pre-bid surveys performed by bidders shall be at no expense to the Owner.

1.5 ORDER OF WORK

The Contractor shall control the order of all work. Should the Contractor place more than one dredge unit on the contract, the additional dredge unit(s) shall be approved by the Engineer. The Contractor shall submit a written plan of his order of work for the approval of the Engineer prior to commencement of the work. This plan shall detail the Contractor's operational method for dredging, dredged material transportation, and placement of all dredged materials. The Contractor shall determine the requirements for staging and fabrication areas for dredging equipment based on his proposed operational methods. Acquisition of real estate interests in any such area and/or required permits for the

particular type land use shall be the sole responsibility of the Contractor, the Owner being held harmless from any liability or legality of procurement, use, or restoration. The Contractor shall give the Engineer ten (10) days written advance notice of the date he plans to modify his order of work in order that required Owner actions may be started sufficiently in advance of the Contractor's operations.

1.6 CHARACTER OF MATERIAL

A. The sampling location plan is shown on the Contract Drawings and the results of laboratory tests on soils are located in Appendix 1 of these specifications. Sampling results include physical and chemical composition, including grain size analysis and plasticity characteristics. The Contractor shall make his own interpretation(s) of this information in determining the character of materials to be excavated.

B. Materials to be removed under this contract within the required dredging prism consist of primarily channel maintenance materials consisting of sand. Large and small debris may exist within the limits of the required dredging, although the Engineer is not aware of any debris.

1.7 OBSTRUCTIONS

The Owner has no knowledge of existing wrecks, abandoned structures, or other material within the indicated limits of dredging of such size or character that would require the use of special or additional plant for its economical removal.

1.8 SUBMITTALS

A. Prior to any dredging work, the Contractor shall submit the following for approval by the Engineer. No work shall begin without approval by the Engineer.

B. Dredging Operation Plan including the following:

1. Complete project team organization with duties, responsibilities, and authorities clearly defined.
2. Names and specifications for all dredging and support plant to be used for each specific work element.
3. Order of work.
4. Schedule.
5. Detailed anchoring and mooring plans.
6. Plan for marking and lighting of floating plant and equipment.
7. Survey Plan: Written plan presenting the job survey effort.
8. Coordinates and land elevations of all control points for electronic positioning and vertical control.
9. Certificates: Manufacturer's guarantee of accuracy of electronic positioning system for dredging surveys.
10. Quality Control procedures.
11. Plan for inspection, identification, handling and disposal of munitions of concern.
12. Spill Containment Plan
13. Accident Prevention Program Plan: Written plan describing the Contractor's Accident Prevention Program

C. Independent Hydrographic Surveyor Qualifications: The Contractor shall be responsible for providing an independent surveyor to perform pre-dredge, progress, and post-dredge hydrographic surveys to determine the volume of all material removed for payment. The surveyor's equipment and workforce shall be independent from the Contractor's. The independent surveyor must be able to document in writing to the Engineer at least three (3) years of experience in hydrographic surveying of navigable channels and possess a current land surveyor's license valid in the State of Delaware. The Contractor shall submit the Independent Hydrographic Surveyor's qualifications to the Engineer for review and approval prior to performing any dredging.

D. Dredging Progress Plan: The Contractor shall prepare and maintain a daily progress plan of the dredging work. The plan shall have the same scale as that of the Contract Drawings for the area being dredged and shall be marked to indicate the progress of the dredging work on a daily basis. Soundings shall be taken as the dredging progresses and they shall be plotted on the progress plan. These records shall be turned over to the Owner at the end of work.

E. Pre-dredging survey as specified in Paragraph 3.1.

F. Post-dredging survey as specified in Paragraphs 3.5 and 3.6.

1.9 NOTICES

A. Start Work. The Contractor shall give the Engineer ten (10) days advance written notice of the date he plans to commence dredging work under this contract in order that required Owner actions may be started sufficiently in advance of the Contractor's operations.

B. Work Hours. Should the Contractor elect to work on Saturdays, Sundays, holidays, or nights, advance notice of this intent shall be given the Engineer within a reasonable time, specifying both the dates and hours to be worked. Adequate lighting to facilitate thorough inspection of night operations shall be provided by the Contractor at no additional cost to the Owner.

PART 2 – PRODUCTS

Not Used**.**

PART 3 – EXECUTION

3.1 PRE-DREDGING SURVEY

A. Once the dredging contract is awarded, pre-dredging surveys shall be performed over the contract area at the expense of the Contractor. Pre-dredging surveys shall be performed as close to the start of dredging as possible, within fourteen (14) days prior to commencement of work in the section to be dredged. Plots and electronic files of the pre-dredge surveys and related quantities requiring excavation shall be submitted for the approval of the Engineer prior to the commencement of the work.

B. Hydrographic surveys shall be completed by a licensed and qualified independent surveyor. Surveys shall be taken on section lines at minimum 25-foot stations perpendicular to the baseline of dredging and on minimum ten (10) foot centers along each section line. Additionally, the Engineer may direct the Contractor to take longitudinal survey profiles to see if there are any excessive ridges or shoals in between the section lines.

C. Hydrographic surveys shall be accomplished with the use of a survey vessel having an automated acquisition system. Horizontal location of survey lines and depth sounding points shall be determined by the use of an automated positioning system utilizing a differential global positioning system. All hydrographic surveys conducted shall follow the guidelines as referenced in the U.S. Corps of Engineers Hydrographic Surveying Manual EM 1110-2-1003, dated 01 April 2004, for navigation and dredging support surveys for soft bottom material. Electronic single beam cross sections, on 25-foot station intervals, shall be utilized to compute the volume of material removed. All electronic echo sounders shall operate nominally at 200 kHz, ±10% of the frequency. On automated surveys, position and depth data will be collected, stored on magnetic or optical media, and subsequently processed by the Surveyor for map preparation and quantity computations.

D. Horizontal and vertical datum for hydrographic surveys shall match the datum on the Contract Drawings.

3.2 DREDGING

A. General: Dredging under this contract shall include removal, transportation, and satisfactory placement of dredged materials as shown on the Contract Drawings and described herein. Dredging limits shown on the Contract Drawings were defined based on surveys performed during the development of these specifications. These limits may require adjustment based on pre-dredging surveys.

B. Required Dredging: Required dredging under this contract includes all materials lying above the minus 6.5-foot bottom reference plane, as referenced to Mean Lower Low Water (MLLW) tidal datum based on the bench mark noted in the Contract Drawings, over the limits of dredging as shown on the Contract Drawings.

C. Hydraulic Dredging: Material shall be excavated by hydraulic pipeline dredges. Material shall be pumped to the designated placement area; booster pumps shall be used as needed. Pipes shall be kept in good water-tight condition to prevent leakage of material. Failure to repair leaks or change methods of operations that cause spillage will result in suspension of dredging operations and require prompt repair or change of operation to prevent leakage or spillage.

D. Side Slopes: Dredging on side slopes shall follow, as closely as practicable, the lines indicated or specified. The Contractor shall be paid for removal of material located above side slopes of 1V:3H originating at the dredge limit as shown on the Contract Drawings. Material removed from below the slope line will be considered excessive dredging. The removal of side slope material is not required where proximity to existing structures limits dredge access, provided a stable slope is achieved at the limits of dredging.

E. Allowable Overdepth: To perform advanced maintenance and accommodate the imprecision of the dredging process, contractor shall dredge up to 1.0 foot deeper than

the design depth as shown on the Contract Drawings. Material actually removed from within the specified overdepth area will be paid for at the contract unit price for dredging. Side slopes for allowable overdepth shall be vertical. Overdepth dredging shall be paid for only in areas where pre-dredge survey depths are shallower than the proposed design depth.

F. Excessive Dredging: Material removed from beyond the limits of dredging or below the allowable overdepth as specified on the Contract Drawings shall be considered excessive dredging for which payment will not be made. Nothing herein shall be construed to prevent payment for the removal of shoals performed in accordance with the specifications herein. The Contractor should be aware that dredging of material below depths authorized in the related permits will expose him to potential legal action and fines from Federal and State regulatory agencies.

G. Shoaling: If, before the Contract is completed, shoaling occurs in any section previously accepted, the Engineer may direct the Contractor to re-dredge the shoaled areas at the Unit Price Bid.

H. Notification of the U.S. Coast Guard: Prior to commencement of work on this Contract, the Contractor shall notify the Commander, Fifth Coast Guard District, of his intended operations to dredge and request that it be published in the Local Notice to Mariners. This notification must be given in sufficient time so that it appears in the Notice to Mariners at least one week prior to the commencement of the dredging operation.

I. Navigational Aids: The Contractor shall not relocate or move any aids to navigation that have been established by the U.S. Coast Guard. If it becomes necessary to have any aid to navigation moved in order to complete dredging operations under this Contract, the Contractor shall notify the U.S. Coast Guard Sector Delaware Bay, Philadelphia, PA, in writing with a copy to the Engineer not less than fifteen (15) days prior to such need for movement. The Contractor shall notify the U.S. Coast Guard of the appropriate time the navigation aid may be relocated to its original position.

J. Signal Lights: The Contractor shall display signal lights and conduct his operations in accordance with the General Regulations of the U.S. Coast Guard governing lights and day signals to be displayed by dredges held in a stationary position by moorings or spuds and by towing vessels with tows on which no signals can be displayed.

K. Vessel Traffic: The Owner will not attempt to keep the existing channel free from vessels or other obstructions. The Contractor shall conduct the work in such a manner as to minimize obstruction to navigation, and in case the Contractor's plant so obstructs the channel as to make difficult or endanger the passage of vessels, said plant shall be promptly moved on the approach of any vessel to such an extent as may be necessary to afford a practicable and safe passage. In order to facilitate the prompt relocation of the Contractor's plant to allow safe passage of vessels (docking or sailing), Contractor's plant must be equipped with a ship-to-ship radio which is capable of transmitting and receiving on both Channel 13 (ship-to-ship) and Channel 16 (hailing/emergency).

L. Explosives, Unexploded Ordnance, or Munitions of Concern: Prior to commencement of dredging, the Contractor shall submit a plan for the inspection, identification, handling and disposal of munitions of concern to the Engineer for approval. The Contractor shall continually inspect the dredging operations area to determine the presence of any

munitions or similar items that may be encountered during the course of the work. Should such inspections detect any such items, the Contractor shall immediately notify the Owner and suspend or limit operations in order to protect personnel, equipment, and property from harm. Operations involving handling of material suspected to contain munitions or other suspect materials shall be suspended until inspected and cleared for activity by a certified and authorized representative of the designated Agency. The Contractor shall attempt no handling or disposal of munitions or similar materials.

3.3 PLACEMENT OF DREDGED MATERIAL

A. Placement of dredged material shall be into the surf zone of the Atlantic Ocean beach north of Indian River Inlet. Refer to Specification Section 31 23 23 for details.

3.4 POST-DREDGING SURVEY

A. After dredging in a section is completed, post-dredging surveys shall be performed over the contract area at the expense of the Contractor. Post-dredging surveys shall be performed as close to the completion of dredging activity as possible, within fourteen (14) days or less. The Contractor shall notify the Engineer when soundings are to be made. Plots and electronic files of the post-dredging survey and final quantity computations shall be submitted for the approval of the Engineer for final examination and acceptance of the work.

B. Hydrographic surveys shall be completed as specified in Section 3.1 Parts B through D.

3.5 FINAL EXAMINATION AND ACCEPTANCE

A. If any shoals, lumps, or lack of design depth be disclosed by examination of the post-dredging survey, the Contractor shall be required to continue dredging until the design depth is obtained. If the bottom material is soft and the shoal areas are small and form no material obstruction to navigation, the removal of such shoals may be waived at the discretion of the Engineer. At the completion of any additional dredging, a new post-dredging survey shall be completed at the expense of the Contractor. The Contractor shall notify the Engineer when additional soundings are to be made. Plots and electronic files of the new post-dredging survey and final quantity computations shall be submitted for the approval of the Engineer for final examination and acceptance of the work. When the area is found to be in a satisfactory condition, it will be accepted as final.

B. After acceptance of the completed work by the Owner, the Contractor shall prepare and submit to the Engineer final survey information in hardcopy and electronic (AutoCAD) formats. Survey data shall include plan view drawings with soundings (bathymetry plot), channel lines, features, and other structures at 1-inch = 50-feet scale, dredging area cross-sections at minimum 25-foot stations perpendicular to the baseline of dredging showing pre-dredging and post-dredging surfaces with the design dredging template, and processed survey data. Dates of the surveys and horizontal and vertical datum shall be provided with the survey data.

C. Final Acceptance of work and corrections made thereon will not be reopened after having once been made, except on evidence of collusion, fraud or obvious error, and the acceptance of a completed section shall not change the time of payment of the retained percentages of the whole or any part of the work.

PART 4 – COMPENSATION

4.1 MEASUREMENT

A. Dredging and Dredged Material Placement shall be measured on a cubic yard basis. Volumes shall be calculated by computing the total volume between the bottom surface shown by soundings of the pre-dredging survey approved by the Engineer and the bottom surface shown by the soundings of the post-dredging survey approved by the Engineer and accepted as final, within the limits of allowable overdepth as described above. Payment will not be made for excessive dredging.

B. The volume of material removed and paid for shall be computed using the Average End Area Method comparing sections from the pre-dredging and post-dredging hydrographic surveys. Both surveys shall be controlled from the same common baseline of dredging and the same common horizontal and vertical datum as shown on the Contract Drawings. Surveys shall be taken on section lines at minimum 25 foot stations perpendicular to the baseline and on minimum ten (10) foot centers along each section line. Survey drawings shall include plan view and cross-sections at each section line extending beyond the adjacent federal channel limit.

4.2 PAYMENT

A. Payment for “Hydraulic Dredging and Placement (100,000 cubic yards),” complete, shall be made at the Lump Sum under Item No. 2 on the Bid Form under the Bid Quantities section.

B. Payment for addition or deduction of the Lump Sum quantity for “Hydraulic Dredging per cubic yard,” complete, shall be made at the Unit Price Bid per cubic yard under Item No. 1 on the Bid Form under the Unit Prices section.

C. The above prices shall include all the work described in this Section and shown on the Contract Drawings including all labor, materials, supplies, services, loading, unloading, transportation, fuel power, water surveys, and equipment necessary to complete the work in every respect to the satisfaction of the Engineer.

-- End of Section –

APPENDIX 1

GEOTECHNICAL REPORTS

AND

CHEMISTRY ANALYTICAL REPORT

JOHN D. HYNES & ASSOCIATES, INC.

Geotechnical and Environmental Consultants
Monitoring Well Installation
Construction Inspection and Materials Testing

July 17, 2014

Edward T. Fulford, P.E.
Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

Re: Report of Subsurface Exploration and Laboratory Testing Services
DNREC Open End Contract 2012-Coastal Engineering – Massey's Channel Dredging
Sussex County, Delaware
Project No.: JDH-10/13/123-3

Dear Mr. Fulford:

John D. Hynes & Associates, Inc. has completed the authorized subsurface exploration and laboratory testing services for the Massey's Channel Dredging located in Sussex County, Delaware. Our services were conducted, generally, in accordance with our proposal dated December 4, 2013, and subsequent communications between our offices.

This report describes the exploration methods employed, exhibits the data obtained, and presents the soil boring logs. Our report also includes the laboratory test results for the channel.

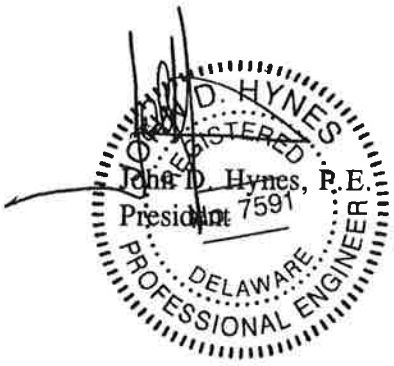
We appreciate the opportunity to be of service to you. If you have any questions regarding the contents of this report or if we may be of further assistance, please contact our office.

Respectfully,

JOHN D. HYNES & ASSOCIATES, INC.

Justin J. Redding, E.I.
Staff Engineer

JJR: JDH/jsl



John D. Hynes, P.E.
President 7591

32185 Beaver Run Drive • Salisbury, Maryland 21804 • 410-546-6462 • Fax 410-548-5346

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REPORT OF
SUBSURFACE EXPLORATION
AND
LABORATORY TESTING SERVICES

DNREC OPEN END CONTRACT 2012-COASTAL ENGINEERING-MASSEY'S CHANNEL DREDGING
SUSSEX COUNTY, DELAWARE

PREPARED FOR
ANDREWS, MILLER & ASSOCIATES, INC.

JULY 17, 2014
PROJECT NO.: JDH-10/13/123-3

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PURPOSE AND SCOPE

The subsurface exploration study was performed to evaluate the subsurface conditions with respect to the following:

1. Determine soil profiles along channel; and
2. Test gradation of materials to be dredged.

The evaluation was performed to determine the types of soil materials that will be encountered while dredging Massey's Channel. The Engineer will use this data to estimate quantities of materials to be excavated and disposed of at the dredge material placement (DMP) Basin.

EXISTING SITE CONDITIONS

As shown on our Project Location Map (Drawing No.: JDH-10/13/123-3-A) in the Appendix, the project site is Massey's Channel, which is just south of Rehoboth Bay. An existing channel extends from the existing Massey's Channel out into the Rehoboth Bay towards the north. Topographically, the depth of the existing channel varies generally between Elevation -0.9 and -16.9 feet MLLW.

FIELD EXPLORATION AND STUDY

In order to determine the nature of the subsurface conditions at the site, 40 borings, designated 301 through 340, were drilled to various depths between May 14, 2013 and May 29, 2014. The borings were drilled to depths of 1 feet to 6.5 feet deep below the mudline, using a hand auger positioned within a driven casing. Boring 340 was drilled using a Mobile B-47 HD drill rig to a depth of 7 feet below the mudline. A Hynes & Associates boat was used for the drilling. The results of all boring and sampling operations are shown on the boring logs.

Andrews, Miller & Associates, Inc. selected the test boring locations and provided Hynes & Associates with coordinates for the test boring locations. Hynes & Associates used a GPS to locate the test borings on the water.

Samples of the subsurface soils were examined by our engineering staff and were visually classified in accordance with the Unified Soil Classification System (USCS) and ASTM Specification D-2488. The estimated USCS symbols appear on the boring logs and a key to the system nomenclature is provided in the Appendix of this report. Also included are reference sheets which define the terms and symbols used on the boring logs.

We note that the test boring records represent our interpretation of the field data based on visual examination and selected soil classification tests. Indicated interfaces between materials may be gradual.

The field exploration data was supplemented with laboratory testing data. The laboratory at John D. Hynes & Associates, Inc. performed 40 Sieve Analysis tests. The test results are noted in Particle Size Data Tables in the Appendix. Testing guidelines transmitted by DNREC and passed along by AMA indicated that for the Channel borings, all samples that are predominantly sands should be evaluated by Sieve Analysis.

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SUBSURFACE CONDITIONS

Considering the 40 borings drilled, boring depths varied between 1.5 feet and 5 feet. Mudline grade varied between Elevation -3.6 to Elevation -7. The borings consisted predominantly of SANDs (SP), but also included low-silt SANDs (SP/SM), Silty SANDs (SM), Clayey SANDs (SC), and Silty CLAY (CL) to boring termination depth. Test results should be referred to in the Sieve Analysis reference tabulations in the Appendix for more specific soil characteristics of the in-place channel soils. Refer to the boring logs for the soil layering at each boring location. We note that some percentage of silt and/or organic silt may have washed out of samples during the drilling operations because of the process of sampling in the water.

PROJECT CHARACTERISTICS

Proposed for development is a deepening of Massey's Channel to a depth of Elevation -8 MLLW. Material from the dredging phase of the project is proposed to be disposed of in a newly constructed dredge material placement (DMP) basin constructed at the shore and south of Middle Island. The evaluation and recommendations by Hynes & Associates related to the DMP basin construction is presented under a separate report.

REMARKS

This report has been prepared solely and exclusively for Andrews, Miller & Associates, Inc. to provide guidance to design professionals in developing plans for the Massey's Channel Dredging project located in Sussex County, Delaware. It has not been developed to meet the needs of others, and application of this report for other than its intended purpose could result in substantial difficulties. The Consulting Engineer cannot be held accountable for any problems which occur due to the application of this report to other than its intended purpose. Additional recommendations can be provided as necessary.

These analyses and recommendations are, of necessity, based on the concepts made available to us at the time of the writing of this report and on-site conditions, surface and subsurface that existed at the time the exploratory borings were drilled. Further assumption has been made that the limited exploratory borings, in relation both to the areal extent of the site and to depth, are representative of conditions across the site. If conditions are encountered during construction which differ significantly from those reported herein, our office should be notified so that our recommendations can be reviewed and revised as necessary. It is also recommended that we be given the opportunity to review the plans and specifications in order to comment on the interaction of soil conditions as described herein and the design requirements. This report, in its entirety, should be attached to the project specifications.

Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with generally accepted engineering principles and practices.

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APPENDIX

1. Investigative Procedures
2. Project Location Map
3. Boring Location Plans
4. Boring Logs
5. Particle Size Data Tables
6. Unified Soil Classification Sheet
7. Field Classification Sheet
8. Information Sheet

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INVESTIGATIVE PROCEDURES

SOIL TEST BORINGS

Soil drilling and sampling operations were conducted in accordance with ASTM Specification D-1586. The borings were advanced by mechanically turning continuous hollow stem auger flights into the ground. At regular intervals, samples were obtained with a standard 1.4 inch I.D., 2.0 inch O:D. splitspoon sampler. The sampler was first seated 6 inches to penetrate any loose cuttings and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot is the "Standard Penetration Resistance". The penetration resistance, when properly evaluated, is an index to the soil's strength, density and behavior under applied loads. The soil descriptions and penetration resistances for each boring are presented on the Test Boring Records in the Appendix.

SOIL CLASSIFICATION

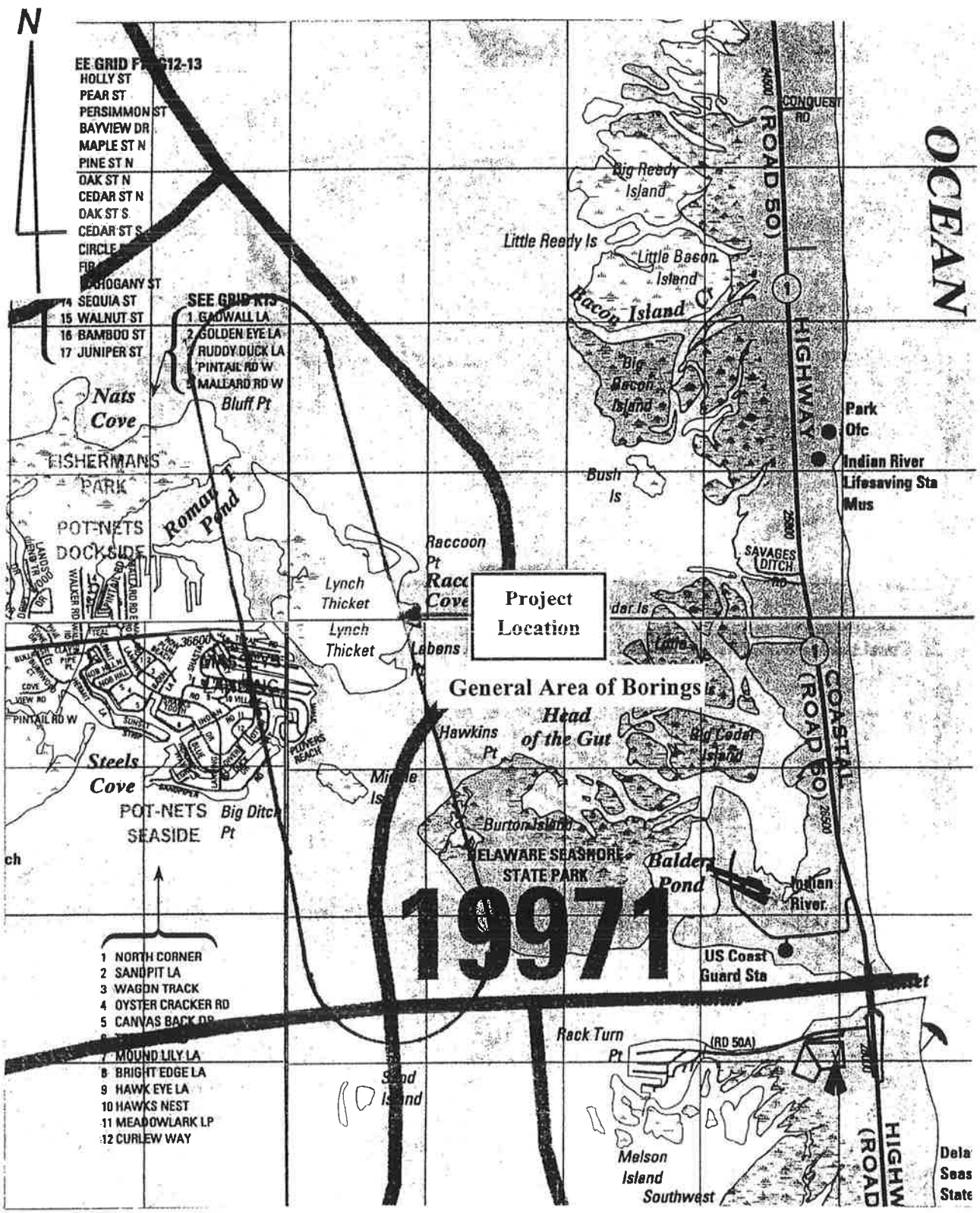
Soil classifications provide a general guide to the engineering properties of various soil types and enable the engineer to apply his past experience to current problems. In our investigation, jar samples obtained during drilling operations are examined in our laboratory and visually classified by the geotechnical engineer in accordance with ASTM Specification D-2488. The soils are classified according to the AASHTO or Unified Classification System (ASTM D-2487). Each of these classification systems and the in-place physical soil properties provides an index for estimating the soil's behavior.

SIEVE ANALYSIS

Gradational analysis tests were performed to determine the particle size and distribution of the samples tested. The grain size distribution of soils coarser than a No. 200 sieve is determined by passing the sample through a standard set of nested sieves. The percentage of materials passing the No. 200 sieve is determined by washing the material over a No. 200 sieve. These tests are in accordance with ASTM D-421, D-422 and D-1140 including the hydrometer. The results are presented in the Appendix to our report.

NATURAL MOISTURE

Portions from representative soil samples obtained during drilling operations were selected for Natural Moisture Content tests. The Natural Moisture Content Test determines the water content of soils by drying into an oven with a standard drying temperature of 110 °C. The lost of mass drying the sample, determines the water content into the soil. The water content of the sample is calculated in percentage. The water content of soils (natural moisture) is determined in accordance with ASTM Specification D-2216.



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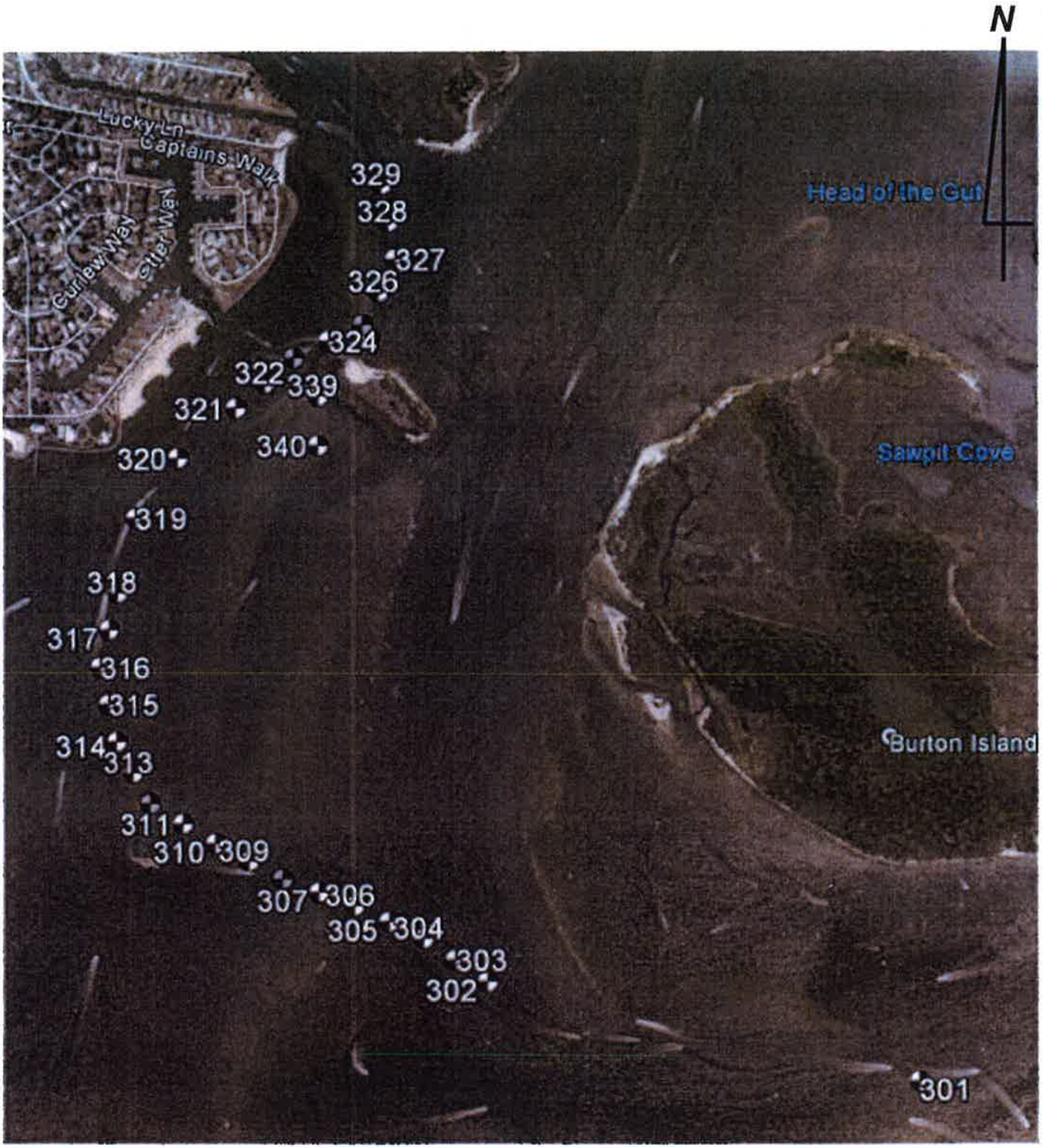
Date: May 16, 2014
Scale: 1 in.= 2,000 ft.
Drawn: ADC Map

Project Location Map
DNREC – Massey's Channel Dredging
Sussex County, Delaware

DWG. No.
JDH-10/13/123-3-A



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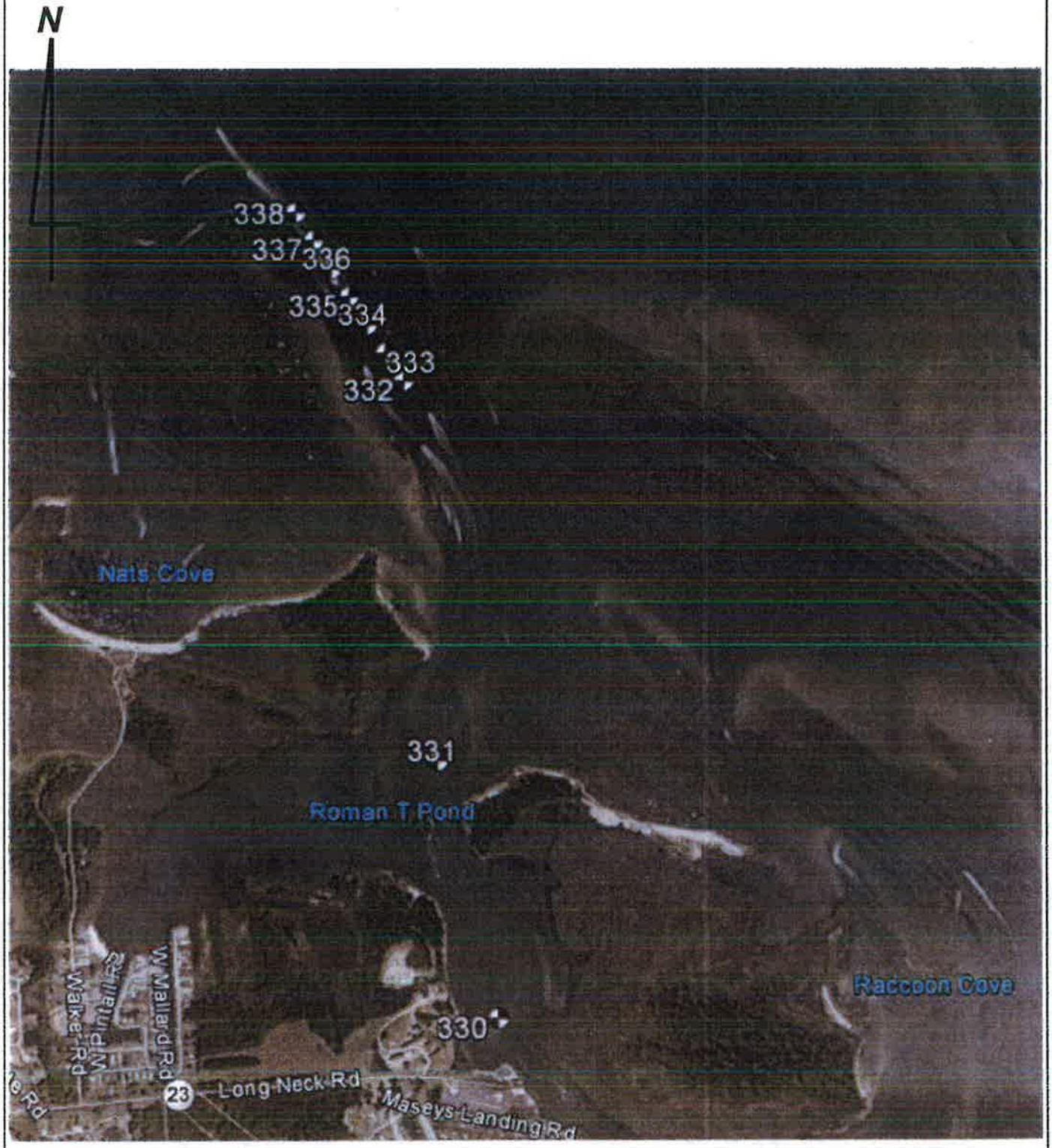
	Date: May 16, 2014
	Scale: 1 in. = 1,218 ft.
	Drawn: Google
Boring Location Plan DNREC – Massey's Channel Dredging Sussex County, Delaware	**DWG. No.** **JDH-10/13/123-3-B-1**



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410-546-6462 / Fax: 410-548-5346

	Date: May 16, 2014
	Scale: 1 in. = 1,400 ft.
	Drawn: Google
Boring Location Plan DNREC – Massey's Channel Dredging Sussex County, Delaware	**DWG. No.** **JDH-10/13/123-3-B-2**

HYNES & ASSOCIATES

LOG OF BORING 301

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 15, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 2 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Gray, saturated, fine to medium SAND, with trace clay, trace organic silt, trace shells		SM	1	Scale 1" ~ 2.5 feet Water depth at 8 feet.
1	Gray, saturated, fine to medium SAND, with little organic silt, trace clay		SM	2	
2	Boring terminated at 2 feet.				
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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LOG OF BORING 302

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: May 15, 2014
Logged By: J. Redding
Drilled By: M. Hynes
Drilling Method: Hand Auger
Total Depth: 2.5 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Brown, saturated, fine to coarse SAND, with trace silt		SP	1	Scale 1" ~ 2.5 feet Water depth at 7 feet.
1					
2	Gray, saturated, fine to coarse SAND, with trace silt, trace fine gravel		SP	2	
	Boring terminated at 2.5 feet.				
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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LOG OF BORING 303

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 15, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Brown to gray, saturated, fine to coarse SAND, with trace fine gravel, trace silt		SP	1	Scale 1" ~ 2.5 feet Water depth at 8.5 feet.
1	Boring terminated at 1 feet.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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LOG OF BORING 304

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Gray, saturated, fine to coarse SAND, with trace organic silt		SP	1	Scale 1" ~ 2.5 feet
1	Boring terminated at 1 feet.				
2					
3					
4					
5					
6					
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10					
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13					
14					
15					

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LOG OF BORING 305

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 3 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light brown, saturated, fine to medium SAND, with trace silt		SP	1	Scale 1" ~ 2.5 feet
1					
2	Light gray, saturated, fine to medium SAND, with trace silt		SP	2	
3	Boring terminated at 3 feet.				
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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LOG OF BORING 306

Andrews, Miller & Associates
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Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 4.5 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light brown, saturated, fine to medium SAND, with trace silt		SP	1	Scale 1" ~ 2.5 feet
2	Light gray, saturated, fine to medium SAND, with trace silt		SP	2	
3				3	
4	Boring terminated at 4.5 feet.				
5					
6					
7					
8					
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14					
15					

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LOG OF BORING 307

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 4.5 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light gray, saturated, fine to medium SAND, with trace silt		SP	1	Scale 1" ~ 2.5 feet
1					
2				2	
3					
4				3	
	Boring terminated at 4.5 feet.				
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 308

Andrews, Miller & Associates
108 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1 foot

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light brown, saturated, fine to medium SAND, with trace silt		SP	1	Scale 1" ~ 2.5 feet
1	Boring terminated at 1 foot.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
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14					
15					

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LOG OF BORING 309

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1.75 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Gray, saturated, fine to medium SAND, with trace organic silt		SP	1	Scale 1" ~ 2.5 feet
2	Boring terminated at 1.75 feet.				

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LOG OF BORING 310

Andrews, Miller & Associates
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Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 4.5 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light g4ray, saturated, fine to coarse SAND, with trace organic silt		SP	1	Scale 1" ~ 2.5 feet
1	Gray, saturated, fine SAND, with little to some organic silt		SM	2	
2					
3				3	
4					
5	Boring terminated at 4.5 feet.				
6					
7					
8					
9					
10					
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12					
13					
14					
15					

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LOG OF BORING 311

Andrews, Miller & Associates
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Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 6.25 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Gray, saturated, fine to medium SAND, with trace organic silt		SP	1	Scale 1" ~ 2.5 feet
1					
2				2	
3				3	
4					
5	Light gray, saturated, fine to medium SAND, with trace organic silt		SP	4	
6	Boring terminated at 6.25 feet.				
7					
8					
9					
10					
11					
12					
13					
14					
15					

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LOG OF BORING 312

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 4.75 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Dark gray, saturated, fine SAND, with little organic silt		SM	1	Scale 1" ~ 2.5 feet
2	Gray, saturated, fine SAND, with little organic silt		SM	2	
3	Light gray, saturated, fine to coarse SAND, with little organic silt		SM	3	
4					
5	Boring terminated at 4.75 feet.				
6					
7					
8					
9					
10					
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12					
13					
14					
15					

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LOG OF BORING 313

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 4.5 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Dark gray, saturated, fine to coarse SAND, with little organic silt		SM	1	Scale 1" ~ 2.5 feet
2	Dark gray, saturated, fine to medium SAND, with little organic silt		SM	2	
3	Light gray, saturated, fine to coarse SAND, with trace organic silt		SP	3	
4	Boring terminated at 4.5 feet.				
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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LOG OF BORING 314

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 4 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light gray, saturated, fine to medium SAND, with trace to little organic silt		SP/SM	1	Scale 1" ~ 2.5 feet
1					
2	Light gray, saturated, fine to coarse SAND, with trace organic silt		SP	2	
3				3	
4	Boring terminated at 4 feet.				
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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LOG OF BORING 315

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 4 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0–1	Light gray, saturated, fine to coarse SAND, with trace organic silt, trace shells		SP	1	Scale 1" ~ 2.5 feet
1–3	Light gray, saturated, fine to coarse SAND, with trace silt		SP	2, 3	
4	Boring terminated at 4 feet.				
5–15					

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LOG OF BORING 316

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 2.5 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Dark gray, saturated, fine to coarse SAND, with some organic silt		SM	1	Scale 1" ~ 2.5 feet
1					
2	Gray, saturated, fine to coarse SAND, with trace fine gravel, trace organic silt		SP	2	
	Boring terminated at 2.5 feet.				
3					
4					
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6					
7					
8					
9					
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11					
12					
13					
14					
15					

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LOG OF BORING 317

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1.25 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Gray, saturated, fine to coarse SAND, with trace to little organic silt		SM	1	Scale 1" ~ 2.5 feet
1	Boring terminated at 1.25 feet.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 318

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 15, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1 foot

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Gray, saturated, fine to coarse SAND, with trace organic silt		SP	1	Scale 1" ~ 2.5 feet Water depth at 8.5 feet.
1	Boring terminated at 1 feet.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 319

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 15, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1 foot

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Gray, saturated, fine to coarse SAND, with trace organic silt		SM	1	Scale 1" ~ 2.5 feet Water depth at 7.5 feet.
1	Boring terminated at 1 foot.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 320

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 28, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1 foot

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Gray, saturated, fine to coarse SAND, with trace fine gravel, trace to little organic silt		SP/SM	1	Scale 1" ~ 2.5 feet Water depth at 9 feet.
1	Boring terminated at 1 foot.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 321

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 15, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 3 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light brown, saturated, fine to coarse SAND, with trace silt		SP	1	Scale 1" ~ 2.5 feet Water depth at 10 feet.
2	Light gray, saturated, fine to coarse SAND, with trace fine gravel, trace silt		SP	2	
3	Boring terminated at 3 feet.				
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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LOG OF BORING 322

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 15, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 3 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light brown to light gray, saturated, fine to coarse SAND, with trace organic silt		SP	1	Scale 1" ~ 2.5 feet
1					Water depth at 8.5 feet.
2				2	
3	Boring terminated at 3 feet.				
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 323

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 15, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 3 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light gray, saturated, fine to coarse SAND, with trace fine gravel, trace silt		SP	1	Scale 1" ~ 2.5 feet
1					Water depth at 8.5 feet.
2				2	
3	Boring terminated at 3 feet.				
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 324

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 6.25 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0–1	Gray, saturated, fine to medium SAND, with trace to little organic silt		SP/SM	1	Scale 1" ~ 2.5 feet
1–6	Light gray, saturated, fine to coarse SAND, with trace organic silt		SP	2, 3, 4	
6	Boring terminated at 6.25 feet.				

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LOG OF BORING 325

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 6 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light brown, saturated, fine to coarse SAND, with trace silt		SP	1	Scale 1" ~ 2.5 feet
2	Light brown to light gray, saturated, fine to coarse SAND, with trace silt		SP	2	
3	Gray, saturated, fine to coarse SAND, with trace organics		SP	3	
4				4	
6	Boring terminated at 6 feet.				

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 15, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 4 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Gray and light brown, saturated, fine to coarse SAND, with trace organic silt		SP	1	Scale 1" ~ 2.5 feet Water depth at 5 feet.
2	Light gray, saturated, fine to coarse SAND, with trace to little silt, trace organic silt, trace fine gravel		SM	2 3	
4	Boring terminated at 4 feet.				
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 327

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 3 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Gray, wet, fine to coarse SAND, with little clay, trace fine gravel, trace organic silt		SC	1	Scale 1" ~ 2.5 feet
1	Light gray, saturated, fine to medium SAND, with little to some silt, trace clay		SM	2	
2					
3	Boring terminated at 1 feet.				
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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LOG OF BORING 328

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 15, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1 foot

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light brown, saturated, fine to coarse SAND, with trace silt		SP	1	Scale 1" ~ 2.5 feet
1	Gray, saturated, fine to coarse SAND, with trace to little organic silt		SP/SM		Water depth at 5.5 feet.
	Boring terminated at 1 feet.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 329

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 28, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1 foot

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light gray, saturated, fine to coarse SAND, with little fine gravel, trace silt		SP	1	Scale 1" ~ 2.5 feet
1	Light gray, saturated, silty CLAY, with little to some fine to coarse sand		CL		Water depth at 9 feet.
	Boring terminated at 1 foot.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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LOG OF BORING 330

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 15, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Brown, saturated, fine to coarse SAND, with trace fine gravel, trace silt		SP	1	Scale 1" ~ 2.5 feet Water depth at 9 feet.
1	Boring terminated at 1 feet.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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LOG OF BORING 331

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 15, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 2.5 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light brown, saturated, fine to coarse SAND, with trace silt		SP	1	Scale 1" ~ 2.5 feet
1	Gray, saturated, fine to coarse SAND, with trace organic silt		SP	2	Water depth at 7.5 feet.
2	Boring terminated at 2.5 feet.				
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 332

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 28, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1 foot

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Gray, saturated, fine to coarse SAND, with trace orgaic silt		SP	1	Scale 1" ~ 2.5 feet Water depth at 7 feet.
1	Boring terminated at 1 foot.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 333

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 15, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 0.5 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light brown to gray, saturated, fine to coarse SAND, with trace fine gravel, trace organic silt		SP	1	Scale 1" ~ 2.5 feet
1	Boring terminated at 0.5 feet.				Water depth at 8.5 feet.
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 334

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 14, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1 foot

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Brown-gray, saturated, fine to coarse SAND, with trace organic silt		SP	1	Scale 1" = 2.5 feet Water depth at 8.5 feet.
1	Boring terminated at 1 foot.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 335

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 14, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1.5 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Brown-gray, saturated, fine to coarse SAND, with trace to little organic silt, trace fine gravel		SP/SM	1	Scale 1" ~ 2.5 feet Water depth at 7.5 feet.
1					
	Boring terminated at 1.5 feet.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 336

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 15, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 2 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Dark gray, saturated, fine to coarse SAND, with trace organic silt		SP	1	Scale 1" ~ 2.5 feet
1				2	Water depth at 7 feet.
2	Boring terminated at 2.5 feet.				
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 337

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 14, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 1.5 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Light brown to gray, saturated, fine to coarse SAND, with trace organic silt		SP	1	Scale 1" ~ 2.5 feet Water depth at 6 feet.
1					
	Boring terminated at 1.5 feet.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 338

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 15, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 2 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0	Brown-gray, saturated, fine to medium SAND, with little organic silt, trace clay		SP/SM	1	Scale 1" = 2.5 feet Water depth at 7 feet.
1					
	Boring terminated at 1.5 feet.				
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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HYNES & ASSOCIATES

LOG OF BORING 339

Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 19, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : Hand Auger
Total Depth: : 6.5 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Remarks
0–2	Light brown, saturated, fine to coarse SAND, with trace silt		SP	1, 2	Scale 1" ~ 2.5 feet
3–4	Light brown, saturated, fine to medium SAND, with trace silt		SP	3	
5–6	Light brown to light gray, saturated, fine to coarse SAND, with trace organic silt		SP	4	
6.5	Boring terminated at 6.5 feet.				

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LOG OF BORING 340

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Andrews, Miller & Associates
106 North Washington Street, Suite 103
Easton, Maryland 21601

DNREC-Massey's Channel Dredging

Project No.: JDH-10/13/123-3

Date Completed: : May 29, 2014
Logged By: : J. Redding
Drilled By: : M. Hynes
Drilling Method: : HSA (Mobile B-47 HD)
Total Depth: : 7 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Blows per 6 inches	Remarks
0	Gray, saturated, loose, fine to medium SAND, with trace to little organic silt		SP/SM	1	2-3-4	Scale 1" ~ 2.5 feet
1						Water depth at 5.5 feet.
2				2	1-2-4	
3	Dark gray, saturated, very loose, fine to coarse SAND, with little to some organic silt		SM	3	1-1-2	
4						
5	Gray, saturated, very loose, fine to coarse SAND, with some to trace clay, little to trace silt		SC	4	1-2-2	
6	Light gray, saturated, very loose, fine to coarse SAND, with little silt, trace fine gravel, trace clay		SM	5	1-1-3	
7	Boring terminated at 7 feet.					
8						
9						
10						
11						
12						
13						
14						
15						

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JOHN D. HYNES & ASSOCIATES, INC.

Geotechnical and Environmental Consultants
Monitoring Well Installation
Construction Inspection and Materials Testing

Laboratory Test Results
Massey's Channel Dredging
Project No.: JDH-10/13/123-3

Boring No./Sample No.	309/S1	310/S1	311/S2	312/S1	313/S3	314/S2	315/S1	316/S2
Begin Depth (ft.)	0	0	1.5	0	3.0	1.5	0	1.5
End Depth (ft.)	1.75	1.5	3.0	1.5	4.5	3.0	1.5	2.5
Sieve Size	Percent Passing							
1"								
¾"								100
½"								95.5
⅜"		100			100	100	100	95.5
No. 4	100	99.7	100		99.9	99.7	99.7	94.8
No.10	99.9	98.7	99.9	100	99.3	97.5	95.5	89.9
No. 20	99.5	86.0	99.8	99.9	93.0	82.7	78.7	67.1
No. 40	95.0	31.7	99.7	99.4	68.1	40.1	41.4	32.3
No. 60	56.6	3.4	97.0	97.5	35.9	13.4	14.0	15.7
No. 100	15.4	1.4	40.1	71.8	17.1	7.5	7.4	9.5
No. 200	2.5	1.1	5.2	13.8	3.5	1.9	3.2	2.7
Natural Moisture %	25.4	25.3	32.2	37.5	24.7	20.4	23.8	20.3

JOHN D. HYNES & ASSOCIATES, INC.

Geotechnical and Environmental Consultants
Monitoring Well Installation
Construction Inspection and Materials Testing

Laboratory Test Results
Massey's Channel Dredging
Project No.: JDH-10/13/123-3

Boring No./Sample No.	301/S1	302/S2	303/S1	304/S1	305/S1	306/S2	307/S2	308/S1
Begin Depth (ft.)	0	1	0	0	0	1.5	1.5	0
End Depth (ft.)	1	2.5	1	1	1.5	3	3	1
Sieve Size	Percent Passing							
1"								
¾"								
½"	100	100		100				
⅜"	99.4	99.8	100	99.7		100		100
No. 4	99.0	99.6	96.4	99.3	100	99.9	100	99.9
No.10	98.5	97.6	82.5	98.0	99.9	99.7	99.9	99.8
No. 20	97.3	80.1	50.5	96.2	99.8	98.8	99.3	97.7
No. 40	87.7	40.6	22.2	93.9	99.5	90.4	93.0	75.9
No. 60	63.4	7.2	4.9	84.1	90.3	52.3	58.3	27.6
No. 100	32.4	2.7	1.9	19.7	12.8	6.4	8.8	3.1
No. 200	14.6	1.5	1.3	3.0	1.6	1.3	1.7	1.1
Natural Moisture %	30.1	22.3	20.3	30.2	27.4	25.2	26.8	24.0

JOHN D. HYNES & ASSOCIATES, INC.

Geotechnical and Environmental Consultants
Monitoring Well Installation
Construction Inspection and Materials Testing

Laboratory Test Results
Massey's Channel Dredging
Project No.: JDH-10/13/123-3

Boring No./Sample No.	317/S1	318/S1	319/S1	320/S1	321/S2	322/S1	323/S1	324/S2
Begin Depth (ft.)	0	0	0	0	1.5	0	0	1.5
End Depth (ft.)	1.25	1.0	1.0	1.0	3.0	1.5	1.5	3.0
Sieve Size	Percent Passing							
1"								
¾"								
½"		100		100				
⅜"	100	96.0	100	97.8	100	100	100	
No. 4	99.8	95.5	98.9	92.3	99.6	99.7	99.0	100
No.10	96.9	93.4	91.7	85.4	94.8	95.9	93.1	99.3
No. 20	86.4	83.9	74.7	74.9	81.6	74.9	73.6	83.5
No. 40	53.8	55.7	41.8	57.6	58.3	34.9	42.8	33.3
No. 60	31.1	34.0	23.3	25.2	25.1	12.9	13.0	8.5
No. 100	17.9	19.7	9.8	14.4	5.8	4.1	4.4	1.9
No. 200	6.0	4.9	3.1	11.3	2.0	1.5	2.0	1.3
Natural Moisture %	22.6	24.7	21.8	22.5	24.2	21.2	21.3	23.0

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Construction Inspection and Materials Testing

Laboratory Test Results
Massey's Channel Dredging
Project No.: JDH-10/13/123-3

Boring No./Sample No.	325/S2	326/S2	327/S1	328/S1	329/S1	330/S1	331/S2	332/S1
Begin Depth (ft.)	1.5	2.0	0	0	0	0	0	0
End Depth (ft.)	3.0	3.0	1.5	1.0	1.0	1.0	1.0	1.0
Sieve Size	Percent Passing							
1"								
¾"								
½"			100			100		
⅜"	100	100	98.7	100	100	98.0	100	100
No. 4	99.9	99.5	95.4	99.6	98.0	94.4	99.8	99.7
No.10	98.9	98.5	89.8	98.1	94.5	91.8	99.0	99.4
No. 20	92.2	93.9	83.1	91.7	92.4	59.9	93.4	95.6
No. 40	68.4	59.3	70.7	63.8	90.6	21.5	52.1	66.0
No. 60	20.4	29.4	53.8	12.6	88.3	4.4	8.4	26.3
No. 100	2.7	22.4	36.2	2.8	86.4	3.2	2.5	11.1
No. 200	1.5	19.9	27.2	1.8	83.1	2.7	2.1	1.3
Natural Moisture %	28.1	20.5	17.4	51.2	23.7	24.2	27.7	24.4

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Geotechnical and Environmental Consultants
Monitoring Well Installation
Construction Inspection and Materials Testing

Laboratory Test Results
Massey's Channel Dredging
Project No.: JDH-10/13/123-3

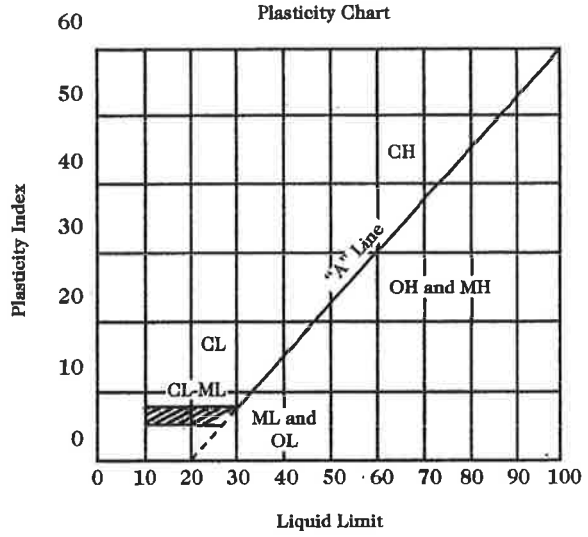
Boring No./Sample No.	333/S1	334/S1	335/S1	336/S1	337/S1	338/S1	339/S3	340/S2
Begin Depth (ft.)	0	0	0	0	0	0	3.0	1.5
End Depth (ft.)	0.5	1.0	1.5	1.0	1.5	1.5	4.5	3.0
Sieve Size	Percent Passing							
1"								
¾"								
½"	100	100	100					
⅜"	98.7	99.8	99.5	100				
No. 4	94.9	98.3	98.7	99.8	100	100		100
No.10	87.6	95.5	96.8	99.5	99.5	99.8	100	99.9
No. 20	72.5	84.6	89.8	91.0	88.8	97.7	99.8	99.4
No. 40	47.1	56.4	69.5	51.1	46.6	80.4	85.2	93.8
No. 60	16.0	22.3	34.5	7.0	9.6	47.8	24.3	84.2
No. 100	7.4	11.1	16.5	2.2	3.2	22.5	5.0	46.9
No. 200	4.4	7.9	9.2	1.4	1.6	10.9	2.4	7.5
Natural Moisture %	21.6	23.9	23.7	25.4	23.6	24.1	27.2	28.8

JOHN D. HYNES & ASSOCIATES, INC.

Geotechnical and Environmental Consultants
Monitoring Well Installation
Construction Inspection and Materials Testing

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions			*Group Symbols*	*Typical Names*	*Laboratory Classification Criteria*	
Coarse-grained soils (More than half of material is larger than No 200 sieve size)	Gravels (More than half of coarse fraction is larger than No 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No 200 sieve size), coarse grained soils are classified as follows: Less than 5 percent: GW, GP, SW, SP. More than 12 percent: GM, GC, SM, SC. 5 to 12 percent: *Borderline cases requiring dual symbols*[c]	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3
			GP	Poorly graded gravels, gravel sand mixtures, little or no fines		Not meeting all graduation requirements for GW
		Gravels with fines (Appreciable amount of fines)	GM[a] d / u	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above "A" line with P.I. greater than 7	
	Sands (More than half of coarse fraction is smaller than No 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands,	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			SP	Poorly graded sands, gravelly sands, little or no fines		Not meeting all graduation requirements for SW
		Sands with fines (Appreciable amount of fines)	SM[a] d / u	Silty sands, sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols.
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above "A" line with P.I. greater than 7	
Fine-grained soils (More than half material is smaller than No 200 sieve)	Silts and clays (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity		
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
			OL	Organic silts and organic silty clays of low plasticity		
	Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			CH	Inorganic clays of high plasticity, fat clays		
			OH	Organic clays of medium to high plasticity, organic silts		
	Highly organic soils		Pt	Peat and other highly organic soils		



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HYNES

FIELD CLASSIFICATION SYSTEM FOR SOIL EXPLORATION

NON-COHESIVE SOILS
(Silt, Sand, Gravel and Combinations)

DENSITY

Very Loose	- 5 blows/ft. or less
Loose	- 6 to 10 blows/ft.
Medium Dense	- 11 to 30 blows/ft.
Dense	- 31 to 50 blows/ft.
Very Dense	- 51 blows/ft. or more

RELATIVE PROPORTIONS

Descriptive Term	Percent
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

PARTICLE SIZE IDENTIFICATION

Boulders	- 8 inch diameter or more
Cobbles	- 3 to 8 inch diameter
Gravel	- Coarse - 1 to 3 inch
	- Medium - 1/2 to 1 inch
	- Fine - 4.75 mm to 1/2 inch
Sand	- Coarse - 2.0 mm to 4.75 mm
	- Medium - 0.425 mm to 2.0 mm
	- Fine - 0.075 mm to 0.425 mm
Silt	- 0.075 mm to 0.002 mm

COHESIVE SOILS
(Clay, Silt and Combinations)

CONSISTENCY

Very Soft	- 3 blows/ft. or less
Soft	- 4 to 5 blows/ft.
Medium Stiff	- 6 to 10 blows/ft.
Stiff	- 11 to 15 blows/ft.
Very Stiff	- 16 to 30 blows/ft.
Hard	- 31 blows/ft. or more

PLASTICITY

Degree of Plasticity	Plasticity Index
None to Slight	0 - 4
Slight	5 - 7
Medium	8 - 22
High to Very High	over 22

Classification on logs are made by visual inspection of samples unless a sample has been subjected to laboratory classification testing.

Standard Penetration Test - Driving a 2.0" O.D., 1-3/8" I.D., splitspoon sampler a distance of 1.0 foot into undisturbed soil with a 140 pound hammer free falling a distance of 30.0 inches. It is customary to drive the spoon 6 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the test are recorded for each 6 inches of penetration on the drill log (Example - 6/8/9). The standard penetration test value (N - value) can be obtained by adding the last two figures (i.e. 8 + 9 = 17 blows/ft.). (ASTM D-1586)

Strata Changes - In the column "Soil Descriptions," on the drill log, the horizontal lines represent strata changes. A solid line (—) represents an actually observed change, a dashed line (----) represents an estimated change.

Groundwater - Observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc. may cause changes in the water levels indicated on the logs.

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Important Information About Your Geotechnical Engineering Report

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. *No one except you* should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one—not even you*—should apply the report for any purpose or project except the one originally contemplated.

Read the full report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, *do not rely on a geotechnical engineering report* that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions *only* at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an *opinion* about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject To Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce such risks, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations", many of these provisions indicate where geotechnical engineers responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Rely on Your Geotechnical Engineer for Additional Assistance

Membership in ASFE exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

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UGER1000.10M

FINDLING, INC.

Summary of Laboratory Test Results

DNREC - Massey's Ditch Channel Maintenance

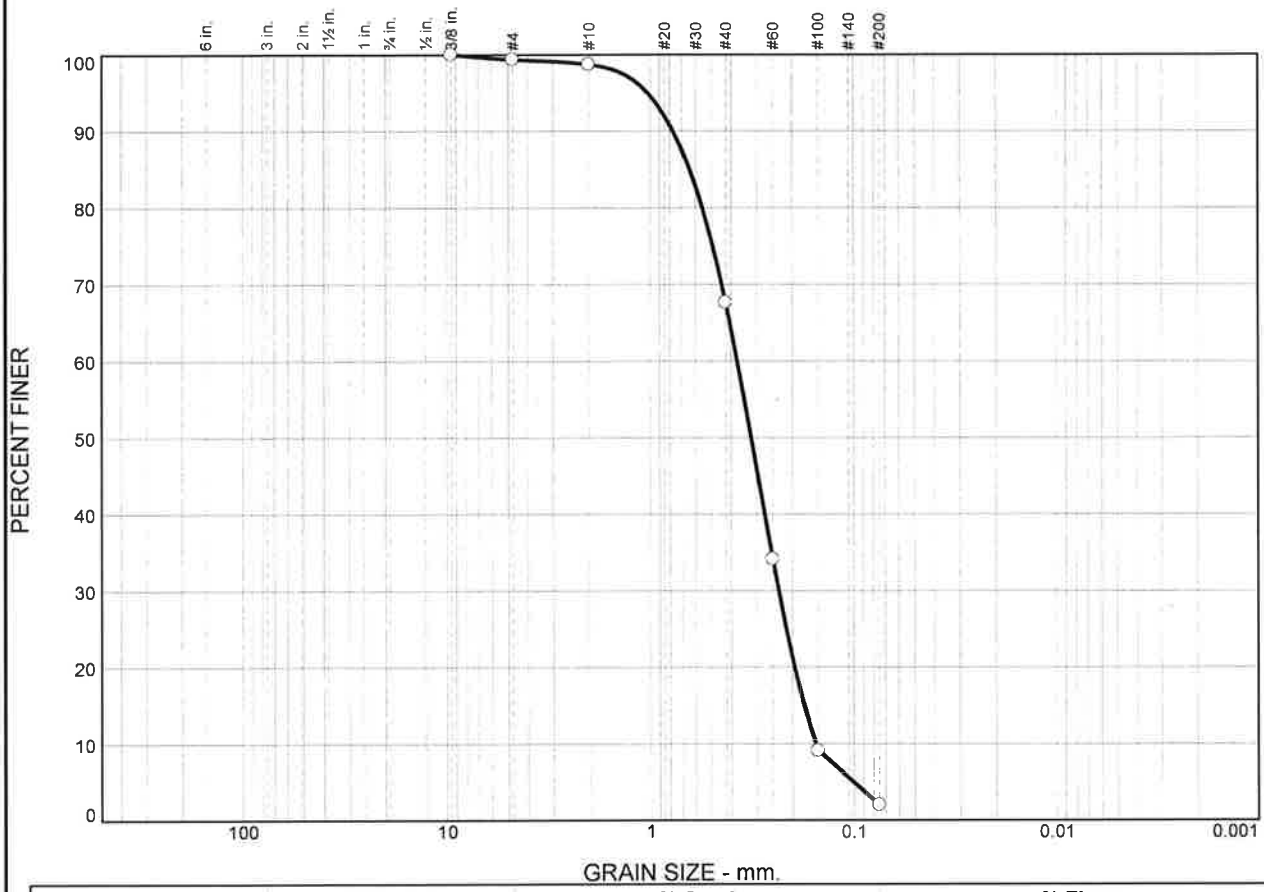
Millsboro, DE

Findling Project No.: 18-1026

Sample ID		Sample Depth	Natural Moisture Content, %	Atterberg Limits			Grain Size Distribution			Modified Proctor Compaction Test (ASTM D1557)		USCS Classificatoin
				LL	PL	PI	GRAVEL (%)	SAND (%)	FINES (%)	Max Dry Density, pcf	Optimum Moisture Content, %	
Grab	B06	Surface	15.0	NV	NP	NP	1	97	2			SP
Grab	B07	Surface	23.3	NV	NP	NP	0	97	3			SP
Grab	B08	Surface	18.2	NV	NP	NP	0	99	1			SP
Grab	B09	Surface	13.2	NV	NP	NP	6	94	0			SP
Grab	B10	Surface	18.0	NV	NP	NP	2	97	1			SP
Grab	B11	Surface	34.5	NV	NP	NP	0	68	32			SM
Grab	B12	Surface	21.1	NV	NP	NP	0	95	5			SP

Note: NV = Non Viscous, NP = Non Plastic

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.6	0.7	31.1	65.6	2.0	

	Colloids	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○		NV	NP	0.6406	0.3731	0.3191	0.2338	0.1757	0.1544	0.95	2.42

Material Description	USCS	AASHTO
○ Greenish grey, poorely graded SAND	SP	A-3

Project No. 18-1026 **Client:** Moffatt & Nichol

Project: DNREC - Massey's Ditch Channel Maintenance

○ **Source of Sample:** Grab **Sample Number:** B06

Date: ○ 08/15/2018

Remarks:

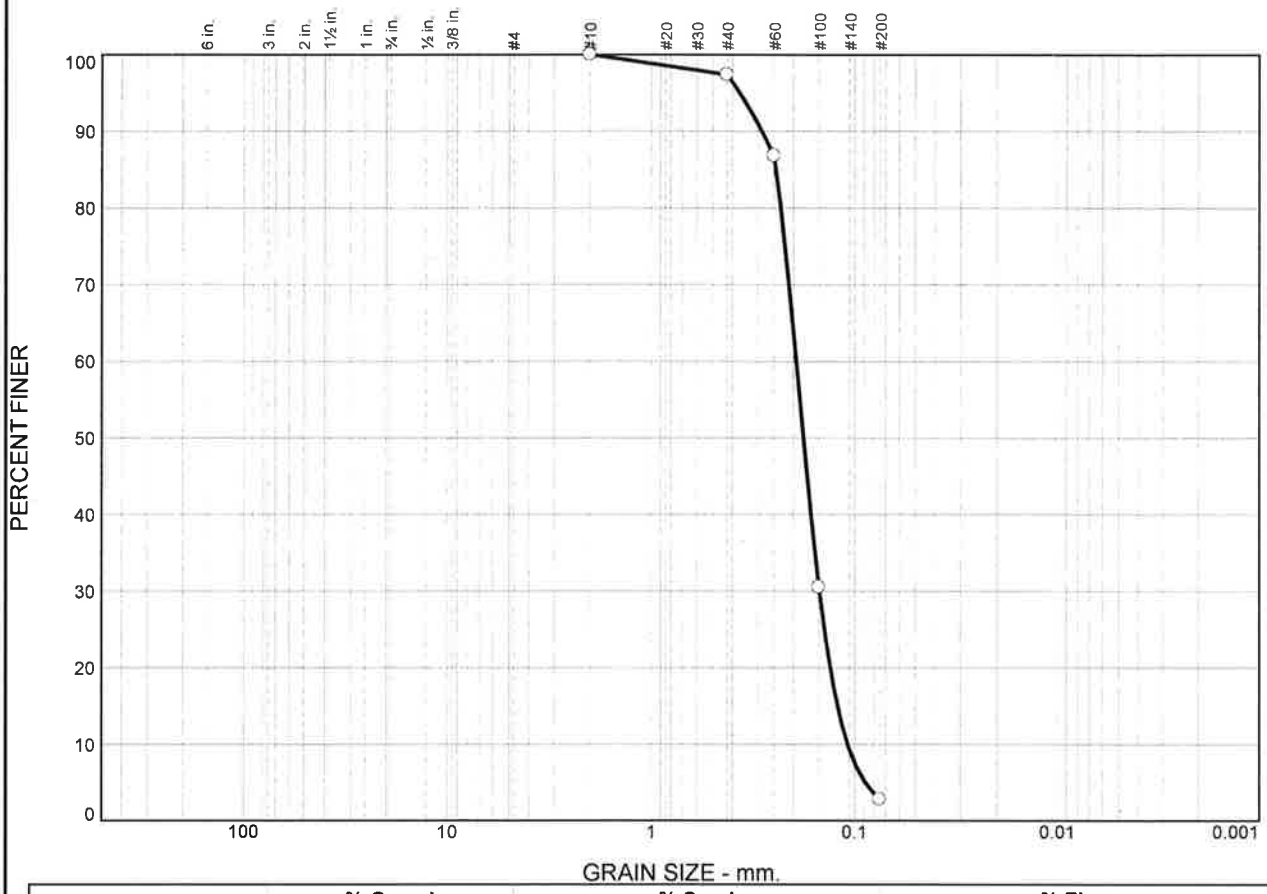
○Moisture Content = 15%

Findling, Inc.

Baltimore, Maryland

Figure

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	2.6	94.6	2.8	

	Colloids	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○		NV	NP	0.2444	0.1937	0.1786	0.1492	0.1213	0.1081	1.06	1.79

	Material Description	USCS	AASHTO
○	Dark grey, poorely graded SAND	SP	A-3

Project No. 18-1026 **Client:** Moffatt & Nichol

Project: DNREC - Massey's Ditch Channel Maintenance

○ **Source of Sample:** Grab **Sample Number:** B07

Date: ○ 08/15/2018

Findling, Inc.

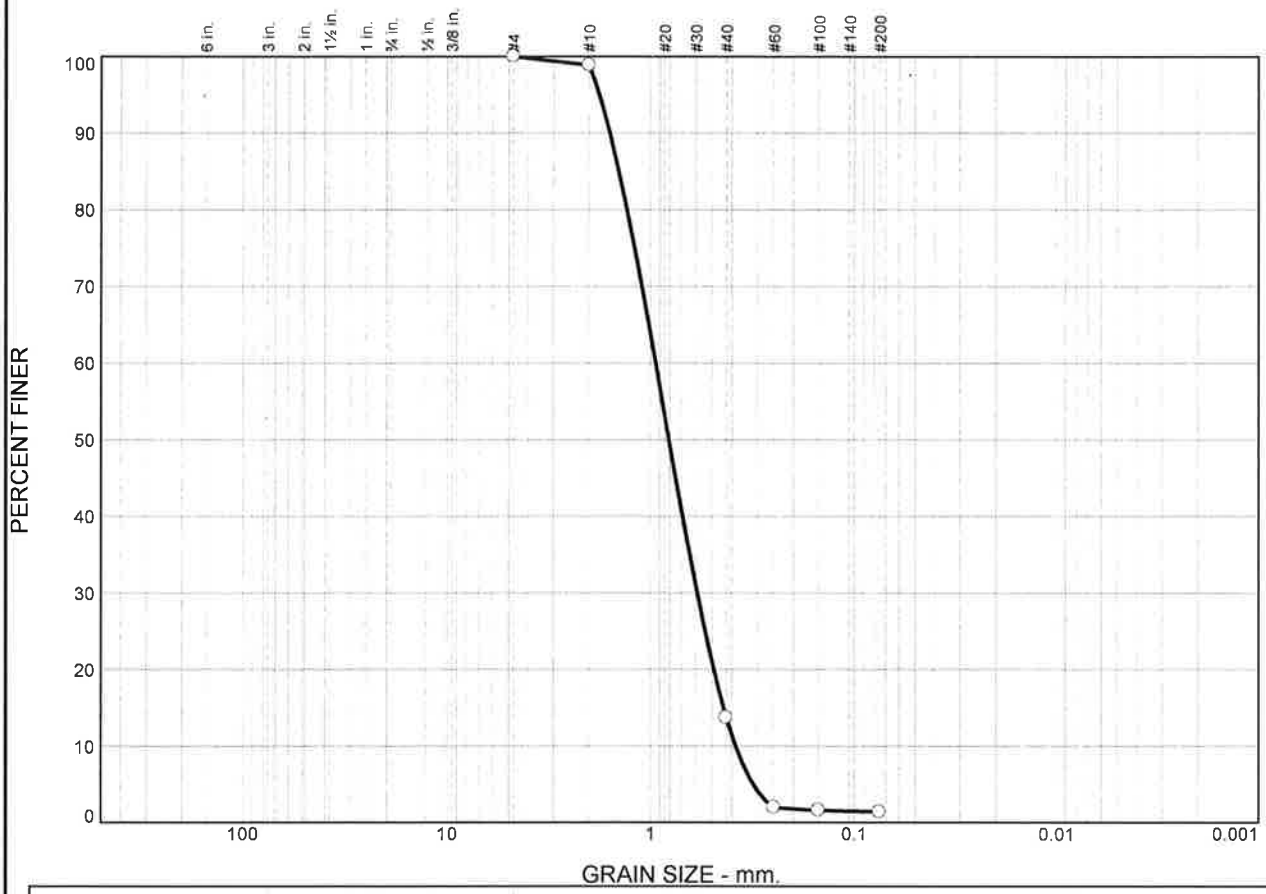
Baltimore, Maryland

Remarks:

○Moisture Content = 23.3%

Figure

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.2	85.1	12.3	1.4	

	Colloids	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○		NV	NP	1.4255	0.9423	0.8095	0.5893	0.4388	0.3829	0.96	2.46

	Material Description	USCS	AASHTO
○	Light grey, poorely graded SAND	SP	A-1-b

Project No. 18-1026 **Client:** Moffatt & Nichol

Project: DNREC - Massey's Ditch Channel Maintenance

○ **Source of Sample:** Grab **Sample Number:** B08

Date: ○ 08/15/2018

Remarks:

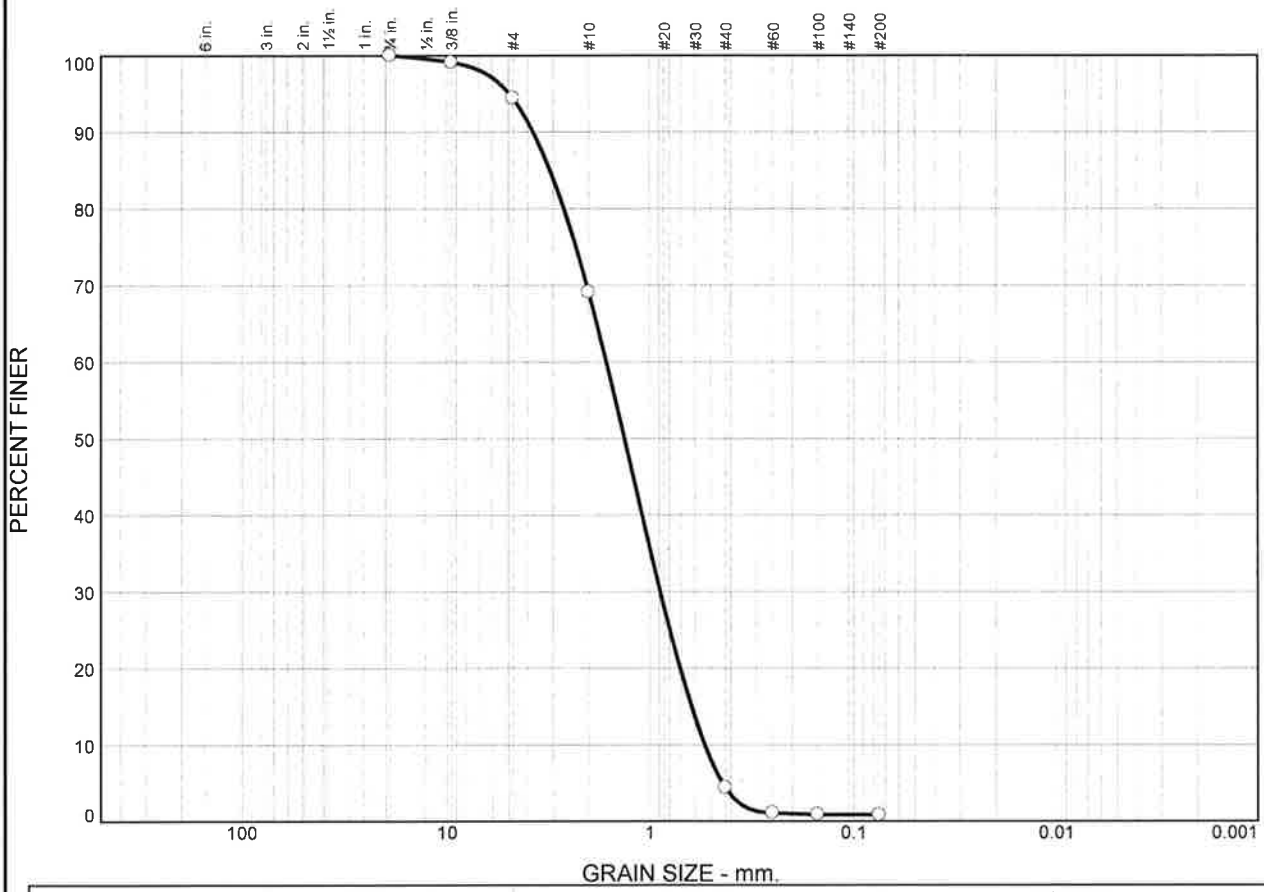
○Moisture Content = 18.2%

Findling, Inc.

Baltimore, Maryland

Figure

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	5.6	25.3	64.7	3.6	0.8	

	Colloids	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○		NV	NP	3.1065	1.6353	1.3322	0.8872	0.6234	0.5371	0.90	3.04

Material Description	USCS	AASHTO
○ Light grey, poorely graded SAND	SP	A-1-b

Project No. 18-1026 **Client:** Moffatt & Nichol

Project: DNREC - Massey's Ditch Channel Maintenance

○ **Source of Sample:** Grab **Sample Number:** B09

Date: ○ 08/15/2018

Remarks:

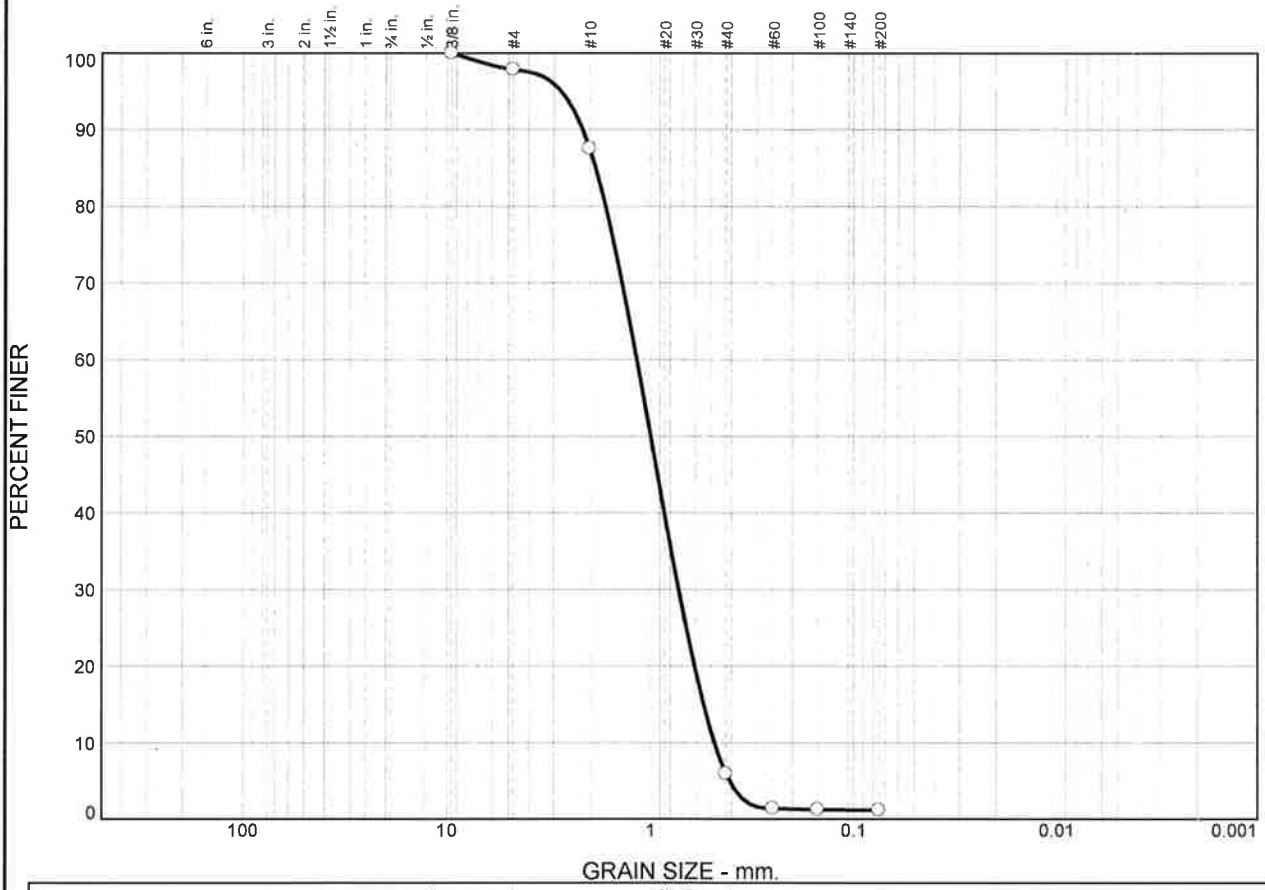
○Moisture Content = 13.2%

Findling, Inc.

Baltimore, Maryland

Figure

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.2	10.3	81.6	4.7	1.2	

	Colloids	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○		NV	NP	1.8684	1.1684	0.9981	0.7256	0.5471	0.4845	0.93	2.41

Material Description	USCS	AASHTO
○ Light grey, poorely graded SAND	SP	A-1-b

Project No. 18-1026 **Client:** Moffatt & Nichol

Project: DNREC - Massey's Ditch Channel Maintenance

○ **Source of Sample:** Grab **Sample Number:** B10

Date: ○ 08/15/2018

Remarks:

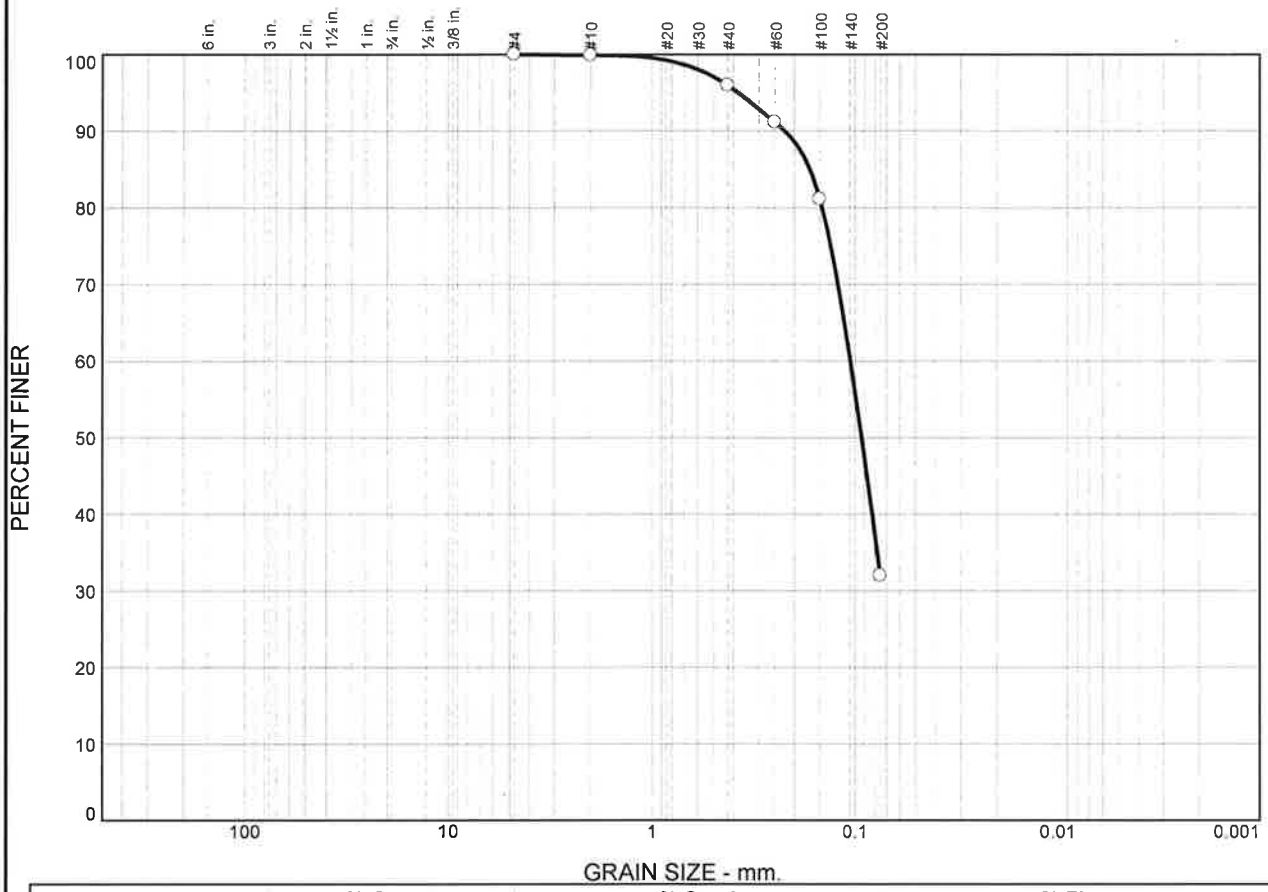
○Moisture Content = 18.0%

Findling, Inc.

Baltimore, Maryland

Figure

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	4.0	63.9	32.0	

	Colloids	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○		NV	NP	0.1679	0.1055	0.0929					

	Material Description	USCS	AASHTO
○	Dark grey, Silty SAND	SM	A-2-4(0)

Project No. 18-1026 **Client:** Moffatt & Nichol

Project: DNREC - Massey's Ditch Channel Maintenance

○ **Source of Sample:** Grab **Sample Number:** B11

Date: ○ 08/15/2018

Findling, Inc.

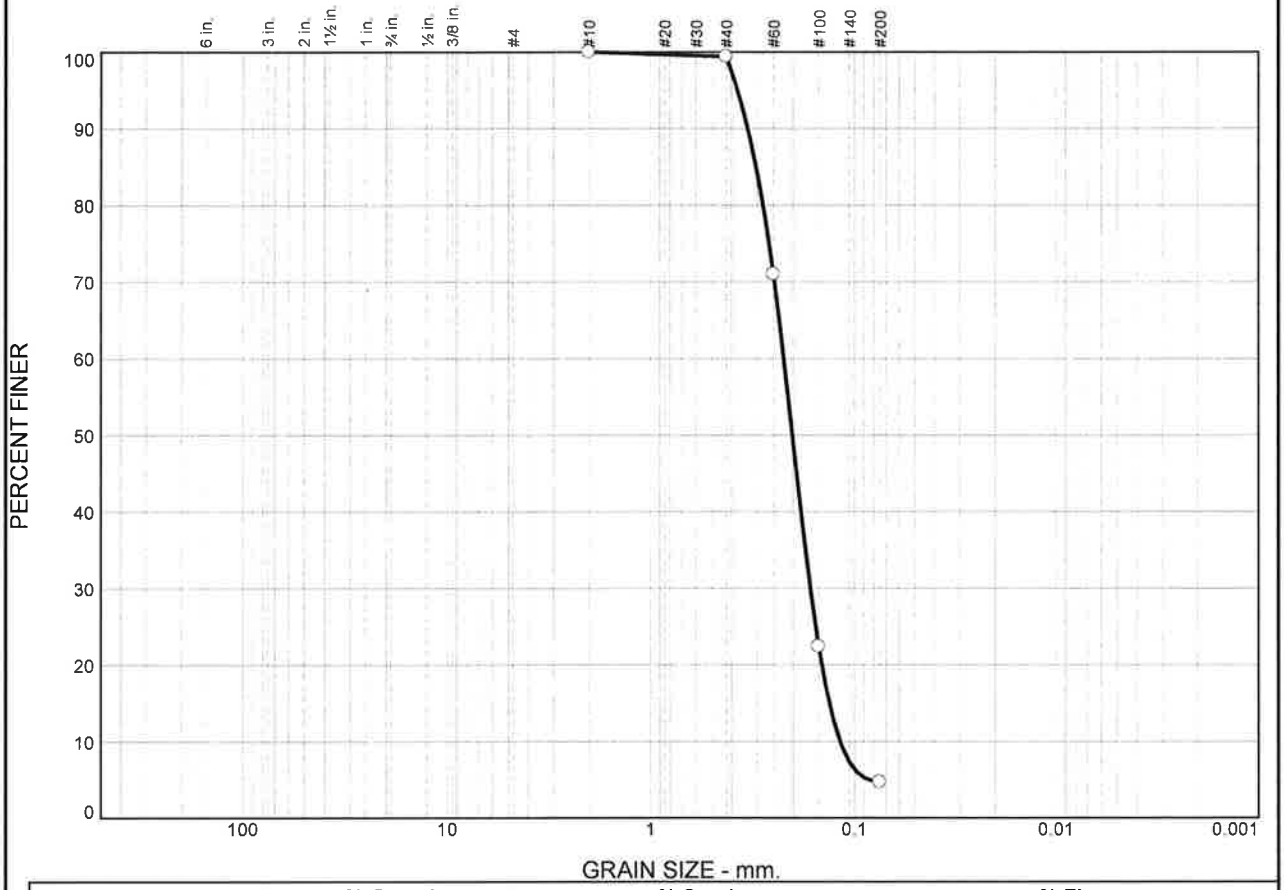
Baltimore, Maryland

Remarks:

○Moisture Content = 34.5%

Figure

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.6	94.7	4.7	

	Colloids	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○		NV	NP	0.3035	0.2223	0.2016	0.1646	0.1330	0.1177	1.04	1.89

	Material Description	USCS	AASHTO
○	Dark grey, poorely graded SAND	SP	A-3

Project No. 18-1026 **Client:** Moffatt & Nichol

Project: DNREC - Massey's Ditch Channel Maintenance

○ **Source of Sample:** Grab **Sample Number:** B12

Date: ○ 08/15/2018

Remarks:

○Moisture Content = 21.1%

Findling, Inc.

Baltimore, Maryland

Figure

Analytical Report for

Findling, Inc.

Certificate of Analysis No.: 18081530

Project Manager: Suri Surendra
Project Name : Massey's Ditch Channel
Project Location: Millsboro, DE
Project ID : 18-1026

August 23, 2018

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PHASE SEPARATION SCIENCE, INC.

August 23, 2018

Suri Surendra
Findling, Inc.
3401 Carlins Park Drive
Baltimore, MD 21215

Reference: PSS Work Order(s) No: **18081530**
Project Name: Massey's Ditch Channel
Project Location: Millsboro, DE
Project ID.: 18-1026

Dear Suri Surendra :

This report includes the analytical results from the analyses performed on the samples received under the project name referenced above and identified with the Phase Separation Science (PSS) Work Order(s) numbered **18081530**.

All work reported herein has been performed in accordance with current NELAP standards, referenced methodologies, PSS Standard Operating Procedures and the PSS Quality Assurance Manual unless otherwise noted in the Case Narrative Summary. PSS is limited in liability to the actual cost of the sample analysis done.

PSS reserves the right to return any unused samples, extracts or related solutions. Otherwise, the samples are scheduled for disposal, without any further notice, on September 19, 2018, with the exception of air canisters which are cleaned immediately following analysis. This includes any samples that were received with a request to be held but lacked a specific hold period. It is your responsibility to provide a written request defining a specific disposal date if additional storage is required. Upon receipt , the request will be acknowledged by PSS, thus extending the storage period.

This report shall not be reproduced except in full, without the written approval of an authorized PSS representative. A copy of this report will be retained by PSS for at least 5 years, after which time it will be disposed of without further notice, unless prior arrangements have been made.

We thank you for selecting Phase Separation Science, Inc. to serve your analytical needs. If you have any questions concerning this report, do not hesitate to contact us at 410-747-8770 or info@phaseonline.com.

Sincerely,

Dan Prucnal

Dan Prucnal
Laboratory Manager

Sample Summary

Client Name: Findling, Inc.

Project Name: Massey's Ditch Channel

Work Order Number(s): 18081530

Project ID: 18-1026

The following samples were received under chain of custody by Phase Separation Science (PSS) on 08/15/2018 at 04:10 pm

Lab Sample Id	Sample Id	Matrix	Date/Time Collected
18081530-001	Sample at Surface	SOIL	08/07/18 11:00
18081530-002	Sample at Depth	SOIL	08/07/18 11:00

Please reference the Chain of Custody and Sample Receipt Checklist for specific container counts and preservatives. Any sample conditions not in compliance with sample acceptance criteria are described in Case Narrative Summary.

Notes:

1. The presence of a common laboratory contaminant such as methylene chloride may be considered a possible laboratory artifact. Where observed, appropriate consideration of data should be taken.
2. Unless otherwise noted in the case narrative, results are reported on a dry weight basis with the exception of pH, flashpoint, moisture, and paint filter test.
3. Drinking water samples collected for the purpose of compliance with SDWA may not be suitable for their intended use unless collected by a certified sampler [COMAR 26.08.05.07.C.2].
4. The analyses of 1,2-dibromo-3-chloropropane (DBCP) and 1,2-dibromoethane (EDB) by EPA 524.2 and calcium, magnesium, sodium and iron by EPA 200.8 are not currently promulgated for use in testing to meet the Safe Drinking Water Act and as such cannot be used for compliance purposes. The listings of the current promulgated methods for testing in compliance with the Safe Drinking Water Act can be found in the 40 CFR part 141.1, for the primary drinking water contaminates, and part 141.3, for the secondary drinking water contaminates.
5. Sample prepared under EPA 3550C with concentrations greater than 20 mg/Kg should employ the microtip extraction procedure if required to meet data quality objectives.
6. The analysis of acrolein by EPA 624 must be analyzed within three days of sampling unless pH is adjusted to 4-5 units [40 CFR part 136.3(e)].
7. Method 180.1, The Determination of Turbidity by Nephelometry, recommends samples over 40 NTU be diluted until the turbidity falls below 40 units. Routine samples over 40 NTU may not be diluted as long as the data quality objectives are not affected.
8. Alkalinity results analyzed by EPA 310.2 that are reported by dilution are estimated and are not in compliance with method requirements.

Standard Flags/Abbreviations:

B	A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
C	Results Pending Final Confirmation.
E	The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
Fail	The result exceeds the regulatory level for Toxicity Characteristic (TCLP) as cited in 40 CFR 261.24 Table 1.
J	The target analyte was positively identified below the reporting limit but greater than the MDL.
MDL	This is the Laboratory Method Detection Limit which is equivalent to the Limit of Detection (LOD). The LOD is an estimate of the minimum amount of a substance that an analytical process can reliably detect. This value will remain constant across multiple similar instrumentation and among different analysts. An LOD is analyte and matrix specific.
ND	Not Detected at or above the reporting limit.
RL	PSS Reporting Limit.
U	Not detected.

Certifications:

NELAP Certifications: PA 68-03330, VA 460156
State Certifications: MD 179, WV 303
Regulated Soil Permit: P330-12-00268
NSWC USCG Accepted Laboratory
LDBE MWAA LD1997-0041-2015

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18081530

Findling, Inc., Baltimore, MD

August 23, 2018

Project Name: Massey's Ditch Channel
Project Location: Millsboro, DE
Project ID: 18-1026

Sample ID: Sample at Surface | **Date/Time Sampled: 08/07/2018 11:00** | **PSS Sample ID: 18081530-001**
Matrix: SOIL | **Date/Time Received: 08/15/2018 16:10** | **% Solids: 84**

TAL Metals | Analytical Method: SW-846 6020 A | Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Aluminum	**2,100**	mg/kg	54		1	08/20/18	08/21/18 20:48	1051
Antimony	ND	mg/kg	2.7		1	08/20/18	08/21/18 02:50	1051
Arsenic	**0.83**	mg/kg	0.54		1	08/20/18	08/21/18 20:48	1051
Barium	**3.4**	mg/kg	2.7		1	08/20/18	08/21/18 20:48	1051
Beryllium	ND	mg/kg	2.7		1	08/20/18	08/21/18 02:50	1051
Cadmium	ND	mg/kg	2.7		1	08/20/18	08/21/18 02:50	1051
Calcium	**550**	mg/kg	54		1	08/20/18	08/21/18 20:48	1051
Chromium	**3.4**	mg/kg	2.7		1	08/20/18	08/21/18 20:48	1051
Cobalt	ND	mg/kg	2.7		1	08/20/18	08/21/18 02:50	1051
Copper	ND	mg/kg	2.7		1	08/20/18	08/21/18 02:50	1051
Iron	**1,600**	mg/kg	54		1	08/20/18	08/21/18 20:48	1051
Lead	ND	mg/kg	2.7		1	08/20/18	08/21/18 02:50	1051
Magnesium	**510**	mg/kg	54		1	08/20/18	08/21/18 20:48	1051
Manganese	**43**	mg/kg	2.7		1	08/20/18	08/21/18 20:48	1051
Mercury	ND	mg/kg	0.11		1	08/20/18	08/21/18 02:50	1051
Nickel	ND	mg/kg	2.7		1	08/20/18	08/21/18 02:50	1051
Potassium	**250**	mg/kg	54		1	08/20/18	08/21/18 20:48	1051
Selenium	ND	mg/kg	2.7		1	08/20/18	08/21/18 02:50	1051
Silver	ND	mg/kg	2.7		1	08/20/18	08/21/18 02:50	1051
Sodium	**1,700**	mg/kg	54		1	08/20/18	08/22/18 15:14	1051
Thallium	ND	mg/kg	2.1		1	08/20/18	08/21/18 02:50	1051
Vanadium	**3.7**	mg/kg	2.7		1	08/20/18	08/21/18 20:48	1051
Zinc	ND	mg/kg	11		1	08/20/18	08/21/18 02:50	1051

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18081530

Findling, Inc., Baltimore, MD

August 23, 2018

Project Name: Massey's Ditch Channel
Project Location: Millsboro, DE
Project ID: 18-1026

Sample ID: Sample at Surface **Date/Time Sampled: 08/07/2018 11:00** **PSS Sample ID: 18081530-001**
Matrix: SOIL **Date/Time Received: 08/15/2018 16:10** **% Solids: 84**

Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: SW3550C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
gamma-BHC (Lindane)	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
beta-BHC	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
delta-BHC	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
Heptachlor	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
Aldrin	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
Heptachlor epoxide	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
gamma-Chlordane	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
alpha-Chlordane	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
4,4-DDE	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
Endosulfan I	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
Dieldrin	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
Endrin	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
4,4-DDD	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
Endosulfan II	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
4,4-DDT	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
Endrin aldehyde	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
Methoxychlor	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
Endosulfan sulfate	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
Endrin ketone	ND	ug/kg	4.8		1	08/16/18	08/16/18 15:27	1014
Toxaphene	ND	ug/kg	120		1	08/16/18	08/16/18 15:27	1014
Chlordane	ND	ug/kg	120		1	08/16/18	08/16/18 15:27	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18081530

Findling, Inc., Baltimore, MD

August 23, 2018

Project Name: Massey's Ditch Channel
Project Location: Millsboro, DE
Project ID: 18-1026

Sample ID: Sample at Surface **Date/Time Sampled: 08/07/2018 11:00** **PSS Sample ID: 18081530-001**
Matrix: SOIL **Date/Time Received: 08/15/2018 16:10** **% Solids: 84**

Polychlorinated Biphenyls — Analytical Method: SW-846 8082 A — Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.061		1	08/16/18	08/20/18 20:42	1029
PCB-1221	ND	mg/kg	0.061		1	08/16/18	08/20/18 20:42	1029
PCB-1232	ND	mg/kg	0.061		1	08/16/18	08/20/18 20:42	1029
PCB-1242	ND	mg/kg	0.061		1	08/16/18	08/20/18 20:42	1029
PCB-1248	ND	mg/kg	0.061		1	08/16/18	08/20/18 20:42	1029
PCB-1254	ND	mg/kg	0.061		1	08/16/18	08/20/18 20:42	1029
PCB-1260	ND	mg/kg	0.061		1	08/16/18	08/20/18 20:42	1029

Polyaromatic Hydrocarbons (PAHs) — Analytical Method: SW-846 8270 C — Preparation Method: SW3550C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Acenaphthylene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Anthracene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Benzo(a)anthracene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Benzo(a)pyrene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Benzo(b)fluoranthene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Benzo(g,h,i)perylene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Benzo(k)fluoranthene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Chrysene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Dibenz(a,h)Anthracene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Fluoranthene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Fluorene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
2-Methylnaphthalene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Naphthalene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Phenanthrene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055
Pyrene	ND	ug/kg	20		1	08/20/18	08/20/18 18:51	1055

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18081530

Findling, Inc., Baltimore, MD

August 23, 2018

Project Name: Massey's Ditch Channel
Project Location: Millsboro, DE
Project ID: 18-1026

Sample ID: Sample at Depth **Date/Time Sampled: 08/07/2018 11:00** **PSS Sample ID: 18081530-002**
Matrix: SOIL **Date/Time Received: 08/15/2018 16:10** **% Solids: 80**

TAL Metals — Analytical Method: SW-846 6020 A — Preparation Method: 3050B

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Aluminum	**2,100**	mg/kg	62		1	08/20/18	08/21/18 20:52	1051
Antimony	ND	mg/kg	3.1		1	08/20/18	08/21/18 02:55	1051
Arsenic	**0.97**	mg/kg	0.62		1	08/20/18	08/21/18 20:52	1051
Barium	ND	mg/kg	3.1		1	08/20/18	08/21/18 02:55	1051
Beryllium	ND	mg/kg	3.1		1	08/20/18	08/21/18 02:55	1051
Cadmium	ND	mg/kg	3.1		1	08/20/18	08/21/18 02:55	1051
Calcium	**900**	mg/kg	62		1	08/20/18	08/21/18 20:52	1051
Chromium	ND	mg/kg	3.1		1	08/20/18	08/21/18 02:55	1051
Cobalt	ND	mg/kg	3.1		1	08/20/18	08/21/18 02:55	1051
Copper	ND	mg/kg	3.1		1	08/20/18	08/21/18 02:55	1051
Iron	**1,500**	mg/kg	62		1	08/20/18	08/21/18 20:52	1051
Lead	ND	mg/kg	3.1		1	08/20/18	08/21/18 02:55	1051
Magnesium	**510**	mg/kg	62		1	08/20/18	08/21/18 20:52	1051
Manganese	**46**	mg/kg	3.1		1	08/20/18	08/21/18 20:52	1051
Mercury	ND	mg/kg	0.12		1	08/20/18	08/21/18 02:55	1051
Nickel	ND	mg/kg	3.1		1	08/20/18	08/21/18 02:55	1051
Potassium	**230**	mg/kg	62		1	08/20/18	08/21/18 20:52	1051
Selenium	ND	mg/kg	3.1		1	08/20/18	08/21/18 02:55	1051
Silver	ND	mg/kg	3.1		1	08/20/18	08/21/18 02:55	1051
Sodium	**2,200**	mg/kg	62		1	08/20/18	08/22/18 15:19	1051
Thallium	ND	mg/kg	2.5		1	08/20/18	08/21/18 02:55	1051
Vanadium	**3.2**	mg/kg	3.1		1	08/20/18	08/21/18 20:52	1051
Zinc	ND	mg/kg	12		1	08/20/18	08/21/18 02:55	1051

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CERTIFICATE OF ANALYSIS

No: 18081530

Findling, Inc., Baltimore, MD

August 23, 2018

Project Name: Massey's Ditch Channel
Project Location: Millsboro, DE
Project ID: 18-1026

Sample ID: Sample at Depth **Date/Time Sampled: 08/07/2018 11:00** **PSS Sample ID: 18081530-002**
Matrix: SOIL **Date/Time Received: 08/15/2018 16:10** **% Solids: 80**

Organochlorine Pesticides — Analytical Method: SW-846 8081 B — Preparation Method: SW3550C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
alpha-BHC	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
gamma-BHC (Lindane)	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
beta-BHC	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
delta-BHC	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
Heptachlor	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
Aldrin	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
Heptachlor epoxide	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
gamma-Chlordane	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
alpha-Chlordane	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
4,4-DDE	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
Endosulfan I	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
Dieldrin	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
Endrin	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
4,4-DDD	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
Endosulfan II	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
4,4-DDT	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
Endrin aldehyde	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
Methoxychlor	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
Endosulfan sulfate	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
Endrin ketone	ND	ug/kg	4.9		1	08/16/18	08/16/18 15:55	1014
Toxaphene	ND	ug/kg	120		1	08/16/18	08/16/18 15:55	1014
Chlordane	ND	ug/kg	120		1	08/16/18	08/16/18 15:55	1014

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PHASE SEPARATION SCIENCE, INC.

CERTIFICATE OF ANALYSIS

No: 18081530

Findling, Inc., Baltimore, MD

August 23, 2018

Project Name: Massey's Ditch Channel
Project Location: Millsboro, DE
Project ID: 18-1026

Sample ID: Sample at Depth **Date/Time Sampled: 08/07/2018 11:00** **PSS Sample ID: 18081530-002**
Matrix: SOIL **Date/Time Received: 08/15/2018 16:10** **% Solids: 80**

Polychlorinated Biphenyls — Analytical Method: SW-846 8082 A — Preparation Method: SW3550C
Clean up Method: SW846 3665A

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
PCB-1016	ND	mg/kg	0.061		1	08/16/18	08/20/18 21:10	1029
PCB-1221	ND	mg/kg	0.061		1	08/16/18	08/20/18 21:10	1029
PCB-1232	ND	mg/kg	0.061		1	08/16/18	08/20/18 21:10	1029
PCB-1242	ND	mg/kg	0.061		1	08/16/18	08/20/18 21:10	1029
PCB-1248	ND	mg/kg	0.061		1	08/16/18	08/20/18 21:10	1029
PCB-1254	ND	mg/kg	0.061		1	08/16/18	08/20/18 21:10	1029
PCB-1260	ND	mg/kg	0.061		1	08/16/18	08/20/18 21:10	1029

Polyaromatic Hydrocarbons (PAHs) — Analytical Method: SW-846 8270 C — Preparation Method: SW3550C

	Result	Units	RL	Flag	Dil	Prepared	Analyzed	Analyst
Acenaphthene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Acenaphthylene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Anthracene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Benzo(a)anthracene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Benzo(a)pyrene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Benzo(b)fluoranthene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Benzo(g,h,i)perylene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Benzo(k)fluoranthene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Chrysene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Dibenz(a,h)Anthracene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Fluoranthene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Fluorene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Indeno(1,2,3-c,d)Pyrene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
2-Methylnaphthalene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Naphthalene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Phenanthrene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055
Pyrene	ND	ug/kg	21		1	08/20/18	08/20/18 19:18	1055

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

August 22, 2018

Phase Separation Science, Inc

Sample Delivery Group:	L1019321
Samples Received:	08/18/2018
Project Number:	18081530
Description:	18-1026

Report To: Lynn Jackson
6630 Baltimore National Pike
Catonsville, MD 21228

Entire Report Reviewed By:

Nancy McLain
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

	Collected by	Collected date/time	Received date/time
18081530-001 L1019321-01 Solid		08/07/18 11:00	08/18/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1155307	1	08/21/18 14:49	08/21/18 14:55	KS
Wet Chemistry by Method USDA LOI	WG1155271	1	08/21/18 18:03	08/22/18 15:00	MMF

	Collected by	Collected date/time	Received date/time
18081530-002 L1019321-02 Solid		08/07/18 11:00	08/18/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Total Solids by Method 2540 G-2011	WG1155307	1	08/21/18 14:49	08/21/18 14:55	KS
Wet Chemistry by Method USDA LOI	WG1155271	1	08/21/18 18:03	08/22/18 15:00	MMF

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Nancy McLain
Project Manager

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	86.1		1	08/21/2018 14:55	WG1155307

Wet Chemistry by Method USDA LOI

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
TOC (Total Organic Carbon)	1750		3.33	10.0	1	08/22/2018 15:00	WG1155271

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	85.8		1	08/21/2018 14:55	WG1155307

Wet Chemistry by Method USDA LOI

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
TOC (Total Organic Carbon)	1360		3.33	10.0	1	08/22/2018 15:00	WG1155271

Method Blank (MB)

(MB) R3335634-1 08/21/18 14:55

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00100			

L1019321-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1019321-02 08/21/18 14:55 • (DUP) R3335634-3 08/21/18 14:55

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	85.8	86.3	1	0.566		10

Laboratory Control Sample (LCS)

(LCS) R3335634-2 08/21/18 14:55

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3335785-1 08/22/18 14:59

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
TOC (Total Organic Carbon)	U		3.33	10.0

L1019321-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1019321-01 08/22/18 15:00 • (DUP) R3335785-4 08/22/18 15:00

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
TOC (Total Organic Carbon)	1750	1870	1	7.15		20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3335785-2 08/22/18 14:59 • (LCSD) R3335785-3 08/22/18 14:59

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TOC (Total Organic Carbon)	3890	6730	6330	173	163	39.6-180			6.08	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
	The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.

ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Phase Separation Science, Inc	18081530	L1019321	08/22/18 15:22	10 of 13

Chain of Custody Form for Subcontracted Analyses

L1019321

Phase Separation Science, Inc
6630 Baltimore National Pike
Baltimore, MD 21228
Phone: (410) 747-8770
Fax: (410) 788-8723

W.O. No. : 18081530
P.O. No. :
Project Number : 18-1026
Report To LOD : No

Samples Transferred To:
Pace Analytical Svc's., LLC - Pittsburgh Lab
1638 Roseytown Rd., Ste's. 2,3,4
Greensburg, PA 15601

10/2016 Contact is Justin Hall, justin.hall@pacelat
Phone : 724-850-5600

For Questions or issues please contact: Lynn Jackson

Report Due On :08/22/18 05:00

Lab Sample ID	Field Sample ID	Date Sampled	Time Sampled	Matrix	Analyses Required	Method	Type of Container	Preservative
18081530-001	Sample at Surface	08/07/18	11:00	Solid	Total Organic Carbon	SM5310B	4 OZ WM GLASS	COOL
18081530-002	Sample at Depth	08/07/18	11:00	Solid	Total Organic Carbon	SM5310B	4 OZ WM GLASS	COOL

-01
-02

Data Deliverables Required: COA

Perform Q.C. on Sample : _____

Send Report Attn : reporting@phaseonline.com

Send InvoiceAttn : invoicing@phaseonline.com

Airbill No.: _____ Carrier : _____

Condition Upon Receipt : _____

Comments : **DE certification required - see Simon C.**

Samples Relinquished By : _____ Date : _____ Time: _____ Samples Received By : [signature] 8/18/18 5:45

Samples Relinquished By: _____ Date : _____ Time : _____ Samples Received By: _____

Samples Relinquished By: _____ Date: _____ Time: _____ Samples Received By: _____

0.4°C

4267 4207 4410

Pace Analytical National Center for Testing & Innovation
Cooler Receipt Form

Client: PACEGP1	SDG#	401932
Cooler Received/Opened On: 8/18/18	Temperature:	0.4° C
Received By: Chrystan Lyle		
Signature:		

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?	✓		
COC Signed / Accurate?		✓	
Bottles arrive intact?		✓	
Correct bottles used?		✓	
Sufficient volume sent?		✓	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			

Pace Analytical®
National Center for Testing & Innovation

Login #:1019321	Client:PACEGPA	Date:08/18/18	Evaluated by:Matthew Lockhart

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time		Login Clarification Needed		**If Broken Container:**
	Improper temperature		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
	Improper preservation		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Courie
	Insufficient sample volume.		Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:Chrysten Lyle
	Broken container:	X	Chain of Custody is missing		Date/Time:08/18/18 0845
	Sufficient sample remains				Temp./Cont. Rec./pH:0.4
					Carrier:Fedex Express
					Tracking#4267 4207 4410

Login Comments:Did not receive a COC.
We received 2- contianers with the work order: 18081530, sampleID are 18081530-001 and 18081530-002, each have 1 4oz container.
Client: Phase Separation Science, Inc.

Client informed by:		Call		Email X		Voice Mail		Date: 8/20/18	Time: 3:19pm
TSR Initials: NM	Client Contact: Dave Pichette								

Login Instructions:

Log for TOC and TS. See attached COC. Use COCODE PHASEPCMD

Case Narrative Summary

Client Name: Findling, Inc.

Project Name: Massey's Ditch Channel

Work Order Number(s): 18081530

Project ID: 18-1026

Any holding time exceedances, deviations from the method specifications, regulatory requirements or variations to the procedures outlined in the PSS Quality Assurance Manual are outlined below.

The analyses of chlorine, pH, dissolved oxygen, temperature and sulfite for drinking water and non-potable samples tested for compliance have a maximum holding time of 15 minutes. As such, all laboratory analyses for these analytes exceed holding times.

Matrix spike and matrix spike duplicate analyses may not be performed due to insufficient sample quantity. In these instances, a laboratory control sample and laboratory control sample duplicate are analyzed unless otherwise noted or specified in the method.

Unless otherwise noted, surrogate recoveries outside of the acceptance criteria are most often the result of sample matrix interference and/or sample dilution.

Quality control samples that display a high bias will not be narrated when sample target compounds are not detected.

Sample Receipt:

Sample(s) received at a temperature greater than 6 degrees C and ice was present.

NELAP accreditation was held for all analyses performed unless noted below. See www.phaseonline.com for complete PSS scope of accreditation.

Analytical Data Package Information Summary

Work Order(s): 18081530
Report Prepared For: Findling, Inc., Baltimore, MD
Project Name: Massey's Ditch Channel
Project Manager: Suri Surendra

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SM2540G	Sample at Surface	Initial	18081530-001	1061	S	156186	156186	08/07/2018	08/16/2018 12:17	08/16/2018 12:17
	Sample at Depth	Initial	18081530-002	1061	S	156186	156186	08/07/2018	08/16/2018 12:17	08/16/2018 12:17
SW-846 6020 A	Sample at Surface	Initial	18081530-001	1051	S	72906	156357	08/07/2018	08/20/2018 10:50	08/21/2018 02:50
	Sample at Depth	Initial	18081530-002	1051	S	72906	156357	08/07/2018	08/20/2018 10:50	08/21/2018 02:55
	72906-1-BKS	BKS	72906-1-BKS	1051	S	72906	156357	--------	08/20/2018 10:50	08/21/2018 00:47
	72906-1-BLK	BLK	72906-1-BLK	1051	S	72906	156357	--------	08/20/2018 10:50	08/21/2018 00:43
	Drums S	MS	18081507-001 S	1051	S	72906	156357	08/15/2018	08/20/2018 10:50	08/21/2018 01:20
	Drums SD	MSD	18081507-001 SD	1051	S	72906	156357	08/15/2018	08/20/2018 10:50	08/21/2018 01:25
	72906-1-BKS	Reanalysis	72906-1-BKS	1051	S	72906	156382	--------	08/20/2018 10:50	08/21/2018 19:32
	Sample at Surface	Reanalysis	18081530-001	1051	S	72906	156382	08/07/2018	08/20/2018 10:50	08/21/2018 20:48
	Sample at Depth	Reanalysis	18081530-002	1051	S	72906	156382	08/07/2018	08/20/2018 10:50	08/21/2018 20:52
	Sample at Surface	Reanalysis	18081530-001	1051	S	72906	156456	08/07/2018	08/20/2018 10:50	08/22/2018 15:14
	Sample at Depth	Reanalysis	18081530-002	1051	S	72906	156456	08/07/2018	08/20/2018 10:50	08/22/2018 15:19
SW-846 8081 B	Sample at Surface	Initial	18081530-001	1014	S	72845	156220	08/07/2018	08/16/2018 10:30	08/16/2018 15:27
	Sample at Depth	Initial	18081530-002	1014	S	72845	156220	08/07/2018	08/16/2018 10:30	08/16/2018 15:55
	72845-1-BKS	BKS	72845-1-BKS	1014	S	72845	156220	--------	08/15/2018 16:43	08/16/2018 12:11
	72845-1-BLK	BLK	72845-1-BLK	1014	S	72845	156220	--------	08/15/2018 16:43	08/16/2018 11:43
	72845-1-BSD	BSD	72845-1-BSD	1014	S	72845	156220	--------	08/15/2018 16:43	08/16/2018 12:39
	GM-Sand S	MS	18081426-001 S	1014	S	72845	156220	08/13/2018	08/15/2018 16:43	08/16/2018 13:07
	GM-Sand SD	MSD	18081426-001 SD	1014	S	72845	156220	08/13/2018	08/15/2018 16:43	08/16/2018 13:35
SW-846 8082 A	Sample at Surface	Initial	18081530-001	1029	S	72861	156268	08/07/2018	08/16/2018 10:48	08/20/2018 20:42
	Sample at Depth	Initial	18081530-002	1029	S	72861	156268	08/07/2018	08/16/2018 10:48	08/20/2018 21:10
	72861-1-BKS	BKS	72861-1-BKS	1029	S	72861	156268	--------	08/16/2018 10:48	08/17/2018 10:30
	72861-1-BLK	BLK	72861-1-BLK	1029	S	72861	156268	--------	08/16/2018 10:48	08/17/2018 10:02
	72861-1-BSD	BSD	72861-1-BSD	1029	S	72861	156268	--------	08/16/2018 10:48	08/17/2018 10:58
	F-GB-19 (5-7) S	MS	18080812-014 S	1029	S	72861	156268	08/07/2018	08/16/2018 10:48	08/17/2018 11:34
	F-GB-19 (5-7) SD	MSD	18080812-014 SD	1029	S	72861	156268	08/07/2018	08/16/2018 10:48	08/17/2018 12:01

Analytical Data Package Information Summary

Work Order(s): 18081530
Report Prepared For: Findling, Inc., Baltimore, MD
Project Name: Massey's Ditch Channel
Project Manager: Suri Surendra

Method	Client Sample Id	Analysis Type	Lab Sample Id	Analyst	Mtx	Prep Batch	Analytical Batch	Sampled	Prepared	Analyzed
SW-846 8270 C	Sample at Surface	Initial	18081530-001	1055	S	72908	156323	08/07/2018	08/20/2018 11:38	08/20/2018 18:51
	Sample at Depth	Initial	18081530-002	1055	S	72908	156323	08/07/2018	08/20/2018 11:38	08/20/2018 19:18
	72908-1-BKS	BKS	72908-1-BKS	1055	S	72908	156323	--------	08/20/2018 11:38	08/20/2018 16:33
	72908-1-BLK	BLK	72908-1-BLK	1055	S	72908	156323	--------	08/20/2018 11:38	08/20/2018 16:05
	72908-1-BSD	BSD	72908-1-BSD	1055	S	72908	156323	--------	08/20/2018 11:38	08/20/2018 17:01
	G-PB-7 (2-4) S	MS	18081032-005 S	1055	S	72908	156323	08/10/2018	08/20/2018 11:38	08/20/2018 17:28
	G-PB-7 (2-4) SD	MSD	18081032-005 SD	1055	S	72908	156323	08/10/2018	08/20/2018 11:38	08/20/2018 17:56

PHASE SEPARATION SCIENCE, INC.

QC Summary 18081530

Findling, Inc.
Massey's Ditch Channel

Analytical Method: SW-846 8081 B Prep Method: SW3550C
Seq Number: 156220 Matrix: Soil Date Prep: 08/16/2018
PSS Sample ID: 18081530-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	118		23-165	%	08/16/18 15:27
Tetrachloro-m-xylene	97		31-145	%	08/16/18 15:27

Analytical Method: SW-846 8082 A Prep Method: SW3550C
Seq Number: 156268 Matrix: Soil Date Prep: 08/16/2018
PSS Sample ID: 18081530-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	82		61-150	%	08/20/18 20:42
Tetrachloro-m-xylene	66		42-142	%	08/20/18 20:42

Analytical Method: SW-846 8270 C Prep Method: SW3550C
Seq Number: 156323 Matrix: Soil Date Prep: 08/20/2018
PSS Sample ID: 18081530-001

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	88		32-107	%	08/20/18 18:51
2-Fluorophenol	80		34-113	%	08/20/18 18:51
Nitrobenzene-d5	83		35-123	%	08/20/18 18:51
Phenol-d6	80		34-120	%	08/20/18 18:51
Terphenyl-D14	89		46-154	%	08/20/18 18:51
2,4,6-Tribromophenol	94		31-113	%	08/20/18 18:51

Analytical Method: SW-846 8081 B Prep Method: SW3550C
Seq Number: 156220 Matrix: Soil Date Prep: 08/16/2018
PSS Sample ID: 18081530-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	108		23-165	%	08/16/18 15:55
Tetrachloro-m-xylene	91		31-145	%	08/16/18 15:55

Analytical Method: SW-846 8082 A Prep Method: SW3550C
Seq Number: 156268 Matrix: Soil Date Prep: 08/16/2018
PSS Sample ID: 18081530-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	87		61-150	%	08/20/18 21:10
Tetrachloro-m-xylene	65		42-142	%	08/20/18 21:10

PHASE SEPARATION SCIENCE, INC.

QC Summary 18081530

Findling, Inc.
Massey's Ditch Channel

Analytical Method: SW-846 8270 C Prep Method: SW3550C
Seq Number: 156323 Matrix: Soil Date Prep: 08/20/2018
PSS Sample ID: 18081530-002

Surrogate	%Rec	Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	92		32-107	%	08/20/18 19:18
2-Fluorophenol	80		34-113	%	08/20/18 19:18
Nitrobenzene-d5	86		35-123	%	08/20/18 19:18
Phenol-d6	84		34-120	%	08/20/18 19:18
Terphenyl-D14	89		46-154	%	08/20/18 19:18
2,4,6-Tribromophenol	99		31-113	%	08/20/18 19:18

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

PHASE SEPARATION SCIENCE, INC.

QC Summary 18081530

Findling, Inc.
Massey's Ditch Channel

Analytical Method: SW-846 6020 A Prep Method: SW3050B
Seq Number: 156357 Matrix: Solid Date Prep: 08/20/18
MB Sample Id: 72906-1-BLK LCS Sample Id: 72906-1-BKS

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	Limits	Units	Analysis Date	Flag
Antimony	<2.259	18.08	16.84	93	80-120	mg/kg	08/21/18 00:47	
Arsenic	<0.4519	18.08	18.00	100	80-120	mg/kg	08/21/18 19:32	
Barium	<2.259	18.08	17.35	96	80-120	mg/kg	08/21/18 19:32	
Beryllium	<2.259	18.08	16.61	92	80-120	mg/kg	08/21/18 19:32	
Cadmium	<2.259	18.08	16.10	89	80-120	mg/kg	08/21/18 00:47	
Calcium	<45.19	180.8	186	103	80-120	mg/kg	08/21/18 19:32	
Chromium	<2.259	18.08	18.76	104	80-120	mg/kg	08/21/18 19:32	
Cobalt	<2.259	18.08	16.17	89	80-120	mg/kg	08/21/18 00:47	
Copper	<2.259	18.08	18.84	104	80-120	mg/kg	08/21/18 19:32	
Iron	<45.19	180.8	160.2	89	80-120	mg/kg	08/21/18 00:47	
Lead	<2.259	18.08	17.13	95	80-120	mg/kg	08/21/18 19:32	
Magnesium	<45.19	180.8	163.4	90	80-120	mg/kg	08/21/18 00:47	
Manganese	<2.259	18.08	16.72	92	80-120	mg/kg	08/21/18 00:47	
Mercury	<0.09038	0.4519	0.4135	92	80-120	mg/kg	08/21/18 00:47	
Nickel	<2.259	18.08	16.36	90	80-120	mg/kg	08/21/18 00:47	
Potassium	<45.19	180.8	132.8	73	80-120	mg/kg	08/21/18 00:47	L
Selenium	<2.259	18.08	16.17	89	80-120	mg/kg	08/21/18 00:47	
Silver	<2.259	18.08	16.32	90	80-120	mg/kg	08/21/18 00:47	
Sodium	<45.19	180.8	227.5	126	80-120	mg/kg	08/21/18 19:32	H
Thallium	<1.808	18.08	15.59	86	80-120	mg/kg	08/21/18 19:32	
Vanadium	<2.259	18.08	18.85	104	80-120	mg/kg	08/21/18 19:32	
Zinc	<9.038	90.38	80.40	89	80-120	mg/kg	08/21/18 00:47	

Analytical Method: SW-846 6020 A Prep Method: SW3050B
Seq Number: 156357 Matrix: Solid Date Prep: 08/20/18
MB Sample Id: 72906-1-BLK

Parameter	MB Result	LOD	RL	Units	Analysis Date	Flag
Aluminum	ND	23.61	47.22	mg/kg	08/21/18 00:43	

PHASE SEPARATION SCIENCE, INC.

QC Summary 18081530

Findling, Inc.
Massey's Ditch Channel

Analytical Method: SW-846 8081 B Prep Method: SW3550C
Seq Number: 156220 Matrix: Solid Date Prep: 08/15/18
MB Sample Id: 72845-1-BLK LCS Sample Id: 72845-1-BKS LCSD Sample Id: 72845-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
alpha-BHC	<3.996	19.98	21.91	110	22.09	110	58-120	1	25	ug/kg	08/16/18 12:11	
gamma-BHC (Lindane)	<3.996	19.98	21.55	108	22.01	110	57-120	2	25	ug/kg	08/16/18 12:11	
beta-BHC	<3.996	19.98	20.35	102	20.82	104	59-118	2	25	ug/kg	08/16/18 12:11	
delta-BHC	<3.996	19.98	21.50	108	22.07	110	52-123	3	25	ug/kg	08/16/18 12:11	
Heptachlor	<3.996	19.98	19.79	99	20.82	104	44-130	5	25	ug/kg	08/16/18 12:11	
Aldrin	<3.996	19.98	21.12	106	21.50	107	59-123	2	25	ug/kg	08/16/18 12:11	
Heptachlor epoxide	<3.996	19.98	20.03	100	20.91	104	61-119	4	25	ug/kg	08/16/18 12:11	
gamma-Chlordane	<3.996	19.98	21.17	106	21.67	108	61-122	2	25	ug/kg	08/16/18 12:11	
alpha-Chlordane	<3.996	19.98	23.13	116	23.66	118	61-123	2	25	ug/kg	08/16/18 12:11	
4,4-DDE	<3.996	19.98	22.39	112	23.02	115	49-131	3	25	ug/kg	08/16/18 12:11	
Endosulfan I	<3.996	19.98	21.16	106	21.60	108	66-118	2	25	ug/kg	08/16/18 12:11	
Dieldrin	<3.996	19.98	21.87	109	22.41	112	60-122	2	25	ug/kg	08/16/18 12:11	
Endrin	<3.996	19.98	21.09	106	22.39	112	39-133	6	25	ug/kg	08/16/18 12:11	
4,4-DDD	<3.996	19.98	22.02	110	22.47	112	44-130	2	25	ug/kg	08/16/18 12:11	
Endosulfan II	<3.996	19.98	21.40	107	21.80	109	59-118	2	25	ug/kg	08/16/18 12:11	
4,4-DDT	<3.996	19.98	21.64	108	23.37	117	28-134	8	25	ug/kg	08/16/18 12:11	
Endrin aldehyde	<3.996	19.98	22.02	110	22.65	113	51-129	3	25	ug/kg	08/16/18 12:11	
Methoxychlor	<3.996	19.98	21.24	106	22.63	113	33-135	6	25	ug/kg	08/16/18 12:11	
Endosulfan sulfate	<3.996	19.98	20.88	105	21.65	108	54-124	4	25	ug/kg	08/16/18 12:11	
Endrin ketone	<3.996	19.98	21.38	107	22.11	110	58-123	3	25	ug/kg	08/16/18 12:11	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	127		104		111		23-165	%	08/16/18 12:11
Tetrachloro-m-xylene	133		112		118		31-145	%	08/16/18 12:11

Analytical Method: SW-846 8082 A Prep Method: SW3550C
Seq Number: 156268 Matrix: Solid Date Prep: 08/16/18
MB Sample Id: 72861-1-BLK LCS Sample Id: 72861-1-BKS LCSD Sample Id: 72861-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
PCB-1016	<0.05025	0.5025	0.3879	77	0.3951	80	60-110	2	25	mg/kg	08/17/18 10:30	
PCB-1260	<0.05025	0.5025	0.4181	83	0.4221	85	60-98	1	25	mg/kg	08/17/18 10:30	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
Decachlorobiphenyl	91		88		89		61-150	%	08/17/18 10:30
Tetrachloro-m-xylene	89		92		93		42-142	%	08/17/18 10:30

PHASE SEPARATION SCIENCE, INC.

QC Summary 18081530

Findling, Inc.
Massey's Ditch Channel

Analytical Method: SW-846 8270 C Prep Method: SW3550C

Seq Number: 156323 Matrix: Solid Date Prep: 08/20/18

MB Sample Id: 72908-1-BLK LCS Sample Id: 72908-1-BKS LCSD Sample Id: 72908-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Acenaphthene	<16.62	1329	1047	79	1105	83	60-116	5	25	ug/kg	08/20/18 16:33	
Acenaphthylene	<16.62	1329	1183	89	1213	91	61-112	3	25	ug/kg	08/20/18 16:33	
Anthracene	<16.62	1329	1071	81	1207	91	66-115	12	25	ug/kg	08/20/18 16:33	
Benzo(a)anthracene	<16.62	1329	1068	80	1079	81	71-113	1	25	ug/kg	08/20/18 16:33	
Benzo(a)pyrene	<16.62	1329	1154	87	1183	89	69-118	2	25	ug/kg	08/20/18 16:33	
Benzo(b)fluoranthene	<16.62	1329	1102	83	1141	86	65-126	3	25	ug/kg	08/20/18 16:33	
Benzo(g,h,i)perylene	<16.62	1329	1164	88	1177	89	69-112	1	25	ug/kg	08/20/18 16:33	
Benzo(k)fluoranthene	<16.62	1329	1055	79	1067	80	57-129	1	25	ug/kg	08/20/18 16:33	
Chrysene	<16.62	1329	1033	78	1077	81	72-114	4	25	ug/kg	08/20/18 16:33	
Dibenz(a,h)Anthracene	<16.62	1329	1186	89	1182	89	72-110	0	25	ug/kg	08/20/18 16:33	
Fluoranthene	<16.62	1329	1133	85	1195	90	69-119	5	25	ug/kg	08/20/18 16:33	
Fluorene	<16.62	1329	1100	83	1128	85	65-115	3	25	ug/kg	08/20/18 16:33	
Indeno(1,2,3-c,d)Pyrene	<16.62	1329	1225	92	1179	89	60-127	4	25	ug/kg	08/20/18 16:33	
2-Methylnaphthalene	<16.62	1329	1219	92	1221	92	70-109	0	25	ug/kg	08/20/18 16:33	
Naphthalene	<16.62	1329	1114	84	1126	85	59-108	1	25	ug/kg	08/20/18 16:33	
Phenanthrene	<16.62	1329	1178	89	1128	85	67-117	4	25	ug/kg	08/20/18 16:33	
Pyrene	<16.62	1329	1096	82	1121	84	77-111	2	25	ug/kg	08/20/18 16:33	

Surrogate	MB %Rec	MB Flag	LCS Result	LCS Flag	LCSD Result	LCSD Flag	Limits	Units	Analysis Date
2-Fluorobiphenyl	97		98		100		32-107	%	08/20/18 16:33
2-Fluorophenol	98		99		102		34-113	%	08/20/18 16:33
Nitrobenzene-d5	99		103		101		35-123	%	08/20/18 16:33
Phenol-d6	94		99		98		34-120	%	08/20/18 16:33
Terphenyl-D14	82		84		84		46-154	%	08/20/18 16:33
2,4,6-Tribromophenol	96		103		102		31-113	%	08/20/18 16:33

F = RPD exceeded the laboratory control limits
X = Recovery of MS, MSD or both outside of QC Criteria
H= Recovery of BS,BSD or both exceeded the laboratory control limits
L = Recovery of BS,BSD or both below the laboratory control limits

SAMPLE CHAIN OF CUSTODY/AGREEMENT FORM

PHASE SEPARATION SCIENCE, INC.

www.phaseonline.com
email: info@phaseonline.com

(1)

*CLIENT: Findling, Inc. *OFFICE LOC. Baltimore, MD

*PROJECT MGR: Suri Surendra *PHONE NO.: (410) 367-1400

EMAIL: Suri.Surendra@Findlinginc.com FAX NO.: (410) 466-6867

*PROJECT NAME: Massey's Ditch Channel PROJECT NO.: 18-1026

SITE LOCATION: Millsboro, DE P.O. NO.:

SAMPLERS: J. Tallman - M. Chism DW CERT NO.:

PSS Work Order #: 18081530 PAGE 1 OF 1

Matrix Codes:
SW=Surface Wtr **DW**=Drinking Wtr **GW**=Ground Wtr **WW**=Waste Wtr **O**=Oil **S**=Soil **WL**=Waste Liquid **WS**=Waste Solid **W**= Wipe

(2)

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX (See Codes)	No. CONTAINERS	SAMPLE TYPE C = COMP G = GRAB	Preservatives Used	Analysis/ Method Required (3) TAL 23	PAH's	PCB's	Pesticides	Total Organic Carbon	REMARKS
1	Sample at Surface	8/7/18	11:00 AM	S	3	C		X	X	X	X	X	
2	Sample at Depth	8/7/18	11:00 AM	S	3	C		X	X	X	X	X	

(5)

Relinquished By: (1)	Date	Time	Received By:
	8/15/18	1610	
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
Relinquished By: (4)	Date	Time	Received By:

(4)

*Requested Turnaround Time
☒ 5-Day ☐ 3-Day ☐ 2-Day
☐ Next Day ☐ Emergency ☐ Other

Data Deliverables Required:

# of Coolers: 1

Custody Seal: ABS

Ice Present: PRES Temp: 9°-12°C

Shipping Carrier: Client

Special Instructions:

6630 Baltimore National Pike • Route 40 West • Baltimore, Maryland 21228 • (410) 747-8770 • (800) 932-9047 • Fax (410) 788-8723

The client (Client Name), by signing, or having client's agent sign, this "Sample Chain of Custody/Agreement Form", agrees to pay for the above requested services per the latest version of the Service Brochure or PSS-provided quotation including any and all attorney's or other reasonable fees if collection becomes necessary. * = REQUIRED

Phase Separation Science, Inc

Sample Receipt Checklist

Work Order #	18081530	**Received By**	Thomas Wingate
Client Name	Findling, Inc.	**Date Received**	08/15/2018 04:10:00 PM
Project Name	Massey's Ditch Channel	**Delivered By**	Client
Project Number	18-1026	**Tracking No**	Not Applicable
Disposal Date	09/19/2018	**Logged In By**	Thomas Wingate

Shipping Container(s)

No. of Coolers 1

		Ice	Present
Custody Seal(s) Intact?	N/A	Temp (deg C)	12
Seal(s) Signed / Dated?	N/A	Temp Blank Present	No

Documentation

		Sampler Name	John Tallman
COC agrees with sample labels?	Yes	MD DW Cert. No.	N/A
Chain of Custody	Yes		

Sample Container

		Custody Seal(s) Intact?	Not Applicable
Appropriate for Specified Analysis?	Yes	Seal(s) Signed / Dated	Not Applicable
Intact?	Yes		
Labeled and Labels Legible?	Yes		

Total No. of Samples Received 2 Total No. of Containers Received 6

Preservation

Total Metals	(pH<2)	N/A
Dissolved Metals, filtered within 15 minutes of collection	(pH<2)	N/A
Orthophosphorus, filtered within 15 minutes of collection		N/A
Cyanides	(pH>12)	N/A
Sulfide	(pH>9)	N/A
TOC, DOC (field filtered), COD, Phenols	(pH<2)	N/A
TOX, TKN, NH3, Total Phos	(pH<2)	N/A
VOC, BTEX (VOA Vials Rcvd Preserved)	(pH<2)	N/A
Do VOA vials have zero headspace?		N/A
624 VOC (Rcvd at least one unpreserved VOA vial)		N/A
524 VOC (Rcvd with trip blanks)	(pH<2)	N/A

Comments: (Any "No" response must be detailed in the comments section below.)

For any improper preservation conditions, list sample ID, preservative added (reagent ID number) below as well as documentation of any client notification as well as client instructions. Samples for pH, chlorine and dissolved oxygen should be analyzed as soon as possible, preferably in the field at the time of sampling. Samples which require thermal preservation shall be considered acceptable when received at a temperature above freezing to 6°C. Samples that are hand delivered on the day that they are collected may not meet these criteria but shall be considered acceptable if there is evidence that the chilling process has begun such as arrival on ice.

Sample(s) received at a temperature greater than 6 degrees C and ice was present.

Samples Inspected/Checklist Completed By: Thomas Wingate Date: 08/15/2018

Thomas Wingate

PM Review and Approval: N Y Jackson Date: 08/16/2018

Lynn Jackson

APPENDIX 2

DNREC SUBAQUEOUS PERMIT &
COASTAL MANAGEMENT CONSISTENCY REVIEW

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WETLANDS AND SUBAQUEOUS LANDS SECTION

PERMIT NO.: SP-409/18; WQ-409/18; WE-409/18 **CONSTRUCTION EXPIRATION DATE:** 11-26-2023

TO CONDUCT THE FOLLOWING ACTIVITIES:

TO HYDRAULICALLY MAINTENANCE DREDGE:
Approximately 50,000 cubic yards of material to a depth of 6.65 feet below Mean Low Water (MLW)

TO HYDRAULICALLY NEW DREDGE:
Approximately 50,000 cubic yards of material to a depth of 6.65 feet below Mean Low Water (MLW)

TO DISPOSE OF AND BENEFICIALLY USE BOTH MAINTENANCE AND NEW DREDGED MATERIAL:
By temporarily placing a 24 inch diameter pipeline across approximately 60 linear feet of State-regulated Wetlands and to deposit the material along 4,000 linear feet of Atlantic Ocean beach for beach nourishment, located on tax parcel # 3-34-25.00-11.00, north of the Indian River Inlet, Delaware Seashore State Park, Rehoboth Beach, Sussex County, Delaware

LOCATED ON PUBLIC SUBAQUEOUS LANDS:
In portions of Massey's Ditch running from the Rehoboth Bay to the Indian River Bay (maintenance dredge), For an 100 foot wide by 1,200 foot long channel north of Lynch Thicket (new dredge), In a shoaled area approximately 500 foot wide by 800 foot long located north of Middle Island (new dredge), East of Long Neck, Sussex County, Delaware

ISSUED TO: DNREC, Division Of Watershed Stewardship
LOCATION OF WORK: Same as above

DISPLAY THIS CERTIFICATE IN A HIGHLY VISIBLE LOCATION ON THE JOB SITE.

Authorized by:

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
DIVISION OF WATER
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

WETLANDS & SUBAQUEOUS
LANDS SECTION

TELEPHONE (302) 739-9943
FAX (302) 739-6304

DNREC, Division of Watershed Stewardship
c/o: Terry L. Deputy
89 Kings Highway
Dover, DE 19901
Tax Parcel: N/A
Disposal Site Tax Parcel: 3-34-25.00-11.00

Subaqueous Lands Permit: SP-409/18
Water Quality Certification: WQ -409/18
Wetlands Permit: WE-409/18
Date of Issuance: 11-28-2018
Construction Expiration Date: 11-28-2023
Amended Date: N/A

SUBAQUEOUS LANDS PERMIT, WATER QUALITY CERTIFICATION AND WETLANDS PERMIT

GRANTED TO:

DNREC, Division of Watershed Stewardship

TO HYDRAULICALLY MAINTENANCE DREDGE:

Approximately 50,000 cubic yards of material to a depth of 6.65 feet below Mean Low Water (MLW)

TO HYDRAULICALLY NEW DREDGE:

Approximately 50,000 cubic yards of material to a depth of 6.65 feet below Mean Low Water (MLW)

LOCATED ON PUBLIC SUBAQUEOUS LANDS:

**In portions of Massey's Ditch running from the Rehoboth Bay to the Indian River Bay (maintenance dredge),
For an 100 foot wide by 1,200 foot long channel north of Lynch Thicket (new dredge),
In a shoaled area approximately 500 foot wide by 800 foot long located north of Middle Island (new dredge),
East of Long Neck, Sussex County, Delaware**

TO DISPOSE OF AND BENEFICIALLY USE BOTH MAINTENANCE AND NEW DREDGED MATERIAL:

By temporarily placing a 24 inch diameter pipeline across approximately 60 linear feet of State-regulated Wetlands and to deposit the material along 4,000 linear feet of Atlantic Ocean beach for beach nourishment, located on tax parcel # 3-34-25.00-11.00, north of the Indian River Inlet, Delaware Seashore State Park, Rehoboth Beach, Sussex County, Delaware

Pursuant to the provisions of 7 Del. C. 7205, the Department's Regulations Governing the Use of Subaqueous Lands, 7 Del. C., Section 6003, the Department's Regulations Governing the Control of Water Pollution and Section 401 of the Clean Water Act, 7 Del. C., §6604, and the Department's Wetlands Regulations, permission is hereby granted on this 28th day of November A.D. 2018, to construct the above-referenced project in accordance with the approved plans (38 sheets), as approved on November 28, 2018; and the application dated September 26, 2018, and received by this Division on September 26, 2018 with subsequent information received November 13, 2018.

WHEREAS, DNREC, Division of Watershed Stewardship, has applied for permission to perform the indicated work to improve navigable water depths at low tide and provide beach nourishment; and;

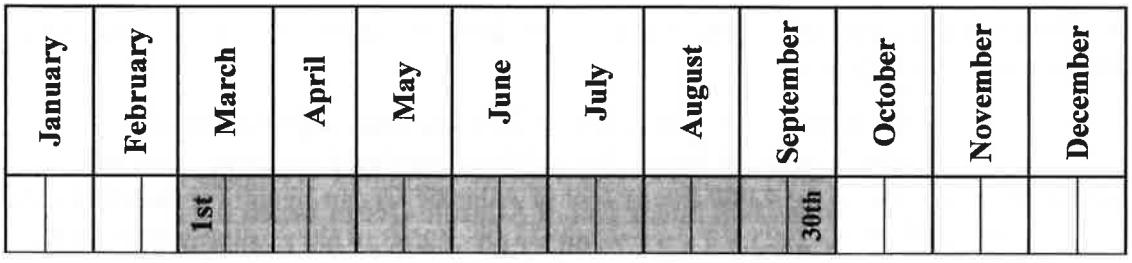
WHEREAS, pursuant to the provisions of 7 Del. C., §7203, the Secretary of the Department of Natural Resources and Environmental Control through his duly authorized representative finds that it is not contrary to the public interest if this project is approved subject to the terms and conditions herein set forth.

WHEREAS, in accordance with Section 401 of the Clean Water Act, 33 U.S.C. Section 1341 and 7 Del. C., Chapter 60, the State of Delaware, by and through the Department of Natural Resources and Environmental Control, certifies that the permitted activity will be conducted in a manner which will not violate the applicable water quality standards of the State of Delaware, subject to the terms and conditions of this approval.

NOW THEREFORE, this Permit is issued subject to the attached Subaqueous Lands, Water Quality Certification, and Wetlands Permit General Conditions and the following special conditions:

SPECIAL CONDITIONS

1. This approval is in accordance with the plans and application submitted to the Department of Natural Resources and Environmental Control, a copy of which is attached hereto and made a part hereof.
2. The primary species of concern for this project area are summer flounder, migratory shorebirds and ground-nesting marsh birds. Reference the chart below for time-of-year restrictions (depicted in gray) when no activity shall take place.



3. This permit is granted for the purpose of improving navigable water depths at low tide and to beneficially reuse the dredged material for beach nourishment. The authorized activity in State-regulated wetlands is for the explicit purpose of placing a temporary pipeline to transfer the dredged material to the beach nourishment area. Any other use without prior written approval shall constitute reason for this Subaqueous Lands Permit, Water Quality Certification and Wetlands Permit being revoked.
4. This Permit shall be valid for a five (5) year period and authorizes the maintenance dredging of 50,000 cubic yards of material and additionally the new dredging of 50,000 cubic yards of material during one (1) dredging event.
5. Subsequent to the authorized dredge activity, minor maintenance dredging of shoaled areas within the allotted construction window may be permitted upon Department approval. The applicant shall coordinate with this office by submitting written notification and bathymetry indicating project need.
6. The permittee shall perform the authorized dredging using hydraulic dredging. The post dredging water depths shall not exceed 6.65 feet below mean low water as indicated on the approved plans. A post-dredging bathymetric survey of the site, showing depths relative to mean low water shall be submitted to this office within 60 days of the completion of the dredging.
7. All dredged material shall be utilized for beach nourishment placed along 4,000 linear feet of Atlantic Ocean beach, located on tax parcel # 3-34-25.00-11.00 and north of the Indian River Inlet, Delaware Seashore State Park, Rehoboth Beach, Delaware. Any further handling (including, but not limited to permanent capping or burial, transportation, removal of the sediment or re-grading) requires prior notification to the Department. Additional authorization may be required at that time depending upon the proposed use.
8. All dredging and disposal shall be conducted in a manner consistent with sound conservation and water pollution control practices.
9. All pipelines shall be kept in good condition at all times and any leaks or breaks shall be promptly and properly repaired.
10. The pipeline placed in the waters of the Rehoboth Bay and Indian River Bay shall be placed in a manner so that they do not impede navigation or cause hazardous conditions.
11. The pipeline shall be removed upon completion of dredging and beach nourishment activities.
12. There shall be no dredging in State-regulated wetlands.
13. No dredged materials shall be deposited on State-regulated wetlands.
14. All waters disturbed during construction activities, except for those intended to be permanently altered for the authorized dredging and beach nourishment, shall be restored to pre-disturbance conditions to include bank elevations and slopes, waterway and wetland surface elevations and contours, and wetland vegetation and densities.
15. Erosion and sediment control measures shall be implemented in accordance with the specifications and criteria in the current Delaware Erosion and Sediment Control Handbook, so as to minimize entry and dispersal of sediment and other contaminants in surface waters.

16. The permittee shall notify the Department of Natural Resources and Environmental Control within ten (10) days of completion of the work authorized by this Permit/Certification by completing and submitting the enclosed Contractor's Post Construction Completion Report form.
17. The work authorized by this Permit is subject to the terms and conditions of the Department of the Army Individual Permit.

IN WITNESS WHEREOF, I, Tyler Brown, the duly authorized representative of Shawn M. Garvin, Secretary of the Department of Natural Resources and Environmental Control, have hereunto set my hand this 28th day of November, 2018.

By Tyler Brown, Section Manager
the duly authorized representative of the Secretary of the
Department of Natural Resources and Environmental Control

Julie R. Molina, Environmental Scientist
Wetlands and Subaqueous Lands Section

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
DIVISION OF WATER
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

GENERAL CONDITIONS

1. The permittee and contractor shall at all times comply with all applicable laws and regulations of the Department of Natural Resources and Environmental Control.
2. The activities authorized herein shall be undertaken in accordance with the Permit conditions, the final stamped and approved plans, and with the information provided in the Permit application.
3. A copy of this Permit and the stamped approved plans shall be available on-site during all phases of construction activity.
4. The conditions contained herein shall be incorporated into any and all construction contracts associated with the construction authorized herein. The permittee and contractor are responsible to ensure that the workers executing the activities authorized by this Permit have full knowledge of, and abide by, the terms and conditions of this Permit.
5. No portion of the structure shall be constructed using creosote treated lumber.
6. No portion of the structure(s) authorized by this Permit shall exceed the dimensions for that structure identified on Page One of this Permit.
7. The activities authorized herein shall be conducted so as not to violate the State of Delaware's Surface Water Quality Standards in effect at the date of Permit authorization.
8. The issuance of this Permit does not constitute approval for any activities that may be required by any other local, state or federal government agency.
9. The issuance of this Permit does not imply approval of any other part, phase, or portion of any overall project the permittee may be contemplating.
10. This Permit authorizes only the activities described herein. Modifications to the project may require a supplemental approval from this office prior to the initiation of construction. A determination of the need for a supplemental approval will be made by this office pursuant to the permittee submitting written notification and revised plans indicating project changes. Failure to contact the Department prior to executing changes to the project shall constitute reason for this Permit being revoked.
11. The Contractors Completion Report shall be filled out and returned within 10 days of completion of the authorized work.
12. The permittee shall protect and hold the State of Delaware harmless from any loss, cost or damage resulting from the activities authorized herein.
13. Representatives of the Department of Natural Resources and Environmental Control shall be allowed to access the property to inspect all work during any phase of the construction and may conduct pre and post-construction inspections, collect any samples or conduct any tests that are deemed necessary.
14. The permittee shall maintain all authorized structures and activities in a good and safe condition.

15. All construction materials, waste or debris associated with this activity shall be properly disposed of and contained at all times to prevent its entry into waters or wetlands. Construction materials shall not be stockpiled in subaqueous lands or wetlands.
16. The permittee and contractor shall employ measures during construction to prevent spills of fuels, lubricants or other hazardous substances. In the event of a spill, the permittee and contractor shall make every effort to stop the leak and contain the spill, and shall immediately contact the Hazardous Spill Response Team (HAZMAT) at 1-800-662-8802 and this office at (302) 739-9943. The permittee and contractor are responsible to comply with all directives to contain and clean up the spilled material(s) as stipulated by the HAZMAT team, and to restore the site as may be required by this office.
17. No construction shall occur after the construction expiration date identified on Page One of this Permit. The permittee may file a construction expiration date extension request of up to one (1) year if necessary to complete the authorized work. Such requests must be received by the Department at least thirty (30) days prior to the construction expiration date.
18. Any actions, operations or installations which are found by the Department to be contrary to the public interest may constitute reason for the discontinuance and/or removal of said action, operation or installation. Removal and restoration shall be at the expense of the permittee and/or upland property owner within thirty (30) days of receipt of written notice of revocation and demand for removal.
19. Disturbance of subaqueous lands or wetlands adjacent to the authorized structures or activities is prohibited unless specifically addressed in the special conditions of this Permit. Disturbance of subaqueous lands or wetlands in the path of construction activities shall be minimized. Any temporarily impacted subaqueous lands or wetlands shall be returned to pre-disturbance elevations and conditions.
20. This Permit is personal and may not be transferred without the prior written consent of the Department. Prior to the transfer of the adjacent upland property, the permittee shall obtain the written consent of the Department to transfer the Permit to the new upland property owner. Failure to obtain such written consent may result in the revocation of this Permit and the removal of all structures authorized by this Permit at the expense of the permittee.
21. The permittee shall notify the Wetlands and Subaqueous Lands Section prior to the commencement of the work authorized by this Permit.
22. No portion of the structure shall be installed within ten (10) feet of the adjacent property lines.
23. No portion of the structure shall exceed 20% of the width of the water body as measured at mean low water.
24. The structures authorized by this Permit shall be constructed and maintained in a manner so as to assure water access to adjacent properties.
25. This Permit does not authorize any future repairs below the water line, or any additions or modifications to the structures authorized herein. Such activities require separate written authorization from the Department of Natural Resources and Environmental Control.
26. Failure to comply with any of the terms or conditions of this Permit may result in enforcement action which could include the revocation of this Permit and subsequent restoration of the site to preconstruction conditions.

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
DIVISION OF WATER
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

WETLANDS & SUBAQUEOUS
LANDS SECTION

TELEPHONE (302) 739-9943
FAX (302) 739-6304

SUBAQUEOUS LANDS PERMIT
CONTRACTOR'S COMPLETION REPORT
POST-CONSTRUCTION

Subaqueous Lands Permit Number: SP-409/18
Water Quality Certification Permit Number: WQ-409/18
Wetlands Permit Number: WE-409/18

Name: DNREC, Division of Watershed Stewardship **Site Address:** East of Long Neck, DE 19966
Parcel #: N/A

I hereby certify that I have constructed the project authorized by the above-referenced Subaqueous Lands Permit in accordance with the approved plans for the project.

_____ _____
Printed Name of Contractor **Name of Company**

_____ _____
Contractor's Signature **Date**

_____
Telephone Number

Upon completion of construction, this form shall be completed, signed by the contractor, and mailed to the Wetlands and Subaqueous Lands Section at:

DNREC
Wetlands and Subaqueous Lands Section
89 Kings Highway
Dover, Delaware 19901

Or faxed to the Wetlands and Subaqueous Lands Section at: **302-739-6304**

This form must be received by the Department within ten days of the date that construction is completed.

For official use only

*Compliance inspection date*_____ *Built in accordance with plans* ☐ *Yes* ☐ *No*

Scientist: _____

Delaware's good nature depends on you!

Affix
Proper
Postage
Here

Mail to:

DNREC – Wetlands and Subaqueous Lands Section
89 Kings Highway
Dover, DE 19901

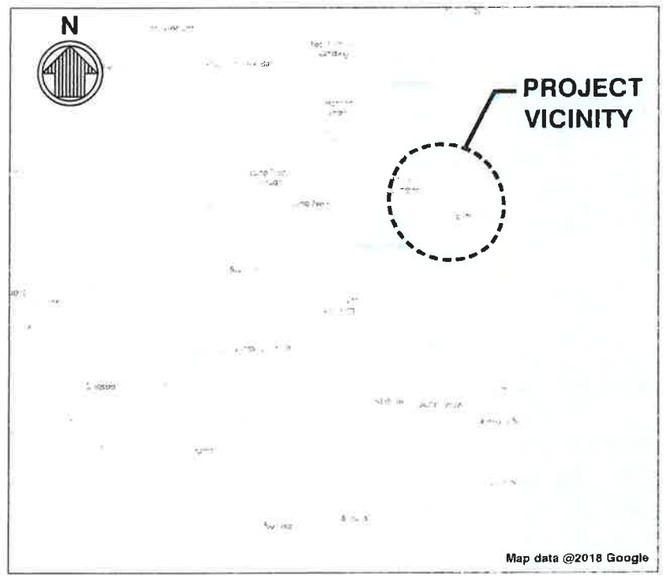
DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DOVER, DELAWARE

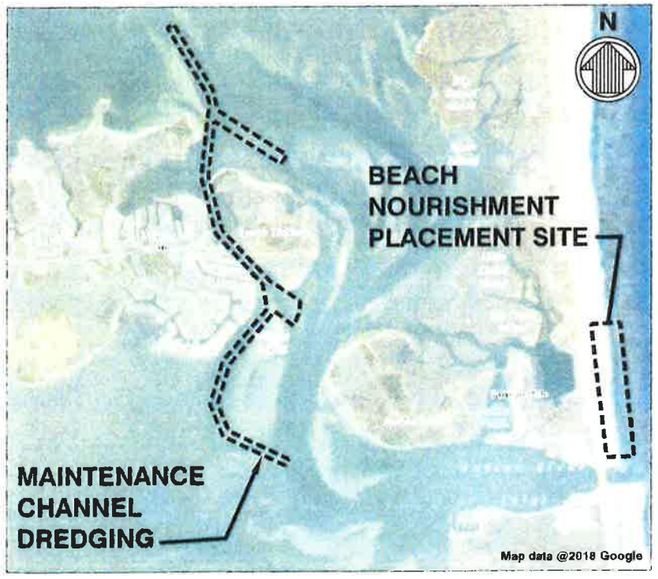
MASSEY'S DITCH CHANNEL MAINTENANCE DREDGING

CONTRACT No. NAT201805/MASSEYS

W.S.L.S.
APPROVED PLANS
PERMIT # SP; WQ; WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)



VICINITY MAP
NTS



LOCATION MAP
NTS

NOV 13 2018

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

TITLE SHEET WITH VICINITY AND LOCATION MAPS

Mark	Description	Date	Appr.

Designed by: PWK	Date: OCT 2018	Rev.	
Dwn by: HR	Ckd by: PGV	M&N Project No. 10248	
Reviewed by: PWK	Drawing code:	Drawing Scale:	
Submitted by: MOFFATT & NICHOL		Plot scale: 1:1 (D SHEET)	

2760 LIGHTHOUSE POINT EAST, SUITE 400
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
G-001
INDEX: 1 OF 38

File: G:\BA\10248 DNREC NAT1700?\10248-01 M-D Dredge\300 CAD_ACTIVE_Massey's Ditch (Sheets)\10248016-001; Plotted: 10/31/2018 12:17 PM by RIDOUANE HICHAM; Saved: 10/24/2018 2:25 PM by PVDELKER

INDEX OF DRAWINGS

INDEX NO	SHEET NO	SHEET TITLE
		GENERAL
1	G–001	TITLE SHEET WITH VICINITY AND LOCATION MAPS
2	G–002	INDEX OF DRAWINGS, GENERAL NOTES, ABBREVIATIONS, AND LEGEND
3	G–101	PLAN – GENERAL ARRANGEMENT
		GEOTECHNICAL
4	B–101	PLAN – BORING LOCATION
		CIVIL
5	C–101	PLAN – CHANNEL DREDGING – SHEET 1 OF 6
6	C–102	PLAN – CHANNEL DREDGING – SHEET 2 OF 6
7	C–103	PLAN – CHANNEL DREDGING – SHEET 3 OF 6
8	C–104	PLAN – CHANNEL DREDGING – SHEET 4 OF 6
9	C–105	PLAN – CHANNEL DREDGING – SHEET 5 OF 6
10	C–106	PLAN – CHANNEL DREDGING – SHEET 6 OF 6
11	C–301	SECTION – TYPICAL DREDGING
12	C–302	SECTION – DREDGING – SHEET 1 OF 21
13	C–303	SECTION – DREDGING – SHEET 2 OF 21
14	C–304	SECTION – DREDGING – SHEET 3 OF 21
15	C–305	SECTION – DREDGING – SHEET 4 OF 21
16	C–306	SECTION – DREDGING – SHEET 5 OF 21
17	C–307	SECTION – DREDGING – SHEET 6 OF 21
18	C–308	SECTION – DREDGING – SHEET 7 OF 21
19	C–309	SECTION – DREDGING – SHEET 8 OF 21
20	C–310	SECTION – DREDGING – SHEET 9 OF 21
21	C–311	SECTION – DREDGING – SHEET 10 OF 21
22	C–312	SECTION – DREDGING – SHEET 11 OF 21
23	C–313	SECTION – DREDGING – SHEET 12 OF 21
24	C–314	SECTION – DREDGING – SHEET 13 OF 21
25	C–315	SECTION – DREDGING – SHEET 14 OF 21
26	C–316	SECTION – DREDGING – SHEET 15 OF 21
27	C–317	SECTION – DREDGING – SHEET 16 OF 21
28	C–318	SECTION – DREDGING – SHEET 17 OF 21
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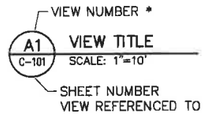
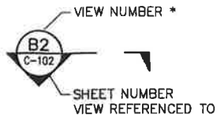
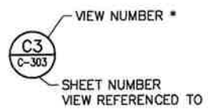
30	C–320	SECTION – DREDGING – SHEET 19 OF 21
31	C–321	SECTION – DREDGING – SHEET 20 OF 21
32	C–322	SECTION – DREDGING – SHEET 21 OF 21
33	C–323	SECTION – DREDGING EAST STA 110+50 0+00 – SHEET 1 OF 2
34	C–324	SECTION – DREDGING EAST STA 110+50 0+00 – SHEET 2 OF 2
35	C–401	ENLARGED PLAN – SAND PLACEMENT DISCHARGE PIPING LAYOUT
36	C–402	ENLARGED PLAN – INLET ROAD UNDER BRIDGE PIPELINE LAYOUT
37	C–403	ENLARGED PLAN – BAY CROSSING INLET ROAD PIPELINE LAYOUT
		REFERENCE
38	R–001	BEACH NOURISHMENT PLACEMENT SITE



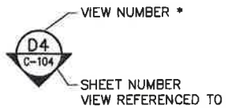
VIEW TITLE



SECTION CUT

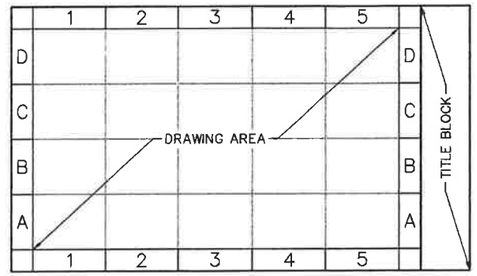


DETAIL CALLOUT



ELEVATION VIEW

* VIEW NUMBER IS BASED ON THE (DACS) LOCATION OF THE LOWER–LEFT EXTENTS OF THE VIEW ON THE REFERENCED SHEET. WHEN REFERENCING DRAWING INFORMATION BETWEEN SHEETS, BOTH THE VIEW AND SHEET NUMBERS MUST BE QUOTED TOGETHER – EITHER IN A CALLOUT FORMAT AS SHOWN ABOVE OR IN THE FORM: "VIEW NO./SHEET NO." (A1/C–501)



DRAWING AREA COORDINATE SYSTEM (DACS)

GENERAL NOTES

1. NOTES BELOW ARE NOT INTENDED TO REPLACE SPECIFICATIONS. SEE SPECIFICATIONS FOR REQUIREMENTS IN ADDITION TO GENERAL NOTES.
2. VERTICAL DATUM IS REFERENCED TO MEAN LOWER LOW WATER (MLLW). HORIZONTAL DATUM IS THE NORTH AMERICAN DATUM OF 1983 (NAD 83), DELAWARE STATE PLANE COORDINATE SYSTEM.

TIDAL DATUM	
MEAN HIGHER HIGH WATER (MHHW)	2.94 FEET
MEAN HIGH WATER (MHW)	2.67 FEET
NORTH AMERICAN VERTICAL DATUM (NAVD88)	1.82 FEET
MEAN LOW WATER (MLW)	0.15 FEET
MEAN LOWER LOW WATER (MLLW)	0.00 FEET

3. THE SURVEY INFORMATION WAS OBTAINED FROM DNREC–DIVISION OF SOIL AND WATER CONSERVATION ON JUNE 2018.
4. THE CONTRACTOR SHALL ABIDE BY ALL APPLICABLE ENVIRONMENTAL PROTECTION STANDARDS, PERMITS, LAWS AND REGULATIONS..
5. ALL SAFETY REGULATIONS ARE TO BE STRICTLY FOLLOWED.
6. CONTRACTOR SHALL TAKE ALL NECESSARY STEPS AND ACTIONS REQUIRED UNDER THE APPLICABLE SAFETY PRACTICES OF THE FOLLOWING REGULATORY AGENCIES INCLUDING, BUT NOT LIMITED TO: DELAWARE OFFICE OF OCCUPATIONAL HEALTH, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AND NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY AND HEALTH (NIOSH).

ABBREVIATIONS

ACI	—	AMERICAN CONCRETE INSTITUTE
AISC	—	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
APPROX	—	APPROXIMATE
AREA	—	AMERICAN RAILWAY ENGINEERING ASSOCIATION
ASTM	—	AMERICAN SOCIETY FOR TESTING MATERIALS
AWPA	—	AMERICAN WOOD PRESERVERS ASSOCIATION
AWS	—	AMERICAN WELDING SOCIETY
BL	—	BASELINE
BLDG	—	BUILDING
BOT	—	BOTTOM
CJ	—	CONSTRUCTION JOINT
CB	—	CATCH BASIN
CCA	—	CHROMATED COPPER ARSENATE
CF	—	CUBIC FEET
CHK	—	CHECKERED
CL	—	CENTERLINE
CLR	—	CLEAR
CMP	—	CORRUGATED METAL PIPE
CONC	—	CONCRETE
CONST	—	CONSTRUCTION
CONT	—	CONTINUOUS
CORR	—	CORRUGATED
CTS	—	CENTERS
CY	—	CUBIC YARDS
DBL	—	DOUBLE
DET	—	DETAIL
DIA	—	DIAMETER
DI	—	DUCTILE IRON
DISCON	—	DISCONTINUOUS
DNREC	—	DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DWG	—	DRAWING
E	—	EAST
EA	—	EACH
EC	—	ELECTRICAL CONTRACTOR
EF	—	EACH FACE
ELEV, EL	—	ELEVATION
EP	—	END POINT
EQ	—	EQUAL
EW	—	EACH WAY
EXIST	—	EXISTING
EXP	—	EXPANSION
F	—	FAHRENHEIT
FFE	—	FINISHED FLOOR ELEVATION
FT	—	FEET
GALV	—	GALVANIZED
HDPE	—	HIGH DENSITY POLYETHYLENE
HORIZ	—	HORIZONTAL
IN.	—	INCHES
INFO	—	INFORMATION
INV	—	INVERT
JT	—	JOINT
KIP	—	1000 LB
KSI	—	KIPS PER SQUARE INCH
KT	—	KNOT
L	—	LENGTH / ANGLE
LB, LBS	—	POUND, POUNDS
LOD	—	LIMIT OF DISTURBANCE
LF	—	LINEAR FEET
LG	—	LONG
LT	—	LEFT
MAX	—	MAXIMUM
MH	—	MANHOLE
MHW	—	MEAN HIGH WATER
MHHW	—	MEAN HIGHER HIGH WATER
MIN	—	MINIMUM
MISC	—	MISCELLANEOUS
MLW	—	MEAN LOW WATER
MLLW	—	MEAN LOWER LOW WATER
MON	—	MONUMENT
MSL	—	MEAN SEA LEVEL
N	—	NORTH AMERICAN VERTICAL DATUM 1988
NAVD88	—	NATIONAL GEODETIC VERTICAL DATUM 1929
NGVD	—	
NIC	—	NOT IN CONTRACT
NTS	—	NOT TO SCALE
NO.	—	NUMBER
OC	—	ON CENTER
OD	—	OUTSIDE DIAMETER
OUTBD	—	OUTBOARD
PC	—	POINT OF CURVE
P/C	—	PRECAST
P/F	—	PREFABRICATED
PI	—	POINT OF INTERSECTION
P/S	—	PRESTRESSED
PERF	—	PERFORATED
PL	—	PLATE
POB	—	POINT OF BEGINNING
PSF	—	POUNDS PER SQUARE FOOT
PSI	—	POUND PER SQUARE INCH
PT	—	POINT OF TANGENT
PVC	—	POLYVINYL CHLORIDE
QTY	—	QUANTITY
R/C	—	REINFORCED CONCRETE
REQ'D	—	REQUIRED
RT	—	RIGHT
S	—	SOUTH
SEC	—	SECOND
SCH	—	SCHEDULE
SF	—	SQUARE FOOT, SILT FENCE
SHT	—	SHEET
SPA.	—	SPACES
SQ	—	SQUARE
SS	—	STAINLESS STEEL
STA	—	STATION
STD	—	STANDARD
T	—	TON
TBR	—	TO BE REMOVED
TC	—	TURBIDITY CURTAIN
TOC	—	TOP OF CONCRETE
TOS	—	TOP OF STEEL
TP	—	TURNING POINT
WT, tw	—	WALL THICKNESS
TYP	—	TYPICAL
U/G	—	UNDERGROUND
UNC	—	UNIFIED NATIONAL COARSE
UON	—	UNLESS OTHERWISE NOTED
VERT	—	VERTICAL
W	—	WEST
W/	—	WITH
WP	—	WORK POINT
WWF	—	WELDED WIRE FABRIC

LEGEND

- (5) EXISTING CONTOUR (BELOW MLLW)
- 5 EXISTING CONTOUR (ABOVE MLLW)
- (5) PROPOSED CONTOUR (BELOW MLLW)
- 5 PROPOSED CONTOUR (ABOVE MLLW)
- DREDGE DEPTH 6.5
- B–1 BORING
- WORKING POINT

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

INDEX OF DRAWINGS, GENERAL NOTES, ABBREVIATIONS, AND LEGEND

Date: OCT 2018 | Rev.
M&N Project No. 10248
Drawing code:
Drawing Scale: Plot scale: 1:1 (D SHEET)
Designed by: PWK | Drawn by: HR | Edited by: PGV | Reviewed by: PWK | Submitted by: MOFFATT & NICHOL

2780 LIGHTHOUSE POINT EAST, STE. B
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
G-002
INDEX: 2 OF 38

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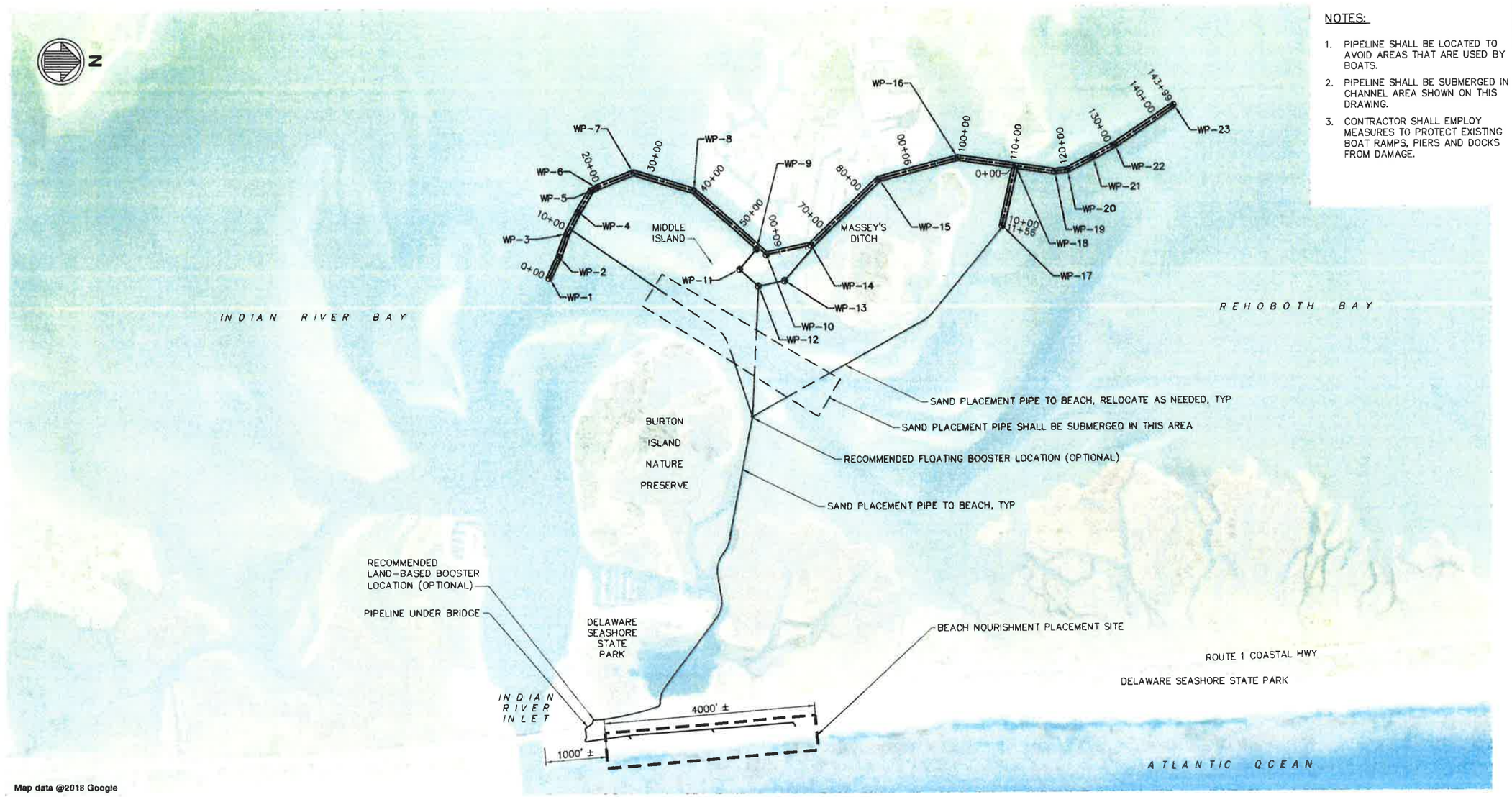
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



NOTES:

1. PIPELINE SHALL BE LOCATED TO AVOID AREAS THAT ARE USED BY BOATS.
2. PIPELINE SHALL BE SUBMERGED IN CHANNEL AREA SHOWN ON THIS DRAWING.
3. CONTRACTOR SHALL EMPLOY MEASURES TO PROTECT EXISTING BOAT RAMPS, PIERS AND DOCKS FROM DAMAGE.

CHANNEL CENTERLINE COORDINATES			
POINT NO	STATION	NORTHING	EASTING
WP-1	0+00.00	222003.98	748381.00
WP-2	4+29.31	222190.35	747994.26
WP-3	8+97.05	222348.43	747554.04
WP-4	13+62.92	222565.39	747141.77
WP-5	18+30.66	222806.61	746741.03
WP-6	19+60.79	222920.32	746677.75
WP-7	27+00.22	223606.00	746401.00
WP-8	38+83.91	224738.00	746747.00
WP-9	55+22.72	225946.76	747854.74
WP-10	57+37.37	226142.00	747957.00

CHANNEL CENTERLINE COORDINATES			
POINT NO	STATION	NORTHING	EASTING
WP-11	55+22.72	225620.34	748233.49
WP-12	57+37.37	225988.43	748550.72
WP-13	59+82.11	226493.63	748445.62
WP-14	66+01.49	226988.00	747781.00
WP-15	83+83.62	228268.00	746541.00
WP-16	99+42.50	229776.00	746146.00
WP-17	11+54.41	230618.66	747433.11
WP-18	110+50.32	230872.18	746306.24
WP-19	118+09.13	231623.00	746416.00
WP-20	120+54.63	231866.96	746388.52

CHANNEL CENTERLINE COORDINATES			
POINT NO	STATION	NORTHING	EASTING
WP-21	125+91.65	232347.55	746148.90
WP-22	130+58.61	232757.97	745926.15
WP-23	143+98.88	233870.62	745178.94

A1 G-101 PLAN – GENERAL ARRANGEMENT
SCALE: 1" = 1000'

NOV 18 2018

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

1000' 0' 1000' 2000'
SCALE: 1"=1000'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

PLAN - GENERAL ARRANGEMENT

Designed by: PWK
Drawn by: HR
Det. by: PGV
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL
Date: OCT 2018
M&N Project No. 10248
Drawing code:
Drawing Scale:
Plot. scale: 1:1 (D SHEET)
Rev.

2700 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-545-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
G-101
INDEX: 3 OF 38

File: Q:\BA\10248 DNREC NA17002\10248-01 M-D Dredge\500 CAD01_ACTIVE_Massey's Ditch (sheets)\10248016-101; Plotted: 10/31/2018 12:43 PM by RIDOUANE, HICHAM; Saved: 10/31/2018 12:42 PM by HRIDOUANE

Map data @2018 Google

A1 / B-101 PLAN – BORING LOCATION
SCALE: 1" = 500'

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

FINDLING BORING LOCATION TABLE		
POINT NO.	NORTHING	EASTING
B-1	222511.68	748005.81
B-2	223619.28	746493.81
B-3	226457.17	747992.00
B-4	226658.67	747753.19
B-5	229889.69	745916.73
B-6	230905.46	747103.54
B-7	234035.63	745347.13

HYNES BORING LOCATION TABLE		
POINT NO.	NORTHING	EASTING
302	221643.77	748942.72
303	221826.95	748702.73
304	222030.44	748320.70
305	222086.93	748146.77
306	222199.93	747872.84
307	222296.75	747661.83
309	222508.78	747232.12
310	222619.24	747042.54
311	222750.58	746833.36
313	222925.34	746733.77

HYNES BORING LOCATION TABLE		
POINT NO.	NORTHING	EASTING
314	223142.37	746606.04
315	223394.30	746564.85
316	223568.74	746538.41
317	223821.66	746576.64
318	224027.07	746655.39
319	224535.43	746722.09
320	224886.13	747018.95
321	225202.31	747363.29
322	225499.17	747713.93
324	225725.95	748159.45

HYNES BORING LOCATION TABLE		
POINT NO.	NORTHING	EASTING
326	225891.99	748300.01
327	226149.88	748338.71
328	226332.98	748341.29
329	226549.60	748307.75
330	228425.28	746747.28
331	229980.95	746417.12
332	232368.95	746180.48
333	232562.63	746026.46
334	232681.82	745971.80
335	232890.40	745822.74

HYNES BORING LOCATION TABLE		
POINT NO.	NORTHING	EASTING
336	233014.56	745758.15
337	233235.88	745602.76
338	233395.42	745502.61
339	225255.91	747907.82
340	224963.16	747887.19

◆ – BORINGS BY FINDLING, INC AUGUST 2018.

◉ – BORINGS BY JOHN D. HYNES & ASSOCIATES, INC MAY 2014.

NOV 13 2018

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

PLAN - BORING LOCATION

Date: OCT 2018
Rev:
Designed by: PWK
Drawn by: PGV
Chkd by: HR
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL
MAN Project No. 10248
Drawing date:
Drawing Scale:
Plot scale: 1:1 (D SHEET)
Plot: 10/29/2018 2:56 PM by HRIDOUANE

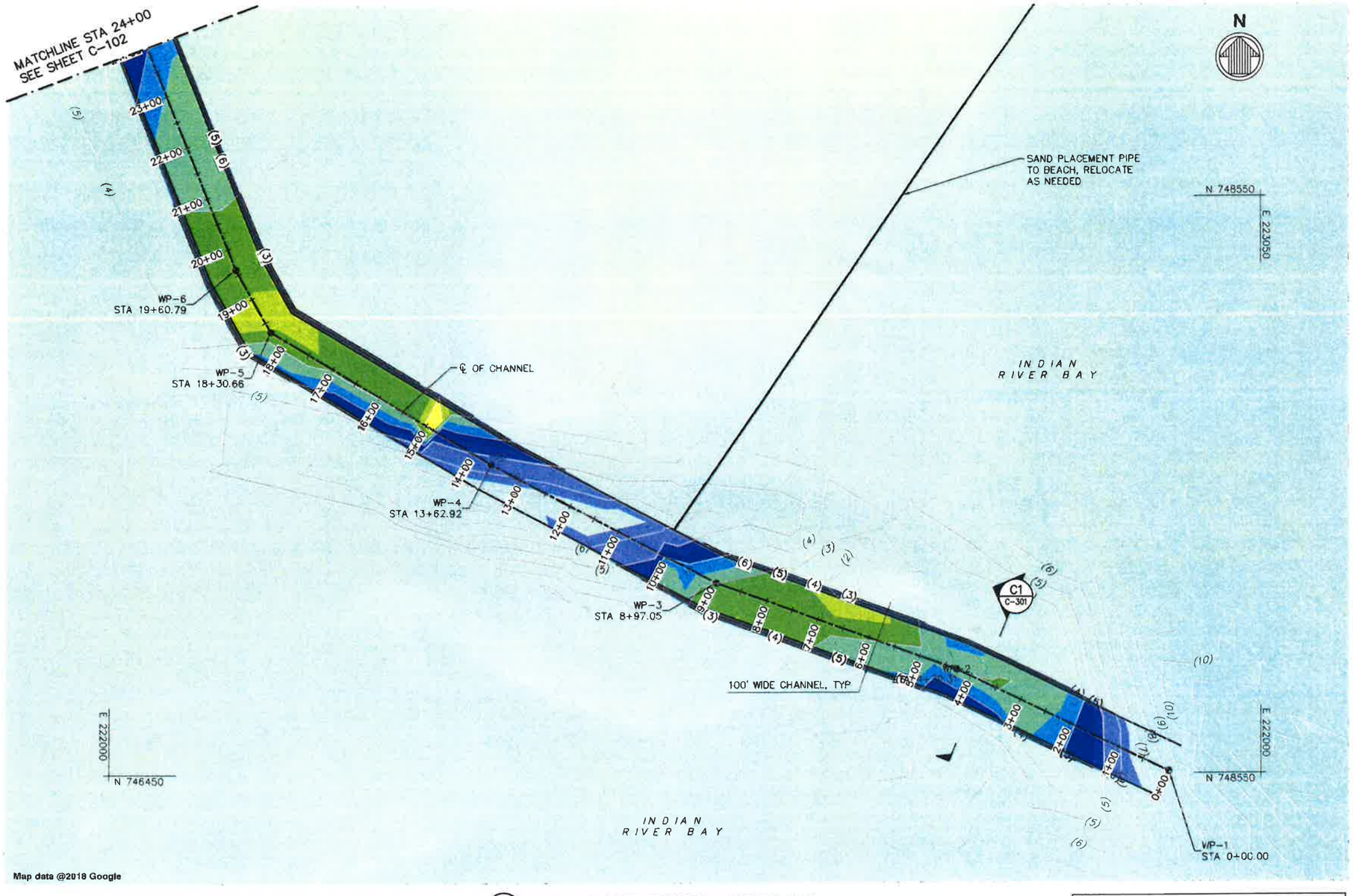
moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD. 21224
410-563-7500

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
B-101
INDEX: 4 OF 38

File: C:\BA\10248 DNREC NAT\70071\10248-01 M-D Dredge\300 CADD_ACTIVE_Massey's Ditch (Streets)\10248018-101; Plotted: 10/31/2018 12:17 PM by RIDOUANE, HICHAM; Saved: 10/29/2018 2:56 PM by HRIDOUANE



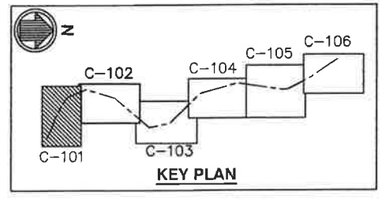
NOTES

1. FOR GENERAL NOTES, ABBREVIATIONS, AND LEGEND, SEE SHEET G-002
2. FOR CENTERLINE OF CHANNEL WORKING POINTS, SEE SHEET G-101.
3. FOR TYPICAL CHANNEL SECTION, SEE SHEET C-301.
4. FOR CHANNEL CROSS SECTIONS, SEE SHEETS C-302 TO C-324.
5. BASED ON SURVEY DATA; CHANNEL AREAS WITH NO COLOR WILL NOT BE DREDGED.

DREDGING THICKNESS (FT)		
MIN	MAX	COLOR
6.00	6.50	
5.50	6.00	
5.00	5.50	
4.50	5.00	
4.00	4.50	
3.50	4.00	
3.00	3.50	
2.50	3.00	
2.00	2.50	
1.50	2.00	
0.00	1.50	

A1 C-101 PLAN – CHANNEL DREDGING – SHEET 1 OF 6
SCALE: 1" = 100'

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)



KEY PLAN

NOV 13 2018

100' 0' 100' 200'
SCALE: 1"=100'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD. 21224
410-563-7300
moffatt & nichol

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

PLAN - CHANNEL DREDGING - SHEET 1 OF 6

Designed by: PWK
Drawn by: HR
Checked by: PGV
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL
Date: OCT 2018
M&N Project No. 10248
Drawing code:
Drawing scale: Plot scale: 1:1 (D SHEET)

Sheet Reference No.
C-101
INDEX: 5 OF 38

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

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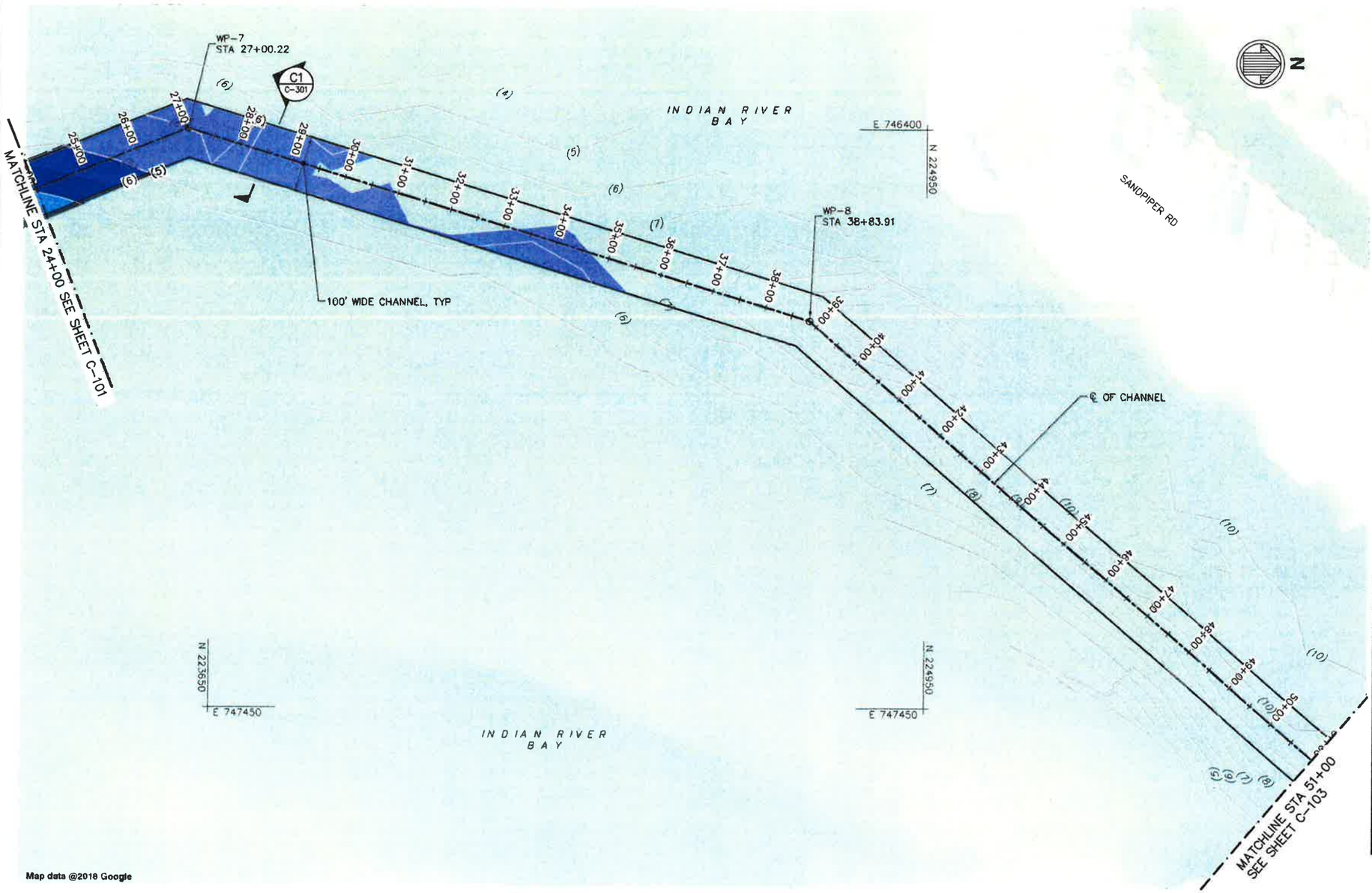
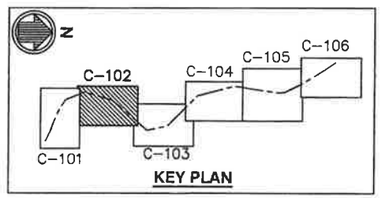


NOTES

1. FOR GENERAL NOTES, ABBREVIATIONS, AND LEGEND, SEE SHEET G-002
2. FOR CENTERLINE OF CHANNEL WORKING POINTS, SEE SHEET G-101.
3. FOR TYPICAL CHANNEL SECTION, SEE SHEET C-301.
4. FOR CHANNEL CROSS SECTIONS, SEE SHEETS C-302 TO C-324.
5. BASED ON SURVEY DATA; CHANNEL AREAS WITH NO COLOR WILL NOT BE DREDGED.

DREDGING THICKNESS (FT)		
MIN	MAX	COLOR
6.00	6.50	
5.50	6.00	
5.00	5.50	
4.50	5.00	
4.00	4.50	
3.50	4.00	
3.00	3.50	
2.50	3.00	
2.00	2.50	
1.50	2.00	
0.00	1.50	

A1 / C-102 PLAN – CHANNEL DREDGING – SHEET 2 OF 6
SCALE: 1" = 100'



100' 0' 100' 200'
SCALE: 1"=100'

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-563-7300

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

PLAN - CHANNEL DREDGING - SHEET 2 OF 6

Designed by: PWK
Drawn by: HR
Checked by: PGV
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL
Date: OCT 2018
M&N Project No: 10248
Drawing ended:
Drawing Scale:
Plot scale: 1:1 (0 SHEET)

Sheet Reference No.
C-102
INDEX: 6 OF 38

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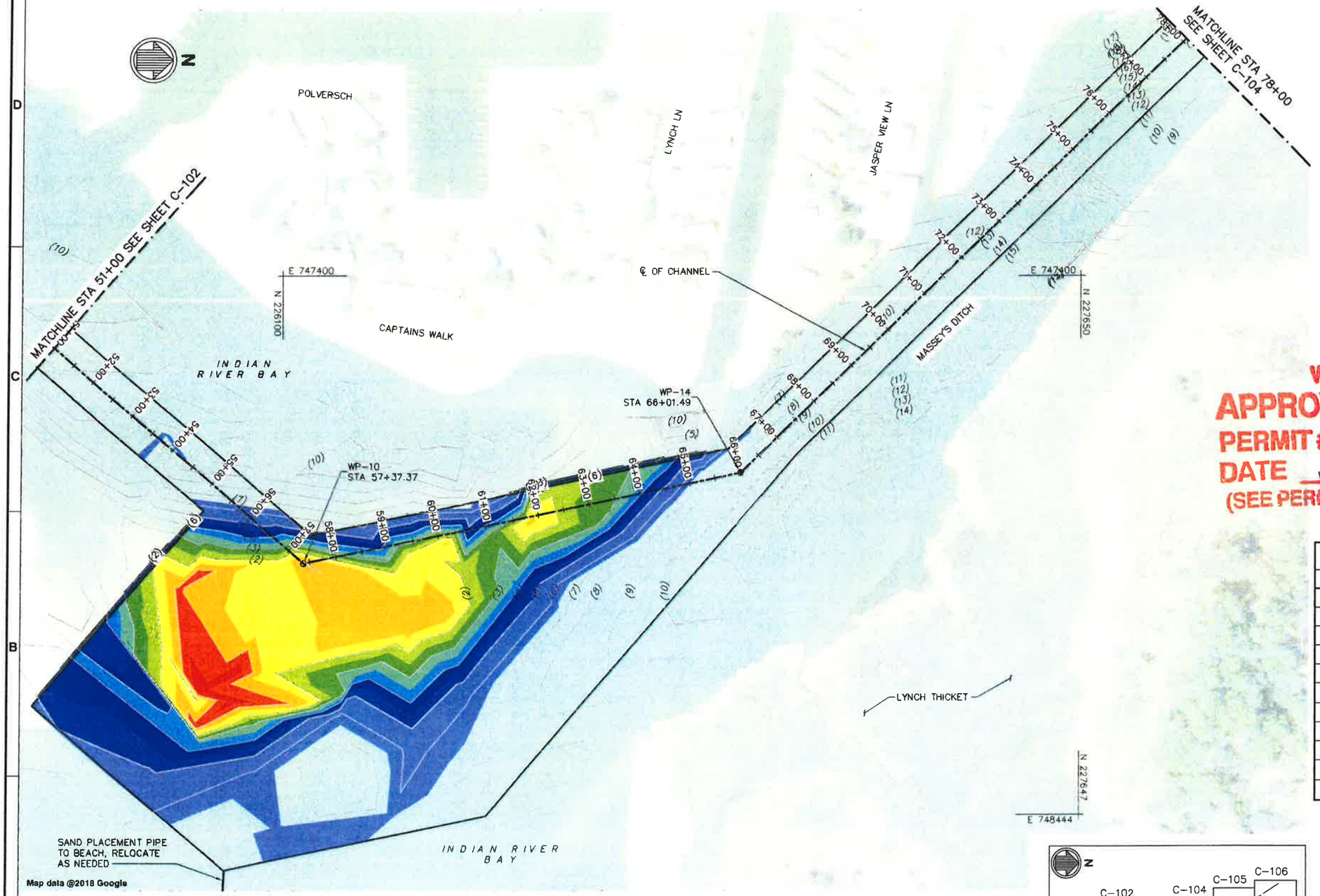


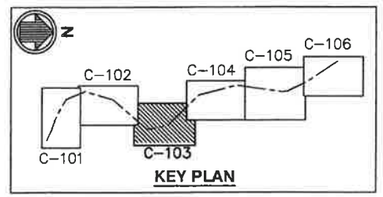
A1 C-103 PLAN – CHANNEL DREDGING – SHEET 3 OF 6
SCALE: 1" = 100'

NOTES

1. FOR GENERAL NOTES, ABBREVIATIONS, AND LEGEND, SEE SHEET G-002
2. FOR CENTERLINE OF CHANNEL WORKING POINTS, SEE SHEET G-101.
3. FOR TYPICAL CHANNEL SECTION, SEE SHEET C-301.
4. FOR CHANNEL CROSS SECTIONS, SEE SHEETS C-302 TO C-324.
5. BASED ON SURVEY DATA; CHANNEL AREAS WITH NO COLOR WILL NOT BE DREDGED.

W.S.L.S.
APPROVED PLANS
PERMIT # SP, WQ, WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

DREDGING THICKNESS (FT)		
MIN	MAX	COLOR
6.00	6.50	
5.50	6.00	
5.00	5.50	
4.50	5.00	
4.00	4.50	
3.50	4.00	
3.00	3.50	
2.50	3.00	
2.00	2.50	
1.50	2.00	
0.00	1.50	



100' 0' 100' 200'
SCALE: 1"=100'

NOV 13 2018

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

PLAN - CHANNEL DREDGING - SHEET 3 OF 6

Date: OCT 2018
M&N Project No. 10248
Drawing code:
Drawing Scale: Plot scale: 1:1 (D SHEET)
Rev.
Designed by: PWK
Drawn by: HR
Checked by: PGV
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL

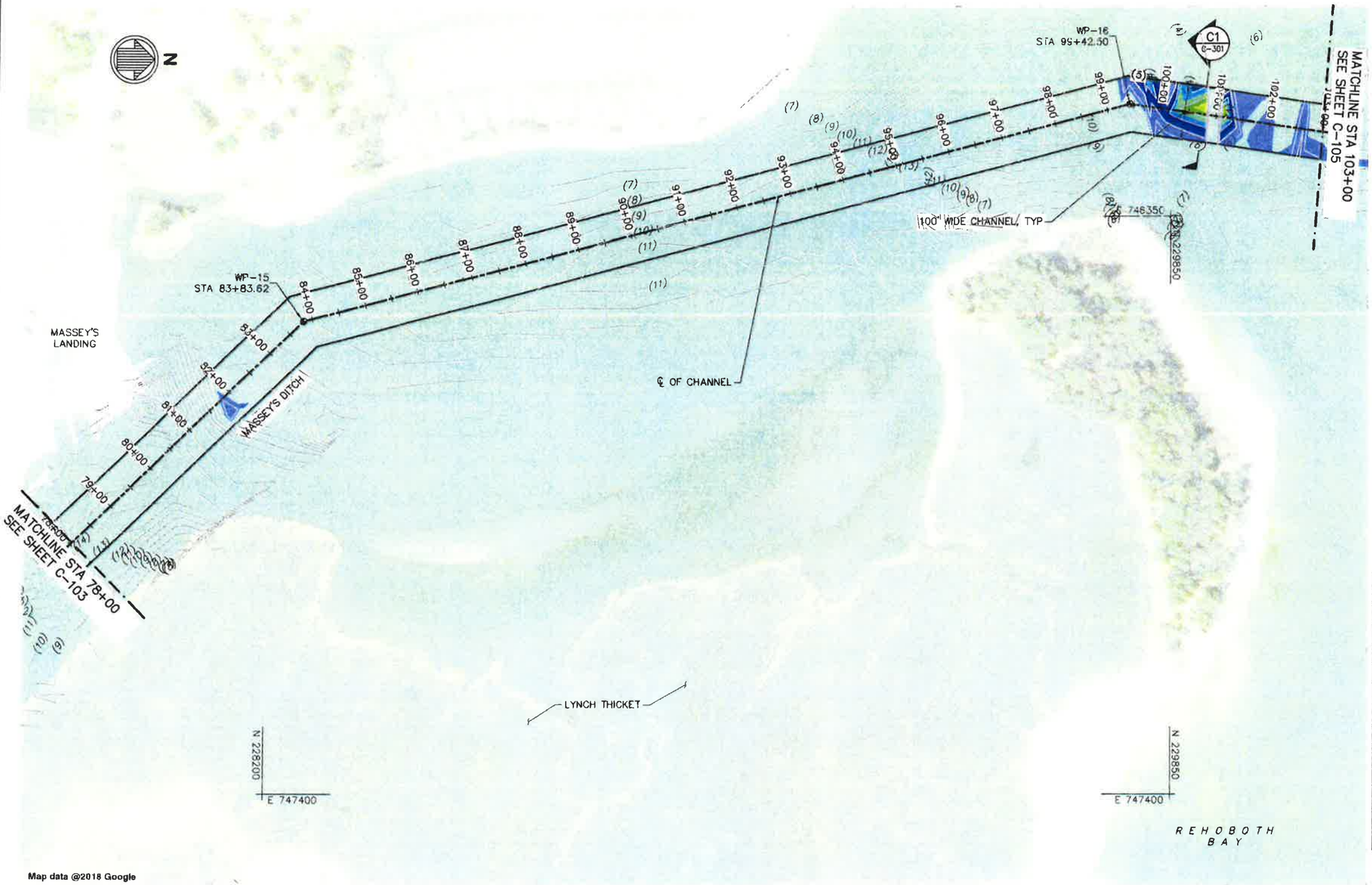
2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-103
INDEX: 7 OF 38

File: Q:\BA\10248 DNREC NAT\7007\10248-01 M-D Dredge\500 CAD_ACTIVE_Massey's Ditch\Sheets\10248101C-103.dwg Plotted: 10/31/2018 12:18 PM by RBOUANE, MICHAK Saved: 10/31/2018 11:56 AM by RBOUANE

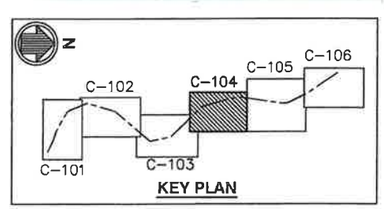


A1 C-104 PLAN – CHANNEL DREDGING – SHEET 4 OF 6
SCALE: 1" = 100'

NOTES

1. FOR GENERAL NOTES, ABBREVIATIONS, AND LEGEND, SEE SHEET G-002
2. FOR CENTERLINE OF CHANNEL WORKING POINTS, SEE SHEET G-101.
3. FOR TYPICAL CHANNEL SECTION, SEE SHEET C-301.
4. FOR CHANNEL CROSS SECTIONS, SEE SHEETS C-302 TO C-324.
5. BASED ON SURVEY DATA; CHANNEL AREAS WITH NO COLOR WILL NOT BE DREDGED.

DREDGING THICKNESS (FT)		
MIN	MAX	COLOR
6.00	6.50	
5.50	6.00	
5.00	5.50	
4.50	5.00	
4.00	4.50	
3.50	4.00	
3.00	3.50	
2.50	3.00	
2.00	2.50	
1.50	2.00	
0.00	1.50	



W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

100' 0' 100' 200'
SCALE: 1"=100'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

PLAN - CHANNEL DREDGING - SHEET 4 OF 6

moffatt & nichol
2780 LIGHTHOUSE POINT EAST,
BALTIMORE, MD 21224
410-563-7300

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

Designed by:	Drawn by:	Checked by:	Reviewed by:	Submitted by:
PWK	HR	PGV	PWK	MOFFATT & NICHOL

Date: OCT 2018
M&N Project No. 10248
Drawing code:
Drawing Scale:
Plot scale: 1:1 (0 SHEET)
Rev:

SEAL

Sheet Reference No.
C-104
INDEX: 8 OF 38

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

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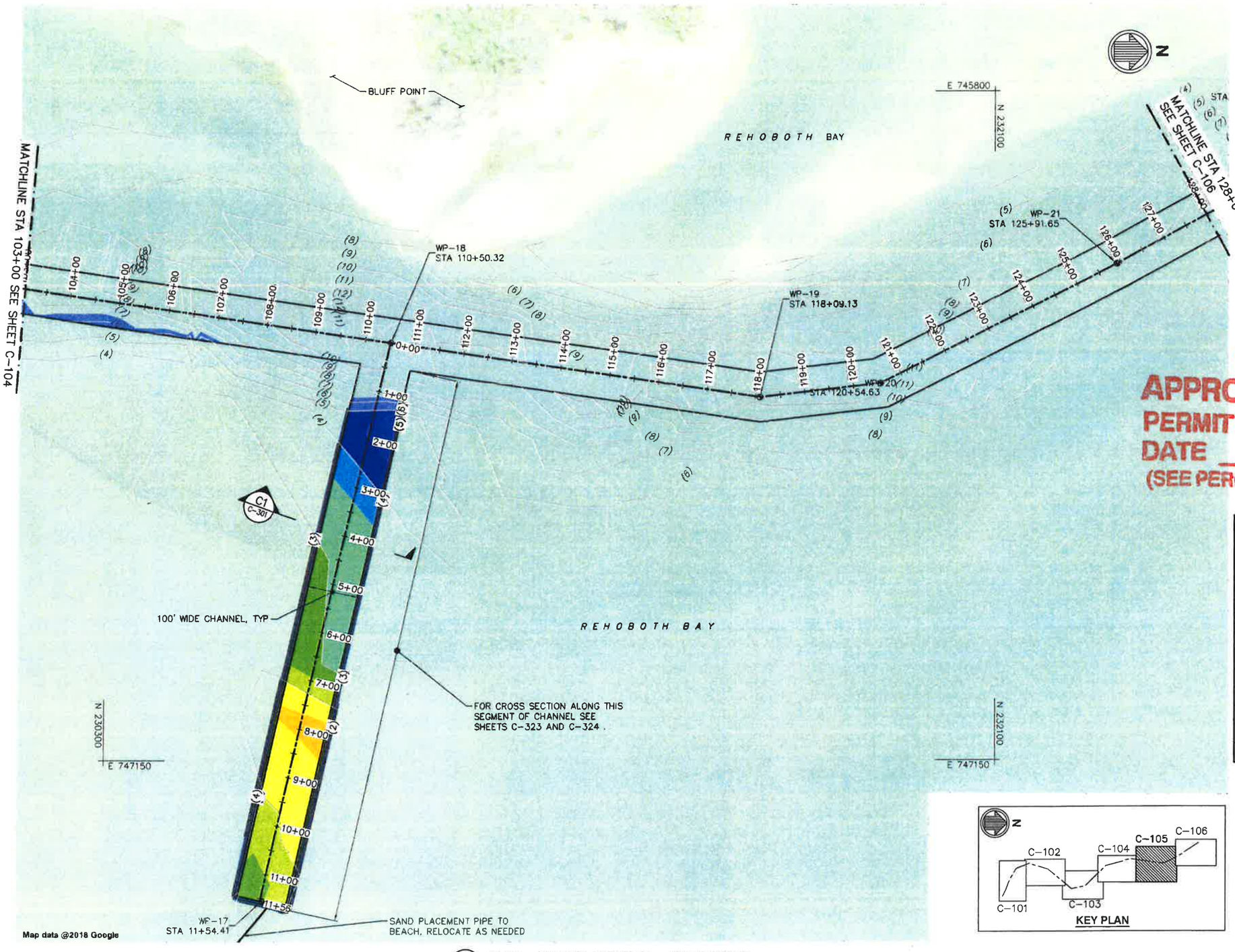


NOTES

1. FOR GENERAL NOTES, ABBREVIATIONS, AND LEGEND, SEE SHEET G-002
2. FOR CENTERLINE OF CHANNEL WORKING POINTS, SEE SHEET G-101.
3. FOR TYPICAL CHANNEL SECTION, SEE SHEET C-301.
4. FOR CHANNEL CROSS SECTIONS, SEE SHEETS C-302 TO C-324.
5. BASED ON SURVEY DATA; CHANNEL AREAS WITH NO COLOR WILL NOT BE DREDGED.

W.S.L.S.
APPROVED PLANS
PERMIT # SP,WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

DREDGING THICKNESS (FT)		
MIN	MAX	COLOR
6.00	6.50	
5.50	6.00	
5.00	5.50	
4.50	5.00	
4.00	4.50	
3.50	4.00	
3.00	3.50	
2.50	3.00	
2.00	2.50	
1.50	2.00	
0.00	1.50	

NOV 13 2018

100' 0' 100' 200'
SCALE: 1"=100'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

A1 / C-105 PLAN – CHANNEL DREDGING – SHEET 5 OF 6
SCALE: 1" = 100'

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

PLAN - CHANNEL DREDGING - SHEET 5 OF 6

Rev. | Description | Date | Appr.

Date: OCT 2018
M&N Project No. 10248
Drawing code:
Drawing Scale: Plot scale: 1:1 (@ SHEET)
Designed by: PWK
Drawn by: HR
Cad by: PGV
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL

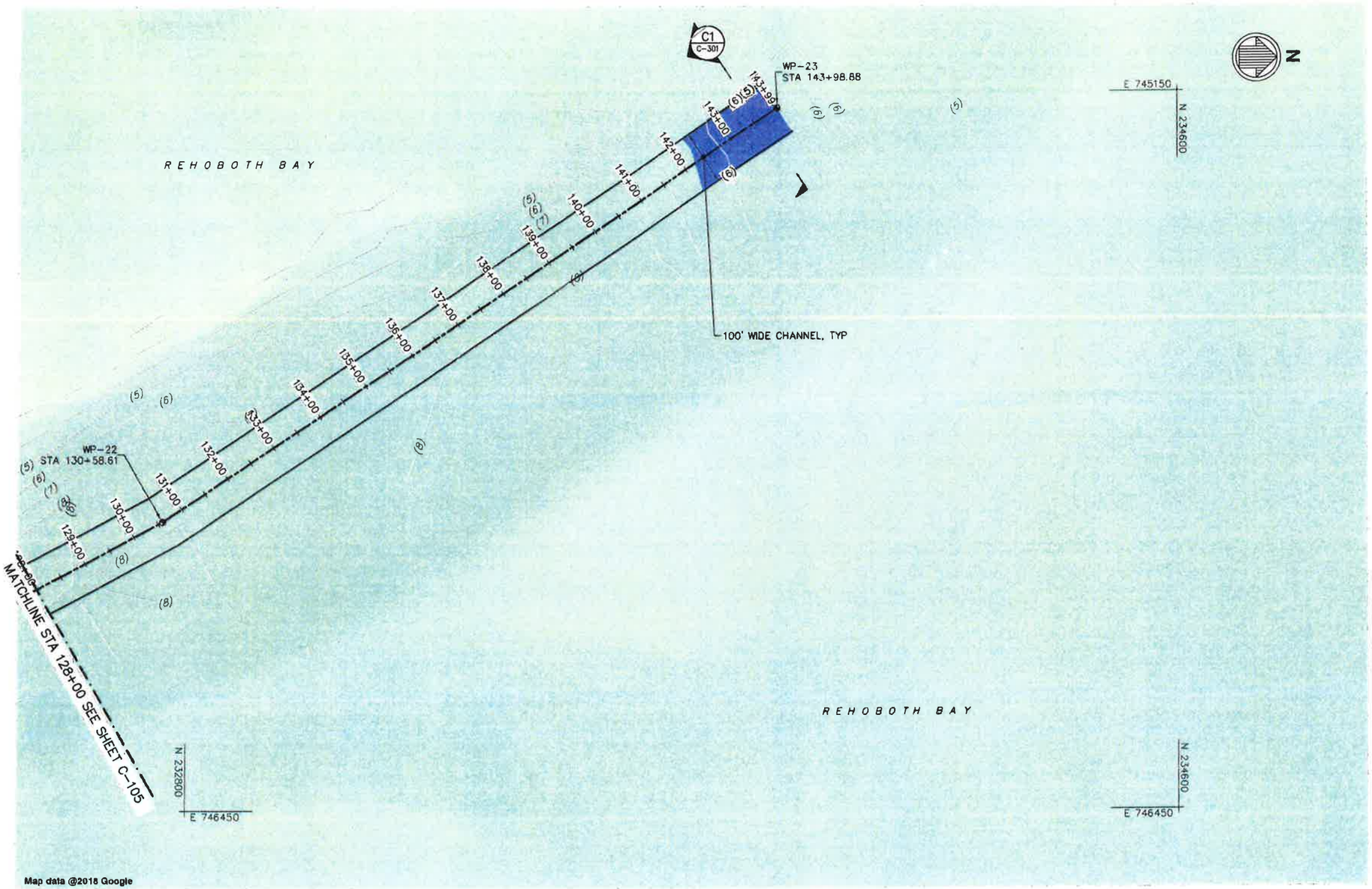
2760 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-105
INDEX: 9 OF 38

File: G:\BA\10248 DNREC NAT\7002\10248-01 M-D Dredge\500 CADD_ACTIVE_Massey's Ditch (sheets)\10248DIC-105; Plotted: 10/31/2018 2:08 PM by RIDOUANE, HICHAM; Saved: 10/31/2018 2:05 PM by HRIDOUANE



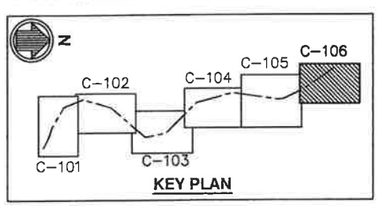
NOTES

1. FOR GENERAL NOTES, ABBREVIATIONS, AND LEGEND, SEE SHEET G-002
2. FOR CENTERLINE OF CHANNEL WORKING POINTS, SEE SHEET G-101.
3. FOR TYPICAL CHANNEL SECTION, SEE SHEET C-301.
4. FOR CHANNEL CROSS SECTIONS, SEE SHEETS C-302 TO C-324.
5. BASED ON SURVEY DATA; CHANNEL AREAS WITH NO COLOR WILL NOT BE DREDGED.

DREDGING THICKNESS (FT)		
MIN	MAX	COLOR
6.00	6.50	
5.50	6.00	
5.00	5.50	
4.50	5.00	
4.00	4.50	
3.50	4.00	
3.00	3.50	
2.50	3.00	
2.00	2.50	
1.50	2.00	
0.00	1.50	

A1 / C-106 PLAN – CHANNEL DREDGING – SHEET 6 OF 6
SCALE: 1" = 100'

W.S.L.S.
APPROVED PLANS
PERMIT # SP; WQ; WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)



KEY PLAN

NOV 28 2018

100' 0' 100' 200'
SCALE: 1"=100'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

PLAN - CHANNEL DREDGING - SHEET 6 OF 6

Designed by: PWK
Drawn by: HR
Chkd by: PGV
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL
Drawing Scale: Plot scale: 1:1 (D SHEET)
Date: OCT 2018
M&N Project No: 10248
Drawing code:
Rev.

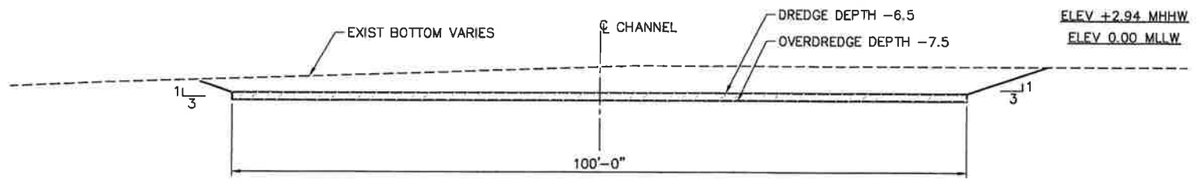
2790 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-467-7500
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

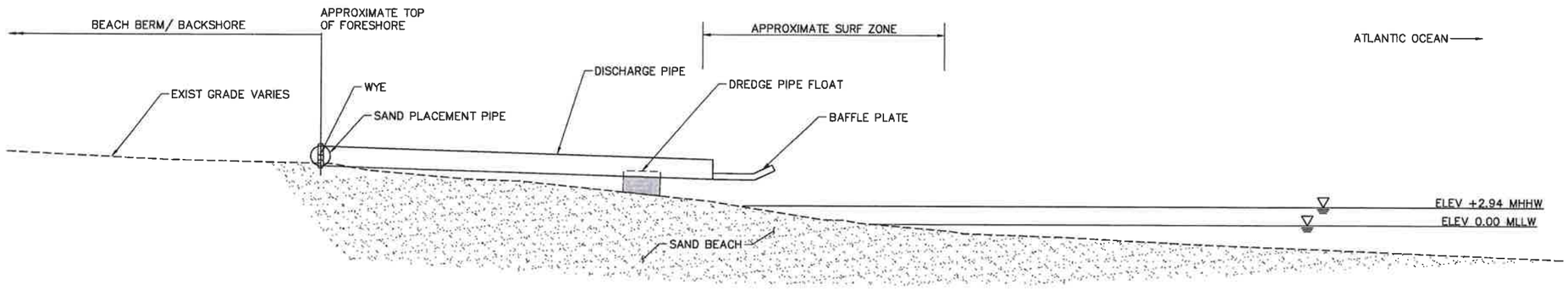
SEAL

Sheet Reference No.
C-106
INDEX: 10 OF 38

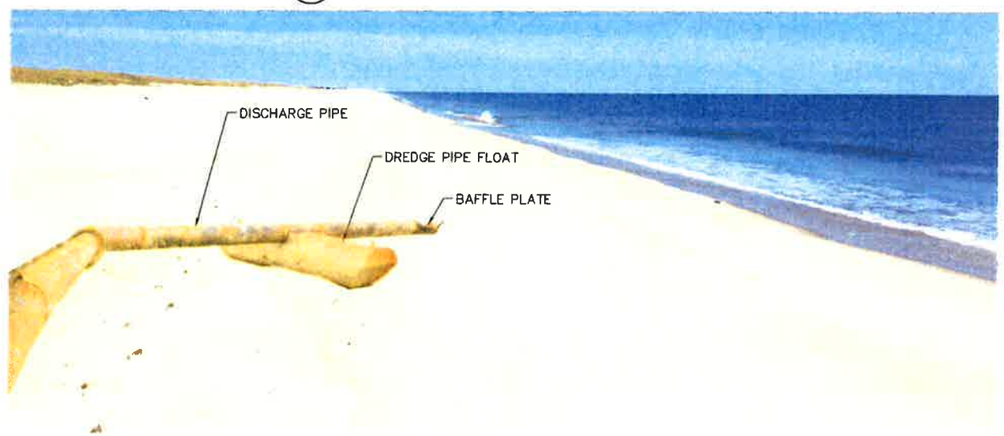
File: Q:\184\10248 DNREC NAT\700?\10248-01 M-D Dredge\500 C4001_4C7161_Massey's Ditch (sheets)\10248101C-106; Plotted: 10/31/2018 12:19 PM by RIDOUANE, HICHAM; Saved: 10/30/2018 2:28 PM by HRIDOUANE



C1 C-301 SECTION – TYPICAL DREDGING
SCALE: 1" = 10'



B1 C-301 SECTION – DISCHARGE PIPE INTO SURF ZONE
SCALE: 1" = 10'



A1 C-301 DISCHARGE PIPE INTO SURF ZONE (LOW TIDE BACKGROUND IMAGE)
SCALE: NTS

ATLANTIC OCEAN

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

No.	Description	Date	Appr.
Mark			

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - TYPICAL DREDGING

moffatt & nichol
2700 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-363-7300

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

Designed by:	Plot by:	Date:	Rev:
PWK	PGV	OCT 2018	
Dwn by:		M&N Project No.	
HR		10248	
Reviewed by:		Drawing code:	
PWK			
Submitted by:		Drawing Scale:	
MOFFATT & NICHOL		Plot scale: 1:1 (D SHEET)	

SEAL

Sheet Reference No.
C-301
INDEX: 11 OF 38

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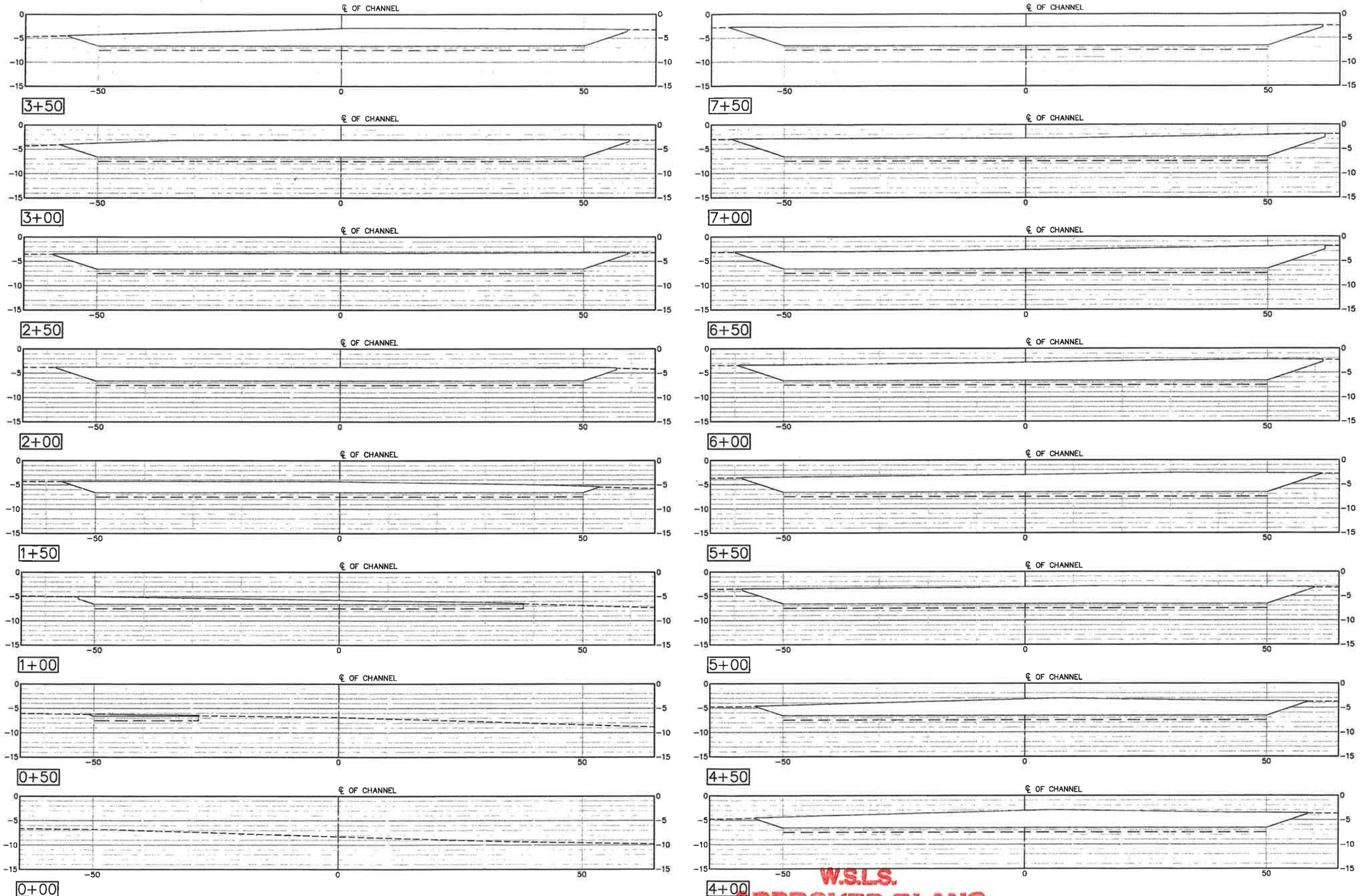

NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP; WQ; WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 1 OF 21

Designed by: PWK	Cad by: POV	Date: OCT 2018	Rev.
Dwn by: HR		M&N Project No. 10248	
Reviewed by: PWK		Drawing code:	
Submitted by: MOFFATT & NICHOL		Drawing Scale: Plot scale 1:1 (D SHEET)	

2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-563-7500
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-302
INDEX: 12 OF 38

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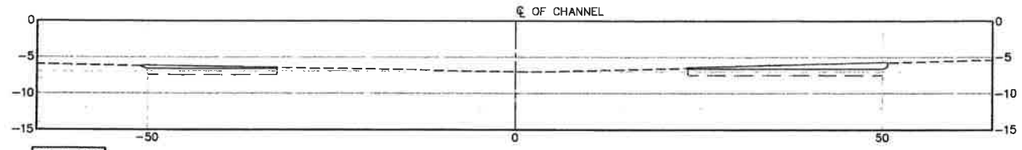

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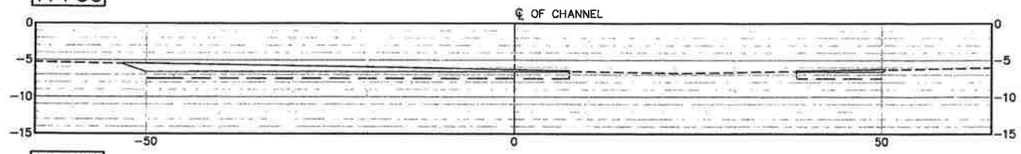

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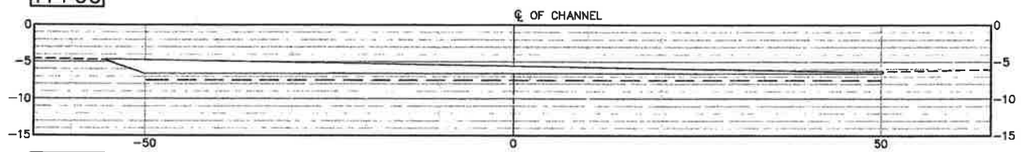

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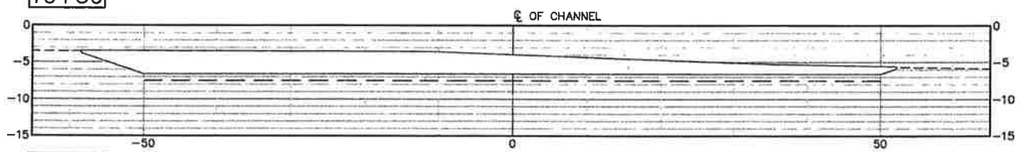

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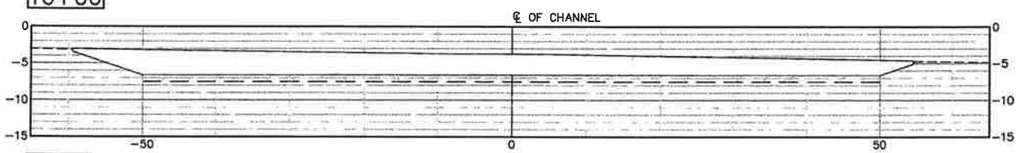

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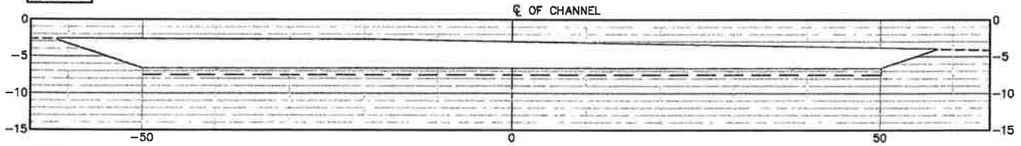

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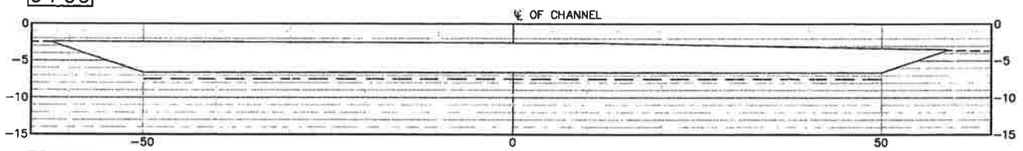

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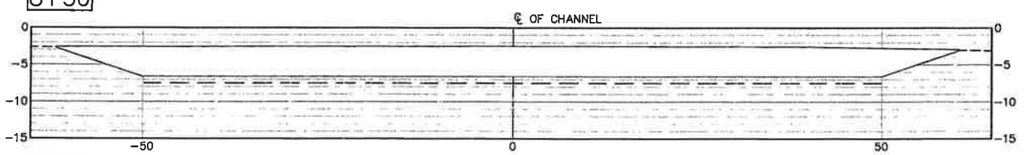

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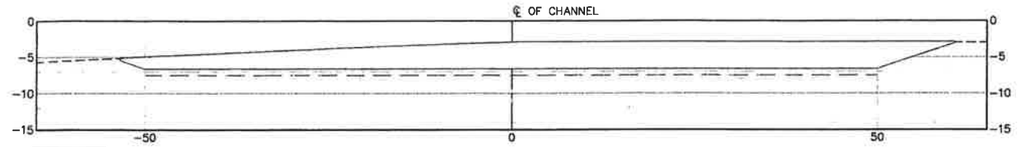

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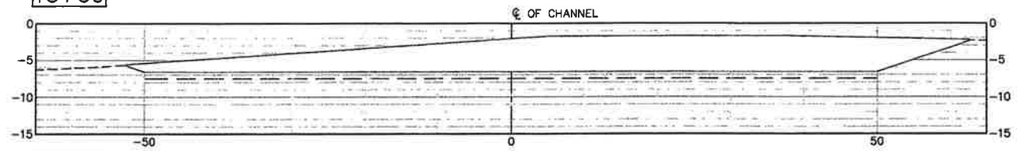

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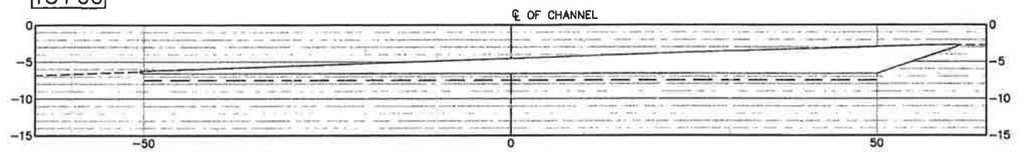

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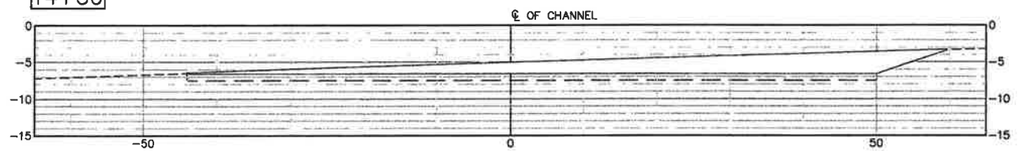

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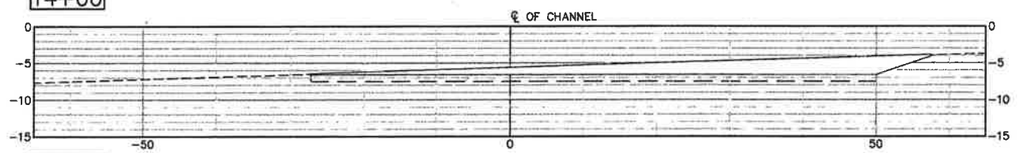

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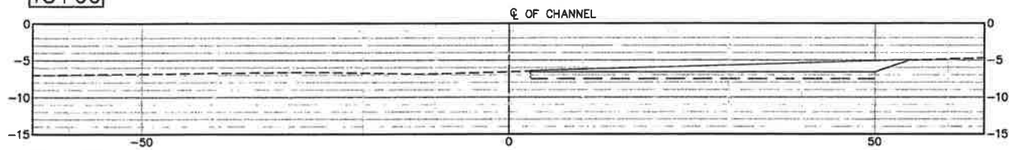

12+50

12+00

NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
NOV 13 2018
PERMIT # SP-WQ-WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 2 OF 21

Designed by: PWK
Drawn by: HR
Checked by: PGV
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL
Date: OCT 2018
M&N Project No. 10248
Drawing code:
Drawing Scale:
Plot scale: 1:1 (D SHEET)
Rev.

2780 LIGHTHOUSE POINT EAST, SUITE 400
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-303
INDEX: 13 OF 38

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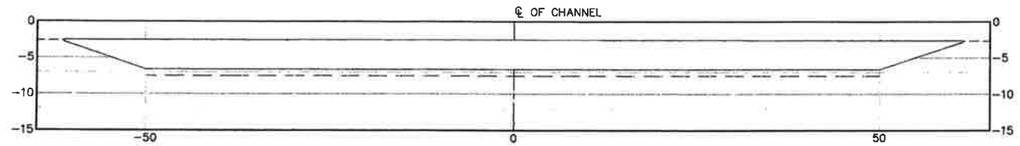

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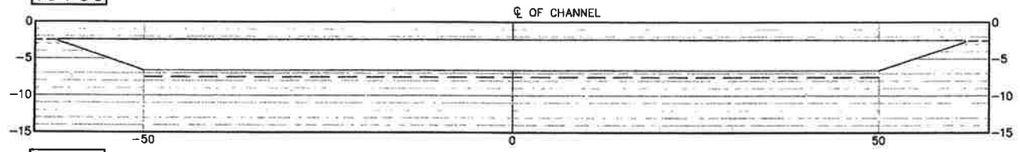

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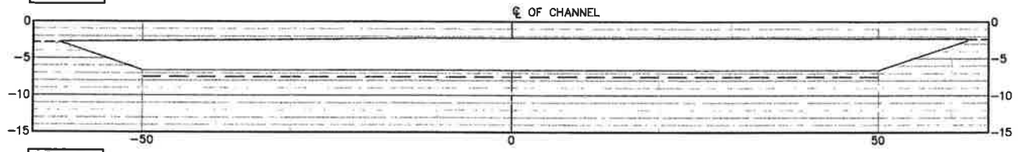

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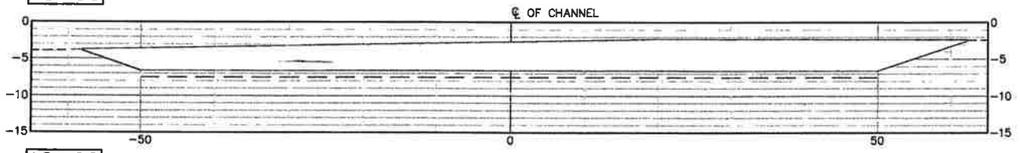

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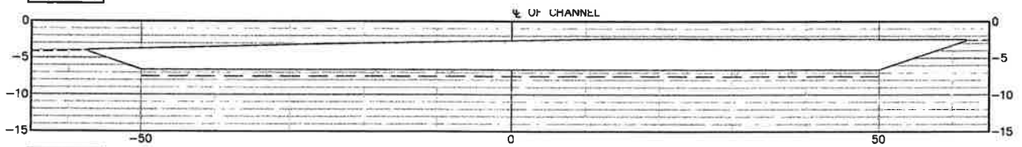

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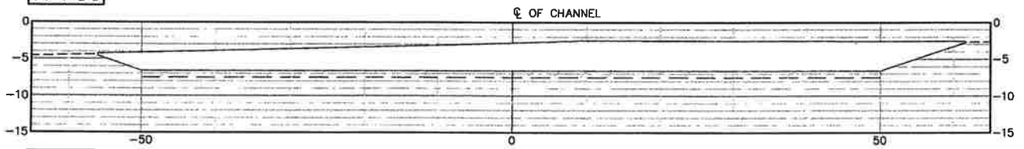

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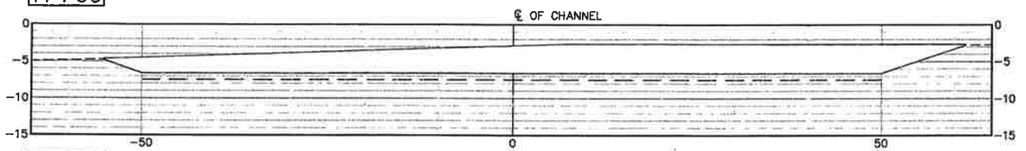

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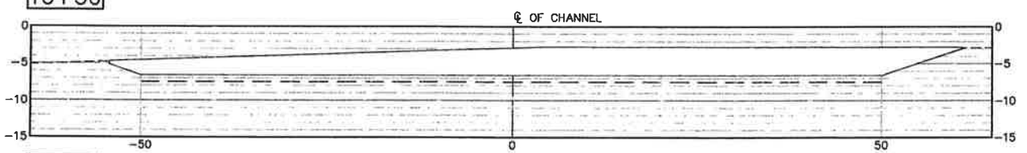

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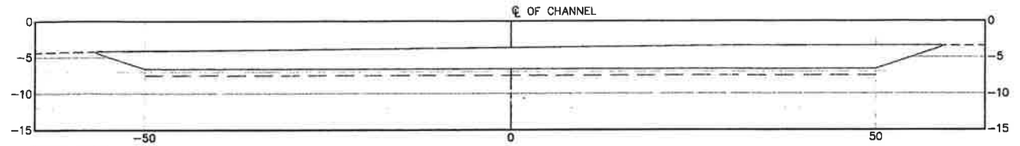

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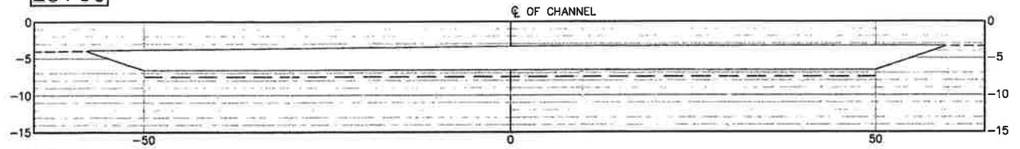

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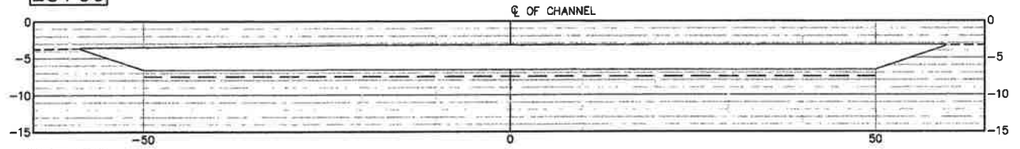

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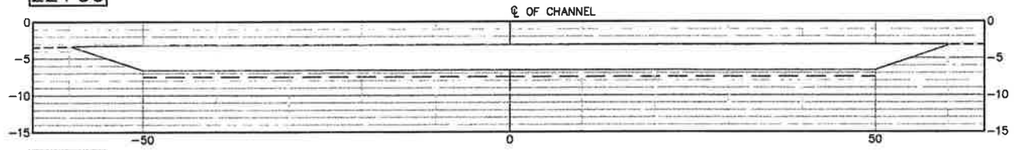

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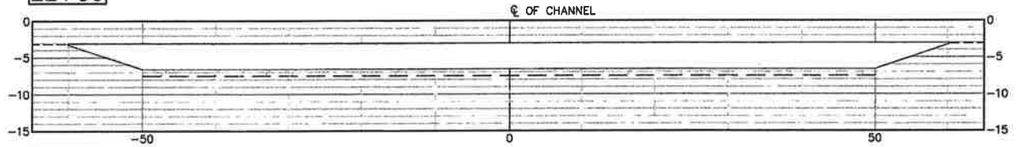

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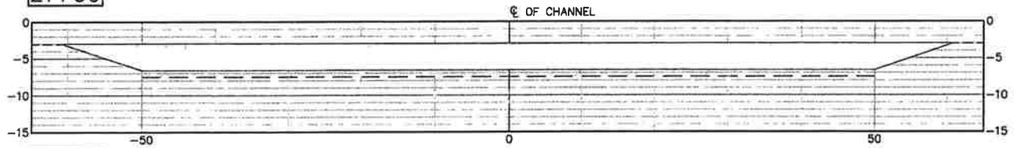

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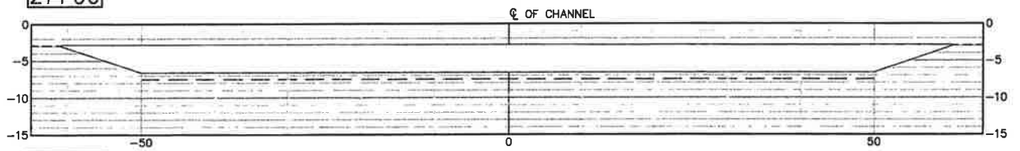

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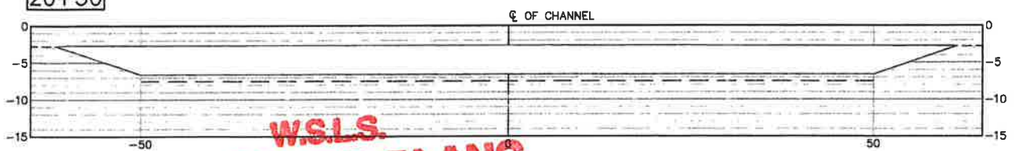

20+00

NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP, WQ, WE-409/18 NOV 13 2018
DATE 11/28/18
(SEE PERMIT CONDITIONS)

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 3 OF 21

Designed by: DSGN	Det by: CHKR	Rev: REVNO	
Gen. by: DRFT	Reviewed by: REVR	Drawing scale:	
Submitted by: MOFFATT & NICHOL	Drawing Scale:	Date: DATE	
Plot scale 1:1 (D SHEET)	M&N Project No. 10248		

2780 LIGHTHOUSE POINT EAST, SUITE D
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-304
INDEX: 14 OF 38

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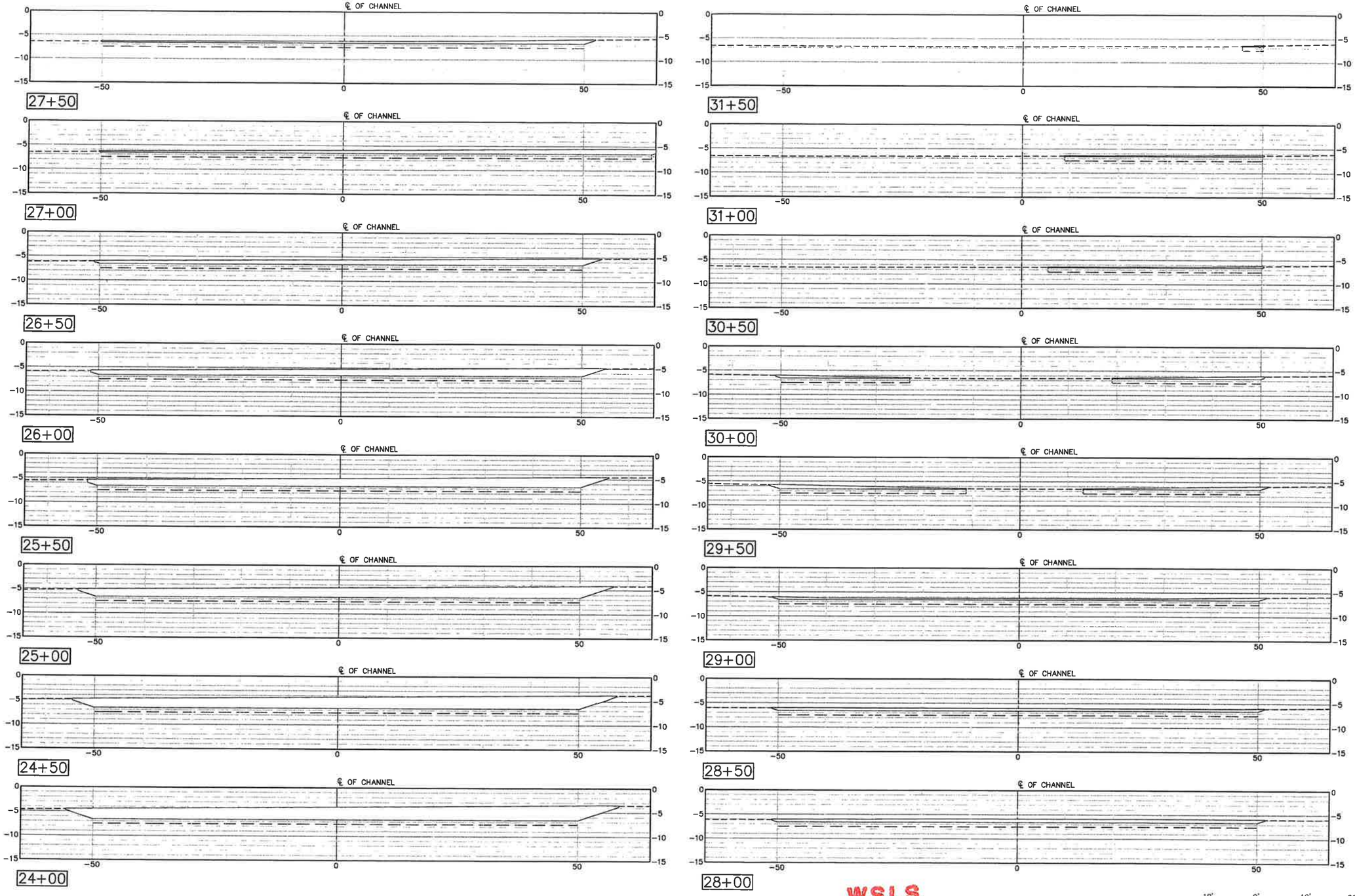

NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS NOV 13 2018
PERMIT # SP, WD, WE-409/18
DATE 11/20/18
(SEE PERMIT CONDITIONS)

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
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DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 4 OF 21

Designed by: DSGN	Det. by: DRFT	Rev. REVNO	Date: DATE
Chd. by: CHKR	Reviewed by: REVR	M&N Project No. 10248	
Submitted by: MOFFATT & NICHOL	Drawing Scale: Plot scale: 1:1 (D SHEET)	Drawing date:	

2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-305
INDEX: 15 OF 38

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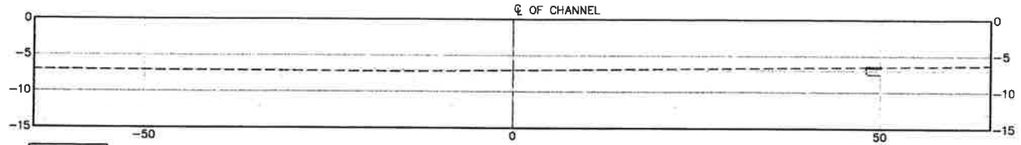

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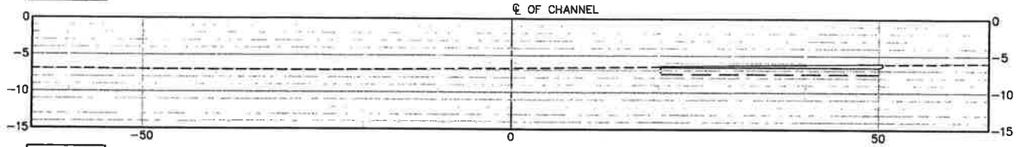

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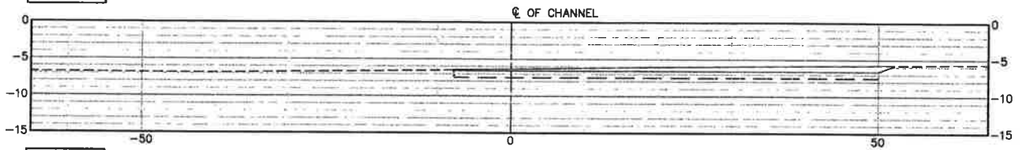

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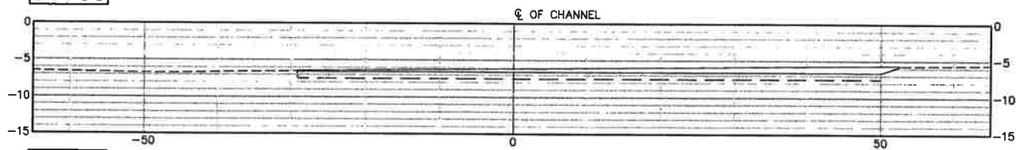

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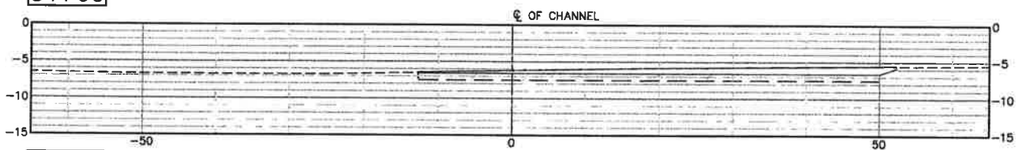

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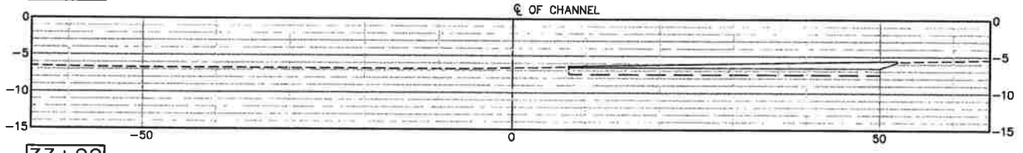

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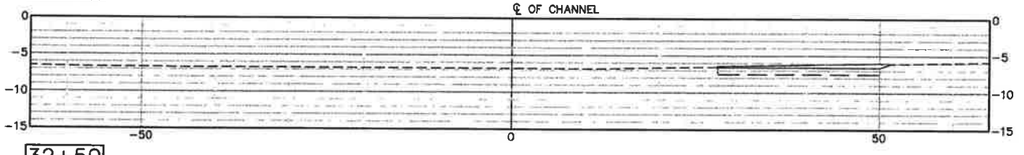

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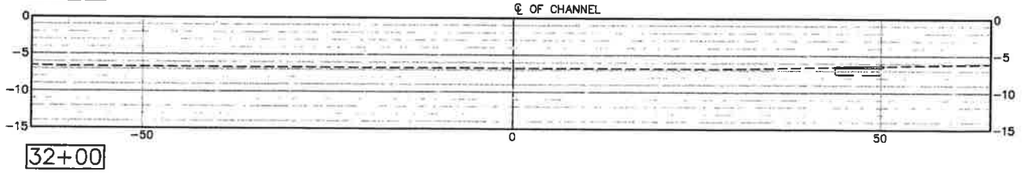

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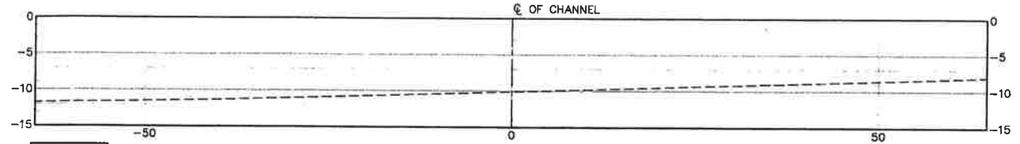

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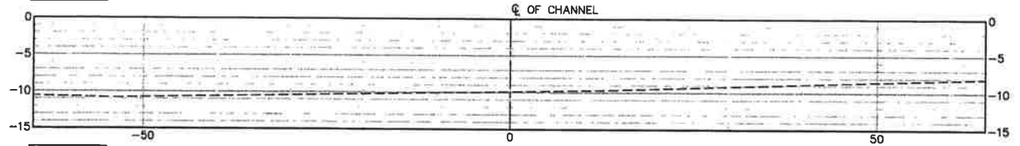

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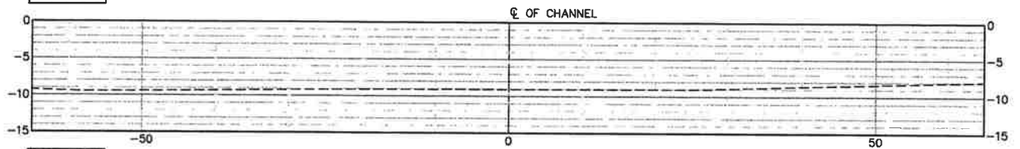

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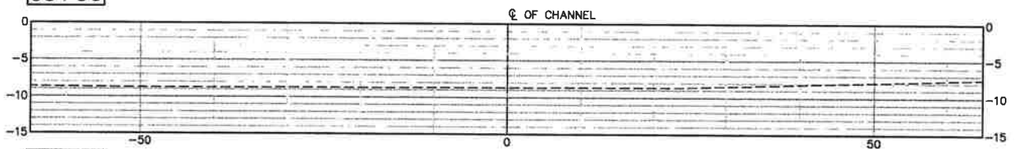

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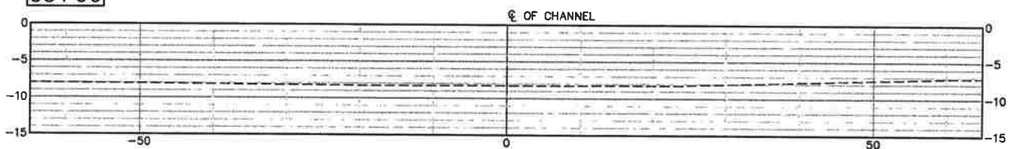

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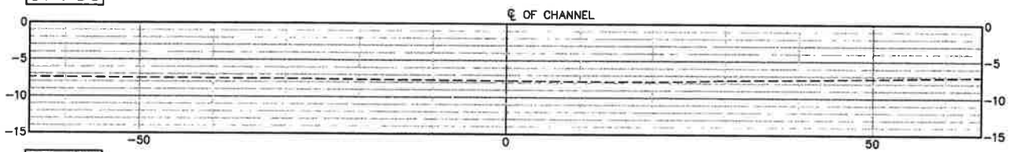

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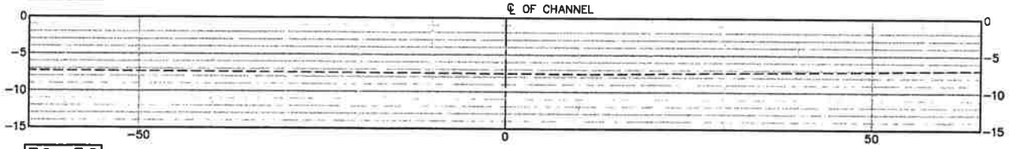


36+50

36+00

NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

- DREDGE DEPTH -6.5
- OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP; WQ; WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)
NOV 13 2018

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEYS DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING -
SHEET 5 OF 21

Date: DATE | Rev: REVNO
Designed by: DSGN | Det by: CHKR
Dwn by: DRFT | Reviewed by: REVR
Submitted by: MOFFATT & NICHOL
M&N Project No. 10248
Drawing code:
Drawing Scale:
Plot scale: 1:1 (0 SHEET)

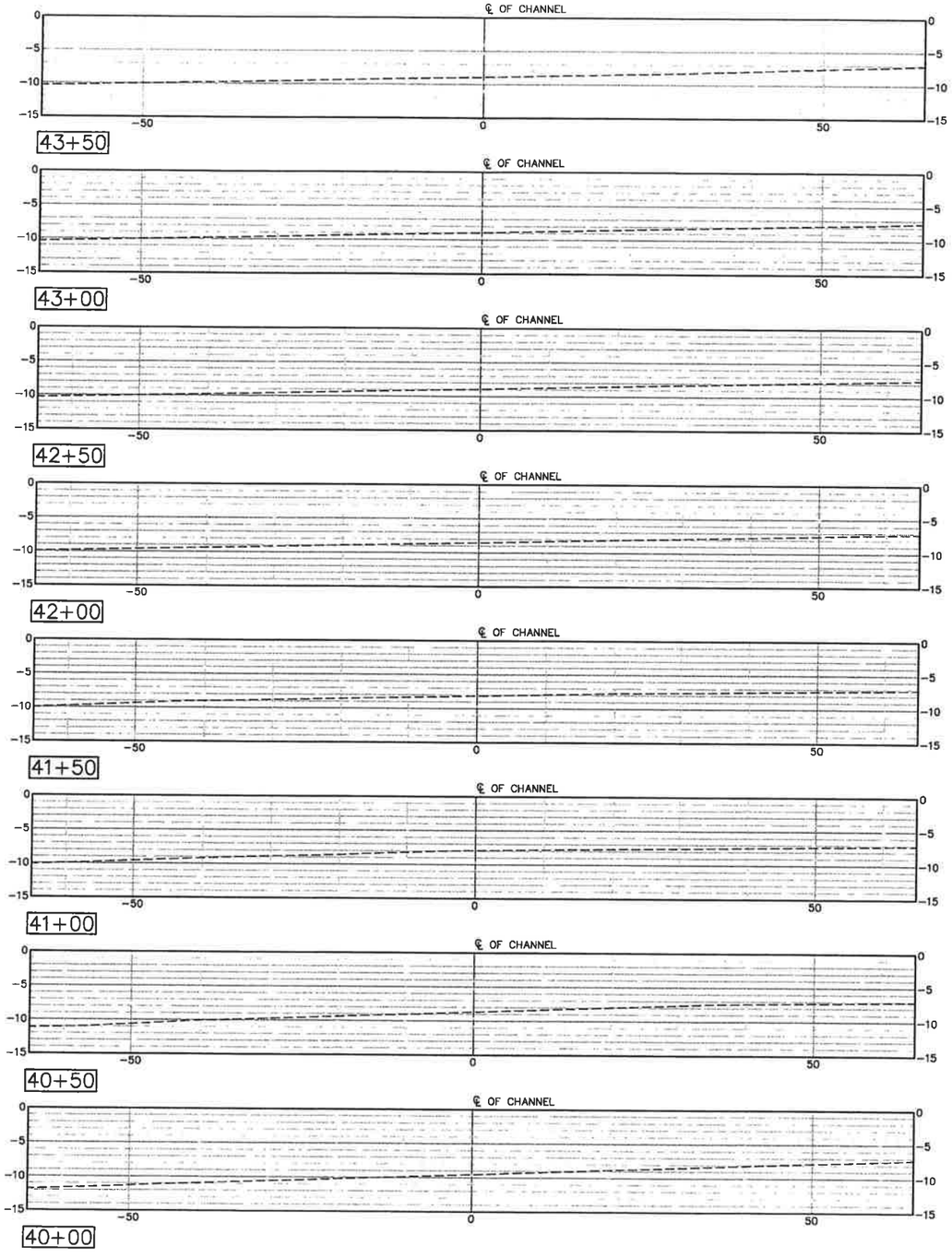
2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-540-7000
moffatt & nichol

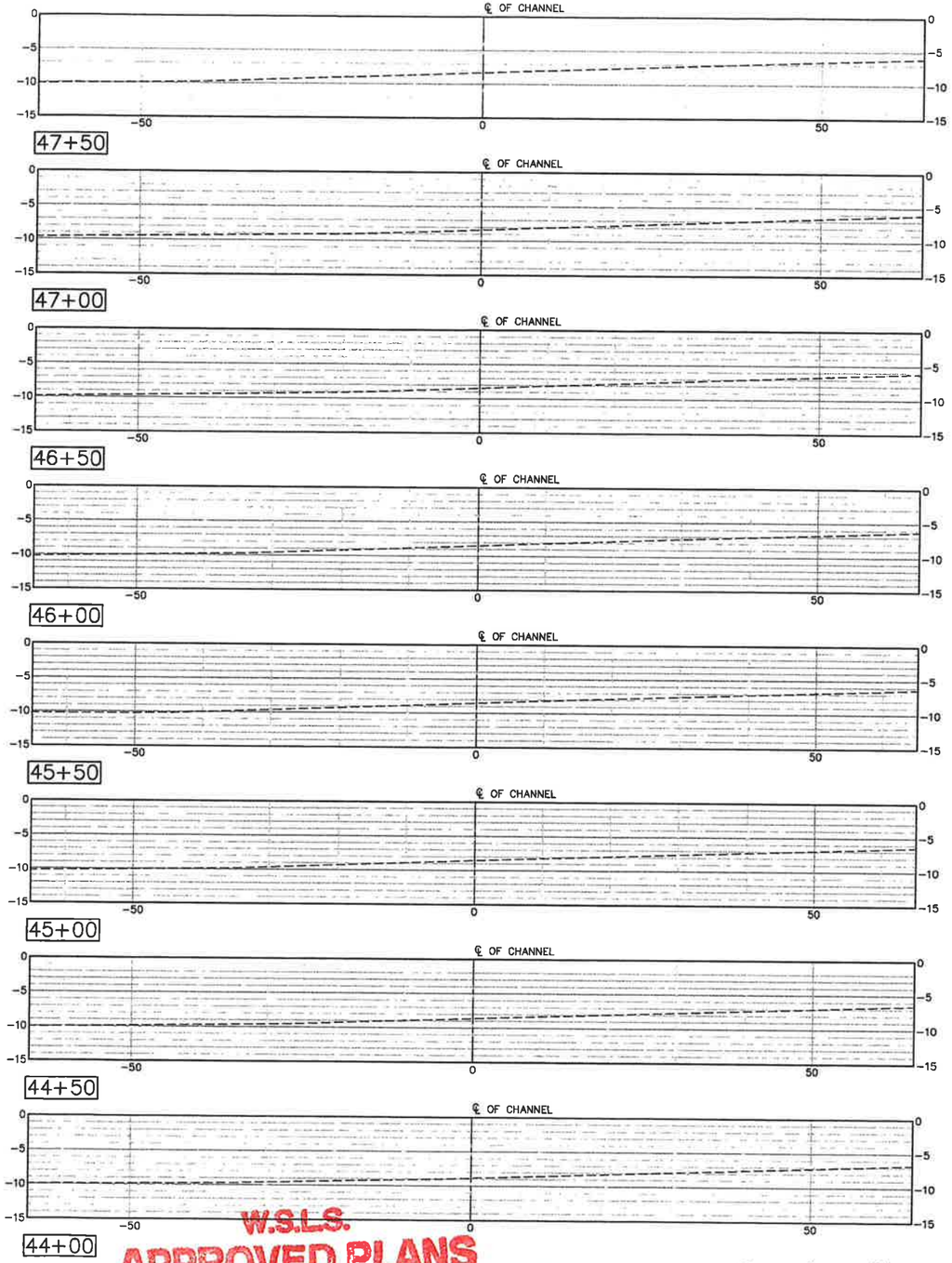
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-306
INDEX: 16 OF 38

File: G:\BA\10248 DNREC NA17.7002\10248-01 M-D Dredge\500 CADD_ACTIVE_Massey's Ditch (streets)\10248101C-306.dwg Layout: C-306 10/31/2018 12:22 PM by RIDOUANE; HICHAM; Saved: 10/30/2018 1:36 PM by HRIDOUANE





NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

- DREDGE DEPTH -6.5
- OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 6 OF 21

Designed by: DSGN	Det by: CHKR	Rev: REVND	Date: DATE
Dwn by: DRFT	Reviewed by: REVR	Drawing code:	M&N Project No. 10248
Submitted by: MOFFATT & NICHOL	Drawing Scale: Plot scale: 1:1 (0 SHEET)		

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. 0
BALTIMORE, MD 21224
410-454-1500

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-307
INDEX: 17 OF 38

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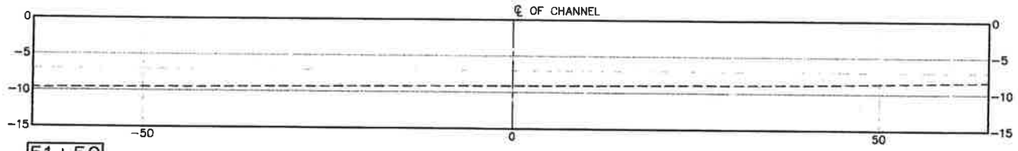

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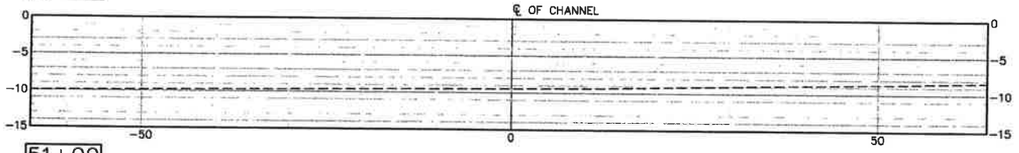

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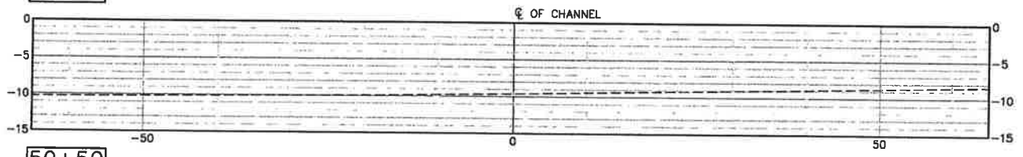

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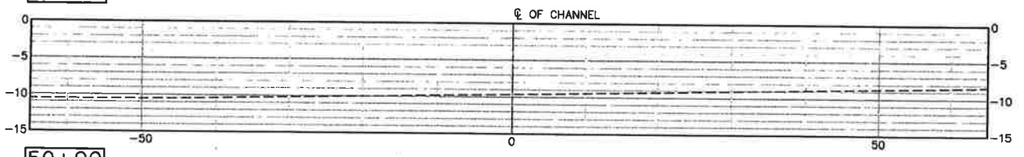

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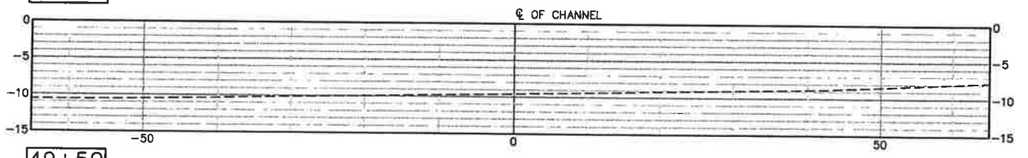

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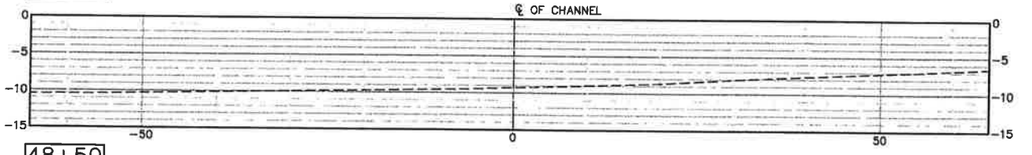

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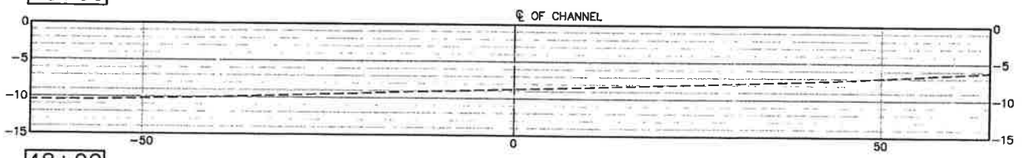

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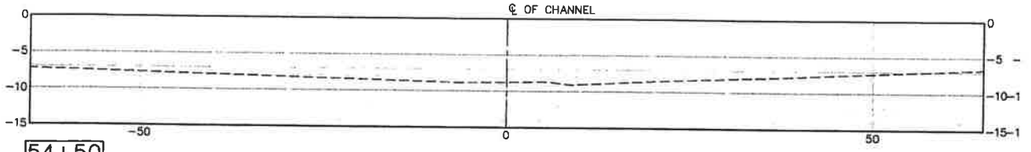

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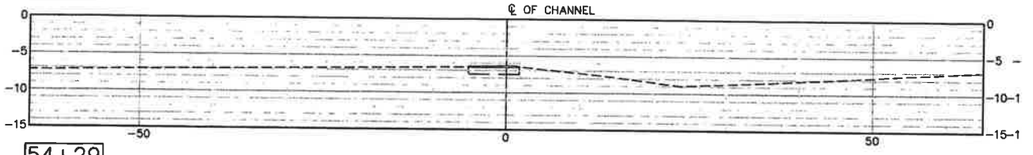

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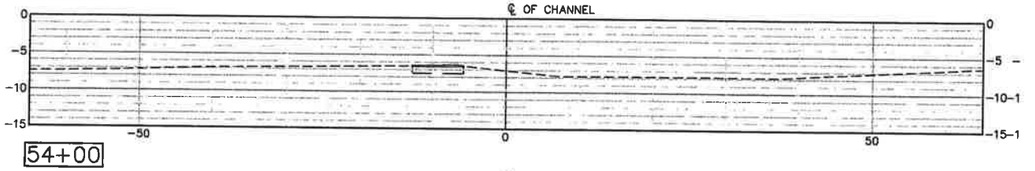

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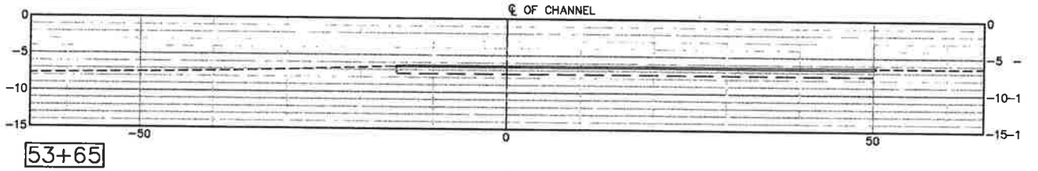

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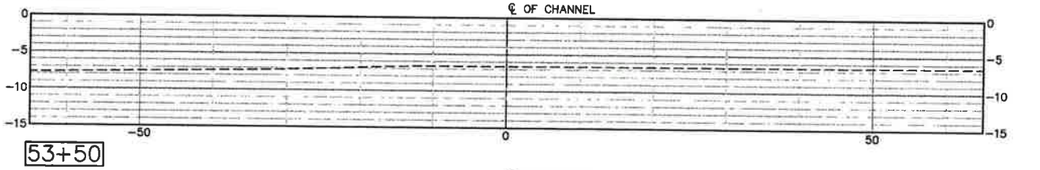

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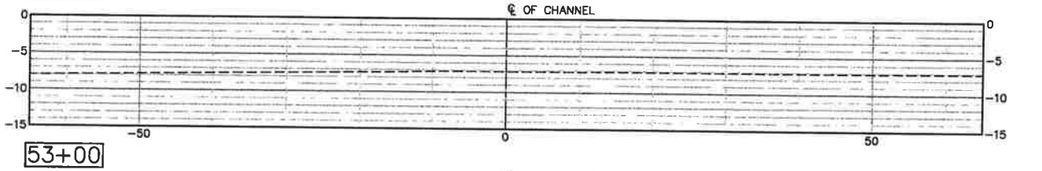

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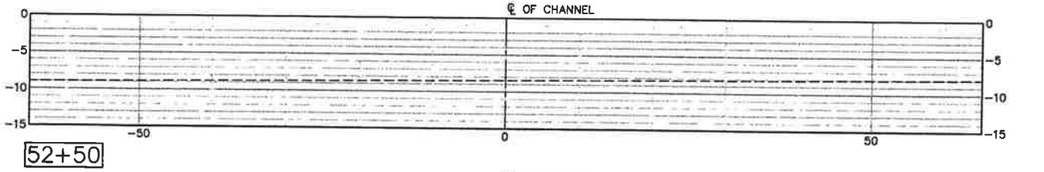

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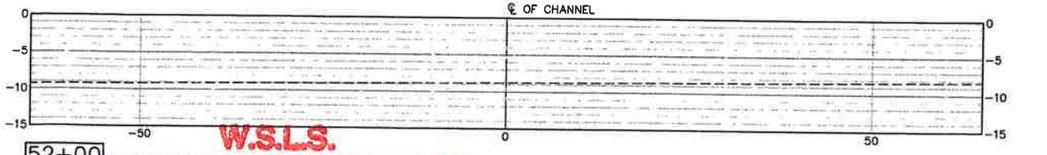

52+00

NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP-WQ-WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 7 OF 21

Date: DATE	Rev: REVNO	Drawing code:	Drawing Scale: Plot scale: 1:1 (0 SHEET)
Designed by: DSOH	Cad by: CHKR		
Dwn. by: DRFT	Reviewed by: REVR	Submitted by: MOFFATT & NICHOL	

M&N Project No. 10248

2780 LIGHTHOUSE POINT EAST, SUITE 400
BALTIMORE, MD 21224
410-563-7300

moffatt & nichol

SEAL

Sheet Reference No.
C-308
INDEX: 18 OF 38

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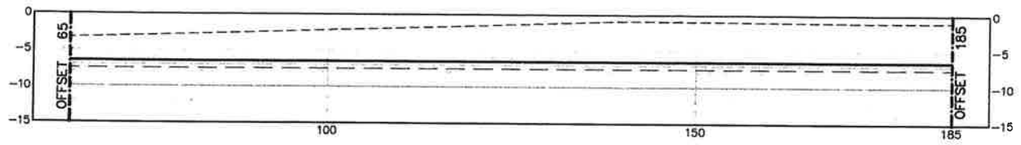

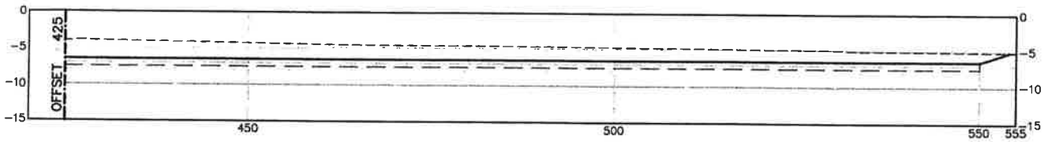

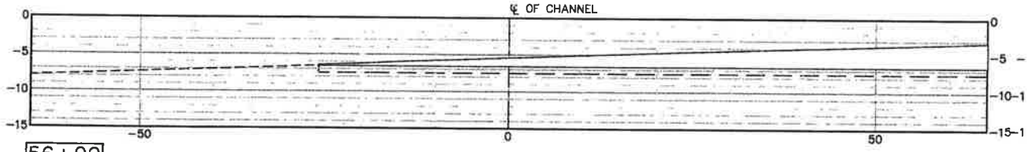

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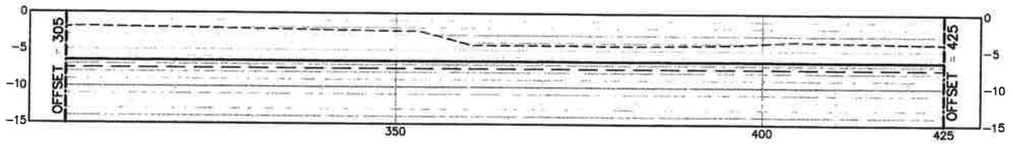

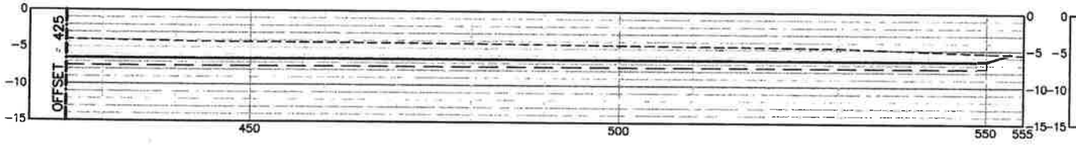

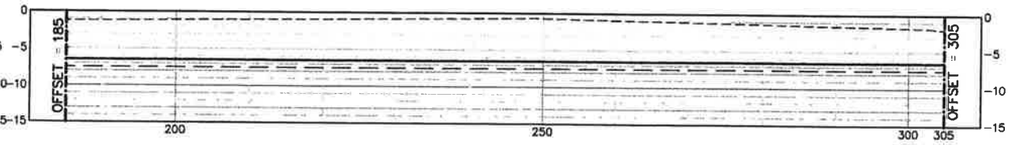

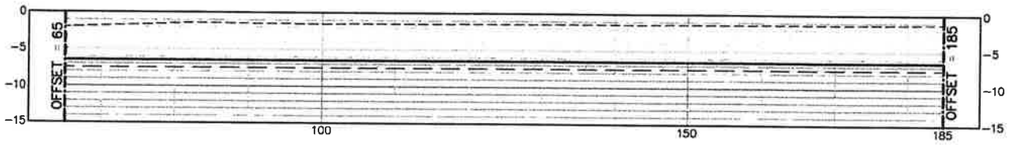

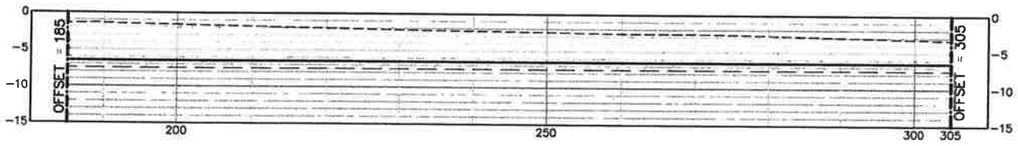

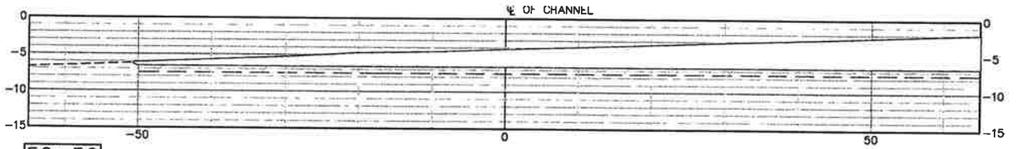

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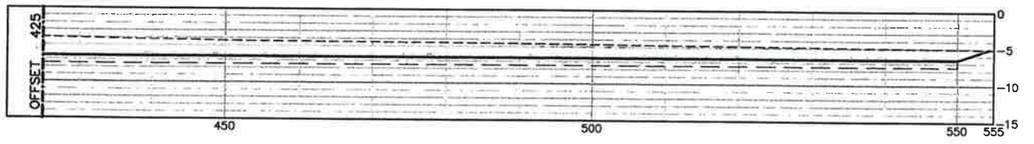

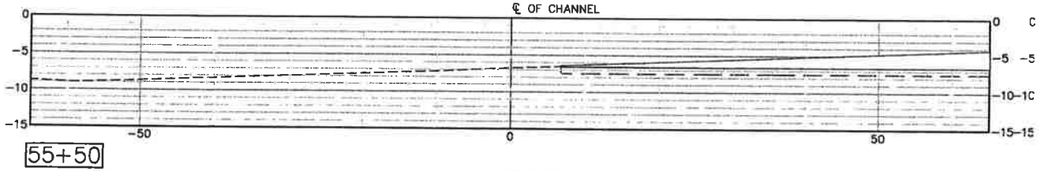

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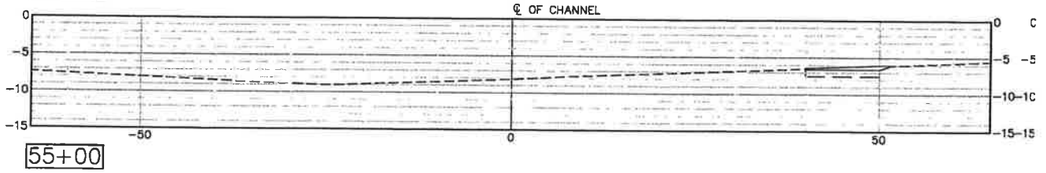

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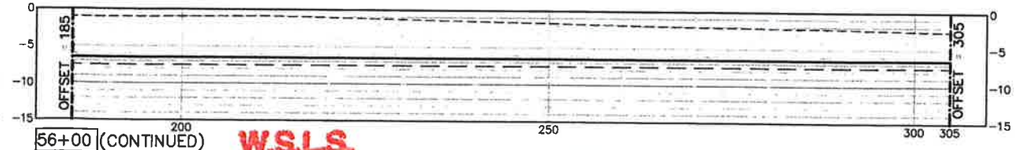

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NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WC-409/18
DATE 11/29/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

No.	Description	Date	App.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING -
SHEET 8 OF 21

Date:	Rev.
DATE	REVNO

Designed by:	Drd by:	M&N Project No.
DSCN	CHKR	10248

Dwn by:	Reviewed by:	Drawing code:
DRFT	REVR	

Submitted by:	Drawing Scale:
MOFFATT & NICHOL	Plot scale: 1:1 (0 SHEET)

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, SUITE D
BALTIMORE, MD 21224
410-563-7500

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-309
INDEX: 19 OF 38

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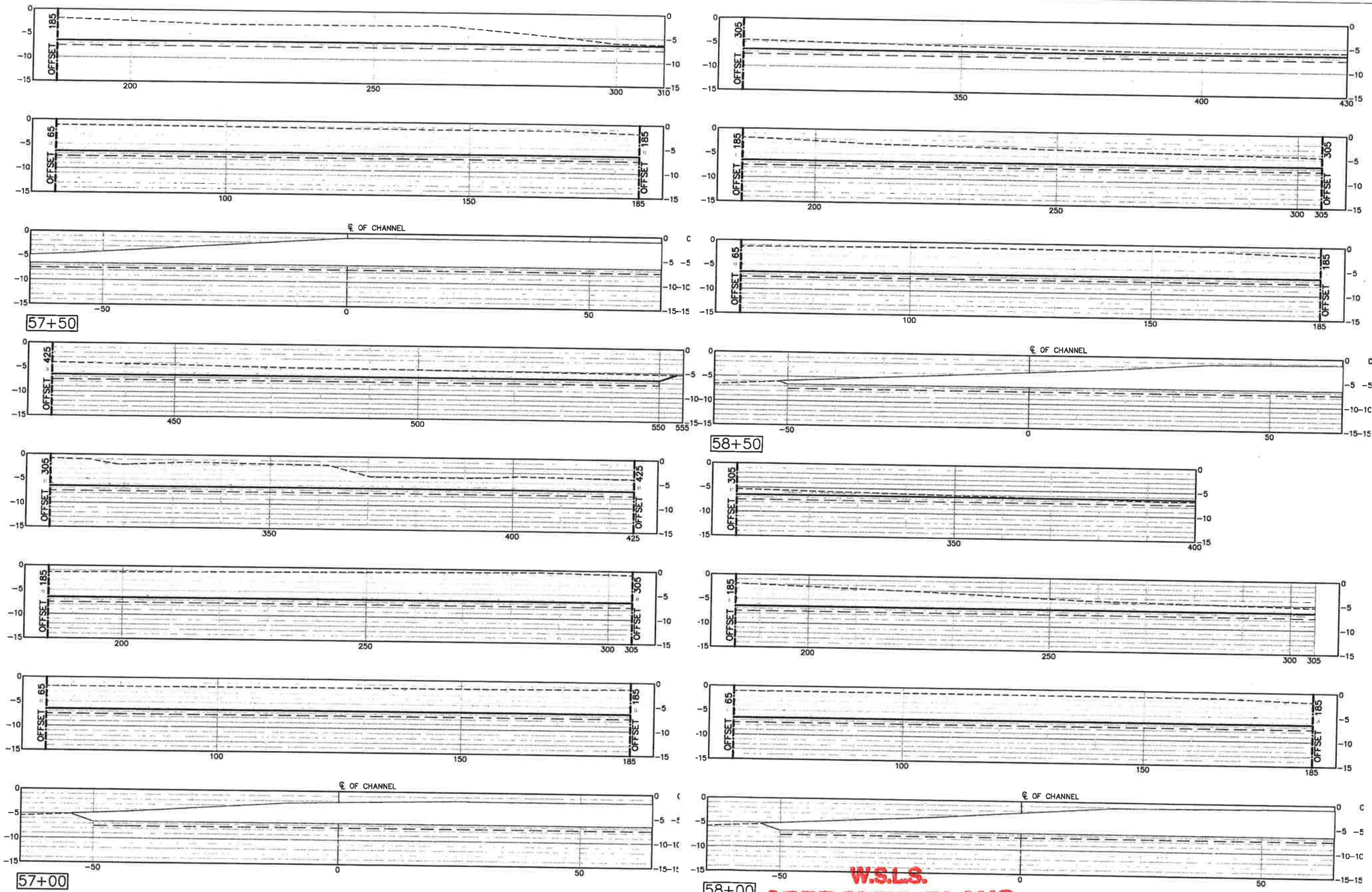

NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 9 OF 21

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, SUITE 1D
BALTIMORE, MD 21224
410-563-7300

Designed by: DSON
Drawn by: DRFT
Checked by: CHKR
Reviewed by: REVR
Submitted by: MOFFATT & NICHOL
Drawing Scale: Plot scale: 1:1 (D SHEET)
M&N Project No. 10248
Drawing date: DATE
Date: DATE
Rev: REVNO

SEAL

Sheet Reference No.
C-310
INDEX: 20 OF 38

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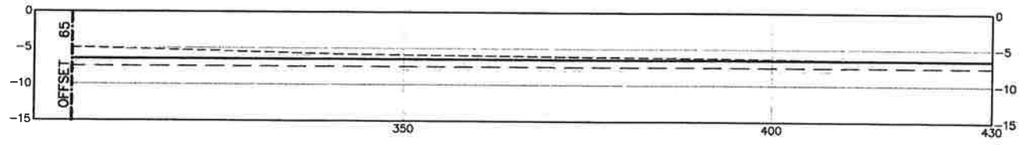

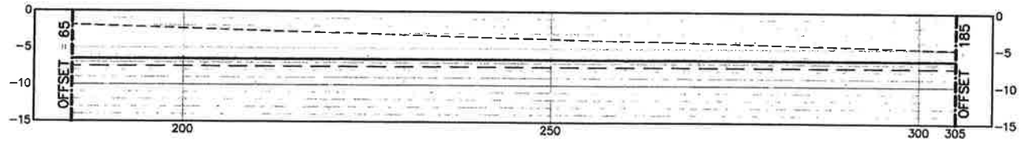

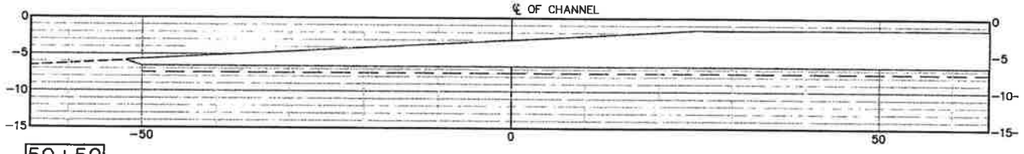

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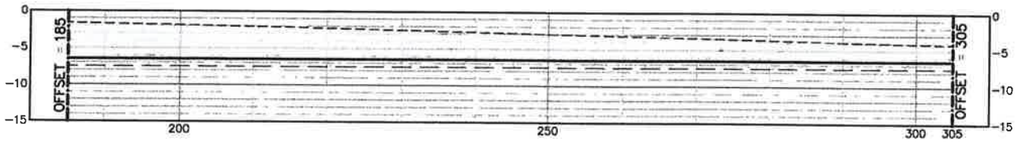

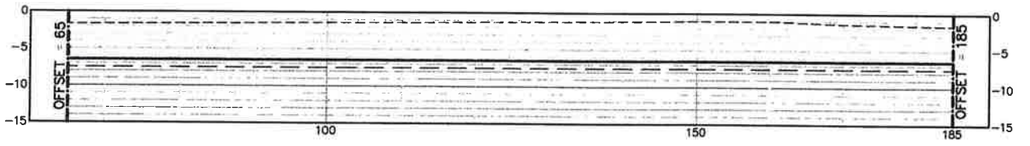

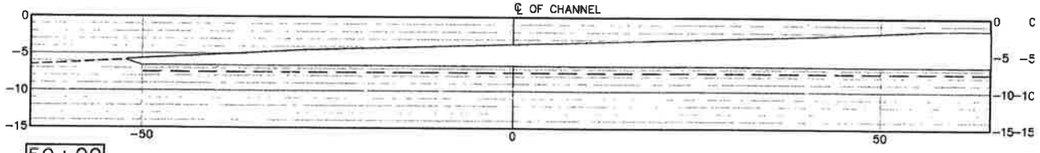

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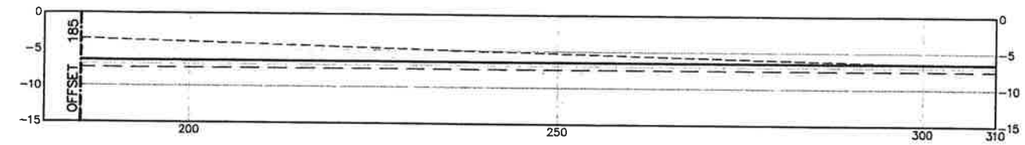
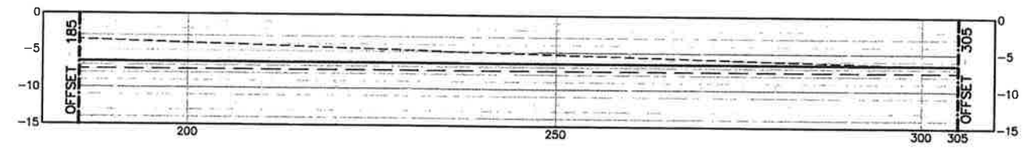
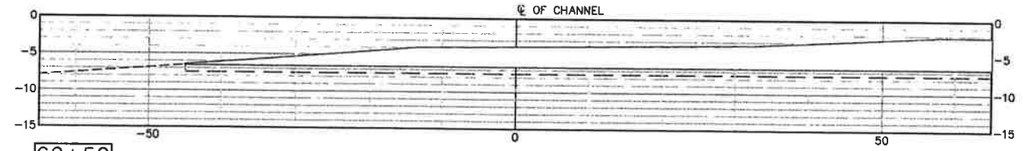
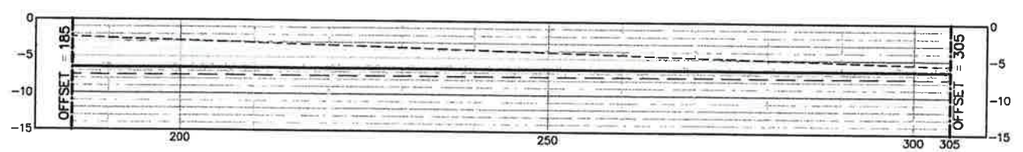
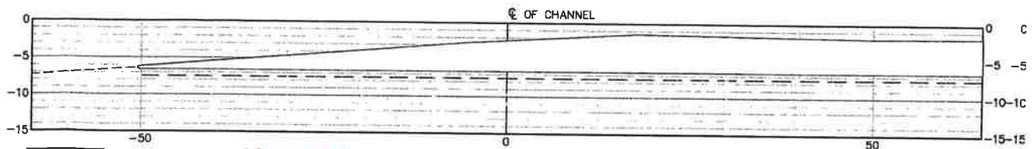






60+50





60+00

NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
NOV 13 2018
PERMIT # SP,WQ,WE-909/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 10 OF 21

Designed by: DSGN	Rev. REVNO		
Drawn by: ORFT	Date: DATE	Chkd by: CHKR	M&N Project No. 10248
Reviewed by: REVR	Drawing code:		
Submitted by: MOFFATT & NICHOL	Drawing Scale: Plot scale: 1:1 (D SHEET)		

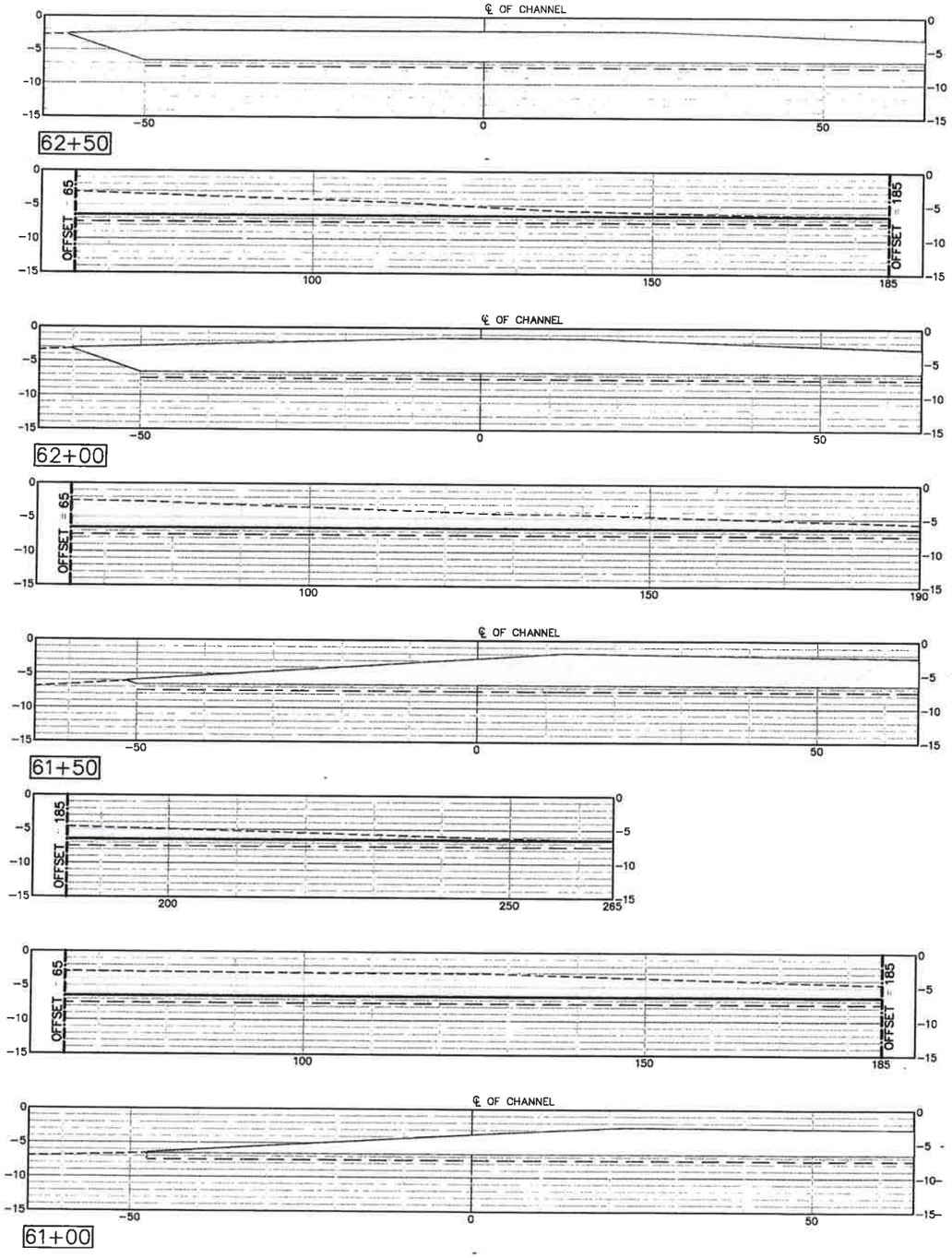
2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-563-3500
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-311
INDEX: 21 OF 38

File: G:\BA\10248 DNREC NA17007\10248-01 M-D Dredge\500 CADD_ACTIVE_Massey's Ditch (sheets)\10248011C-311.dgn Plotted: 10/31/2018 12:26 PM by RIDOUANE, HICHAM, Saved: 10/31/2018 9:42 AM by HRIDOUANE



NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP; WQ; WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

moffatt & nichol
2780 LIGHTHOUSE POINT EAST.
BALTIMORE, MD 21224
410-563-7300

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 11 OF 21

Designed by: DSON
Drawn by: DRFT
Checked by: CHKR
Reviewed by: REVR
Submitted by: MOFFATT & NICHOL
Date: DATE
Rev. REVNO
M&N Project No. 10248
Drawing code:
Drawing Scale:
Plot scale: 1:1 (D SHEET)

Sheet Reference No.
C-312
INDEX: 22 OF 38

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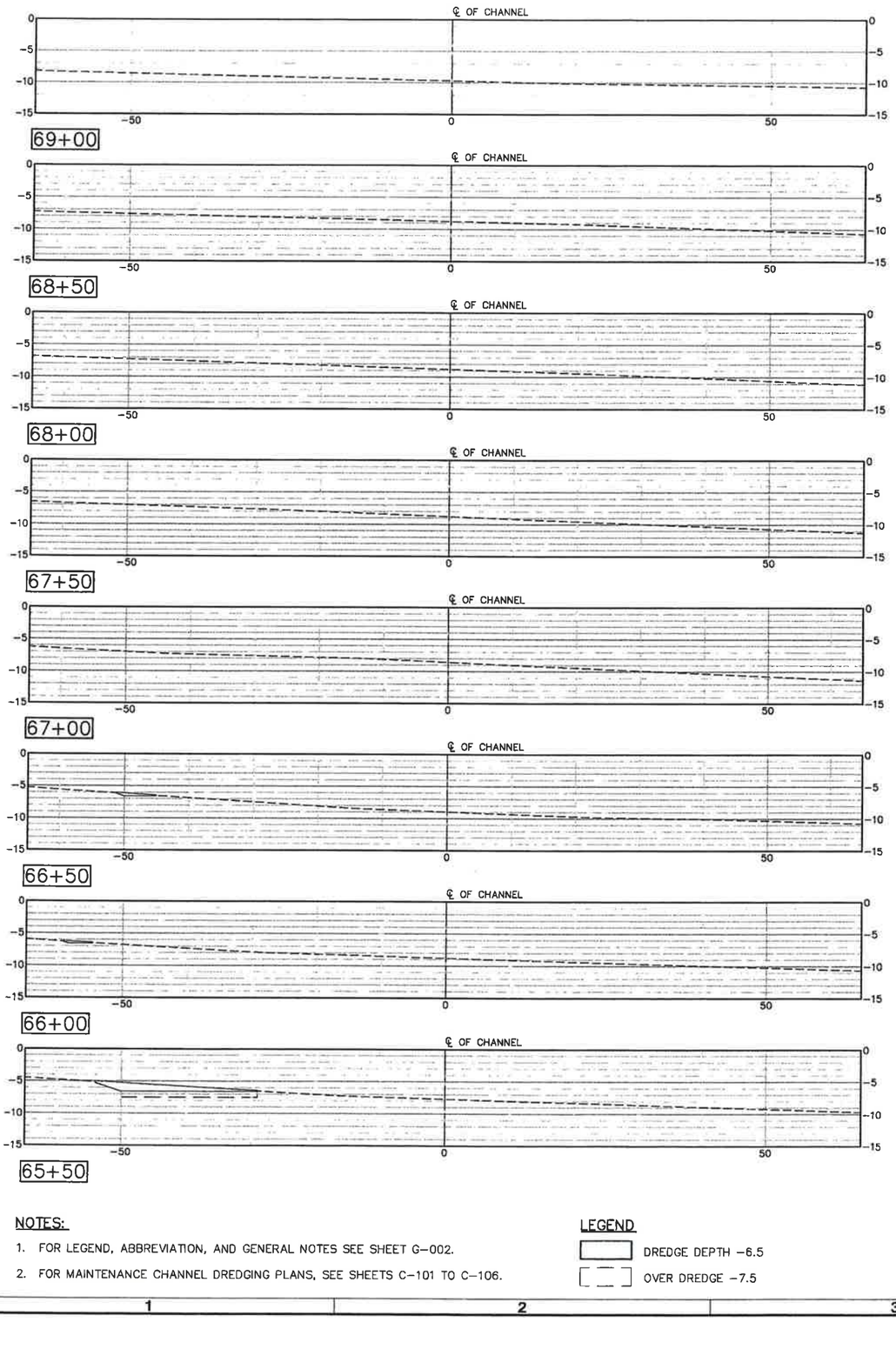
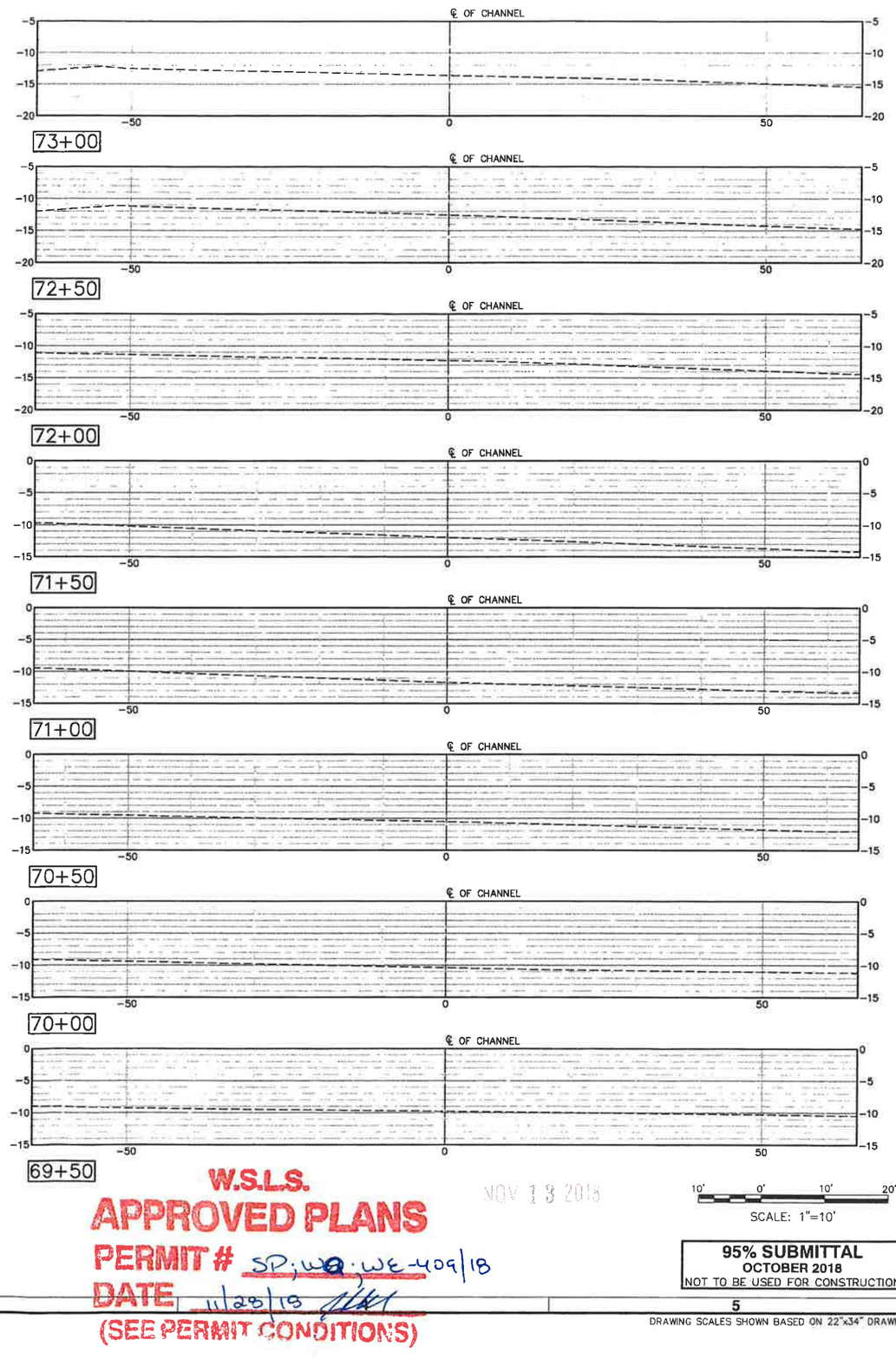
Saved: 10/31/2018 10:02 AM by HIRODUANE





NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/29/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

No.	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 12 OF 21

moffatt & nichol
2700 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-563-7300

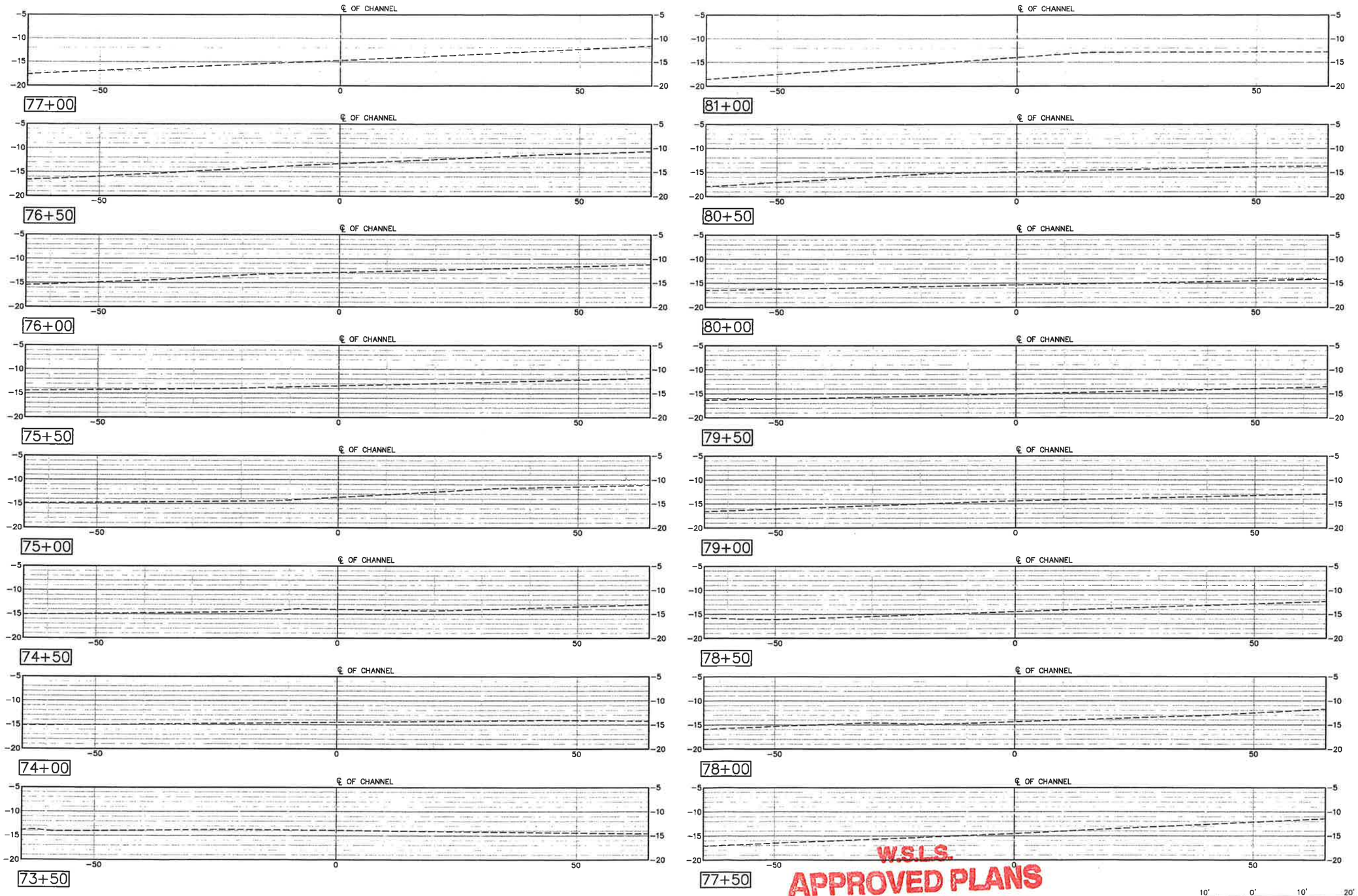
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

Designed by: DSGN	Date: DATE	Rev. REVNO
Dwn by: DRFT	Chkd by: CHKR	M&N Project No. 10248
Reviewed by: REVR		Drawing code:
Submitted by: MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (D SHEET)

SEAL

Sheet Reference No.
C-313
INDEX: 23 OF 38

File: Q:\BA\10248 DNREC NAT\7007\10248-01 M+O Dredge\300 CAD01_ACTIVE_Massey's Ditch (sheets)\10248DIC-313; Plotted: 10/31/2018 12:28 PM by RIDOUANE; Saved: 10/31/2018 10:09 AM by HRIDOUANE



NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP, WQ, WE-409/18 NOV 19 2018
DATE 11/28/18
(SEE PERMIT CONDITIONS)

10' 0' 10' 20'

SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 13 OF 21

Designed by: DSGN	Det'd by: CHKR	Date: DATE	Rev. REVNO
Dwn. by: DRFT		M&N Project No. 10248	
Reviewed by: REVR		Drawing code:	
Submitted by: MOFFATT & NICHOL		Drawing Scale:	Plot scale: 1:1 (0 SHEET)

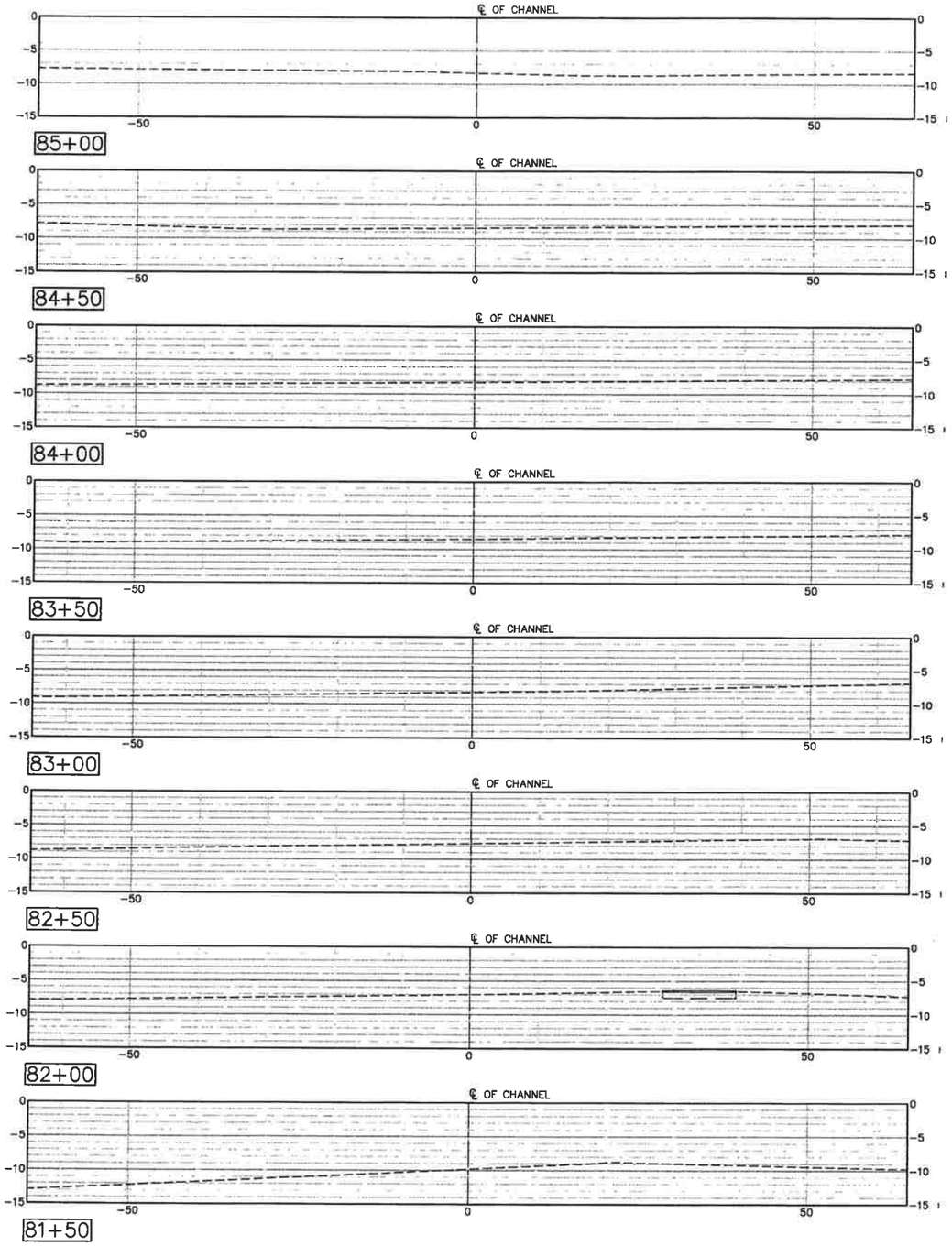
2780 LIGHTHOUSE POINT EAST, STE. 10
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-314
INDEX: 24 OF 38

File: G:\BA\10248 DNREC NAT7007\10248-01 M-D Dredge\500 CAD01_ACTIVE_Massey's Ditch (sheets)\1024801C-314. Plotted: 10/31/2018 12:29 PM by RIDOUANE. HICHAM. Saved: 10/31/2018 10:08 AM by HRIDOUANE



NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS NOV 13 2018
PERMIT # SP, WQ, WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

No.	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 14 OF 21

Date: DATE	Rev. REVNO		
Designed by: DSCN	Ckd by: CHKR	MBH Project No. 10248	Drawing code:
Dwn by: DRFT	Reviewed by: REVR		Drawing Scale:
	Submitted by: MOFFATT & NICHOL		Plot scale: 1:1 (@ SHEET)

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-563-7500

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-315
INDEX: 25 OF 38

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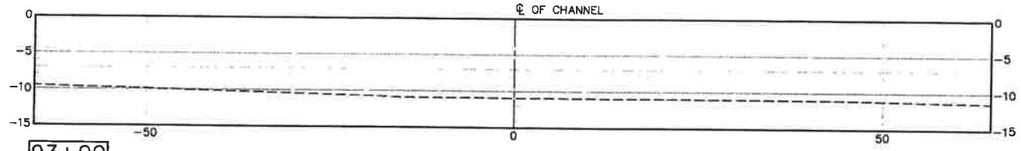
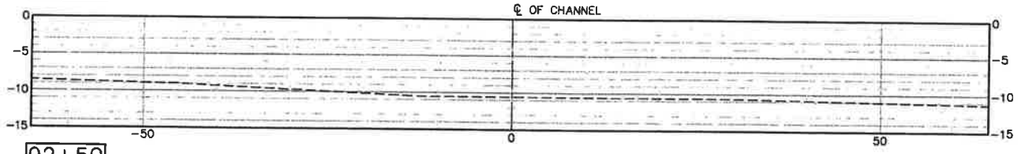
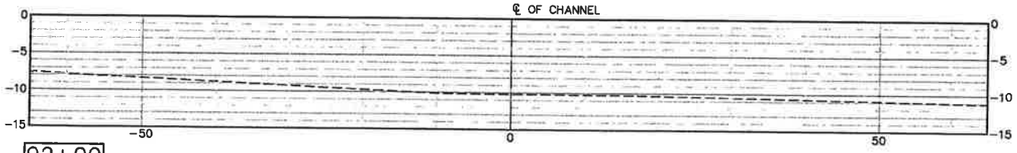
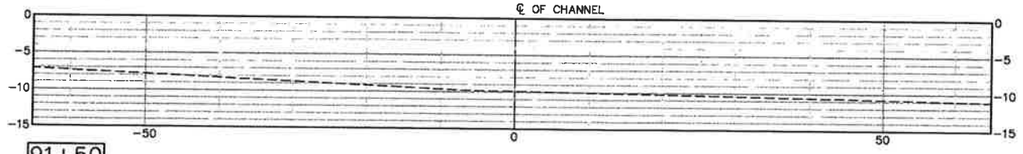
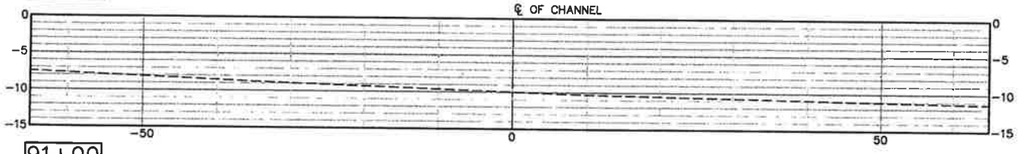
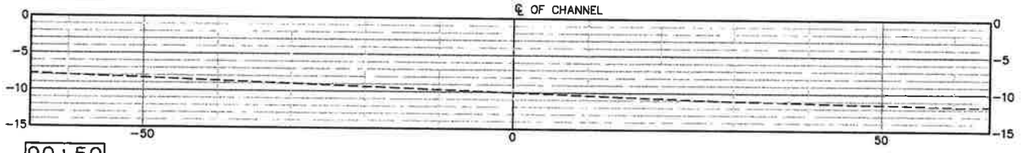


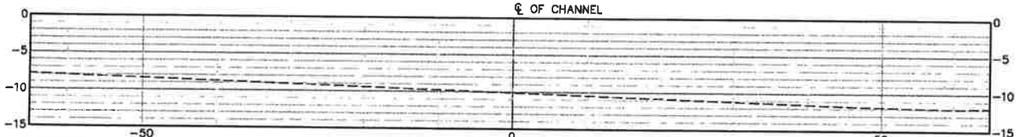


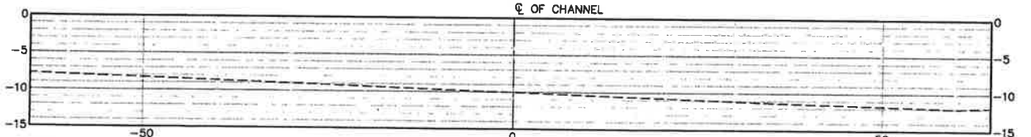


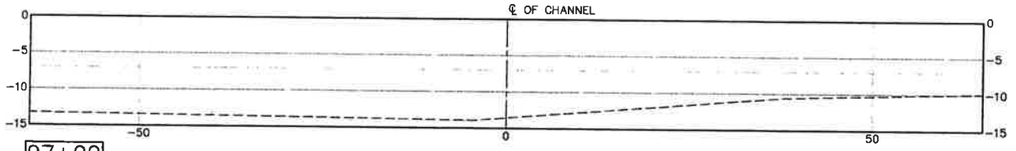


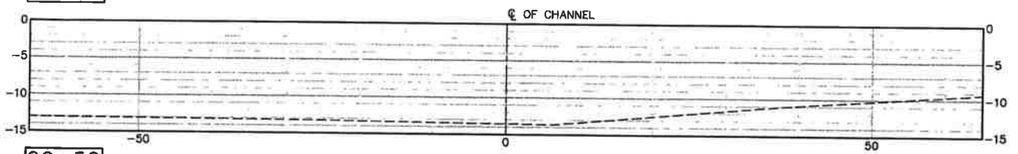


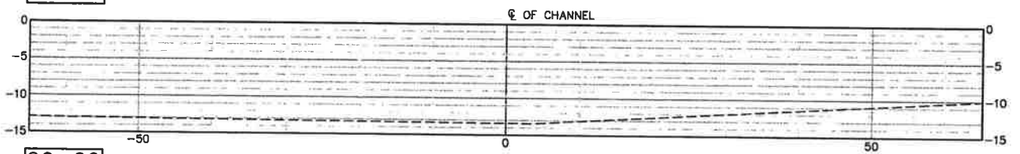


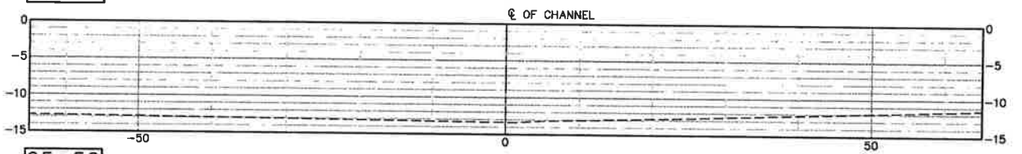


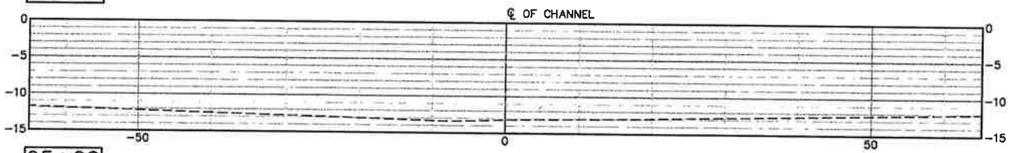


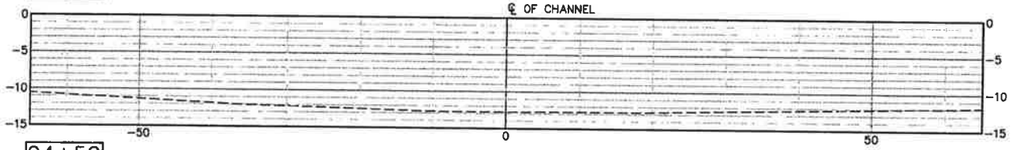


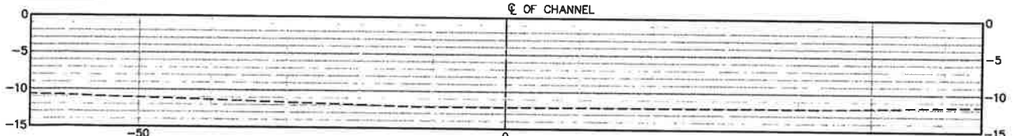


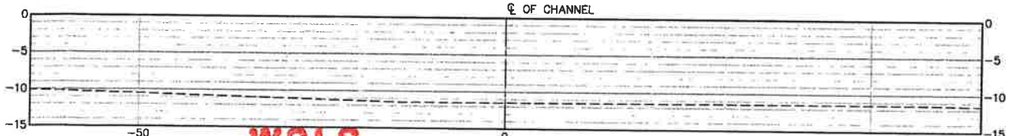












NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP, WQ, WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)
NOV 13 2018

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

moffatt & nichol
2780 LIGHTHOUSE POINT EAST.
SUITE D
BALTIMORE, MD 21224
410-563-7300

Designed by: DSGN
Drawn by: DRFT
Checked by: CHKR
Reviewed by: REVR
Submitted by: MOFFATT & NICHOL
Date: DATE
M&N Project No. 10248
Drawing code:
Drawing Scale:
Plot scale: 1:1 (D SHEET)
Rev. REVNO

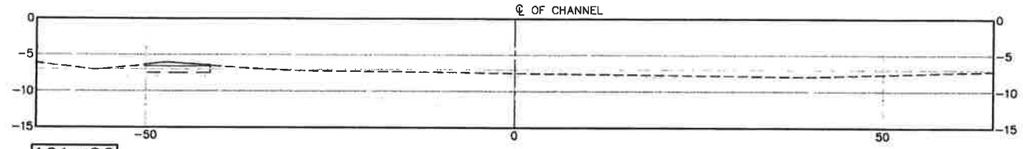
MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING -
SHEET 15 OF 21

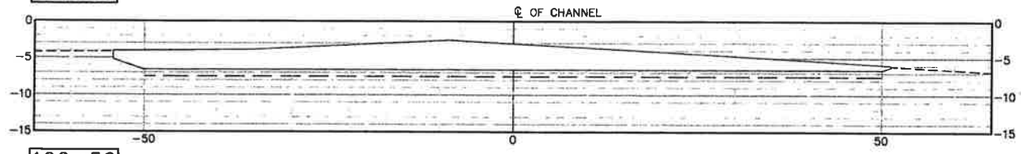
SEAL

Sheet Reference No.
C-316
INDEX: 26 OF 38

File: G:\BA\10248 DNREC NAT7002\10248-01 M-D Dredge\500 CAD01_ACTIVE_Massey's Ditch (sheets)\1024801C-316; Plotted: 10/31/2018 12:30 PM by RIDOUANE; HICHAM; Saved: 10/31/2018 10:34 AM by RIDOUANE



101+00



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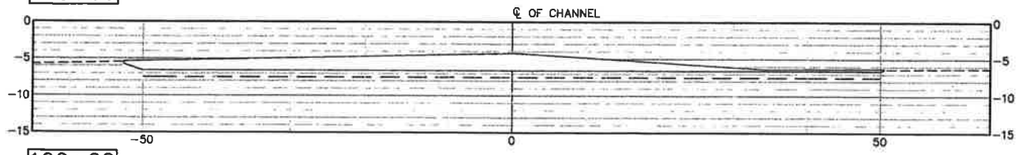

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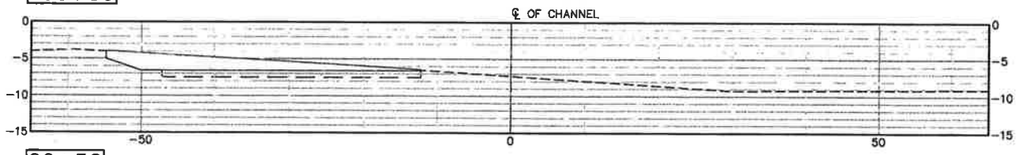
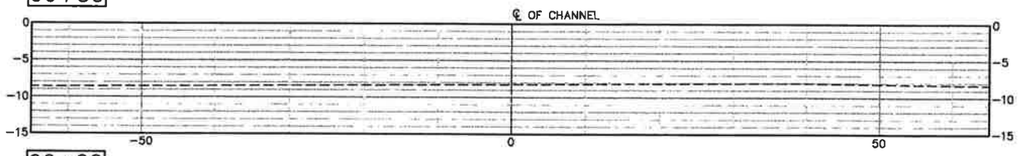


99+50



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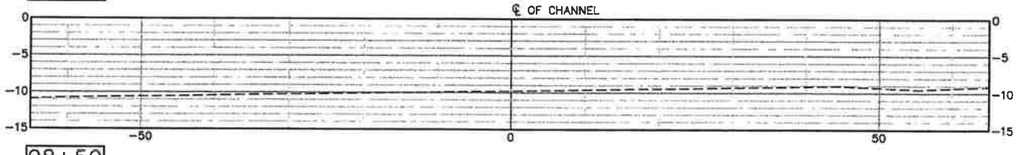
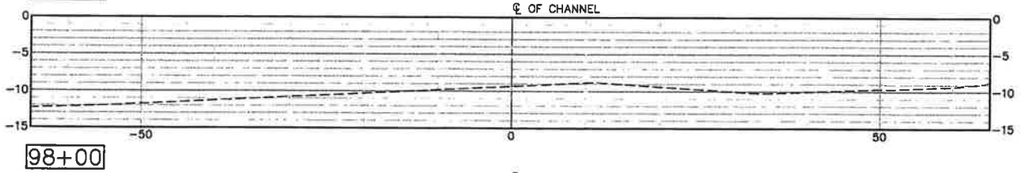
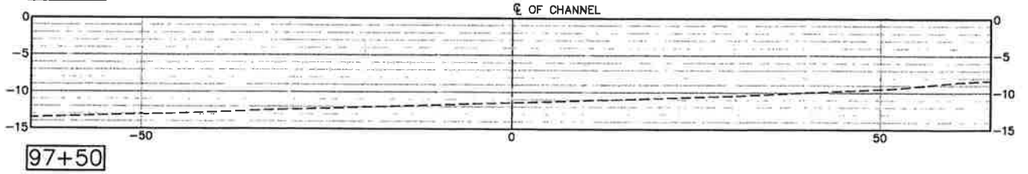


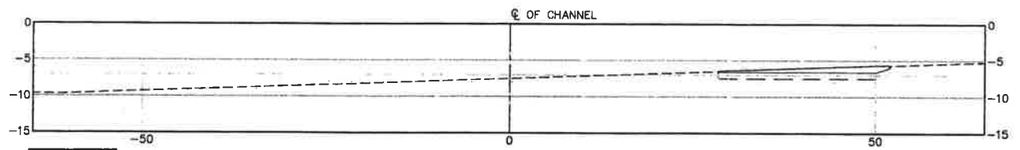
98+50



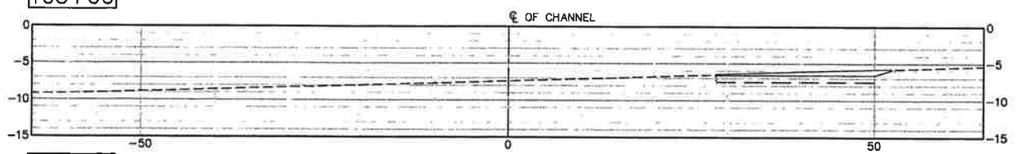
98+00



97+50



105+00



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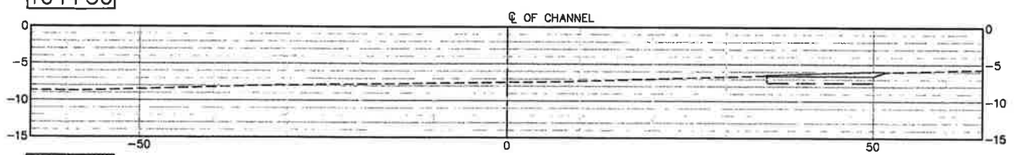
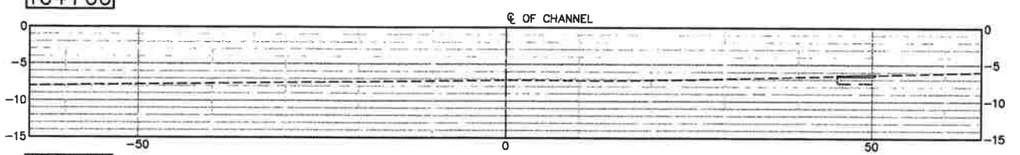
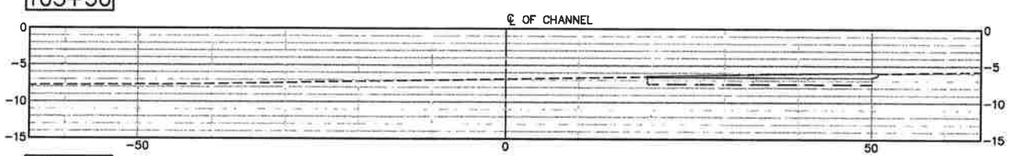


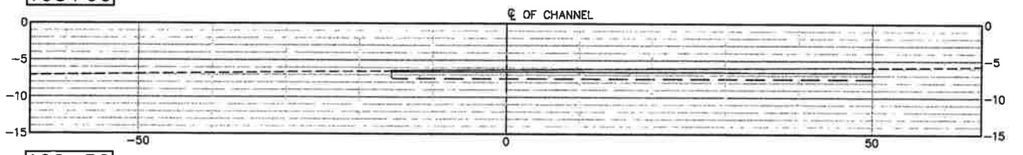
104+00



103+50



103+00



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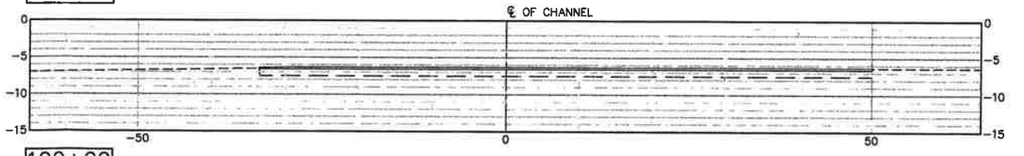

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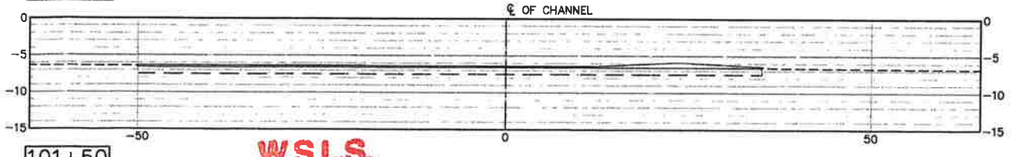


101+50

NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

- DREDGE DEPTH -6.5
- OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS NOV 13 2018
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING -
SHEET 16 OF 21

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-563-7300

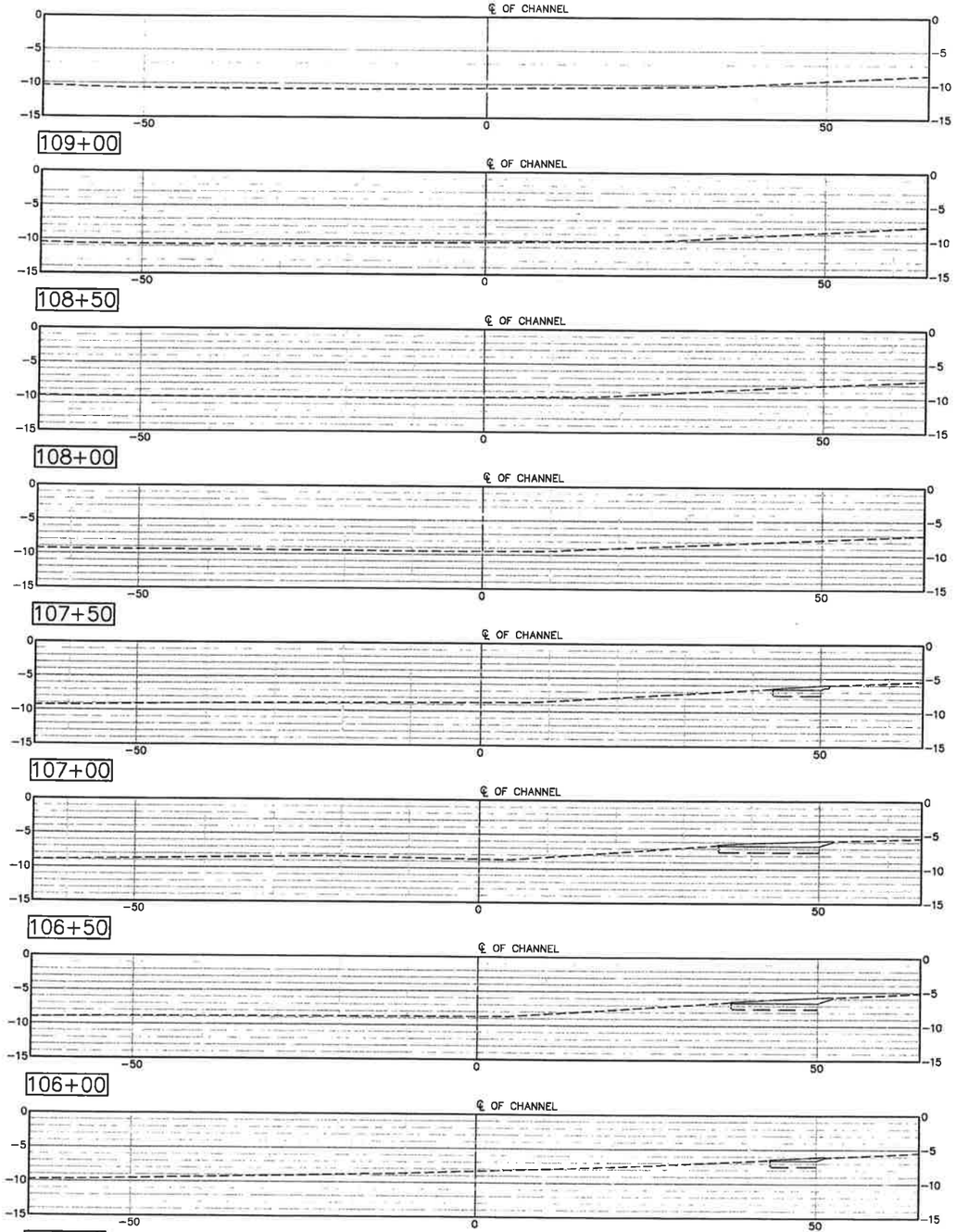
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

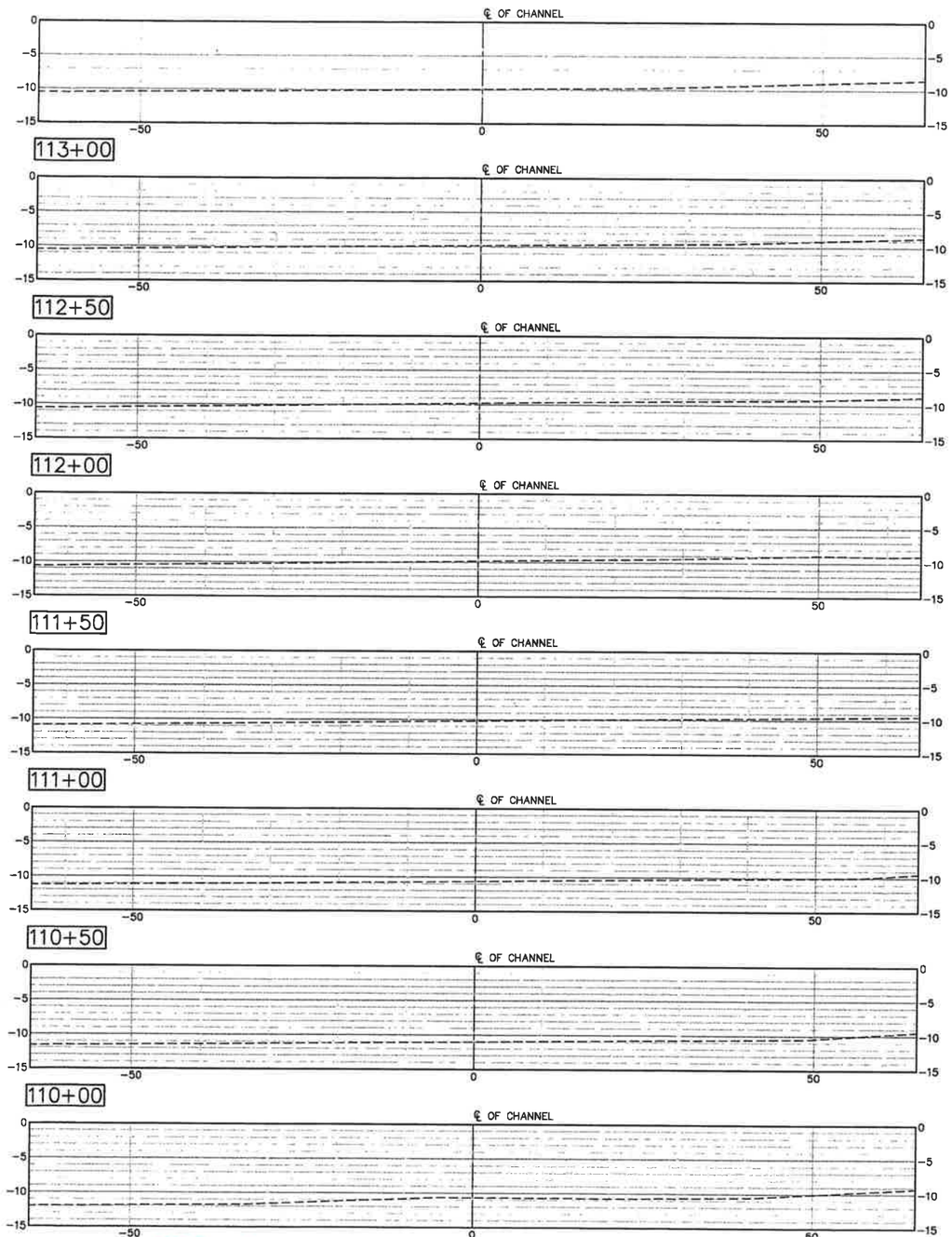
Date:	DATE	Rev.	REVNO
Designed by:	DSGN	M&N Project No.	10248
Dwn by:	DRFT	Chd by:	CHKR
Reviewed by:	REVR	Drawing code:	
Submitted by:	MOFFATT & NICHOL	Drawing Scale:	
		Plot scale: 1:1 (D SHEET)	

SEAL

Sheet Reference No.
C-317
INDEX: 27 OF 38

File: G:\BA\10248 DNREC NAT\7002\10248-01 M-D Dredge\500 CADD_ACTIVE_Massey's Ditch (sheets)\10248101C-317.dwg Plotted: 10/31/2018 12:30 PM by RIDOUANE, HICHAM; Saved: 10/31/2018 10:34 AM by HRIDOUANE





NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING -
SHEET 17 OF 21

Date: DATE
Rev: REVNO
M&N Project No. 10248
Drawing code:
Drawing Scale:
Plot scale: 1:1 (D SHEET)
Designed by: DSON
Cad by: CHKR
Dwn by: DRFT
Reviewed by: REVR
Submitted by: MOFFATT & NICHOL

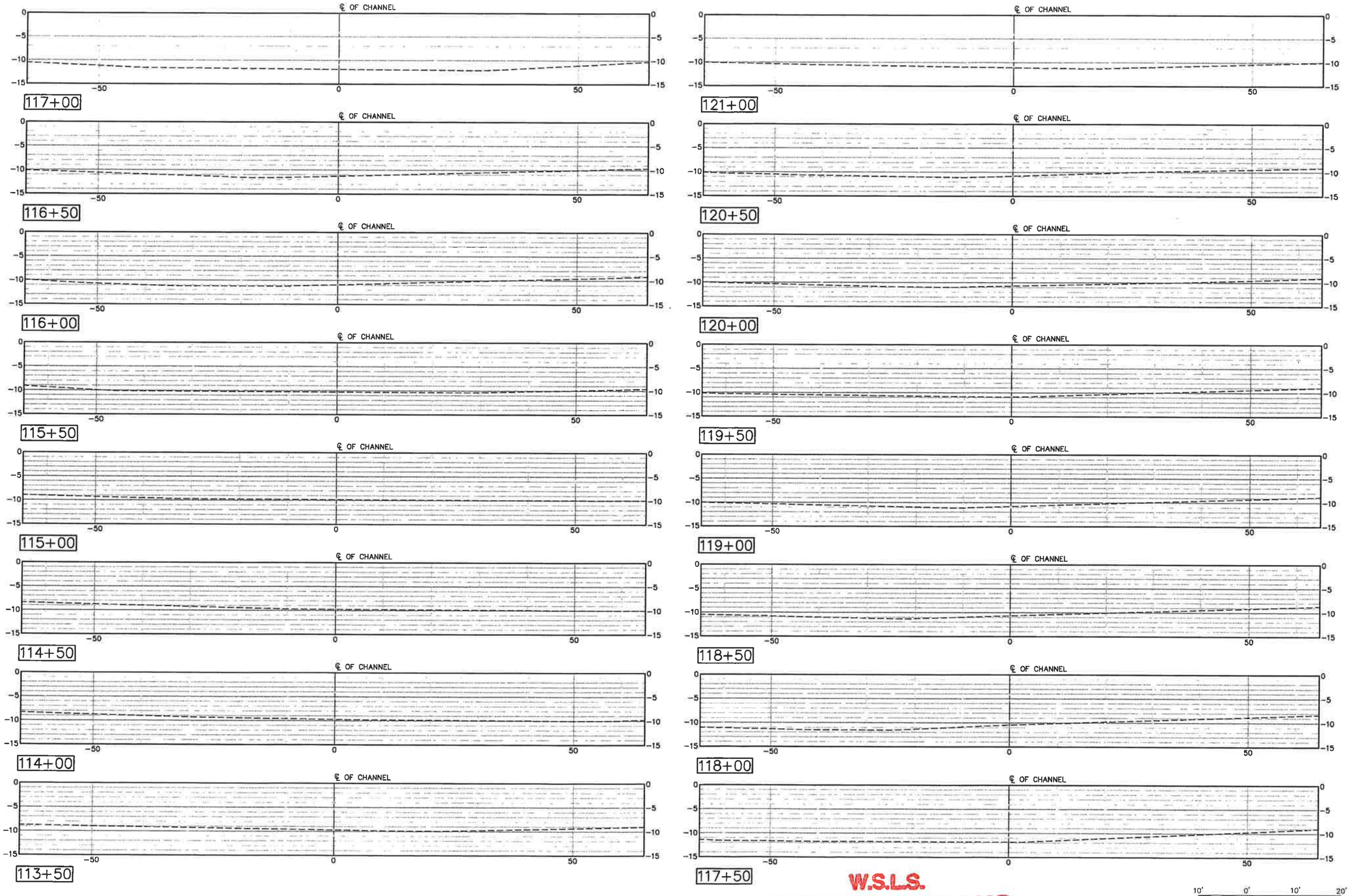
2780 LIGHTHOUSE POINT EAST,
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-318
INDEX: 28 OF 38

File: G:\BA\10248 DNREC NAT7200\10248-01 M-D Dredge\300 CADD_ACTIVE_Massey's Ditch (sheets)\1024801C-318; Plotted: 10/31/2018 12:31 PM by RIDOUANE, HICHAM; Saved: 10/31/2018 10:38 AM by HRIDOUANE



NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
NOV 13 2018
PERMIT # SP-WQ-WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

No.	Description	Date	Appr.

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 18 OF 21

Date: DATE | Rev: REVNO
M&N Project No.: 10248
Drawing code:
Drawing Scale:
Plot scale: 1:1 (@ SHEET)
Designed by: DSGN
Drn by: DRFT | Ckd by: CHKR
Reviewed by: REVR
Submitted by: MOFFATT & NICHOL

moffatt & nichol
2780 LIGHTHOUSE POINT EAST,
BALTIMORE, MD 21224
410-563-7300

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-319
INDEX: 29 OF 38

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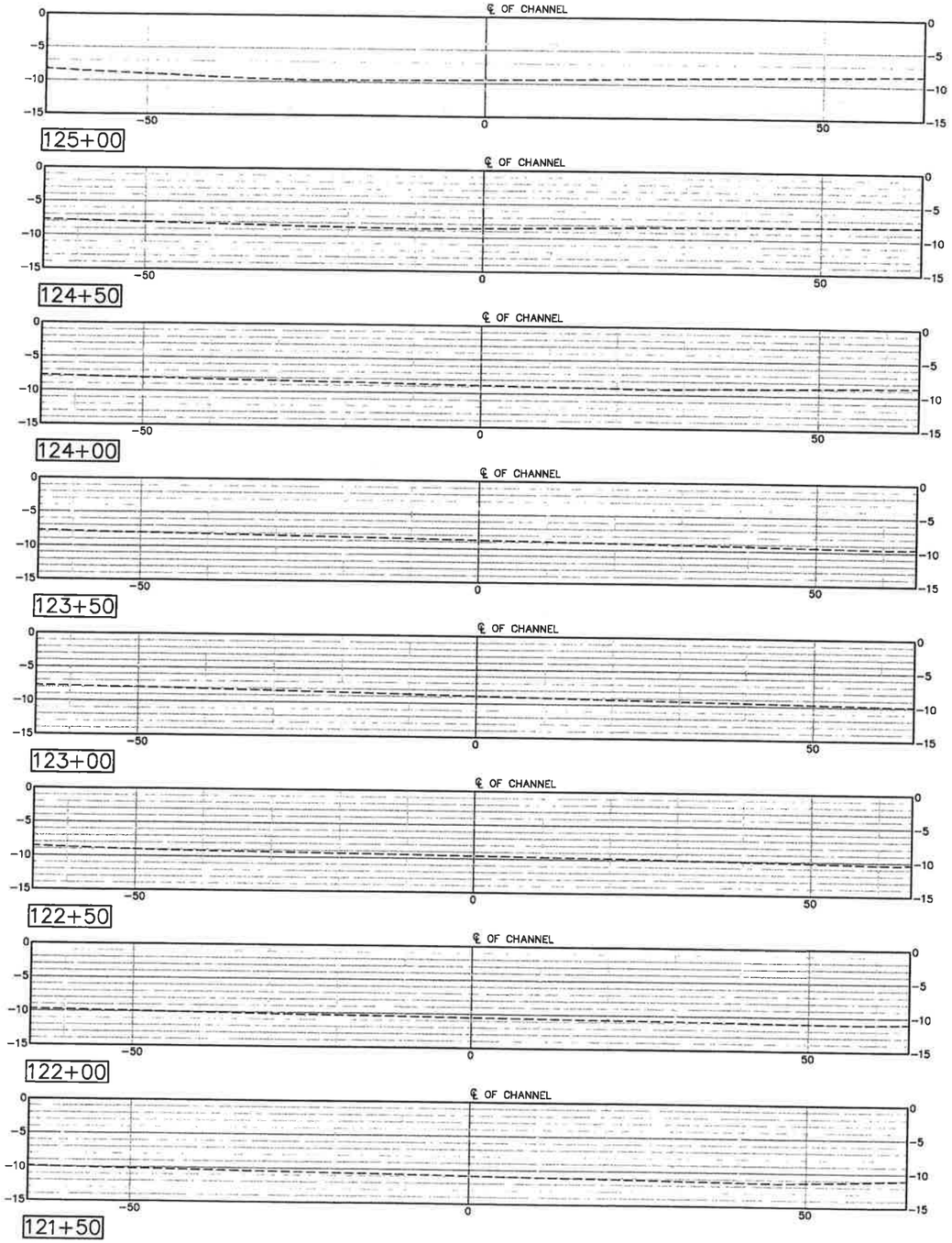

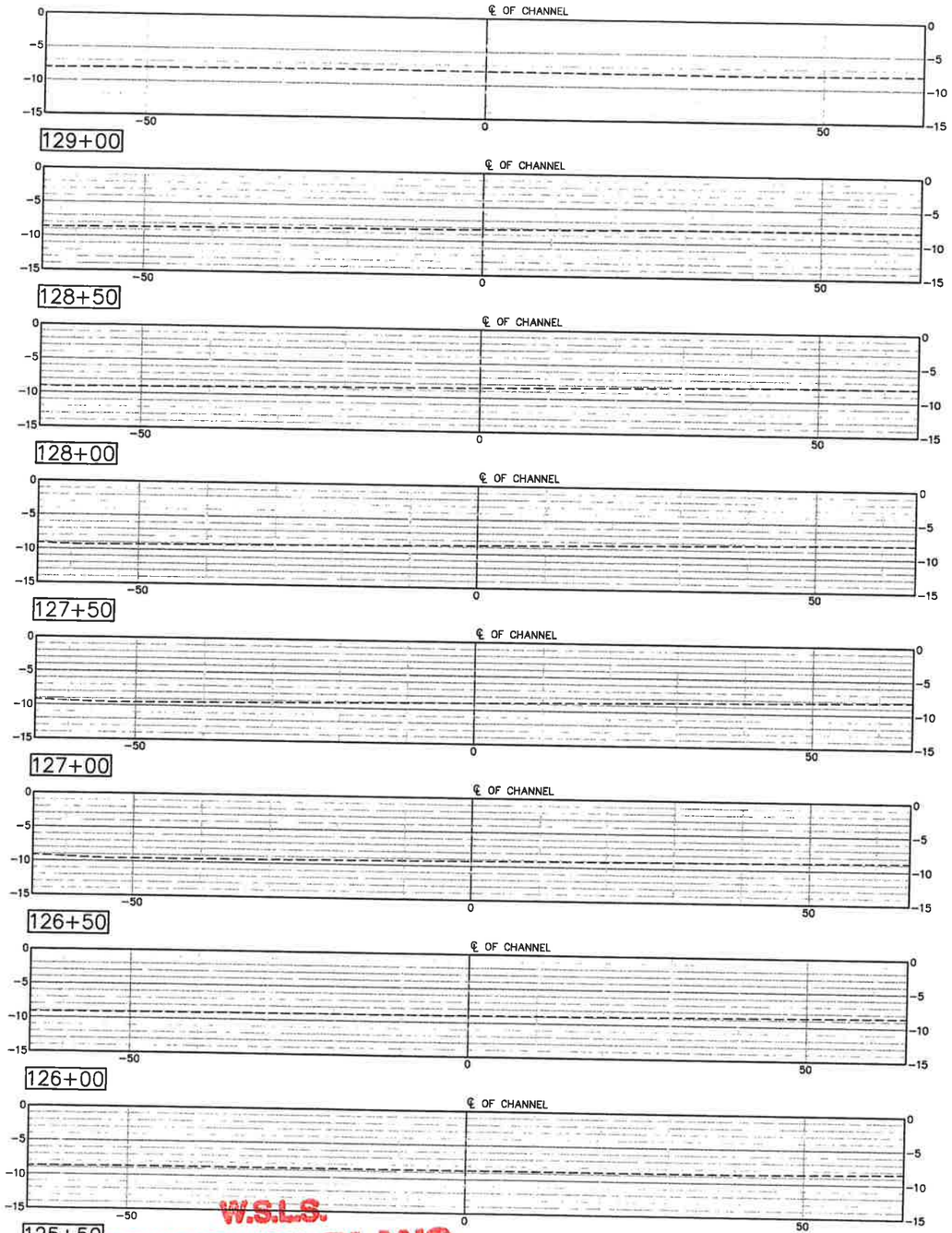

NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP-WQ-WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 19 OF 21

Date: DATE	Rev. NO/NO		
Designed by: DSON	M&N Project No. 10248	Drawing code:	
Dwn by: DRFT	Chkd by: CHKR	Reviewed by: REVR	Drawing Scale:
		Submitted by:	Plot scale: 1:1 (0 SHEET)

2780 LIGHTHOUSE POINT EAST,
SUITE 400
BALTIMORE, MD 21224
410-563-7300

moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

MOFFATT & NICHOL

SEAL

Sheet Reference No.
C-320
INDEX: 30 OF 38

Plotted: 10/31/2018 12:32 PM by RIDOUANE, HICHAM, Saved: 10/31/2018 12:15 PM by RIDOUANE
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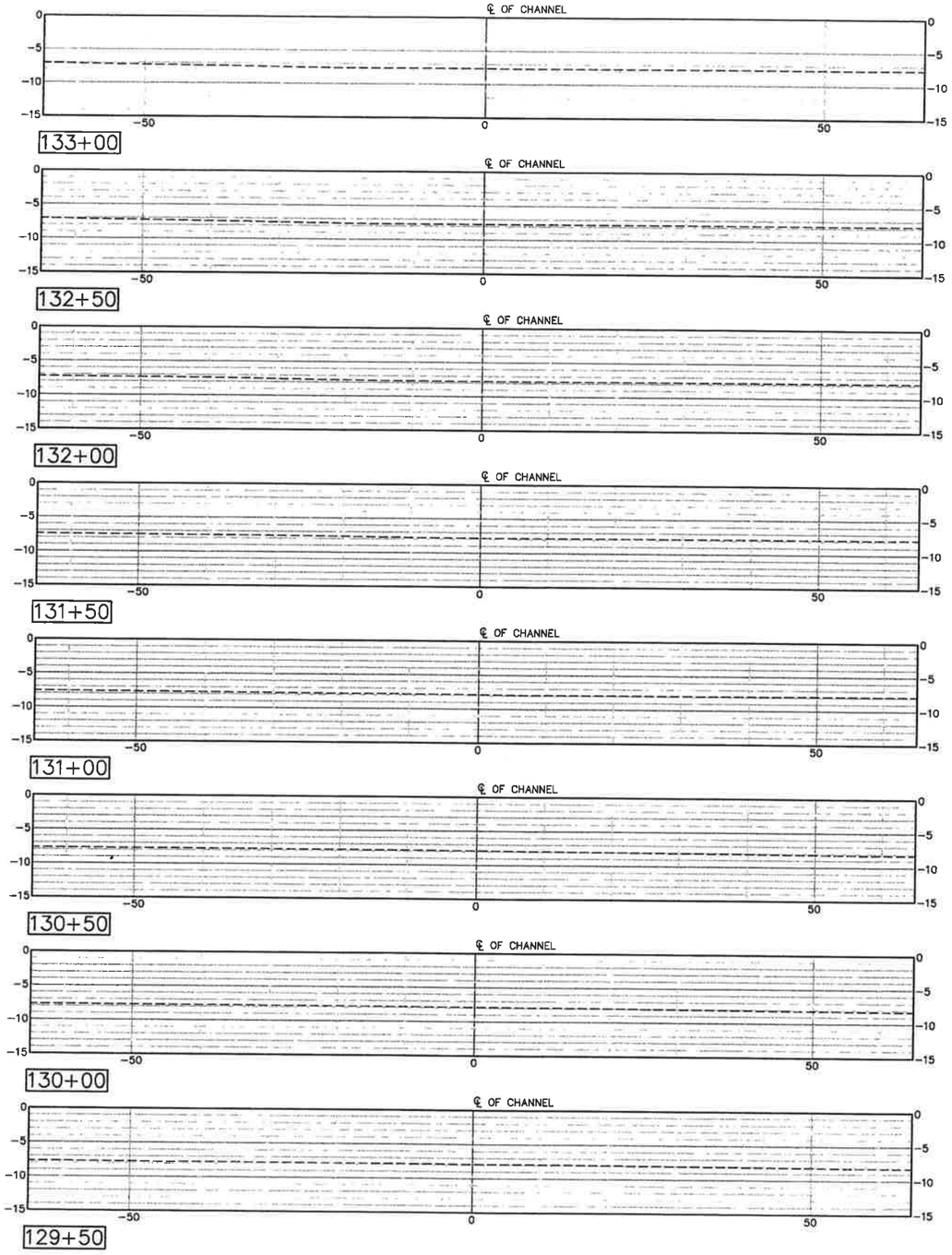

NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP-WQ-WE-409/18 NOV 13 2018
DATE 11/28/18
(SEE PERMIT CONDITIONS)

10' 0' 10' 20'

SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 20 OF 21

Designed by: DSCN
Drawn by: DRFT
Checked by: CHKR
Reviewed by: REVR
Submitted by: MOFFATT & NICHOL

Date: DATE
Rev. REVNO
M&N Project No. 10248
Drawing code:
Drawing Scale:
Plot scale: 1:1 (D SHEET)

2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-553-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-321
INDEX: 31 OF 38

File: G:\EA\10248 DNREC NAT\7007\10248-01 M-D Dredge\1500 CADD_ACTIVE_Massey's Ditch (sheets)\10248101C-321; Plotted: 10/31/2018 12:32 PM by RIDOUANE; HICHAM; Saved: 10/31/2018 10:43 AM by HRIDOUANE

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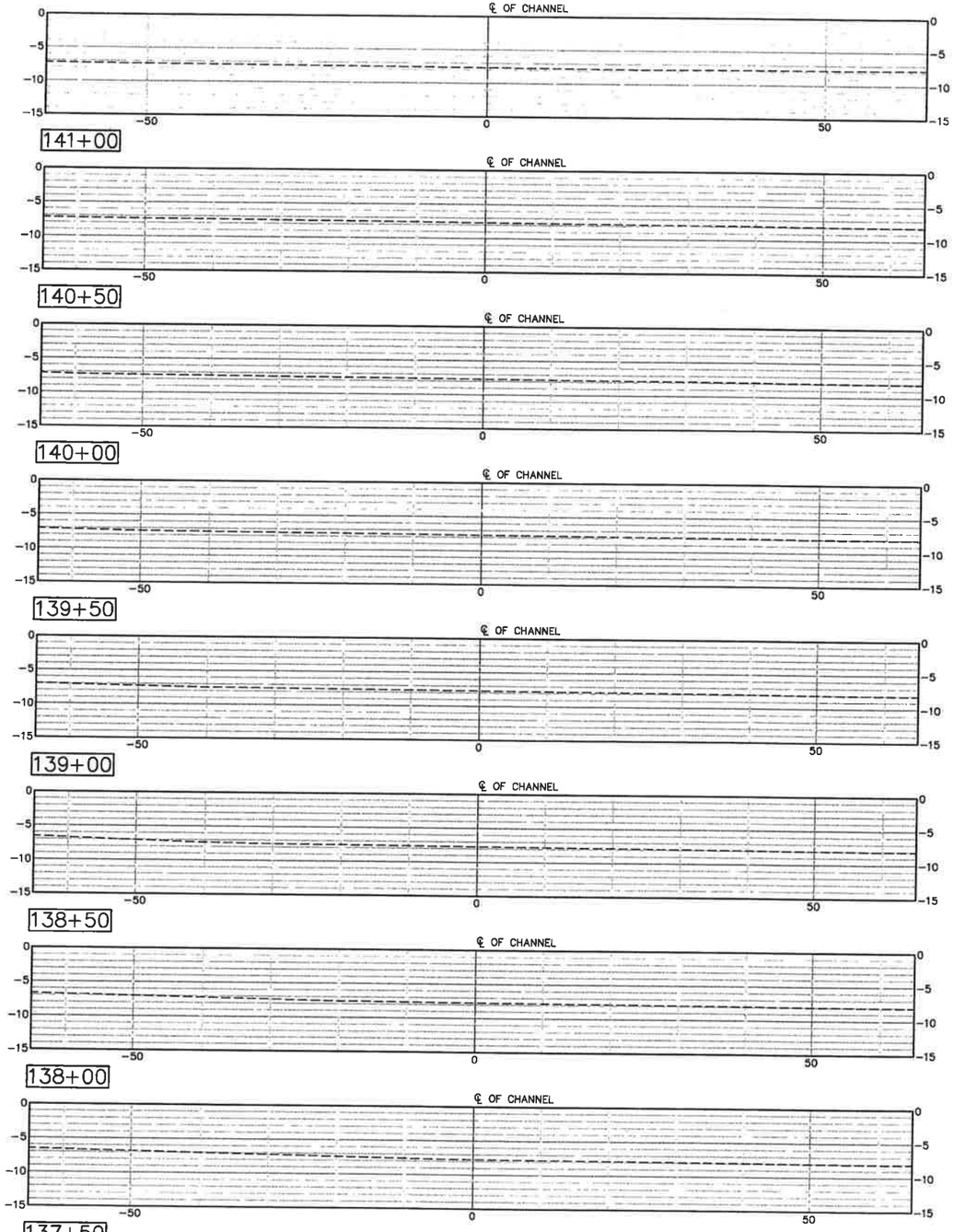

NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP-WQ-WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

10' 0' 10' 20'

SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING - SHEET 21 OF 21

Date: DATE	Rev: REVNO		
Designed by: DSGN	Dwn by: DRFT	Chd by: CHKR	M&N Project No. 10248
Reviewed by: REVR	Drawing code:		
Submitted by: MOFFATT & NICHOL	Drawing Scale:		Plot scale: 1:1 (@ SHEET)

2780 LIGHTHOUSE POINT EAST, STE. 10
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-322
INDEX: 32 OF 38

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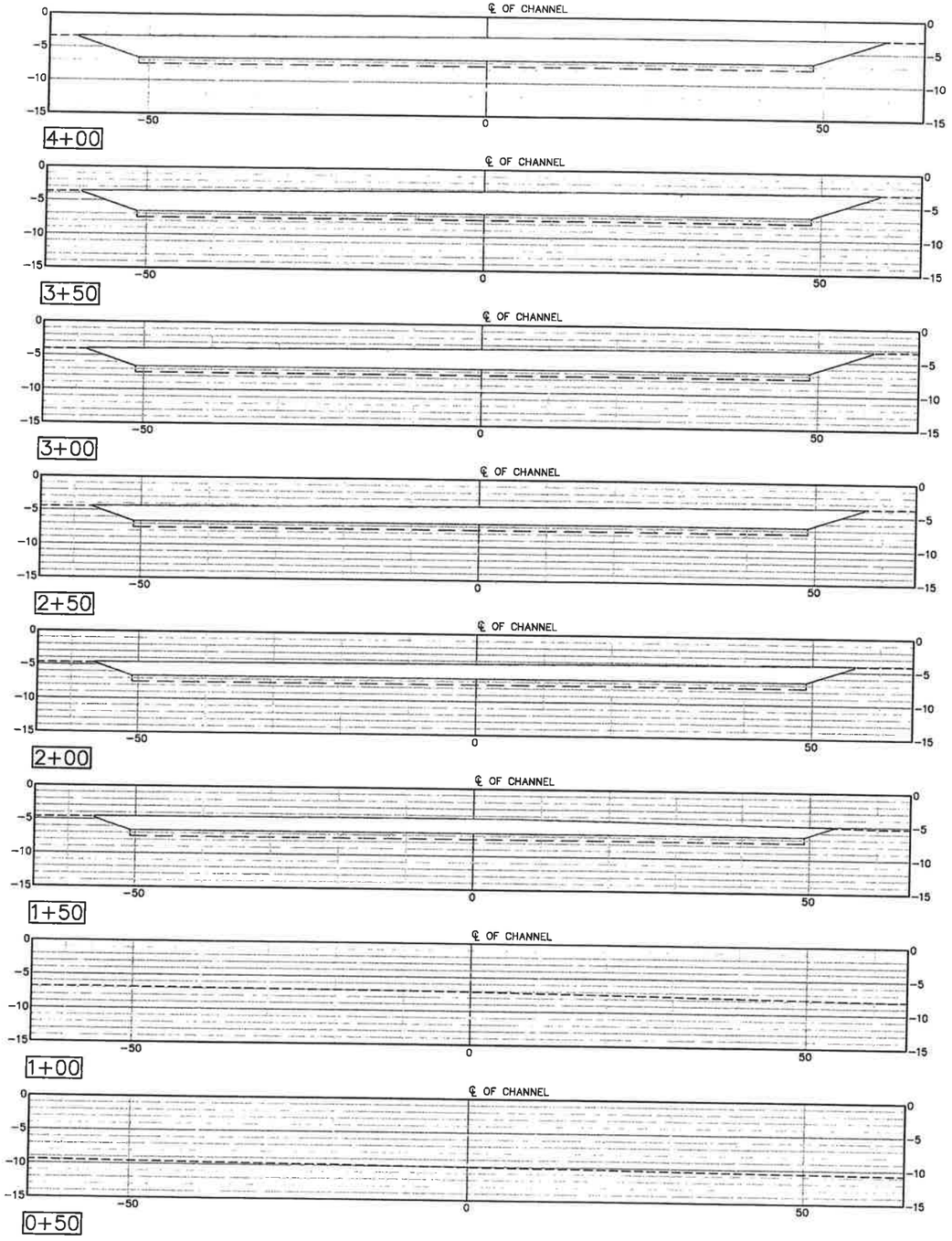
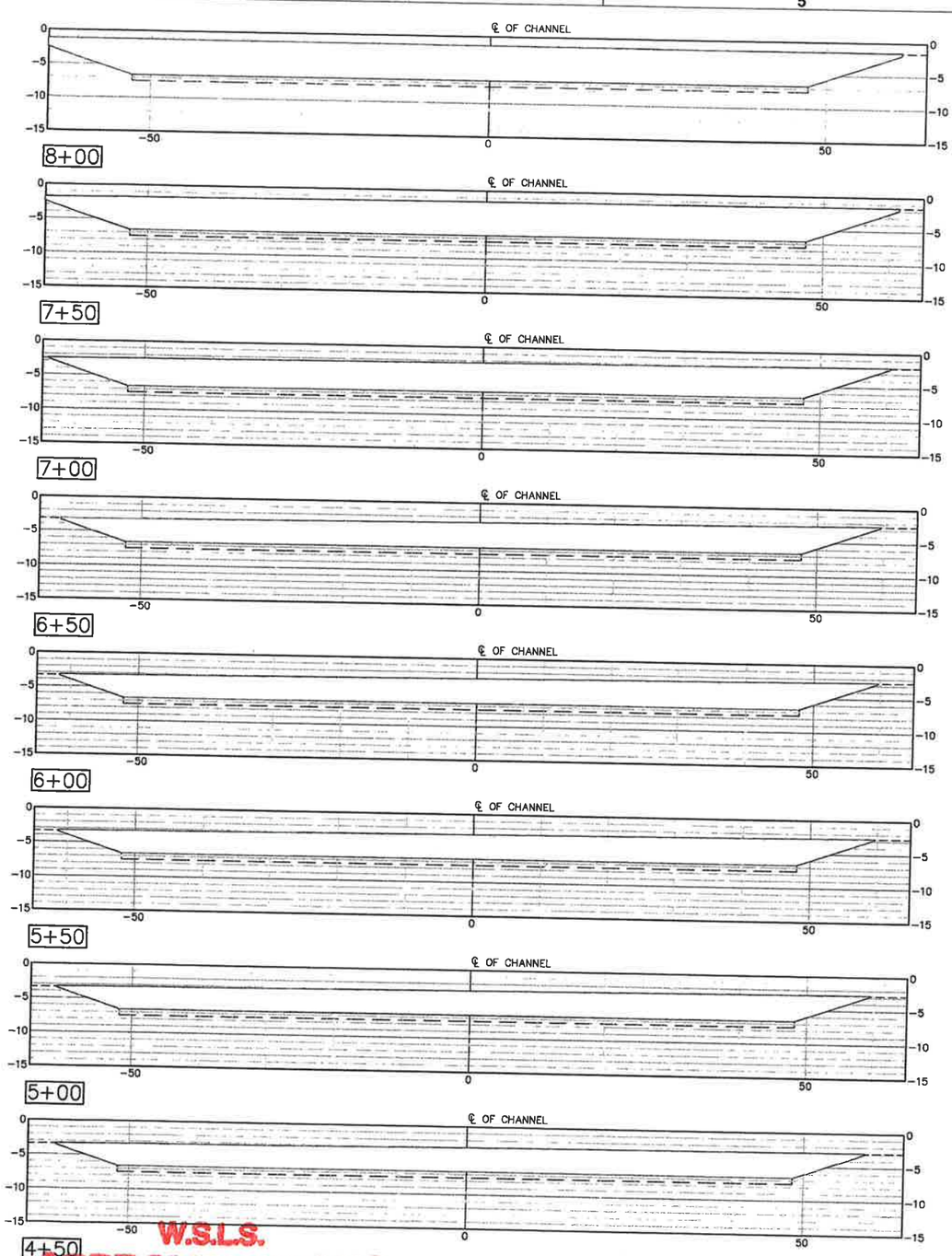




NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING EAST
STA 110+50 0+00 - SHEET 1
OF 2

Date: DATE	Rev. REVNO		
Designed by: DSGN	Det by: CHKR	M&N Project No. 10248	
Dwn by: DRFT	Reviewed by: REVR	Drawing code:	
	Submitted by: MOFFATT & NICHOL	Drawing Scale:	
		Plot scale: 1:1 (D SHEET)	

2780 LIGHTHOUSE POINT EAST, SUITE 400
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

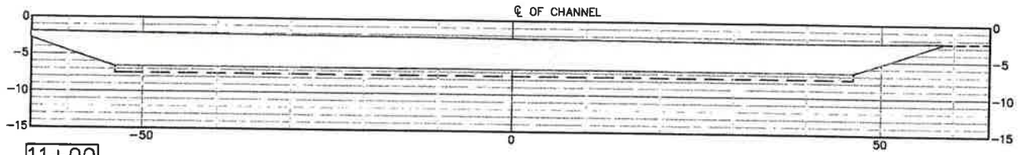
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

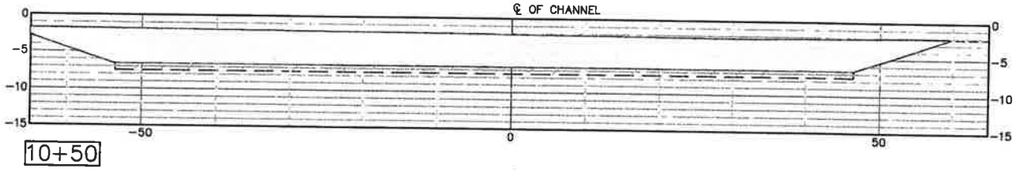
Sheet Reference No.
C-323
INDEX: 33 OF 38

File: Q:\BA\10248 DNREC NAT\7002\10248-01 4-D Dredge\300 CADD_ACTIVE_Massey's Ditch (Sheets)\10248011C-323; Plotted: 10/31/2018 12:34 PM by RIDOUANE, MICHAM; Saved: 10/31/2018 11:12 AM by RIDOUANE

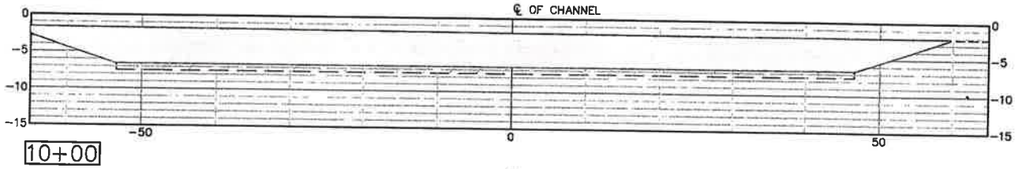
DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



11+00

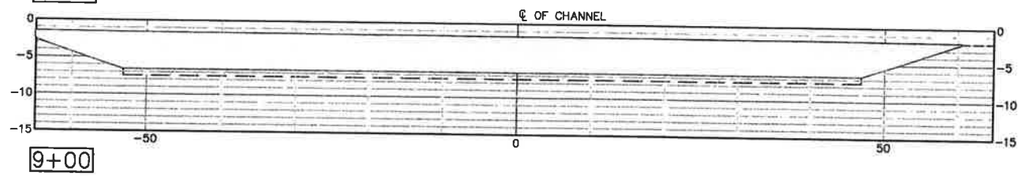


10+50

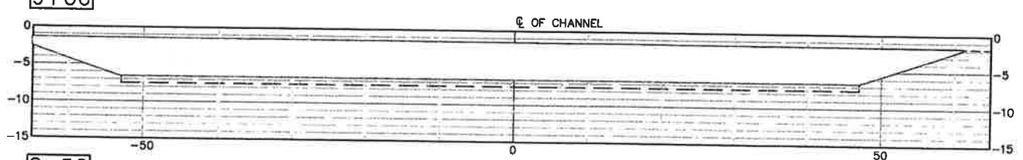


10+00

9+50



9+00



8+50

NOTES:

1. FOR LEGEND, ABBREVIATION, AND GENERAL NOTES SEE SHEET G-002.
2. FOR MAINTENANCE CHANNEL DREDGING PLANS, SEE SHEETS C-101 TO C-106.

LEGEND

DREDGE DEPTH -6.5

OVER DREDGE -7.5

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18 NOV 13 2018
DATE 11/28/18
(SEE PERMIT CONDITIONS)

10' 0' 10' 20'
SCALE: 1"=10'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

SECTION - DREDGING EAST
STA 110+50 0+00 - SHEET 2
OF 2

Date: DATE	M&N Project No. 10248	Drawing Code:	Rev. REVMD
Designed by: DSGN	Cad by: CHKR	Drawing Scale:	
Drawn by: DRFT	Reviewed by: REVR	Submitted by:	Plot scale: 1:1 (0 SHEET)

2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

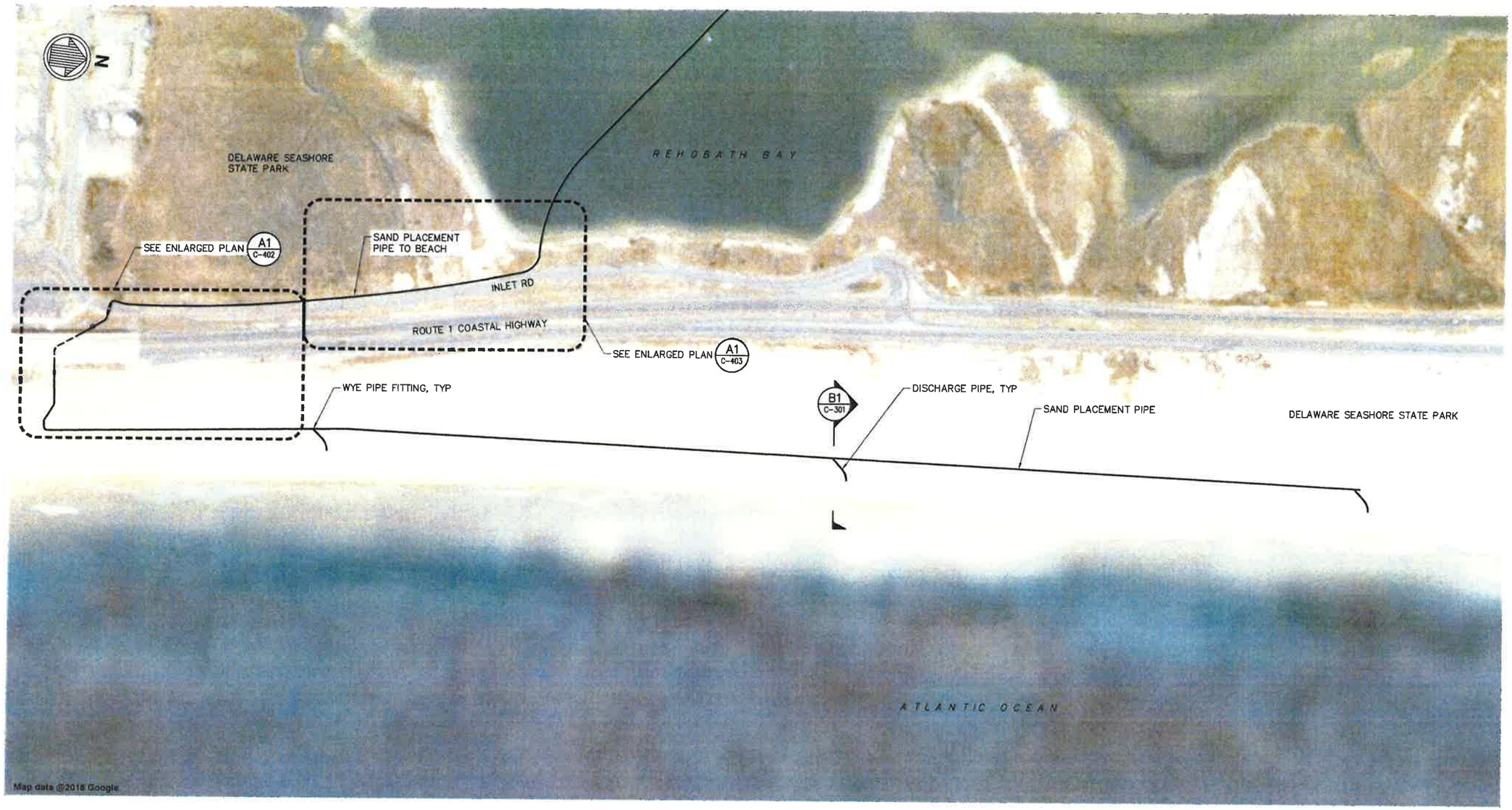
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

MOFFATT & NICHOL

SEAL

Sheet Reference No.
C-324
INDEX: 34 OF 38

File: G:\BA\10248 DNREC NAT\700?\10248-01 M-D Dredge\500 CADD_ACTIVE_Massey's Ditch (Sheets)\10248101C-324; Plotted: 10/31/2018 12:14 PM by RIDOUANE, HICHAM; Saved: 10/31/2018 11:12 AM by RIDOUANE



A1 C-401 ENLARGED PLAN – SAND PLACEMENT DISCHARGE PIPING LAYOUT
SCALE: 1" = 160'

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

160' 0' 160' 320'
SCALE: 1"=160'

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

ENLARGED PLAN - SAND PLACEMENT DISCHARGE PIPING LAYOUT

Designed by: DSGN	Date: DATE	Rev. REVNO	
Dwn by: DRFT	Ckd by: CHKR	M&N Project No. 10248	
Reviewed by: REVR		Drawing code:	
Submitted by: MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (B SHEET)	

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, SUITE C
BALTIMORE, MD 21224
410-563-7300

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-401
INDEX: 35 OF 38

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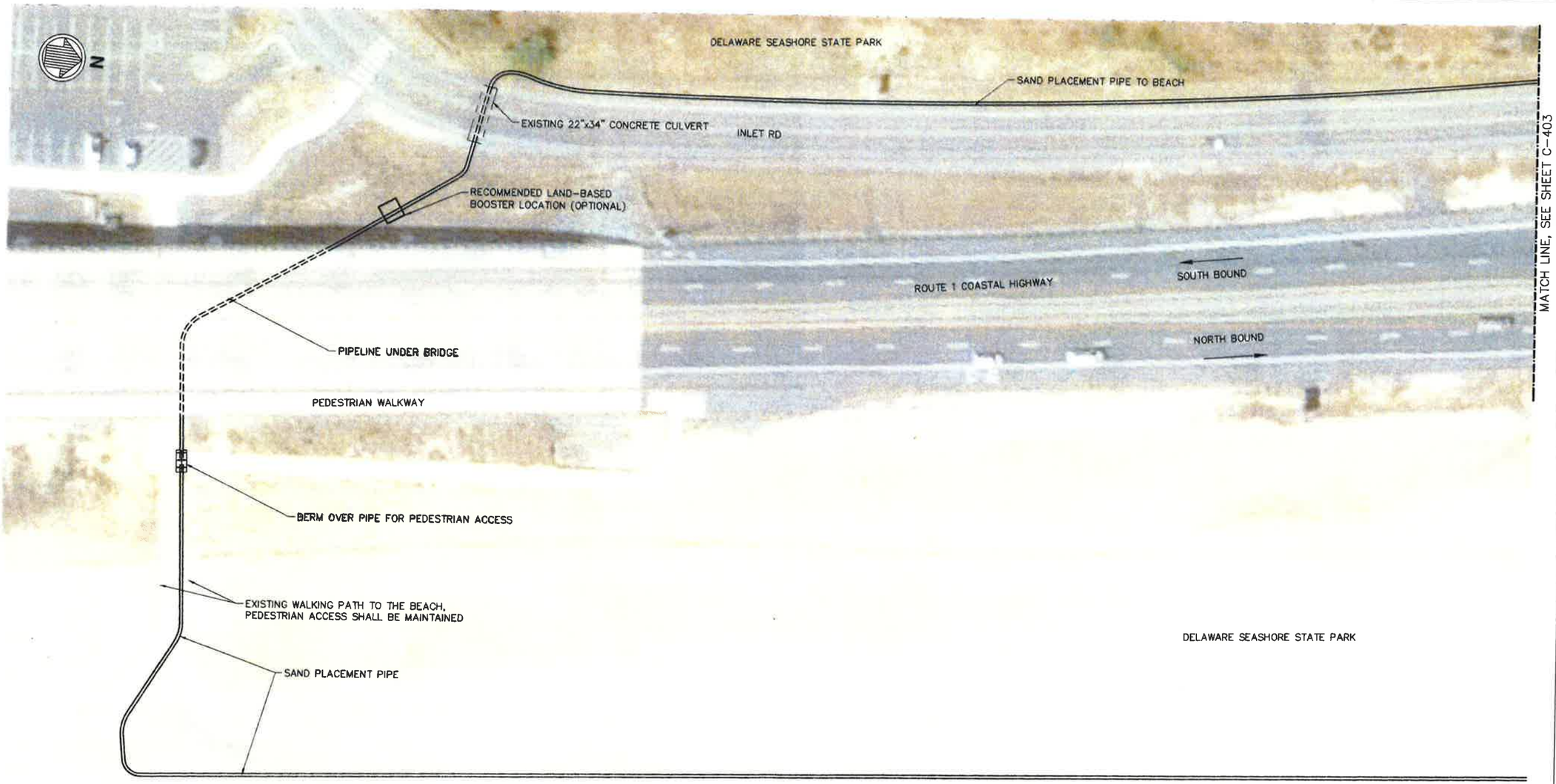

A1 / C-402 ENLARGED PLAN – INLET ROAD UNDER BRIDGE PIPELINE LAYOUT
SCALE: 1" = 30'

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

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

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

ENLARGED PLAN - INLET ROAD
UNDER BRIDGE PIPELINE LAYOUT

Rev. REVNO | Date: DATE | M&M Project No. 10248 | Drawing code: | Drawing Scale: | Plot scale: 1:1 (0 SHEET)
Designed by: DSGN | Chkd by: CHKR | Dwn by: DRFT | Reviewed by: REVR | Submitted by: MOFFATT & NICHOL

2780 LIGHTHOUSE POINT EAST, SUITE 1
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

SEAL

Sheet Reference No.
C-402
INDEX: 36 OF 38

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MATCH LINE, SEE SHEET C-402

A1 C-403 ENLARGED PLAN – BAY CROSSING INLET ROAD PIPELINE LAYOUT
SCALE: 1" = 30'

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/28/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

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

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINETENANCE DREDGING
SUSSEX COUNTY, DELAWARE

ENLARGED PLAN - BAY CROSSING INLET ROAD PIPELINE LAYOUT

Designed by: DSGN	Date: DATE	Rev: REVNO	
Dwn. by: DRFT	Ckd. by: CHKR	M&N Project No. 10248	
Reviewed by: REVR		Drawing code:	
Submitted by: MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (0 SHEET)	

2780 LIGHTHOUSE POINT EAST,
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
C-403
INDEX: 37 OF 38

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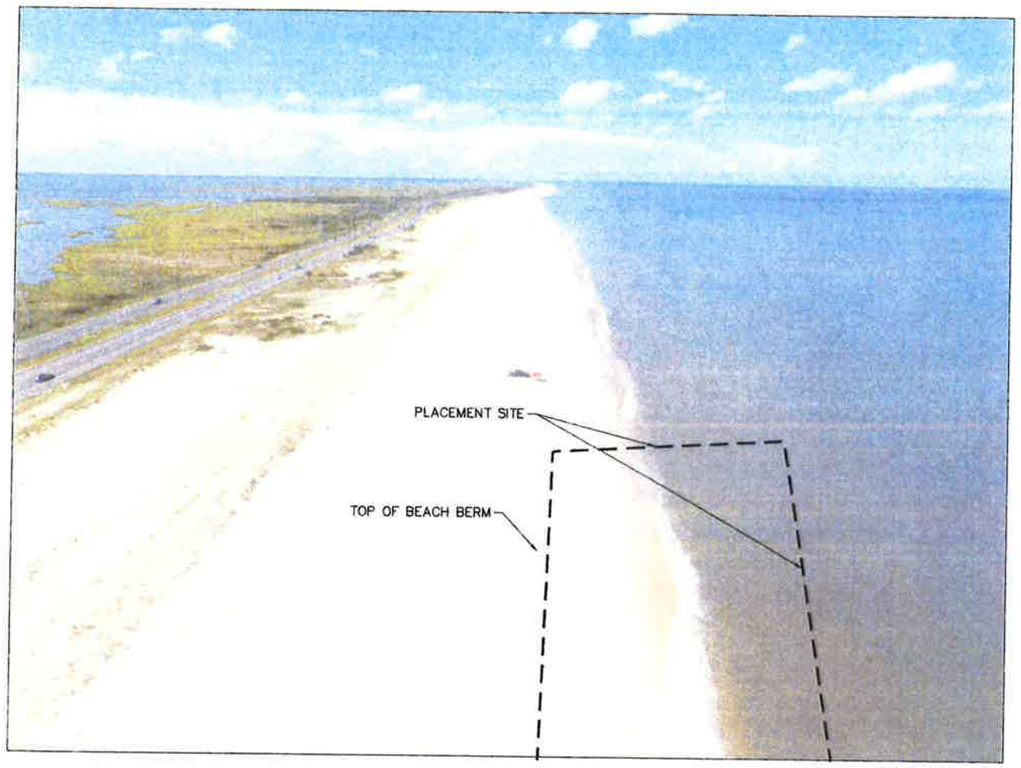
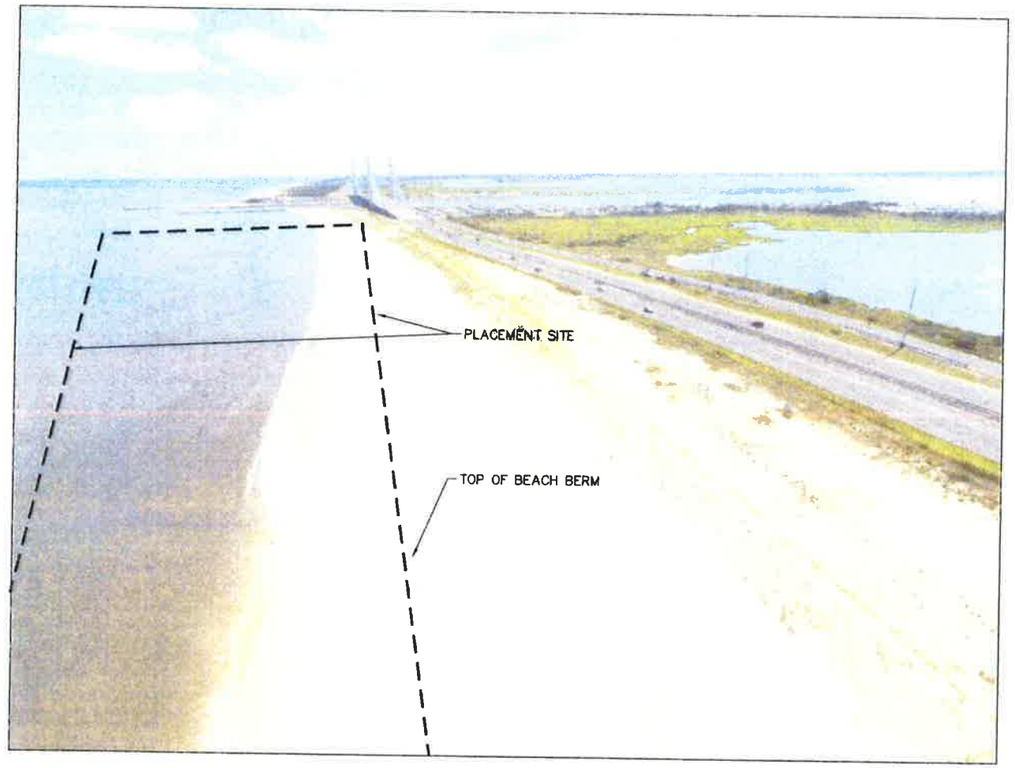


B1 R-001 BENEFICIAL USE PLACEMENT AREA – LOOKING NORTH
SCALE: NTS



B3 R-001 BENEFICIAL USE PLACEMENT AREA – LOOKING SOUTH
SCALE: NTS

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18
DATE 11/29/18
(SEE PERMIT CONDITIONS)

NOV 13 2018

95% SUBMITTAL
OCTOBER 2018
NOT TO BE USED FOR CONSTRUCTION

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

No.	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

BEACH NOURISHMENT PLACEMENT SITE

Date: OCT 2018 | Rev.
M&N Project No. 10248
Drawing code:
Drawing Scale:
Plot scale: 1:1 (@ SHEET)

Designed by: PWK
Drawn by: HR
Cad by: PGV
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL

2760 LIGHTHOUSE POINT EAST, SUITE 400
BALTIMORE, MD 21224
410-563-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

SEAL

Sheet Reference No.
R-001
INDEX: 38 OF 38

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STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES &
ENVIRONMENTAL CONTROL
DIVISION OF WATER
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

WETLANDS & SUBAQUEOUS
LANDS SECTION

TELEPHONE (302) 739-9943
FAX (302) 739-6304

March 26, 2019

DNREC, Division of Watershed Stewardship
c/o: Terry L. Deputy
89 Kings Highway
Dover, DE 19901

Moffatt & Nichol
c/o Peter Kotulak
2780 Lighthouse Point, Suite D
Baltimore, MD 21224

Subaqueous Lands Permit: SP-409/18
Water Quality Certification: WQ -409/18
Wetlands Permit: WE-409/18
Original Date of Issuance: November 28, 2018
Issuance of Addendum: March 26, 2019

RE: SP-409/18; WQ-409/18; WE-409/18: Addendum to the Subaqueous Lands Permit, Water Quality Certification and Wetlands Permit issued to DNREC, Division of Watershed Stewardship on November 28, 2018 - this addendum allows for an alternate pipeline location and increased footprint for beach nourishment.

Dear Mr. Deputy and Mr. Kotulak,

This letter is to serve as an addendum to the above-referenced Subaqueous Lands Permit, Water Quality Certification and Wetlands Permit. DNREC, Division of Watershed Stewardship has requested to add an alternate pipeline location along the southerly edge of the Burton Island Nature Preserve and continue eastward to the disposal location. In addition, the placement site of the dredged material for beach nourishment is requested to extend 800 feet south toward the Inlet.

By this letter, the Wetlands and Subaqueous Lands Section authorizes the alternate pipeline location and the extended placement site along a total of 4,800 linear feet of the Atlantic Ocean beach for beach nourishment. The approved activity for the additional pipeline location allows for either the original pipeline location or the alternate location to be utilized for temporary placement during construction activities. However, the alternate pipeline location will eliminate impacts to State-regulated wetlands.

Therefore, the Wetlands and Subaqueous Lands Section hereby voids Sheet Reference No. G-101, C-401, C-402 and C-403 dated October 2018 of the previously approved plans.
Permission is hereby granted in accordance with the approved plans labeled Sheet Reference No. G-101, C-401, C-402, C-403 and C-404 dated May 2019 (5 sheets) as approved on March 26,

2019 and shall be incorporated with the previously approved Subaqueous Lands Permit, Water Quality Certification and Wetlands Permit.

The following special conditions shall be added to and be made a part-of SP; WQ; and WE-409/18:

1. The alternate pipeline location shall be placed channelward of the mean low water line in subaqueous lands. No portion of the alternate pipeline location shall be placed on vegetated areas along the Burton Island Nature Preserve. The applicant shall coordinate with the Division of Parks and Recreation on the placement of the alternate pipeline; the submerged pipeline shall not affect the ingress and egress of vessels utilizing the Indian River Marina and the associated Public boat ramp.

2. A portion of the alternate pipeline location shall be submerged as depicted on plan Sheet Reference No. G-101 dated May 2019.

Special Condition no. 7 of SP; WQ and WE-409/18 shall be voided and replaced with the following:

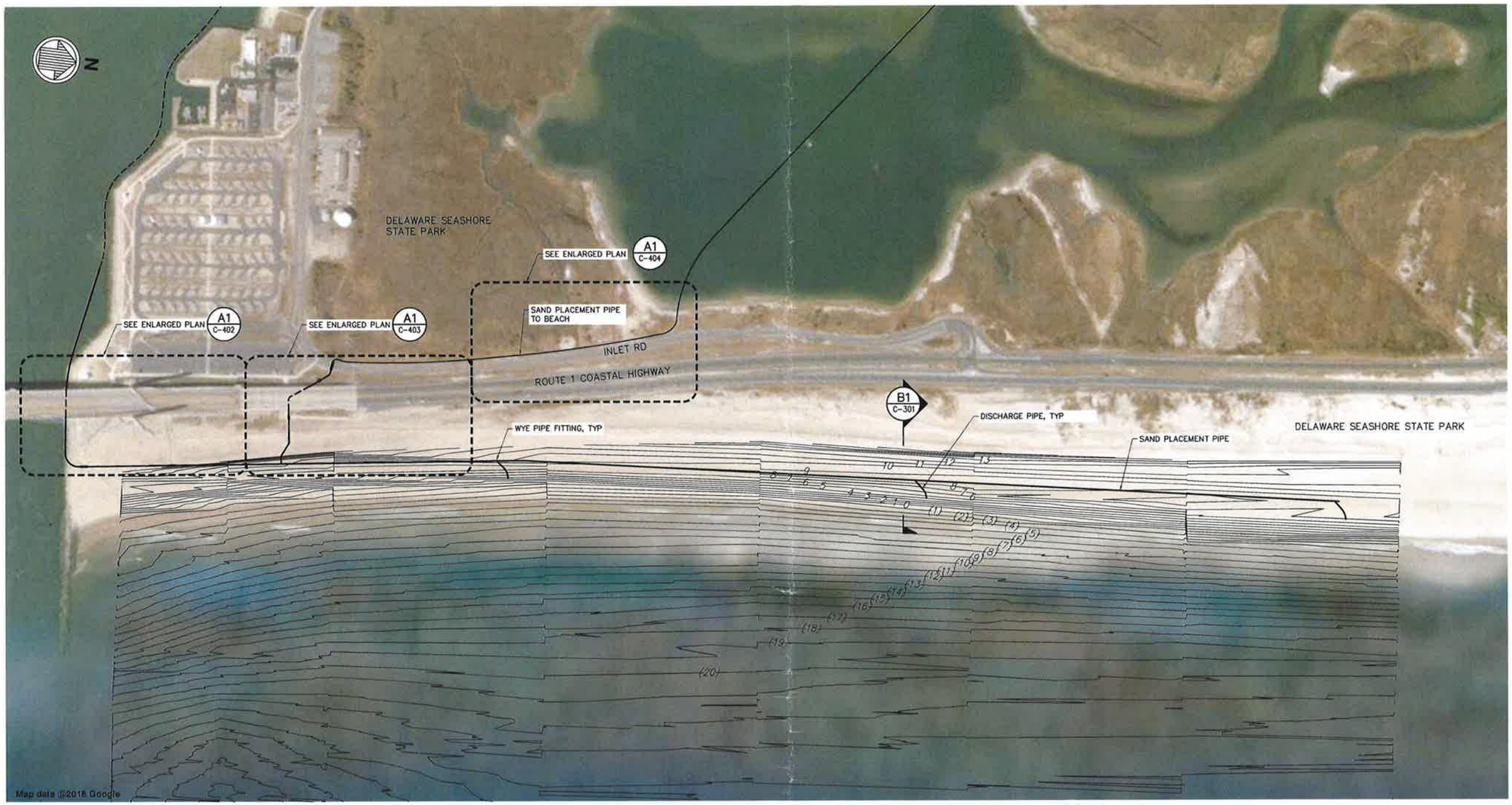
7. All dredged material shall be utilized for beach nourishment placed along 4,800 linear feet of Atlantic Ocean beach, located on tax parcel # 3-34-25.00-11.00 and north of the Indian River Inlet, Delaware Seashore State Park, Rehoboth Beach, Delaware. Any further handling (including, but not limited to permanent capping or burial, transportation, removal of the sediment or re-grading) requires prior notification to the Department. Additional authorization may be required at that time depending upon the proposed use.

All other terms and conditions of SP; WQ; and WE-409/18 shall remain in full force and effect. This Addendum does not authorize any future additions or modifications to the activities authorized herein. Such activities require separate written authorization from the Department of Natural Resources and Environmental Control. Coordination with this office prior to undertaking any future maintenance activities within subaqueous lands is required.

A copy of this letter, the approved plans, and the approved Subaqueous Lands Permit, Water Quality Certification and Wetlands Permit must be available on-site at all times during construction. This authorization may be revoked upon violation of any of the permit conditions.

Sincerely,

Tyler Brown
Section Manager
Wetlands & Subaqueous Lands Section



A1 C-401 ENLARGED PLAN – SAND PLACEMENT DISCHARGE PIPING LAYOUT
SCALE: 1" = 200'

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18 Addendum
DATE 3/26/19
(SEE PERMIT CONDITIONS)

160' 0' 160' 320'
SCALE: 1"=160'

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

No.	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

ENLARGED PLAN - SAND PLACEMENT DISCHARGE PIPING LAYOUT

Designed by: PWK	Det by: PWK	Date: MAY 01, 2019	Rev. REVNO
Dwn by: HR		M&N Project No. 10248	
Reviewed by: -		Drawing code:	
Submitted by: MOFFATT & NICHOL		Drawing Scale: Plot scale: 1=1 (D SHEET)	

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD. 21224
410-563-7500

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

PETER WILLIAM KOTULAK LICENSE No. 18765 PROFESSIONAL ENGINEER DELAWARE
SEAL

Sheet Reference No.
C-401
INDEX: 36 OF 40

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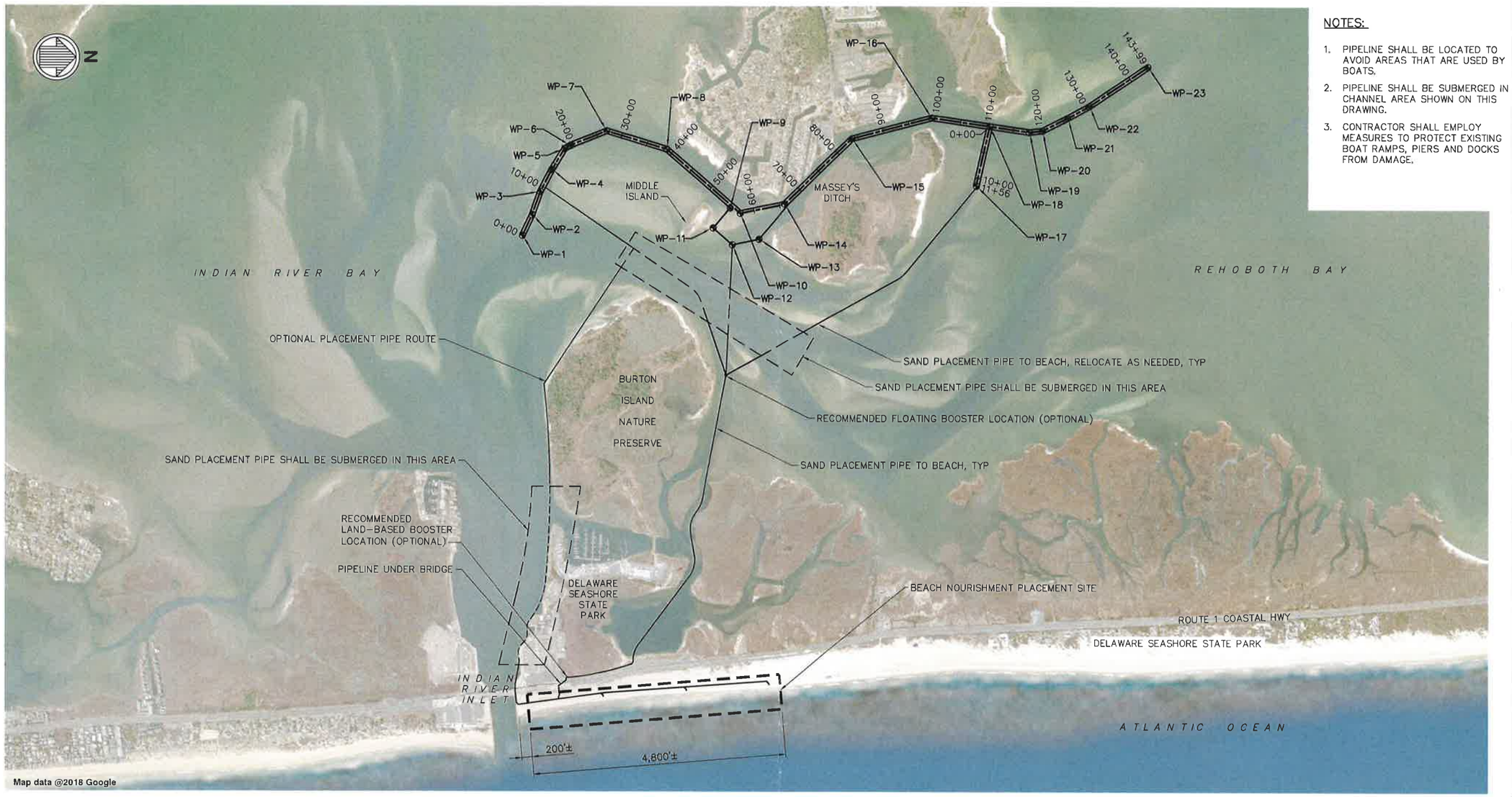

NOTES:

1. PIPELINE SHALL BE LOCATED TO AVOID AREAS THAT ARE USED BY BOATS.
2. PIPELINE SHALL BE SUBMERGED IN CHANNEL AREA SHOWN ON THIS DRAWING.
3. CONTRACTOR SHALL EMPLOY MEASURES TO PROTECT EXISTING BOAT RAMPS, PIERS AND DOCKS FROM DAMAGE.

CHANNEL CENTERLINE COORDINATES			
POINT NO	STATION	NORTHING	EASTING
WP-1	0+00.00	222003.98	748381.00
WP-2	4+29.31	222190.35	747994.26
WP-3	8+97.05	222348.43	747554.04
WP-4	13+62.92	222565.39	747141.77
WP-5	18+30.66	222806.61	746741.03
WP-6	19+60.79	222920.32	746677.75
WP-7	27+00.22	223606.00	746401.00
WP-8	38+83.91	224738.00	746747.00
WP-9	55+22.72	225946.76	747854.74
WP-10	57+37.37	226142.00	747957.00

CHANNEL CENTERLINE COORDINATES			
POINT NO	STATION	NORTHING	EASTING
WP-11	55+22.72	225620.34	748233.49
WP-12	57+37.37	225988.43	748550.72
WP-13	59+82.11	226493.63	748445.62
WP-14	66+01.49	226988.00	747781.00
WP-15	83+83.62	228268.00	746541.00
WP-16	99+42.50	229776.00	746146.00
WP-17	11+54.41	230618.66	747433.11
WP-18	110+50.32	230872.18	746306.24
WP-19	118+09.13	231623.00	746416.00
WP-20	120+54.63	231866.96	746388.52

CHANNEL CENTERLINE COORDINATES			
POINT NO	STATION	NORTHING	EASTING
WP-21	125+91.65	232347.55	746148.90
WP-22	130+58.61	232757.97	745926.15
WP-23	143+98.88	233870.62	745178.94

A1 / G-101 PLAN – GENERAL ARRANGEMENT
SCALE: 1" = 1000'

W.S.L.S.
APPROVED PLANS
PERMIT # SP; WQ; WE-409/18 Addendum
DATE 3/26/19
(SEE PERMIT CONDITIONS)

1000' 0' 1000' 2000'
SCALE: 1"=1000'

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DEPARTMENT OF NATIONAL RESOURCES AND ENVIRONMENTAL CONTROL

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

PLAN - GENERAL ARRANGEMENT

Rev.	Date	Description
-	MAY 01, 2019	

Designed by: PWK
Drawn by: HR
Checked by: PCV
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL
Drawing Scale: Plot scale: 1:1 (D SHEET)
M&N Project No. 10248
Drawing code:

2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-565-7360

moffatt & nichol

PETER WILLIAM KOTULAK
LICENSE
No. 18765
DELAWARE
PROFESSIONAL ENGINEER
5/6/19
SEAL

Sheet Reference No.
G-101
INDEX: 3 OF 40

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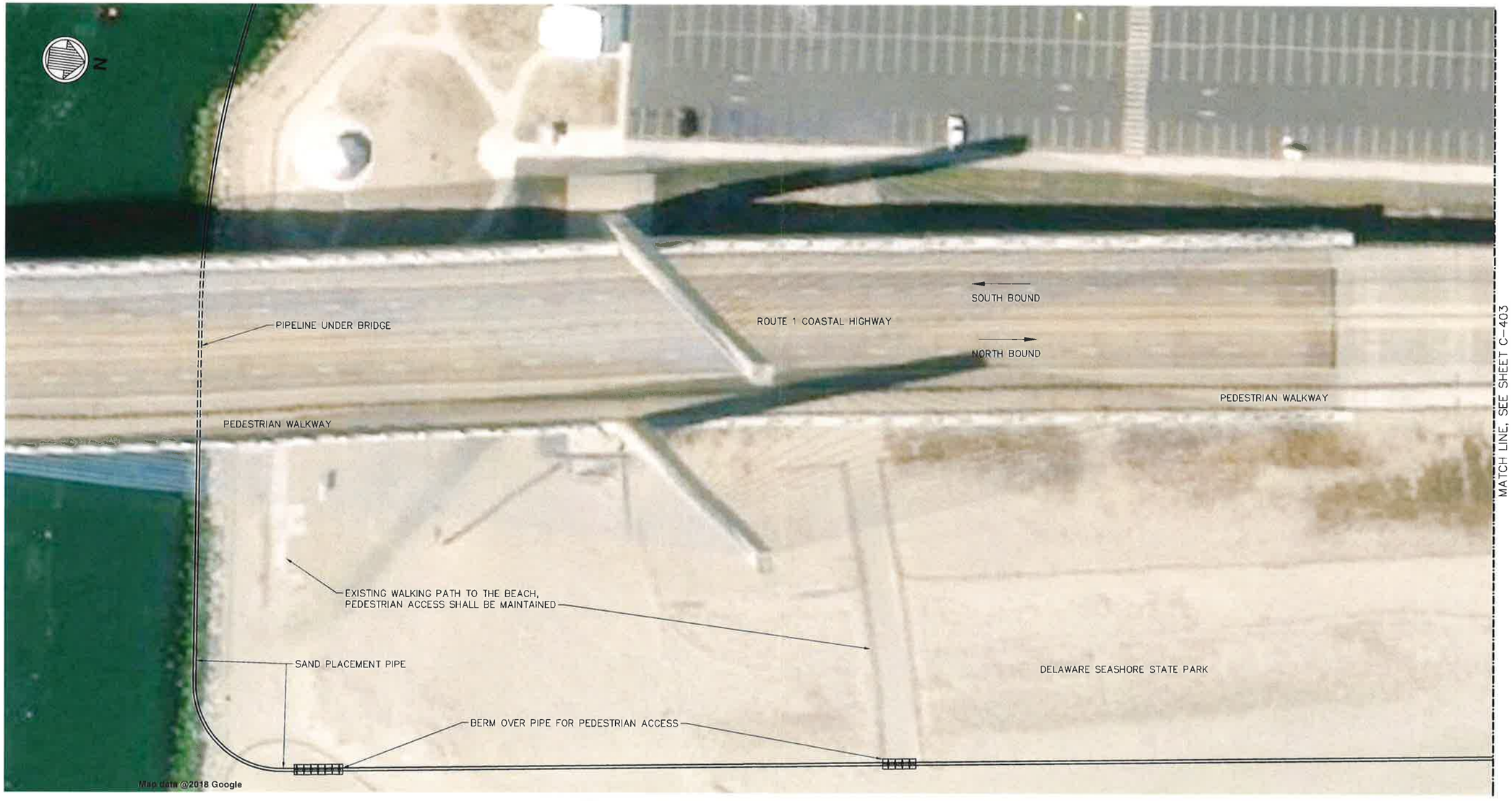

A1 / C-402 ENLARGED PLAN – INLET ROAD UNDER BRIDGE PIPELINE LAYOUT 1 OF 2
SCALE: 1" = 30'

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18 Addendum
DATE 3/26/19
(SEE PERMIT CONDITIONS)

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

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

Mark	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

ENLARGED PLAN - INLET ROAD
UNDER BRIDGE PIPELINE LAYOUT
1 OF 2

Date: MAY 01, 2019
Rev: REVNO
M&N Project No. 10248
Drawing code:
Drawing Scale:
Plot scale: 1:1 (D SHEET)
Designed by: PWK
Drawn by: HR
Cad by: PCV
Reviewed by: -
Submitted by: MOFFATT & NICHOL

2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD. 21224
410-282-7000
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

PROFESSIONAL ENGINEER
PETER WILLIAM KOTULAK
LICENSE
No. 18765
DELAWARE
4/18/19
SEAL

Sheet Reference No.
C-402
INDEX: 37 OF 40

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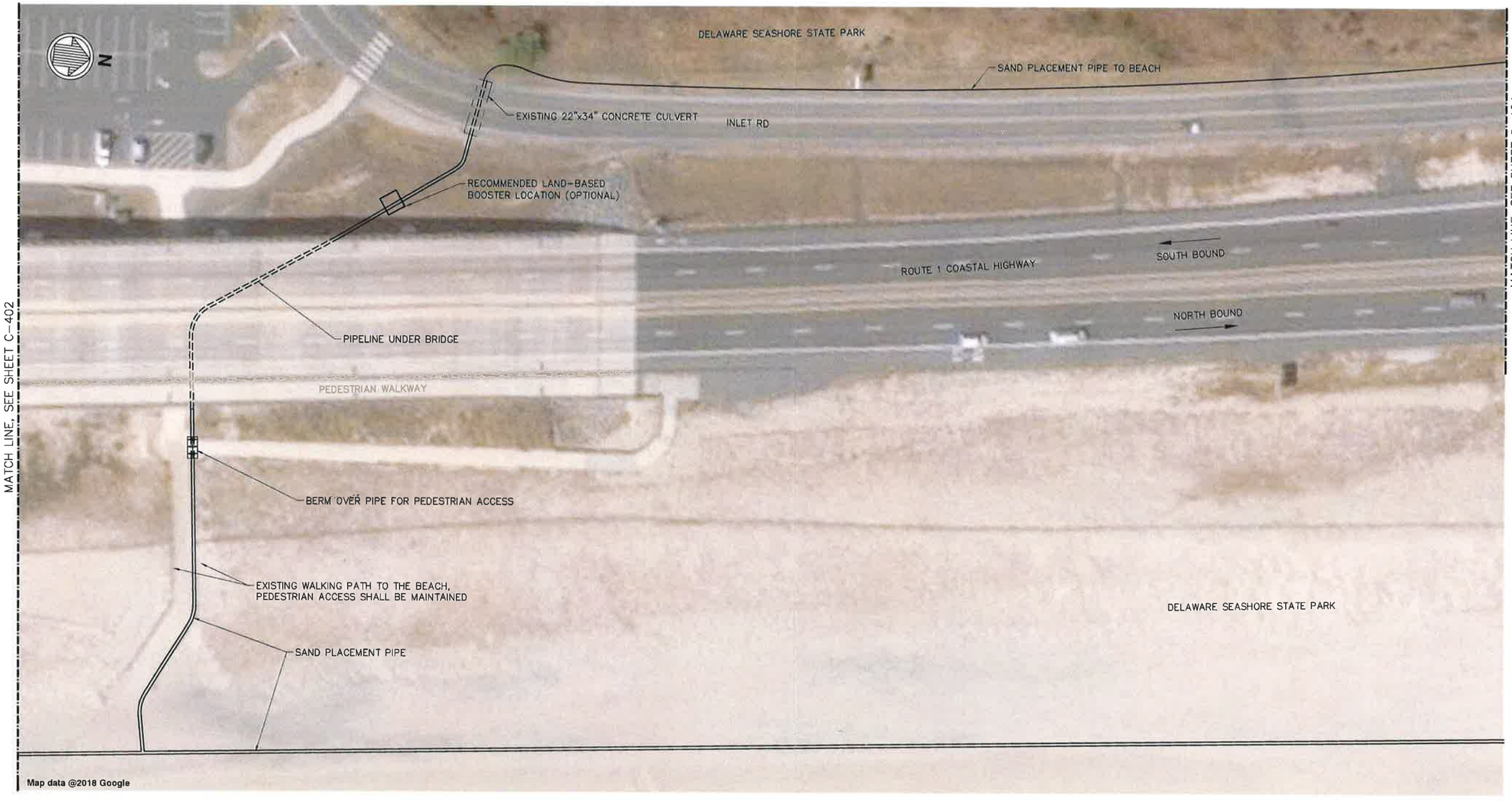

MATCH LINE, SEE SHEET C-402

MATCH LINE, SEE SHEET C-404

A1 / C-403 ENLARGED PLAN – INLET ROAD UNDER BRIDGE PIPELINE LAYOUT 2 OF 2
SCALE: 1" = 30'

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18 Addendum
DATE 3/26/19
(SEE PERMIT CONDITIONS)

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

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

No.	Description	Date	Appr.
Mrks.			

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

ENLARGED PLAN - INLET ROAD UNDER BRIDGE PIPELINE LAYOUT 2 OF 2

Designed by: PWK
Drawn by: HR
Cad by: PGV
Reviewed by: PWK
Submitted by: MOFFATT & NICHOL
Date: MAY 01, 2019
M&N Project No. 10248
Drawing date:
Drawing Scale:
Plot scale: 1:1 (D SHEET)
Rev. 1

moffatt & nichol
2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-284-1302

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

ROBERT PETER WILLIAM KOTULA LICENSE No. 18765 DELAWARE ENGINEER
5/13/19
SEAL

Sheet Reference No.
C-403
INDEX: 38 OF 40

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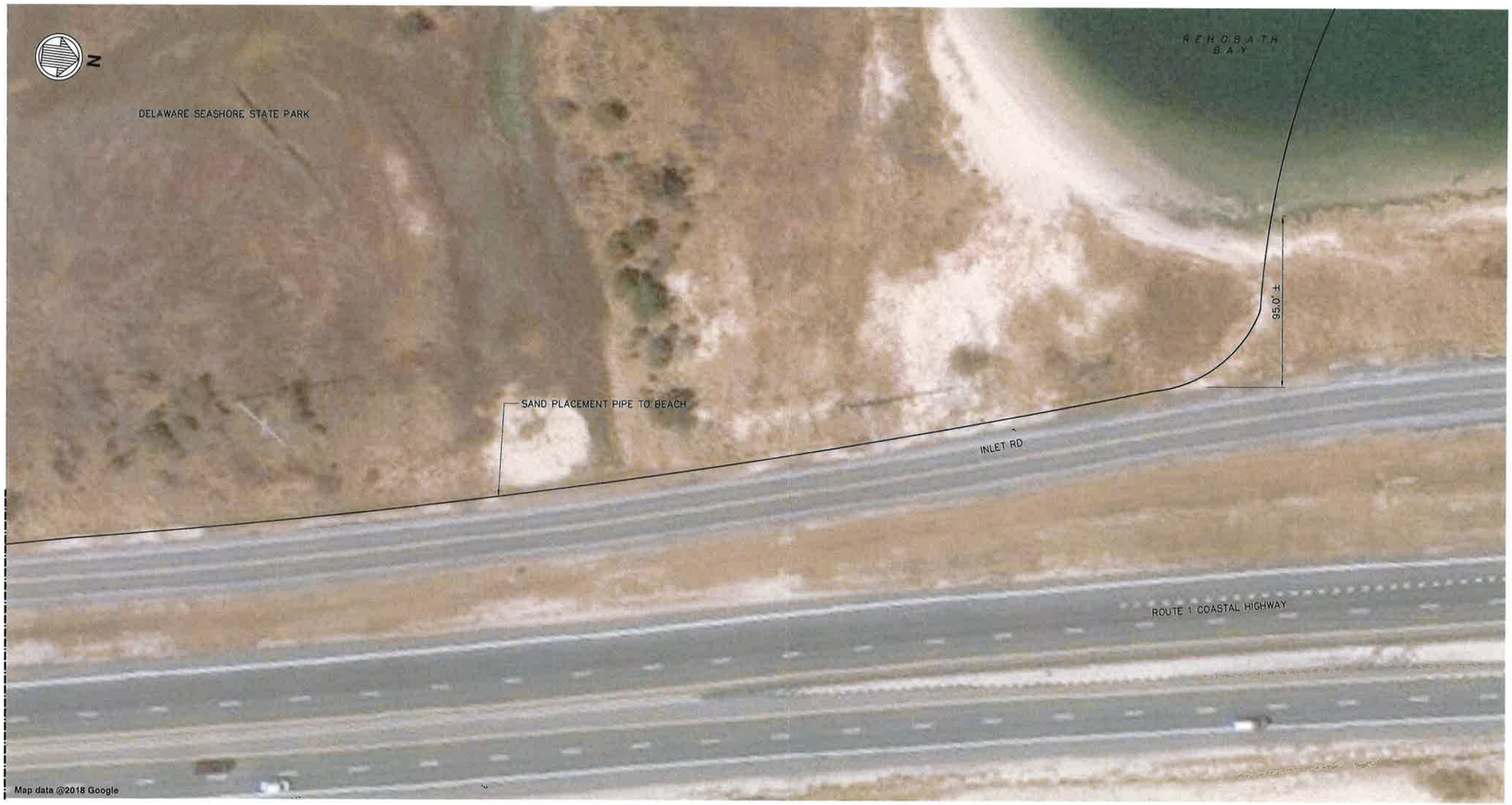

MATCH LINE, SEE SHEET C-403

A1 / C-404 ENLARGED PLAN – BAY CROSSING INLET ROAD PIPELINE LAYOUT
SCALE: 1" = 30'

W.S.L.S.
APPROVED PLANS
PERMIT # SP;WQ;WE-409/18 Addendum
DATE 3/26/19
(SEE PERMIT CONDITIONS)

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

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

No.	Description	Date	Appr.

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

ENLARGED PLAN - BAY CROSSING
INLET ROAD PIPELINE LAYOUT

Designed by: PWK	Det by: HR	Rev: 1	
	Cad by: PWK	Date: MAY 01, 2019	M&N Project No. 10248
Reviewed by: PGV		Drawing code:	
Submitted by: MOFFATT & NICHOL		Drawing Scale: Plot scale: 1:1 (D SHEET)	

2780 LIGHTHOUSE POINT EAST, STE. D
BALTIMORE, MD 21224
410-282-7300
moffatt & nichol

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

PROFESSIONAL ENGINEER PETER WILLIAM KOTULAK LICENSE No. 18765 DELAWARE
5/15/19
SEAL

Sheet Reference No.
C-404
INDEX: 39 OF 40

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STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL
DIVISION OF CLIMATE, COASTAL, & ENERGY

DELAWARE COASTAL MANAGEMENT PROGRAM

100 W. WATER STREET, SUITE 7B
DOVER, DELAWARE 19904

Phone: (302) 739- 9283
http://de.gov/coastal

December 5, 2018

Charles Williams
DNREC, Division of Watershed Stewardship
89 Kings Highway
Dover, DE 19901

RE: Delaware Coastal Management Program — Federal Consistency Certification for Massey's Ditch Channel Maintenance Dredging (FC 2018.0127)

Dear Mr. Williams,

The Delaware Coastal Management Program (DCMP) of the Delaware Department of Natural Resources and Environment Control (DNREC) has completed its review of the above referenced project. This letter is in response to the federal consistency certification dated and received September 26, 2018, submitted by you on behalf of the Delaware Department of Natural Resources and Environmental Control (DNREC), Division of Watershed Stewardship.

PROPOSED ACTION

The DNREC Division of Watershed Stewardship is proposing to hydraulically dredge the federal navigation channel in Massey's Ditch Channel, Sussex County, DE for maintenance purposes. Two new areas adjacent to the channel will be dredged to improve an alternate route around Massey's Ditch and to prevent subsequent shoaling in the channel. The project will consist of dredging approximately 100,000 cubic yards of predominantly sand from the channel bottom and depositing the sand via hydraulic pipeline on the beach on the north side of the Indian River Inlet, allowing the material disperse naturally. The purpose of this project is to improve vessel navigation in the area at low tide and to provide sand nourishment to a heavily eroded beach.

FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT

Pursuant to the Coastal Zone Management Act of 1972, as amended, federal activities located inside or outside of Delaware's federally approved coastal management area that can have

reasonably foreseeable effects on coastal uses must be implemented in a manner consistent with the enforceable policies of the DCMP including: wetlands management, beach management, coastal waters management, subaqueous lands and coastal strip management, public lands management, living resources, and state owned coastal recreation and conservation.

FEDERAL CONSISTENCY ANALYSIS

The Delaware CZM Program consists of a network of programs administered by several agencies. The DNREC DCMP coordinates the review of consistency certifications with agencies administering the enforceable and advisory policies of the program. The following agencies participated in this review:

DNREC, Division of Parks and Recreation
DNREC, Division of Watershed Stewardship, Shoreline and Waterway Management Section
DNREC, Division of Water Resources, Wetlands and Subaqueous Lands Section
DNREC, Division of Fish and Wildlife
DNREC, Division of Air Quality

To protect living resources of the State, the DNREC, Division of Fish and Wildlife recommended specific time of year restrictions (see Conditional Concurrence section).

PUBLIC PARTICIPATION

In accordance with 15 CFR §930.61, the public was invited to participate in the review of the Massey's Ditch channel maintenance dredging project. Public notice of this proposed action was published in the Delaware State News, The News Journal, and DNREC public notices list service on October 7, 2018. The public was given 30 days to submit comments on the published notice. No public comments were received in response to this notice.

CONDITIONAL CONCURRENCE

Based on its review and pursuant to National Oceanic and Atmospheric Administration regulations (15 CFR 930), the DCMP conditionally concurs that the Massey's Ditch channel maintenance dredging as proposed above, is consistent to the maximum extent practicable with the program.

The project area is known to be utilized year-round by one or more life stages of the summer flounder (*Paralichthys dentatus*). Additionally, the dredge pipe will be placed over marsh habitat utilized by ground-nesting marsh birds. As such, to be consistent with the DCMP's enforceable policies, the following conditions must be satisfied as they relate to the Living Resources policy 5.11.2.1:

1. No dredging shall occur within the project area March 1 – September 30 to minimize impact to summer flounder and marsh birds.

Failure to comply with 15 CFR §930.4 as it relates to the conditions above will result in this conditional concurrence being considered an objection. Under this scenario, the applicant is advised that pursuant to 15 CFR 930, subpart H, and within 30 days from receipt of this letter, a request may be submitted to the Secretary of Commerce to override the objection. In order to grant an override request, the Secretary must find that the activity is consistent with the objectives or purposes of the Coastal Management Act, or is necessary in the interest of national security. A copy of the request and supporting information must be sent to the Delaware Coastal Management Program and the federal permitting or licensing agency. The Secretary may collect fees for administering and processing the request.

Thank you for the opportunity to review and respond to the Massey's Ditch channel maintenance dredging federal consistency certification. If you have any questions, please contact me or Kristi Lieske of my staff at (302) 739-9283.

Sincerely,

Kimberly B. Cole, Administrator
Delaware Coastal Management Program

KBC/kl
cc: FC File 2018.0127
Elena Stewart, DNREC Parks and Recreation
Jennifer Pongratz, DNREC Shoreline and Waterways
Julie Molina, DNREC WSLS
John Clark, DNREC F&W
Deanna Morozowich, DNREC Air Quality
Mike Yost, USACE

APPENDIX 3

U.S. ARMY CORPS OF ENGINEERS (USACE) PERMIT

This notice of authorization must be conspicuously displayed at the site of work.

United States Army Corps of Engineers

DEC 20 2018

A permit to conduct hydraulic maintenance dredging of the federally authorized project commonly referred to as Massey's Ditch and Big Ditch

at Reboth Bay to Indian River Bay, Sussex County, Delaware

has been issued to Mr. Terry Dupty **on** DEC 20 2018

Address of Permittee 89 Kings Highway, Dover, Delaware 19901

Permit Number

CENAP-OP-R-2018-833-85

Edward E. Bonner
Chief, Regulatory Branch

District Commander
for: Kristen N. Dahle
Lieutenant Colonel,
Corps of Engineers

ENG FORM 4336, Jul 81 (ER 1145-2-303) EDITION OF JUL 70 MAY BE USED

(Proponent: DAEN-CWO)

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

REPLY TO
ATTENTION OF

DEC 20 2018

Regulatory Branch
Applications Section I

SUBJECT: CENAP-OP-R-2018-833-85 (Final IP)
Delaware Department of Natural Resources and Environmental Control
Location: Lat. 38.620033° N/Long.75.088949° W

Mr. Terry Deputy
Delaware Department of Natural Resources
and Environmental Control
89 Kings Highway
Dover, Delaware 19901

Dear Mr. Deputy:

Enclosed is a Department of the Army Permit (Enclosure 1) authorizing you to conduct hydraulic maintenance dredging of the federally authorized project commonly referred to as Massey's Ditch and Big Ditch, as well as new dredging north of Middle Island (8.5 acres) and north of Lynch Thicket Island (2.7 acres) to a depth of -7.5 feet MLLW. Including, the discharge of the dredged material along 4,000 linear feet in the surf zone at the Delaware Seashore State Park, just north of the Indian River Inlet for beach nourishment. Also enclosed is a notice of authorization (ENG Form 4336-Enclosure 2) to be conspicuously displayed at the site of work.

Carefully review all the terms and conditions of the Department of the Army permit and understand them fully. Performing any work not specifically authorized by the permit or failing to comply with its conditions may subject you and/or your contractor to the enforcement provisions of our regulations. If a contractor performs the work for you, both you and the contractor are responsible for assuring the work is done in conformance with the conditions and limitations of this permit. Please be sure the person who will do the work has read and understands the conditions of the permit.

This office shall be notified of the commencement and completion of the permitted work. To assist you in meeting this requirement, enclosed with the Department of the Army Permit is a Notification/Certification of Work Commencement Form and a Notification/Certification of Work Completion/ Compliance Form (Enclosures 3 and 4) which must be signed and returned to this office. Additional information concerning this permit may be obtained by writing to Michael D. Yost of my office at the above address, by email at michael.d.yost@usace.army.mil or by calling (267) 240-5278.

If any material changes in the location or plans of the permitted work are found necessary on account of unforeseen or altered conditions or otherwise, revised plans should be submitted promptly to this office in order that the revised plans, if found unobjectionable, may receive the approval required by law before operations on the permitted work are commenced.

Sincerely,

Edward E. Bonner
Chief, Regulatory Branch

Enclosures

DEPARTMENT OF THE ARMY PERMIT

PERMITTEE AND PERMIT NUMBER:

PERMITTEE: Delaware Department of Natural Resources and Environmental Control
CENAP-OP-R-2018-833-85

ISSUING OFFICE:

Department of the Army
U.S. Army Corps of Engineers, Philadelphia District
Wanamaker Building - 100 Penn Square East
Philadelphia, Pennsylvania 19107-3390

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

PROJECT DESCRIPTION: 10-year maintenance dredging permit to conduct hydraulic maintenance dredging of the federally authorized project commonly referred to as Massey's Ditch and Big Ditch, as well as new dredging north of Middle Island (8.5 acres) and north of Lynch Thicket Island (2.7 acres) to a depth of -7.5 feet MLLW. This authorization allows for the discharge of the dredged material along 4,000 linear feet of the surf zone in the Delaware Seashore State Park, just north of the Indian River Inlet for beach nourishment. All work is to be completed in accordance with the attached plans prepared by Moffatt & Nichol.

PROJECT LOCATION: Massey's Ditch Federal Navigation Channel from Rehoboth Bay to the Indian River Bay, east of the Long Neck Peninsula, Millsboro, Sussex County, Delaware (Lat. 38.620033° N/Long.75.088949° W).

PERMIT CONDITIONS:

General Conditions:

1. The time limit for completing the work authorized ends on 31 December 2028. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. All work performed in association with the above noted project shall be conducted in accordance with the project plans prepared by Moffatt & Nichol, dated September 2018, entitled: *DELAWARE DEPARTMENT OF~NATURAL RESOURCES AND~ENVIRONMENTAL CONTROL~DOVER, DELAWARE~MASSEY'S DITCH CHANNEL~MAINTENANCE DREDGING~PERMIT DRAWINGS*, 13 sheets.

2. Construction activities shall not result in the disturbance or alteration of greater than 54 acres of waters of the United States.

3. Any deviation in construction methodology or project design from that shown on the above noted drawings must be approved by this office, in writing, prior to performance of the work. All modifications to the above noted project plans shall be approved, in writing, by this office. No work shall be performed prior to written approval of this office.

4. This office shall be notified at least 10 days prior to the commencement of authorized work by completing and signing the attached *Notification/ Certification of Work Commencement*

Form. This office shall also be notified within 10 days of the completion of the authorized work by completing and signing the attached *Notification/Certification of Work Completion/Compliance Form*. Notifications required by this condition may be in writing by mail, fax, or electronic notification via email. Oral notifications are not acceptable. Similar notification is required each time maintenance work is to be done under the terms of this Corps of Engineers permit.

5. The Special Conditions imposed by the Delaware Department of Natural Resources and Environmental Control (DDNREC) on your DDNREC Section 401 WQC and/or DDNREC CZM concurrence shall also be conditions to this Department of the Army permit.

6. The permittee is responsible for ensuring that the contractor and/or workers executing the activity(s) authorized by this permit have knowledge of the terms and conditions of the authorization and that a copy of the permit document is at the project site throughout the period the work is underway.

7. Dredging and dredged material disposal shall not occur from March 1 through September 30 of any year.

8. A minimum 50 feet buffer shall be maintained between the final dredged area top of slope and any vegetated wetland edge.

FURTHER INFORMATION:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

☒ Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

☒ Section 404 of the Clean Water Act (33 U.S.C. 1344).

☐ Section 103 of the Marine Protection, Research and Sanctuaries Act.

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal projects.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data. The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General Condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

(PERMITTEE) 12-18-18 (DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

(District Engineer) Dec 20, 2018 (DATE)
Edward E. Bonner, Chief, Regulatory Branch

for Kristen N. Dahle
Lieutenant Colonel, Corps of Engineers
District Commander

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) (DATE)

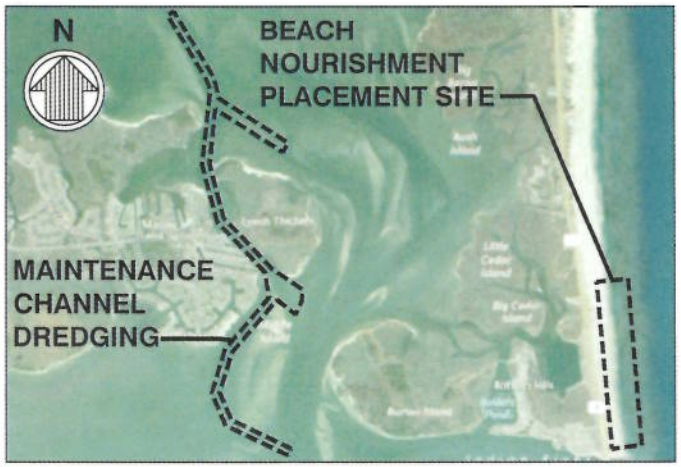
DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DOVER, DELAWARE

MASSEY'S DITCH CHANNEL MAINTENANCE DREDGING

PERMIT DRAWINGS

VICINITY MAP
NTS



LOCATION MAP
NTS

PURPOSE: MASSEY'S DITCH DREDGING DATUM: MLLW	COVER SHEET DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL 89 KINGS HIGHWAY, DOVER, DE 19901	MASSEY'S DITCH DREDGING APPLICATION BY: MOFFATT & NICHOL SHEET 1 OF 13 DATE: SEPT 2018

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INDEX OF DRAWINGS	
SHEET NUMBER	SHEET TITLE
1	COVER SHEET
2	GENERAL NOTES
3	PLAN – GENERAL ARRANGEMENT SHT 1 OF 2
4	PLAN – GENERAL ARRANGEMENT SHT 2 OF 2
5	PLAN – BORING LOCATIONS
6	PLAN – CHANNEL DREDGING 1 OF 6
7	PLAN – CHANNEL DREDGING 2 OF 6
8	PLAN – CHANNEL DREDGING 3 OF 6
9	PLAN – CHANNEL DREDGING 4 OF 6
10	PLAN – CHANNEL DREDGING 5 OF 6
11	PLAN – CHANNEL DREDGING 6 OF 6
12	SECTION – 1 OF 2
13	SECTION – 2 OF 2

ABBREVIATIONS

APPROX	—	APPROXIMATE
BL	—	BASELINE
CL	—	CENTERLINE
CF	—	CUBIC FEET
CY	—	CUBIC YARD
DMCF	—	DREDGE MATERIAL CONTAINMENT FACILITY
DNREC	—	DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
ELEV, EL	—	ELEVATION
MHW	—	MEAN HIGH WATER
MHHW	—	MEAN HIGHER HIGH WATER
MIN	—	MINIMUM
MLW	—	MEAN LOW WATER
MLLW	—	MEAN LOWER LOW WATER
MLLW	—	MEAN LOWER LOW WATER
N	—	NORTH
NAVD88	—	NORTH AMERICA VERTICAL DATUM OF 1988
NGVD	—	NORTH GEODETIC VERTICAL DATUN
NTS	—	NOT TO SCALE

GENERAL NOTES

1. NOTES BELOW ARE NOT INTENDED TO REPLACE SPECIFICATIONS. SEE SPECIFICATIONS FOR REQUIREMENTS IN ADDITION TO GENERAL NOTES.
2. VERTICAL DATUM IS REFERENCED TO MLLW HORIZONTAL DATUM IS THE NORTH AMERICAN DATUM OF 1983 (NAD 83), DELAWARE STATE PLANE COORDINATE SYSTEM.

TIDAL DATUM	
MEAN HIGHER HIGH WATER (MHHW)	2.94 FEET
MEAN HIGH WATER (MHW)	2.67 FEET
NORTH AMERICAN VERTICAL DATUM (NAVD88)	1.82 FEET
MEAN LOW WATER (MLW)	0.15 FEET
MEAN LOWER LOW WATER (MLLW)	0.00 FEET

3. THE SURVEY WAS OBTAINED FROM DNREC–DIVISION OF SOIL AND WATER CONSERVATION ON JUNE 2018.
4. THE CONTRACTOR SHALL ABIDE BY ALL APPLICABLE ENVIRONMENTAL PROTECTION STANDARDS, PERMITS, LAWS AND REGULATIONS. DISPOSAL OF DREDGED MATERIALS IN THE LITTLE RIVER IS NOT PERMITTED.
5. ALL SAFETY REGULATIONS ARE TO BE STRICTLY FOLLOWED.
6. CONTRACTOR SHALL TAKE ALL NECESSARY STEPS AND ACTIONS REQUIRED UNDER THE APPLICABLE SAFETY PRACTICES OF THE FOLLOWING REGULATORY AGENCIES INCLUDING, BUT NOT LIMITED TO: DELAWARE OFFICE OF OCCUPATIONAL HEALTH, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AND NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY AND HEALTH (NIOSH).

PURPOSE: MASSEY'S DITCH DREDGING DATUM: MLLW	GENERAL NOTES DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL 89 KINGS HIGHWAY, DOVER, DE 19901	MASSEY'S DITCH DREDGING APPLICATION BY: MOFFATT & NICHOL SHEET 2 OF 13 DATE: SEPT 2018

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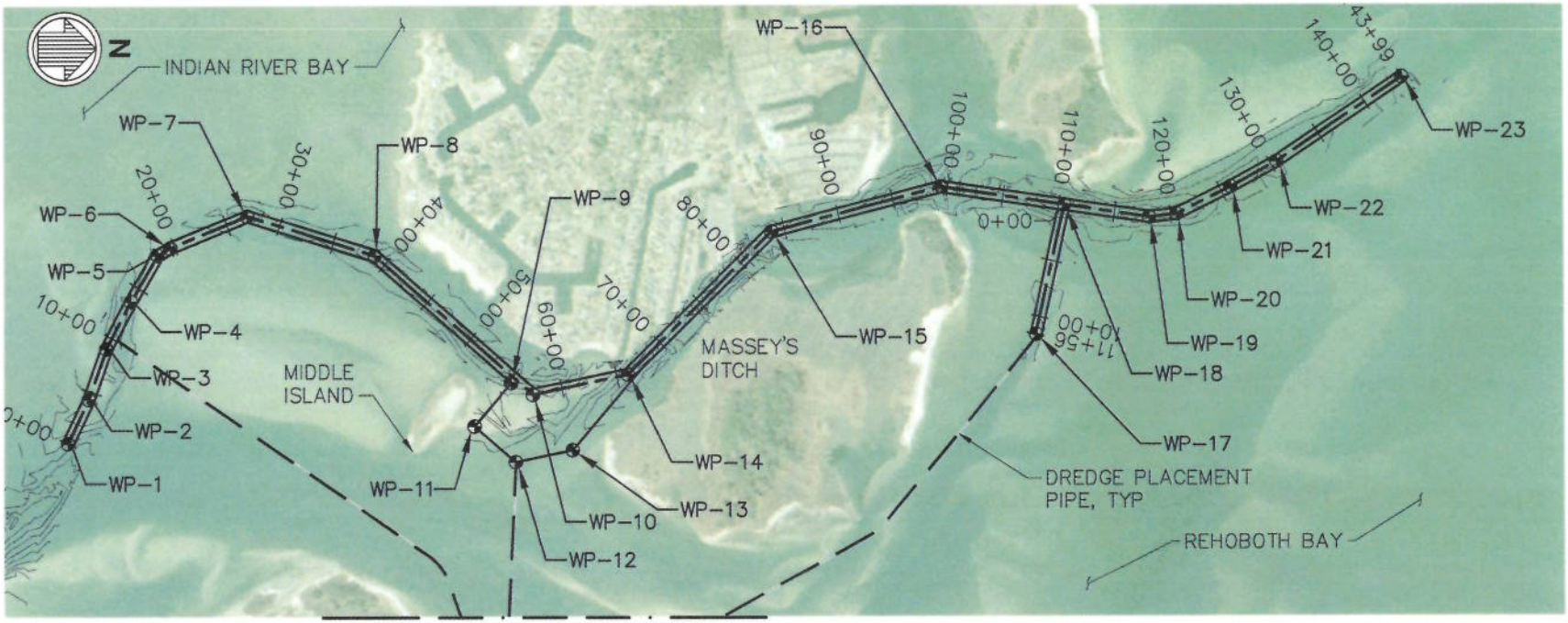

FOR CONTINUATION SEE SHEET 4

CHANNEL COORDINATES			
PNT NO	STATION	NORTHING	EASTING
WP-1	0+00.00	222003.98	748381.00
WP-2	4+29.31	222190.35	747994.26
WP-3	8+97.05	222348.43	747554.04
WP-4	13+62.92	222565.39	747141.77
WP-5	18+30.66	222806.61	746741.03
WP-6	19+60.79	222920.32	746677.75
WP-7	27+00.22	223606.00	746401.00
WP-8	38+83.91	224738.00	746747.00

CHANNEL COORDINATES			
PNT NO	STATION	NORTHING	EASTING
WP-9	55+22.72	225946.76	747854.74
WP-10	57+37.37	226142.00	747957.00
WP-11	55+22.72	225620.34	748233.49
WP-12	57+37.37	225988.43	748550.72
WP-13	59+82.11	226493.63	748445.62
WP-14	66+01.49	226988.00	747781.00
WP-15	83+83.62	228268.00	746541.00
WP-16	99+42.50	229776.00	746146.00

CHANNEL COORDINATES			
PNT NO	STATION	NORTHING	EASTING
WP-17	11+54.41	230618.66	747433.11
WP-18	110+50.32	230872.18	746306.24
WP-19	118+09.13	231623.00	746416.00
WP-20	120+54.63	231866.96	746388.52
WP-21	125+91.65	232347.55	746148.90
WP-22	130+58.61	232757.97	745926.15
WP-23	143+98.88	233870.62	745178.94

PURPOSE: MASSEY'S DITCH DREDGING

DATUM: MLLW

PLAN – GENERAL ARRANGEMENT SHT 1 OF 2

750' 0' 750' 1500'

SCALE: 1"=1500'

DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY, DOVER, DE 19901

MASSEY'S DITCH DREDGING

APPLICATION BY: MOFFATT & NICHOL

SHEET 3 OF 13 DATE: SEPT 2018

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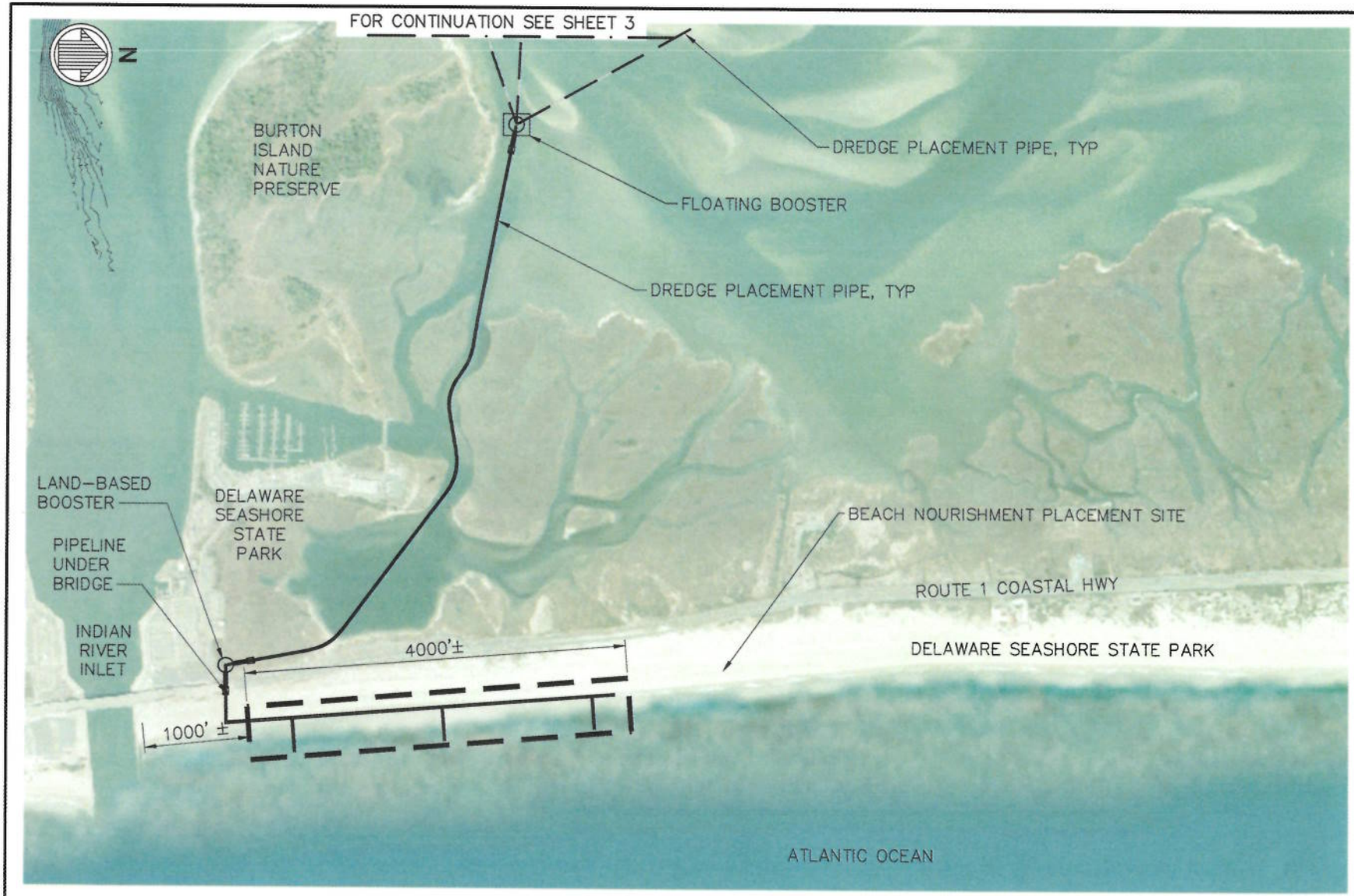

PURPOSE: MASSEY'S DITCH DREDGING

DATUM: MLLW

PLAN – GENERAL ARRANGEMENT SHT 2 OF 2

750' 0' 750' 1500'

SCALE: 1"=1500'

DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY, DOVER, DE 19901

MASSEY'S DITCH DREDGING

APPLICATION BY: MOFFATT & NICHOL

SHEET 4 OF 13 DATE: SEPT 2018

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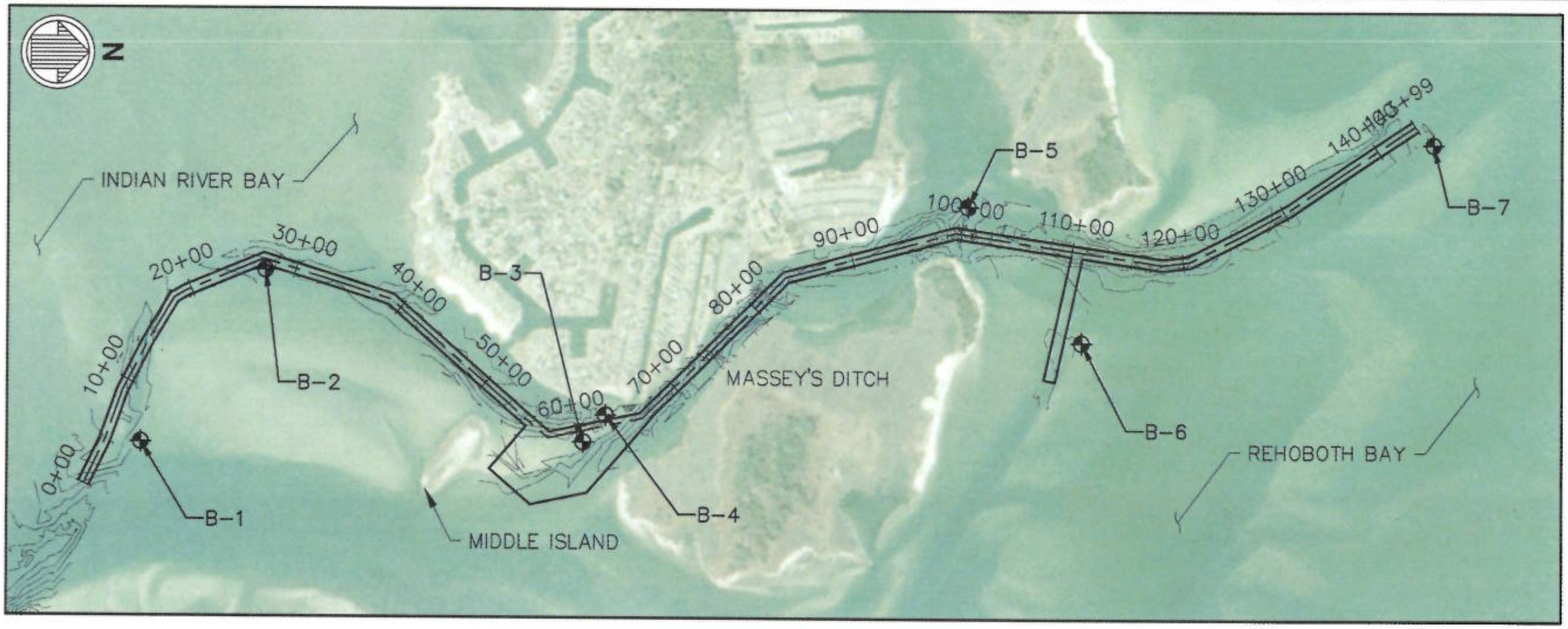

BORING LOCATIONS TABLE		
POINT NO.	NORTHING	EASTING
B-1	222511.68	748005.81
B-2	223619.28	746493.81
B-3	226457.17	747992.00
B-4	226658.67	747753.19
B-5	229889.69	745916.73
B-6	230905.46	747103.54
B-7	234035.63	745347.13

PURPOSE: MASSEY'S DITCH DREDGING

DATUM: MLLW

PLAN – BORING LOCATIONS

750' 0' 750' 1500'

SCALE: 1"=1500'

DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY, DOVER, DE 19901

MASSEY'S DITCH DREDGING

APPLICATION BY: MOFFATT & NICHOL

SHEET 5 OF 13 DATE: SEPT 2018

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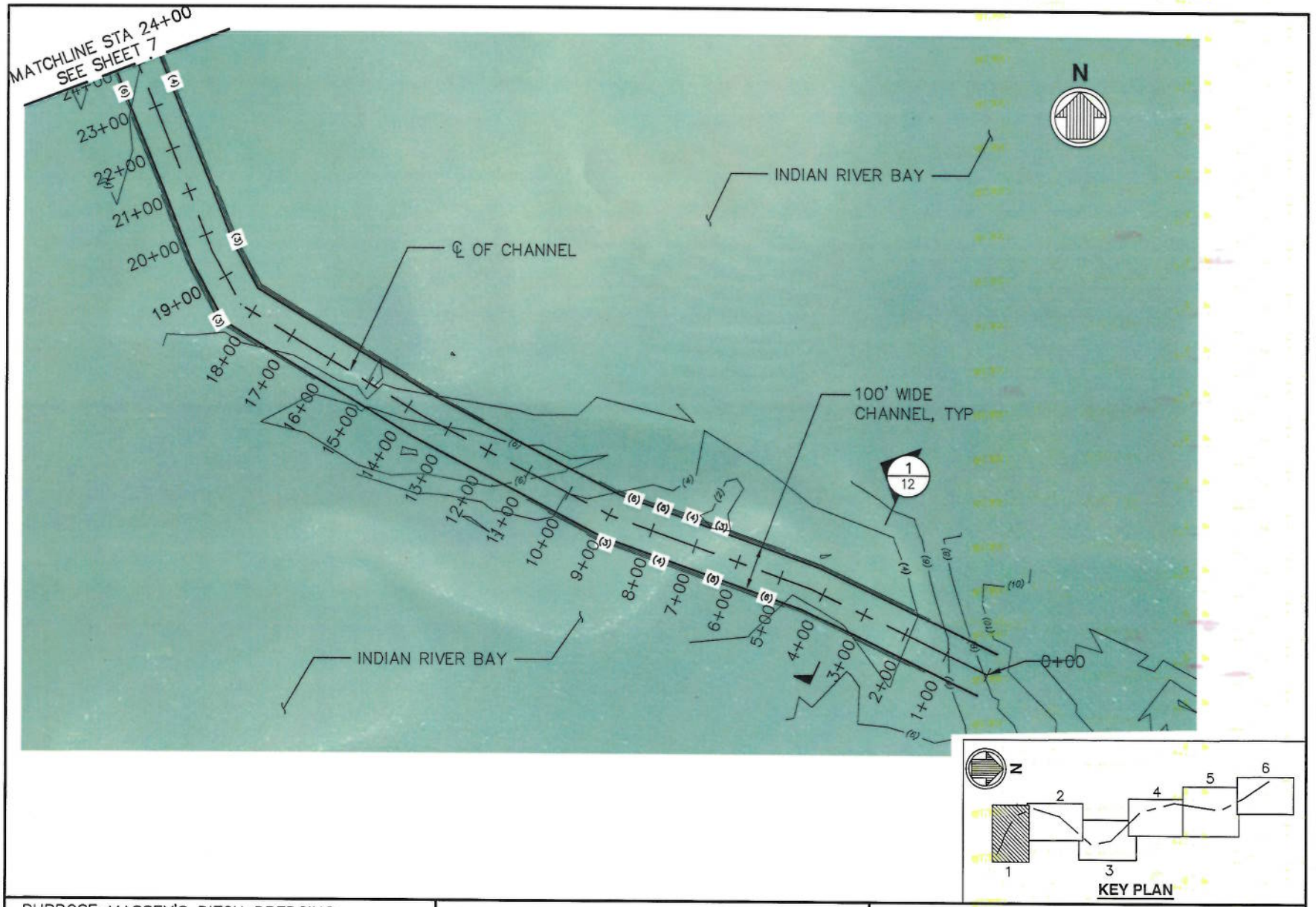

PURPOSE: MASSEY'S DITCH DREDGING

DATUM: MLLW

PLAN – CHANNEL DREDGING – SHEET 1 OF 6

150' 0' 150' 300'

SCALE: 1"=300'

DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY, DOVER, DE 19901

MASSEY'S DITCH DREDGING

APPLICATION BY: MOFFATT & NICHOL

SHEET 6 OF 13 DATE: SEPT 2018

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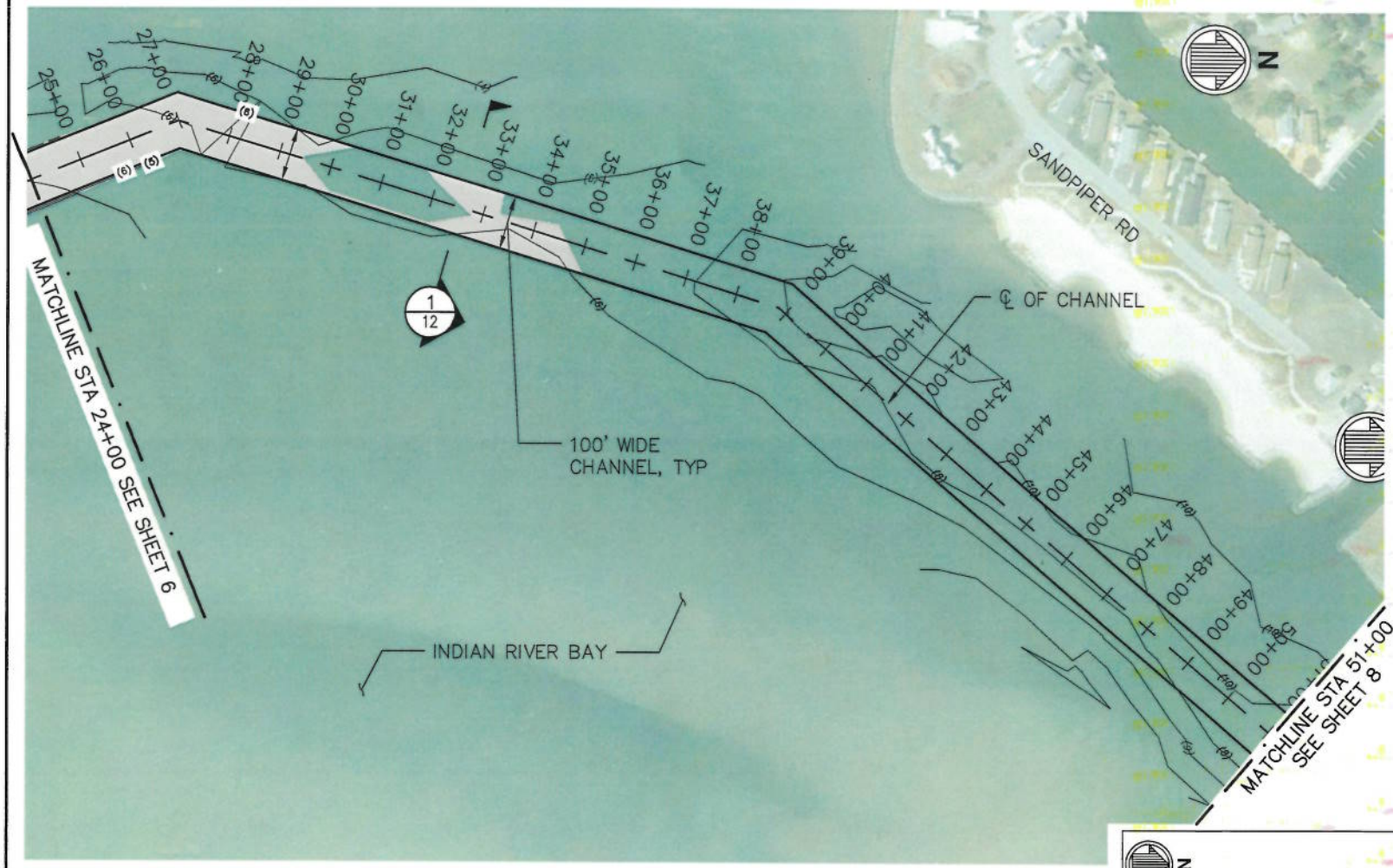

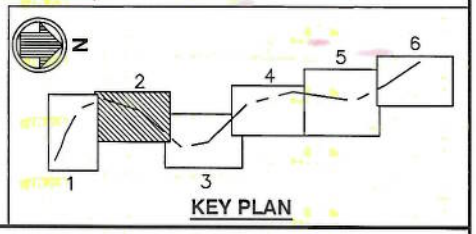

PURPOSE: MASSEY'S DITCH DREDGING

DATUM: MLLW

PLAN – CHANNEL DREDGING 2 OF 6

150' 0' 150' 300'

SCALE: 1"=300'

DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY, DOVER, DE 19901

MASSEY'S DITCH DREDGING

APPLICATION BY: MOFFATT & NICHOL

SHEET 7 OF 13 DATE: SEPT 2018

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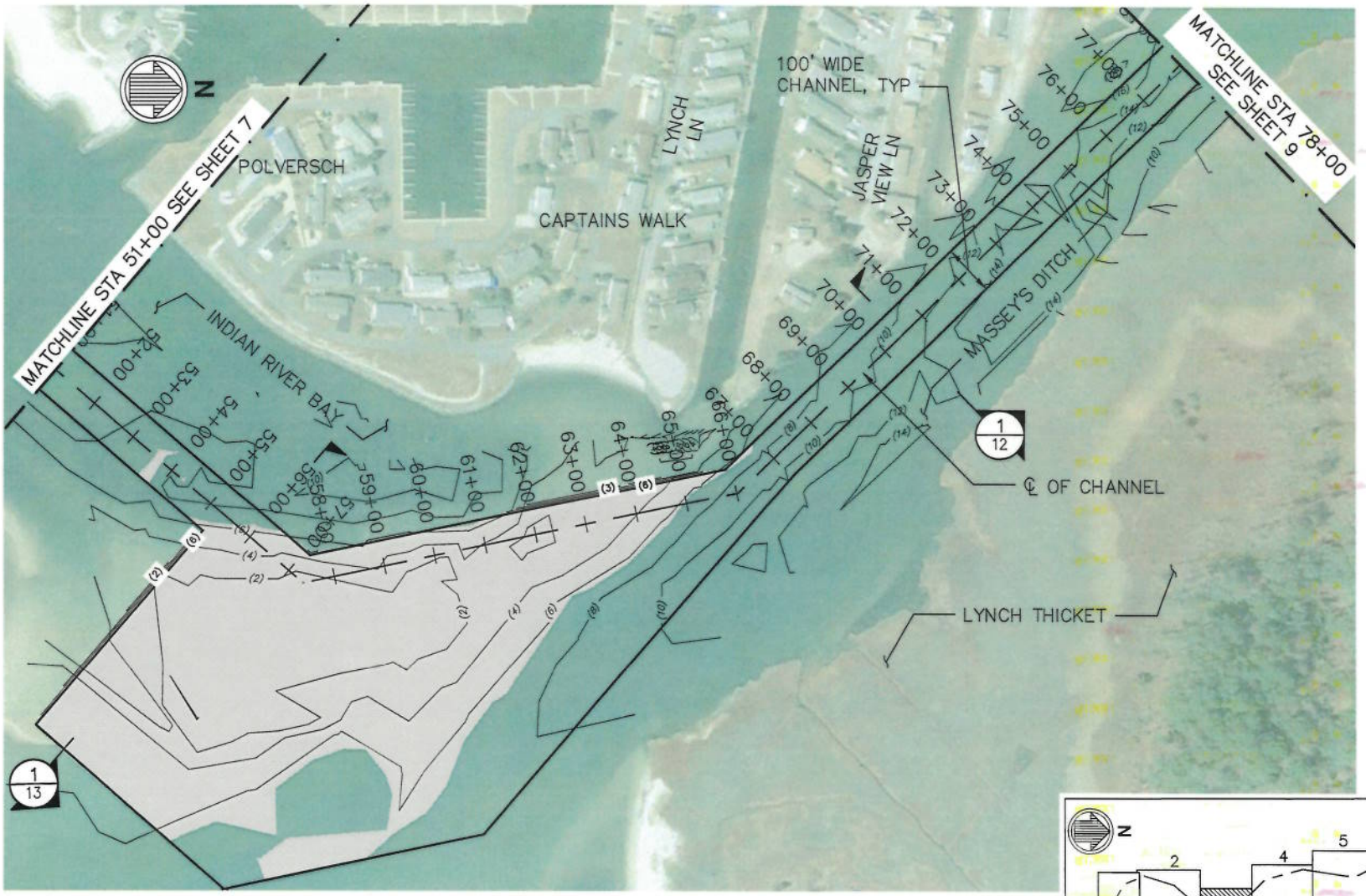

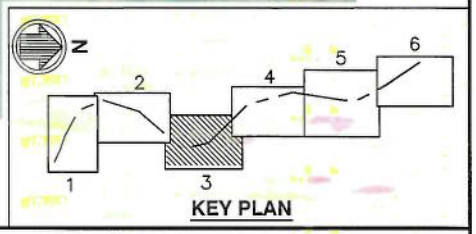

PURPOSE: MASSEY'S DITCH DREDGING

DATUM: MLLW

PLAN – CHANNEL DREDGING 3 OF 6

150' 0' 150' 300'

SCALE: 1"=300'

DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY, DOVER, DE 19901

MASSEY'S DITCH DREDGING

APPLICATION BY: MOFFATT & NICHOL

SHEET 8 OF 13 DATE: SEPT 2018

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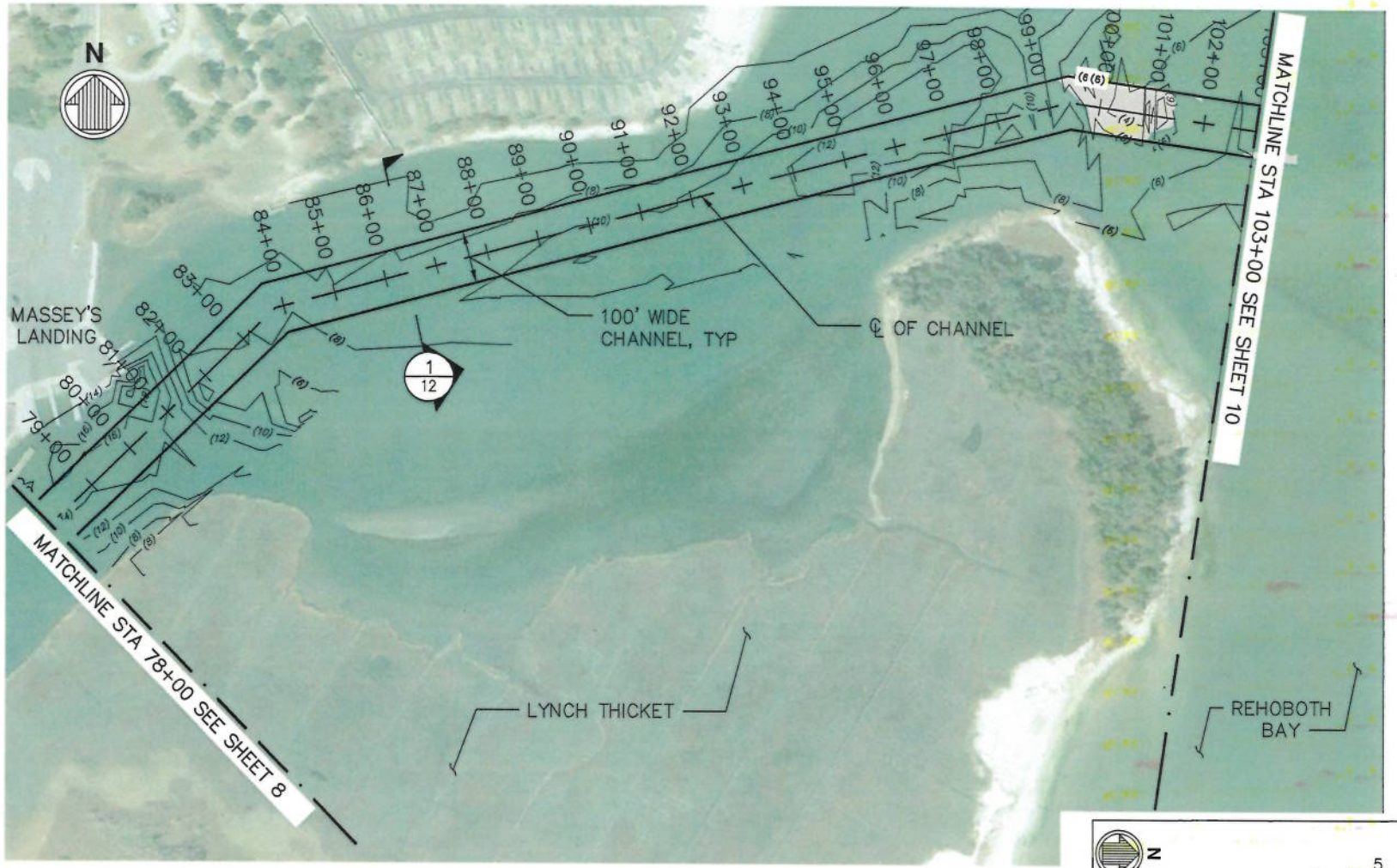

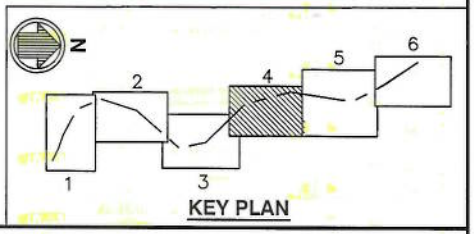

PURPOSE: MASSEY'S DITCH DREDGING

DATUM: MLLW

PLAN – CHANNEL DREDGING 4 OF 6

150' 0' 150' 300'

SCALE: 1"=300'

DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY, DOVER, DE 19901

MASSEY'S DITCH DREDGING

APPLICATION BY: MOFFATT & NICHOL

SHEET 9 OF 13 DATE: SEPT 2018

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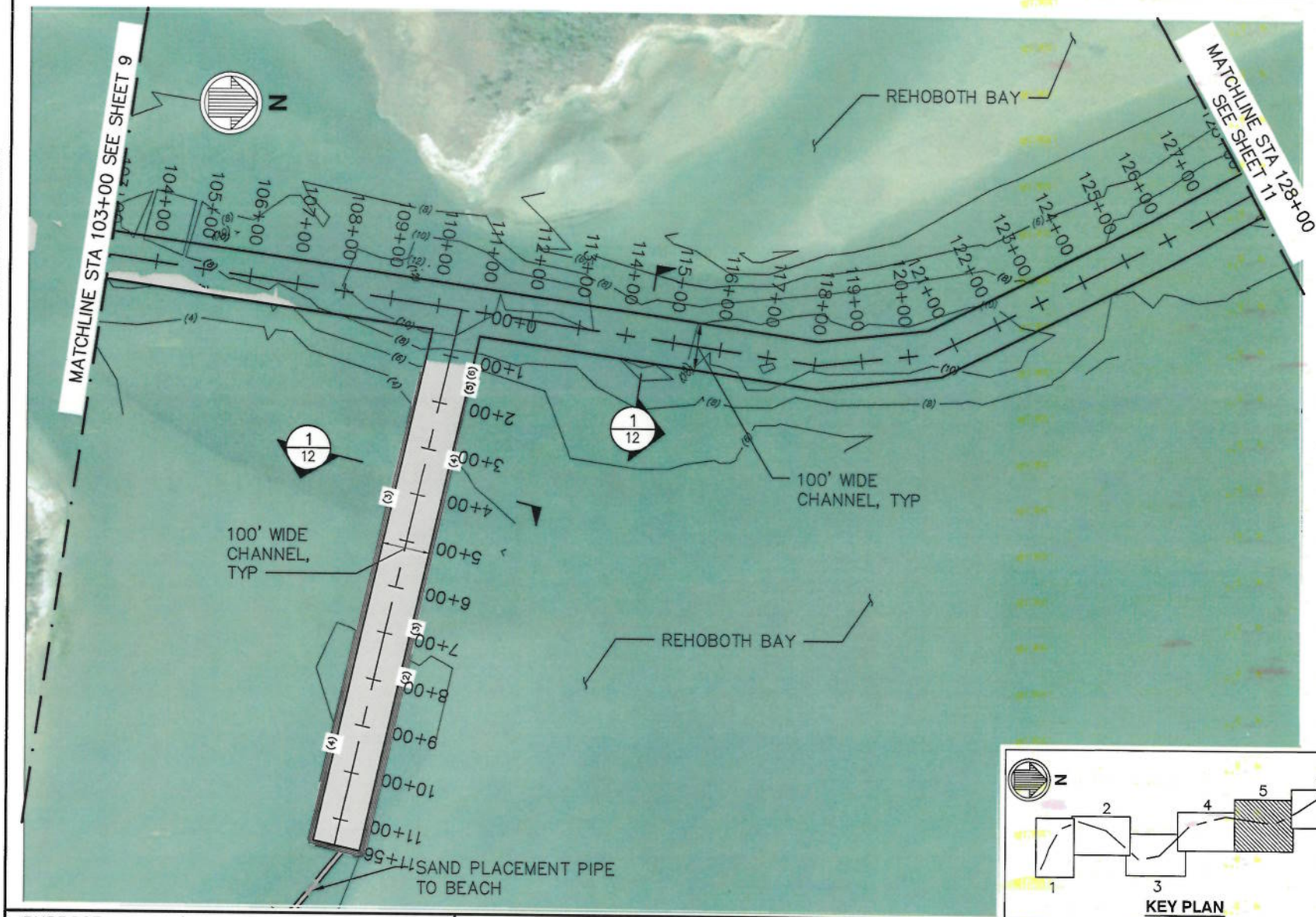

PURPOSE: MASSEY'S DITCH DREDGING

DATUM: MLLW

PLAN – CHANNEL DREDGING 5 OF 6

150' 0' 150' 300'

SCALE: 1"=300'

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY, DOVER, DE 19901

MASSEY'S DITCH DREDGING

APPLICATION BY: MOFFATT & NICHOL

SHEET 10 OF 13 DATE: SEPT 2018

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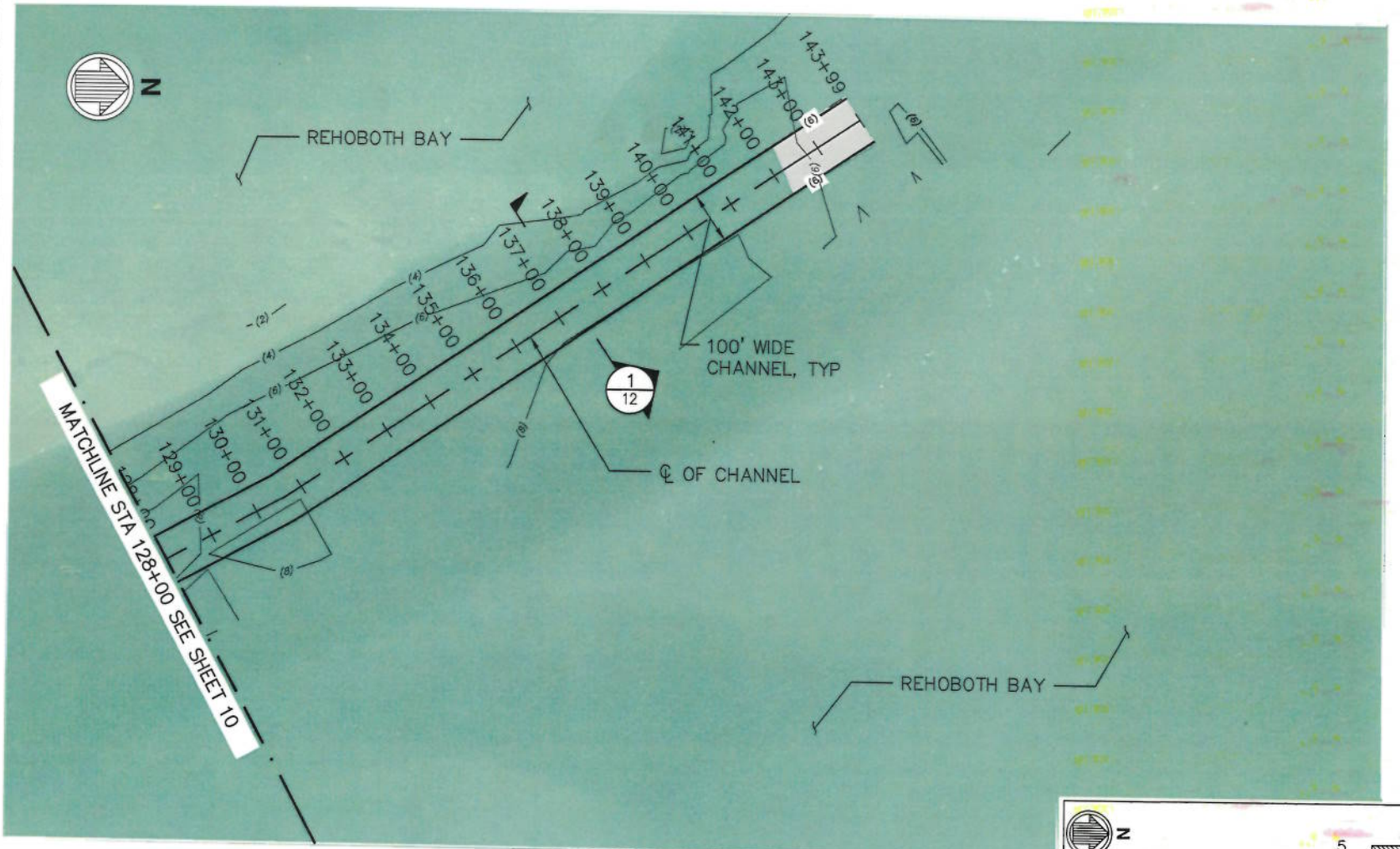

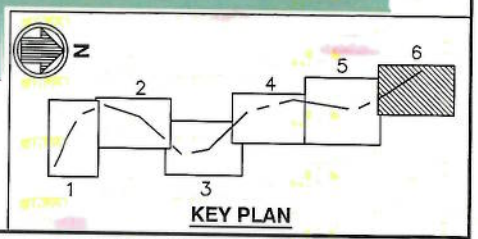

KEY PLAN

PURPOSE: MASSEY'S DITCH DREDGING

DATUM: MLLW

PLAN – CHANNEL DREDGING 6 OF 6

150' 0' 150' 300'

SCALE: 1"=300'

DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY, DOVER, DE 19901

MASSEY'S DITCH DREDGING

APPLICATION BY: MOFFATT & NICHOL

SHEET 11 OF 13 DATE: SEPT 2018

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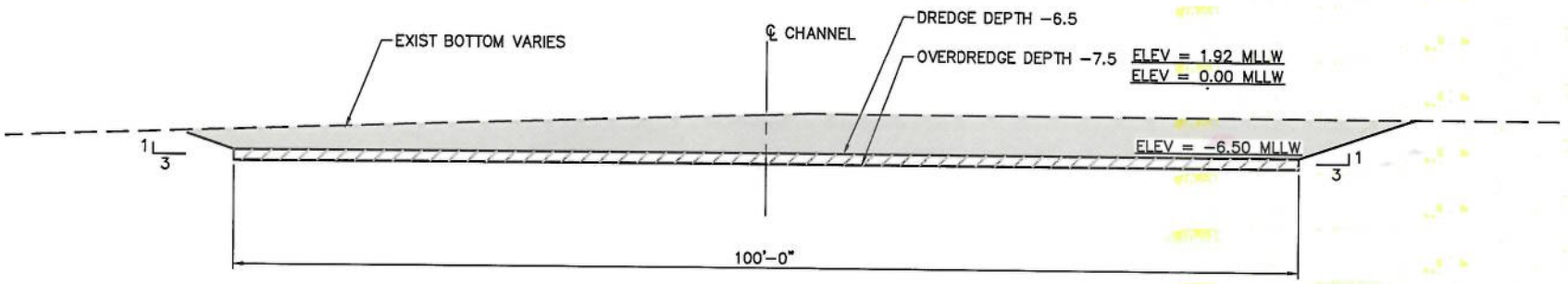
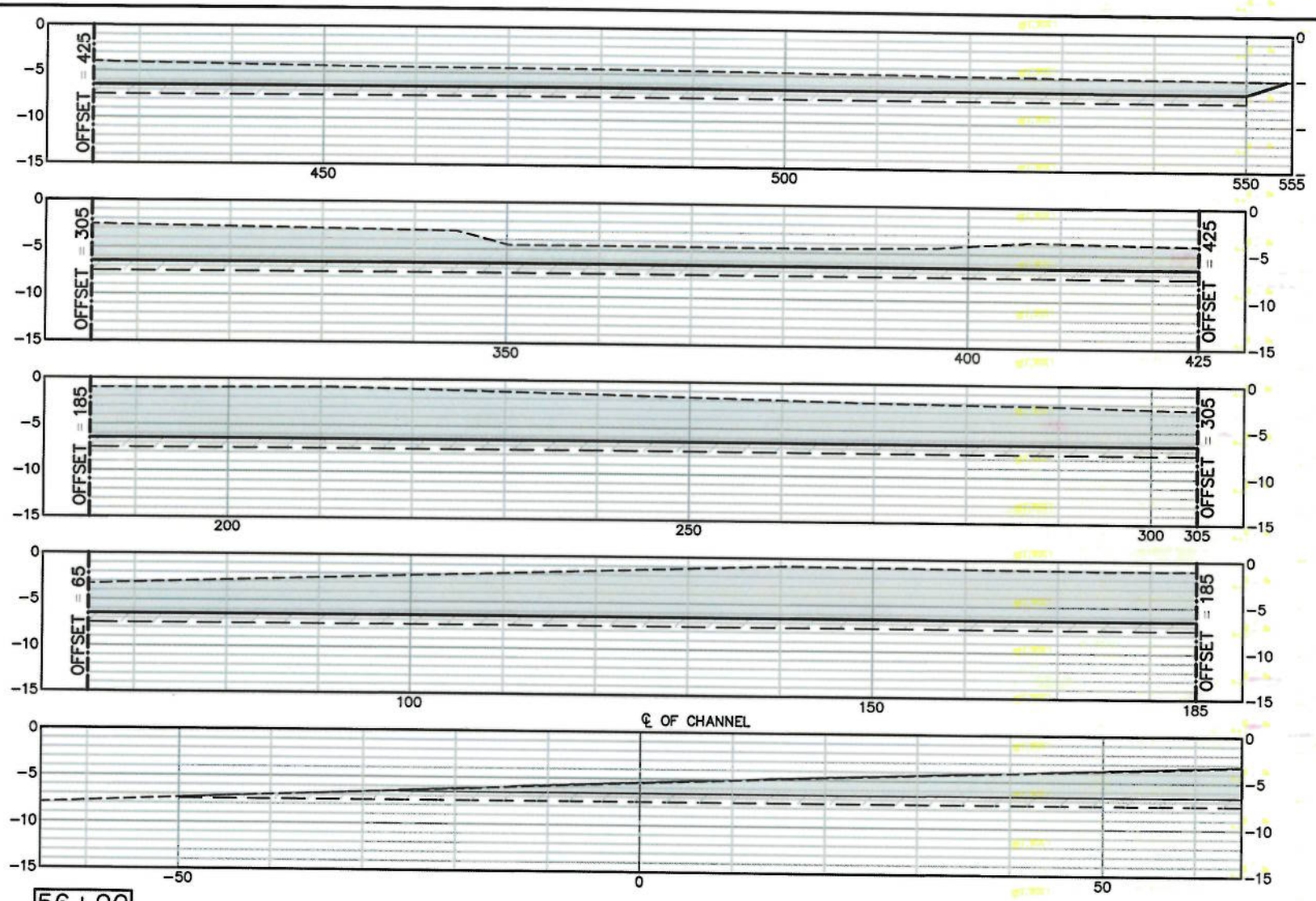


1/6 SECTION – TYPICAL DREDGING
SCALE: NTS

7,8,9,10,11

PURPOSE: MASSEY'S DITCH DREDGING DATUM: MLLW	SECTION – 1 OF 2 DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL 89 KINGS HIGHWAY, DOVER, DE 19901	MASSEY'S DITCH DREDGING APPLICATION BY: MOFFATT & NICHOL SHEET 12 OF 13 DATE: SEPT 2018



56+00

1/8 SECTION – DREDGING
SCALE: NTS

PURPOSE: MASSEY'S DITCH DREDGING

DATUM: MLLW

SECTION – 2 OF 2

DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY, DOVER, DE 19901

MASSEY'S DITCH DREDGING

APPLICATION BY: MOFFATT & NICHOL

SHEET 13 OF 13 DATE: SEPT 2018

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NOTIFICATION/CERTIFICATION OF WORK COMMENCEMENT FORM

Permit Number: CENAP-OP-R-2018-833-85 (IP)
State Permit #:
Name of Permittee: Delaware Department of Natural Resources and Environmental Control
Waterway: Indian River Bay/Rehoboth Bay
County: Sussex State: DE
Compensation/Mitigation Work Required: Yes ☐ No ☒

TO: U.S. Army Corps of Engineers, Philadelphia District
Wanamaker Building - 100 Penn Square East
Philadelphia, Pennsylvania 19107-3390
Attention: CENAP-OP-R

I have received authorization to conduct hydraulic maintenance dredging of the federally authorized project commonly referred to as Massey's Ditch and Big Ditch, as well as new dredging north of Middle Island (8.5 acres) and north of Lynch Thicket Island (2.7 acres) to a depth of -7.5 feet MLLW. As well as, the discharge of the dredged material along 4,000 linear feet in the surf zone at the Delaware Seashore State Park, just north of the Indian River Inlet for beach nourishment.

The work will be performed by:

Name of Person or Firm _____

Address: _____

_____

I hereby certify that I have reviewed the approved plans, have read the terms and conditions of the above referenced permit, and shall perform the authorized work in strict accordance with the permit document. The authorized work will begin on or about _____ and should be completed on or about _____.

Please note that the permitted activity is subject to compliance inspections by the Army Corps of Engineers. If you fail to return this notification form or fail to comply with the terms or conditions of the permit, you are subject to permit suspension, modification, revocation, and/or penalties.

_____ _____
Permittee (Signature and Date) Telephone Number

_____ _____
Contractor (Signature and Date) Telephone Number

NOTE: This form shall be completed/signed and returned to the Philadelphia District Office a minimum of 10 days prior to commencing work.

Enclosure 3

NOTIFICATION/CERTIFICATION OF WORK COMPLETION/COMPLIANCE FORM

Permit Number; CENAP-OP-R-2018-833-85 (IP)
Name of Permittee: Delaware Department of Natural Resources and Environmental Control
Name of Contractor:
County: Sussex
State: Delaware
Waterway Indian River Bay/Rehoboth Bay

Within 10 days of completion of the activity authorized by this permit, please sign this certification and return it to the following address:

Department of the Army
U.S. Army Corps of Engineers, Philadelphia District
Wanamaker Building - 100 Penn Square East
Philadelphia, Pennsylvania 19107-3390
Attention: CENAP-OP-R

Please note that the permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to return this notification form or fail to perform work in compliance with the permit, you are subject to administrative, civil and/or criminal penalties. Further, the subject permit may be suspended or revoked.

I hereby certify that the work authorized by the above referenced permit has been completed in accordance with the terms and conditions of the above noted permit.

The authorized work was commenced on _____.

The authorized work was completed on _____.

Dredging authorized: Yes ☒ No ☐ If yes, see ***NOTE*** below.

The volume of dredged material was_____ cubic yards.

The dredged material was placed at _____.

_____ _____
Signature of Contractor Signature of Permittee

Address: _____ Address: _____

_____ _____

Telephone Number: _____ Telephone Number: _____

SPECIAL NOTE FOR MAINTENANCE DREDGING:
If the above referenced permit authorizes maintenance dredging, the permittee/contractor shall notify this office of the completion of the work by submitting this form for each dredging occurrence. This form may be reproduced for this purpose.

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT CORPS OF ENGINEERS
WANAMAKER BUILDING, 100 PENN SQUARE EAST
PHILADELPHIA, PENNSYLVANIA 19107-3390

REPLY TO
ATTENTION OF

Regulatory Branch
Application Section I

APR 16 2019

SUBJECT: CENAP-OP-R-2018-833-85 (IP Modification)
Project Name: DDNREC Massey's Ditch Maintenance Dredging SX
Location: Lat. 38.620033° N/Long.75.088949° W

Peter Kotulak
Moffatt & Nichol
2780 Lighthouse Point East
Suite D
Baltimore, Maryland 21224

Dear Mr. Kotulak:

Reference is made to Department of the Army Permit CENAP-OP-R-2018-833-85, dated December 20, 2019, authorizing 10-year hydraulic maintenance dredging of the federally authorized project referred to as Massey's Ditch and Big Ditch, as well as additional dredging north of Middle Island and north of Lynch Thicket Island to a depth of -7.5 feet MLLW with disposal of the dredged material along the surf zone in the Delaware Seashore State Park north of the Indian River Inlet.

In accordance with your request dated March 15, 2019, the enclosed plans (*G-101, C-401 and C-402*) are approved to supersede the previously approved plans (*Sheets 3, 4*). The revised plans provides for an optional disposal pipeline placement location through the Indian River Inlet and adding 800 linear feet to the southern boundary of the disposal area.

Furthermore, the following shall be added as a special condition:

That a minimum of 30 days prior to commencing work, the permittee/contractor shall request in writing, from the U.S. Coast Guard, that a Local Notice to Mariners be issued regarding the authorized construction work. This written request shall include the location of work, a description of the construction activities, the type of construction equipment to be used and expected duration of work in the waterway. The written request may be sent via electronic means to michael.a.davis@uscg.mil and D05-SMB-CGD5Waterways@uscg.mil or by mail to the following: Commander (DPW), Fifth Coast Guard District, 431 Crawford Street, Portsmouth, Virginia 23704-5004.

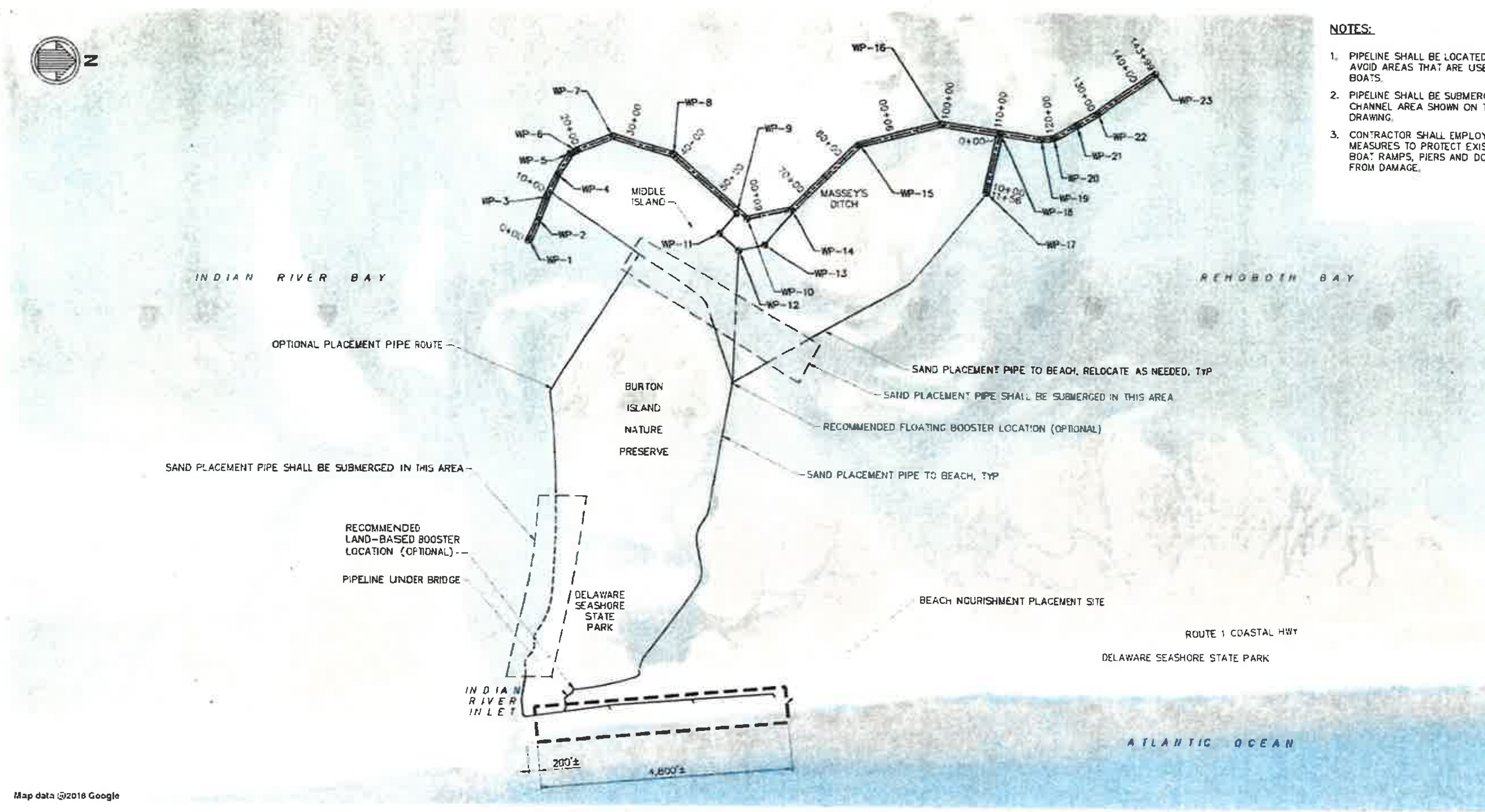
All other conditions to which this permit was made subject remain in full force and effect. This authorization does not affect your responsibility to obtain any other Federal, State or local approvals required by law for this project before beginning work.

If you should have any questions regarding this matter, please contact Michael D. Yost by mail at 1203 College Park Drive, Suite 103, Dover, Delaware 19904, by email at michael.d.yost@usace.army.mil or telephone at (267) 240-5278.

Sincerely,

Edward E. Bonner
for Chief, Regulatory Branch

Enclosure



NOTES:

1. PIPELINE SHALL BE LOCATED TO AVOID AREAS THAT ARE USED BY BOATS.
2. PIPELINE SHALL BE SUBMERGED IN CHANNEL AREA SHOWN ON THIS DRAWING.
3. CONTRACTOR SHALL EMPLOY MEASURES TO PROTECT EXISTING BOAT RAMPS, PIERS AND DOCKS FROM DAMAGE.

A1 PLAN – GENERAL ARRANGEMENT
SCALE: 1" = 1000'

CHANNEL CENTERLINE COORDINATES

POINT NO	STATION	NORTHING	EASTING
WP-1	0+00.00	222003.98	748381.00
WP-2	4+29.31	222190.35	747994.26
WP-3	8+97.05	222348.43	747554.04
WP-4	13+62.92	222565.39	747141.77
WP-5	18+30.66	222806.61	746741.03
WP-6	19+60.79	222920.32	746677.75
WP-7	27+00.22	223606.00	746401.00
WP-8	38+83.91	224738.00	746747.00
WP-9	55+22.72	225946.76	747854.74
WP-10	57+37.37	226142.00	747957.00

CHANNEL CENTERLINE COORDINATES

POINT NO	STATION	NORTHING	EASTING
WP-11	55+22.72	225620.34	748233.49
WP-12	57+37.37	225988.43	748550.72
WP-13	59+82.11	226493.63	748445.62
WP-14	66+01.49	226988.00	747781.00
WP-15	83+83.62	228268.00	746541.00
WP-16	99+42.50	229776.00	746146.00
WP-17	11+54.41	230618.66	747433.11
WP-18	110+50.32	230872.18	746306.24
WP-19	118+09.13	231623.00	746416.00
WP-20	120+54.63	231866.96	746388.52

CHANNEL CENTERLINE COORDINATES

POINT NO	STATION	NORTHING	EASTING
WP-21	125+91.65	232347.55	746148.90
WP-22	130+58.61	232757.97	745926.15
WP-23	143+98.88	233870.62	745178.94

SCALE: 1"=1000'

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

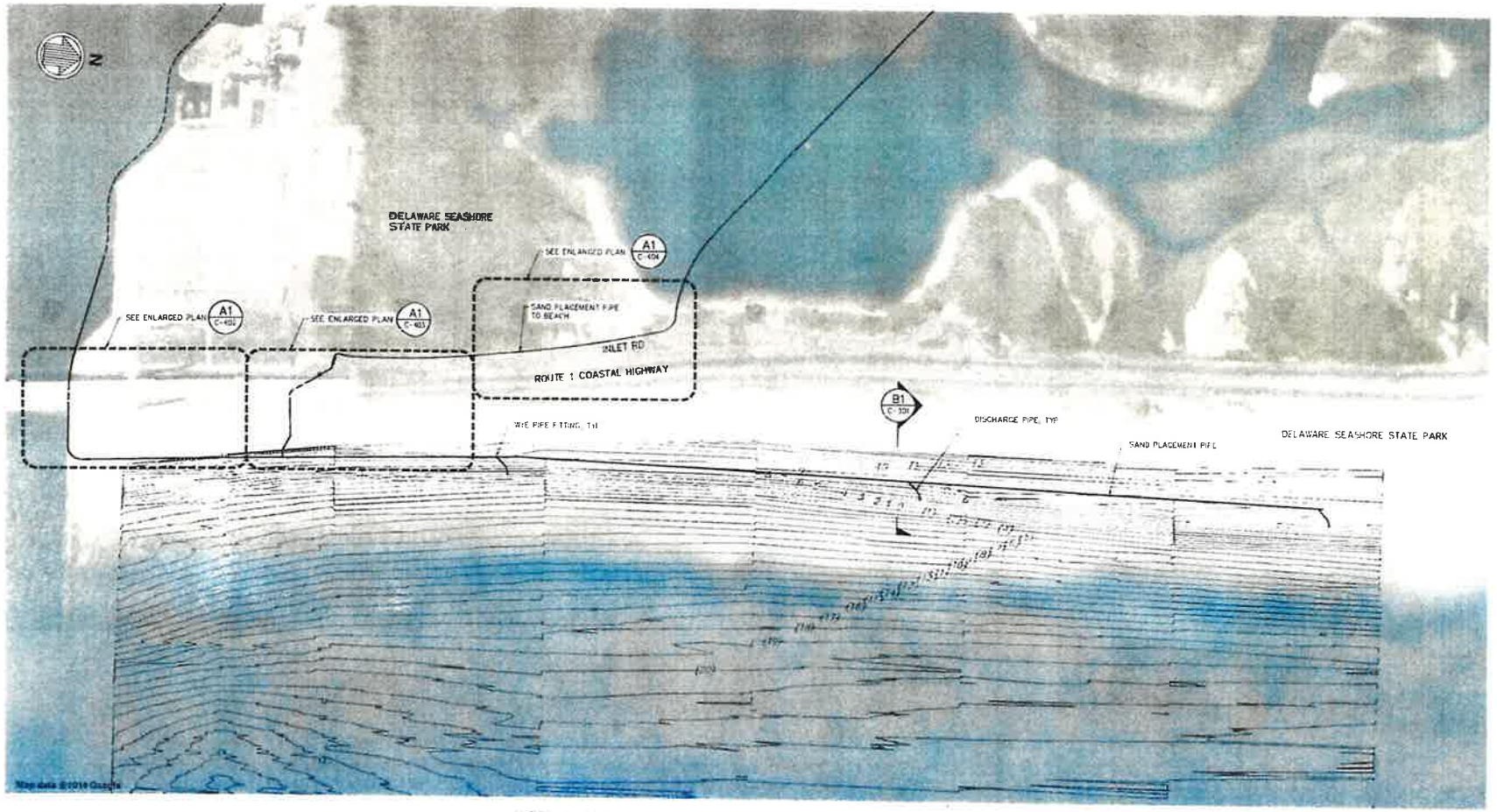
PLAN - GENERAL ARRANGEMENT

moffatt & nichol
2785 LIGHTHOUSE POINT EAST, BALTIMORE, MD 21224

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
89 KINGS HIGHWAY
DOVER, DE 19901

Sheet Reference No.
G-101
INDEX 3 OF 40

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING



A1 C-401 ENLARGED PLAN – SAND PLACEMENT DISCHARGE PIPING LAYOUT
SCALE: 1" = 200'

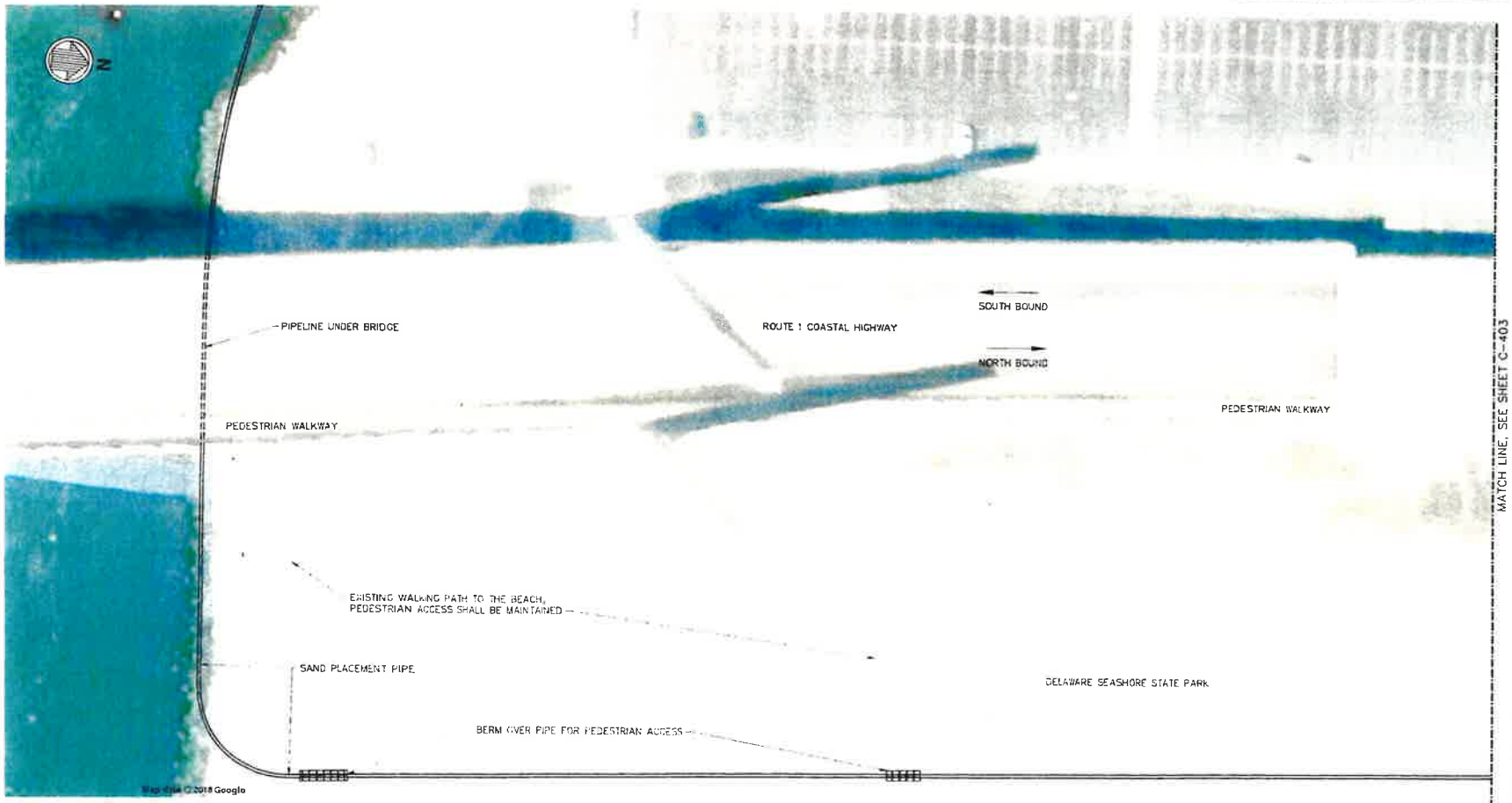
160' 0' 160' 320'
SCALE: 1"=160'

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

ENLARGED PLAN - SAND PLACEMENT DISCHARGE PIPING LAYOUT

Sheet Reference No.
C-401
INDEX 36 OF 40



A1 / C-402 ENLARGED PLAN – INLET ROAD UNDER BRIDGE PIPELINE LAYOUT 1 OF 2
SCALE: 1" = 30'

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

DRAWING SCALES SHOWN BASED ON 22"x34" DRAWING

MASSEY'S DITCH
MAINTENANCE DREDGING
SUSSEX COUNTY, DELAWARE

ENLARGED PLAN - INLET ROAD
UNDER BRIDGE PIPELINE LAYOUT
1 OF 2

Sheet Reference No.
C-402
INDEX 37 OF 40